



# 650V

Frames 1, 2 and 3 (Software v5)

HA501306U001 Issue 1  
Software Manual

aerospace  
climate control  
electromechanical  
filtration  
fluid & gas handling  
hydraulics  
pneumatics  
process control  
sealing & shielding



ENGINEERING YOUR SUCCESS.





---

# 650V AC Drive

Frames 1, 2 and 3

## Software Product Manual

HA501306U001 Issue 1

Compatible with Version 5.2 (onwards) Software

2011 Parker SSD Drives, a division of Parker Hannifin Ltd.

All rights strictly reserved. No part of this document may be stored in a retrieval system, or transmitted in any form or by any means to persons not employed by a Parker SSD Drives company without written permission from Parker SSD Drives, a division of Parker Hannifin Ltd. Although every effort has been taken to ensure the accuracy of this document it may be necessary, without notice, to make amendments or correct omissions. Parker SSD Drives cannot accept responsibility for damage, injury, or expenses resulting therefrom.

### WARRANTY

Parker SSD Drives warrants the goods against defects in design, materials and workmanship for the period of 24 months from the date of manufacture, or 12 months from the date of delivery (whichever is the longer period), on the terms detailed in Parker SSD Drives Standard Conditions of Sale IA500504.

Parker SSD Drives reserves the right to change the content and product specification without notice.

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS  
DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL  
INJURY AND PROPERTY DAMAGE.**

This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

# Safety Information



## Requirements

**IMPORTANT:** Please read this information BEFORE installing the equipment.

### Intended Users

This manual is to be made available to all persons who are required to install, configure or service equipment described herein, or any other associated operation.

The information given is intended to highlight safety issues, and to enable the user to obtain maximum benefit from the equipment.

Complete the following table for future reference detailing how the unit is to be installed and used.

| INSTALLATION DETAILS                                      |                                                   |
|-----------------------------------------------------------|---------------------------------------------------|
| Serial Number<br>(see product label)                      |                                                   |
| Where installed<br>(for your own information)             |                                                   |
| Unit used as a:<br>(refer to Certification for the drive) | Component                      Relevant Apparatus |
| Unit fitted:                                              | Wall-mounted                      Enclosure       |

### Application Area

The equipment described is intended for industrial motor speed control utilising AC induction or AC synchronous machines.

### Personnel

Installation, operation and maintenance of the equipment should be carried out by qualified personnel. A qualified person is someone who is technically competent and familiar with all safety information and established safety practices; with the installation process, operation and maintenance of this equipment; and with all the hazards involved.

### Product Warnings

|                                                                                                                              |                                                                                                                              |                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>Caution</b><br>Risk of electric shock |  <b>Caution</b><br>Refer to documentation |  <b>Earth/Ground</b><br>Protective Conductor Terminal |
|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|

# Safety Information



## Hazards

1. This equipment can endanger life by exposure to rotating machinery and high voltages.
2. The equipment must be permanently earthed due to the high earth leakage current, and the drive motor must be connected to an appropriate safety earth.
3. Ensure all incoming supplies are isolated before working on the equipment. Be aware that there may be more than one supply connection to the drive.
4. There may still be dangerous voltages present at power terminals (motor output, supply input phases, DC bus and the brake, where fitted) when the motor is at standstill or is stopped.
5. For measurements use only a meter to IEC 61010 (CAT III or higher). Always begin using the highest range. CAT I and CAT II meters must not be used on this product.
6. Allow at least 5 minutes for the drive's capacitors to discharge to safe voltage levels (<50V). Use the specified meter capable of measuring up to 1000V dc & ac rms to confirm that less than 50V is present between all power terminals and earth.
7. Unless otherwise stated, this product must NOT be dismantled. In the event of a fault the drive must be returned. Refer to "Routine Maintenance and Repair".

**WARNING! - Ignoring the following may result in injury or damage to equipment**

### SAFETY

**Where there is conflict between EMC and Safety requirements, personnel safety shall always take precedence.**

- Never perform high voltage resistance checks on the wiring without first disconnecting the drive from the circuit being tested.
- Whilst ensuring ventilation is sufficient, provide guarding and /or additional safety systems to prevent injury or damage to equipment.
- When replacing a drive in an application and before returning to use, it is essential that all user defined parameters for the product's operation are correctly installed.
- All control and signal terminals are SELV, i.e. protected by double insulation. Ensure all external wiring is rated for the highest system voltage.
- Thermal sensors contained within the motor must have at least basic insulation.
- All exposed metalwork in the Inverter is protected by basic insulation and bonded to a safety earth.
- RCDs are not recommended for use with this product but, where their use is mandatory, only Type B RCDs should be used.

### EMC

- In a domestic environment this product may cause radio interference in which case supplementary mitigation measures may be required.
- This equipment contains electrostatic discharge (ESD) sensitive parts. Observe static control precautions when handling, installing and servicing this product.
- This is a product of the restricted sales distribution class according to IEC 61800-3. It is designated as "professional equipment" as defined in EN61000-3-2. Permission of the supply authority shall be obtained before connection to the low voltage supply.

## CAUTION!

### APPLICATION RISK

- The specifications, processes and circuitry described herein are for guidance only and may need to be adapted to the user's specific application. We can not guarantee the suitability of the equipment described in this Manual for individual applications.

### RISK ASSESSMENT

Under fault conditions, power loss or unintended operating conditions, the drive may not operate as intended. In particular:

- Stored energy might not discharge to safe levels as quickly as suggested, and can still be present even though the drive appears to be switched off
- The motor's direction of rotation might not be controlled
- The motor speed might not be controlled
- The motor might be energised

A drive is a component within a drive system that may influence its operation or effects under a fault condition. Consideration must be given to:

- Stored energy
- Supply disconnects
- Sequencing logic
- Unintended operation

# Contents

Contents

Page

| <b>CHAPTER 1</b> | <b>PROGRAMMING YOUR APPLICATION</b>                | <b>1-1</b> |
|------------------|----------------------------------------------------|------------|
|                  | <b>Programming with Block Diagrams .....</b>       | <b>1-1</b> |
|                  | Modifying a Block Diagram Over Comms .....         | 1-1        |
|                  | • Configuration and Parameterisation Modes .....   | 1-1        |
|                  | • Execution Rules .....                            | 1-2        |
|                  | • Saving Your Modifications .....                  | 1-2        |
|                  | <b>Function Block Descriptions .....</b>           | <b>1-3</b> |
|                  | Understanding the Function Block Description ..... | 1-3        |
|                  | Function Blocks by Category .....                  | 1-4        |
|                  | Function Blocks in Alphabetical Order .....        | 1-5        |
|                  | • ANALOG INPUT .....                               | 1-5        |
|                  | • ANALOG OUTPUT .....                              | 1-7        |
|                  | • APP CONFIG .....                                 | 1-8        |
|                  | • APP CONFIG .....                                 | 1-8        |
|                  | • APP MENU .....                                   | 1-11       |
|                  | • AT LOAD .....                                    | 1-13       |
|                  | • AT SPEED .....                                   | 1-14       |
|                  | • AUTO RESTART .....                               | 1-15       |
|                  | • AUTOTUNE.....                                    | 1-17       |
|                  | • BRAKE CONTROL.....                               | 1-18       |
|                  | • COMMS CONTROL .....                              | 1-19       |
|                  | • COMMS PORTS.....                                 | 1-20       |
|                  | • CURRENT LIMIT .....                              | 1-22       |
|                  | • CURRENT LIMIT .....                              | 1-22       |
|                  | • DEMULTIPLEXER .....                              | 1-23       |
|                  | • DIGITAL INPUT.....                               | 1-24       |
|                  | • DIGITAL INPUTS.....                              | 1-25       |
|                  | • DIGITAL OUTPUT .....                             | 1-26       |
|                  | • DIGITAL OUTPUTS .....                            | 1-27       |
|                  | • DISPLAY/KEYPAD .....                             | 1-28       |
|                  | • DISPLAY SCALE .....                              | 1-29       |
|                  | • DYNAMIC BRAKING .....                            | 1-31       |
|                  | • ENCODER.....                                     | 1-32       |
|                  | • ENERGY METER.....                                | 1-33       |
|                  | • FEEDBACKS .....                                  | 1-34       |
|                  | • FLUXING.....                                     | 1-35       |
|                  | • FLYCATCHING.....                                 | 1-38       |
|                  | • INJ BRAKING .....                                | 1-40       |
|                  | • INVERSE TIME.....                                | 1-41       |
|                  | • INVERSE TIME.....                                | 1-41       |

# Contents

| <i>Contents</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <i>Page</i>                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| <ul style="list-style-type: none"> <li>• I/O TRIPS ..... 1-42</li> <li>• LOCAL CONTROL..... 1-43</li> <li>• LOGIC FUNCTION ..... 1-44</li> <li>• MINIMUM SPEED ..... 1-49</li> <li>• MMI ACCESS ..... 1-50</li> <li>• MOTOR DATA..... 1-51</li> <li>• MULTIPLEXER ..... 1-53</li> <li>• PATTERN GEN..... 1-54</li> <li>• PID ..... 1-55</li> <li>• PID ..... 1-55</li> <li>• PRESET..... 1-57</li> <li>• RAISE/LOWER ..... 1-59</li> <li>• REFERENCE..... 1-60</li> <li>• REFERENCE JOG..... 1-63</li> <li>• REFERENCE RAMP ..... 1-64</li> <li>• REFERENCE STOP..... 1-66</li> <li>• SEQUENCING LOGIC..... 1-67</li> <li>• SKIP FREQUENCIES ..... 1-70</li> <li>• SLEW RATE LIMIT ..... 1-72</li> <li>• SLIP COMP ..... 1-73</li> <li>• SPEED LOOP..... 1-74</li> <li>• STABILISATION ..... 1-76</li> <li>• STALL TRIP..... 1-77</li> <li>• TORQUE LIMIT ..... 1-78</li> <li>• TRIPS HISTORY ..... 1-79</li> <li>• TRIPS STATUS..... 1-80</li> <li>• VALUE FUNCTION ..... 1-83</li> <li>• VOLTAGE CONTROL ..... 1-91</li> <li>• ZERO SPEED ..... 1-92</li> <li>• ZERO SPEED ..... 1-92</li> </ul> |                                    |
| <b>Normal/Heavy Duty Selection .....</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>1-93</b>                        |
| <b>CHAPTER 2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>PARAMETER SPECIFICATION 2-1</b> |
| <b>Specification Table: Tag Number Order.....</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>2-2</b>                         |
| <b>MMI Parameters .....</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>2-21</b>                        |
| Pref Cross Reference Table .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2-24                               |
| <b>Product-Related Default Values .....</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>2-26</b>                        |
| * Frequency Dependent Defaults .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2-26                               |
| ** Power Dependent Defaults.....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2-27                               |
| <b>CHAPTER 3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>SERIAL COMMUNICATIONS 3-1</b>   |

# Contents

*Contents*

*Page*

## **Communications Technology Options..... 3-1**

DSELite ..... 3-1

## **Connection to the P3 Port ..... 3-1**

## **CHAPTER 4 SEQUENCING LOGIC STATES 4-1**

### **Principle State Machine ..... 4-1**

Main Sequencing States..... 4-1

State Outputs of the SEQUENCING LOGIC Function Block ..... 4-1

Transition of States ..... 4-2

State Diagram ..... 4-3

### **External Control of the Drive ..... 4-4**

Communications Command..... 4-4

- Example Commands ..... 4-5

Communications Status ..... 4-6

## **CHAPTER 5 APPLICATIONS 5-1**

### **The Default Application ..... 5-1**

### **How to Load an Application ..... 5-1**

### **Application Description ..... 5-1**

Application 1: Basic Speed Control (default) ..... 4

Application 2: Auto/Manual..... 6

Application 3: Preset Speeds..... 8

Application 4: Raise/Lower Trim..... 5

Application 5: PID ..... 4

Application 6: Aux Comms ..... 4



## Chapter 1

## PROGRAMMING YOUR APPLICATION

You can program the drive to your specific application. This programming simply involves changing parameter values. Access the parameters using the keypad, or DSE Lite (or other suitable programming tool).

Each Application recalls a pre-programmed set of default parameters and links when it is loaded.

Refer to Chapter 5: “Applications” for further information.

## Programming with Block Diagrams

Block diagram programming provides a visual method of planning the software to suit your application. There are block diagrams provided at the end of this chapter, each showing the software connections for an Application. These pages replicate the DSE Lite programming screens. DSE Lite is SSD Drive’s own programming tool.

The processes performed by an Application are represented as a block diagram, consisting of *function blocks* and *links*:

- Each function block contains the parameters required for setting-up a particular processing feature. Sometimes more than one instance of a function block is provided for a feature, i.e. for multiple digital inputs.
- Software links are used to connect the function blocks. Each link transfers the value of an output parameter to an input parameter of another (or the same) function block.

Each individual block is a processing feature, i.e. it takes the input parameter, processes the information, and makes the result available as one or more output parameters.

## Modifying a Block Diagram Over Comms

### Configuration and Parameterisation Modes

There are two modes of operation used while modifying a block diagram: *Configuration* and *Parameterisation* modes.

#### Configuration Mode

In the Configuration Mode you can modify the links in the function block diagram. You can also change parameter values, as above. The drive cannot run in this mode.

When you attempt to change a parameter value requiring Configuration Mode to be enabled, the drive automatically enters Configuration Mode.

Once in Configuration Mode, to return to Parameterisation Mode simply press the **E** key repeatedly.

#### Parameterisation Mode

In parameterisation mode you can change parameter values. The drive can be running or stopped. Note that some parameters can only be changed when the drive is stopped. It is not possible to modify the internal links when the drive is in parameterisation



mode.

# 1-2 Programming Your Application

## Execution Rules

The complete block diagram is executed every 5ms. Just before a function block is executed, all the links that have that block as their destination are executed, thereby copying new values in to the block's parameter inputs. The input parameters are then processed to produce a new set of output parameters. The execution order of the blocks is automatically arranged for minimal delay.

- The output value transferred by a link on execution is clamped to be between the maximum and minimum value for its destination input parameter.
- Refer to the table below for the result of linking different parameter types.

| Source Value<br>(the input) | Source Type | Destination<br>Type | Destination Value<br>(the result)                                  |
|-----------------------------|-------------|---------------------|--------------------------------------------------------------------|
| TRUE                        | Boolean     | Real                | 0.01                                                               |
| FALSE                       | Boolean     | Real                | 0.00                                                               |
| $\geq 0.005$                | Real        | Boolean             | TRUE                                                               |
| $\leq 0.005$                | Real        | Boolean             | FALSE                                                              |
| LOCAL ONLY (1)              | Enumerated  | Real                | 1.00                                                               |
| 2.00                        | Real        | Enumerated          | REMOTE ONLY (2) (Note that (2) will not always return Remote Only) |

Table 1-1 Execution Rules

## Saving Your Modifications

Whenever a value/link is changed, the modification is stored automatically and will be saved on power-down.

# Function Block Descriptions

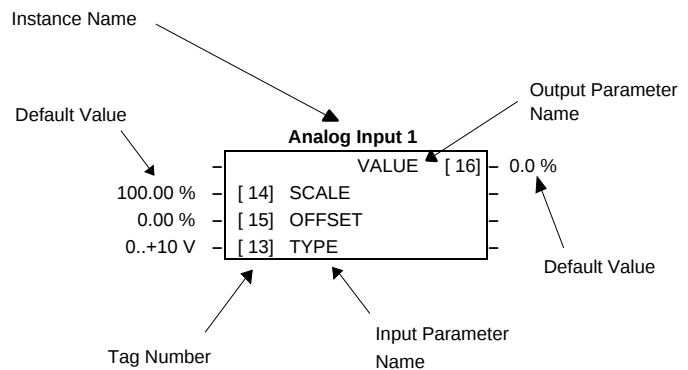
**Note:** To view all parameters available on the MMI, Full menu detail must be selected in the DETAILED MENUS parameter (<sup>ST</sup>99). Additional blocks/parameters are available over the Comms.

## Understanding the Function Block Description

The following function blocks show the parameter information necessary for programming the drive.

Input parameters are shown on the left hand side, and output parameters are shown on the right hand side of the block.

The diagrams assume that the UK country code is selected and that a 400V 11kW Frame C power board is fitted. This is reflected in the values of certain parameters, see “\*” and “\*\*” in the table below.



**Figure Chapter 1 -1 Function Block Parameter Information**

|                                    |                                                                                                                                                                                                                                                                                                         |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Instance Name</b>               | Names the function block and MMI menu                                                                                                                                                                                                                                                                   |
| <b>Default Value</b>               | The default value of the unmodified macro, Macro 0                                                                                                                                                                                                                                                      |
| <b>Input/Output Parameter Name</b> | The name shown on DSE Lite                                                                                                                                                                                                                                                                              |
| <b>Tag Number</b>                  | Unique identification used for communications                                                                                                                                                                                                                                                           |
| <b>*</b>                           | Parameters marked with “*” are set to a value depending upon the “operating frequency” of the drive. Refer to Chapter 2: “Parameter Specification” - Frequency Dependent Defaults; and the Installation Product Manual, Chapter 5: “The Operator Station” - Changing the Product Code (3-button reset). |
| <b>**</b>                          | Parameters marked with “**” are set to a value depending on the overall “power build” of the drive indicated by the product code. Refer to Chapter 2: “Parameter Specification” - Power Dependent Defaults; and the Installation Product Manual: Chapter 2: “Understanding the Product Code”.           |

**Note:** The “Range” for a parameter value is given in the Parameter Description Table on each Function Block page. Ranges for outputs are given as “—.xx %”, for example, indicating an indeterminate integer for the value, to two decimal places.

|           |                                                                                                                                                                                       |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>F</b>  | Parameters indicated with <b>F</b> are visible with Full menus only. Refer to the DETAILED MENUS parameter ( <sup>ST</sup> 99) in the MMI ACCESS function block, page 1-50.           |
| <b>M</b>  | Parameters indicated with <b>M</b> are Motor Parameters. They are not reset by changing Application using parameter <sup>P</sup> 1; all other parameters are reset to default values. |
| <b>VF</b> | Parameters indicated with <b>VF</b> are only visible when the drive is in VF (Volts/Hz) motor control mode, as selected by parameter <sup>S</sup> CL01.                               |
| <b>SV</b> | Parameters indicated with <b>SV</b> are only visible when the drive is in SV (Sensorless Vector) motor control mode, as selected by parameter <sup>S</sup> CL01.                      |

# 1-4 Programming Your Application

## Function Blocks by Category

The function block descriptions in this chapter are arranged in alphabetical order, however, they are listed below by Category.

### Communications

|             |      |
|-------------|------|
| COMMS PORTS | 1-20 |
|-------------|------|

### Configuration

|            |     |
|------------|-----|
| APP CONFIG | 1-8 |
|------------|-----|

### Encoder Functions

|         |      |
|---------|------|
| ENCODER | 1-32 |
|---------|------|

### Hoist/Lift

|               |      |
|---------------|------|
| BRAKE CONTROL | 1-18 |
|---------------|------|

### Inputs/Outputs

|               |     |                 |      |
|---------------|-----|-----------------|------|
| ANALOG INPUT  | 1-5 | DIGITAL INPUT   | 1-24 |
| ANALOG OUTPUT | 1-7 | DIGITAL INPUTS  | 1-25 |
|               |     | DIGITAL OUTPUT  | 1-26 |
|               |     | DIGITAL OUTPUTS | 1-27 |

### Menus

|          |      |            |      |
|----------|------|------------|------|
| APP MENU | 1-11 | MMI ACCESS | 1-50 |
|----------|------|------------|------|

### Miscellaneous

|                |      |                |      |
|----------------|------|----------------|------|
| DEMULTIPLEXER  | 1-23 | MULTIPLEXER    | 1-53 |
| LOGIC FUNCTION | 1-44 | VALUE FUNCTION | 1-83 |

### Motor Control

|                |      |                 |      |
|----------------|------|-----------------|------|
| AUTOTUNE       | 1-17 | INVERSE TIME    | 1-41 |
| CURRENT LIMIT  | 1-22 | MOTOR DATA      | 1-50 |
| DISPLAY/KEYPAD | 1-28 | PATTERN GEN     | 1-54 |
| DISPLAY SCALE  | 1-29 | SLEW RATE LIMIT | 1-72 |
| ENERGY METER   | 1-33 | SLIP COMP       | 1-73 |
| FEEDBACKS      | 1-34 | SPEED LOOP      | 1-74 |
| FLUXING        | 1-35 | STABILISATION   | 1-76 |
| FLYCATCHING    | 1-38 | TORQUE LIMIT    | 1-78 |
| INJ BRAKING    | 1-40 | VOLTAGE CONTROL | 1-91 |

### Sequencing and Referencing

|               |      |                  |      |
|---------------|------|------------------|------|
| AUTO RESTART  | 1-15 | REFERENCE JOG    | 1-63 |
| COMMS CONTROL | 1-19 | REFERENCE RAMP   | 1-64 |
| LOCAL CONTROL | 1-43 | REFERENCE STOP   | 1-66 |
| REFERENCE     | 1-60 | SEQUENCING LOGIC | 1-67 |

### Setpoint Functions

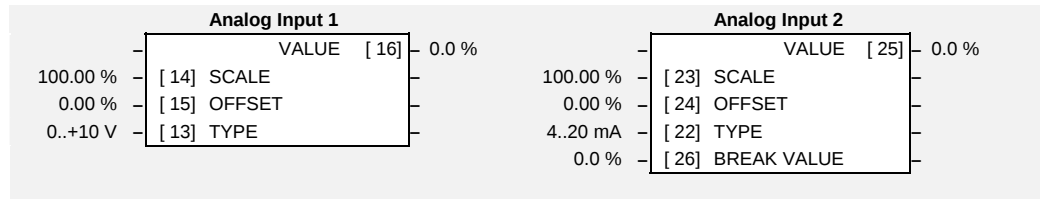
|               |      |                  |      |
|---------------|------|------------------|------|
| AT LOAD       | 1-13 | PRESET           | 1-57 |
| AT SPEED      | 1-14 | RAISE/LOWER      | 1-59 |
| MINIMUM SPEED | 1-49 | SKIP FREQUENCIES | 1-70 |
| PID           | 1-55 | ZERO SPEED       | 1-92 |

### Trips

|            |      |               |      |
|------------|------|---------------|------|
| I/O TRIPS  | 1-42 | TRIPS HISTORY | 1-79 |
| STALL TRIP | 1-77 | TRIPS STATUS  | 1-80 |

## Function Blocks in Alphabetical Order

### ANALOG INPUT



The analog input block converts the input voltage or current into a value expressed as a percentage of a configurable range.

### Parameter Descriptions

**SCALE** *SET/IN IP11 & IP21* *Range: -300.00 to 300.00 %*

A scaling factor applied to the raw input. With a scaling factor of 100.00% and an offset of 0.00%, an input equal to the low input range will appear as a value of 0.00%. Similarly, an input equal to the high input range will appear as a value of 100.00%.

**OFFSET** *SET/IN IP12 & IP22* *Range: -300.00 to 300.00 %*

An offset added to the input after the scaling factor has been applied.

**TYPE** *SET/IN IP13 & IP23* *Range: Enumerated - see below*

The input range and type.

ANALOG INPUT 1 supports Types 0 and 1 only. ANALOG INPUT 2 support all types.

*Enumerated Value : Type*

- 0 : 0..+10 V
- 1 : 0..+5 V
- 2 : 0..20 mA
- 3 : 4..20 mA

**BREAK VALUE** *Range: -100.0 to 100.0 %*

The value that will appear as the VALUE output when BREAK is TRUE

**VALUE** *SET/IN IPA1 & IPA2* *Range: —.x %*

The input reading with scaling and offset applied.

# 1-6 Programming Your Application

## Functional Description

The drive has two analog inputs. There is an analog input function block for each:

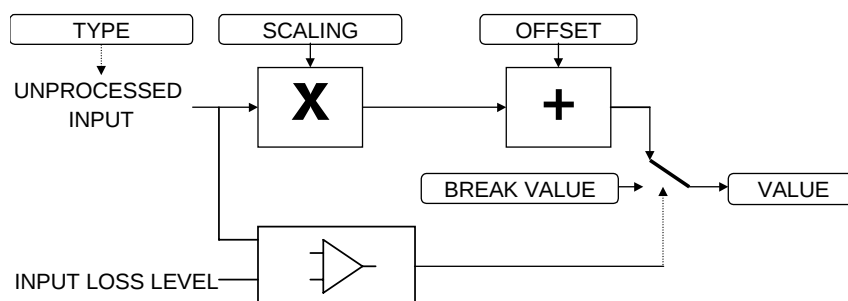
ANALOG INPUT 1 is associated with the signal on terminal 2

ANALOG INPUT 2 is associated with the signal on terminal 3

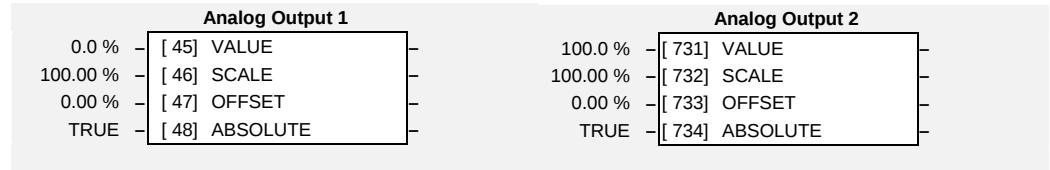
The input voltage is pre-processed and converted into a numeric value by the analog input electronics of the drive. The analog input function blocks further process this reading so that a value of 0.00% represents an input equal to the low input range, while a value of 100.00% represents an input equal to the high input range. The SCALE and OFFSET factors are then applied as shown to produce a value suitable for use in the application.

The break detect facility is only used in conjunction with the "4 to 20mA" hardware range. An input break is defined as an input reading less than either 0.1V or 0.45mA. When an input break has been detected, the VALUE output is forced to be the BREAK VALUE.

If you don't want the break detect facility, select the "0 to 20mA". You can also apply OFFSET to recreate the "4 to 20mA" hardware range.



## ANALOG OUTPUT



The analog output block convert the demand percentage into a form suitable for driving the analog output electronics of the drive.

## Parameter Descriptions

**VALUE** *DIAG OPA1 & A2* *Range: -300.0 to 300.0 %*

The demanded value to output.

**SCALE** *SET/OUT OP11 & 12* *Range: -300.00 to 300.00 %*

A scaling factor to apply to VALUE . A scaling factor of 100.00% has no effect.

**OFFSET** *SET/OUT OP12 & 22* *Range: -300.00 to 300.00 %*

An offset added to VALUE after the scaling factor has been applied. An offset factor of 0.00% has no effect.

**ABS** *SET/OUT OP13 & 23* *Range: FALSE / TRUE*

When TRUE the output sign is ignored.

## Functional Description

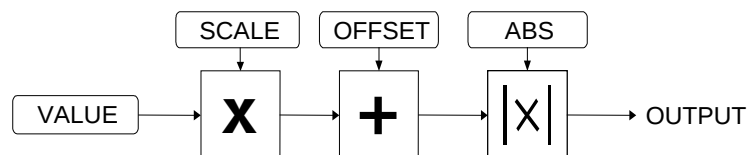
The drive has two analog outputs:

ANALOG OUTPUT 1 is associated with terminal 5  
ANALOG OUTPUT 2 is associated with terminal 4

The scaling and offset parameters are applied to the demand value as shown.

If ABS is TRUE then the final output is the magnitude of value after being scaled and offset and the output sign is ignored

If ABS is FALSE then as above, except that the output sign is valid.



# 1-8 Programming Your Application

## APP CONFIG

This block controls the selection of user application and of the output wiring

| App Config     |   |                       |
|----------------|---|-----------------------|
| STANDARD       | - | [1091] APPLICATION    |
| DEMAND         | - | [1092] ANOUT 1 SOURCE |
| NONE           | - | [1109] ANOUT 2 SOURCE |
| HEALTH         | - | [1093] RELAY SOURCE   |
| NONE           | - | [1094] DIGIO2 SOURCE  |
| NONE           | - | [1016] DIGIO1 SOURCE  |
| FALSE          | - | [1064] APP LOCK       |
| RUN FORWARD    | - | [310] DIGIN 1 DEST    |
| REMOTE REVERSE | - | [311] DIGIN 2 DEST    |
| JOG            | - | [312] DIGIN 3 DEST    |
| NOT STOP       | - | [313] DIGIN 4 DEST    |
| COAST STOP     | - | [314] DIGIN 5 DEST    |
| NONE           | - | [315] DIGIN 6 DEST    |
| NONE           | - | [316] DIGIN 7 DEST    |

## Parameter Descriptions

**APPLICATION** *PAR1* *Range: Enumerated - see below*

This parameter selects and loads the Application to be used. APP 0 will not control a motor. APP 7 & 8 are for future use. You can edit an Application in DSE Lite and, then set this parameter to CUSTOM to produce your own custom Application.

Refer to Chapter 5: "Applications" which gives detailed information about each Application.

- 0 : NULL
- 1 : STANDARD
- 2 : LOCAL/REM (AUTO/MANUAL)
- 3 : PRESETS
- 4 : RAISE/LOWER
- 5 : PID
- 6 : AUXILLARY COMMS
- 7 : APP 7
- 8 : APP 8
- 9 : CUSTOM

**ANOUT 1 SOURCE** *SET/CONF AOP1* *Range: Enumerated - see below*

This parameter is ignored if APPLICATION is set to CUSTOM.

The source of the analog output, terminal 5. An internal link is made to one of the following parameters:

- 0 : NONE *No link is made*
- 1 : DEMAND *SPEED DEMAND in the REFERENCE block*
- 2 : CURRENT *MOTOR CURRENT% in the FEEDBACKS block*
- 3 : PID ERROR *ERROR in the PID Block*
- 4 : R/L OUTPUT *OUTPUT in the RAISE/LOWER block*

**ANOUT 2 SOURCE** *SET/CONF AOP2* *Range: Enumerated - see below*

This parameter is ignored if APPLICATION is set to CUSTOM.

The source of the analog output, terminal 4. An internal link is made to one of the following parameters:

- 0 : NONE *No link is made*
- 1 : DEMAND *SPEED DEMAND in the REFERENCE block*
- 2 : CURRENT *MOTOR CURRENT% in the FEEDBACKS block*
- 3 : PID ERROR *ERROR in the PID Block*
- 4 : R/L OUTPUT *OUTPUT in the RAISE/LOWER block*

## Parameter Descriptions

**RELAY SOURCE**      *SET\CONF DOP3*      *Range: Enumerated - see below*

This parameter is ignored if APPLICATION is set to CUSTOM.

The source of the relay output, terminals RL1A and RL1B. An internal link is made to one of the following parameters:

|              |                                              |
|--------------|----------------------------------------------|
| 0 : NONE     | <i>No link is made</i>                       |
| 1 : HEALTH   | <i>HEALTHY in the SEQ LOGIC block</i>        |
| 2 : TRIPPED  | <i>TRIPPED in the SEQ LOGIC block</i>        |
| 3 : RUNNING  | <i>RUNNING in the SEQ LOGIC block</i>        |
| 4 : AT ZERO  | <i>AT ZERO SPD in the ZERO SPEED block</i>   |
| 5 : AT SPEED | <i>AT SPEED in the AT SPEED block</i>        |
| 6 : AT LOAD  | <i>AT OR ABOVE LOAD in the AT LOAD block</i> |
| 7 : READY    | <i>Waiting for contactor to be closed</i>    |

**DIGIO2 SOURCE**      *SET\CONF DOP2*      *Range: Enumerated - see below*

This parameter is ignored if APPLICATION is set to CUSTOM.

The source of the digital output 2, terminal 10. An internal link is made to one of the following parameters:

|              |                                              |
|--------------|----------------------------------------------|
| 0 : NONE     | <i>No link is made</i>                       |
| 1 : HEALTH   | <i>HEALTHY in the SEQ LOGIC block</i>        |
| 2 : TRIPPED  | <i>TRIPPED in the SEQ LOGIC block</i>        |
| 3 : RUNNING  | <i>RUNNING in the SEQ LOGIC block</i>        |
| 4 : AT ZERO  | <i>AT ZERO SPD in the ZERO SPEED block</i>   |
| 5 : AT SPEED | <i>AT SPEED in the AT SPEED block</i>        |
| 6 : AT LOAD  | <i>AT OR ABOVE LOAD in the AT LOAD block</i> |
| 7 : READY    | <i>Waiting for contactor to be closed</i>    |

**DIGIO1 SOURCE**      *SET\CONF DOPD1*      *Range: Enumerated - see below*

This parameter is ignored if APPLICATION is set to CUSTOM.

The source of the digital output 1, terminal 9. An internal link is made to one of the following parameters:

|              |                                              |
|--------------|----------------------------------------------|
| 0 : NONE     | <i>No link is made</i>                       |
| 1 : HEALTH   | <i>HEALTHY in the SEQ LOGIC block</i>        |
| 2 : TRIPPED  | <i>TRIPPED in the SEQ LOGIC block</i>        |
| 3 : RUNNING  | <i>RUNNING in the SEQ LOGIC block</i>        |
| 4 : AT ZERO  | <i>AT ZERO SPD in the ZERO SPEED block</i>   |
| 5 : AT SPEED | <i>AT SPEED in the AT SPEED block</i>        |
| 6 : AT LOAD  | <i>AT OR ABOVE LOAD in the AT LOAD block</i> |
| 7 : READY    | <i>Waiting for contactor to be closed</i>    |

**APP LOCK**       *SET\SETP ST98*      *Range: FALSE / TRUE*

Set this parameter to TRUE to prevent the APPLICATION parameter from being edited.

**DIGIN 1 DEST**      *SET\CONF DIN1*      *Range: Enumerated – see below*

This parameter is ignored if APPLICATION is set to CUSTOM.

- 0 : NONE
- 1 : RUN FORWARD
- 2 : RUN REVERSE
- 3 : NOT STOP
- 4 : JOG
- 5 : CONTACTOR CLOSED
- 6 : DRIVE ENABLE
- 7 : NOT FAST STOP
- 8 : NOT COAST STOP
- 9 : REMOTE REVERSE
- 10 : REM TRIP RESET
- 11 : RAISE INPUT

## Parameter Descriptions

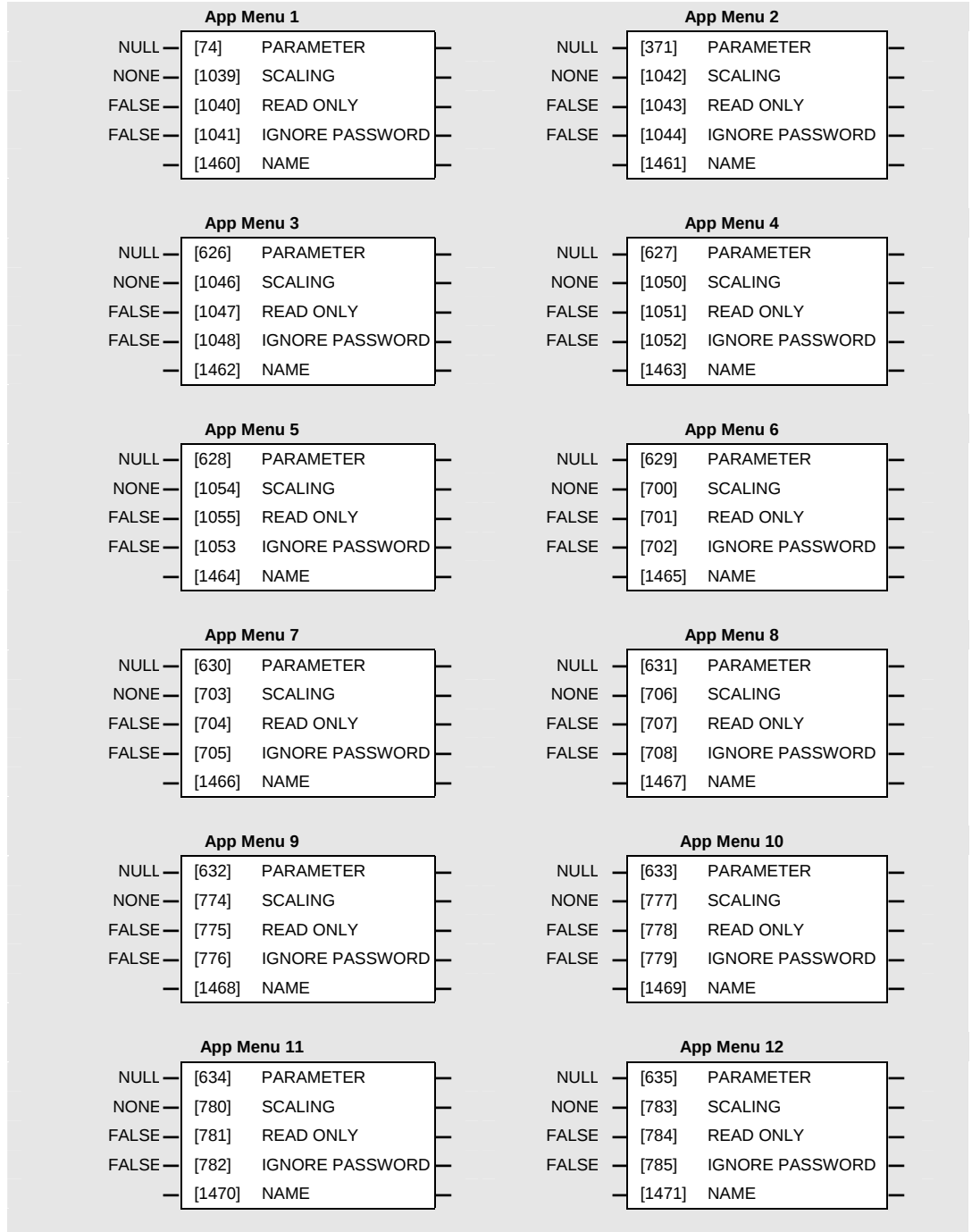
12 : LOWER INPUT  
 13 : RL RESET  
 14 : PID ENABLE  
 15 : VALUE 1 INPUT A  
 16 : VALUE 1 INPUT B  
 17 : VALUE 1 INPUT C  
 18 : VALUE 2 INPUT A  
 19 : VALUE 2 INPUT B  
 20 : VALUE 2 INPUT C  
 21 : VALUE 3 INPUT C  
 22 : VALUE 4 INPUT C  
 23 : LOGIC 1 INPUT A  
 24 : LOGIC 1 INPUT B  
 25 : LOGIC 1 INPUT C  
 26 : LOGIC 3 INPUT A  
 27 : LOGIC 3 INPUT B  
 28 : LOGIC 3 INPUT C

|                     |                      |                                             |
|---------------------|----------------------|---------------------------------------------|
| <b>DIGIN 2 DEST</b> | <i>SET\CONF DIN2</i> | <i>Range: Enumerated – see DIGIN 1 DEST</i> |
| <b>DIGIN 3 DEST</b> | <i>SET\CONF DIN3</i> | <i>Range: Enumerated – see DIGIN 1 DEST</i> |
| <b>DIGIN 4 DEST</b> | <i>SET\CONF DIN4</i> | <i>Range: Enumerated – see DIGIN 1 DEST</i> |
| <b>DIGIN 5 DEST</b> | <i>SET\CONF DIN5</i> | <i>Range: Enumerated – see DIGIN 1 DEST</i> |
| <b>DIGIN 6 DEST</b> | <i>SET\CONF DIN6</i> | <i>Range: Enumerated – see DIGIN 1 DEST</i> |
| <b>DIGIN 7 DEST</b> | <i>SET\CONF DIN7</i> | <i>Range: Enumerated – see DIGIN 1 DEST</i> |

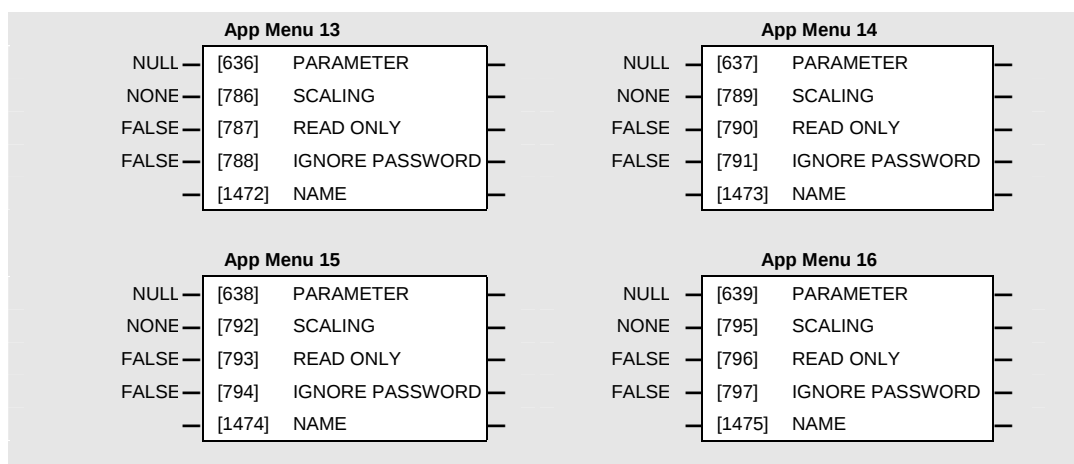
## APP MENU

These function blocks are used to configure the Application menu. This feature provides quick access to frequently used parameters. Any parameter may be “promoted” to the Application menu, and the parameter is then automatically saved on power-down.

In addition, parameters displayed in the Operator menu may be given a different name, and may be rescaled for display using the DISPLAY SCALE function blocks.



# 1-12 Programming Your Application



## Parameter Descriptions

### PARAMETER

Range: 0 to 1686

Enter the parameter to be displayed in the APP MENU. The parameter may be selected by first choosing the block that the parameter is within, then choosing the parameter itself.

### NAME

Range: 16 characters maximum

The NAME parameter is only shown when the drive is used with the 6901 operator station. When the standard 650 operator station is used, (the 6511 or 6512) then the entries in the APP MENU are simply numbered AP1 to AP16.

### SCALING

Range: See below

Selects a DISPLAY SCALE function block to be applied to the value of PARAMETER.

Enumerated Value : DISPLAY SCALE function block

- 0 : NONE
- 1 : DISPLAY SCALE 1
- 2 : DISPLAY SCALE 2

### READ ONLY

Range: FALSE / TRUE

When TRUE, this entry in the APP MENU will not be adjustable.

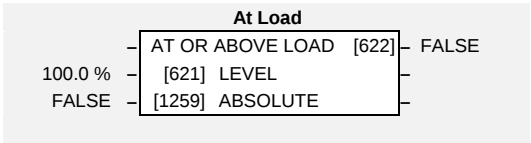
### IGNORE PASSWORD

Range: FALSE / TRUE

When TRUE, this entry in the APP MENU may be adjusted regardless of the password protection feature.

**AT LOAD**

This function block is used to generate the AT OR ABOVE LOAD signal that may be used as a digital output (refer to the APP CONFIG block).



If operating as an open-loop drive (V/F fluxing) it is important to enter the no-load current at rated speed in to the MAG CURRENT parameter (<sup>S</sup>CL14 - MOTOR DATA function block), otherwise the LEVEL from this block could be inaccurate.

**Parameter Descriptions**

**LEVEL** *SET\SETP ST42* *Range: -300.0 to 300.0 %*  
This parameter sets the value of load at which the AT OR ABOVE LOAD parameter becomes TRUE. 100% = rated torque for the motor.

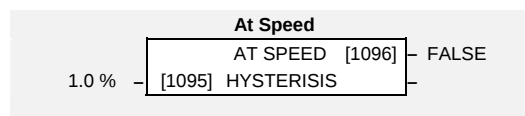
**ABSOLUTE** *SET\SETP ST43* *Range: FALSE / TRUE*  
When TRUE, the direction of rotation is ignored. In this case, the comparison level should always be positive.  
  
When FALSE, the direction of rotation is not ignored. Driving a load in the reverse direction gives a negative value for torque. In this case, the comparison level may be positive or negative.

**AT OR ABOVE LOAD** *Range: FALSE / TRUE*  
This parameter is TRUE if the load is equal to or above the value set by the LEVEL parameter.

# 1-14 Programming Your Application

## AT SPEED

This function block is used to generate the AT SPEED signal that may be used as a digital output (refer to the APP CONFIG block).



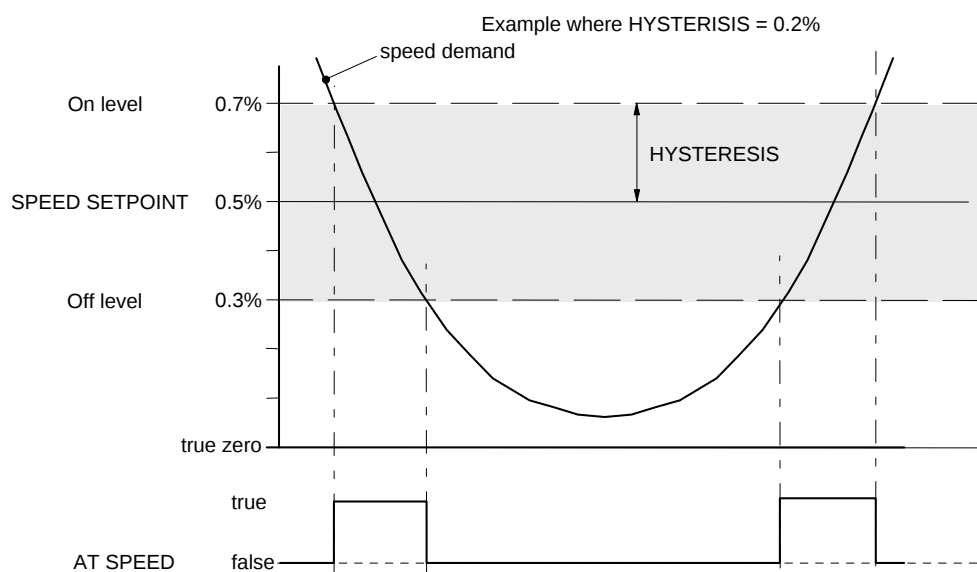
## Parameter Descriptions

### HYSTERESIS

Range: 0.0 to 300.0 %

Provides a hysteresis band about the Speed Setpoint in which the AT SPEED output is stable.

The Speed Setpoint is shown by the Speed Setpoint (%) diagnostic in the Diagnostics menu, which is shown as a percentage of the MAX SPEED parameter (Hz).



### AT SPEED

Range: FALSE / TRUE

This parameter is TRUE when the speed demand is within the hysteresis band, as shown above, otherwise it is FALSE.

## AUTO RESTART

Auto Restart (or Auto Reset) provides the facility to automatically reset a choice of trip events and restart the drive with a programmed number of attempts, after which, a manual or remote trip reset is required if the drive is not successfully restarted. The number of attempted restarts is recorded. This count is cleared after a trip-free period of operation, (5 minutes or 4 x ATTEMPT DELAY 1, whichever is the longer), or after a successful manual or remote trip reset, or by removing the Run signal.

| Auto Restart |                     |       |       |
|--------------|---------------------|-------|-------|
|              | PENDING             | [608] | FALSE |
|              | RESTARTING          | [616] | FALSE |
|              | ATTEMPTS LEFT       | [614] | 0     |
|              | TIME LEFT           | [615] | 0.0s  |
|              | STATE               | [610] | IDLE  |
| 0            | [612] ATTEMPTS      |       |       |
| 10.0 s       | [613] ATTEMPT DELAY |       |       |
| 0x0000       | [609] TRIGGERS 1    |       |       |
| 0x0000       | [744] TRIGGERS 1+   |       |       |
| FALSE        | [611] EXTENDED MODE |       |       |

In addition, if EXTENDED MODE is TRUE, then the Auto Restart feature will also operate when the drive is not running.

## Parameter Descriptions

**ATTEMPTS** *SET\SETP ST21*

*Range: 1 to 10*

Determines the number of restarts that will be permitted before requiring an external fault reset.

**ATTEMPT DELAY 1** *SET\SETP ST22*

*Range: 0.0 to 600.0 s*

Determines the delay between restart attempts for a trip included in TRIGGERS 1. The delay is measured from all error conditions clearing.

**TRIGGERS 1 and TRIGGERS+ 1** *SET\SETP ST23 and SET\SETP ST24*

*Range: 0000 to FFFF*

Allows Auto Restart to be enabled for a selection of trip conditions.

Refer to TRIPS STATUS, page 1-80 for an explanation of the four-digit codes.

**EXTENDED MODE**

*Range: FALSE / TRUE*

When FALSE, the block functions as in earlier versions of firmware.

When TRUE, the auto-restart feature operates to reset a trip even when the run signal is removed.

**WARNING:** When EXTENDED MODE is active and the RUN input goes TRUE after a trip occurs, ***the drive will start*** when the trip is automatically reset if the POWER UP START parameter in the SEQUENCING LOGIC block is TRUE.

**PENDING**

*Range: FALSE / TRUE*

Indicates that an auto restart will occur after the programmed delay.

**RESTARTING**

*Range: FALSE / TRUE*

Indicates that an auto restart is occurring. TRUE for a single block diagram execution cycle.

**ATTEMPTS LEFT**

*Range: —.*

Indicates the number of attempts left before an external fault reset is required.

**TIME LEFT**

*Range: —.x s*

When in the Restarting state, this parameter indicates the time left before an auto restart attempt will be permitted. When non-zero, this value is unaffected by changes to ATTEMPT DELAY 1.

# 1-16 Programming Your Application

## STATE

*Range: Enumerated (see below)*

*Enumerated Value : Mode*

0 : DISABLED

1 : IDLE

2 : ARMED

3 : TIMING

4 : LOCKED

**DISABLED:** The auto restart function is disabled by setting the number of attempts allowed to zero.

**IDLE:** The idle state.

**ARMED:** The auto restart function has detected a relevant trip has occurred. A restart will be attempted once the trip source becomes inactive.

**TIMING:** When non-zero this parameter indicates the time until a restart will be attempted.

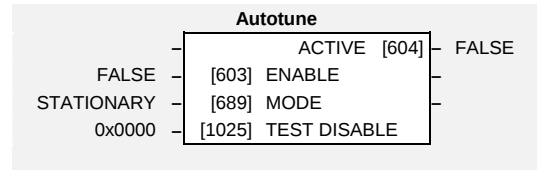
**LOCKED:** The auto restart function is temporarily disabled due to the number of restarts reaching the restart attempts count.

## AUTOTUNE

**Designed for SENSORLESS VEC Motor Control Mode.**

The Autotune is an automatic test sequence performed by the drive to identify motor model parameters. The motor model is used by the Sensorless Vector control mode. You **MUST** perform an Autotune before operating the drive in the Sensorless Vector control mode.

Refer to the Installation Product Manual, Chapter 4: “Operating the Drive” - Set-up using the Sensorless Vector Fluxing Mode.



## Parameter Descriptions

**ENABLE** SET\CTRL CL21 *Range: FALSE / TRUE*

Determines whether the Autotune sequence is operational or not. The Autotune sequence is operational when set to TRUE and the drive is run. Refer to the Installation Product Manual, Chapter 4: “Operating the Drive” - The Autotune Feature.

**MODE** SET\CTRL CL20 *Range: Enumerated - see below*

Selects the Autotune operating mode. Refer to the Installation Product Manual, Chapter 4: “Operating the Drive” – The Autotune Feature.

*Enumerated Value : Mode*

0 : STATIONARY

1 : ROTATING

**ACTIVE** *Range: FALSE / TRUE*

This indicates the current state of the Autotune sequence. The Autotune sequence is operational when displaying TRUE.

**TEST DISABLE** *Range: 0000 to FFFF*

This allows individual Autotune tests to be disabled. The values corresponding to disabled tests are shown below.

| Value | Disabled Tests                             |
|-------|--------------------------------------------|
| 0000  | None                                       |
| 0001  | Stator Resistance                          |
| 0002  | Leakage Inductance                         |
| 0003  | Stator Resistance and Leakage Inductance   |
| 0004  | Magnetising Current                        |
| 0005  | Stator Resistance and Magnetising Current  |
| 0006  | Leakage Inductance and Magnetising Current |
| 0007  | All tests                                  |

## Functional Description

The Autotune sequence identifies the following motor parameters:-

- Per-phase stator resistance (STATOR RES)
- Per-phase leakage inductance (LEAKAGE INDUC)
- Per-phase mutual inductance (MUTUAL INDUC)
- Rotor time constant (ROTOR TIME CONST)
- No-load magnetising line current (MAG CURRENT)

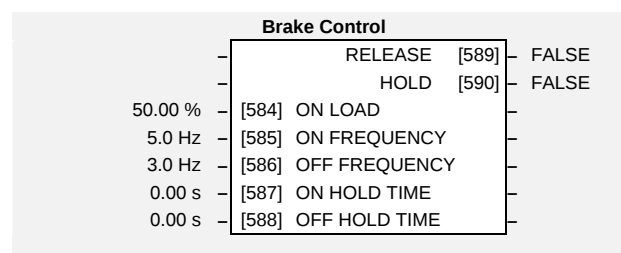
The Rotating Autotune sequence rotates the motor up to the user-programmed MAX SPEED (REFERENCE function block) in order to identify these parameters.

The Stationary Autotune sequence does not rotate the motor and requires the correct value of Magnetising Current to be entered.

The values of the above are stored in the MOTOR DATA function block. Autotune will overwrite any previous entry made for these parameters. Autotune can only be initiated from the “stopped” condition. When the test is complete, the stack is disabled and ENABLE is set to FALSE.

## BRAKE CONTROL

This is used to control electro-mechanical motor brakes in hoist and lift applications.



## Parameter Descriptions

### ON LOAD

Range: 0.00 to 150.00 %

Load level at which the external motor brake is released.

### ON FREQUENCY

Range: 0.0 to 500.0 Hz

The output electrical frequency at which the external motor brake is released.

### OFF FREQUENCY

Range: 0.0 to 500.0 Hz

The output electrical frequency at which the external motor brake is applied.

### ON HOLD TIME

Range: 0.00 to 60.00 s

Sets the duration of the pulse output on HOLD when RELEASE becomes TRUE.

### OFF HOLD TIME

Range: 0.00 to 60.00 s

Sets the duration of the pulse output on HOLD when RELEASE becomes FALSE.

### RELEASE

Range: FALSE/ TRUE

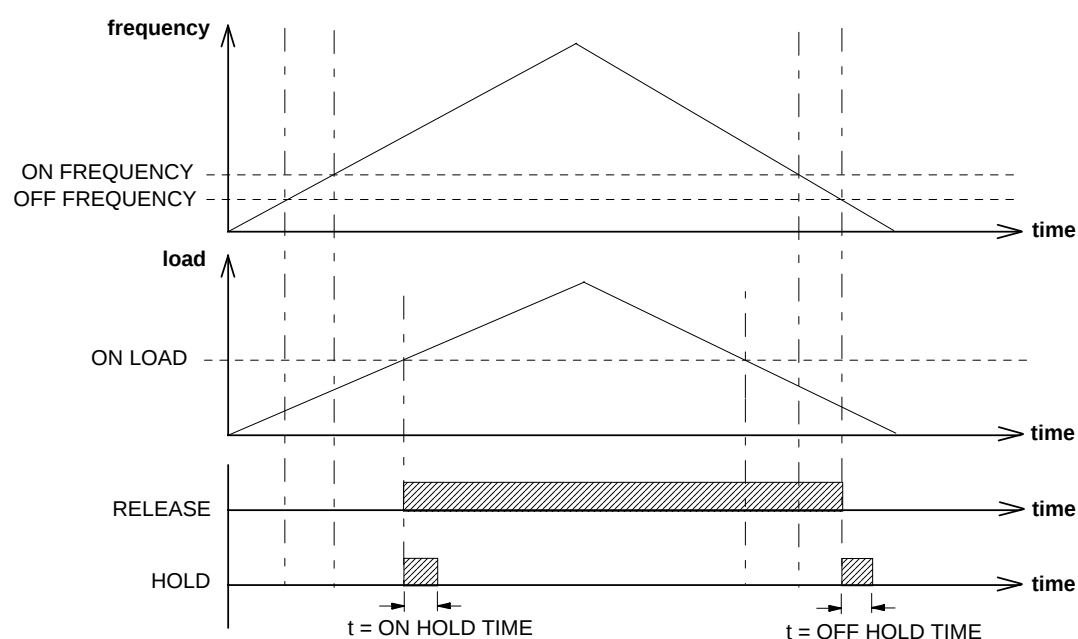
Boolean output providing a signal to operate the brake delay. Note RELEASE is forced FALSE if the drive is not in Run mode, or if Autotune, Flycatching or Injection Braking are active.

### HOLD

Range: FALSE / TRUE

Becomes TRUE when the brake is toggled On or Off by the function block, and remains TRUE for the duration set by OFF HOLD TIME or ON HOLD TIME.

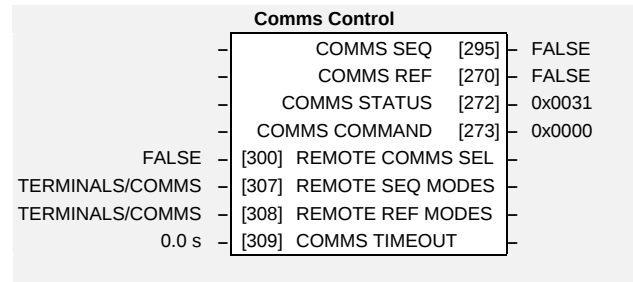
## Functional Description



## COMMS CONTROL

This block switches between Remote Terminal and Remote Comms operating modes.

The drive must be in Remote mode for selection to be made - REMOTE mode is enabled in the LOCAL CONTROL function block (REF MODES) and selected by the keypad. Refer to the outputs of the LOCAL CONTROL function block for the mode in use.



## Parameter Descriptions

**REMOTE COMMS SEL** SET\SERL SE01 *Range: FALSE / TRUE*

Selects the type of remote communications mode:

0 : FALSE, and in REMOTE mode then control is from the terminals.

1 : TRUE, and in REMOTE mode then control is from the communications.

**REMOTE SEQ MODES** *Range: Enumerated - see below*

Selects the type of remote sequencing mode:

*Enumerated Value : Mode*

0 : TERMINALS/COMMS

1 : TERMINALS ONLY

2 : COMMS ONLY

**REMOTE REF MODES** *Range: Enumerated - see below*

Selects the type of remote reference mode:

*Enumerated Value : Mode*

0 : TERMINALS/COMMS

1 : TERMINALS ONLY

2 : COMMS ONLY

**COMMS TIMEOUT** SET\SERL SE02 *Range: 0.0 to 600.0 s*

Sets the maximum time allowed between refreshing the COMMS COMMAND parameter. The drive will trip if this time is exceeded. Set the time to 0.00 seconds to disable this feature.

**COMMS SEQ** *Range: FALSE / TRUE*

Diagnostic indicating if operating in Remote Sequencing Comms Mode.

If FALSE (0), the drive may be in Local Sequencing mode or Remote Sequencing Terminal mode.

**COMMS REF** *Range: FALSE / TRUE*

Diagnostic indicating if operating in Remote Reference Comms Mode.

If FALSE (0), the drive may be in Local Reference mode or Remote Reference Terminal mode.

**COMMS STATUS** *Range: 0000 to FFFF*

Diagnostic showing the 16-bit Status word as seen by the communications.

Refer to Chapter 4: "Sequencing Logic".

**COMMS COMMAND** *Range: 0000 to FFFF*

Diagnostic showing the 16-bit Command as written by the communications.

Refer to Chapter 4: "Sequencing Logic".

## COMMS PORTS

This function block configures the programming ports that allow connection to the keypad, or to a personal computer.

The parameters below are used to identify the drive to the controlling software for drive configuration and storage of parameters.

| Comms Ports |                         |
|-------------|-------------------------|
| 0           | [102] GROUP ID (GID)    |
| 0           | [103] COMMS ADDRESS     |
| 9600        | [1062] BAUD RATE        |
| NONE        | [1061] PARITY           |
| 5           | [1260] REPLY DELAY      |
| AUTOMATIC   | [1060] OP PORT PROTOCOL |
| AUTOMATIC   | [1059] P3 PORT PROTOCOL |
| MODBUS      | [117] RS485 PROTOCOL    |
| FALSE       | [129] SWITCH OP PORT    |
|             | [90] SWAP WORD ORDER    |

## Parameter Descriptions

### GROUP ID (GID)

Range: 0 to 7

The SSD Drives protocol group identity address.

### COMMS ADDRESS

 SET\SERL SE03

Range: 0 to 255

The SSD Drives protocol unit identity address or the Modbus node address.

Note: if set to 0, the drive will only respond to broadcast messages.

### BAUD RATE

 SET\SERL SE04

Range: Enumerated - see below

Selects the Baud Rate for the MODBUS protocol.

Enumerated Value : Baud Rate

- 0 : 1200
- 1 : 2400
- 2 : 4800
- 3 : 7200
- 4 : 9600
- 5 : 14400
- 6 : 19200
- 7 : 38400
- 8 : 57600

### PARITY

 SET\SERL SE05

Range: Enumerated - see below

Selects the Parity for the MODBUS protocol.

Enumerated Value : Parity

- 0 : NONE
- 1 : ODD
- 2 : EVEN

### REPLY DELAY

 SET\SERL SE06

Range: 0 to 200

The time in milliseconds between the drive receiving the complete request from the communications master (PLC/PC) and replying to this request.

### OP PORT PROTOCOL

 SET\SERL SE07

Range: Enumerated - see below

Selects the protocol to be used by the keypad port on the front of the drive. When EIBISYNC ASCII is selected, BAUD RATE is 19200 and PARITY is EVEN.

Enumerated Value : Protocol

- 0 : AUTOMATIC - checks for keypad or EI ASCII
- 1 : KEYPAD
- 2 : EIBISYNC ASCII
- 3 : MODBUS
- 4 : FIELDBUS (reserved for future use)

## Parameter Descriptions

### P3 PORT PROTOCOL

 SET\SERL SE08

Range: Enumerated - see below

Selects the protocol to be used by the RS232 programming port on the drive's control board. When EIBISYNC ASCII is selected, BAUD RATE is 19200 and PARITY is EVEN.

*Enumerated Value : Protocol*

- 0 : AUTOMATIC - checks for keypad or EI ASCII
- 1 : KEYPAD
- 2 : EIBISYNC ASCII
- 3 : MODBUS
- 4 : FIELDBUS (reserved for future use)

### SWAP WORD ORDER

Range: FALSE / TRUE

This parameter controls the order in which 16-bit words are sent when reading 32-bit word data via the Modbus protocol.

## Functional Description

When communicating using the EI BISYNC ASCII protocol, the unit will always respond to GID = 0 and UID = 0, as this is the broadcast address used by the 6901 keypad.

**CURRENT LIMIT****Designed for all Motor Control Modes.**

| Current Limit |                        |
|---------------|------------------------|
| 300.00 %      | [365] CURRENT LIMIT    |
| TRUE          | [686] REGEN LIM ENABLE |

This function block allows you to set the maximum level of motor rated current (as a % of the user-set MOTOR CURRENT) which is allowed to flow before current limit action occurs. If the measured motor current exceeds the current limit value with a motoring load, the motor speed is reduced to shed the excess load. If the measured motor current exceeds the current limit value with a regenerating load, the motor speed is increased up to a maximum of MAX SPEED (REFERENCE function block).

**Note:** *The maximum value of CURRENT LIMIT for a particular motor is limited by the 650V current rating. If a motor of larger rating than the 650V is connected to the drive, then the current limit applies to the 650V and not the motor. In this case the maximum value of the current limit parameter is 150.00%*

**Parameter Descriptions**

**CURRENT LIMIT**   SET\CTRL CL81 Range: 0.00 to 300.00 %

This parameter sets the level of motor current, as a % of MOTOR CURRENT (refer to the MOTOR DATA function block) at which the drive begins to take current limit action.

Refer also to “Normal/Heavy Duty Selection”, page 1-93.

**REGEN LIM ENABLE** Range: FALSE / TRUE

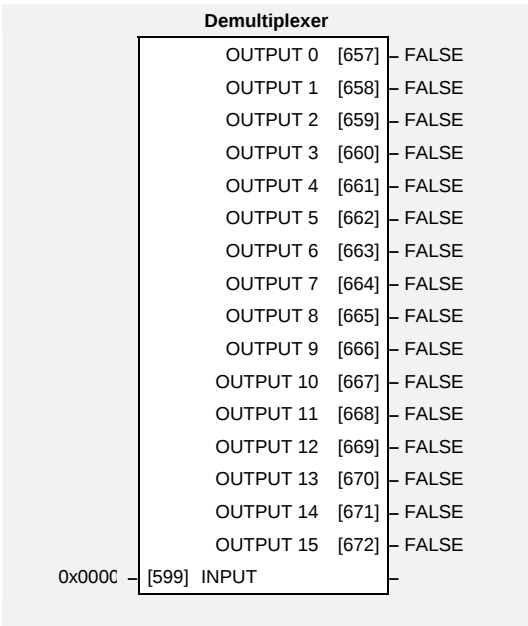
This parameter enables or disables regenerative current limit action.

*Note that this parameter only works in open-loop VOLTS / Hz motor control mode.*

DEMULTIPLEXER

The demultiplexer function block splits the input word into 16 individual bits.

This may be used to extract the individual trip bits from the ACTIVE TRIPS parameter, for example.



Parameter Descriptions

INPUT

The input to be split into its component bits.

Range: 0000 to FFFF

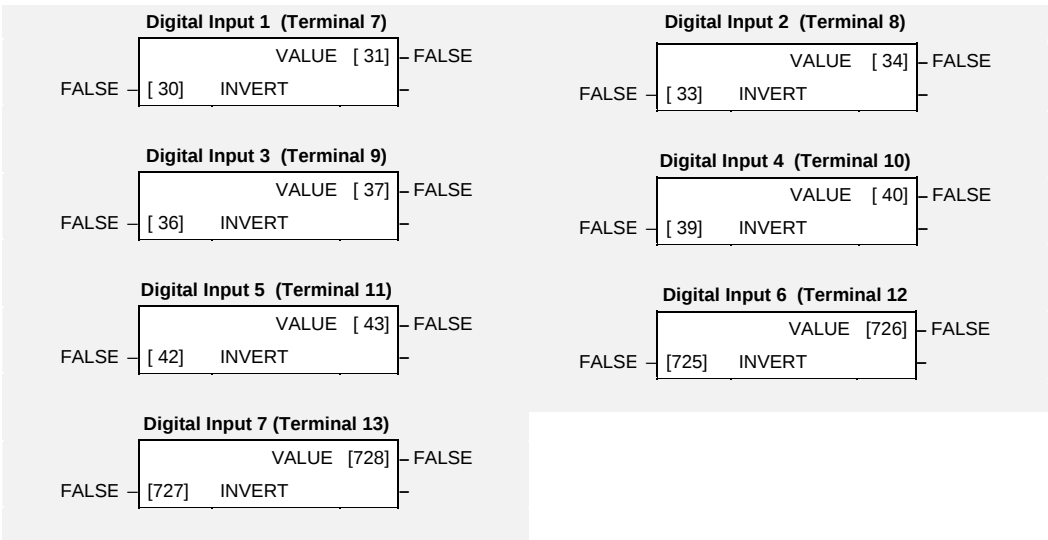
OUTPUT 0 TO OUTPUT 15

Each output returns the corresponding bit of the 16 bit input word.

Range: FALSE / TRUE

DIGITAL INPUT

The digital input block converts the physical input voltage to TRUE or FALSE control signals.



Functional Description

There is a DIGITAL INPUT function block associated with each of the following terminals:

The Control Board has seven configurable digital inputs:

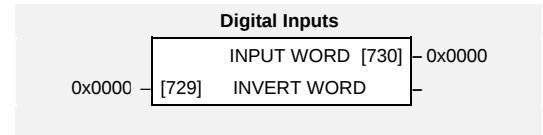
- DIGITAL INPUT 1 is associated with terminal 7
- DIGITAL INPUT 2 is associated with terminal 8
- DIGITAL INPUT 3 is associated with terminal 9 (shares terminal with DOUT1)
- DIGITAL INPUT 4 is associated with terminal 10 (shares terminal with DOUT2)
- DIGITAL INPUT 5 is associated with terminal 11
- DIGITAL INPUT 6 is associated with terminal 12
- DIGITAL INPUT 7 is associated with terminal 13

Parameter Descriptions

|                                                      |                     |                     |
|------------------------------------------------------|---------------------|---------------------|
| <b>INVERT</b>                                        | SET/IN IP01 to IP07 | Range: FALSE / TRUE |
| Controls the optional inversion of the VALUE output. |                     |                     |
| <b>VALUE</b>                                         | SET/IN IPD1 to IPD7 | Range: FALSE / TRUE |
| The TRUE or FALSE input, (after any inversion).      |                     |                     |

## DIGITAL INPUTS

The Digital Inputs function block summarises the state of all 7 digital inputs and their invert flags.



## Parameter Descriptions

### INVERT WORD

Range: 0x0000 to 0x007F

Combined value specifying the INVERT parameter for all seven digital inputs.

### INPUT WORD

DIAG\IN\DIIN

Range: 0x0000 to 0x007F

Combined representation of all seven digital inputs in one parameter.

## Functional Description

The INPUT WORD is formed from the sum of the digital inputs. Similarly the INVERT WORD is the sum of the digital input INVERT parameters.

The bit masks associated with each input are shown here:

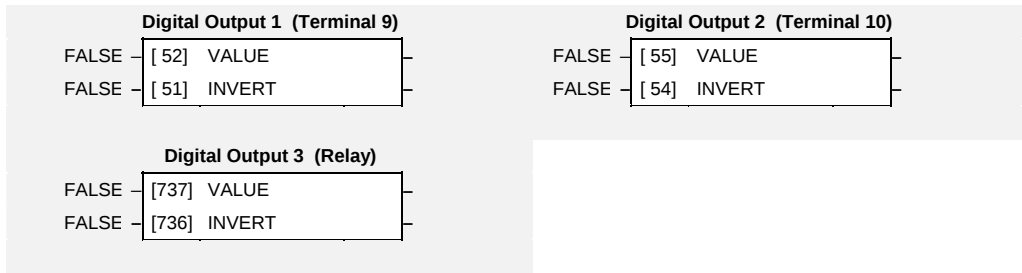
DIGITAL INPUT 1 = 0001  
 DIGITAL INPUT 2 = 0002  
 DIGITAL INPUT 3 = 0004  
 DIGITAL INPUT 4 = 0008  
 DIGITAL INPUT 5 = 0010  
 DIGITAL INPUT 6 = 0020  
 DIGITAL INPUT 7 = 0040

The masks may be combined as described in the TRIPS STATUS function block, section "Hexadecimal Representation of Trips". For example, if all seven digital inputs are active, INPUT WORD would show 0x007F. To invert inputs 3, 6 and 7 would require a value of 0x0064 in INVERT WORD.

Avoid wiring to the INVERT WORD parameter as well as the individual INVERT parameters in the DIGITAL INPUT function blocks in a single application. When wiring to these parameters using the MMI or from a communications master, the most recent value written will apply.

DIGITAL OUTPUT

The digital output block converts a logic TRUE or FALSE demand to a physical output signal.



Parameter Descriptions

**VALUE** SET/OUT OP23 - DOUT2 SET/OUT OP33 - DOUT3 Range: FALSE / TRUE

The TRUE or FALSE output demand.

**INVERT** SET/OUT OP22 - DOUT2 SET/OUT OP32 - DOUT3 Range: FALSE / TRUE

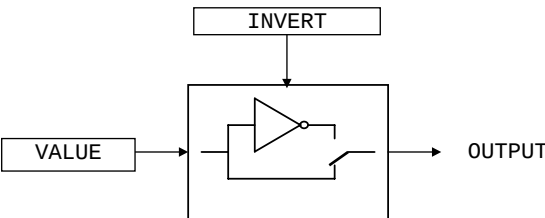
Controls the optional inversion of the VALUE output.

Functional Description

There is a DIGITAL OUTPUT function block associated with each of the following terminals:

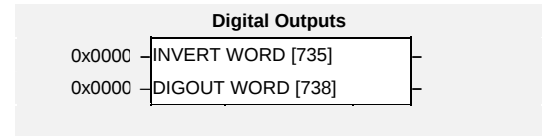
The Control Board has three digital outputs (volt-free relay contacts):

- DIGITAL OUTPUT 1 is associated with terminals 9 (shares terminal with DIN3)
- DIGITAL OUTPUT 2 is associated with terminals 10 (shares terminal with DIN4)
- DIGITAL OUTPUT 3 is associated with terminals RL1A and RL1B (user relay)



## DIGITAL OUTPUTS

The Digital Outputs function block summarises the state of the three digital outputs and their invert flags.



## Parameter Descriptions

### INVERT WORD

Range: 0x0000 to 0x0003

Combined value specifying the INVERT parameter for all three digital outputs.

### DIGOUT WORD

DIAG\OUT\DOUT

Range: 0x0000 to 0x0003

Combined value specifying the INPUT parameter for all three digital outputs.

## Functional Description

The INVERT WORD is formed from the sum of the digital output INVERT parameters. Similarly the DIGOUT WORD is the sum of the digital output INPUT parameters.

The bit masks associated with each output are shown here:

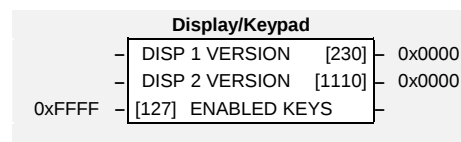
DIGITAL OUTPUT 1 = 0001  
 DIGITAL OUTPUT 2 = 0002  
 DIGITAL OUTPUT 3, (relay) = 0004

The masks may be combined as described in the TRIPS STATUS function block, section "Hexadecimal Representation of Trips". For example, if all three digital inputs are active, DIGOUT WORD should show 0x0007.

Avoid wiring to the INVERT WORD parameter as well as the individual INVERT parameters in the DIGITAL INPUT function blocks in a single application. When wiring to these parameters using the MMI or from a communications master, the most recent value written will apply. Similarly, avoid wiring to the DIGOUT WORD as well as the individual VALUE parameter for each digital output in a single application.

## DISPLAY/KEYPAD

This function block provides information about the keypad connected to the drive and can be used to customise the keypad control keys.



## Parameter Descriptions

### ENABLED KEYS SET/ST52

Range: 0000 to FFFF

The following keys on the 6901 keypad can be enabled or disabled separately. The combination produces the parameter setting as in the table below. The default of 0xFFFF enables all keys.



| Parameter Setting | RUN     | L/R     | JOG     | DIR     |
|-------------------|---------|---------|---------|---------|
| 0000              | -       | -       | -       | -       |
| 0010              | -       | -       | -       | ENABLED |
| 0020              | -       | -       | ENABLED | -       |
| 0030              | -       | -       | ENABLED | ENABLED |
| 0040              | -       | ENABLED | -       | -       |
| 0050              | -       | ENABLED | -       | ENABLED |
| 0060              | -       | ENABLED | ENABLED | -       |
| 0070              | -       | ENABLED | ENABLED | ENABLED |
| 0080              | ENABLED | -       | -       | -       |
| 0090              | ENABLED | -       | -       | ENABLED |
| 00A0              | ENABLED | -       | ENABLED | -       |
| 00B0              | ENABLED | -       | ENABLED | ENABLED |
| 00C0              | ENABLED | ENABLED | -       | -       |
| 00D0              | ENABLED | ENABLED | -       | ENABLED |
| 00E0              | ENABLED | ENABLED | ENABLED | -       |
| 00F0              | ENABLED | ENABLED | ENABLED | ENABLED |



When using the standard 6511 and 6521 keypad, disabling the **DIR** key prevents the local setpoint going negative (for reverse). Similarly, disabling the **L/R** key prevents the drive being changed from Local to Remote, or Remote to Local modes.

### DISP 1 VERSION

Range: 0000 to FFFF

This is the software version of the keypad connected to the keypad port on the front of the drive.

### DISP 2 VERSION

Range: 0000 to FFFF

This is the software version of the keypad connected to the RS232 programming port. This port is located on the control board inside the drive.

## DISPLAY SCALE

These function blocks can be used to display any floating point parameter with an applied scaling factor, formulae and your preferred units. The Display Scale blocks work together with APP MENU blocks 1 to 16 for entries in the APP MENU, and with the MMI ACCESS menu for display of the setpoint.

| Display Scale 1 |       |               | Display Scale 2 |       |               |
|-----------------|-------|---------------|-----------------|-------|---------------|
| DEFAULT         | [334] | DECIMAL PLACE | DEFAULT         | [379] | DECIMAL PLACE |
| A/B*X+C         | [125] | FORMULA       | A/B*X+C         | [676] | FORMULA       |
| 1.00            | [321] | COEFFICIENT A | 1.00            | [375] | COEFFICIENT A |
| 1.00            | [44]  | COEFFICIENT B | 1.00            | [673] | COEFFICIENT B |
| 0.00            | [322] | COEFFICIENT C | 0.00            | [376] | COEFFICIENT C |
| 0.00            | [101] | HIGH LIMIT    | 0.00            | [674] | HIGH LIMIT    |
| 0.00            | [53]  | LOW LIMIT     | 0.00            | [675] | LOW LIMIT     |
|                 | [323] | UNITS         |                 | [377] | UNITS         |

## Parameter Descriptions

### DECIMAL PLACE

Range: See below

Select the position of the decimal point.

Enumerated Value : Position

- 0 : DEFAULT
- 1 : X.X
- 2 : X.XX
- 3 : X.XXX
- 4 : X.XXXX
- 5 : DEFAULT

### FORMULA

Range: See below

Select a formula where A, B and C are the coefficients listed below, and X is the value to modify.

Enumerated Value : Formula

- 0 : A/B \* X + C
- 1 : A/B \* (X+C)
- 2 : A/(B \* X) + C
- 3 : A/(B \* (X+C))

### COEFFICIENT A

Range: -30000.00 to 30000.00

Coefficient used as defined by the formula.

### COEFFICIENT B

Range: -30000.00 to 30000.00

Coefficient used as defined by the formula.

### COEFFICIENT C

Range: -30000.00 to 30000.00

Coefficient used as defined by the formula.

### HIGH LIMIT

Range: -30000.00 to 30000.00

Use high limit to set a maximum value for the modified parameter on the keypad. Setting the HIGH LIMIT lower than or equal to the LOW LIMIT makes the parameter “read-only”.

### LOW LIMIT

Range: -30000.00 to 30000.00

Use low limit to set a minimum value for the modified parameter on the keypad. Setting the HIGH LIMIT higher than or equal to the HIGH LIMIT makes the parameter “read-only”.

## Parameter Descriptions

### UNITS

*Range: (see below)*

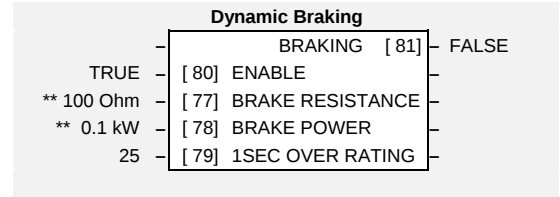
*Enumerated Value :*

- 0 :
- 1 : V
- 2 : RPM
- 3 : A
- 4 : kW
- 5 : %
- 6 : %ms
- 7 : Hz
- 8 : s
- 9 : ms
- 10 : Hzs
- 11 : ohms
- 12 : mH
- 13 : Nm
- 14 : deg
- 15 : kgm<sup>^2</sup>
- 16 : Nm/Hz
- 17 : /s<sup>^2</sup>
- 18 : /s<sup>^3</sup>
- 19 : Pa
- 20 : kPa
- 21 : bar
- 22 : degC
- 23 : K
- 24 : m3/h

## DYNAMIC BRAKING

**Designed for all Motor Control Modes.**

The dynamic braking function block controls the rate at which energy from a regenerating motor is dumped into a resistive load. This dumping prevents the dc link voltage reaching levels which would cause an Overvoltage trip.



## Parameter Descriptions

|                                                                                                  |               |                        |
|--------------------------------------------------------------------------------------------------|---------------|------------------------|
| <b>ENABLE</b>                                                                                    | SET\SETP ST31 | Range: FALSE / TRUE    |
| Enables operation of the dynamic braking block.                                                  |               |                        |
| <b>BRAKE RESISTANCE</b>                                                                          | SET\SETP ST32 | Range: 1 to 1000 Ohm   |
| The value of the load resistance.                                                                |               |                        |
| <b>BRAKE POWER</b>                                                                               | SET\SETP ST33 | Range: 0.1 to 510.0 kW |
| The power that the load resistance may continually dissipate.                                    |               |                        |
| <b>1SEC OVER RATING</b>                                                                          | SET\SETP ST34 | Range: 1 to 40         |
| Multiplier that may be applied to BRAKE POWER for power overloads lasting no more than 1 second. |               |                        |
| <b>BRAKING</b>                                                                                   |               | Range: FALSE / TRUE    |
| A read-only parameter indicating the state of the brake switch.                                  |               |                        |

## Functional Description

When enabled, the DYNAMIC BRAKING block monitors the internal dc link voltage every milli-second and sets the state of the brake switch accordingly.

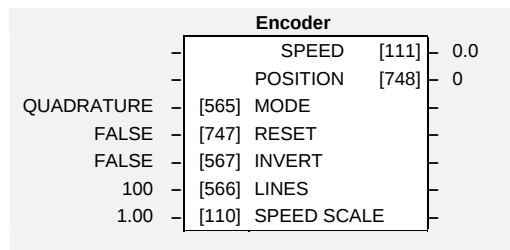
The dynamic braking block provides a control signal that is used by the SLEW RATE LIMIT block. This causes the setpoint to be temporarily frozen whenever the dynamic brake is operating because the dc link voltage exceeds the internal comparison level. This allows the stop rate to be automatically tuned to the characteristics of the load, motor, drive and brake resistor.

The DYNAMIC BRAKING block operates even when the motor output is not enabled. This allows the block to continually monitor the energy dumped into the braking resistor, and the energy dissipated across the brake switch. With this information the drive is able to deduce the loading on the brake resistor. Optional trips may be enabled should the switch or resistor be loaded beyond its capabilities.

Refer also to the Installation Product Manual, Chapter 12: “Application Notes” - Dynamic Braking.

## ENCODER

The ENCODER block allows Speed Feedback to be measured. Simple position measuring is also provided, but is limited to a 16-bit range.



## Parameter Descriptions

**MODE** SET\ENC EN01 *Range: Enumerated - see below*

Set this parameter to the requirements for your encoder.

*Enumerated Value : Mode*

- 0 : QUADRATURE (using digital inputs 6 & 7, ENCA and ENCB respectively)
- 1 : CLOCK/DIR (using digital inputs 6 & 7, ENCA and ENCB respectively)
- 2 : CLOCK (using digital input 6, ENCA)

**RESET** SET\ENC EN02 *Range: FALSE / TRUE*

When TRUE the POSITION and SPEED outputs are set (and held) at zero.

**INVERT** SET\ENC EN03 *Range: FALSE / TRUE*

When TRUE, changes the sign of the measured speed and the direction of the position count.

**LINES** SET\ENC EN04 *Range: 100 to 10000*

The number of lines must be set to match the type of encoder being used. Incorrect setting of this parameter will result in an erroneous speed measurement.

**SPEED SCALE** SET\ENC EN05 *Range: 0.00 to 300.00*

This parameter allows the output "speed" to be scaled to any value the user requires. With a default value of 1.00, the output "speed" is measured in revs per second. Changing the SPEED SCALE value to 60.00 will provide an output in revs per minute.

To provide an output in percent of the motor maximum speed, where maximum speed is the maximum speed your motor will run in rpm, the SPEED SCALE parameter should be set to the result of:

$$\frac{6000}{\text{maximum speed (rpm)}}$$

**SPEED** SET\ENC EN06 *Range: xxx.x*

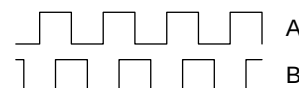
Speed feedback, in units defined by the SPEED SCALE parameter.

**POSITION** *Range: xxxx*

Number of encoder "counts" from when RESET was set to FALSE. The value will increment or decrement depending on the direction the encoder is rotated. The value will "wrap around" between 32767 and -32768.

## Functional Description

A quadrature encoder uses 2 input signals (A and B), phase shifted by a quarter of a cycle (90°). Direction is obtained by looking at the combined state of A and B.



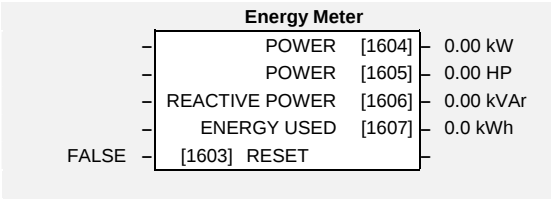
Speed is calculated using the following function:

$$\text{SPEED HZ} = \text{filter} \left[ \frac{\text{CountsPerSecond}}{\text{Lines} \times 4}, \text{FilterTime} \right]$$

where counts per second are the number of edges received from the encoder. There are 4 counts per line.

ENERGY METER

This block measures the energy used by the load.



Parameter Descriptions

**RESET** Range: FALSE / TRUE

When RESET is set to TRUE, the ENERGY USED parameter is reset to zero automatically when the maximum value is reached.

When RESET is set to FALSE, the ENERGY USED parameter is held at the maximum value when the maximum value has been reached

Changing this from FALSE to TRUE at anytime will cause the ENERGY USED parameter to be reset to zero.

**POWER** Range: -32768.00 to 32767.00 kW

This diagnostic shows the power being delivered to the load in kilowatts.

**POWER** Range: -32768.00 to 32767.00 HP

This diagnostic shows the power being delivered to the load in horsepower.

**REACTIVE POWER** Range: -32768.00 to 32767.00  
kVAr

This diagnostic shows the reactive power being delivered to the load in kilovolt-amperes reactive.

**ENERGY USED** Range: 0.00 to 32767.00 kWh

This diagnostic shows the total energy consumed by the load in kilowatt hours.

## FEEDBACKS

**Designed for all Motor Control Modes.**

The FEEDBACKS block allows you to view speed feedback and motor current related diagnostics.

| Feedbacks       |        |             |
|-----------------|--------|-------------|
| DC LINK VOLTS   | [ 75]  | 700 V       |
| MOTOR CURRENT % | [ 66]  | 0.0 %       |
| MOTOR CURRENT A | [ 67]  | 0.0 A       |
| TERMINAL VOLTS  | [1020] | 0 V         |
| SPEED FBK RPM   | [569]  | 0.00 RPM    |
| SPEED FBK REV/S | [568]  | 0.00        |
| SPEED FBK %     | [749]  | 0.00 %      |
| TORQUE FEEDBACK | [ 70]  | 0.00 %      |
| FIELD FEEDBACK  | [ 73]  | 0.00 %      |
| FALSE           | [ 50]  | NORMAL DUTY |

*NORMAL DUTY was previously referred to as Quadratic Torque in past Drives' manuals.*

## Parameter Descriptions

### NORMAL DUTY

PAR\ P12

Range: FALSE/TRUE

When TRUE, selects NORMAL DUTY allowing higher continuous ratings with less overload capability. This is especially suited to fan or pump applications.

When FALSE, selects HEAVY DUTY.

### DC LINK VOLTS

DIAG 3

Range: —, V

This diagnostic shows the voltage on the dc link capacitors.

### MOTOR CURRENT %

Range: —.xx %

Contains the level of rms line current being drawn from the drive and is seen as a % of the MOTOR CURRENT parameter setting in the MOTOR DATA function block.

### MOTOR CURRENT A

DIAG 4

Range: —.xx A

This diagnostic contains the level of rms line current being drawn from the drive.

### SPEED FBK REV/S

Range: —.xx

This parameter changes according to the CONTROL MODE (MOTOR DATA function block):

- In SENSORLESS VEC mode the parameter shows the calculated mechanical speed of the motor shaft in revolutions per second.
- In VOLTS / Hz mode, the parameter shows the motor synchronous speed in revolutions per second.

### SPEED FBK %

Range: —.xx %

This parameter changes according to the CONTROL MODE (MOTOR DATA function block):

- In SENSORLESS VEC mode the parameter shows the calculated mechanical speed of the motor shaft as a percentage of the user maximum speed setting (MAX SPEED in the REFERENCE function block).
- In VOLTS / Hz mode, the parameter shows the electrical drive output frequency as a percentage of the user maximum speed setting (MAX SPEED in the REFERENCE function block).

### TORQUE FEEDBACK

SET\SETP ST41

Range: —.xx %

Shows the estimated motor torque, as a percentage of rated motor torque.

### FIELD FEEDBACK

Range: —.xx %

A value of 100% indicates the motor is operating at rated magnetic flux (field).

## FLUXING

**Designed for VOLTS/Hz motor Control Mode.**

This function block allows user parameterisation of the conventional (volts/hertz) fluxing strategy of the drive. This is achieved through two flexible Volts-to-frequency templates. Starting torque performance can also be tailored through the FIXED BOOST and AUTO BOOST parameters.

| Fluxing    |                       |
|------------|-----------------------|
| LINEAR LAW | [104] V/F SHAPE       |
| ** 0.00 %  | [107] FIXED BOOST     |
| 0.00 %     | [108] AUTO BOOST      |
| ** FALSE   | [1058] 601 FLUXING    |
| FALSE      | [1655] ENERGY SAVING  |
|            | [1656] ACCEL BOOST    |
|            | [1657] USER FREQ 1    |
|            | [1658] USER VOLTAGE 1 |
|            | [1659] USER FREQ 2    |
|            | [1660] USER VOLTAGE 2 |
|            | [1661] USER FREQ 3    |
|            | [1662] USER VOLTAGE 3 |
|            | [1663] USER FREQ 4    |
|            | [1664] USER VOLTAGE 4 |
|            | [1679] LOW ENERGY LIM |

## Parameter Descriptions

### V/F SHAPE

PAR\ P11

Range: Enumerated - see below

This parameter determines the type of volts to frequency template is used to flux the motor. The choices of this parameter are:

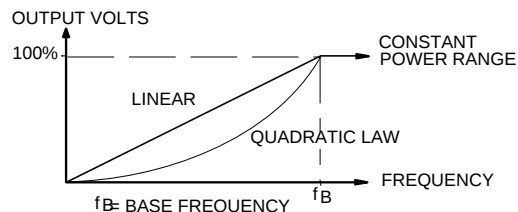
Enumerated Value : V/F Shape

0 : LINEAR LAW

1 : FAN LAW

LINEAR LAW : This gives a constant flux characteristic up to the BASE FREQUENCY

FAN LAW: This gives a quadratic flux characteristic up to the BASE FREQUENCY. This matches the load requirement for fan and most pump applications



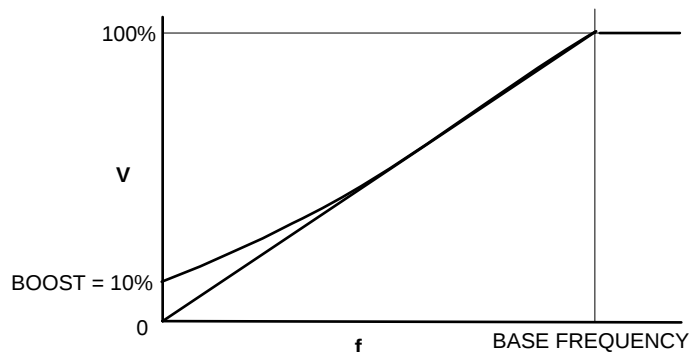
USER DEFINED: the flux characteristic is defined by a total of six points in the Frequency/Voltage curve. Two points are fixed, these are 0Hz give 0% Volts and Base Frequency gives 100% Volts. The other four points are defined by parameters USER FREQ 1 to 4 and USER VOLTAGE 1 to 4.

### FIXED BOOST

**M VF** PAR\ P13

Range: 0.00 to 25.00 %

This parameter allows for no-load stator resistance voltage drop compensation. This correctly fluxes the motor (under no-load conditions) at low output frequencies, thereby increasing available motor torque. Fixed boost can be set in addition to auto boost.



## Parameter Descriptions

**AUTO BOOST** F M VF SET\CTRL CL08 *Range: 0.00 to 25.00 %*

This parameter allows for load dependent stator resistance voltage drop compensation. This correctly fluxes the motor (under load conditions) at low output frequencies, thereby increasing available motor torque. Auto boost can be set in addition to fixed boost.

The value of the AUTO BOOST parameter determines level of additional volts supplied to the motor for 100% load.

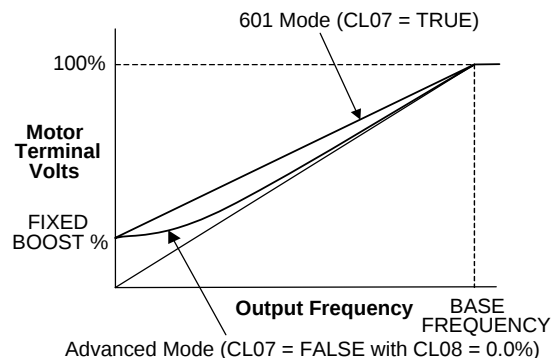
Setting the value of auto boost too high can cause the drive to enter current limit. If this occurs, the drive will be unable to ramp up in speed. Reducing the value of auto boost will eliminate this problem.

**601 FLUXING (BOOST MODE)** F M VF SET\CTRL CL07 *Range: FALSE / TRUE*

Determines the relationship between fixed boost and terminal volts. There are two settings:

FALSE produces the terminal volts profile shown below (with Auto Boost, CL08, set to 0.0 %). In this mode AUTO BOOST (CL08) should be set to provide optimum low speed performance.

TRUE emulates the terminal volts profile provided by the SSD Drives' 601 product. This allows drop in replacement of the 601 by the 650V. AUTO BOOST (CL08) has no effect in this mode.



**ENERGY SAVING** F VF SET\CTRL CL09 *Range: FALSE / TRUE*

When set TRUE, the demanded volts are reduced to minimise energy consumption if the drive is operating in a steady state at light load.

**ACCEL BOOST** *Range:*

This parameter provides an additional amount of fixed boost.

**USER FREQ 1 to 4** *Range: 0.0 to 100.0%*

These parameters provide 4 frequency points, which together with the USER VOLTAGE parameters, provide the user defined voltage profile. (USER FREQ n, USER VOLTAGE n) provide up to 4 (x,y) points on this profile. The USER FREQ parameters are defined as a percentage of the BASE FREQUENCY parameter, (refer to the MOTOR DATA function block).

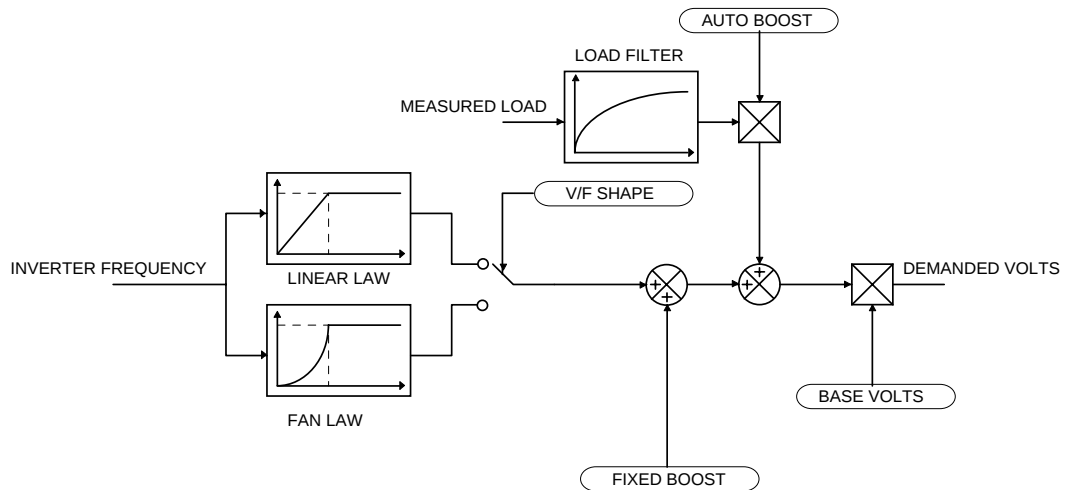
**USER VOLTAGE 1 to 4** *Range: 0.0 to 100.0%*

These parameters provide 4 voltage points, which together with the USER FREQ parameters, provide the user defined voltage profile. (USER FREQ n, USER VOLTAGE n) provide up to 4 (x,y) points on this profile. The USER VOLTAGE parameters are defined as a percentage of the MOTOR VOLTAGE parameter (refer to the MOTOR DATA function block).

**LOW ENERGY LIM** *Range: FALSE / TRUE*

This parameter is used in conjunction with the ENERGY SAVING input. The energy saving mode of operation is inhibited when the absolute value of the speed demand is less than this limit.

## Functional Description



The function block allows the user to parameterise the drive's conventional V/F motor fluxing scheme. Three V/F shapes are available, LINEAR LAW, FAN LAW and USER DEFINED:

- Linear Law V/F shape should be used in applications requiring constant motor torque though out the speed range (e.g. machine tools or hoists).
- Fan Law V/F shape provides extra energy savings for fan or pump applications.
- User Defined shape can be used to customize the fluxing curve for specialist applications.

Correct no-load motor fluxing at low drive output frequencies can be achieved by setting the FIXED BOOST parameter.

Correct motor fluxing under load conditions is achieved by setting the AUTO BOOST parameter.

The motor is correctly fluxed when the FIELD FEEDBACK diagnostic in the FEEDBACKS function block reads 100.0% .

**FLYCATCHING****Designed for all Motor Control Modes.**

This block performs a directional speed search. It allows the drive to seamlessly catch a spinning motor before controlling the motor to the desired setpoint.

This is especially useful for large inertia fan loads, where drafts in building air ducts can cause a fan to 'windmill'.

| Flycatching   |          |                  |        |
|---------------|----------|------------------|--------|
|               | ACTIVE   | [576]            | FALSE  |
|               | SETPOINT | [28]             | 0.00 % |
| FALSE         | [570]    | VHz ENABLE       |        |
| TRUE          | [1553]   | VECTOR ENABLE    |        |
| ALWAYS        | [571]    | START MODE       |        |
| BIDIRECTIONAL | [572]    | SEARCH MODE      |        |
| ** 9.00 %     | [573]    | SEARCH VOLTS     |        |
| ** 40.00 %    | [32]     | SEARCH BOOST     |        |
| ** 10.0 s     | [574]    | SEARCH TIME      |        |
| 5.0 Hz        | [575]    | MIN SEARCH SPEED |        |
| ** 3.0 s      | [709]    | REFLUX TIME      |        |

**Parameter Descriptions**

**VHz ENABLE** **VF** SETCTRL CL03 Range: FALSE / TRUE  
Enables flycatching in Volts/Hz control mode when TRUE.

**VECTOR ENABLE** **SV** SETCTRL CL03 Range: FALSE / TRUE  
Enables flycatching in Sensorless Vector control mode when TRUE.

**START MODE** Range: Enumerated - see below  
The mode of operation for the flycatching sequence software.

Enumerated Value : Start Mode

0 : ALWAYS  
1 : TRIP OR POWERUP  
2 : TRIP

**SEARCH MODE** Range: Enumerated - see below  
The type of speed search carried out by the flycatching sequence.

Enumerated Value : Search Mode

0 : BIDIRECTIONAL  
1 : UNIDIRECTIONAL

**SEARCH VOLTS** Range: 0.00 to 100.00 %  
The percentage level of the search volts applied to the motor during the speed search phase of the flycatching sequence. Increasing this parameter improves the accuracy of the discovered motor speed but increases the braking influence of the speed search on the rotating motor.

**SEARCH BOOST** Range: 0.00 to 50.00 %  
The level of search boost applied to the motor during the speed search phase of the flycatching sequence.

**SEARCH TIME** Range: 0.1 to 60.0 s  
The search rate during the speed search phase of the flycatching sequence. Performing the flycatching speed search too quickly can cause the drive to inaccurately identify the motor speed. Refluxing at an inaccurate motor speed can cause the drive to trip on overvoltage. If this occurs, increasing this parameter will reduce the risk of tripping.

**MIN SEARCH SPEED** Range: 0.0 to 500.0 Hz  
The lowest search speed before the speed search phase of the flycatching sequence is considered to have failed.

**REFLUX TIME** Range: 0.1 to 20.0 s  
The rate of rise of volts from the search level to the working level after a successful speed search. Refluxing the motor too quickly can cause the drive to trip on either overvoltage or overcurrent. In either case, increasing this parameter will reduce the risk of tripping.

## Parameter Descriptions

### ACTIVE

Range: FALSE / TRUE

A diagnostic output indicating whether the flycatching sequence is active.

### SETPPOINT

Range xxx.xx %

This output is the setpoint caught at the end of a successful flycatching sequence.

## Functional Description

The flycatching function enables the drive to be restarted smoothly into a spinning motor. It applies small search voltages to the motor whilst ramping the drive frequency from maximum speed (MAX SPEED in the REFERENCE function block) to zero. When the motor load goes from motoring to regenerating, the speed search has succeeded and is terminated.

The type of speed sequence may be Unidirectional or Bidirectional. The examples below assume a “positive” setpoint. (A “negative” setpoint would alter the signs for MAX SPEED and MIN SEARCH SPEED in the examples).

### Unidirectional

The search is performed only in the direction of the speed setpoint:

The drive starts the search at +110% of MAX SPEED. It then searches to the MIN SEARCH SPEED (for example +5Hz), towards zero.

If the speed is not found, the drive will ramp to the speed setpoint from zero, as normal.

### Bidirectional

Initially, the search is performed in the direction of the speed setpoint:

The drive starts the search at +110% of MAX SPEED. It then searches to the MIN SEARCH SPEED (for example +5Hz), towards zero.

If the speed is not found in this direction, a second speed search is performed in the opposite direction:

The drive starts the search at -110% of MAX SPEED. It then searches to the MIN SEARCH SPEED (for example -5Hz), towards zero.

If the speed is not found, the drive will ramp to the speed setpoint from zero, as normal.

The flycatching sequence can be triggered by different starting conditions:

|                   |                                                                         |
|-------------------|-------------------------------------------------------------------------|
| ALWAYS:           | All starts (after controlled or uncontrolled stop, or after a power-up) |
| TRIP or POWER-UP: | After uncontrolled stop, i.e. trip or coast, or after a power-up        |
| TRIP:             | After uncontrolled stop, i.e. trip or coast                             |

## INJ BRAKING

**Designed for VOLTS/Hz Motor Control Mode.**

The injection braking block provides a method of stopping spinning induction motors without returning the kinetic energy of the motor and load back in to the dc link of the drive. This is achieved by running the motor highly inefficiently so that all the energy stored in the load is dissipated in the motor. Thus, high inertia loads can be stopped without the need for an external dynamic braking resistor.

| Inj Braking |              |                |
|-------------|--------------|----------------|
|             | ACTIVE [583] | FALSE          |
| ** 0.5 s    | [710]        | DEFLUX TIME    |
| ** 9.0 Hz   | [577]        | FREQUENCY      |
| 100.0 %     | [578]        | I-LIM LEVEL    |
| ** 2.0 s    | [579]        | DC PULSE       |
| ** 1.0 s    | [580]        | FINAL DC PULSE |
| ** 2.5 %    | [581]        | DC LEVEL       |
| 30.0 s      | [582]        | TIMEOUT        |
| ** 100.00 % | [739]        | BASE VOLTS     |

## Parameter Descriptions

### DEFLUX TIME

*Range: 0.1 to 20.0 s*

Determines the time in which the drive defluxes the motor prior injection braking.

### FREQUENCY

*Range: 1.0 to 240.0 Hz*

Determines the maximum frequency applied to the motor for the low frequency injection braking mode. It is also clamped internally so as never to exceed 50% of base speed value.

### I-LIM LEVEL

*Range: 50.0 to 150.0 %*

Determines the level of motor current flowing during low frequency injection braking.

### DC PULSE

*Range: 0.0 to 100.0 s*

Determines the duration of the dc pulse applied to the motor when injection braking is required for motor speeds below 20% of base speed. The actual dc pulse time applied to the motor is dependent on the ratio of initial motor speed to 20% of base speed.

### FINAL DC PULSE

*Range: 0.0 to 10.0 s*

Determines the duration of the final dc holding pulse applied to the motor after either low frequency injection braking or timed dc pulse.

### DC LEVEL

*Range: 0.0 to 25.0 %*

Determines the level of dc pulse applied to the motor during either the timed or final dc pulse.

### TIMEOUT

*Range: 0.0 to 600.0 s*

Determines the maximum amount of time the sequence is allowed to remain in the low frequency injection braking state.

### BASE VOLTS

*Range: 0.00 to 115.47 %*

Determines the maximum volts at base speed applied to the motor during injection braking.

### ACTIVE

*Range: FALSE / TRUE*

Indicates the state of the drive. TRUE when injection braking.

## INVERSE TIME

**Designed for all Motor Control Modes.**

The purpose of the inverse time is to automatically reduce the drive current limit in response to prolonged overload conditions. As the motor current exceeds the AIMING POINT level, the excess current is integrated. Motor current is allowed to flow at the CURRENT LIMIT (see the CURRENT LIMIT function block) for a period defined by the DELAY parameter. At this point the inverse time current limit is ramped down from 150.0 % to the level defined by AIMING POINT. The rate at which the inverse time current limit is ramped to the AIMING POINT is defined by DOWN TIME.

Once the overload condition is removed, the inverse time current limit level is ramped back toward the CURRENT LIMIT level at a rate defined by UP TIME.

In Normal Duty torque mode, the allowed overload is reduced to 115.0 % for 60.0 s before inverse time current limit action occurs.

| Inverse Time |                 |        |              |
|--------------|-----------------|--------|--------------|
| -            | IT LIMITING     | [1152] | FALSE        |
| -            | INVERSE TIME OP | [1153] | 150.0 %      |
| 105.0 %      | -               | [1148] | AIMING POINT |
| 30.0 s       | -               | [1149] | DELAY        |
| 10.0 s       | -               | [1150] | DOWN TIME    |
| 120.0 s      | -               | [1151] | UP TIME      |

## Parameter Descriptions

### AIMING POINT

Range: 50.0 to 150.0%

Determines the final level of the inverse time current limit after a period of prolonged motor overload

### DELAY

Range: 5.0 to 60.0s

Determines the maximum allowed overload duration for 150.0 % motor current (110.0% in QUADRATIC TORQUE mode) before inverse time current limit action is taken.

Refer also to “Normal/Heavy Duty Selection”, page 1-93.

### DOWN TIME

Range: 1.0 to 10.0s

Determines the rate at which the inverse time current limit is ramped to the AIMING POINT after a period of prolonged overload.

### UP TIME

Range: 1.0 to 600.0s

Determines the rate at which the inverse time current limit is ramped back to the CURRENT LIMIT once the overload is removed.

### IT LIMITING

Range: FALSE / TRUE

This indicates if the inverse time current limit is active.

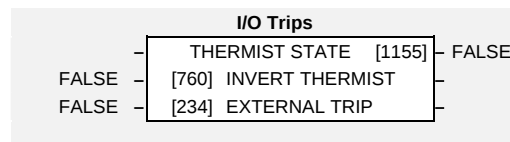
### INVERSE TIME OP

Range: —.x %

This indicates the present level of the inverse time current limit.

## I/O TRIPS

This function block is designed to operate in conjunction with the Digital Input function blocks to trip the drive on a loss of safety control input.



## Parameter Descriptions

### INVERT THERMIST

Range: FALSE / TRUE

Inverts the sense of the motor thermistor input. The default FALSE is normally-closed/low impedance.

### EXTERNAL TRIP

Range: FALSE / TRUE

When this input is set TRUE the drive will trip on EXTERNAL TRIP. This input may be connected to one of the digital inputs to provide an high priority coast to stop that also sets the TRIPPED output high.

### THERMIST STATE

Range: FALSE / TRUE

The current state of the motor thermistor trip input, modified by INVERT THERMIST input.

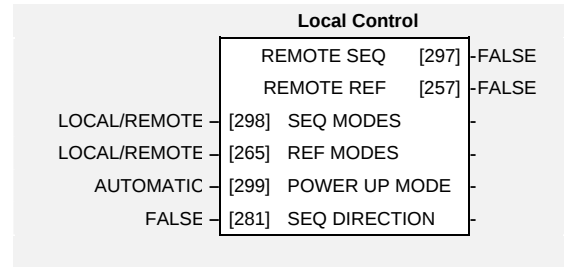
## Functional Description

The I/O TRIPS function block allows trips to be generated by signals on the input terminals of the drive. Refer to the Installation Product Manual, Chapter 7 for a description of the trips supported by the drive.

## LOCAL CONTROL

This block allows the available modes of Local and Remote operation to be customised. It also indicates the selected mode.

You can only switch between Local and Remote modes using the keypad. Refer to the Installation Product Manual, Chapter 5: "The Keypad" - Selecting Local or Remote Control.



## Parameter Descriptions

### SEQ MODES

Range: Enumerated - see below

Allows the source of sequencing (stop/start) commands to be selected. Local/Remote allows selection by the L/R key on the keypad. The remaining two selections disable the L/R key for selecting the sequencing commands source and lock the source to be either Local (keypad) or Remote (an external signal to the drive terminals). The modes supported are:

Enumerated Value : Seq Mode

- 0 : LOCAL/REMOTE
- 1 : LOCAL ONLY
- 2 : REMOTE ONLY

### REF MODES

Range: Enumerated - see below

Allows the source of the reference (speed control) signal to be selected. Local/Remote allows selection by the L/R key on the keypad. The remaining two selections disable the L/R key for selecting the reference signal source and lock the source to be either Local (keypad) or Remote (an external signal to the drive terminals). The modes supported are:

Enumerated Value : Ref Mode

- 0 : LOCAL/REMOTE
- 1 : LOCAL ONLY
- 2 : REMOTE ONLY

### POWER UP MODE

Range: Enumerated - see below

Allows the power-up operating mode of the drive to be selected. Local is the keypad, Remote is an external signal to the drive terminals. Automatic is the same mode as at power-down. The modes supported are:

Enumerated Value : Power Up Mode

- 0 : LOCAL
- 1 : REMOTE
- 2 : AUTOMATIC

### SEQ DIRECTION

Range: FALSE / TRUE

This parameter is used in conjunction with the 6901 Keypad which has a "direction" key, Forward/Reverse.

When this parameter is set to TRUE, the source of the "direction" command is as defined by the SEQ MODES parameter

When this parameter is set to FALSE, the source of the "direction" command is as defined by the REF MODES parameter

### REMOTE SEQ

Range: FALSE / TRUE

This parameter indicates the present source of the sequencing commands. When set to FALSE, stop-start commands are from Local (keypad), when TRUE stop-start commands are from Remote (from the terminals).

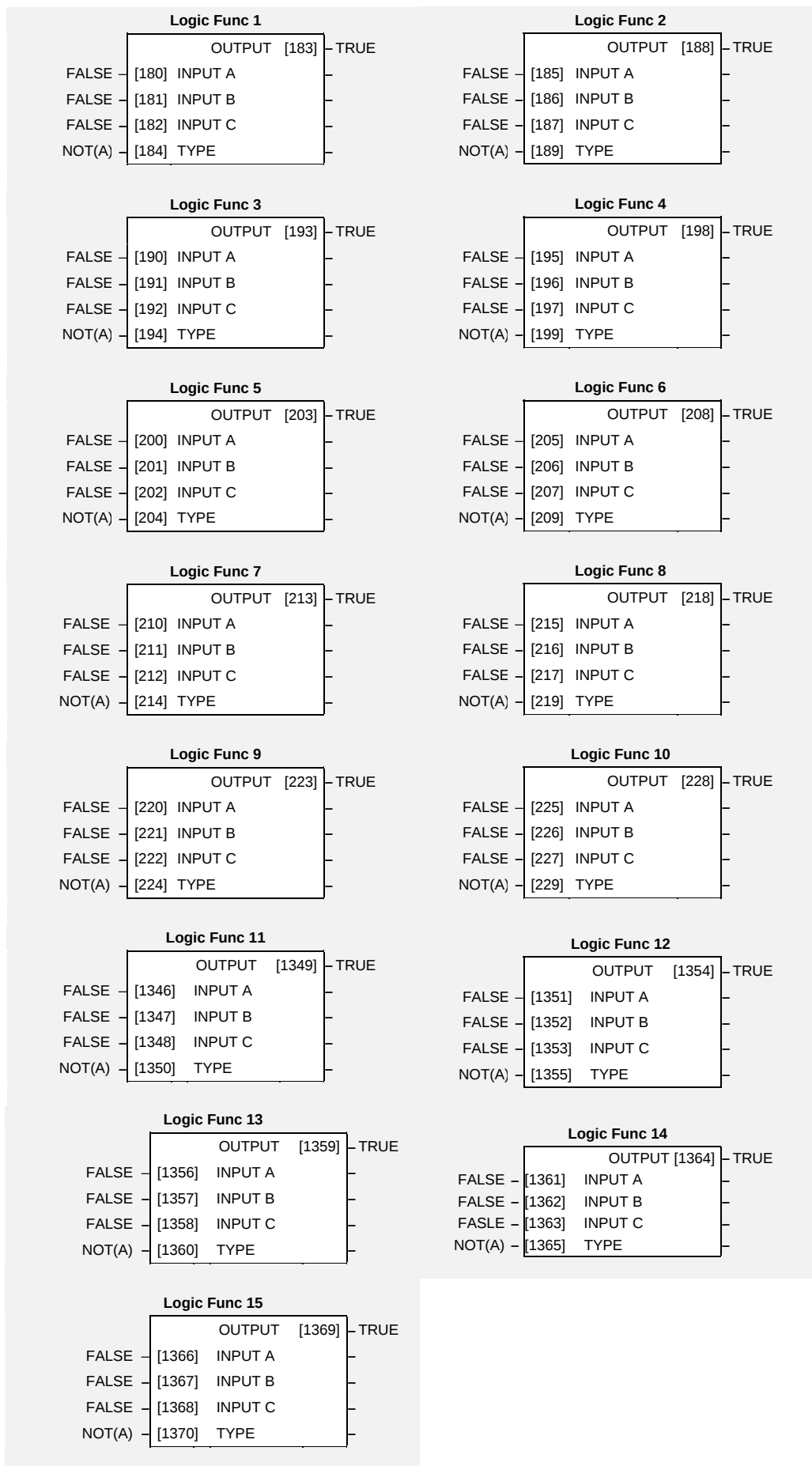
### REMOTE REF

Range: FALSE / TRUE

This parameter indicates the present source of the reference signal. When set to FALSE, speed control is from Local (keypad), when TRUE speed control is from Remote (from the terminals).

## LOGIC FUNCTION

These generic function blocks can be configured to perform one of a number of simple functions upon a fixed number of inputs.



## Parameter Descriptions

### INPUT A

General purpose logic input.

Range: FALSE / TRUE

### INPUT B

General purpose logic input.

Range: FALSE / TRUE

### INPUT C

General purpose logic input.

Range: FALSE / TRUE

### TYPE

The operation to be performed on the three inputs to produce the output value. The operations that can be selected are:

Range: Enumerated - see below

*Enumerated Value : Type*

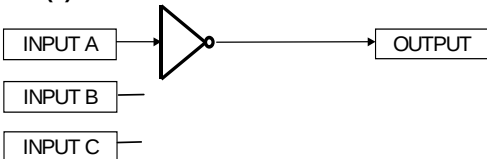
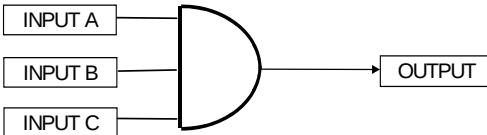
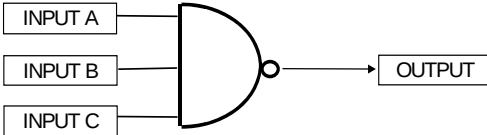
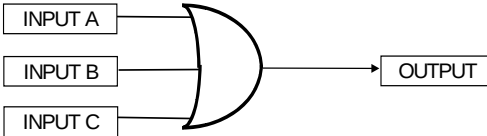
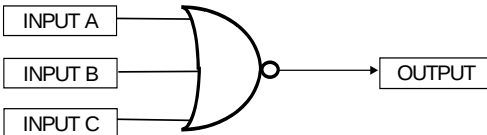
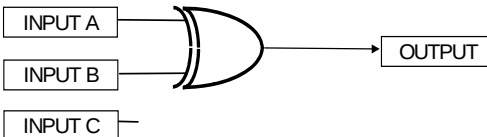
- 0 : NOT(A)
- 1 : AND(A,B,C)
- 2 : NAND(A,B,C)
- 3 : OR(A,B,C)
- 4 : NOR(A,B,C)
- 5 : XOR(A,B)
- 6 : 0-1 EDGE(A)
- 7 : 1-0 EDGE(A)
- 8 : AND(A,B,!C)
- 9 : OR(A,B,!C)
- 10 : S FLIP-FLOP
- 11 : R FLIP-FLOP
- 12 : LATCH
- 13 : SWITCH
- 14 : (A AND B) OR
- 15 : (A OR B) AND C

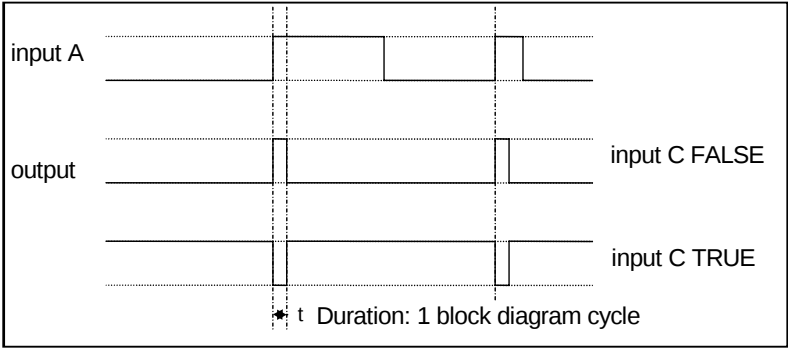
### OUTPUT

The result of performing the selected operation on the inputs.

Range: FALSE / TRUE

**Functional Description**

| Operation   | Description                                                                                               |                                                                                                             |
|-------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| NOT(A)      | <b>NOT(A)</b><br>       | If INPUT A is TRUE the OUTPUT is FALSE, otherwise the OUTPUT is TRUE.                                       |
| AND(A,B,C)  | <b>AND(A,B,C)</b><br>   | If A and B and C are all TRUE then the OUTPUT is TRUE, otherwise the OUTPUT is FALSE.                       |
| NAND(A,B,C) | <b>NAND(A,B,C)</b><br>  | If A and B and C are all TRUE then the OUTPUT is FALSE, otherwise the OUTPUT is TRUE.                       |
| OR(A,B,C)   | <b>OR(A,B,C)</b><br>  | If at least one of A or B or C is TRUE then the OUTPUT is TRUE, otherwise the OUTPUT is FALSE.              |
| NOR(A,B,C)  | <b>NOR(A,B,C)</b><br> | If at least one of A or B or C is TRUE then the OUTPUT is FALSE, otherwise the OUTPUT is TRUE.              |
| XOR(A,B)    | <b>XOR(A,B)</b><br>   | If A and B are the same, (both TRUE or both FALSE), then the output is FALSE, otherwise the output is TRUE. |

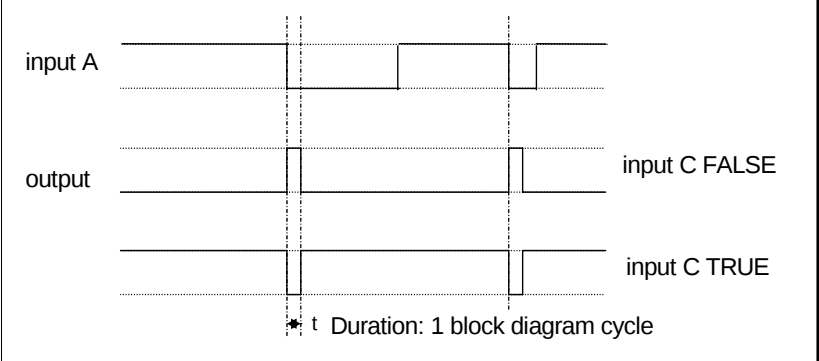
| Operation   | Description                                                                        |
|-------------|------------------------------------------------------------------------------------|
| 0-1 EDGE(A) |  |

**Rising Edge Trigger**

Input B is not used.

This function outputs a pulse of 5ms duration when INPUT A to the block becomes TRUE. When INPUT C is TRUE, the output is inverted.

The output is held TRUE for one execution of the function block diagram.

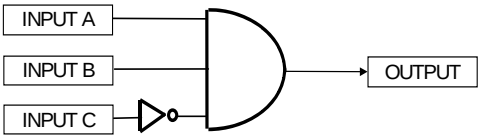
|             |                                                                                     |
|-------------|-------------------------------------------------------------------------------------|
| 1-0 EDGE(A) |  |
|-------------|-------------------------------------------------------------------------------------|

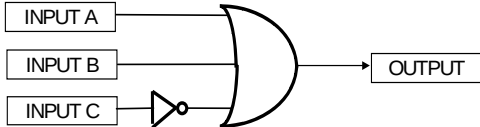
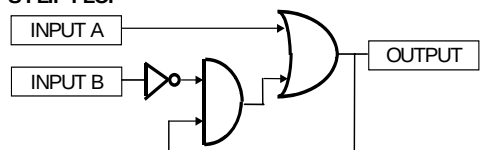
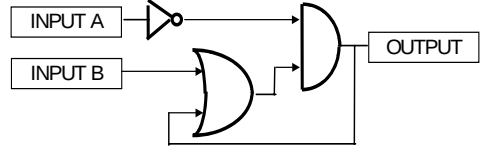
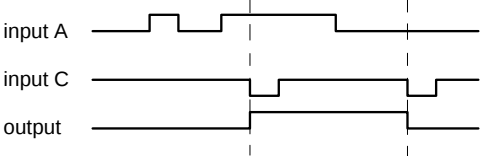
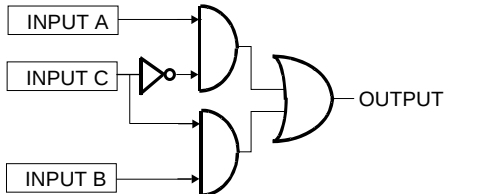
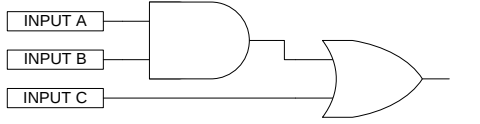
**Falling Edge Trigger**

Input B is not used.

This function outputs a pulse of 20ms duration when INPUT A to the block becomes FALSE. When INPUT C is TRUE, the output is inverted.

The output is held TRUE for one execution of the function block diagram.

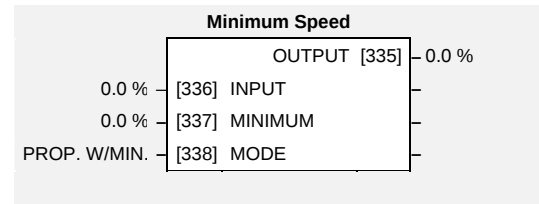
|             |                                                                                      |                     |
|-------------|--------------------------------------------------------------------------------------|---------------------|
| AND(A,B,!C) | <b>AND(A,B,!C)</b>                                                                   | <b>Input State</b>  |
|             |  | <b>Output State</b> |
|             |                                                                                      | A B C Output State  |
|             |                                                                                      | 0 0 0 0             |
|             |                                                                                      | 0 0 1 0             |
|             |                                                                                      | 0 1 0 0             |
|             |                                                                                      | 0 1 1 0             |
|             |                                                                                      | 1 0 0 0             |
|             |                                                                                      | 1 0 1 0             |
|             |                                                                                      | 1 1 0 1             |
|             |                                                                                      | 1 1 1 0             |
|             | Refer to the Truth Table.                                                            |                     |
|             | FALSE = 0, TRUE = 1.                                                                 |                     |

| Operation        | Description                                                                                                                                                      |                                                                                                                                             |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| OR(A,B,!C)       | <b>OR(A,B,!C)</b><br><br><br>Refer to the Truth Table.<br>FALSE = 0, TRUE = 1. | <b>Input State</b>                                                                                                                          |
|                  |                                                                                                                                                                  | <b>A    B    C    Output State</b>                                                                                                          |
|                  |                                                                                                                                                                  | 0    0    0    1                                                                                                                            |
|                  |                                                                                                                                                                  | 0    0    1    0                                                                                                                            |
|                  |                                                                                                                                                                  | 0    1    0    1                                                                                                                            |
|                  |                                                                                                                                                                  | 0    1    1    1                                                                                                                            |
|                  |                                                                                                                                                                  | 1    0    0    1                                                                                                                            |
|                  |                                                                                                                                                                  | 1    0    1    1                                                                                                                            |
|                  |                                                                                                                                                                  | 1    1    0    1                                                                                                                            |
|                  |                                                                                                                                                                  | 1    1    1    1                                                                                                                            |
| S FLIP-FLOP      | <b>S FLIP-FLOP</b><br>                                                         | This is a set dominant flip-flop. INPUT A functions as <i>set</i> , and INPUT B as <i>reset</i> .                                           |
|                  |                                                                                                                                                                  |                                                                                                                                             |
| R FLIP-FLOP      | <b>R FLIP-FLOP</b><br>                                                        | This is a reset dominant flip-flop. INPUT A functions as <i>reset</i> , and INPUT B as <i>set</i> .                                         |
|                  |                                                                                                                                                                  |                                                                                                                                             |
| LATCH            |                                                                              | When INPUT C is low, the output is the value of INPUT A. This output value is then latched until INPUT C is low again. INPUT B is not used. |
|                  |                                                                                                                                                                  |                                                                                                                                             |
| SWITCH           |                                                                              | When INPUT C is FALSE, the output is equal to INPUT A. When INPUT C is TRUE, the output is equal to INPUT B.                                |
|                  |                                                                                                                                                                  |                                                                                                                                             |
| (A AND B) OR C   | <br><br>Refer to the truth table<br>FALSE = 0, TRUE = 1.                     | <b>A    B    C    Output</b>                                                                                                                |
|                  |                                                                                                                                                                  | 0    0    0    0                                                                                                                            |
|                  |                                                                                                                                                                  | 0    0    1    1                                                                                                                            |
|                  |                                                                                                                                                                  | 0    1    0    0                                                                                                                            |
|                  |                                                                                                                                                                  | 0    1    1    1                                                                                                                            |
|                  |                                                                                                                                                                  | 1    0    0    0                                                                                                                            |
|                  |                                                                                                                                                                  | 1    0    1    1                                                                                                                            |
|                  |                                                                                                                                                                  | 1    1    0    1                                                                                                                            |
|                  |                                                                                                                                                                  | 1    1    1    1                                                                                                                            |
|                  |                                                                                                                                                                  | (A OR B) AND C                                                                                                                              |
| 0    0    0    0 |                                                                                                                                                                  |                                                                                                                                             |
| 0    0    1    0 |                                                                                                                                                                  |                                                                                                                                             |
| 0    1    0    0 |                                                                                                                                                                  |                                                                                                                                             |
| 0    1    1    1 |                                                                                                                                                                  |                                                                                                                                             |
| 1    0    0    0 |                                                                                                                                                                  |                                                                                                                                             |
| 1    0    1    1 |                                                                                                                                                                  |                                                                                                                                             |
| 1    1    0    0 |                                                                                                                                                                  |                                                                                                                                             |
| 1    1    1    1 |                                                                                                                                                                  |                                                                                                                                             |

## MINIMUM SPEED

The minimum speed block is used to determine how the drive will follow a reference. There are two modes

1. Proportional : minimum limit
2. Linear : between minimum and maximum.



## Parameter Descriptions

### INPUT

The input for this block.

Range: -300.0 to 300.0 %

### MINIMUM

PAR\ P3

Range: -100.0 to 100.0 %

This parameter determines the minimum output value from this block

### MODE

SET\SETP ST06

Range: Enumerated - see below

This parameter represents the operating mode of the block. There are two modes:

Enumerated Value : Operating Mode

0 : PROP. W/MIN.

1 : LINEAR

### OUTPUT

The output is determined by the MODE selected, see below.

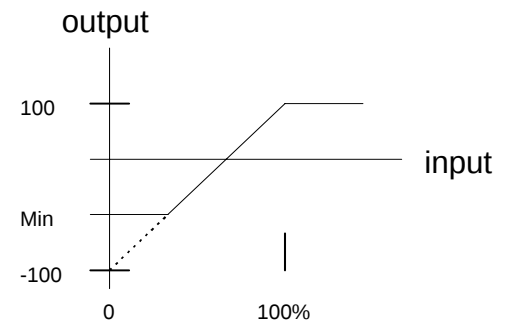
Range: —.x %

## Functional Description

There are two operating modes for the MINIMUM SPEED block:

### Proportional with Minimum

In this mode the MINIMUM SPEED block behaves like a simple clamp. The minimum value has the valid range -100% to 100% and the output is always greater than or equal to the minimum value.



### Linear

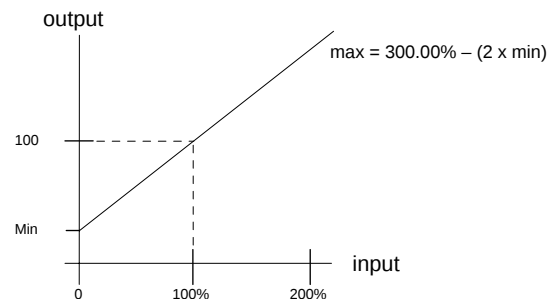
In this mode the MINIMUM SPEED block first clamps the input to zero then rescales the input such that the output goes linearly between minimum and 100% for an input that goes from 0 to 100%.

Note the constraints:-

min  $\geq$  0

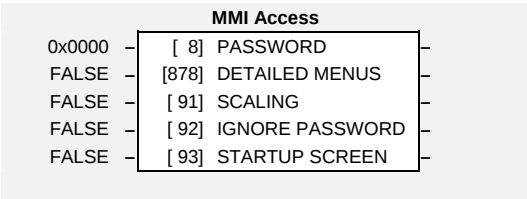
input  $\geq$  0

max = 100%



MMI ACCESS

This function block contains options associated with operator station password protection and the amount of detail the menu structure will show.



Parameter Descriptions

**PASSWORD** *PAR\ P99* *Range: 0000 to FFFF*

Setting a non-zero value enables the password feature.

**DETAILED MENUS** *SET\SETP ST99* *Range: FALSE / TRUE*

Selects Full menu detail for the keypad. The additional parameters shown in the menus are indicated in this manual by **F**

**SCALING** *Range: See below*

Selects a DISPLAY SCALE function block to be applied to the value of SETPOINT DISPLAY

*Enumerated Value : DISPLAY SCALE function block*

- 0 : NONE
- 1 : DISPLAY SCALE 1
- 2 : DISPLAY SCALE 2

**IGNORE PASSWORD** *Range: FALSE / TRUE*

When TRUE, this entry in the MMI ACCESS may be adjusted regardless of the password protection feature.

**STARTUP SCREEN** *Range: See below*

Selects which of the Operator Menu parameters will be displayed after the Welcome screen.

*Enumerated Value : Startup Screen*

- 0 : selects REMOTE SETPOINT or LOCAL SETPOINT
- 1 : selects parameter defined by APP MENU 1
- 2 : selects parameter defined by APP MENU 2
- : etc.
- 16 : selects parameter defined by APP MENU 16

## MOTOR DATA

**Designed for all Motor Control Modes.**

In this function block you enter the details of the motor under control and any available motor nameplate information.

*The Autotune feature will determine the MAG CURRENT, STATOR RES, LEAKAGE INDUC, MUTUAL INDUC and ROTOR TIME CONST motor model parameter.*

The OVERLOAD parameter determines the allowed level of motor overload. This can be especially useful when operating with motors smaller than the inverter rating.

| Motor Data      |        |                  |
|-----------------|--------|------------------|
| * 50.0 Hz       | [1159] | BASE FREQUENCY   |
| * ** 400.0 V    | [1160] | MOTOR VOLTAGE    |
| ** 20.00 A      | [ 64]  | MOTOR CURRENT    |
| ** 6.00 A       | [ 65]  | MAG CURRENT      |
| * ** 1460.0 rpm | [ 83]  | NAMEPLATE RPM    |
| 4 POLE          | [ 84]  | MOTOR POLES      |
| VOLTS / HZ      | [1157] | CONTROL MODE     |
| ** 11.00 kW     | [1158] | POWER            |
| * ** STAR       | [124]  | MOTOR CONNECTION |
| ** 0.86         | [242]  | POWER FACTOR     |
| ** 2.0          | [1164] | OVERLOAD         |
| ** 0.7698 Ohm   | [119]  | STATOR RES       |
| ** 24.50 mH     | [120]  | LEAKAGE INDUC    |
| ** 98.01 mH     | [121]  | MUTUAL INDUC     |
| ** 379.56 ms    | [1163] | ROTOR TIME CONST |

**Note:** *Do not attempt to control motors whose rated current is less than 50% of the drive rated current. Poor motor control or Autotune problems may occur if you do.*

## Parameter Descriptions

**BASE FREQUENCY**  **PAR\ P7** *Range: 7.5 to 240.0Hz*

This parameter contains the motor nameplate base frequency. Refer to FLUXING, page 1-35.

**MOTOR VOLTAGE**  **SET\CTRL CL12** *Range: 0.0 to 575.0V*

This parameter contains the motor nameplate voltage at base frequency. Refer to VOLTAGE CONTROL, page 1-91.

**MOTOR CURRENT**  **PAR\ P6 &** *Range: 0.01 to 999.99A*  
 **SV SET\CTRL CL10**

This parameter contains the motor nameplate full-load line current.

**MAG CURRENT**  **SET\CTRL CL14** *Range: 0.01 to 999.99A*

This parameter contains the motor model no-load line current as determined by the Autotune, or from the motor nameplate.

**NAMEPLATE RPM**  **SET\CTRL CL02** *Range: 0.1 to 30000.0 rpm*

This parameter contains the motor nameplate full-load rated speed. This is the motor speed in rpm at base frequency minus full load slip.

**MOTOR POLES**  **SV SET\CTRL CL11** *Range: Enumerated - see below*

This parameter contains the motor nameplate pole-pairs.

*Enumerated Value : Motor Poles*

- 0 : 2 pole
- 1 : 4 pole
- 2 : 6 pole
- 3 : 8 pole
- 4 : 10 pole
- 5 : 12 pole

**CONTROL MODE** **SET\CTRL CL01** *Range: Enumerated - see below*

Determines the main method of motor control used by the drive.

*Enumerated Value : Control Mode*

- 0 : VOLTS / HZ
- 1 : SENSORLESS VEC

# 1-52 Programming Your Application

**POWER** **M SV** SET\CTRL CL15 *Range: 0.00 to 355.00kW*

This parameter contains the motor nameplate power.

**MOTOR CONNECTION** **M SV** SET\CTRL CL16 *Range: Enumerated - see below*

This parameter contains the motor nameplate connection.

*Enumerated Value : Motor Connection*

0 : DELTA

1 : STAR

**POWER FACTOR** *Range: 0.50 to 0.99*

This parameter contains the motor nameplate full-load power factor.

**OVERLOAD** *Range: 1.0 to 5.0*

This parameter contains the allowable motor overload factor. It is used to match the drive current measurement range to the motor. The drive is set up so that the **Motor Current x Overload** can be measured up to a maximum of 2 x the drive constant torque current rating.

The OVERLOAD parameter has no effect on the current, inverse time or torque limits.

**STATOR RES** **F M SV** SET\CTRL CL17 *Range: 0.0000 to 250.0000 Ohm*

This parameter contains the motor model per-phase stator resistance as determined by Autotune.

**LEAKAGE INDUC** **F M SV** SET\CTRL CL18 *Range: 0.00 to 300.00 mH*

This parameter contains the motor model per-phase leakage inductance as determined by Autotune.

**MUTUAL INDUC** **F M SV** SET\CTRL CL19 *Range: 0.00 to 3000.00 mH*

This parameter contains the motor model per-phase mutual inductance as determined by Autotune.

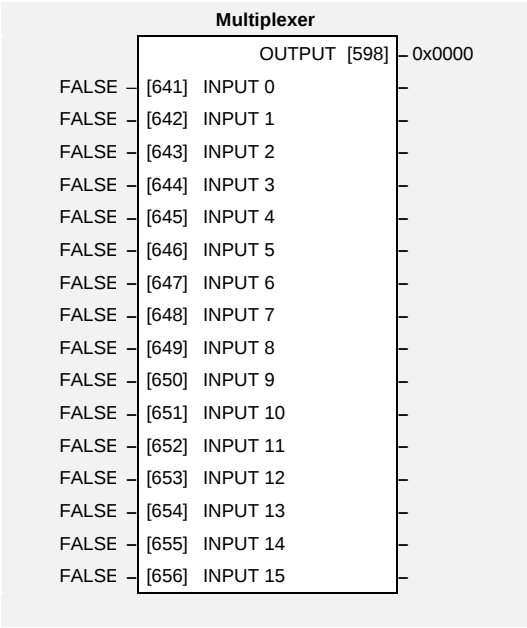
**ROTOR TIME CONST** **F M SV** SET\CTRL CL1A *Range: 10.00 to 3000.00*

This parameter contains the motor model rotor time constant as determined by Autotune.

MULTIPLEXER

The block collects together 16 Boolean input values into a single word.

For example, it may be used to set and clear individual bits within a word such as the TRIGGERS 1 word for the AUTO RESTART function block.



Parameter Descriptions

INPUT 0 TO INPUT 15

The Boolean inputs to be assembled into a single word.

Range: FALSE / TRUE

OUTPUT

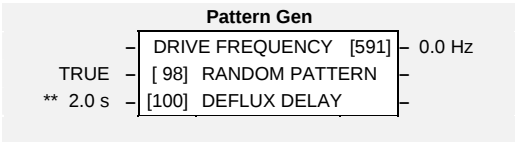
The resulting word.

Range: 0000 to FFFF

**PATTERN GEN**

*Designed for all Motor Control Modes.*

The pattern generator function block allows you to configure the drive PWM (Pulse Width Modulator) operation.



**Parameter Descriptions**

**RANDOM PATTERN**

*Range: FALSE / TRUE*

This parameter selects between random pattern (quiet motor noise) or the more conventional fixed carrier PWM strategies. When TRUE, random pattern is enabled.

**DEFLUX DELAY**

*Range: 0.1 to 10.0 s*

Sets the minimum allowed delay between disabling and then re-enabling PWM production (i.e. stopping and starting the drive).

**DRIVE FREQUENCY**

*DIAG 1*

*Range: —.x Hz*

This indicates the drive output frequency.

**Functional Description**

The drive provides a unique quiet pattern PWM strategy in order to reduce audible motor noise. The user is able to select between the quite pattern or the more conventional fixed carrier frequency method. With the quiet pattern strategy selected (random pattern enabled), audible motor noise is reduced to a dull hiss.

## PID

This function block allows the drive to be used in applications requiring a trim to the setpoint, depending on feedback from an external measurement device. Typically this will be used for process control, i.e. pressure or flow.

| PID      |                        |                |
|----------|------------------------|----------------|
|          | OUTPUT                 | [1256] -0.00 % |
|          | ERROR                  | [619] -0.00 %  |
|          | LIMITING               | [1257] -FALSE  |
| 0.00 %   | [1247] SETPOINT        |                |
| 0.00 %   | [617] FEEDBACK         |                |
| 0.00 %   | [1248] FEED FWD        |                |
| 1.00     | [618] FEEDBACK GAIN    |                |
| 0.00     | [1249] FEED FWD GAIN   |                |
| 0.10     | [1250] P GAIN          |                |
| 1.00     | [1251] I GAIN          |                |
| 0.00     | [1252] D GAIN          |                |
| 300.00 % | [1253] LIMIT           |                |
| FALSE    | [1254] ENABLE PID      |                |
| FALSE    | [1098] INTEGRAL DEFEAT |                |
| 0.05 s   | [1255] D FILTER TC     |                |
| 1.0000   | [1258] OUTPUT SCALING  |                |
| 0.00 %   | [318] LOW LIMIT        |                |
| TRUE     | [319] SYMMETRIC LIMIT  |                |

## Parameter Descriptions

### SETPOINT

The input setpoint to the PID block.

Range: -300.00 to 300.00 %

### FEEDBACK

The feedback input to the PID block.

Range: -300.00 to 300.00 %

### FEED FWD

The feed forward input to the PID block.

Range: -300.00 to 300.00 %

### FEEDBACK GAIN

PAR\ P505

The feedback gain of the PID block.

Range: -10.00 to 10.00

### FEED FWD GAIN

The feed forward gain of the PID block.

Range: -10.00 to 10.00

### P GAIN

PAR\ P501

The Proportional gain of the PID block.

Range: 0.00 to 100.00

### I GAIN

PAR\ P502

The Integral gain of the PID block.

Range: 0.00 to 100.00

### D GAIN

PAR\ P503

The Derivative gain of the PID block.

Range: 0.00 to 100.00

### LIMIT

PAR\ P506

This parameter determines the maximum positive limit of the PID output. When SYMMETRIC LIMIT is TRUE this parameter also determines the maximum negative limit of the PID output.

Range: 0.00 to 300.00 %

### ENABLE PID

When TRUE, the PID output operates normally; when FALSE, the output is zero and the integral term is reset to zero.

Range: FALSE / TRUE

### INTEGRAL DEFEAT

This parameter resets the integral term to zero when TRUE.

Range: FALSE / TRUE

### D FILTER TC

PAR\ P504

In order to help attenuate high frequency noise on the PID output, a first order output filter has

Range: 0.05 to 5.00 s

## Parameter Descriptions

been provided. This parameter determines the output filter time constant.

## OUTPUT

Range: xx.xx %

The output of the PID function.

## ERROR

Range: xx.xx %

The result of SETPOINT - FEEDBACK x FEEDBACK GAIN.

## LIMITING

*Range: FALSE / TRUE*

This output is TRUE if the output is at the LIMIT value.

## OUTPUT SCALING

Range: -3.0000 to 3.0000

This parameter represents an overall scaling factor which is applied after the PID positive and negative clamps.

**LOW LIMIT**

Range: -300.00 to 0.00

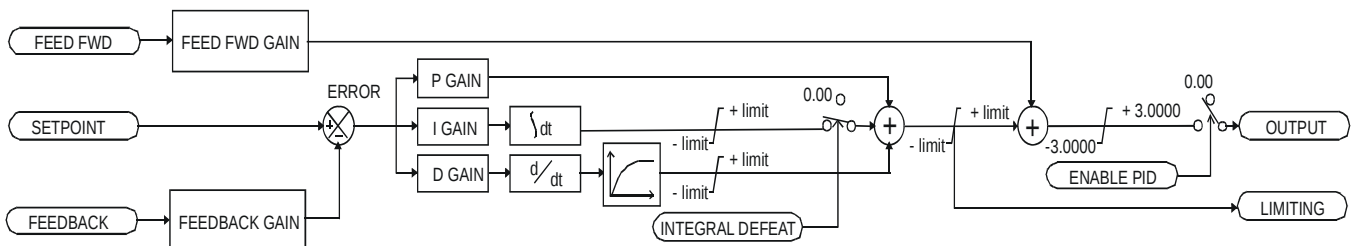
When SYMMETRIC LIMIT is FALSE, this LOW LIMIT parameter defines the minimum value of the output.

## SYMMETRIC LIMIT

*Range: FALSE / TRUE*

Affects the operation of LIMIT and LOW LIMIT. When TRUE, (symmetrical), the single LIMIT parameter is used for both the positive and negative limit values. When FALSE the limit values may be different, LIMIT is used for the upper limit and LOW LIMIT is used for the lower limit.

## Functional Description

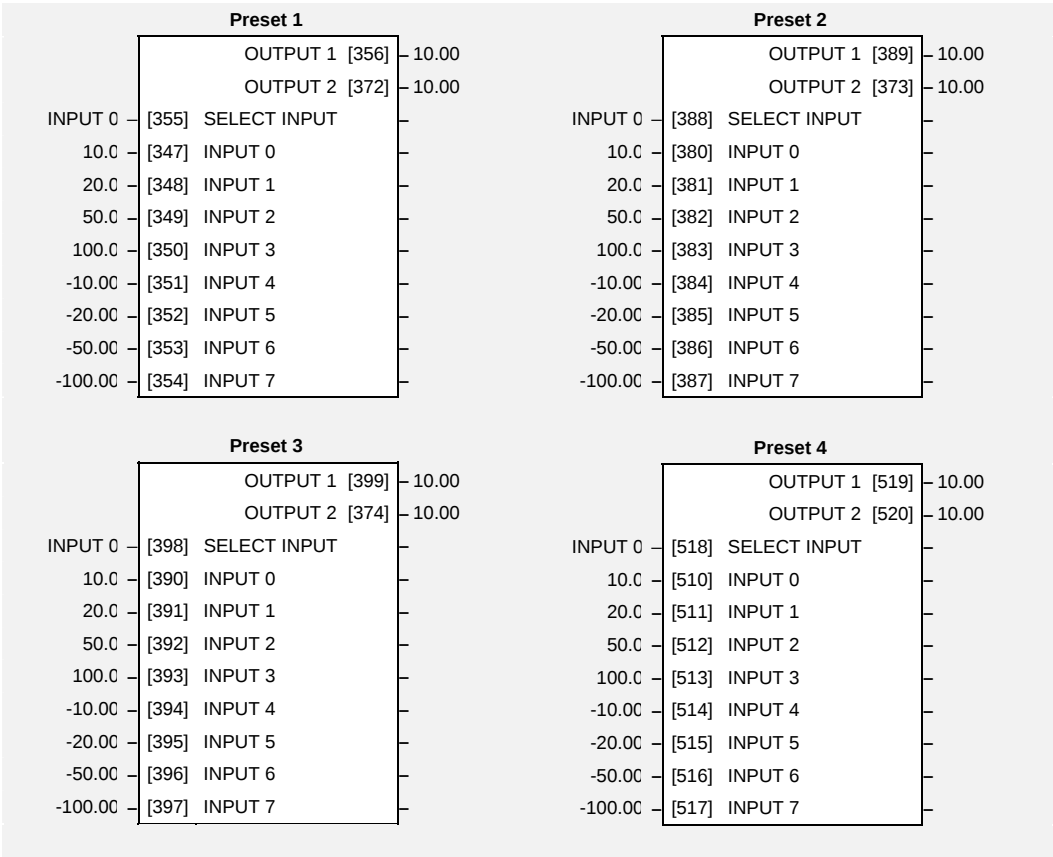


For an application that requires closed loop control, the error term may be derived from the setpoint and feedback using a value function block. This error term is then used by the PID. The output of the PID may be used to trim the demand setpoint via the SPEED TRIM parameter in the REFERENCE function block.

PRESET

Each block is used to select a value from one of eight inputs, depending on the value of another input. A second output is provided to allow the block to be used as two banks of four inputs.

The Range of preset inputs is -32768.0 to 32767.



Parameter Descriptions

**SELECT INPUT** *Range: Enumerated - see below*  
Determines which of the inputs is routed to OUTPUT 1 . In addition, if SELECT INPUT is in the range 0 to 3, INPUT 4 to INPUT 7 respectively is routed to OUTPUT 2.

*Enumerated Value : Select Input*

- 0 : INPUT 0
- 1 : INPUT 1
- 2 : INPUT 2
- 3 : INPUT 3
- 4 : INPUT 4
- 5 : INPUT 5
- 6 : INPUT 6
- 7 : INPUT 7

**INPUT 0 TO INPUT 7** *PAR\ P301 to P308* *Range: -300.00 to 300.00*  
Inputs to the Preset block.

**OUTPUT 1** *Range: —.xx*  
Selected input.

**OUTPUT 2** *Range: —.xx*  
Selected input (if SELECT INPUT is in the correct range).

# 1-58 Programming Your Application

## Functional Description

The Preset function block is a de-multiplexer.

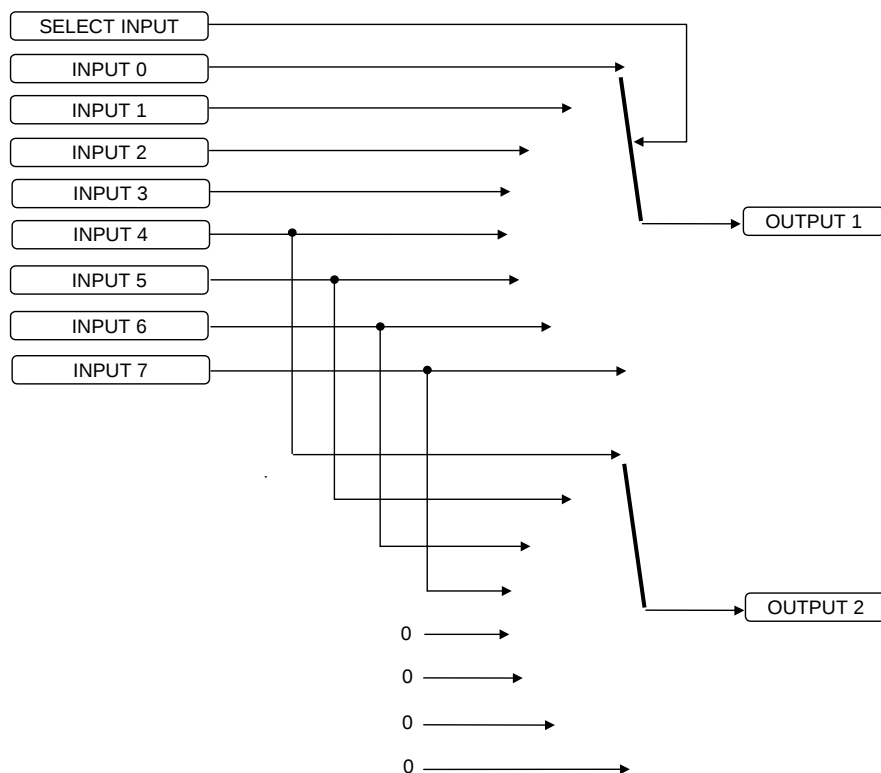
OUTPUT 1 and OUTPUT 2 return the values at selected inputs set by SELECT INPUT.

OUTPUT 2 returns the value of a different input to OUTPUT 1, i.e:

if SELECT INPUT = 0 then OUTPUT 1 = INPUT 0, OUTPUT 2 = INPUT 4

if SELECT INPUT = 1 then OUTPUT 1 = INPUT 1, OUTPUT 2 = INPUT 5 etc.

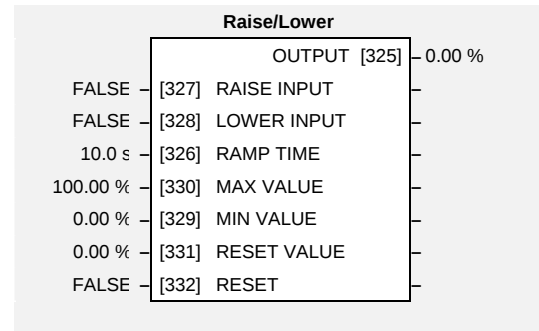
When SELECT INPUT is set to 4, 5, 6 or 7, OUTPUT 2 will return a value of zero.



## RAISE/LOWER

This function block acts as an internal motorised potentiometer (MOP).

The OUTPUT is preserved during power-down of the drive.



## Parameter Descriptions

### RAISE INPUT

Range: FALSE / TRUE

When TRUE causes OUTPUT to ramp up.

### LOWER INPUT

Range: FALSE / TRUE

When TRUE causes OUTPUT to ramp down.

### RAMP TIME

PAR\ P401

Range: 0.0 to 600.0 s

Rate of change of the OUTPUT . Defined as time to change from 0.00% to 100.00% . Note that the raise and lower rates are always the same.

### MAX VALUE

PAR\ P402

Range: -100.00 to 100.00 %

The maximum value to which OUTPUT will ramp up to.

### MIN VALUE

PAR\ P403

Range: -100.00 to 100.00 %

The minimum value to which OUTPUT will ramp down to.

### RESET VALUE

PAR\ P404

Range: -100.00 to 100.00 %

The value the OUTPUT is set to when RESET is TRUE.

### RESET

Range: FALSE / TRUE

When TRUE, forces OUTPUT to track RESET VALUE .

### OUTPUT

Range: —.xx %

The ramped output. This parameter is persistent, that is, it is saved throughout a power failure.

## Functional Description

The table below describes how OUTPUT is controlled by the RAISE INPUT, LOWER INPUT and RESET inputs.

| RESET | RAISE INPUT | LOWER INPUT | Action                                      |
|-------|-------------|-------------|---------------------------------------------|
| TRUE  | Any         | Any         | OUTPUT tracks RESET VALUE                   |
| FALSE | TRUE        | FALSE       | OUTPUT ramps up to MAX VALUE at RAMP TIME   |
| FALSE | FALSE       | TRUE        | OUTPUT ramps down to MIN VALUE at RAMP TIME |
| FALSE | FALSE       | FALSE       | OUTPUT not changed. *                       |
| FALSE | TRUE        | TRUE        | OUTPUT not changed. *                       |

\* If OUTPUT is greater than MAX VALUE the OUTPUT will be clamped MAX VALUE. If OUTPUT is less than MIN VALUE the OUTPUT be clamped to MIN VALUE.

If MAX VALUE is less than MIN VALUE then MAX VALUE will be used as the lower limit, and MIN VALUE will be used as the upper limit.

## REFERENCE

This function block holds all the parameters concerning the generation of the setpoint reference.

| Reference |                       |       |
|-----------|-----------------------|-------|
|           | SPEED DEMAND [255]    | 0.0 % |
|           | SPEED SETPOINT [254]  | 0.0 % |
|           | RAMP INPUT [56]       | 0.0 % |
|           | REVERSE [256]         | FALSE |
|           | LOCAL SETPOINT [247]  | 0.0 % |
|           | COMMS SETPOINT [770]  | 0.0 % |
|           | LOCAL REVERSE [250]   | FALSE |
| 0.0 %     | [245] REMOTE SETPOINT |       |
| 0.0 %     | [248] SPEED TRIM      |       |
| * 50.0 Hz | [57] MAX SPEED        |       |
| 110.0 %   | [252] MAX SPEED CLAMP |       |
| -110.0 %  | [253] MIN SPEED CLAMP |       |
| FALSE     | [243] TRIM IN LOCAL   |       |
| FALSE     | [249] REMOTE REVERSE  |       |
| 0.0 %     | [251] LOCAL MIN SPEED |       |

## Parameter Descriptions

### REMOTE SETPOINT

Range: -110.0 to 110.0 %

This is the target reference that the drive will ramp to in remote reference mode (not including trim), direction is taken from REMOTE REVERSE and the sign of REMOTE SETPOINT.

### SPEED TRIM

Range: -110.00 to 110.00 %

The trim is added to the ramp output in remote mode (or if TRIM IN LOCAL is TRUE) to form SPEED DEMAND. The trim is typically connected to the output of a PID in a closed loop system. Note that the output of the REFERENCE RAMP block is set to - SPEED TRIM when the drive is started. This ensures that the SPEED DEMAND ramps from zero.

### MAX SPEED

 PAR\ P2

Range: 7.5 to 300.0 Hz

The maximum speed of the drive in electrical Hertz (Hz).

### MAX SPEED CLAMP

Range: 0.0 to 110.0 %

Maximum value for SPEED DEMAND.

### MIN SPEED CLAMP

Range: -110.0 to 0.0 %

Minimum value for SPEED DEMAND.

### TRIM IN LOCAL

Range: FALSE / TRUE

When TRUE, SPEED TRIM is always added to the ramp output. When FALSE, SPEED TRIM is added only in Remote mode.

### REMOTE REVERSE

Range: FALSE / TRUE

Demanded direction when in Remote Reference mode. This is usually connected directly to the Sequencing Logic.

### LOCAL MIN SPEED

 SET\SETP ST51

Range: 0.0 to 100.0 %

The magnitude of the minimum setpoint that will be used when running in Local Mode.

### SPEED DEMAND

Range: —.x %

Indicates actual speed demand. This is the input to the frequency controller.

### SPEED SETPOINT

DIAG 2

Range: —.x %

This diagnostic indicates target speed. This will be equal to either LOCAL SETPOINT, REMOTE SETPOINT, JOG SETPOINT or COMMS SETPOINT. (Refer to the REFERENCE JOG function block for the JOG SETPOINT parameter).

## Parameter Descriptions

### RAMP INPUT

*Range: —.x %*

The RAMP INPUT diagnostic is the same as the SPEED SETPOINT when the drive is running normally. When the drive is stopped or stopping RAMP INPUT will be set to zero.

### REVERSE

*Range: FALSE / TRUE*

Indicates demanded direction. This may not be the actual direction as no account of setpoint sign is taken.

### LOCAL SETPOINT

*Range: —.x %*

Indicates the Operator Station setpoint. It is saved on power down. Direction is taken from LOCAL REVERSE.

### COMMS SETPOINT

*Range: —.x %*

This setpoint is the target reference that the drive will ramp to in Remote Reference Comms mode (not including trim). The direction is always positive, i.e. forward.

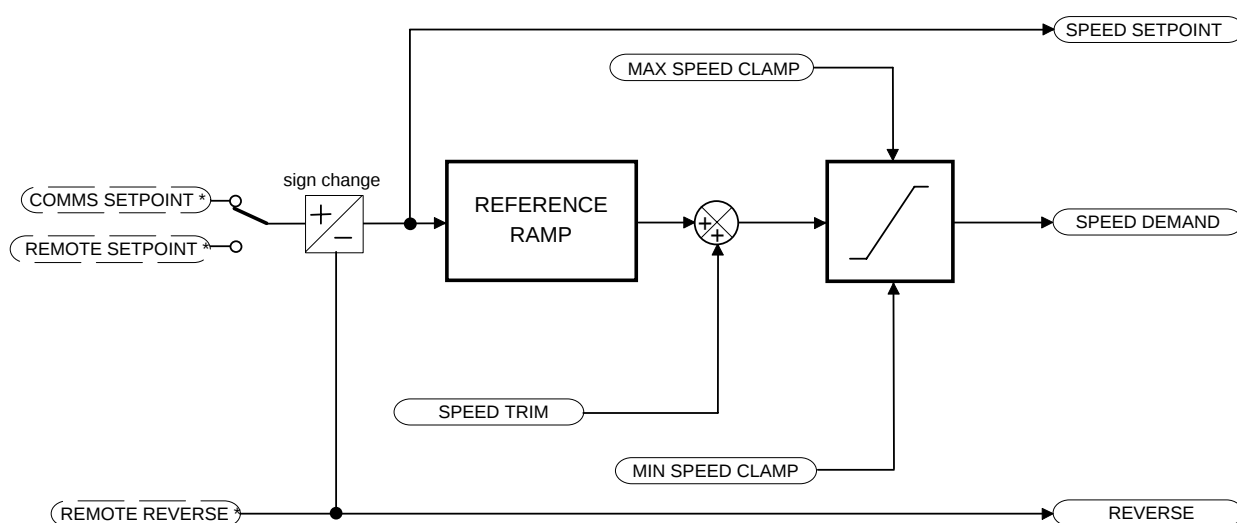
### LOCAL REVERSE

*Range: FALSE / TRUE*

Indicates demanded direction in Local Reference mode, saved on power-down.

## Functional Description

### Remote Reference



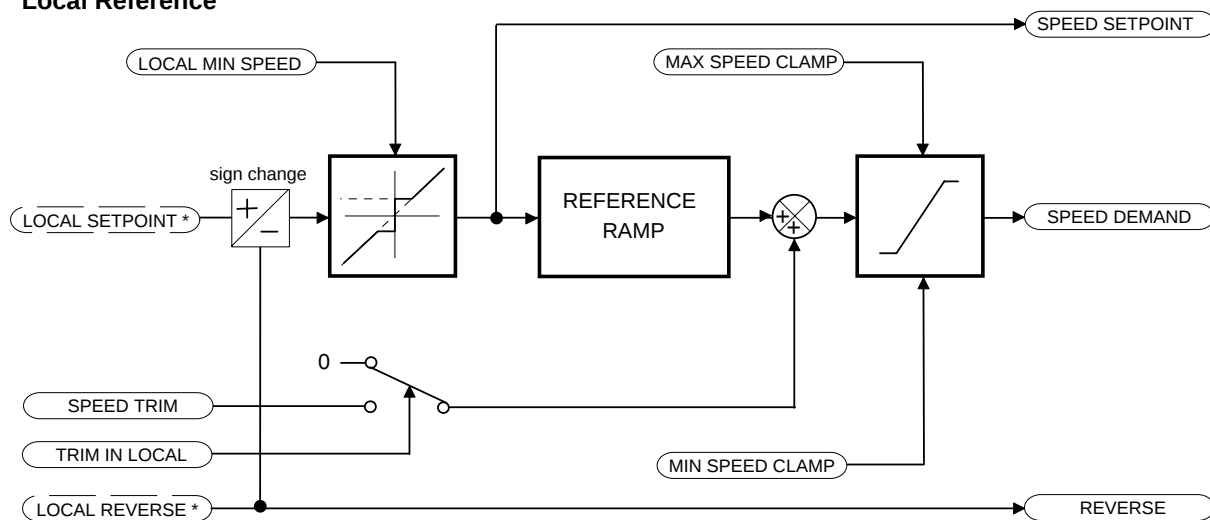
\* Set only from Comms using tag 269 (readable as tag 770 in block diagram)

REMOTE SETPOINT if Remote Reference Terminal mode

COMMS SETPOINT if Remote Reference Comms mode

(Mode is selectable in COMMS CONTROL block)

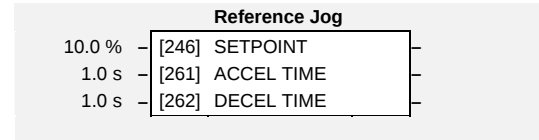
### Local Reference



\* Set only from the Operator Station

## REFERENCE JOG

This block holds all the parameters that concern the Jog functionality on the drive.



## Parameter Descriptions

**SETPOINT** *PAR\ P8* *Range: -100.0 to 100.0 %*

The setpoint is the target reference that the drive will ramp to.

**ACCEL TIME** *SET\SETP ST01* *Range: 0.0 to 3000.0 s*

The time that the drive will take to ramp the jog setpoint from 0.00% to 100.00%.

**DECEL TIME** *SET\SETP ST02* *Range: 0.0 to 3000.0 s*

The time that the drive will take to ramp the jog setpoint from 100.00% to 0.00%.

## Functional Description

The REFERENCE JOG function block is used to configure the action of the drive when used in jog mode.

### Start/Stop Controlled Remotely

When the JOG input is TRUE, the SPEED DEMAND (REFERENCE function block) ramps up to the jog SETPOINT at a ramp rate set by jog ACCEL TIME. The drive will continue to run at the jog SETPOINT while the JOG input remains TRUE.

### Start/Stop Controlled Locally (6901 keypad)

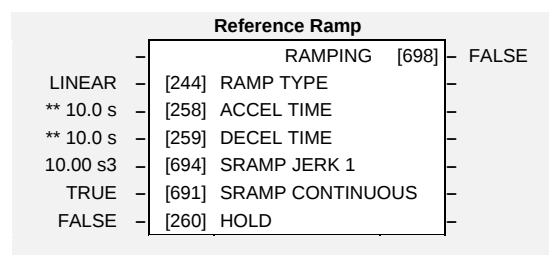
When the JOG key is pressed and held, the SPEED DEMAND (REFERENCE function block) ramps up to the jog SETPOINT at a ramp rate set by jog ACCEL TIME. Release the jog key to "stop" the drive.

### Interaction between RUN and JOG

Only one of these signals can be in effect at any one time; the other signal is ignored. The drive must be "stopped" to change from running to jogging, or vice versa.

## REFERENCE RAMP

This function block forms part of the reference generation. It provides the facility to control the rate at which the drive will respond to a changing setpoint demand.



## Parameter Descriptions

**RAMP TYPE** *SET\SETP ST03* *Range: Enumerated - see below*

Select the ramp type:

*Enumerated Value : Ramp Type*

0 : LINEAR

1 : S

**ACCEL TIME** *PAR\ P4* *Range: 0.0 to 3000.0 s*

The time that the drive will take to ramp the setpoint from 0.00% to 100.00%.

**DECEL TIME** *PAR\ P5* *Range: 0.0 to 3000.0 s*

The time that the drive will take to ramp the setpoint from 100.00% to 0.00%.

**SRAMP JERK 1** *SET\SETP ST04* *Range: 0.00 to 100.00 s3*

Rate of change of acceleration for the first segment of the curve in units per second<sup>3</sup>, i.e. if the full speed of the machine is 1.25m/s then the acceleration will be:

$$1.25 \times 50.00\% = 0.625\text{m/s}^3$$

**SRAMP CONTINUOUS** *SET\SETP ST05* *Range: FALSE / TRUE*

When TRUE, and S ramp is selected in RAMP TYPE, forces a smooth transition if the speed setpoint is changed when ramping. The curve is controlled by the SRAMP ACCEL and SRAMP JERK 1 to SRAMP JERK 4 parameters. When FALSE, there is an immediate transition from the old curve to the new curve.

**RAMP HOLD** *Range: FALSE / TRUE*

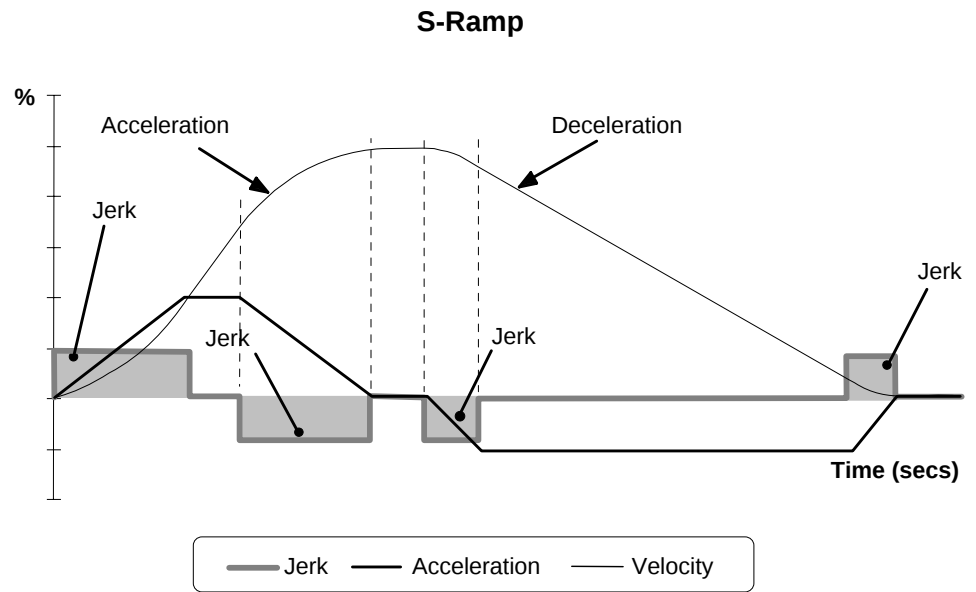
When TRUE the output of the ramp is held at its last value.

**RAMPING** *Range: FALSE / TRUE*

Set TRUE when ramping.

## Functional Description

The ramp output takes the form shown below.



## REFERENCE STOP

This function block holds all the parameters concerning the stopping method of the drive.

| Reference Stop |         |                 |
|----------------|---------|-----------------|
| RAMPED         | - [279] | RUN STOP MODE   |
| 10.0 s         | - [263] | STOP TIME       |
| 0.1 %          | - [266] | STOP ZERO SPEED |
| 0.5 s          | - [284] | STOP DELAY      |
| RAMPED         | - [304] | FAST STOP MODE  |
| 30.0 s         | - [275] | FAST STOP LIMIT |
| 0.1 s          | - [264] | FAST STOP TIME  |
| 1200 Hz/s      | - [126] | FINAL STOP RATE |

## Parameter Descriptions

**RUN STOP MODE** *PAR\ P9* *Range: Enumerated - see below*  
Selects stopping mode that the controller will use once the run command has been removed. The choices are:

*Enumerated Value : Stopping Mode*

0 : RAMPED

1 : COAST

2 : DC INJECTION

When RAMPED is selected the drive will decelerate using the reference ramp deceleration time, provided it is non zero. When COAST is selected the motor will free-wheel. When DC INJECTION is selected the motor is stopped by applying dc current.

**STOP TIME** *Range: 0.0 to 600.0 s*  
Rate at which the demand is ramped to zero after the ramp has been quenched.

**STOP ZERO SPEED** *Range: 0.0 to 100.0 %*  
Threshold for zero speed detection used by stop sequences.

**STOP DELAY** *Range: 0.0 to 30.0 s*  
Sets the time at which the drive holds zero speed before quenching after a normal stop or a jog stop. This may be particularly useful if a mechanical brake requires time to operate at zero speed, or for jogging a machine to position.

**FAST STOP MODE** *Range: Enumerated - see below*  
Selects stopping mode used during a fast stop, two options ramped or coast.

*Enumerated Value : Stopping Mode*

0 : RAMPED

1 : COAST

**FAST STOP LIMIT** *Range: 0.0 to 3000.0 s*  
Maximum time that the drive will try to Fast Stop, before quenching.

**FAST STOP TIME** *Range: 0.0 to 600.0 s*  
Rate at which the SPEED DEMAND is ramped to zero (see REFERENCE function block)

**FINAL STOP RATE** *Range: 12 to 4800 Hz/s*  
Rate at which any internally generated setpoint trims are removed. For example, the trim due to the slip compensation block.

## SEQUENCING LOGIC

This function block contains all the parameters relating to the sequencing (start and stop) of the drive.

Before the drive will respond to the RUN FWD, RUN REV or JOG parameters (cause the drive to run or jog), the parameters DRIVE ENABLE, NOT FAST STOP and NOT COAST STOP need to be set to TRUE. In addition, the drive needs to be healthy (HEALTHY is TRUE). The drive will only respond to RUN FWD, RUN REV and JOG if the drive is in the Remote Sequencing mode.

If RUN FWD and RUN REV are TRUE, both are ignored and the drive will stop.

| Sequencing Logic |                         |       |               |
|------------------|-------------------------|-------|---------------|
|                  | TRIPPED                 | [289] | FALSE         |
|                  | RUNNING                 | [285] | FALSE         |
|                  | JOGGING                 | [302] | FALSE         |
|                  | STOPPING                | [303] | FALSE         |
|                  | OUTPUT CONTACTOR        | [286] | FALSE         |
|                  | SWITCH ON ENABLE        | [288] | TRUE          |
|                  | SWITCHED ON             | [306] | FALSE         |
|                  | READY                   | [287] | FALSE         |
|                  | SYSTEM RESET            | [305] | FALSE         |
|                  | SEQUENCER STATE         | [301] | START ENABLED |
|                  | REMOTE REV OUT          | [296] | FALSE         |
|                  | HEALTHY                 | [274] | TRUE          |
|                  | FAN RUNNING             | [620] | FALSE         |
| FALSE            | [291] RUN FORWARD       |       |               |
| FALSE            | [292] RUN REVERSE       |       |               |
| FALSE            | [293] NOT STOP          |       |               |
| FALSE            | [280] JOG               |       |               |
| TRUE             | [1235] CONTACTOR CLOSED |       |               |
| TRUE             | [276] DRIVE ENABLE      |       |               |
| TRUE             | [277] NOT FAST STOP     |       |               |
| TRUE             | [278] NOT COAST STOP    |       |               |
| FALSE            | [294] REMOTE REVERSE    |       |               |
| FALSE            | [282] REM TRIP RESET    |       |               |
| TRUE             | [290] TRIP RST BY RUN   |       |               |
| TRUE             | [283] POWER UP START    |       |               |
| TRUE             | [1686] START DELAY      |       |               |

## Parameter Descriptions

### RUN FWD

Range: FALSE / TRUE

Setting this parameter to TRUE causes the drive to run in the forward direction.

### RUN REV

Range: FALSE / TRUE

Setting this parameter to TRUE causes the drive to run in the reverse direction.

### NOT STOP

Range: FALSE / TRUE

Setting this parameter TRUE will latch the RUN FWD or RUN REV commands. Once latched, they can be reset to FALSE and the drive will continue to run. Setting NOT STOP to FALSE causes the run commands to be unlatched.

### JOG

Range: FALSE / TRUE

Setting this parameter TRUE causes the drive to run at the speed set by JOG SETPOINT (refer to the REFERENCE JOG function block). Once jogging, setting JOG to FALSE causes the drive to ramp to zero.

### CONTACTOR CLOSED

Range: FALSE / TRUE

Feedback used to indicate that the external contactor has been closed. It must be TRUE for the sequencer to proceed from the SWITCHED ON state to the READY STATE, refer to SEQUENCER STATE.

### DRIVE ENABLE

Range: FALSE / TRUE

This provides a means of electronically inhibiting drive operation. Whilst running, setting this parameter to FALSE disables the drive operation and causes the motor to coast.

### NOT FAST STOP

Range: FALSE / TRUE

Whilst running or jogging, setting this parameter to FALSE causes the drive to ramp to zero. The rate is set by FAST STOP RATE in the STOP function block. The action of setting NOT FAST STOP to TRUE is latched. The drive cannot be restarted until fast stop is completed. This signal is effective even when the drive is in Local mode.

## Parameter Descriptions

### NOT COAST STOP

*Range: FALSE / TRUE*

Setting this parameter to FALSE disables the drive operation and causes the motor to coast. The action of setting this parameter to TRUE is latched. The drive can not be restarted until the coast stop is completed. This signal is effective even when the drive is in Local mode.

### REMOTE REVERSE

*Range: FALSE / TRUE*

For remote setpoints, setting this to TRUE inverts the demanded direction of motor rotation.

### REM TRIP RESET

*Range: FALSE / TRUE*

On a transition to TRUE, this input clears latched trips.

### TRIP RST BY RUN

*Range: FALSE / TRUE*

This allows the rising edge of run command to clear latched trips.

### POWER UP START

*Range: FALSE / TRUE*

If TRUE, this allows the drive to go directly to run mode if in remote and a run command is present. If FALSE, a low to high transition of the run command is required.

### START DELAY

*Range: 0.000 to 30.000*

Delays the action of "ramping to setpoint" from the Run command. This can allow a period for motor flux to establish before the ramp to setpoint.

### RUNNING

*Range: FALSE / TRUE*

Indicates that the drive is in the enabled state.

### JOGGING

*Range: FALSE / TRUE*

Indicates that the drive is in the JOG mode.

### STOPPING

*Range: FALSE / TRUE*

Indicates that the drive is stopping.

### OUTPUT CONTACTOR

*Range: FALSE / TRUE*

Output to be used to drive an external contactor in the motor output. This contactor is normally closed unless a Trip condition has occurred or the drive goes into the re-configuration mode.

### SWITCH ON ENABLE

*Range: FALSE / TRUE*

Sometimes referred to as READY TO SWITCH ON, this parameter indicates that the drive will accept a run command.

### SWITCHED ON

*Range: FALSE / TRUE*

Run accepted. Waiting for CONTACTOR CLOSED and deflux to be completed

### READY

*Range: FALSE / TRUE*

Indicates that the drive's power stack is operable and the drive will run if enabled.

### SYSTEM RESET

*Range: FALSE / TRUE*

TRUE for a single block diagram execution cycle after drive enters either RUN or JOG mode.

### SEQUENCER STATE

*Range: Enumerated - see below*

This parameter indicates the current sequencing state:

*Enumerated Value : State*

- 0 : START DISABLED
- 1 : START ENABLED
- 2 : SWITCHED ON
- 3 : READY
- 4 : ENABLED
- 5 : F-STOP ACTIVE
- 6 : TRIP ACTIVE
- 7 : TRIPPED

### REMOTE REV OUT

*Range: FALSE / TRUE*

This parameter indicates the current state of remote direction and RUN REV. Note - this is the demanded direction, not the actual direction.

**Parameter Descriptions****HEALTHY***Range: FALSE / TRUE*

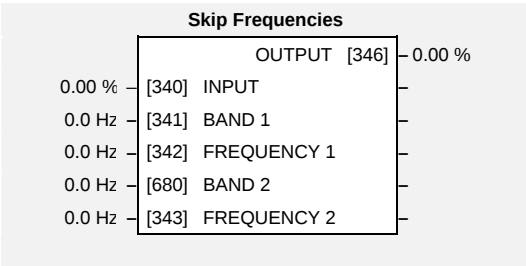
Set FALSE when the drive trips, and set TRUE when the run command is removed. This output is False while the pre-charge relay is open on power-up.

**FAN RUNNING***Range: FALSE / TRUE*

This diagnostic is TRUE is the drive's cooling fans are running.

SKIP FREQUENCIES

This function block may be used to prevent the drive operating at frequencies that cause mechanical resonance in the load.



Parameter Descriptions

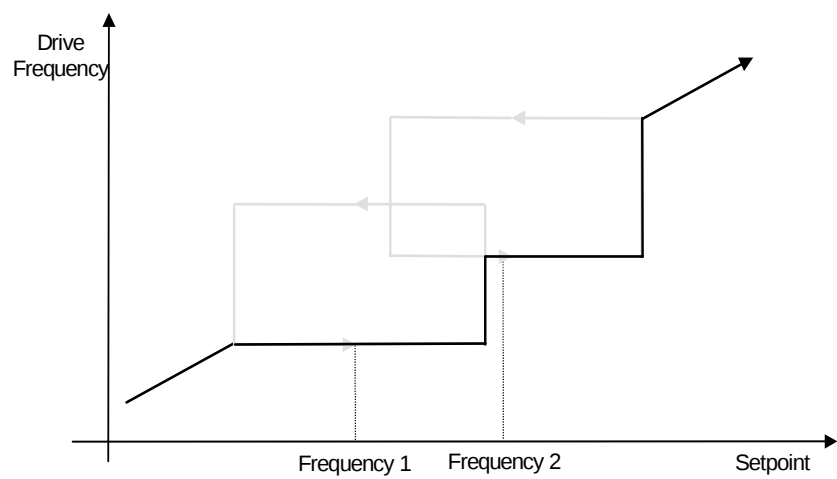
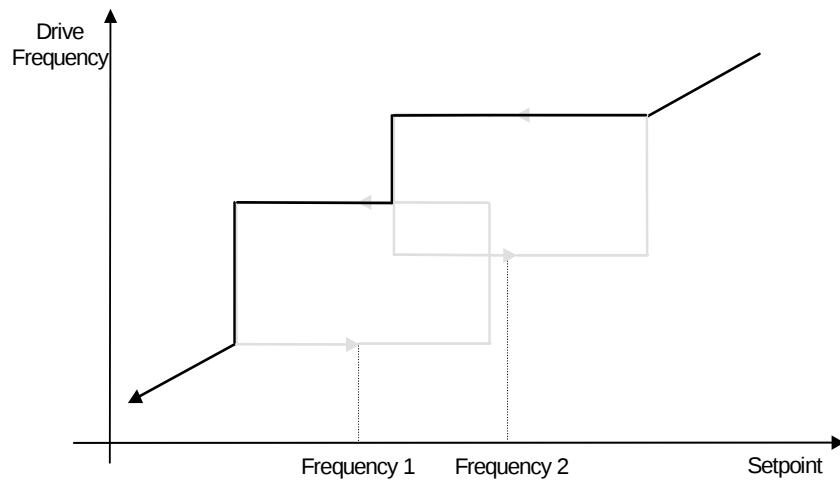
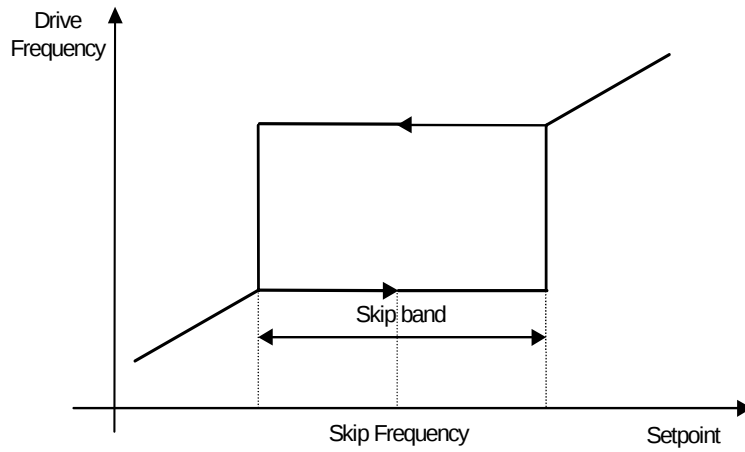
|                                                                       |                      |                                   |
|-----------------------------------------------------------------------|----------------------|-----------------------------------|
| <b>INPUT</b>                                                          |                      | <i>Range: -300.00 to 300.00 %</i> |
| The value of the block input in %.                                    |                      |                                   |
| <b>BAND 1</b>                                                         | <i>SET\SETP ST12</i> | <i>Range: 0.0 to 60.0 Hz</i>      |
| The width of each skip band in Hz.                                    |                      |                                   |
| <b>FREQUENCY 1</b>                                                    | <i>SET\SETP ST11</i> | <i>Range: 0.0 to 240.0 Hz</i>     |
| This parameter contains the centre frequency of each skip band in Hz. |                      |                                   |
| <b>BAND 2</b>                                                         | <i>SET\SETP ST14</i> | <i>Range: 0.0 to 60.0 Hz</i>      |
| The width of each skip band in Hz.                                    |                      |                                   |
| <b>FREQUENCY 2</b>                                                    | <i>SET\SETP ST13</i> | <i>Range: 0.0 to 240.0 Hz</i>     |
| This parameter contains the centre frequency of each skip band in Hz. |                      |                                   |
| <b>OUTPUT</b>                                                         |                      | <i>Range: —.xx %</i>              |
| Diagnostic on the output of the function block in %                   |                      |                                   |

Functional Description

Two programmable skip frequencies are available to avoid resonances within the mechanical system. Enter the value of frequency that causes the resonance using the “FREQUENCY” parameter and then programme the width of the skip band using its “BAND” parameter. The drive will then avoid sustained operation within the forbidden band as shown in the diagram. The skip frequencies are symmetrical and thus work in forward and reverse.

**Note:** *Setting the FREQUENCY to 0 disables the corresponding band.  
Setting the BAND to 0 causes the value of BAND 1 to be used for this band.*

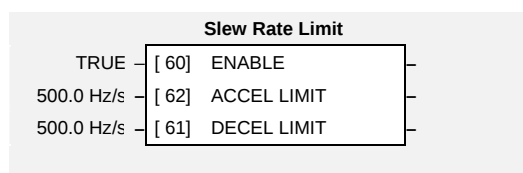
The behaviour of this function block is illustrated below.



## SLEW RATE LIMIT

**Designed for all Motor Control Modes.**

This function block prevents over-current and over-voltage faults occurring due to a rapidly changing setpoint.



## Parameter Descriptions

### ENABLE

Range: FALSE / TRUE

When this parameter is FALSE, this function block is disabled and the setpoint is unaffected by this function block.

### ACCEL LIMIT

Range: 1.0 to 1200.0 Hz/s

The maximum rate at which the setpoint may accelerate away from zero.

### DECEL LIMIT

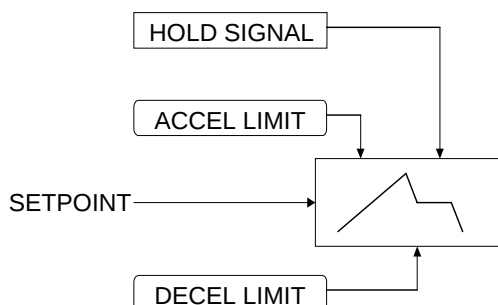
Range: 1.0 to 1200.0 Hz/s

The maximum rate at which the setpoint may decelerate towards zero.

## Functional Description

The SLEW RATE LIMIT block obtains the setpoint from the output of the application, correctly scaled by the SETPOINT SCALE block. The rate of change limits are applied and the setpoint is then passed on for further processing.

When the braking block determines that the internal dc link voltage is too high it issues a Hold signal. This causes the SLEW RATE LIMIT block to hold the setpoint at its current value. This typically lasts for only 1ms, time for the excess energy to be dumped into the braking resistor.



# SLIP COMP

**Designed for VOLTS/Hz motor Control Mode.**

The slip compensation function block allows the drive to maintain motor speed in the presence of load disturbances.

| Slip Comp |                      |
|-----------|----------------------|
| FALSE     | [ 82] ENABLE         |
| 150.0 RPM | [ 85] MOTORING LIMIT |
| 150.0 RPM | [ 86] REGEN LIMIT    |

## Parameter Descriptions

**ENABLE**  SET\CTRL CL04 *Range: FALSE / TRUE*

For the slip compensation to be operational this must be TRUE. Eliminates motor speed variations under load conditions in V/F fluxing mode when the correct value for MAG CURRENT is entered into <sup>S</sup>CL14

**MOTORING LIMIT** *Range: 0.0 to 600.0 rpm*

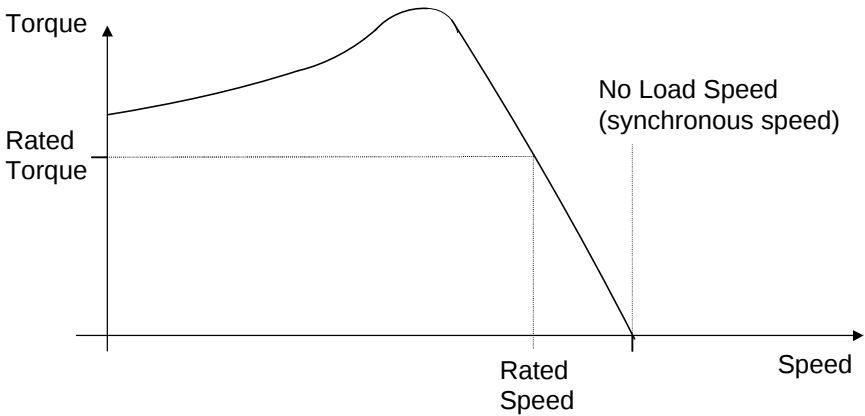
The maximum trim that will be produced by the slip compensation block when the motor is driving the load (motoring).

**REGEN LIMIT** *Range: 0.0 to 600.0 rpm*

The maximum trim that will be produced by the slip compensation block when the motor is being driven by the load, (regenerating).

## Functional Description

Based on the rated speed, the no load speed and the rated load of the motor, the slip compensation block adjusts the demand frequency to compensate for any speed slippage resulting from the load.



## SPEED LOOP

**Designed for SENSORLESS VEC Motor Control Mode.**

This function block controls the speed of the motor by comparing the actual speed to the demanded speed, and applying more or less torque in response to the error.

### Fixed Inputs and Outputs

#### Speed Demand

This is connected to the output of the SETPOINT SCALE function block.

#### Speed Feedback

When configured as SENSORLESS VEC, the speed feedback is calculated from the voltages and currents in the motor.

#### Torque Demand

The output of the SPEED LOOP function block is a torque demand. This torque demand is passed on to the TORQUE LIMIT function block, which causes the torque to be generated in the motor.

| Speed Loop       |                         |          |  |
|------------------|-------------------------|----------|--|
| TOTL SPD DMD RPM | [1203]                  | 0.00 RPM |  |
| TOTAL SPD DMD %  | [1206]                  | 0.00 %   |  |
| SPEED ERROR      | [1207]                  | 0.00 %   |  |
| TORQUE DEMAND    | [1204]                  | 0.00 %   |  |
| ** 20.00         | [1187] SPEED PROP GAIN  |          |  |
| ** 100 ms        | [1188] SPEED INT TIME   |          |  |
| FALSE            | [1189] INT DEFEAT       |          |  |
| 0.00 %           | [1190] SPEED INT PRESET |          |  |
| 3.0 ms           | [1191] SPEED DMD FILTER |          |  |
| 1.5 ms           | [1192] SPEED FBK FILTER |          |  |
| 0.00 %           | [1193] (AUX) TORQUE DMD |          |  |
| 5.00 %           | [1194] ADAPTIVE THRESH  |          |  |
| 20.00            | [1195] ADAPTIVE P-GAIN  |          |  |
| 110.00 %         | [1200] SPEED POS LIM    |          |  |
| -110.00 %        | [1201] SPEED NEG LIM    |          |  |
| FALSE            | [1202] TORQ CTRL MODE   |          |  |

## Parameter Descriptions

### SPEED PROP GAIN



SET\CTRL CL91

Range: 0.00 to 300.00

Sets the proportional gain of the loop.

Speed error (revolutions per second) x proportional gain = torque percent.

### SPEED INT TIME



SET\CTRL CL92

Range: 1 to 15000 ms

This is the integral time constant of the speed loop. A speed error which causes the proportional term to produce a torque demand T, will cause the integral term to also ramp up to a torque demand T after a time equal to "speed int time".

### INT DEFEAT

Range: FALSE / TRUE

When TRUE, the integral term does not operate.

### SPEED INT PRESET

Range: -500.00 to 500.00 %

The integral term will be preset to this value when the drive starts.

### SPEED DMD FILTER

Range: 0.0 to 14.0 ms

The speed demand is filtered to reduce ripple. The filter is first order with time constant equal to the value of this parameter.

### SPEED FBK FILTER

Range: 0.0 to 15.0 ms

The speed feedback is filtered to reduce ripple, such as that caused by low line count encoders. The filter is first order with time constant equal to the value of this parameter.

### (AUX) TORQUE DMD

Range: -300.00 to 300.00 %

When the drive is operating in speed control mode, the value of this parameter is added on to the torque demand produced by the speed loop PI. When the drive is operating in torque control mode (i.e. "TORQ CTRL MODE is TRUE) the speed loop PI does not operate and the torque demand becomes the value of this parameter..

### ADAPTIVE THRESH

5.00%

Range: 0.00 to 10.00 %

Below the threshold, the speed loop P gain is ADAPTIVE P\_GAIN.

## Parameter Descriptions

**ADAPTIVE P-GAIN** 20.00 Range: 0.00 to 300.00

When the speed is more than twice the threshold the speed loop P gain is SPEED PROP GAIN. Between these two values of speed, the P gain is linearly interpolated from ADAPTIVE P-GAIN to SPEED PROP GAIN.

**SPEED POS LIM** **F SV** SET\CTRL CL93 Range: -110.00 to 110.00 %

This sets the upper limit of the speed demand.

**SPEED NEG LIM** **F SV** SET\CTRL CL94 Range: -110.00 to 110.00 %

This sets the lower limit of the speed demand.

**TORQ CTRL MODE** Range: FALSE / TRUE

Selects between Speed Control mode and Torque Control mode. When TRUE, (Torque Control mode) the torque demand output from the speed loop block is the sum of the Direct Input plus the AUX TORQUE DMD parameter.

**TOTL SPD DMD RPM** Range: —.xx rpm

This shows the final values of the speed demand obtained after summing all sources. It is the value presented to the speed loop.

**TOTAL SPD DMD %** Range: —.00 %

This shows the final values of the speed demand obtained after summing all sources. It is the value presented to the speed loop.

**SPEED ERROR** Range: —.00 %

Shows the difference between the demanded speed and the actual speed.

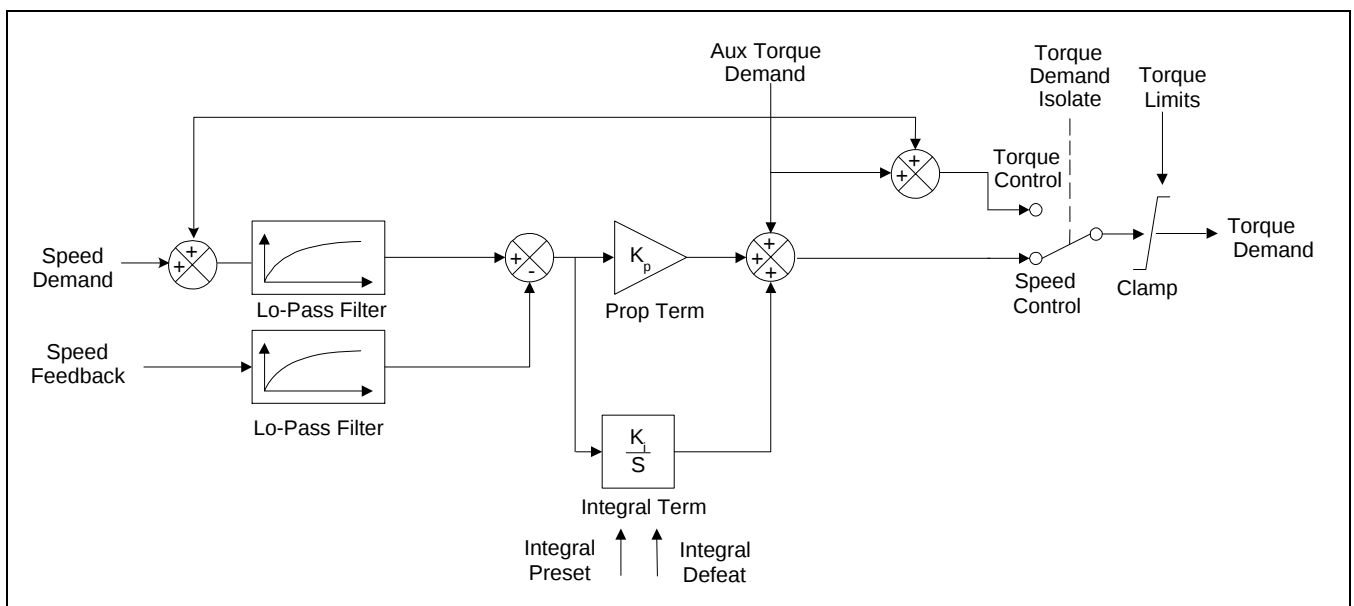
**TORQUE DEMAND** Range: —.00 %

Shows the demanded motor torque as a percentage of rated motor torque.

## Functional Description

The speed error (speed demand minus speed feedback) is calculated and processed via a proportional + integral (PI) controller. The output of the PI controller is a torque demand, which is passed directly to the torque control block.

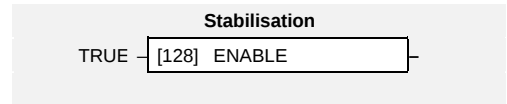
The speed demand is derived from the Setpoint Scale block. When the drive is in SENSORLESS VEC mode, the speed feedback is calculated from the voltages and currents in the motor.



### STABILISATION

*Designed for VOLTS/Hz motor Control Mode.*

Enabling this function reduces the problem of unstable running in induction motors. This can be experienced at approximately half full speed, and under low load conditions.



### Parameter Descriptions

**ENABLE**

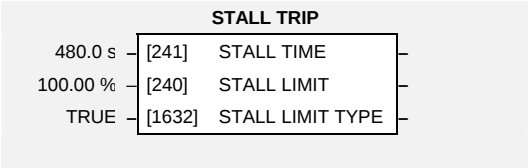
**VF** SET\CTRL CL05

Range: FALSE / TRUE

Enables (or disables) the stabilisation function.

STALL TRIP

The function block protects the motor from damage that may be caused by continuous operation beyond specification.



Parameter Descriptions

**STALL LIMIT** Range: 50.00 to 150.00 %  
This parameter is now obsolete.

**STALL TIME** Range: 0.1 to 3000.0 s  
The time after which a stall condition will cause a trip.

**STALL LIMIT TYPE**  *SET\CTRL CL84* Range: FALSE / TRUE  
This parameter determines whether the stall trip operates on motor torque or motor current.  
  
*Enumerated Value : Stall Limit Type*  
FALSE : TORQUE  
TRUE : CURRENT

Functional Description

If STALL LIMIT is set to TORQUE and the estimated load exceeds the active TORQUE LIMIT (refer to the TORQUE LIMIT function block) for a time greater than STALL TIME then the stall trip will become active. The timer is reset whenever the estimated load is less than the active Torque Limit.

Similarly, if the STALL LIMIT is set to CURRENT and the measured current exceeds the active Current Limit (i.e. the drive is in current limit) for a time greater than STALL TIME, the stall trip will become active. The timer is reset whenever the measured current is less than the active Current Limit.

Refer to the Installation Product Manual, Chapter 7 for a description of the trips supported by the drive.

## TORQUE LIMIT

**Designed for all Motor Control Modes.**

This function block allows you to set the maximum level of motor rated torque which is allowed before torque limit action occurs.

If the estimated motor torque is greater than the ACTUAL POS LIM value, the motor speed is controlled to maintain the torque at this level. A similar situation occurs if the estimated motor torque is less than the ACTUAL NEG LIM value.

The torque limit function block has separate positive and negative torque limits. In addition, a symmetric main torque limit is also provided.

The lowest positive and negative torque limits (including any current limit or inverse time current limit action) is indicated in the ACTUAL POS LIM and ACTUAL NEG LIM diagnostic. These are the final limits used to limit motor torque.

| Torque Limit |                        |        |         |
|--------------|------------------------|--------|---------|
|              | ACTUAL POS LIM         | [1212] | 150.0 % |
|              | ACTUAL NEG LIM         | [1213] | 150.0 % |
| 200.0 %      | [1208] POS TORQUE LIM  |        |         |
| -200.0 %     | [1209] NEG TORQUE LIM  |        |         |
| 200.0 %      | [1210] MAIN TORQUE LIM |        |         |
| FALSE        | [1211] SYMMETRIC LIM   |        |         |
| 150.00 %     | [1554] FAST STOP T-LIM |        |         |

## Parameter Descriptions

**POS TORQUE LIM**  **SETCTRL CL82** Range: -500.0 to 500.0 %

This parameter sets the maximum allowed level of positive motor torque.

**NEG TORQUE LIM**  **SETCTRL CL83** Range: -500.0 to 500.0 %

This parameter sets the maximum allowed level of negative motor torque

**MAIN TORQUE LIM** Range: 0.0 to 300.0 %

This parameter sets the symmetric limit on the maximum allowed motor torque.

**SYMMETRIC LIM** Range: FALSE / TRUE/

When TRUE, the NEG TORQUE LIM is forced to reflect the POS TORQUE LIM parameter.

**FAST STOP T-LIM** Range: 0.00 to 300.00 %

This parameter sets the torque limit used during a Fast Stop.

**ACTUAL POS LIM** Range: —.0 %

This indicates the final actual positive torque limit including any current limit or inverse time current limit action.

**ACTUAL NEG LIM** Range: —.0 %

This indicates the final actual negative torque limit including any current limit or inverse time current limit action.

## TRIPS HISTORY

This function block records the last ten trips that caused the drive to stop.

To do this, it stores the value of the FIRST TRIP parameter, tag number 6, taken from the TRIPS STATUS function block.

| Trips History   |       |         |
|-----------------|-------|---------|
| TRIP 1 (NEWEST  | [500] | NO TRIP |
| TRIP 2          | [501] | NO TRIP |
| TRIP 3          | [502] | NO TRIP |
| TRIP 4          | [503] | NO TRIP |
| TRIP 5          | [504] | NO TRIP |
| TRIP 6          | [505] | NO TRIP |
| TRIP 7          | [506] | NO TRIP |
| TRIP 8          | [507] | NO TRIP |
| TRIP 9          | [508] | NO TRIP |
| TRIP 10 (OLDEST | [509] | NO TRIP |

## Parameter Descriptions

### TRIP 1 (NEWEST)

Range: Enumerated

Records the most recent trip that caused the drive to stop. The values that this (and the parameters below) may take are the same as tag number 6, FIRST TRIP, detailed in the TRIPS STATUS function block.

### TRIP 2

Range: As above

Records the second most recent trip that caused the drive to stop.

### TRIP 3

Range: As above

Records the third most recent trip that caused the drive to stop.

### TRIP 4

Range: As above

Records the fourth most recent trip that caused the drive to stop.

### TRIP 5

Range: As above

Records the fifth most recent trip that caused the drive to stop.

### TRIP 6

Range: As above

Records the sixth most recent trip that caused the drive to stop.

### TRIP 7

Range: As above

Records the seventh most recent trip that caused the drive to stop.

### TRIP 8

Range: As above

Records the eighth most recent trip that caused the drive to stop.

### TRIP 9

Range: As above

Records the ninth most recent trip that caused the drive to stop.

### TRIP 10 (OLDEST)

Range: As above

Records the tenth most recent trip that caused the drive to stop.

## Functional Description

This function block provides a view of the ten most recent trips that caused the drive to stop. Every time a new trip occurs this is entered as TRIP 1 (NEWEST and the other recorded trips are moved down. If more than ten trips have occurred since the drive was configured then only the ten most recent trips will be available for inspection.

These parameters are preserved through a power failure.

Refer to TRIPS STATUS, page 1-80 for an explanation of the four-digit codes.

## TRIPS STATUS

The drive supports advanced and flexible trip logic to support monitoring of the drive itself, the motor and the load. This function block provides a view in to the current trip condition(s) and allows some trips to be disabled.

Refer to the "Trips and Fault Finding" chapter in the Installation Product Manual for trip descriptions.

| Trips Status |                       |       |         |
|--------------|-----------------------|-------|---------|
|              | ACTIVE TRIPS          | [ 4]  | 0x0000  |
|              | ACTIVE TRIPS+         | [740] | 0x0000  |
|              | LATCHED TRIPS         | [237] | 0x0000  |
|              | LATCHED TRIPS+        | [238] | 0x0000  |
|              | WARNINGS              | [ 5]  | 0x0000  |
|              | WARNINGS+             | [741] | 0x0000  |
|              | FIRST TRIP            | [ 6]  | NO TRIP |
| 0x0660       | [231] DISABLE TRIPS   |       |         |
| 0x0000       | [742] DISABLED TRIPS+ |       |         |

## Parameter Descriptions

### DISABLE TRIPS and DISABLE TRIPS+

Range: 0000 to FFFF

Indicates which trips have been disabled. Not all trips may be disabled, the DISABLED TRIPS mask is ignored for trips that cannot be disabled. See below for which trips may be disabled and how this parameter is formed.

### ACTIVE TRIPS and ACTIVE TRIPS+

Range: 0000 to FFFF

Indicates all active trips, including user-disabled trips that are reporting a trip condition. The parameter returns a coded representation of the trip status. See below for a description of how this parameter is formed.

### LATCHED TRIPS and LATCHED TRIPS+

Range: 0000 to FFFF

These two parameters have the same format as ACTIVE TRIPS and ACTIVE TRIPS+. They differ only in that ACTIVE TRIPS shows only those trip inputs that are currently active. LATCHED TRIPS shows all trips that are currently active, and also all trips that have been active since the last trip reset. For example, once an over-current event has caused the drive to stop, the over-current state is resolved so ACTIVE TRIPS will no longer show over current, while LATCHED TRIPS will show this.

The LATCHED TRIPS outputs are cleared by issuing a trip reset.

### WARNINGS and WARNINGS+

Range: 0000 to FFFF

Indicates which conditions are likely to cause a trip, including potential conditions that may affect user-disabled trips. These parameters are a coded representation of the warning status. See below for a description of how this parameter is formed.

### FIRST TRIP

Range: Enumerated – see table below

From when a trip occurs until that trip is reset, this parameter indicates the trip source. When several trips have occurred, this parameter indicates the first one that was detected.

## Functional Description

The tables below show the possible parameter values for the FIRST TRIP, TRIPS HISTORY and the AUTO RESTART function blocks. Each trip has a unique, four-digit hexadecimal number as shown in the tables below.

| <b>ACTIVE TRIPS, WARNINGS, DISABLE TRIPS<br/>and TRIGGERS 1 (AUTO RESTART function block)</b> |                                                |                                   |        |                            |                            |
|-----------------------------------------------------------------------------------------------|------------------------------------------------|-----------------------------------|--------|----------------------------|----------------------------|
| ID                                                                                            | Trip Name<br>(MMI 6901)                        | Trip Name<br>(MMI 6511 &<br>6521) | Mask   | Frames 1-3<br>User Disable | Frames C-F<br>User Disable |
| 0                                                                                             | NO TRIP                                        |                                   | 0x0000 | N/A                        | N/A                        |
| 1                                                                                             | OVERVOLTAGE                                    | DCHI                              | 0x0001 |                            |                            |
| 2                                                                                             | UNDERVOLTAGE                                   | DCLO                              | 0x0002 |                            |                            |
| 3                                                                                             | OVERCURRENT                                    | OC                                | 0x0004 |                            |                            |
| 4                                                                                             | HEATSINK                                       | HOT                               | 0x0008 |                            |                            |
| 5                                                                                             | EXTERNAL TRIP                                  | ET                                | 0x0010 | ✓                          | ✓                          |
| 6                                                                                             | INVERSE TIME                                   | 51 t                              | 0x0020 | ✓                          | ✓                          |
| 7                                                                                             | CURRENT LOOP                                   | 5LOOP                             | 0x0040 | ✓                          | ✓                          |
| 8                                                                                             | MOTOR STALLED                                  | 5StLL                             | 0x0080 | ✓                          | ✓                          |
| 9                                                                                             | ANIN FAULT                                     | 5 t 3                             | 0x0100 | ✓                          | ✓                          |
| 10                                                                                            | BRAKE RESISTOR                                 | 5db r                             | 0x0200 | ✓                          | ✓                          |
| 11                                                                                            | BRAKE SWITCH                                   | 5db S                             | 0x0400 | ✓                          | ✓                          |
| 12                                                                                            | DISPLAY/KEYPAD                                 | 5dl SP                            | 0x0800 | ✓                          | ✓                          |
| 13                                                                                            | LOST COMMS                                     | SCI                               | 0x1000 | ✓                          | ✓                          |
| 14                                                                                            | CONTACTOR FBK                                  | CNTC                              | 0x2000 | ✓                          | ✓                          |
| 15                                                                                            | SPEED FEEDBACK                                 | 5SPd                              | 0x4000 | ✓                          | ✓                          |
| 16                                                                                            | ■ AMBIENT TEMP                                 | AOT                               | 0x8000 |                            |                            |
| 17                                                                                            | MOTOR OVERTEMP                                 | 5Ot                               | 0x0001 | ✓                          | ✓                          |
| 18                                                                                            | CURRENT LIMIT                                  | I HI                              | 0x0002 |                            |                            |
| 19                                                                                            | <i>Trip 19 (Reserved)</i>                      | TR19                              | 0x0004 |                            |                            |
| 20                                                                                            | ■ 24V FAILURE                                  | T 6                               | 0x0008 | ✓                          | ✓                          |
| 21                                                                                            | LOW SPEED OVER I                               | LSPD                              | 0x0010 |                            |                            |
| 22                                                                                            | ANOUT 2 FAULT (or T4<br>on the 650 op station) | T 4                               | 0x0020 | ✓                          | ✓                          |
| 23                                                                                            | <i>Trip 23 (Reserved)</i>                      | TR23                              | 0x0040 |                            |                            |
| 24                                                                                            | ■ DESAT (OVER I)                               | SHRT                              | 0x0080 |                            |                            |
| 25                                                                                            | DC LINK RIPPLE                                 | DCRP                              | 0x0100 |                            |                            |
| 26                                                                                            | ■ BRAKE SHORT CCT                              | DBSC                              | 0x0200 |                            |                            |
| 27                                                                                            | OVERSPEED                                      | 5OSPd                             | 0x0400 | ✓                          | ✓                          |
| 28                                                                                            | ANOUT FAULT                                    | T 5                               | 0x0800 | ✓                          | ✓                          |
| 29                                                                                            | DIGIO 1 (T9) FAULT                             | T 9                               | 0x1000 | ✓                          | ✓                          |
| 30                                                                                            | DIGIO 2 (T10) FAULT                            | T 10                              | 0x2000 | ✓                          | ✓                          |
| 31                                                                                            | UNKNOWN                                        | TRIP                              | 0x4000 |                            |                            |
| 32                                                                                            | OTHER                                          | TR32                              | 0x8000 |                            |                            |
| 33                                                                                            | ◆ ■ ZERO I CAL                                 | ICAL                              | 0x8000 | N/A                        | N/A                        |
| 34                                                                                            | MAX SPEED LOW                                  | ATN1                              | 0x8000 | N/A                        | N/A                        |
| 35                                                                                            | MAIN VOLTS LOW                                 | ATN2                              | 0x8000 | N/A                        | N/A                        |
| 36                                                                                            | NOT AT SPEED                                   | ATN3                              | 0x8000 | N/A                        | N/A                        |
| 37                                                                                            | MAG CURRENT FAIL                               | ATN4                              | 0x8000 | N/A                        | N/A                        |
| 38                                                                                            | NEGATIVE SLIP F                                | ATN5                              | 0x8000 | N/A                        | N/A                        |
| 39                                                                                            | TR TOO LARGE                                   | ATN6                              | 0x8000 | N/A                        | N/A                        |
| 40                                                                                            | TR TOO SMALL                                   | ATN7                              | 0x8000 | N/A                        | N/A                        |
| 41                                                                                            | MAX RPM DATA ERR                               | ATN8                              | 0x8000 | N/A                        | N/A                        |

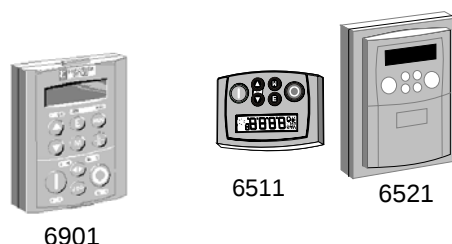
| <b>ACTIVE TRIPS, WARNINGS, DISABLE TRIPS<br/>and TRIGGERS 1 (AUTO RESTART function block)</b> |                         |                                   |        |                            |                            |
|-----------------------------------------------------------------------------------------------|-------------------------|-----------------------------------|--------|----------------------------|----------------------------|
| ID                                                                                            | Trip Name<br>(MMI 6901) | Trip Name<br>(MMI 6511 &<br>6521) | Mask   | Frames 1-3<br>User Disable | Frames C-F<br>User Disable |
| 42                                                                                            | LEAKGE L TIMEOUT        | ATN9                              | 0x8000 | N/A                        | N/A                        |
| 43                                                                                            | MOTOR TURNING ERR       | ATNA                              | 0x8000 | N/A                        | N/A                        |
| 44                                                                                            | MOTOR STALL ERR         | ATNB                              | 0x8000 | N/A                        | N/A                        |

- Not available on Frames 1-3
- ◆ Not available on Frames C-F

Enter FFFF to select/accept all, for example, entering FFFF for TRIGGERS 1 would make the drive auto-restart for trips with IDs from 1 to 16 inclusive.

### Keypads (MMIs):

Trips shown as displays, i.e. , can be disabled using the keypads in the TRIPS menu. Other trips, as indicated, can be disabled over the Comms.



## Hexadecimal Representation of Trips

When more than one trip is to be represented at the same time then the trip codes are simply added together to form the value displayed. Within each digit, values between 10 and 15 are displayed as letters A to F

For example referring to the tables above, if the ACTIVE TRIPS parameter is **02C8**, then this represents:

- a “2” in digit 3
- an “8” and a “4” in digit 2  
(8+4 = 12, displayed as C)
- an “8” in digit 1

This in turn represents the active trips BRAKE RESISTOR, MOTOR STALLED, CURRENT LOOP and HEATSINK, (an unlikely situation).

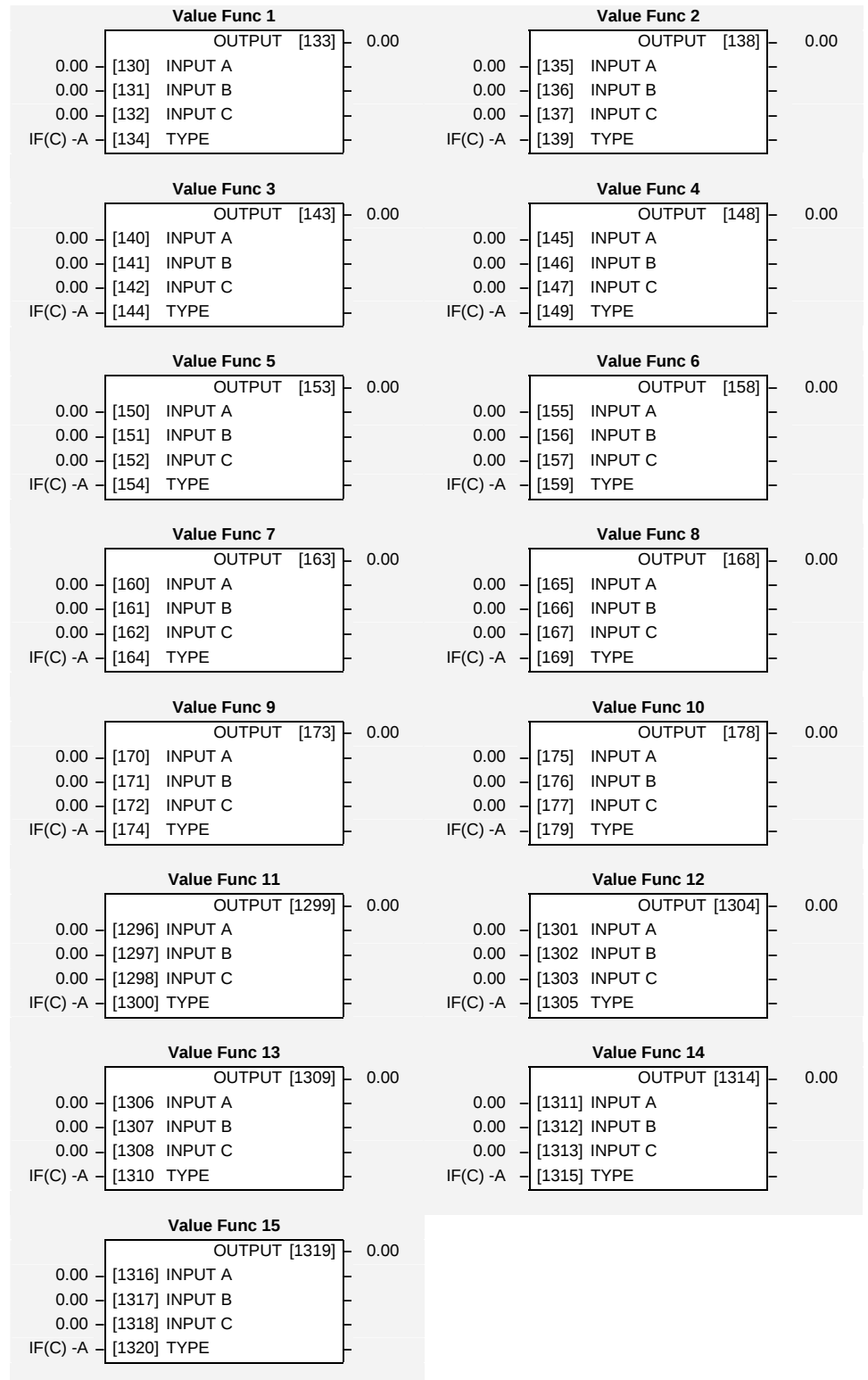
In the same way, the ACTIVE TRIPS + parameter displaying **02C8** would represent BRAKE SHORT CCT, DESAT (OVER I), Trip 23 (Reserved) and 24V FAILURE, (another unlikely situation).

**Note:** The hexadecimal value is used over comms, however, pressing the **M** key whilst displaying the hexadecimal trip value will show the list of all trips and their current values.

| Decimal number | Display |
|----------------|---------|
| 10             | A       |
| 11             | B       |
| 12             | C       |
| 13             | D       |
| 14             | E       |
| 15             | F       |

## VALUE FUNCTION

The value function blocks can be configured to perform one of a number of functions upon a fixed number of inputs.



Boolean inputs and outputs are  
 Outputs: FALSE = 0.00, TRUE = 0.01  
 Inputs:  $-0.005 < x < 0.005$  = FALSE, Else TRUE

## Parameter Descriptions

**INPUT A** Range: -32768.00 to 32767.00

General purpose input.

**INPUT B** Range: -32768.00 to 32767.00

General purpose input.

**INPUT C** Range: -32768.00 to 32767.00

General purpose input.

**TYPE** Range: Enumerated - see below

The operation to be performed on the three inputs to produce the output value.

*Enumerated Value : Type*

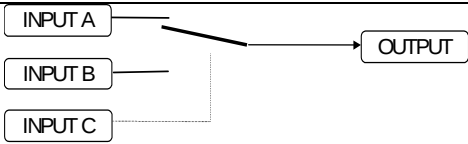
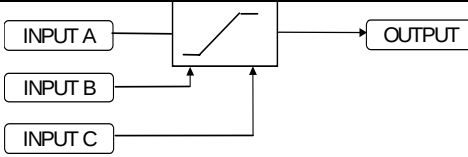
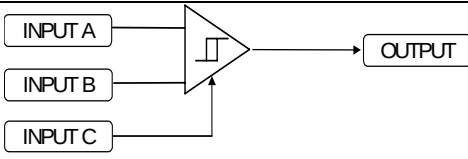
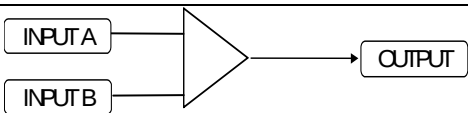
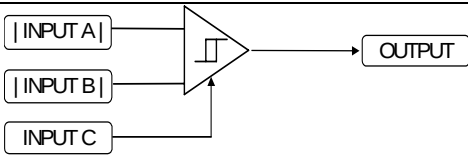
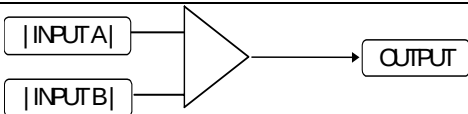
- 0 : IF(C) -A
- 1 : ABS(A+B+C)
- 2 : SWITCH(A,B)
- 3 : (A\*B)/C
- 4 : A+B+C
- 5 : A-B-C
- 6 : B<=A<=C
- 7 : A>B+/-C
- 8 : A>=B
- 9 : ABS(A)>B+/-C
- 10 : ABS(A)>=B
- 11 : A(1+B)
- 12 : IF(C) HOLD(A)
- 13 : BINARY DECODE
- 14 : ON DELAY
- 15 : OFF DELAY
- 16 : TIMER
- 17 : MINIMUM PULSE
- 18 : PULSE TRAIN
- 19 : WINDOW
- 20 : UP/DWN COUNTER
- 21 : (A\*B)/C ROUND
- 22 : WINDOW NO HYST
- 23 : WIND A>=B,A<=C
- 24 : A<=B
- 25 : ((A\*B)/100)+C
- 26 : MIN(A,B,C)
- 27 : MAX(A,B,C)
- 28 : PROFILE SQRT
- 29 : PROFILE LINEAR
- 30 : PROFILE  $x^2$
- 31 : PROFILE  $x^3$
- 32 : PROFILE  $x^4$
- 33 : ON A>B, OFF A<C
- 34 : (A+B) CLAMPED C
- 35 : (A-B) CLAMPED C
- 36 : (A\*B) CLAMPED C
- 37 : (A/B) CLAMPED C
- 38 : A>=B:A, A<=C:0
- 39 : (A \* B) + C
- 40 : A \* (B + C)
- 41 : A \* (B - C)
- 42 : A \* (1+B/C)
- 43 : A \* (1+(B \* C))
- 44 : MONOSTABLE HIGH
- 45 : MONOSTABLE LOW
- 46 : FILTER
- 47 : (A-B)/(B-C)
- 48 : 100\*(A-B)/(B-C)

**OUTPUT** Range: —.xx

The result of performing the selected operation on the inputs.

## Functional Description

OUTPUT is generated from the inputs according to the operation type selected. The output is always limited to be within the range -32768.00 to +32767.00.

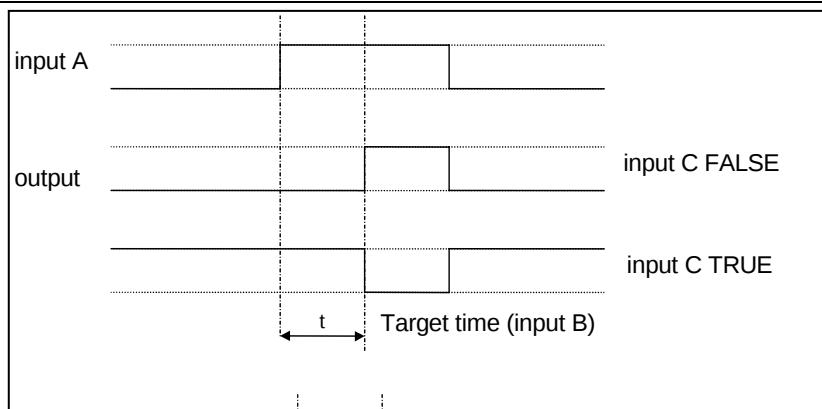
| Operation             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IF(C) -A              | If INPUT C is not zero the OUTPUT is minus INPUT A, otherwise the OUTPUT is the same as INPUT A.                                                                                                                                                                                                                                                                                                                                                                                          |
| ABS(A+B+C)            | The OUTPUT is set to the absolute value of INPUT A + INPUT B + INPUT C.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| SWITCH(A,B)           |  <p>If INPUT C is zero the OUTPUT is set to INPUT A, otherwise the output is set to INPUT B</p>                                                                                                                                                                                                                                                                                                         |
| (A*B)/C               | The OUTPUT is set to (INPUT A * INPUT B) / (INPUT C). The algorithm compensates for the remainder term.                                                                                                                                                                                                                                                                                                                                                                                   |
| A+B+C                 | The OUTPUT is set to (INPUT A + INPUT B + INPUT C).                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| A-B-C                 | The OUTPUT is set to (INPUT A - INPUT B - INPUT C).                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| B <= A <= C           |  <p>The OUTPUT is set to the value of INPUT A, limited to between a maximum value of INPUT C and a minimum value of INPUT B. If INPUT B is greater than INPUT C the output is undefined.</p>                                                                                                                                                                                                            |
| A > B +/- C           |  <p>The OUTPUT is TRUE if INPUT A is greater than INPUT B + INPUT C. The OUTPUT is FALSE if INPUT A is less than INPUT B - INPUT C.</p> <p>Otherwise the OUTPUT is unchanged. In this way the block acts as a simple comparator with a comparison level of INPUT B and a hysteresis band equal to +/- INPUT C.</p>                                                                                    |
| A >= B                |  <p>The OUTPUT is TRUE if INPUT A is greater than or equal to INPUT B, otherwise the OUTPUT is FALSE.</p>                                                                                                                                                                                                                                                                                             |
| ABS(A) > ABS(B) +/- C |  <p>The OUTPUT is TRUE if the magnitude of INPUT A is greater than or equal to the magnitude of INPUT B - INPUT C.</p> <p>The OUTPUT is FALSE if the magnitude of INPUT A is less than the magnitude of INPUT B + INPUT C. Otherwise the OUTPUT is unchanged. In this way the block acts as a magnitude comparator with a comparison level of INPUT B and a hysteresis band equal to +/- INPUT C.</p> |
| ABS(A) >= ABS(B)      |  <p>The OUTPUT is TRUE if the magnitude of INPUT A is greater than or equal to the magnitude of INPUT B, otherwise the OUTPUT is FALSE.</p>                                                                                                                                                                                                                                                           |
| A(1+B)                | The OUTPUT is set to INPUT A + ( INPUT A * INPUT B / 100.00 ).                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Operation    | Description                                                                                                                                                                                      |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IF(C) HOLD A | <p>If INPUT C is zero, the OUTPUT is set to INPUT A, otherwise the OUTPUT is unchanged.</p> <p>On powering up the drive, the output will be pre-loaded with the last saved value of input B.</p> |

|               |                                                                  |         |         |        |
|---------------|------------------------------------------------------------------|---------|---------|--------|
| BINARY DECODE | The OUTPUT is set according to which of the INPUTs are non-zero. |         |         |        |
|               | INPUT C                                                          | INPUT B | INPUT A | OUTPUT |
|               | 0                                                                | 0       | 0       | 0.00   |
|               | 0                                                                | 0       | ≠0      | 1.00   |
|               | 0                                                                | ≠0      | 0       | 2.00   |
|               | 0                                                                | ≠0      | ≠0      | 3.00   |
|               | ≠0                                                               | 0       | 0       | 4.00   |
|               | ≠0                                                               | 0       | ≠0      | 5.00   |
|               | ≠0                                                               | ≠0      | 0       | 6.00   |
|               | ≠0                                                               | ≠0      | ≠0      | 7.00   |

In the above table, ≠0 indicates that the corresponding input is not zero.

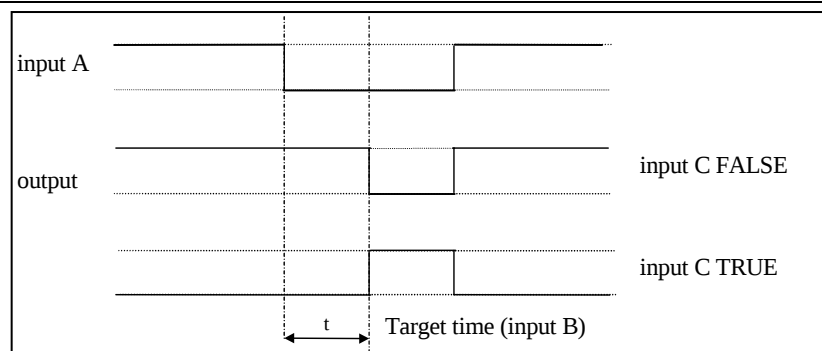
## ON DELAY



A programmable delay between receiving and outputting a Boolean TRUE signal.

INPUT A becoming TRUE starts the delay timer. INPUT B sets the duration of the delay in seconds (1 = 1 second). At the end of the duration, OUTPUT becomes TRUE unless INPUT A has reverted to FALSE. Setting INPUT C to TRUE (≠0) inverts the output.

## OFF DELAY

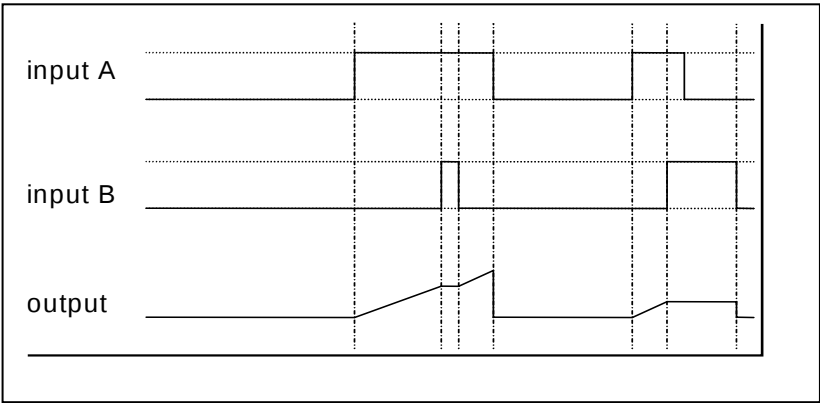


A programmable delay between receiving and outputting a Boolean FALSE signal.

INPUT A becoming FALSE starts the delay timer. INPUT B sets the duration of the delay in seconds (1 = 1 second). Setting INPUT C to TRUE (≠0) inverts the output. At the end of the duration, OUTPUT becomes FALSE unless INPUT A has reverted to TRUE.

| Operation | Description |
|-----------|-------------|
|-----------|-------------|

TIMER

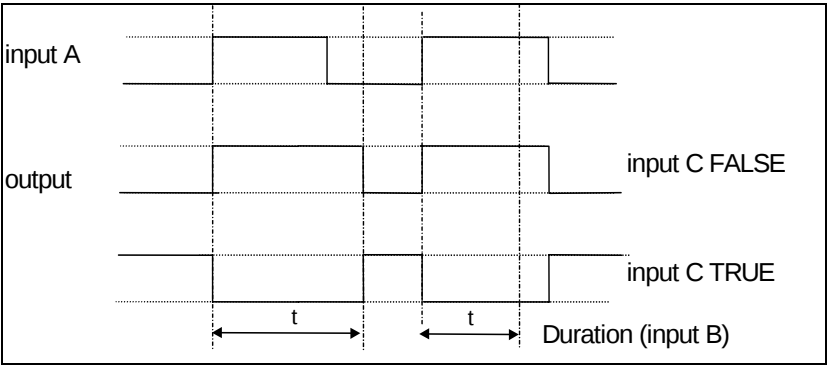


Times the period elapsed from when INPUT A is set TRUE and held TRUE, to when INPUT B becomes TRUE.

OUTPUT is the duration of the timer in seconds (1 = 1 second), starting from zero. If INPUT B is TRUE, the value for OUTPUT is held until INPUT B is released. If on release INPUT A is still TRUE, the timer will continue from the held value. Setting INPUT A and INPUT B to FALSE resets the timer.

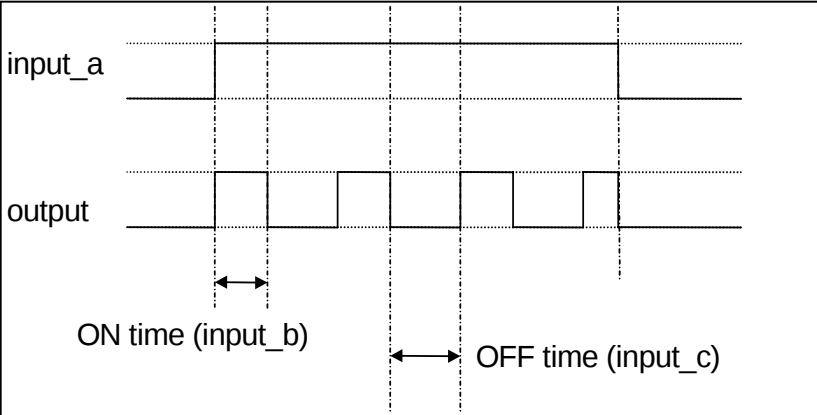
INPUT C is not used.

MINIMUM  
PULSE



Creates an output of adjustable minimum time when INPUT A is TRUE. (INPUT A is assumed to be a sequence of TRUE pulses and FALSE off periods.)

INPUT B sets the length of the minimum pulse required in seconds (1 = 1 second). INPUT C inverts the output when TRUE. The duration of the pulse is *at least* the period set by INPUT B.

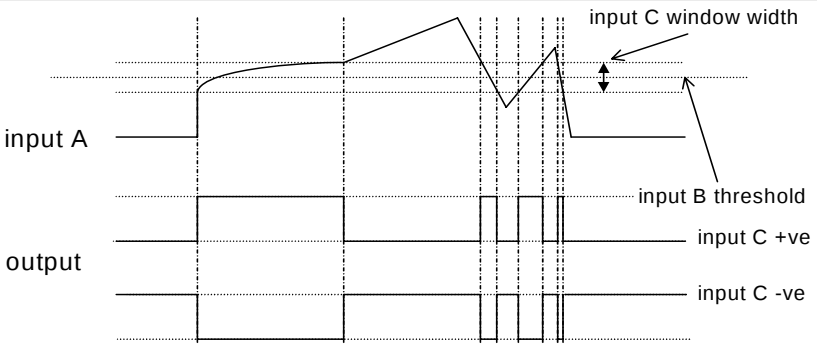
| Operation   | Description                                                                        |
|-------------|------------------------------------------------------------------------------------|
| PULSE TRAIN |  |

Creates a pulsed FALSE / TRUE output of programmable frequency.

INPUT A enables the pulse train when TRUE, disables when FALSE.

INPUT B sets the length of the *on* part of the pulse in seconds (1 = 1 second).

INPUT C sets the length of the *off* part of the pulse in seconds (1 = 1 second).

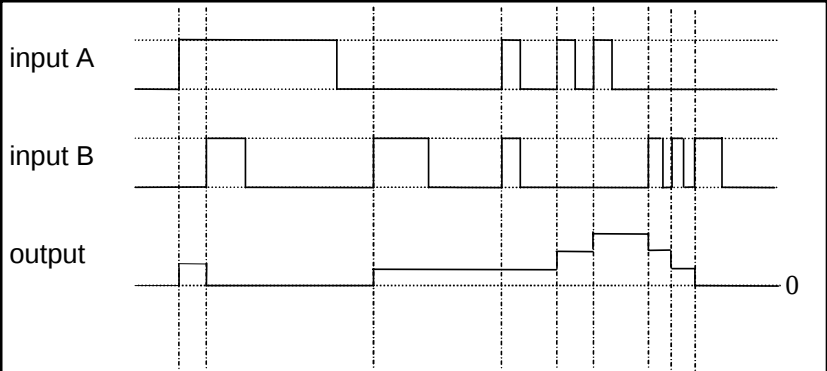
|        |                                                                                     |
|--------|-------------------------------------------------------------------------------------|
| WINDOW |  |
|--------|-------------------------------------------------------------------------------------|

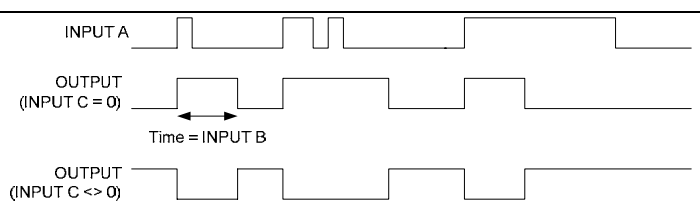
This function outputs TRUE when INPUT A is within a programmable range, and FALSE otherwise.

INPUT B sets the threshold of the window to be monitored. INPUT C defines the range of the window around the threshold. When the value of INPUT A is inside the window, the window expands by 0.01 to avoid flutter on output if noisy, i.e. if INPUT B = 5 and INPUT C = 4 then the range is 3 to 7, expanded to 2.5 to 7.5 when the value if INPUT A is inside the window.

If INPUT C is set to zero, the output will only be TRUE if INPUT A is exactly equal to INPUT B (this is fulfilled in the default condition when inputs A, B & C are all zero)

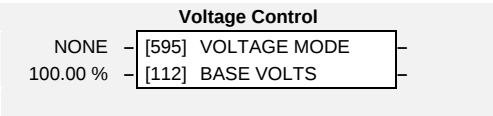
If INPUT C is set to a negative value, its absolute value defines the window range, and the output is inverted.

| Operation                   | Description                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UP/DOWN COUNTER             |  <p>INPUT A provides a rising edge trigger to increment the output count by one.</p> <p>INPUT B provides a rising edge trigger to decrement the output count by one.</p> <p>INPUT C holds the output at zero.</p> <p>The output starts at zero. The output is limited at <math>\pm 300.00</math>.</p> |
| $(A*B)/C$ ROUND             | The OUTPUT is set to $(\text{INPUT A} * \text{INPUT B}) / (\text{INPUT C})$ . This is the same as $(A*B)/C$ (enumerated value 3) except that the result is rounded.                                                                                                                                                                                                                     |
| WINDOW NO HYST              | This is the same as WINDOW (enumerated value 19) except that there is no hysteresis when inside the 'window'. Thus, from the diagram given in WINDOW, if INPUT B = 5 and INPUT C = 4 then the range is 3 to 7.                                                                                                                                                                          |
| WIND $A \geq B, A \leq C$   | This is the same as WINDOW (enumerated value 19) except that instead of setting hysteresis, the upper and lower limits are set independently. The lower limit is INPUT B, the upper limit is INPUT C. OUTPUT is True if $B \leq A \leq C$ .                                                                                                                                             |
| $A \leq B$                  | The OUTPUT is True if INPUT A is less than or equal to INPUT B, otherwise OUTPUT is False.                                                                                                                                                                                                                                                                                              |
| $((A*B)/100)+C$             | OUTPUT is set to $(\text{INPUT A} \times \text{INPUT B})/100 + \text{INPUT C}$ .                                                                                                                                                                                                                                                                                                        |
| MIN(A,B,C)                  | The OUTPUT is set to the minimum value of INPUT A, B and C.                                                                                                                                                                                                                                                                                                                             |
| MAX(A,B,C)                  | The OUTPUT is set to the maximum value of INPUT A, B and C.                                                                                                                                                                                                                                                                                                                             |
| PROFILE SQRT                | OUTPUT = INPUT B + (INPUT C - INPUT B) x square root A.                                                                                                                                                                                                                                                                                                                                 |
| PROFILE LINEAR              | OUTPUT = INPUT B + (INPUT C - INPUT B) x INPUT A                                                                                                                                                                                                                                                                                                                                        |
| PROFILE $x^2$               | OUTPUT = INPUT B + (INPUT C - INPUT B) x $(\text{INPUT A})^2$                                                                                                                                                                                                                                                                                                                           |
| PROFILE $x^3$               | OUTPUT = INPUT B + (INPUT C - INPUT B) x $(\text{INPUT A})^3$                                                                                                                                                                                                                                                                                                                           |
| PROFILE $x^4$               | OUTPUT = INPUT B + (INPUT C - INPUT B) x $(\text{INPUT A})^4$                                                                                                                                                                                                                                                                                                                           |
| ON $A > B$ ,<br>OFF $A < C$ | If A is greater than B, OUTPUT is 0.01. If A is less than C, OUTPUT is 0.00. Otherwise OUTPUT is unchanged.                                                                                                                                                                                                                                                                             |
| $(A+B)$ CLAMPED C           | The output is the result of the arithmetic operation, clamped by the value of C. If C is greater than zero, the output is clamped to be less than C. If C is negative, the output is clamped to be greater than C. If C is zero the output is not clamped                                                                                                                               |
| $(A-B)$ CLAMPED C           |                                                                                                                                                                                                                                                                                                                                                                                         |
| $(A*B)$ CLAMPED C           |                                                                                                                                                                                                                                                                                                                                                                                         |
| $(A/B)$ CLAMPED C           |                                                                                                                                                                                                                                                                                                                                                                                         |

| Operation                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $A \geq B: A, A \leq C: 0$ | If A is greater or equal to B, OUTPUT is set to A. If A is less than or equal to C, OUTPUT is 0.00. Otherwise OUTPUT is unchanged.                                                                                                                                                                                                                                                                                                                                                          |
| $(A * B) + C$              | The output is the result of the arithmetic operation.                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| $A * (B + C)$              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| $A * (B - C)$              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| $A * (1 + B/C)$            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| $A * (1 + (B * C))$        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| MONOSTABLE HIGH            |  <p>For each rising edge on input A, the output is active for a time defined by input B, (in seconds). If a subsequent rising edge is detected while the output is active, the end time of the output pulse is delayed as if it had been restarted.</p> <p>The output pulse is active high if input C is zero. If input C is not zero then the output pulse is active low and the idle state is high.</p> |
| MONOSTABLE LOW             | <p>For each falling edge on input A, the output is active for a time defined by input B, (in seconds). If a subsequent falling edge is detected while the output is active, the end time of the output pulse is delayed as if it had been restarted.</p> <p>The output pulse is active high if input C is zero. If input C is not zero then the output pulse is active low and the idle state is high.</p>                                                                                  |
| FILTER                     | <p>The output is the result of passing INPUT A through a first order filter with a time constant in seconds defined by INPUT B.</p> <p>Input C acts as a filter reset. When C is zero the filter is active. When C is non-zero the filter output is reset to be the same as input A.</p>                                                                                                                                                                                                    |
| $(A-B)/(B-C)$              | The output is the result of the arithmetic operation.                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| $100*(A-B)/(B-C)$          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

# VOLTAGE CONTROL

*Designed for VOLTS/Hz motor Control Mode.*



This function block allows the motor output volts to be controlled in the presence of dc link voltage variations. This is achieved by controlling the level of PWM modulation as a function of measured dc link volts. The dc link volts may vary either due to supply variations or regenerative braking by the motor.

Three control modes are available, None, Fixed and Automatic.

## Parameter Descriptions

**VOLTAGE MODE**  *SETCTRL CL06* *Range: Enumerated - see below*  
Set to NONE, no attempt is made to control the PWM modulation depth for variations in dc link voltage.

Set to FIXED, the drive's output volts are maintained, regardless of variations in the dc link voltage. The drive's product code sets the default value for demanded maximum output voltage (see MOTOR VOLTS below).

Set to AUTOMATIC, the voltage is controlled as above, but the output voltage is allowed to rise smoothly as dc link volts vary. This allows the motor to be overfluxed during deceleration, thereby increasing braking performance.

*Enumerated Value : Voltage Mode*

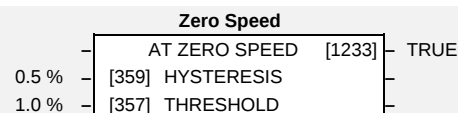
- 0 : NONE
- 1 : FIXED
- 2 : AUTOMATIC

**BASE VOLTS** *Range: 0.00 to 115.47 %*  
This parameter directly scales the output of the voltage control function block, thus allowing further scaling of the drive output volts if required.

Refer also to "Normal/Heavy Duty Selection", page 1-93.

## ZERO SPEED

This function block detects when the speed is at or close to zero. HYSTERESIS and THRESHOLD are user-definable.



## Parameter Descriptions

### HYSTERESIS

Range: 0.0 to 300.0 %

Provides a hysteresis band about which the outputs are stable.

IF the hysteresis value is  $\geq$  to the Threshold  
 THEN the level is set to 2 x the hysteresis value and the Off level is set to zero,  
 ELSE the On level = Threshold + Hysteresis and the Off level = Threshold - Hysteresis.

### THRESHOLD

Range: 0.0 to 300.0 %

The nominal level below which the outputs are set.

### AT ZERO SPEED

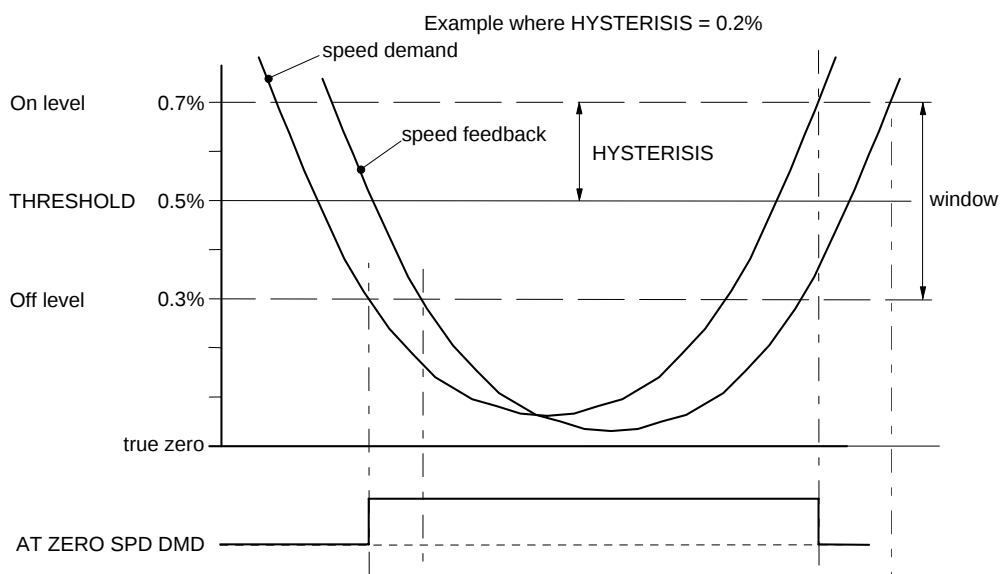
Range: FALSE / TRUE

TRUE when at zero speed feedback, as defined by THRESHOLD and HYSTERESIS.

IF (abs(speed feedback)) > On Level at zero speed = FALSE  
 ELSE if (abs(speed feedback))  $\leq$  Off Level at zero speed = TRUE  
 ELSE at zero speed is unchanged

## Functional Description

**Note:** The speed feedback used is the speed demand added to all trims, (such as those due to stabilisation or slip compensation).



## Normal/Heavy Duty Selection

When selecting or de-selecting Normal Duty, several parameter values and their limits are modified.

The parameters affected are shown in the table below.

| Change from HEAVY DUTY to NORMAL DUTY |                    |          |                        |
|---------------------------------------|--------------------|----------|------------------------|
| Function Block                        | Parameter          | Set to   | Note                   |
| INVERSE TIME                          | Max Overload Level | 110.0 %  | Internal Parameter     |
| CURRENT LIMIT                         | CURRENT LIMIT      | 110.0 %  | High Limit set 110.0 % |
| VOLTAGE CONTROL                       | BASE VOLTS         | 115.47 % | High Limit 115.47 %    |

| Change from NORMAL DUTY to HEAVY DUTY |                    |         |                        |
|---------------------------------------|--------------------|---------|------------------------|
| Function Block                        | Parameter          | Set to  | Note                   |
| INVERSE TIME                          | Max Overload Level | 150.0 % | Internal Parameter     |
| CURRENT LIMIT                         | CURRENT LIMIT      | 150.0 % | High Limit set 150.0 % |
| VOLTAGE CONTROL                       | BASE VOLTS         | 100.0 % | High Limit 115.47 %    |



# PARAMETER SPECIFICATION

The headings for the Tag No. table are described below.

|                       |                                                                                |                                                  |
|-----------------------|--------------------------------------------------------------------------------|--------------------------------------------------|
| <b>Tag</b>            | A numeric identification of the parameter.                                     |                                                  |
| <b>Pref</b>           | A numeric identification of the parameter                                      |                                                  |
| <b>MMI Name</b>       | The parameter name as it appears on the MMI (keypad).                          |                                                  |
| <b>DSEliteName</b>    | The parameter name as it appears in SSD Drives' own programming tool, DSElite. |                                                  |
| <b>Function Block</b> | The function block under which the parameter is stored in DSElite              |                                                  |
| <b>Type</b>           | REAL                                                                           | Floating point value                             |
|                       | INT                                                                            | Integer value                                    |
|                       | BOOL                                                                           | A Boolean (bit) representing FALSE or TRUE       |
|                       | ENUM                                                                           | An enumerated value representing a selection     |
|                       | WORD                                                                           | 16 Bit hexadecimal number                        |
|                       | TAG                                                                            | Requires the Tag Number of a parameter           |
| <b>Range</b>          | This varies with parameter type:                                               |                                                  |
|                       | REAL, INT                                                                      | The upper and lower limits of the parameter      |
|                       | BOOL                                                                           | 0 = FALSE, 1 = TRUE                              |
|                       | ENUM                                                                           | A list of possible selections for that parameter |
|                       | WORD                                                                           | 0000 to FFFF (hexadecimal)                       |
|                       | TAG                                                                            | The upper and lower limits of the parameter      |
| <b>ID</b>             | Serial Communications Mnemonic:<br>Refer to Chapter 3: "Serial Communications" |                                                  |

In the MMI Parameters table the following Notes apply:

- F** Parameter only visible on MMI in detailed menus mode.
- M** Parameter is a Motor parameter, not reset on changing Application.
- VF** Parameter is only visible when in VF motor control mode.
- SV** Parameter is only visible when in SV motor control mode.
- (0) Modbus decimal point is xxxx.
- (1) Modbus decimal point is xxx.x
- (2) Modbus decimal point is xx.xx
- (3) Modbus decimal point is x.xxx

## 2-2 Parameter Specification

### Specification Table: Tag Number Order

| Tag | Pref  | DSElite name     | MMI Name    | Function block name | Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Type | ID |
|-----|-------|------------------|-------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| 4   | 50.03 | ACTIVE TRIPS     |             | TRIPS STATUS        | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | WORD | 04 |
| 5   | 50.05 | WARNINGS         |             | TRIPS STATUS        | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | WORD | 05 |
| 6   | 50.07 | FIRST TRIP       |             | TRIPS STATUS        | 0 : NO TRIP<br>1 : OVERVOLTAGE<br>2 : UNDERVOLTAGE<br>3 : OVERCURRENT<br>4 : HEATSINK<br>5 : EXTERNAL TRIP<br>6 : INVERSE TIME<br>7 : CURRENT LOOP<br>8 : MOTOR STALLED<br>9 : ANIN FAULT<br>10 : BRAKE RESISTOR<br>11 : BRAKE SWITCH<br>12 : DISPLAY / KEYPAD<br>13 : LOST COMMS<br>14 : CONTACTOR FBK<br>15 : SPEED FEEDBACK<br>16 : AMBIENT TEMP<br>17 : MOTOR OVERTEMP<br>18 : CURRENT LIMIT<br>19 : SHORT CIRCUIT<br>20 : 24V FAILURE<br>21 : LOW SPEED OVER I<br>22 : AOUT2 FAULT<br>23 : ENCODER 1 FAULT<br>24 : DESAT (OVER I)<br>25 : VDC RIPPLE<br>26 : BRAKE SHORT CCT<br>27 : OVERSPEED<br>28 : AOUT1 FAULT<br>29 : DIG IO 1 FAULT<br>30 : DIG IO 2 FAULT<br>31 : UNKNOWN<br>32 : OTHER<br>33 : ZERO I CAL<br>34 : MAX SPEED LOW<br>35 : MAINS VOLTS LOW<br>36 : NOT AT SPEED<br>37 : MAG CURRENT FAIL<br>38 : NEGATIVE SLIP F<br>39 : TR TOO LARGE<br>40 : TR TOO SMALL<br>41 : MAX RPM DATA ERR<br>42 : LEAKGE L TIMEOUT<br>43 : MOTOR TURNING ERR<br>44 : MOTOR STALL ERR | ENUM | 06 |
| 8   | 21.01 | PASSWORD         | PAR 99      | MMI ACCESS          | 0x0000 to 0xFFFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | WORD | 08 |
| 9   | 0.27  | 500V PWR BOARD   |             | PROD DATA           | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | BOOL | 09 |
| 10  | 0.28  | HW UNDERLAP COMP |             | PROD DATA           | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | BOOL | 0a |
| 13  | 10.03 | TYPE             | SET\IN IP13 | ANALOG INPUT 1      | 0 : 0..10 V<br>1 : 0..5 V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ENUM | 0d |
| 14  | 10.01 | SCALE            | SET\IN IP11 | ANALOG INPUT 1      | -300.00 to 300.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | REAL | 0e |
| 15  | 10.02 | OFFSET           | SET\IN IP12 | ANALOG INPUT 1      | -300.00 to 300.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | REAL | 0f |
| 16  | 10.05 | VALUE            | DIAG IPA1   | ANALOG INPUT 1      | Output (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | REAL | 0g |
| 19  | 9.02  | address lo word  |             | peek data           | 0x0000 to 0xFFFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | WORD | 0j |
| 20  | 9.05  | output as word   |             | peek data           | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | WORD | 0k |
| 22  | 11.03 | TYPE             | SET\IN IP23 | ANALOG INPUT 2      | 0 : 0..10 V<br>1 : 0..5 V<br>2 : 0..20 mA<br>3 : 4..20 mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ENUM | 0m |
| 23  | 11.01 | SCALE            | SET\IN IP21 | ANALOG INPUT 2      | -300.00 to 300.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | REAL | 0n |
| 24  | 11.02 | OFFSET           | SET\IN IP22 | ANALOG INPUT 2      | -300.00 to 300.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | REAL | 0o |
| 25  | 11.06 | VALUE            | DIAG IPA2   | ANALOG INPUT 2      | Output (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | REAL | 0p |
| 26  | 11.04 | BREAK VALUE      |             | ANALOG INPUT 2      | -100.0 to 100.0 (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | REAL | 0q |
| 28  | 57.15 | SETPOINT         |             | FLYCATCHING         | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | REAL | 0s |
| 29  | 57.13 | error scaler     |             | FLYCATCHING         | 0.00 to 300.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | REAL | 0t |
| 30  | 13.01 | INVERT 1         | SET\IN IP01 | DIGITAL INPUTS      | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | BOOL | 0u |
| 31  | 13.09 | INPUT 1          | SET\IN IPD1 | DIGITAL INPUTS      | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | BOOL | 0v |
| 32  | 57.06 | SEARCH BOOST     |             | FLYCATCHING         | 0.00 to 50.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | REAL | 0w |
| 33  | 13.02 | INVERT 2         | SET\IN IP02 | DIGITAL INPUTS      | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | BOOL | 0x |

# Parameter Specification 2-3

| Tag | Pref   | DSElite name     | MMI Name      | Function block name | Range                                                                              | Type | ID |
|-----|--------|------------------|---------------|---------------------|------------------------------------------------------------------------------------|------|----|
| 34  | 13.10  | INPUT 2          | SET\IN IPD2   | DIGITAL INPUTS      | Output                                                                             | BOOL | 0y |
| 35  | 57.10  | load level       |               | FLYCATCHING         | -50.00 to 50.00                                                                    | REAL | 0z |
| 36  | 13.03  | INVERT 3         | SET\IN IP03   | DIGITAL INPUTS      | 0 to 1                                                                             | BOOL | 10 |
| 37  | 13.11  | INPUT 3          | SET\IN IPD3   | DIGITAL INPUTS      | Output                                                                             | BOOL | 11 |
| 38  | 57.11  | slew delta       |               | FLYCATCHING         | 0.10 to 300.00                                                                     | REAL | 12 |
| 39  | 13.04  | INVERT 4         | SET\IN IP04   | DIGITAL INPUTS      | 0 to 1                                                                             | BOOL | 13 |
| 40  | 13.12  | INPUT 4          | SET\IN IPD4   | DIGITAL INPUTS      | Output                                                                             | BOOL | 14 |
| 41  | 57.12  | regen hold       |               | FLYCATCHING         | 0.01 to 5.00                                                                       | REAL | 15 |
| 42  | 13.05  | INVERT 5         | SET\IN IP05   | DIGITAL INPUTS      | 0 to 1                                                                             | BOOL | 16 |
| 43  | 13.13  | INPUT 5          | SET\IN IPD5   | DIGITAL INPUTS      | Output                                                                             | BOOL | 17 |
| 44  | 71.1.4 | COEFFICIENT B    |               | DISPLAY SCALE 1     | -32768.0000 to 32767.0000(2)                                                       | REAL | 18 |
| 45  | 12.1.1 | VALUE            | DIAG OPA1     | ANALOG OUTPUT 1     | -300.0 to 300.0 (2)                                                                | REAL | 19 |
| 46  | 12.1.2 | SCALE            | SET\OUT A011  | ANALOG OUTPUT 1     | -300.00 to 300.00                                                                  | REAL | 1a |
| 47  | 12.1.3 | OFFSET           | SET\OUT A012  | ANALOG OUTPUT 1     | -300.00 to 300.00                                                                  | REAL | 1b |
| 48  | 12.1.4 | ABSOLUTE         | SET\OUT A013  | ANALOG OUTPUT 1     | 0 to 1                                                                             | BOOL | 1c |
| 50  | 27.01  | NORMAL DUTY      | PAR 12        | FEEDBACKS           | 0 to 1                                                                             | BOOL | 1e |
| 51  | 14.02  | INVERT 1         | SET\OUT OPD1  | DIGITAL OUTPUTS     | 0 to 1                                                                             | BOOL | 1f |
| 52  | 14.01  | DIGOUT 1         |               | DIGITAL OUTPUTS     | 0 to 1                                                                             | BOOL | 1g |
| 53  | 71.1.7 | LOW LIMIT        |               | DISPLAY SCALE 1     | -32768.0000 to 32767.0000 (2)                                                      | REAL | 1h |
| 54  | 14.04  | INVERT 2         | SET\OUT OPD2  | DIGITAL OUTPUTS     | 0 to 1                                                                             | BOOL | 1i |
| 55  | 14.03  | DIGOUT 2         |               | DIGITAL OUTPUTS     | 0 to 1                                                                             | BOOL | 1j |
| 56  | 23.11  | RAMP INPUT       |               | REFERENCE           | Output (2)                                                                         | REAL | 1k |
| 57  | 23.03  | MAX SPEED        | PAR 2         | REFERENCE           | 7.5 to 300.0                                                                       | REAL | 1l |
| 58  | 0.29   | AOUT2 OFFSET CAL |               | PROD DATA           | 0 to 255                                                                           | INT  | 1m |
| 59  | 0.30   | AOUT2 GAIN CAL   |               | PROD DATA           | 0 to 255                                                                           | INT  | 1n |
| 60  | 34.01  | ENABLE           |               | SLEW RATE LIMIT     | 0 to 1                                                                             | BOOL | 1o |
| 61  | 34.03  | DECEL LIMIT      |               | SLEW RATE LIMIT     | 1.0 to 1200.0                                                                      | REAL | 1p |
| 62  | 34.02  | ACCEL LIMIT      |               | SLEW RATE LIMIT     | 1.0 to 1200.0                                                                      | REAL | 1q |
| 63  | 34.04  | output           |               | SLEW RATE LIMIT     | Output                                                                             | REAL | 1r |
| 64  | 35.03  | MOTOR CURRENT    | PAR 6         | MOTOR DATA          | 0.01 to 999.99 (1)                                                                 | REAL | 1s |
| 65  | 35.04  | MAG CURRENT      | SET\CTRL CL14 | MOTOR DATA          | 0.01 to 999.99 (1)                                                                 | REAL | 1t |
| 66  | 27.03  | MOTOR CURRENT %  |               | FEEDBACKS           | Output                                                                             | REAL | 1u |
| 67  | 27.04  | MOTOR CURRENT A  | DIAG 4        | FEEDBACKS           | Output                                                                             | REAL | 1v |
| 70  | 27.11  | TORQUE FEEDBACK  | SET\SETP ST41 | FEEDBACKS           | Output                                                                             | REAL | 1y |
| 73  | 27.12  | FIELD FEEDBACK   |               | FEEDBACKS           | Output                                                                             | REAL | 21 |
| 74  | 70.1.1 | PARAMETER        |               | APP MENU 1          | 0 to 1686                                                                          | PREF | 22 |
| 75  | 27.02  | DC LINK VOLTS    | DIAG 3        | FEEDBACKS           | Output                                                                             | REAL | 23 |
| 76  | 36.02  | brake level      |               | DYNAMIC BRAKING     | 0.00 to 100.00                                                                     | REAL | 24 |
| 77  | 36.04  | BRAKE RESISTANCE | SET\SETP ST32 | DYNAMIC BRAKING     | 1 to 1000                                                                          | INT  | 25 |
| 78  | 36.05  | BRAKE POWER      | SET\SETP ST33 | DYNAMIC BRAKING     | 0.1 to 510.0                                                                       | REAL | 26 |
| 79  | 36.06  | 1SEC OVER RATING | SET\SETP ST34 | DYNAMIC BRAKING     | 1 to 40                                                                            | INT  | 27 |
| 80  | 36.01  | ENABLE           | SET\SETP ST31 | DYNAMIC BRAKING     | 0 to 1                                                                             | BOOL | 28 |
| 81  | 36.03  | BRAKING          |               | DYNAMIC BRAKING     | Output                                                                             | BOOL | 29 |
| 82  | 39.01  | ENABLE           | SET\CTRL CL04 | SLIP COMP           | 0 to 1                                                                             | BOOL | 2a |
| 83  | 35.05  | NAMEPLATE RPM    | SET\CTRL CL02 | MOTOR DATA          | 0.1 to 30000.0 (0)                                                                 | REAL | 2b |
| 84  | 35.06  | MOTOR POLES      | SET\CTRL CL11 | MOTOR DATA          | 0 : 2 POLE<br>1 : 4 POLE<br>2 : 6 POLE<br>3 : 8 POLE<br>4 : 10 POLE<br>5 : 12 POLE | ENUM | 2c |
| 85  | 39.02  | MOTORING LIMIT   |               | SLIP COMP           | 0.0 to 600.0                                                                       | REAL | 2d |
| 86  | 39.03  | REGEN LIMIT      |               | SLIP COMP           | 0.0 to 600.0                                                                       | REAL | 2e |
| 87  | 39.04  | filter tc        |               | SLIP COMP           | 200. to 5000.                                                                      | REAL | 2f |
| 88  | 39.05  | output           |               | SLIP COMP           | Output                                                                             | REAL | 2g |
| 90  | 18.10  | SWAP WORD ORDER  |               | COMMS PORTS         | 0 to 1                                                                             | BOOL | 2i |
| 91  | 21.04  | SCALING          |               | MMI ACCESS          | 0 : NONE<br>1 : DISPLAY SCALE 1<br>2 : DISPLAY SCALE 2                             | ENUM | 2j |
| 92  | 21.05  | IGNORE PASSWORD  |               | MMI ACCESS          | 0 to 1                                                                             | BOOL | 2k |
| 93  | 21.06  | STARTUP SCREEN   |               | MMI ACCESS          | 0 to 16                                                                            | INT  | 2l |
| 94  | 8.01   | task index       |               | task                | 0 to 2                                                                             | INT  | 2m |
| 95  | 8.02   | elapsed time     |               | task                | Output (1)                                                                         | REAL | 2n |
| 96  | 8.03   | elapsed max time |               | task                | Output (1)                                                                         | REAL | 2o |
| 97  | 61.09  | volts demand     |               | tr adaptation       | Output (0)                                                                         | REAL | 2p |
| 98  | 25.01  | RANDOM PATTERN   |               | PATTERN GEN         | 0 to 1                                                                             | BOOL | 2q |
| 99  | 25.05  | stack frequency  |               | PATTERN GEN         | Output                                                                             | REAL | 2r |
| 100 | 25.02  | DEFLUX DELAY     |               | PATTERN GEN         | 0.1 to 10.0                                                                        | REAL | 2s |
| 101 | 71.1.6 | HIGH LIMIT       |               | DISPLAY SCALE 1     | -32768.0000 to 32767.0000 (2)                                                      | REAL | 2t |
| 102 | 18.01  | GROUP ID (GID)   |               | COMMS PORTS         | 0 to 7                                                                             | INT  | 2u |
| 103 | 18.02  | COMMS ADDRESS    | SET\SERL SE03 | COMMS PORTS         | 0 to 255                                                                           | INT  | 2v |

## 2-4 Parameter Specification

| Tag | Pref   | DSElite name     | MMI Name      | Function block name | Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Type | ID |
|-----|--------|------------------|---------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| 104 | 33.01  | V/F SHAPE        | PAR 11        | FLUXING             | 0 : LINEAR LAW<br>1 : FAN LAW<br>2 : USER DEFINED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ENUM | 2w |
| 107 | 33.02  | FIXED BOOST      | PAR 13        | FLUXING             | 0.00 to 25.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | REAL | 2z |
| 108 | 33.03  | AUTO BOOST       | PAR 14        | FLUXING             | 0.00 to 25.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | REAL | 30 |
| 109 | 33.04  | auto boost tc    |               | FLUXING             | 0.020 to 5.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | REAL | 31 |
| 110 | 66.05  | SPEED SCALE      | SET\ENC EN05  | ENCODER             | 0.00 to 300.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | REAL | 32 |
| 111 | 66.06  | SPEED            | SET\ENC EN06  | ENCODER             | Output (0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | REAL | 33 |
| 112 | 53.02  | BASE VOLTS       |               | VOLTAGE CONTROL     | 0.00 to 115.47                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | REAL | 34 |
| 117 | 18.08  | RS485 PROTOCOL   |               | COMMS PORTS         | 0 : AUTOMATIC<br>1 : KEYPAD<br>2 : EIBISYNC ASCII<br>3 : MODBUS<br>4 : FIELDBUS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ENUM | 39 |
| 119 | 35.14  | STATOR RES       | SET\CTRL CL17 | MOTOR DATA          | 0.0000 to 250.0000 (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | REAL | 3b |
| 120 | 35.15  | LEAKAGE INDUC    | SET\CTRL CL18 | MOTOR DATA          | 0.00 to 3000.00 (1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | REAL | 3c |
| 121 | 35.16  | MUTUAL INDUC     | SET\CTRL CL19 | MOTOR DATA          | 0.00 to 3000.00 (1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | REAL | 3d |
| 124 | 35.09  | MOTOR CONNECTION | SET\CTRL CL16 | MOTOR DATA          | 0 : DELTA<br>1 : STAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ENUM | 3g |
| 125 | 71.1.2 | FORMULA          |               | DISPLAY SCALE 1     | 0 :<br>1 : A/B * X + C<br>2 : A/B * (X+C)<br>3 : A/(B * X) + C<br>4 : A/(B * (X+C))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ENUM | 3h |
| 126 | 43.08  | FINAL STOP RATE  |               | REFERENCE STOP      | 12. to 4800.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | REAL | 3i |
| 127 | 22.01  | ENABLED KEYS     | SET\SETP ST52 | DISPLAY/KEYPAD      | 0x0000 to 0xFFFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | WORD | 3j |
| 128 | 31.01  | ENABLE           | SET\CTRL CL05 | STABILISATION       | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | BOOL | 3k |
| 129 | 18.09  | SWITCH OP PORT   |               | COMMS PORTS         | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | BOOL | 3l |
| 130 | 15.1.1 | INPUT A          |               | VALUE FUNC 1        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | REAL | 3m |
| 131 | 15.1.2 | INPUT B          |               | VALUE FUNC 1        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | REAL | 3n |
| 132 | 15.1.3 | INPUT C          |               | VALUE FUNC 1        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | REAL | 3o |
| 133 | 15.1.5 | OUTPUT           |               | VALUE FUNC 1        | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | REAL | 3p |
| 134 | 15.1.4 | TYPE             |               | VALUE FUNC 1        | 0 : IF(C) -A<br>1 : ABS(A+B+C)<br>2 : SWITCH(A,B)<br>3 : (A*B)/C<br>4 : A+B+C<br>5 : A-B-C<br>6 : B<=A<=C<br>7 : A>B+/-C<br>8 : A>=B<br>9 : ABS(A)>B+/-C<br>10 : ABS(A)>=B<br>11 : A(1+B)<br>12 : IF(C) HOLD(A)<br>13 : BINARY DECODE<br>14 : ON DELAY<br>15 : OFF DELAY<br>16 : TIMER<br>17 : MINIMUM PULSE<br>18 : PULSE TRAIN<br>19 : WINDOW<br>20 : UP/DWN COUNTER<br>21 : (A*B)/C ROUND<br>22 : WINDOW NO HYST<br>23 : WIND A>=B,A<=C<br>24 : A<=B<br>25 : ((A*B)/100)+C<br>26 : MIN(A,B,C)<br>27 : MAX(A,B,C)<br>28 : PROFILE SQRT<br>29 : PROFILE LINEAR<br>30 : PROFILE x^2<br>31 : PROFILE x^3<br>32 : PROFILE x^4<br>33 : ON A>B, OFF A<C<br>34 : (A+B) CLAMPED C<br>35 : (A-B) CLAMPED C<br>36 : (A*B) CLAMPED C<br>37 : (A/B) CLAMPED C<br>38 : A>=B:A, A<=C:0<br>39 : (A * B) + C<br>40 : A * (B + C)<br>41 : A * (B - C)<br>42 : A * (1+B/C) | ENUM | 3q |

# Parameter Specification 2-5

| Tag | Pref    | DSElite name | MMI Name | Function block name | Range                                                                                                                                                                                                                                                                                            | Type | ID |
|-----|---------|--------------|----------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
|     |         |              |          |                     | 43 : $A * (1 + (B * C))$<br>44 : MONOSTABLE HIGH<br>45 : MONOSTABLE LOW<br>46 : FILTER<br>47 : $(A-B)/(B-C)$<br>48 : $100 * (A-B)/(B-C)$                                                                                                                                                         |      |    |
| 135 | 15.2.1  | INPUT A      |          | VALUE FUNC 2        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 3r |
| 136 | 15.2.2  | INPUT B      |          | VALUE FUNC 2        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 3s |
| 137 | 15.2.3  | INPUT C      |          | VALUE FUNC 2        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 3t |
| 138 | 15.2.5  | OUTPUT       |          | VALUE FUNC 2        | Output                                                                                                                                                                                                                                                                                           | REAL | 3u |
| 139 | 15.2.4  | TYPE         |          | VALUE FUNC 2        | Same as 134                                                                                                                                                                                                                                                                                      | ENUM | 3v |
| 140 | 15.3.1  | INPUT A      |          | VALUE FUNC 3        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 3w |
| 141 | 15.3.2  | INPUT B      |          | VALUE FUNC 3        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 3x |
| 142 | 15.3.3  | INPUT C      |          | VALUE FUNC 3        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 3y |
| 143 | 15.3.5  | OUTPUT       |          | VALUE FUNC 3        | Output                                                                                                                                                                                                                                                                                           | REAL | 3z |
| 144 | 15.3.4  | TYPE         |          | VALUE FUNC 3        | Same as 134                                                                                                                                                                                                                                                                                      | ENUM | 40 |
| 145 | 15.4.1  | INPUT A      |          | VALUE FUNC 4        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 41 |
| 146 | 15.4.2  | INPUT B      |          | VALUE FUNC 4        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 42 |
| 147 | 15.4.3  | INPUT C      |          | VALUE FUNC 4        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 43 |
| 148 | 15.4.5  | OUTPUT       |          | VALUE FUNC 4        | Output                                                                                                                                                                                                                                                                                           | REAL | 44 |
| 149 | 15.4.4  | TYPE         |          | VALUE FUNC 4        | Same as 134                                                                                                                                                                                                                                                                                      | ENUM | 45 |
| 150 | 15.5.1  | INPUT A      |          | VALUE FUNC 5        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 46 |
| 151 | 15.5.2  | INPUT B      |          | VALUE FUNC 5        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 47 |
| 152 | 15.5.3  | INPUT C      |          | VALUE FUNC 5        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 48 |
| 153 | 15.5.5  | OUTPUT       |          | VALUE FUNC 5        | Output                                                                                                                                                                                                                                                                                           | REAL | 49 |
| 154 | 15.5.4  | TYPE         |          | VALUE FUNC 5        | Same as 134                                                                                                                                                                                                                                                                                      | ENUM | 4a |
| 155 | 15.6.1  | INPUT A      |          | VALUE FUNC 6        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4b |
| 156 | 15.6.2  | INPUT B      |          | VALUE FUNC 6        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4c |
| 157 | 15.6.3  | INPUT C      |          | VALUE FUNC 6        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4d |
| 158 | 15.6.5  | OUTPUT       |          | VALUE FUNC 6        | Output                                                                                                                                                                                                                                                                                           | REAL | 4e |
| 159 | 15.6.4  | TYPE         |          | VALUE FUNC 6        | Same as 134                                                                                                                                                                                                                                                                                      | ENUM | 4f |
| 160 | 15.7.1  | INPUT A      |          | VALUE FUNC 7        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4g |
| 161 | 15.7.2  | INPUT B      |          | VALUE FUNC 7        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4h |
| 162 | 15.7.3  | INPUT C      |          | VALUE FUNC 7        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4i |
| 163 | 15.7.5  | OUTPUT       |          | VALUE FUNC 7        | Output                                                                                                                                                                                                                                                                                           | REAL | 4j |
| 164 | 15.7.4  | TYPE         |          | VALUE FUNC 7        | Same as 134                                                                                                                                                                                                                                                                                      | ENUM | 4k |
| 165 | 15.8.1  | INPUT A      |          | VALUE FUNC 8        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4l |
| 166 | 15.8.2  | INPUT B      |          | VALUE FUNC 8        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4m |
| 167 | 15.8.3  | INPUT C      |          | VALUE FUNC 8        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4n |
| 168 | 15.8.5  | OUTPUT       |          | VALUE FUNC 8        | Output                                                                                                                                                                                                                                                                                           | REAL | 4o |
| 169 | 15.8.4  | TYPE         |          | VALUE FUNC 8        | Same as 134                                                                                                                                                                                                                                                                                      | ENUM | 4p |
| 170 | 15.9.1  | INPUT A      |          | VALUE FUNC 9        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4q |
| 171 | 15.9.2  | INPUT B      |          | VALUE FUNC 9        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4r |
| 172 | 15.9.3  | INPUT C      |          | VALUE FUNC 9        | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4s |
| 173 | 15.9.5  | OUTPUT       |          | VALUE FUNC 9        | Output                                                                                                                                                                                                                                                                                           | REAL | 4t |
| 174 | 15.9.4  | TYPE         |          | VALUE FUNC 9        | Same as 134                                                                                                                                                                                                                                                                                      | ENUM | 4u |
| 175 | 15.10.1 | INPUT A      |          | VALUE FUNC 10       | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4v |
| 176 | 15.10.2 | INPUT B      |          | VALUE FUNC 10       | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4w |
| 177 | 15.10.3 | INPUT C      |          | VALUE FUNC 10       | -32768.00 to 32767.00                                                                                                                                                                                                                                                                            | REAL | 4x |
| 178 | 15.10.5 | OUTPUT       |          | VALUE FUNC 10       | Output                                                                                                                                                                                                                                                                                           | REAL | 4y |
| 179 | 15.10.4 | TYPE         |          | VALUE FUNC 10       | Same as 134                                                                                                                                                                                                                                                                                      | ENUM | 4z |
| 180 | 16.1.1  | INPUT A      |          | LOGIC FUNC 1        | 0 to 1                                                                                                                                                                                                                                                                                           | BOOL | 50 |
| 181 | 16.1.2  | INPUT B      |          | LOGIC FUNC 1        | 0 to 1                                                                                                                                                                                                                                                                                           | BOOL | 51 |
| 182 | 16.1.3  | INPUT C      |          | LOGIC FUNC 1        | 0 to 1                                                                                                                                                                                                                                                                                           | BOOL | 52 |
| 183 | 16.1.5  | OUTPUT       |          | LOGIC FUNC 1        | Output                                                                                                                                                                                                                                                                                           | BOOL | 53 |
| 184 | 16.1.4  | TYPE         |          | LOGIC FUNC 1        | 0 : NOT(A)<br>1 : AND(A,B,C)<br>2 : NAND(A,B,C)<br>3 : OR(A,B,C)<br>4 : NOR(A,B,C)<br>5 : XOR(A,B)<br>6 : 0-1 EDGE(A)<br>7 : 1-0 EDGE(A)<br>8 : AND(A,B,!C)<br>9 : OR(A,B,!C)<br>10 : S FLIP-FLOP<br>11 : R FLIP-FLOP<br>12 : LATCH<br>13 : SWITCH<br>14 : (A AND B) OR C<br>15 : (A OR B) AND C | ENUM | 54 |
| 185 | 16.2.1  | INPUT A      |          | LOGIC FUNC 2        | 0 to 1                                                                                                                                                                                                                                                                                           | BOOL | 55 |
| 186 | 16.2.2  | INPUT B      |          | LOGIC FUNC 2        | 0 to 1                                                                                                                                                                                                                                                                                           | BOOL | 56 |

## 2-6 Parameter Specification

| Tag | Pref    | DSElite name    | MMI Name      | Function block name | Range               | Type | ID |
|-----|---------|-----------------|---------------|---------------------|---------------------|------|----|
| 187 | 16.2.3  | INPUT C         |               | LOGIC FUNC 2        | 0 to 1              | BOOL | 57 |
| 188 | 16.2.5  | OUTPUT          |               | LOGIC FUNC 2        | Output              | BOOL | 58 |
| 189 | 16.2.4  | TYPE            |               | LOGIC FUNC 2        | Same as 184         | ENUM | 59 |
| 190 | 16.3.1  | INPUT A         |               | LOGIC FUNC 3        | 0 to 1              | BOOL | 5a |
| 191 | 16.3.2  | INPUT B         |               | LOGIC FUNC 3        | 0 to 1              | BOOL | 5b |
| 192 | 16.3.3  | INPUT C         |               | LOGIC FUNC 3        | 0 to 1              | BOOL | 5c |
| 193 | 16.3.5  | OUTPUT          |               | LOGIC FUNC 3        | Output              | BOOL | 5d |
| 194 | 16.3.4  | TYPE            |               | LOGIC FUNC 3        | Same as 184         | ENUM | 5e |
| 195 | 16.4.1  | INPUT A         |               | LOGIC FUNC 4        | 0 to 1              | BOOL | 5f |
| 196 | 16.4.2  | INPUT B         |               | LOGIC FUNC 4        | 0 to 1              | BOOL | 5g |
| 197 | 16.4.3  | INPUT C         |               | LOGIC FUNC 4        | 0 to 1              | BOOL | 5h |
| 198 | 16.4.5  | OUTPUT          |               | LOGIC FUNC 4        | Output              | BOOL | 5i |
| 199 | 16.4.4  | TYPE            |               | LOGIC FUNC 4        | Same as 184         | ENUM | 5j |
| 200 | 16.5.1  | INPUT A         |               | LOGIC FUNC 5        | 0 to 1              | BOOL | 5k |
| 201 | 16.5.2  | INPUT B         |               | LOGIC FUNC 5        | 0 to 1              | BOOL | 5l |
| 202 | 16.5.3  | INPUT C         |               | LOGIC FUNC 5        | 0 to 1              | BOOL | 5m |
| 203 | 16.5.5  | OUTPUT          |               | LOGIC FUNC 5        | Output              | BOOL | 5n |
| 204 | 16.5.4  | TYPE            |               | LOGIC FUNC 5        | Same as 184         | ENUM | 5o |
| 205 | 16.6.1  | INPUT A         |               | LOGIC FUNC 6        | 0 to 1              | BOOL | 5p |
| 206 | 16.6.2  | INPUT B         |               | LOGIC FUNC 6        | 0 to 1              | BOOL | 5q |
| 207 | 16.6.3  | INPUT C         |               | LOGIC FUNC 6        | 0 to 1              | BOOL | 5r |
| 208 | 16.6.5  | OUTPUT          |               | LOGIC FUNC 6        | Output              | BOOL | 5s |
| 209 | 16.6.4  | TYPE            |               | LOGIC FUNC 6        | Same as 184         | ENUM | 5t |
| 210 | 16.7.1  | INPUT A         |               | LOGIC FUNC 7        | 0 to 1              | BOOL | 5u |
| 211 | 16.7.2  | INPUT B         |               | LOGIC FUNC 7        | 0 to 1              | BOOL | 5v |
| 212 | 16.7.3  | INPUT C         |               | LOGIC FUNC 7        | 0 to 1              | BOOL | 5w |
| 213 | 16.7.5  | OUTPUT          |               | LOGIC FUNC 7        | Output              | BOOL | 5x |
| 214 | 16.7.4  | TYPE            |               | LOGIC FUNC 7        | Same as 184         | ENUM | 5y |
| 215 | 16.8.1  | INPUT A         |               | LOGIC FUNC 8        | 0 to 1              | BOOL | 5z |
| 216 | 16.8.2  | INPUT B         |               | LOGIC FUNC 8        | 0 to 1              | BOOL | 60 |
| 217 | 16.8.3  | INPUT C         |               | LOGIC FUNC 8        | 0 to 1              | BOOL | 61 |
| 218 | 16.8.5  | OUTPUT          |               | LOGIC FUNC 8        | Output              | BOOL | 62 |
| 219 | 16.8.4  | TYPE            |               | LOGIC FUNC 8        | Same as 184         | ENUM | 63 |
| 220 | 16.9.1  | INPUT A         |               | LOGIC FUNC 9        | 0 to 1              | BOOL | 64 |
| 221 | 16.9.2  | INPUT B         |               | LOGIC FUNC 9        | 0 to 1              | BOOL | 65 |
| 222 | 16.9.3  | INPUT C         |               | LOGIC FUNC 9        | 0 to 1              | BOOL | 66 |
| 223 | 16.9.5  | OUTPUT          |               | LOGIC FUNC 9        | Output              | BOOL | 67 |
| 224 | 16.9.4  | TYPE            |               | LOGIC FUNC 9        | Same as 184         | ENUM | 68 |
| 225 | 16.10.1 | INPUT A         |               | LOGIC FUNC 10       | 0 to 1              | BOOL | 69 |
| 226 | 16.10.2 | INPUT B         |               | LOGIC FUNC 10       | 0 to 1              | BOOL | 6a |
| 227 | 16.10.3 | INPUT C         |               | LOGIC FUNC 10       | 0 to 1              | BOOL | 6b |
| 228 | 16.10.5 | OUTPUT          |               | LOGIC FUNC 10       | Output              | BOOL | 6c |
| 229 | 16.10.4 | TYPE            |               | LOGIC FUNC 10       | Same as 184         | ENUM | 6d |
| 230 | 22.02   | DISP 1 VERSION  |               | DISPLAY/KEYPAD      | Output              | WORD | 6e |
| 231 | 50.01   | DISABLE TRIPS   | SET\TRIP LOOP | TRIPS STATUS        | 0x0000 to 0xFFFF    | WORD | 6f |
| 234 | 54.02   | EXTERNAL TRIP   |               | IO TRIPS            | 0 to 1              | BOOL | 6i |
| 237 | 50.09   | LATCHED TRIPS   |               | TRIPS STATUS        | Output              | WORD | 6l |
| 238 | 50.10   | LATCHED TRIPS+  |               | TRIPS STATUS        | Output              | WORD | 6m |
| 240 | 56.02   | STALL LIMIT     |               | STALL TRIP          | 50.00 to 150.00     | REAL | 6o |
| 241 | 56.01   | STALL TIME      |               | STALL TRIP          | 0.1 to 3000.0       | REAL | 6p |
| 242 | 35.10   | POWER FACTOR    |               | MOTOR DATA          | 0.50 to 0.99        | REAL | 6q |
| 243 | 23.06   | TRIM IN LOCAL   |               | REFERENCE           | 0 to 1              | BOOL | 6r |
| 244 | 42.01   | RAMP TYPE       | SET\SETP ST03 | REFERENCE RAMP      | 0 : LINEAR<br>1 : S | ENUM | 6s |
| 245 | 23.01   | REMOTE SETPOINT |               | REFERENCE           | -110.0 to 110.0 (2) | REAL | 6t |
| 246 | 20.01   | SETPOINT        | PAR 8         | REFERENCE JOG       | -100.0 to 100.0 (2) | REAL | 6u |
| 247 | 23.13   | LOCAL SETPOINT  |               | REFERENCE           | -100.0 to 100.0 (2) | REAL | 6v |
| 248 | 23.02   | SPEED TRIM      |               | REFERENCE           | -110.00 to 110.00   | REAL | 6w |
| 249 | 23.07   | REMOTE REVERSE  |               | REFERENCE           | 0 to 1              | BOOL | 6x |
| 250 | 23.15   | LOCAL REVERSE   |               | REFERENCE           | Output              | BOOL | 6y |
| 251 | 23.16   | LOCAL MIN SPEED | SET\SETP ST51 | REFERENCE           | 0.0 to 100.0        | REAL | 6z |
| 252 | 23.04   | MAX SPEED CLAMP |               | REFERENCE           | 0.0 to 110.0 (2)    | REAL | 70 |
| 253 | 23.05   | MIN SPEED CLAMP |               | REFERENCE           | -110.0 to 0.0 (2)   | REAL | 71 |
| 254 | 23.10   | SPEED SETPOINT  | DIAG 2        | REFERENCE           | Output (2)          | REAL | 72 |
| 255 | 23.09   | SPEED DEMAND    |               | REFERENCE           | Output (2)          | REAL | 73 |
| 256 | 23.12   | REVERSE         |               | REFERENCE           | Output              | BOOL | 74 |
| 257 | 41.06   | REMOTE REF      |               | LOCAL CONTROL       | Output              | BOOL | 75 |
| 258 | 42.02   | ACCEL TIME      | PAR 4         | REFERENCE RAMP      | 0.0 to 3000.0       | REAL | 76 |
| 259 | 42.03   | DECEL TIME      | PAR 5         | REFERENCE RAMP      | 0.0 to 3000.0       | REAL | 77 |
| 260 | 42.06   | HOLD            |               | REFERENCE RAMP      | 0 to 1              | BOOL | 78 |
| 261 | 20.02   | ACCEL TIME      | SET\SETP ST01 | REFERENCE JOG       | 0.0 to 3000.0       | REAL | 79 |
| 262 | 20.03   | DECEL TIME      | SET\SETP ST02 | REFERENCE JOG       | 0.0 to 3000.0       | REAL | 7a |
| 263 | 43.02   | STOP TIME       |               | REFERENCE STOP      | 0.0 to 600.0        | REAL | 7b |

# Parameter Specification 2-7

| Tag | Pref  | DSElite name     | MMI Name      | Function block name | Range                                                                                                                                                                                                                                                 | Type | ID |
|-----|-------|------------------|---------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| 264 | 43.07 | FAST STOP TIME   |               | REFERENCE STOP      | 0.0 to 600.0                                                                                                                                                                                                                                          | REAL | 7c |
| 265 | 41.02 | REF MODES        |               | LOCAL CONTROL       | 0 : LOCAL/REMOTE<br>1 : LOCAL ONLY<br>2 : REMOTE ONLY                                                                                                                                                                                                 | ENUM | 7d |
| 266 | 43.03 | STOP ZERO SPEED  |               | REFERENCE STOP      | 0.0 to 100.0 (2)                                                                                                                                                                                                                                      | REAL | 7e |
| 269 | 23.08 | comms setpoint   |               | REFERENCE           | -100.0 to 100.0 (2)                                                                                                                                                                                                                                   | REAL | 7h |
| 270 | 19.07 | COMMS REF        |               | COMMS CONTROL       | Output                                                                                                                                                                                                                                                | BOOL | 7i |
| 271 | 19.05 | comms command in |               | COMMS CONTROL       | 0x0000 to 0xFFFF                                                                                                                                                                                                                                      | WORD | 7j |
| 272 | 19.08 | COMMS STATUS     |               | COMMS CONTROL       | Output                                                                                                                                                                                                                                                | WORD | 7k |
| 273 | 19.09 | COMMS COMMAND    |               | COMMS CONTROL       | Output                                                                                                                                                                                                                                                | WORD | 7l |
| 274 | 24.24 | HEALTHY          |               | SEQUENCING LOGIC    | Output                                                                                                                                                                                                                                                | BOOL | 7m |
| 275 | 43.06 | FAST STOP LIMIT  |               | REFERENCE STOP      | 0.0 to 3000.0                                                                                                                                                                                                                                         | REAL | 7n |
| 276 | 24.06 | DRIVE ENABLE     |               | SEQUENCING LOGIC    | 0 to 1                                                                                                                                                                                                                                                | BOOL | 7o |
| 277 | 24.07 | NOT FAST STOP    |               | SEQUENCING LOGIC    | 0 to 1                                                                                                                                                                                                                                                | BOOL | 7p |
| 278 | 24.08 | NOT COAST STOP   |               | SEQUENCING LOGIC    | 0 to 1                                                                                                                                                                                                                                                | BOOL | 7q |
| 279 | 43.01 | RUN STOP MODE    | PAR 9         | REFERENCE STOP      | 0 : RAMPED<br>1 : COAST<br>2 : DC INJECTION                                                                                                                                                                                                           | ENUM | 7r |
| 280 | 24.04 | JOG              |               | SEQUENCING LOGIC    | 0 to 1                                                                                                                                                                                                                                                | BOOL | 7s |
| 281 | 41.04 | SEQ DIRECTION    |               | LOCAL CONTROL       | 0 to 1                                                                                                                                                                                                                                                | BOOL | 7t |
| 282 | 24.10 | REM TRIP RESET   |               | SEQUENCING LOGIC    | 0 to 1                                                                                                                                                                                                                                                | BOOL | 7u |
| 283 | 24.12 | POWER UP START   |               | SEQUENCING LOGIC    | 0 to 1                                                                                                                                                                                                                                                | BOOL | 7v |
| 284 | 43.04 | STOP DELAY       |               | REFERENCE STOP      | 0.0 to 30.0 (3)                                                                                                                                                                                                                                       | REAL | 7w |
| 285 | 24.14 | RUNNING          |               | SEQUENCING LOGIC    | Output                                                                                                                                                                                                                                                | BOOL | 7x |
| 286 | 24.17 | OUTPUT CONTACTOR |               | SEQUENCING LOGIC    | Output                                                                                                                                                                                                                                                | BOOL | 7y |
| 287 | 24.20 | READY            |               | SEQUENCING LOGIC    | Output                                                                                                                                                                                                                                                | BOOL | 7z |
| 288 | 24.18 | SWITCH ON ENABLE |               | SEQUENCING LOGIC    | Output                                                                                                                                                                                                                                                | BOOL | 80 |
| 289 | 24.13 | TRIPPED          |               | SEQUENCING LOGIC    | Output                                                                                                                                                                                                                                                | BOOL | 81 |
| 290 | 24.11 | TRIP RST BY RUN  |               | SEQUENCING LOGIC    | 0 to 1                                                                                                                                                                                                                                                | BOOL | 82 |
| 291 | 24.01 | RUN FORWARD      |               | SEQUENCING LOGIC    | 0 to 1                                                                                                                                                                                                                                                | BOOL | 83 |
| 292 | 24.02 | RUN REVERSE      |               | SEQUENCING LOGIC    | 0 to 1                                                                                                                                                                                                                                                | BOOL | 84 |
| 293 | 24.03 | NOT STOP         |               | SEQUENCING LOGIC    | 0 to 1                                                                                                                                                                                                                                                | BOOL | 85 |
| 294 | 24.09 | REMOTE REVERSE   |               | SEQUENCING LOGIC    | 0 to 1                                                                                                                                                                                                                                                | BOOL | 86 |
| 295 | 19.06 | COMMS SEQ        |               | COMMS CONTROL       | Output                                                                                                                                                                                                                                                | BOOL | 87 |
| 296 | 24.23 | REMOTE REV OUT   |               | SEQUENCING LOGIC    | Output                                                                                                                                                                                                                                                | BOOL | 88 |
| 297 | 41.05 | REMOTE SEQ       |               | LOCAL CONTROL       | Output                                                                                                                                                                                                                                                | BOOL | 89 |
| 298 | 41.01 | SEQ MODES        |               | LOCAL CONTROL       | Same as 265                                                                                                                                                                                                                                           | ENUM | 8a |
| 299 | 41.03 | POWER UP MODE    |               | LOCAL CONTROL       | 0 : LOCAL<br>1 : REMOTE<br>2 : AUTOMATIC                                                                                                                                                                                                              | ENUM | 8b |
| 300 | 19.01 | REMOTE COMMS SEL | SET\SERL SE01 | COMMS CONTROL       | 0 to 1                                                                                                                                                                                                                                                | BOOL | 8c |
| 301 | 24.22 | SEQUENCER STATE  |               | SEQUENCING LOGIC    | 0 : START DISABLED<br>1 : START ENABLED<br>2 : SWITCHED ON<br>3 : READY<br>4 : ENABLED<br>5 : F-STOP ACTIVE<br>6 : TRIP ACTIVE<br>7 : TRIPPED<br>8 : RESTART PENDING                                                                                  | ENUM | 8d |
| 302 | 24.15 | JOGGING          |               | SEQUENCING LOGIC    | Output                                                                                                                                                                                                                                                | BOOL | 8e |
| 303 | 24.16 | STOPPING         |               | SEQUENCING LOGIC    | Output                                                                                                                                                                                                                                                | BOOL | 8f |
| 304 | 43.05 | FAST STOP MODE   |               | REFERENCE STOP      | 0 : RAMPED<br>1 : COAST                                                                                                                                                                                                                               | ENUM | 8g |
| 305 | 24.21 | SYSTEM RESET     |               | SEQUENCING LOGIC    | Output                                                                                                                                                                                                                                                | BOOL | 8h |
| 306 | 24.19 | SWITCHED ON      |               | SEQUENCING LOGIC    | Output                                                                                                                                                                                                                                                | BOOL | 8i |
| 307 | 19.02 | REMOTE SEQ MODES |               | COMMS CONTROL       | 0 : TERMINALS/COMMS<br>1 : TERMINALS ONLY<br>2 : COMMS ONLY                                                                                                                                                                                           | ENUM | 8j |
| 308 | 19.03 | REMOTE REF MODES |               | COMMS CONTROL       | Same as 307                                                                                                                                                                                                                                           | ENUM | 8k |
| 309 | 19.04 | COMMS TIMEOUT    | SET\SERL SE02 | COMMS CONTROL       | 0.0 to 600.0                                                                                                                                                                                                                                          | REAL | 8l |
| 310 | 7.08  | DIGIN 1 DEST     | SET\CONF DIN1 | APP CONFIG          | 0 : NONE<br>1 : RUN FORWARD<br>2 : RUN REVERSE<br>3 : NOT STOP<br>4 : JOG<br>5 : CONTACTOR CLOSED<br>6 : DRIVE ENABLE<br>7 : NOT FAST STOP<br>8 : NOT COAST STOP<br>9 : REMOTE REVERSE<br>10 : REM TRIP RESET<br>11 : RAISE INPUT<br>12 : LOWER INPUT | ENUM | 8m |

## 2-8 Parameter Specification

| Tag | Pref   | DSElite name    | MMI Name      | Function block name | Range                                                                                                                                                                                                                                                                                                                                                                            | Type | ID |
|-----|--------|-----------------|---------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
|     |        |                 |               |                     | 13 : RL RESET<br>14 : PID ENABLE<br>15 : VALUE 1 INPUT A<br>16 : VALUE 1 INPUT B<br>17 : VALUE 1 INPUT C<br>18 : VALUE 2 INPUT A<br>19 : VALUE 2 INPUT B<br>20 : VALUE 2 INPUT C<br>21 : VALUE 3 INPUT C<br>22 : VALUE 4 INPUT C<br>23 : LOGIC 1 INPUT A<br>24 : LOGIC 1 INPUT B<br>25 : LOGIC 1 INPUT C<br>26 : LOGIC 3 INPUT A<br>27 : LOGIC 3 INPUT B<br>28 : LOGIC 3 INPUT C |      |    |
| 311 | 7.09   | DIGIN 2 DEST    | SET\CONF DIN2 | APP CONFIG          | Same as 310                                                                                                                                                                                                                                                                                                                                                                      | ENUM | 8n |
| 312 | 7.10   | DIGIN 3 DEST    | SET\CONF DIN3 | APP CONFIG          | Same as 310                                                                                                                                                                                                                                                                                                                                                                      | ENUM | 8o |
| 313 | 7.11   | DIGIN 4 DEST    | SET\CONF DIN4 | APP CONFIG          | Same as 310                                                                                                                                                                                                                                                                                                                                                                      | ENUM | 8p |
| 314 | 7.12   | DIGIN 5 DEST    | SET\CONF DIN5 | APP CONFIG          | Same as 310                                                                                                                                                                                                                                                                                                                                                                      | ENUM | 8q |
| 315 | 7.13   | DIGIN 6 DEST    | SET\CONF DIN6 | APP CONFIG          | Same as 310                                                                                                                                                                                                                                                                                                                                                                      | ENUM | 8r |
| 316 | 7.14   | DIGIN 7 DEST    | SET\CONF DIN7 | APP CONFIG          | Same as 310                                                                                                                                                                                                                                                                                                                                                                      | ENUM | 8s |
| 318 | 46.17  | LOW LIMIT       |               | PID                 | -300.00 to 0.00                                                                                                                                                                                                                                                                                                                                                                  | REAL | 8u |
| 319 | 46.18  | SYMMETRIC LIMIT |               | PID                 | 0 to 1                                                                                                                                                                                                                                                                                                                                                                           | BOOL | 8v |
| 321 | 71.1.3 | COEFFICIENT A   |               | DISPLAY SCALE 1     | -32768.0000 to 32767.0000<br>(2)                                                                                                                                                                                                                                                                                                                                                 | REAL | 8x |
| 322 | 71.1.5 | COEFFICIENT C   |               | DISPLAY SCALE 1     | -32768.0000 to 32767.0000<br>(2)                                                                                                                                                                                                                                                                                                                                                 | REAL | 8y |
| 323 | 71.1.8 | UNITS           |               | DISPLAY SCALE 1     | 0 :<br>1 : V<br>2 : RPM<br>3 : A<br>4 : kW<br>5 : %<br>6 : %ms<br>7 : Hz<br>8 : s<br>9 : ms<br>10 : Hzs<br>11 : ohms<br>12 : mH<br>13 : Nm<br>14 : deg<br>15 : kgm^2<br>16 : Nm/Hz<br>17 : /s^2<br>18 : /s^3<br>19 : Pa<br>20 : kPa<br>21 : bar<br>22 : degC<br>23 : K<br>24 : m3/h                                                                                              | ENUM | 8z |
| 325 | 44.08  | OUTPUT          |               | RAISE/LOWER         | Output                                                                                                                                                                                                                                                                                                                                                                           | REAL | 91 |
| 326 | 44.03  | RAMP TIME       |               | RAISE/LOWER         | 0.0 to 600.0                                                                                                                                                                                                                                                                                                                                                                     | REAL | 92 |
| 327 | 44.01  | RAISE INPUT     |               | RAISE/LOWER         | 0 to 1                                                                                                                                                                                                                                                                                                                                                                           | BOOL | 93 |
| 328 | 44.02  | LOWER INPUT     |               | RAISE/LOWER         | 0 to 1                                                                                                                                                                                                                                                                                                                                                                           | BOOL | 94 |
| 329 | 44.05  | MIN VALUE       |               | RAISE/LOWER         | -100.00 to 100.00                                                                                                                                                                                                                                                                                                                                                                | REAL | 95 |
| 330 | 44.04  | MAX VALUE       |               | RAISE/LOWER         | -100.00 to 100.00                                                                                                                                                                                                                                                                                                                                                                | REAL | 96 |
| 331 | 44.06  | RESET VALUE     |               | RAISE/LOWER         | -100.00 to 100.00                                                                                                                                                                                                                                                                                                                                                                | REAL | 97 |
| 332 | 44.07  | RESET           |               | RAISE/LOWER         | 0 to 1                                                                                                                                                                                                                                                                                                                                                                           | BOOL | 98 |
| 334 | 71.1.1 | DECIMAL PLACE   |               | DISPLAY SCALE 1     | 0 : X.<br>1 : X.X<br>2 : X.XX<br>3 : X.XXX<br>4 : X.XXXX<br>5 : DEFAULT                                                                                                                                                                                                                                                                                                          | ENUM | 9a |
| 335 | 45.04  | OUTPUT          |               | MINIMUM SPEED       | Output (2)                                                                                                                                                                                                                                                                                                                                                                       | REAL | 9b |
| 336 | 45.01  | INPUT           |               | MINIMUM SPEED       | -300.0 to 300.0 (2)                                                                                                                                                                                                                                                                                                                                                              | REAL | 9c |
| 337 | 45.02  | MINIMUM         | PAR 3         | MINIMUM SPEED       | -100.0 to 100.0 (2)                                                                                                                                                                                                                                                                                                                                                              | REAL | 9d |
| 338 | 45.03  | MODE            | SET\SETP ST06 | MINIMUM SPEED       | 0 : PROP. W/MIN<br>1 : LINEAR                                                                                                                                                                                                                                                                                                                                                    | ENUM | 9e |
| 340 | 55.01  | INPUT           |               | SKIP FREQUENCIES    | -300.00 to 300.00                                                                                                                                                                                                                                                                                                                                                                | REAL | 9g |
| 341 | 55.02  | BAND 1          | SET\SETP ST12 | SKIP FREQUENCIES    | 0.0 to 60.0                                                                                                                                                                                                                                                                                                                                                                      | REAL | 9h |
| 342 | 55.03  | FREQUENCY 1     | SET\SETP ST11 | SKIP FREQUENCIES    | 0.0 to 300.0                                                                                                                                                                                                                                                                                                                                                                     | REAL | 9i |

# Parameter Specification 2-9

| Tag | Pref    | DSElite name  | MMI Name      | Function block name | Range                                                                                                                | Type | ID |
|-----|---------|---------------|---------------|---------------------|----------------------------------------------------------------------------------------------------------------------|------|----|
| 343 | 55.05   | FREQUENCY 2   | SET\SETP ST13 | SKIP FREQUENCIES    | 0.0 to 300.0                                                                                                         | REAL | 9j |
| 346 | 55.06   | OUTPUT        |               | SKIP FREQUENCIES    | Output                                                                                                               | REAL | 9m |
| 347 | 17.1.2  | INPUT 0       |               | PRESET 1            | -32768.00 to 32767.00                                                                                                | REAL | 9n |
| 348 | 17.1.3  | INPUT 1       |               | PRESET 1            | -32768.00 to 32767.00                                                                                                | REAL | 9o |
| 349 | 17.1.4  | INPUT 2       |               | PRESET 1            | -32768.00 to 32767.00                                                                                                | REAL | 9p |
| 350 | 17.1.5  | INPUT 3       |               | PRESET 1            | -32768.00 to 32767.00                                                                                                | REAL | 9q |
| 351 | 17.1.6  | INPUT 4       |               | PRESET 1            | -32768.00 to 32767.00                                                                                                | REAL | 9r |
| 352 | 17.1.7  | INPUT 5       |               | PRESET 1            | -32768.00 to 32767.00                                                                                                | REAL | 9s |
| 353 | 17.1.8  | INPUT 6       |               | PRESET 1            | -32768.00 to 32767.00                                                                                                | REAL | 9t |
| 354 | 17.1.9  | INPUT 7       |               | PRESET 1            | -32768.00 to 32767.00                                                                                                | REAL | 9u |
| 355 | 17.1.1  | SELECT INPUT  |               | PRESET 1            | 0 : INPUT 0<br>1 : INPUT 1<br>2 : INPUT 2<br>3 : INPUT 3<br>4 : INPUT 4<br>5 : INPUT 5<br>6 : INPUT 6<br>7 : INPUT 7 | ENUM | 9v |
| 356 | 17.1.10 | OUTPUT 1      |               | PRESET 1            | Output                                                                                                               | REAL | 9w |
| 357 | 49.02   | THRESHOLD     |               | ZERO SPEED          | 0.0 to 300.0 (2)                                                                                                     | REAL | 9x |
| 359 | 49.01   | HYSTERESIS    |               | ZERO SPEED          | 0.0 to 300.0 (2)                                                                                                     | REAL | 9z |
| 365 | 28.01   | CURRENT LIMIT | SET\CTRL CL81 | CURRENT LIMIT       | 0.00 to 300.00                                                                                                       | REAL | a5 |
| 367 | 29.01   | prop gain     |               | open-loop i-lim     | 0.00 to 300.00                                                                                                       | REAL | a7 |
| 368 | 29.02   | integral gain |               | open-loop i-lim     | 0.00 to 300.00                                                                                                       | REAL | a8 |
| 369 | 29.03   | setpoint      |               | open-loop i-lim     | Output                                                                                                               | REAL | a9 |
| 370 | 29.04   | limiting      |               | open-loop i-lim     | Output                                                                                                               | BOOL | aa |
| 371 | 70.2.1  | PARAMETER     |               | APP MENU 2          | 0 to 1686                                                                                                            | PREF | ab |
| 372 | 17.1.11 | OUTPUT 2      |               | PRESET 1            | Output                                                                                                               | REAL | ac |
| 373 | 17.2.11 | OUTPUT 2      |               | PRESET 2            | Output                                                                                                               | REAL | ad |
| 374 | 17.3.11 | OUTPUT 2      |               | PRESET 3            | Output                                                                                                               | REAL | ae |
| 375 | 71.2.3  | COEFFICIENT A |               | DISPLAY SCALE 2     | -32768.0000 to 32767.0000 (2)                                                                                        | REAL | af |
| 376 | 71.2.5  | COEFFICIENT C |               | DISPLAY SCALE 2     | -32768.0000 to 32767.0000 (2)                                                                                        | REAL | ag |
| 377 | 71.2.8  | UNITS         |               | DISPLAY SCALE 2     | Same as 323                                                                                                          | ENUM | ah |
| 379 | 71.2.1  | DECIMAL PLACE |               | DISPLAY SCALE 2     | Same as 334                                                                                                          | ENUM | aj |
| 380 | 17.2.2  | INPUT 0       |               | PRESET 2            | -32768.00 to 32767.00                                                                                                | REAL | ak |
| 381 | 17.2.3  | INPUT 1       |               | PRESET 2            | -32768.00 to 32767.00                                                                                                | REAL | al |
| 382 | 17.2.4  | INPUT 2       |               | PRESET 2            | -32768.00 to 32767.00                                                                                                | REAL | am |
| 383 | 17.2.5  | INPUT 3       |               | PRESET 2            | -32768.00 to 32767.00                                                                                                | REAL | an |
| 384 | 17.2.6  | INPUT 4       |               | PRESET 2            | -32768.00 to 32767.00                                                                                                | REAL | ao |
| 385 | 17.2.7  | INPUT 5       |               | PRESET 2            | -32768.00 to 32767.00                                                                                                | REAL | ap |
| 386 | 17.2.8  | INPUT 6       |               | PRESET 2            | -32768.00 to 32767.00                                                                                                | REAL | aq |
| 387 | 17.2.9  | INPUT 7       |               | PRESET 2            | -32768.00 to 32767.00                                                                                                | REAL | ar |
| 388 | 17.2.1  | SELECT INPUT  |               | PRESET 2            | Same as 355                                                                                                          | ENUM | as |
| 389 | 17.2.10 | OUTPUT 1      |               | PRESET 2            | Output                                                                                                               | REAL | at |
| 390 | 17.3.2  | INPUT 0       |               | PRESET 3            | -32768.00 to 32767.00                                                                                                | REAL | au |
| 391 | 17.3.3  | INPUT 1       |               | PRESET 3            | -32768.00 to 32767.00                                                                                                | REAL | av |
| 392 | 17.3.4  | INPUT 2       |               | PRESET 3            | -32768.00 to 32767.00                                                                                                | REAL | aw |
| 393 | 17.3.5  | INPUT 3       |               | PRESET 3            | -32768.00 to 32767.00                                                                                                | REAL | ax |
| 394 | 17.3.6  | INPUT 4       |               | PRESET 3            | -32768.00 to 32767.00                                                                                                | REAL | ay |
| 395 | 17.3.7  | INPUT 5       |               | PRESET 3            | -32768.00 to 32767.00                                                                                                | REAL | az |
| 396 | 17.3.8  | INPUT 6       |               | PRESET 3            | -32768.00 to 32767.00                                                                                                | REAL | b0 |
| 397 | 17.3.9  | INPUT 7       |               | PRESET 3            | -32768.00 to 32767.00                                                                                                | REAL | b1 |
| 398 | 17.3.1  | SELECT INPUT  |               | PRESET 3            | Same as 355                                                                                                          | ENUM | b2 |
| 399 | 17.3.10 | OUTPUT 1      |               | PRESET 3            | Output                                                                                                               | REAL | b3 |
| 400 | 1.1.1   | SOURCE        |               | LINK 1              | 0 to 1686                                                                                                            | PREF | b4 |
| 401 | 1.1.2   | DESTINATION   |               | LINK 1              | 0 to 1686                                                                                                            | PREF | b5 |
| 402 | 1.2.1   | SOURCE        |               | LINK 2              | 0 to 1686                                                                                                            | PREF | b6 |
| 403 | 1.2.2   | DESTINATION   |               | LINK 2              | 0 to 1686                                                                                                            | PREF | b7 |
| 404 | 1.3.1   | SOURCE        |               | LINK 3              | 0 to 1686                                                                                                            | PREF | b8 |
| 405 | 1.3.2   | DESTINATION   |               | LINK 3              | 0 to 1686                                                                                                            | PREF | b9 |
| 406 | 1.4.1   | SOURCE        |               | LINK 4              | 0 to 1686                                                                                                            | PREF | ba |
| 407 | 1.4.2   | DESTINATION   |               | LINK 4              | 0 to 1686                                                                                                            | PREF | bb |
| 408 | 1.5.1   | SOURCE        |               | LINK 5              | 0 to 1686                                                                                                            | PREF | bc |
| 409 | 1.5.2   | DESTINATION   |               | LINK 5              | 0 to 1686                                                                                                            | PREF | bd |
| 410 | 1.6.1   | SOURCE        |               | LINK 6              | 0 to 1686                                                                                                            | PREF | be |
| 411 | 1.6.2   | DESTINATION   |               | LINK 6              | 0 to 1686                                                                                                            | PREF | bf |
| 412 | 1.7.1   | SOURCE        |               | LINK 7              | 0 to 1686                                                                                                            | PREF | bg |
| 413 | 1.7.2   | DESTINATION   |               | LINK 7              | 0 to 1686                                                                                                            | PREF | bh |
| 414 | 1.8.1   | SOURCE        |               | LINK 8              | 0 to 1686                                                                                                            | PREF | bi |
| 415 | 1.8.2   | DESTINATION   |               | LINK 8              | 0 to 1686                                                                                                            | PREF | bj |
| 416 | 1.9.1   | SOURCE        |               | LINK 9              | 0 to 1686                                                                                                            | PREF | bk |

# 2-10 Parameter Specification

| Tag | Pref   | DSElite name | MMI Name | Function block name | Range     | Type | ID |
|-----|--------|--------------|----------|---------------------|-----------|------|----|
| 417 | 1.9.2  | DESTINATION  |          | LINK 9              | 0 to 1686 | PREF | bl |
| 418 | 1.10.1 | SOURCE       |          | LINK 10             | 0 to 1686 | PREF | bm |
| 419 | 1.10.2 | DESTINATION  |          | LINK 10             | 0 to 1686 | PREF | bn |
| 420 | 1.11.1 | SOURCE       |          | LINK 11             | 0 to 1686 | PREF | bo |
| 421 | 1.11.2 | DESTINATION  |          | LINK 11             | 0 to 1686 | PREF | bp |
| 422 | 1.12.1 | SOURCE       |          | LINK 12             | 0 to 1686 | PREF | bq |
| 423 | 1.12.2 | DESTINATION  |          | LINK 12             | 0 to 1686 | PREF | br |
| 424 | 1.13.1 | SOURCE       |          | LINK 13             | 0 to 1686 | PREF | bs |
| 425 | 1.13.2 | DESTINATION  |          | LINK 13             | 0 to 1686 | PREF | bt |
| 426 | 1.14.1 | SOURCE       |          | LINK 14             | 0 to 1686 | PREF | bu |
| 427 | 1.14.2 | DESTINATION  |          | LINK 14             | 0 to 1686 | PREF | bv |
| 428 | 1.15.1 | SOURCE       |          | LINK 15             | 0 to 1686 | PREF | bw |
| 429 | 1.15.2 | DESTINATION  |          | LINK 15             | 0 to 1686 | PREF | bx |
| 430 | 1.16.1 | SOURCE       |          | LINK 16             | 0 to 1686 | PREF | by |
| 431 | 1.16.2 | DESTINATION  |          | LINK 16             | 0 to 1686 | PREF | bz |
| 432 | 1.17.1 | SOURCE       |          | LINK 17             | 0 to 1686 | PREF | c0 |
| 433 | 1.17.2 | DESTINATION  |          | LINK 17             | 0 to 1686 | PREF | c1 |
| 434 | 1.18.1 | SOURCE       |          | LINK 18             | 0 to 1686 | PREF | c2 |
| 435 | 1.18.2 | DESTINATION  |          | LINK 18             | 0 to 1686 | PREF | c3 |
| 436 | 1.19.1 | SOURCE       |          | LINK 19             | 0 to 1686 | PREF | c4 |
| 437 | 1.19.2 | DESTINATION  |          | LINK 19             | 0 to 1686 | PREF | c5 |
| 438 | 1.20.1 | SOURCE       |          | LINK 20             | 0 to 1686 | PREF | c6 |
| 439 | 1.20.2 | DESTINATION  |          | LINK 20             | 0 to 1686 | PREF | c7 |
| 440 | 1.21.1 | SOURCE       |          | LINK 21             | 0 to 1686 | PREF | c8 |
| 441 | 1.21.2 | DESTINATION  |          | LINK 21             | 0 to 1686 | PREF | c9 |
| 442 | 1.22.1 | SOURCE       |          | LINK 22             | 0 to 1686 | PREF | ca |
| 443 | 1.22.2 | DESTINATION  |          | LINK 22             | 0 to 1686 | PREF | cb |
| 444 | 1.23.1 | SOURCE       |          | LINK 23             | 0 to 1686 | PREF | cc |
| 445 | 1.23.2 | DESTINATION  |          | LINK 23             | 0 to 1686 | PREF | cd |
| 446 | 1.24.1 | SOURCE       |          | LINK 24             | 0 to 1686 | PREF | ce |
| 447 | 1.24.2 | DESTINATION  |          | LINK 24             | 0 to 1686 | PREF | cf |
| 448 | 1.25.1 | SOURCE       |          | LINK 25             | 0 to 1686 | PREF | cg |
| 449 | 1.25.2 | DESTINATION  |          | LINK 25             | 0 to 1686 | PREF | ch |
| 450 | 1.26.1 | SOURCE       |          | LINK 26             | 0 to 1686 | PREF | ci |
| 451 | 1.26.2 | DESTINATION  |          | LINK 26             | 0 to 1686 | PREF | cj |
| 452 | 1.27.1 | SOURCE       |          | LINK 27             | 0 to 1686 | PREF | ck |
| 453 | 1.27.2 | DESTINATION  |          | LINK 27             | 0 to 1686 | PREF | cl |
| 454 | 1.28.1 | SOURCE       |          | LINK 28             | 0 to 1686 | PREF | cm |
| 455 | 1.28.2 | DESTINATION  |          | LINK 28             | 0 to 1686 | PREF | cn |
| 456 | 1.29.1 | SOURCE       |          | LINK 29             | 0 to 1686 | PREF | co |
| 457 | 1.29.2 | DESTINATION  |          | LINK 29             | 0 to 1686 | PREF | cp |
| 458 | 1.30.1 | SOURCE       |          | LINK 30             | 0 to 1686 | PREF | cq |
| 459 | 1.30.2 | DESTINATION  |          | LINK 30             | 0 to 1686 | PREF | cr |
| 460 | 1.31.1 | SOURCE       |          | LINK 31             | 0 to 1686 | PREF | cs |
| 461 | 1.31.2 | DESTINATION  |          | LINK 31             | 0 to 1686 | PREF | ct |
| 462 | 1.32.1 | SOURCE       |          | LINK 32             | 0 to 1686 | PREF | cu |
| 463 | 1.32.2 | DESTINATION  |          | LINK 32             | 0 to 1686 | PREF | cv |
| 464 | 1.33.1 | SOURCE       |          | LINK 33             | 0 to 1686 | PREF | cw |
| 465 | 1.33.2 | DESTINATION  |          | LINK 33             | 0 to 1686 | PREF | cx |
| 466 | 1.34.1 | SOURCE       |          | LINK 34             | 0 to 1686 | PREF | cy |
| 467 | 1.34.2 | DESTINATION  |          | LINK 34             | 0 to 1686 | PREF | cz |
| 468 | 1.35.1 | SOURCE       |          | LINK 35             | 0 to 1686 | PREF | d0 |
| 469 | 1.35.2 | DESTINATION  |          | LINK 35             | 0 to 1686 | PREF | d1 |
| 470 | 1.36.1 | SOURCE       |          | LINK 36             | 0 to 1686 | PREF | d2 |
| 471 | 1.36.2 | DESTINATION  |          | LINK 36             | 0 to 1686 | PREF | d3 |
| 472 | 1.37.1 | SOURCE       |          | LINK 37             | 0 to 1686 | PREF | d4 |
| 473 | 1.37.2 | DESTINATION  |          | LINK 37             | 0 to 1686 | PREF | d5 |
| 474 | 1.38.1 | SOURCE       |          | LINK 38             | 0 to 1686 | PREF | d6 |
| 475 | 1.38.2 | DESTINATION  |          | LINK 38             | 0 to 1686 | PREF | d7 |
| 476 | 1.39.1 | SOURCE       |          | LINK 39             | 0 to 1686 | PREF | d8 |
| 477 | 1.39.2 | DESTINATION  |          | LINK 39             | 0 to 1686 | PREF | d9 |
| 478 | 1.40.1 | SOURCE       |          | LINK 40             | 0 to 1686 | PREF | da |
| 479 | 1.40.2 | DESTINATION  |          | LINK 40             | 0 to 1686 | PREF | db |
| 480 | 1.41.1 | SOURCE       |          | LINK 41             | 0 to 1686 | PREF | dc |
| 481 | 1.41.2 | DESTINATION  |          | LINK 41             | 0 to 1686 | PREF | dd |
| 482 | 1.42.1 | SOURCE       |          | LINK 42             | 0 to 1686 | PREF | de |
| 483 | 1.42.2 | DESTINATION  |          | LINK 42             | 0 to 1686 | PREF | df |
| 484 | 1.43.1 | SOURCE       |          | LINK 43             | 0 to 1686 | PREF | dg |
| 485 | 1.43.2 | DESTINATION  |          | LINK 43             | 0 to 1686 | PREF | dh |
| 486 | 1.44.1 | SOURCE       |          | LINK 44             | 0 to 1686 | PREF | di |
| 487 | 1.44.2 | DESTINATION  |          | LINK 44             | 0 to 1686 | PREF | dj |
| 488 | 1.45.1 | SOURCE       |          | LINK 45             | 0 to 1686 | PREF | dk |
| 489 | 1.45.2 | DESTINATION  |          | LINK 45             | 0 to 1686 | PREF | dl |

# Parameter Specification 2-11

| Tag | Pref    | DSElite name     | MMI Name      | Function block name | Range                                          | Type | ID |
|-----|---------|------------------|---------------|---------------------|------------------------------------------------|------|----|
| 490 | 1.46.1  | SOURCE           |               | LINK 46             | 0 to 1686                                      | PREF | dm |
| 491 | 1.46.2  | DESTINATION      |               | LINK 46             | 0 to 1686                                      | PREF | dn |
| 492 | 1.47.1  | SOURCE           |               | LINK 47             | 0 to 1686                                      | PREF | do |
| 493 | 1.47.2  | DESTINATION      |               | LINK 47             | 0 to 1686                                      | PREF | dp |
| 494 | 1.48.1  | SOURCE           |               | LINK 48             | 0 to 1686                                      | PREF | dq |
| 495 | 1.48.2  | DESTINATION      |               | LINK 48             | 0 to 1686                                      | PREF | dr |
| 496 | 1.49.1  | SOURCE           |               | LINK 49             | 0 to 1686                                      | PREF | ds |
| 497 | 1.49.2  | DESTINATION      |               | LINK 49             | 0 to 1686                                      | PREF | dt |
| 498 | 1.50.1  | SOURCE           |               | LINK 50             | 0 to 1686                                      | PREF | du |
| 499 | 1.50.2  | DESTINATION      |               | LINK 50             | 0 to 1686                                      | PREF | dv |
| 500 | 51.01   | TRIP 1 (NEWEST)  | DIAG TH1      | TRIPS HISTORY       | Same as 6                                      | ENUM | dw |
| 501 | 51.02   | TRIP 2           | DIAG TH2      | TRIPS HISTORY       | Same as 6                                      | ENUM | dx |
| 502 | 51.03   | TRIP 3           | DIAG TH3      | TRIPS HISTORY       | Same as 6                                      | ENUM | dy |
| 503 | 51.04   | TRIP 4           | DIAG TH4      | TRIPS HISTORY       | Same as 6                                      | ENUM | dz |
| 504 | 51.05   | TRIP 5           | DIAG TH5      | TRIPS HISTORY       | Same as 6                                      | ENUM | e0 |
| 505 | 51.06   | TRIP 6           | DIAG TH6      | TRIPS HISTORY       | Same as 6                                      | ENUM | e1 |
| 506 | 51.07   | TRIP 7           | DIAG TH7      | TRIPS HISTORY       | Same as 6                                      | ENUM | e2 |
| 507 | 51.08   | TRIP 8           | DIAG TH8      | TRIPS HISTORY       | Same as 6                                      | ENUM | e3 |
| 508 | 51.09   | TRIP 9           | DIAG TH9      | TRIPS HISTORY       | Same as 6                                      | ENUM | e4 |
| 509 | 51.10   | TRIP 10 (OLDEST) | DIAG TH10     | TRIPS HISTORY       | Same as 6                                      | ENUM | e5 |
| 510 | 17.4.2  | INPUT 0          |               | PRESET 4            | -32768.00 to 32767.00                          | REAL | e6 |
| 511 | 17.4.3  | INPUT 1          |               | PRESET 4            | -32768.00 to 32767.00                          | REAL | e7 |
| 512 | 17.4.4  | INPUT 2          |               | PRESET 4            | -32768.00 to 32767.00                          | REAL | e8 |
| 513 | 17.4.5  | INPUT 3          |               | PRESET 4            | -32768.00 to 32767.00                          | REAL | e9 |
| 514 | 17.4.6  | INPUT 4          |               | PRESET 4            | -32768.00 to 32767.00                          | REAL | ea |
| 515 | 17.4.7  | INPUT 5          |               | PRESET 4            | -32768.00 to 32767.00                          | REAL | eb |
| 516 | 17.4.8  | INPUT 6          |               | PRESET 4            | -32768.00 to 32767.00                          | REAL | ec |
| 517 | 17.4.9  | INPUT 7          |               | PRESET 4            | -32768.00 to 32767.00                          | REAL | ed |
| 518 | 17.4.1  | SELECT INPUT     |               | PRESET 4            | Same as 355                                    | ENUM | ee |
| 519 | 17.4.10 | OUTPUT 1         |               | PRESET 4            | Output                                         | REAL | ef |
| 520 | 17.4.11 | OUTPUT 2         |               | PRESET 4            | Output                                         | REAL | eg |
| 560 | 18.11   | SER NO WORD 0    |               | COMMS PORTS         | 0x0000 to 0xFFFF                               | WORD | fk |
| 561 | 18.12   | SER NO WORD 0    |               | COMMS PORTS         | 0x0000 to 0xFFFF                               | WORD | fl |
| 562 | 18.13   | SER NO WORD 0    |               | COMMS PORTS         | 0x0000 to 0xFFFF                               | WORD | fm |
| 563 | 18.14   | SER NO WORD 0    |               | COMMS PORTS         | 0x0000 to 0xFFFF                               | WORD | fn |
| 564 | 18.15   | OPTION VERSION   |               | COMMS PORTS         | 0x0000 to 0xFFFF                               | WORD | fo |
| 565 | 66.01   | MODE             | SET\ENC EN01  | ENCODER             | 0 : QUADRATURE<br>1 : CLOCK/DIR<br>2 : CLOCK   | ENUM | fp |
| 566 | 66.04   | LINES            | SET\ENC EN04  | ENCODER             | 100 to 10000                                   | INT  | fq |
| 567 | 66.03   | INVERT           | SET\ENC EN03  | ENCODER             | 0 to 1                                         | BOOL | fr |
| 568 | 27.07   | SPEED FBK REV/S  |               | FEEDBACKS           | Output                                         | REAL | fs |
| 569 | 27.06   | SPEED FBK RPM    |               | FEEDBACKS           | Output (1)                                     | REAL | ft |
| 570 | 57.01   | VHz ENABLE       | SET\CTRL CL03 | FLYCATCHING         | 0 to 1                                         | BOOL | fu |
| 571 | 57.03   | START MODE       |               | FLYCATCHING         | 0 : ALWAYS<br>1 : TRIP OR POWER UP<br>2 : TRIP | ENUM | fv |
| 572 | 57.04   | SEARCH MODE      |               | FLYCATCHING         | 0 : BIDIRECTIONAL<br>1 : UNIDIRECTION          | ENUM | fw |
| 573 | 57.05   | SEARCH VOLTS     |               | FLYCATCHING         | 0.00 to 100.00                                 | REAL | fx |
| 574 | 57.07   | SEARCH TIME      |               | FLYCATCHING         | 0.1 to 60.0                                    | REAL | fy |
| 575 | 57.08   | MIN SEARCH SPEED |               | FLYCATCHING         | 0.0 to 500.0                                   | REAL | fz |
| 576 | 57.14   | ACTIVE           |               | FLYCATCHING         | Output                                         | BOOL | g0 |
| 577 | 30.02   | FREQUENCY        |               | INJ BRAKING         | 1.0 to 300.0                                   | REAL | g1 |
| 578 | 30.03   | I-LIM LEVEL      |               | INJ BRAKING         | 50.0 to 150.0 (2)                              | REAL | g2 |
| 579 | 30.04   | DC PULSE         |               | INJ BRAKING         | 0.0 to 100.0                                   | REAL | g3 |
| 580 | 30.05   | FINAL DC PULSE   |               | INJ BRAKING         | 0.0 to 10.0                                    | REAL | g4 |
| 581 | 30.06   | DC LEVEL         |               | INJ BRAKING         | 0.0 to 25.0                                    | REAL | g5 |
| 582 | 30.07   | TIMEOUT          |               | INJ BRAKING         | 0.0 to 600.0                                   | REAL | g6 |
| 583 | 30.09   | ACTIVE           |               | INJ BRAKING         | Output                                         | BOOL | g7 |
| 584 | 69.01   | ON LOAD          |               | BRAKE CONTROL       | 0.00 to 150.00                                 | REAL | g8 |
| 585 | 69.02   | ON FREQUENCY     |               | BRAKE CONTROL       | 0.0 to 500.0                                   | REAL | g9 |
| 586 | 69.03   | OFF FREQUENCY    |               | BRAKE CONTROL       | 0.0 to 500.0                                   | REAL | ga |
| 587 | 69.04   | ON HOLD TIME     |               | BRAKE CONTROL       | 0.00 to 300.00                                 | REAL | gb |
| 588 | 69.05   | OFF HOLD TIME    |               | BRAKE CONTROL       | 0.00 to 300.00                                 | REAL | gc |
| 589 | 69.06   | RELEASE          |               | BRAKE CONTROL       | Output                                         | BOOL | gd |
| 590 | 69.07   | HOLD             |               | BRAKE CONTROL       | Output                                         | BOOL | ge |
| 591 | 25.03   | DRIVE FREQUENCY  | DIAG 1        | PATTERN GEN         | Output (2)                                     | REAL | gf |
| 594 | 53.03   | dem dc tc        |               | VOLTAGE CONTROL     | 0.002 to 5.000                                 | REAL | gi |
| 595 | 53.01   | VOLTAGE MODE     | SET\CTRL CL06 | VOLTAGE CONTROL     | 0 : NONE<br>1 : FIXED<br>2 : AUTOMATIC         | ENUM | gj |
| 597 | 53.04   | meas dc tc       |               | VOLTAGE CONTROL     | 0.100 to 5.000                                 | REAL | gl |

## 2-12 Parameter Specification

| Tag | Pref    | DSElite name     | MMI Name      | Function block name | Range                                                              | Type | ID |
|-----|---------|------------------|---------------|---------------------|--------------------------------------------------------------------|------|----|
| 598 | 47.17   | OUTPUT           |               | MULTIPLEXER         | Output                                                             | WORD | gm |
| 599 | 48.01   | INPUT            |               | DEMULTIPLEXER       | 0x0000 to 0xFFFF                                                   | WORD | gn |
| 602 | 31.02   | slew rate        |               | STABILISATION       | 0.00 to 50.00                                                      | REAL | gq |
| 603 | 63.01   | ENABLE           | SET\CTRL CL21 | AUTOTUNE            | 0 to 1                                                             | BOOL | gr |
| 604 | 63.09   | ACTIVE           |               | AUTOTUNE            | Output                                                             | BOOL | gs |
| 608 | 40.05   | PENDING          |               | AUTO RESTART        | Output                                                             | BOOL | gw |
| 609 | 40.03   | TRIGGERS         | SET\SETP ST23 | AUTO RESTART        | 0x0000 to 0xFFFF                                                   | WORD | gx |
| 610 | 40.10   | STATE            |               | AUTO RESTART        | 0 : DISABLED<br>1 : IDLE<br>2 : ARMED<br>3 : TIMEING<br>4 : LOCKED | ENUM | gy |
| 611 | 40.09   | EXTENDED MODE    |               | AUTO RESTART        | 0 to 1                                                             | BOOL | gz |
| 612 | 40.01   | ATTEMPTS         | SET\SETP ST21 | AUTO RESTART        | 0 to 10                                                            | INT  | h0 |
| 613 | 40.02   | ATTEMPT DELAY    | SET\SETP ST22 | AUTO RESTART        | 0.0 to 600.0                                                       | REAL | h1 |
| 614 | 40.07   | ATTEMPTS LEFT    |               | AUTO RESTART        | Output                                                             | INT  | h2 |
| 615 | 40.08   | TIME LEFT        |               | AUTO RESTART        | Output                                                             | REAL | h3 |
| 616 | 40.06   | RESTARTING       |               | AUTO RESTART        | Output                                                             | BOOL | h4 |
| 617 | 46.02   | FEEDBACK         |               | PID                 | -300.00 to 300.00                                                  | REAL | h5 |
| 618 | 46.04   | FEEDBACK GAIN    |               | PID                 | -10.00 to 10.00                                                    | REAL | h6 |
| 619 | 46.14   | ERROR            |               | PID                 | Output                                                             | REAL | h7 |
| 620 | 24.26   | FAN RUNNING      |               | SEQUENCING LOGIC    | Output                                                             | BOOL | h8 |
| 621 | 65.01   | LEVEL            | SET\SETP ST42 | AT LOAD             | -300.0 to 300.0 (2)                                                | REAL | h9 |
| 622 | 65.02   | AT OR ABOVE LOAD |               | AT LOAD             | Output                                                             | BOOL | ha |
| 626 | 70.3.1  | PARAMETER        |               | APP MENU 3          | 0 to 1686                                                          | PREF | he |
| 627 | 70.4.1  | PARAMETER        |               | APP MENU 4          | 0 to 1686                                                          | PREF | hf |
| 628 | 70.5.1  | PARAMETER        |               | APP MENU 5          | 0 to 1686                                                          | PREF | hg |
| 629 | 70.6.1  | PARAMETER        |               | APP MENU 6          | 0 to 1686                                                          | PREF | hh |
| 630 | 70.7.1  | PARAMETER        |               | APP MENU 7          | 0 to 1686                                                          | PREF | hi |
| 631 | 70.8.1  | PARAMETER        |               | APP MENU 8          | 0 to 1686                                                          | PREF | hj |
| 632 | 70.9.1  | PARAMETER        |               | APP MENU 9          | 0 to 1686                                                          | PREF | hk |
| 633 | 70.10.1 | PARAMETER        |               | APP MENU 10         | 0 to 1686                                                          | PREF | hl |
| 634 | 70.11.1 | PARAMETER        |               | APP MENU 11         | 0 to 1686                                                          | PREF | hm |
| 635 | 70.12.1 | PARAMETER        |               | APP MENU 12         | 0 to 1686                                                          | PREF | hn |
| 636 | 70.13.1 | PARAMETER        |               | APP MENU 13         | 0 to 1686                                                          | PREF | ho |
| 637 | 70.14.1 | PARAMETER        |               | APP MENU 14         | 0 to 1686                                                          | PREF | hp |
| 638 | 70.15.1 | PARAMETER        |               | APP MENU 15         | 0 to 1686                                                          | PREF | hq |
| 639 | 70.16.1 | PARAMETER        |               | APP MENU 16         | 0 to 1686                                                          | PREF | hr |
| 640 | 50.08   | undervolts level |               | TRIPS STATUS        | 50.00 to 100.00                                                    | REAL | hs |
| 641 | 47.01   | INPUT 0          |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | ht |
| 642 | 47.02   | INPUT 1          |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | hu |
| 643 | 47.03   | INPUT 2          |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | hv |
| 644 | 47.04   | INPUT 3          |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | hw |
| 645 | 47.05   | INPUT 4          |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | hx |
| 646 | 47.06   | INPUT 5          |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | hy |
| 647 | 47.07   | INPUT 6          |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | hz |
| 648 | 47.08   | INPUT 7          |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | i0 |
| 649 | 47.09   | INPUT 8          |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | i1 |
| 650 | 47.10   | INPUT 9          |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | i2 |
| 651 | 47.11   | INPUT 10         |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | i3 |
| 652 | 47.12   | INPUT 11         |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | i4 |
| 653 | 47.13   | INPUT 12         |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | i5 |
| 654 | 47.14   | INPUT 13         |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | i6 |
| 655 | 47.15   | INPUT 14         |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | i7 |
| 656 | 47.16   | INPUT 15         |               | MULTIPLEXER         | 0 to 1                                                             | BOOL | i8 |
| 657 | 48.02   | OUTPUT 0         |               | DEMULTIPLEXER       | Output                                                             | BOOL | i9 |
| 658 | 48.03   | OUTPUT 1         |               | DEMULTIPLEXER       | Output                                                             | BOOL | ia |
| 659 | 48.04   | OUTPUT 2         |               | DEMULTIPLEXER       | Output                                                             | BOOL | ib |
| 660 | 48.05   | OUTPUT 3         |               | DEMULTIPLEXER       | Output                                                             | BOOL | ic |
| 661 | 48.06   | OUTPUT 4         |               | DEMULTIPLEXER       | Output                                                             | BOOL | id |
| 662 | 48.07   | OUTPUT 5         |               | DEMULTIPLEXER       | Output                                                             | BOOL | ie |
| 663 | 48.08   | OUTPUT 6         |               | DEMULTIPLEXER       | Output                                                             | BOOL | if |
| 664 | 48.09   | OUTPUT 7         |               | DEMULTIPLEXER       | Output                                                             | BOOL | ig |
| 665 | 48.10   | OUTPUT 8         |               | DEMULTIPLEXER       | Output                                                             | BOOL | ih |
| 666 | 48.11   | OUTPUT 9         |               | DEMULTIPLEXER       | Output                                                             | BOOL | ii |
| 667 | 48.12   | OUTPUT 10        |               | DEMULTIPLEXER       | Output                                                             | BOOL | ij |
| 668 | 48.13   | OUTPUT 11        |               | DEMULTIPLEXER       | Output                                                             | BOOL | ik |
| 669 | 48.14   | OUTPUT 12        |               | DEMULTIPLEXER       | Output                                                             | BOOL | il |
| 670 | 48.15   | OUTPUT 13        |               | DEMULTIPLEXER       | Output                                                             | BOOL | im |
| 671 | 48.16   | OUTPUT 14        |               | DEMULTIPLEXER       | Output                                                             | BOOL | in |
| 672 | 48.17   | OUTPUT 15        |               | DEMULTIPLEXER       | Output                                                             | BOOL | io |
| 673 | 71.2.4  | COEFFICIENT B    |               | DISPLAY SCALE 2     | -32768.0000 to 32767.0000<br>(2)                                   | REAL | ip |

# Parameter Specification 2-13

| Tag | Pref   | DSElite name     | MMI Name      | Function block name | Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Type | ID |
|-----|--------|------------------|---------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| 674 | 71.2.6 | HIGH LIMIT       |               | DISPLAY SCALE 2     | -32768.0000 to 32767.0000 (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | REAL | iq |
| 675 | 71.2.7 | LOW LIMIT        |               | DISPLAY SCALE 2     | -32768.0000 to 32767.0000 (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | REAL | ir |
| 676 | 71.2.2 | FORMULA          |               | DISPLAY SCALE 2     | Same as 125                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ENUM | is |
| 680 | 55.04  | BAND 2           | SET\SETP ST14 | SKIP FREQUENCIES    | 0.0 to 60.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | REAL | iw |
| 683 | 37.01  | state            |               | motor sequencing    | 0 : INITIALISED<br>1 : PRE-CHARGING<br>2 : STOPPED<br>3 : DEFLUX DELAY<br>4 : CHARGING GATES<br>5 : CHARGING DONE<br>6 : DRIVE ENABLED<br>7 : START<br>8 : AUTO-TUNING<br>9 : AUTO-TUNING<br>10 : FLYCATCHING<br>11 : FLYCATCHING<br>12 : FLYCATCHING<br>13 : RUNNING<br>14 : STOPPING<br>15 : STOPPING<br>16 : STOPPING<br>17 : INJ BRAKING<br>18 : INJ BRAKING<br>19 : COASTING<br>20 : STOP DELAY<br>21 : POST-RUN<br>22 : STACK TRIPPED<br>23 : FLYCATCHING<br>24 : FLYCATCHING<br>25 : FLYCATCHING<br>26 : CUR LOOP TEST<br>27 : START DELAY | ENUM | iz |
| 684 | 31.03  | stb gain         |               | STABILISATION       | -3.000 to 3.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | REAL | j0 |
| 685 | 31.04  | time constant    |               | STABILISATION       | 0.020 to 10.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | REAL | j1 |
| 686 | 28.02  | REGEN LIM ENABLE |               | CURRENT LIMIT       | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | j2 |
| 687 | 31.06  | output           |               | STABILISATION       | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | REAL | j3 |
| 688 | 31.07  | trim             |               | STABILISATION       | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | REAL | j4 |
| 689 | 63.02  | MODE             | SET\CTRL CL20 | AUTOTUNE            | 0 : STATIONARY<br>1 : ROTATING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ENUM | j5 |
| 691 | 42.05  | SRAMP CONTINUOUS | SET\SETP ST05 | REFERENCE RAMP      | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | j7 |
| 694 | 42.04  | SRAMP JERK 1     | SET\SETP ST04 | REFERENCE RAMP      | 0.01 to 100.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | REAL | ja |
| 698 | 42.07  | RAMPING          |               | REFERENCE RAMP      | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | je |
| 700 | 70.6.2 | SCALING          |               | APP MENU 6          | Same as 91                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ENUM | ig |
| 701 | 70.6.3 | READ ONLY        |               | APP MENU 6          | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | jh |
| 702 | 70.6.4 | IGNORE PASSWORD  |               | APP MENU 6          | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | ji |
| 703 | 70.7.2 | SCALING          |               | APP MENU 7          | Same as 91                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ENUM | jj |
| 704 | 70.7.3 | READ ONLY        |               | APP MENU 7          | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | jk |
| 705 | 70.7.4 | IGNORE PASSWORD  |               | APP MENU 7          | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | jl |
| 706 | 70.8.2 | SCALING          |               | APP MENU 8          | Same as 91                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ENUM | jm |
| 707 | 70.8.3 | READ ONLY        |               | APP MENU 8          | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | jn |
| 708 | 70.8.4 | IGNORE PASSWORD  |               | APP MENU 8          | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | jo |
| 709 | 57.09  | REFLUX TIME      |               | FLYCATCHING         | 0.1 to 20.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | REAL | jp |
| 710 | 30.01  | DEFLUX TIME      |               | INJ BRAKING         | 0.1 to 20.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | REAL | jq |
| 725 | 13.06  | INVERT 6         | SET\IN IP06   | DIGITAL INPUTS      | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | k5 |
| 726 | 13.14  | INPUT 6          | SET\IN IPD6   | DIGITAL INPUTS      | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | k6 |
| 727 | 13.07  | INVERT 7         | SET\IN IP07   | DIGITAL INPUTS      | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | k7 |
| 728 | 13.15  | INPUT 7          | SET\IN IPD7   | DIGITAL INPUTS      | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | k8 |
| 729 | 13.08  | INVERT WORD      |               | DIGITAL INPUTS      | 0x0000 to 0xFFFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | WORD | k9 |
| 730 | 13.16  | INPUT WORD       | DIAG DIN      | DIGITAL INPUTS      | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | WORD | ka |
| 731 | 12.2.1 | VALUE            | DIAG OPA2     | ANALOG OUTPUT 2     | -300.0 to 300.0 (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | REAL | kb |
| 732 | 12.2.2 | SCALE            | SET\OUT AO21  | ANALOG OUTPUT 2     | -300.00 to 300.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | REAL | kc |
| 733 | 12.2.3 | OFFSET           | SET\OUT AO22  | ANALOG OUTPUT 2     | -300.00 to 300.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | REAL | kd |
| 734 | 12.2.4 | ABSOLUTE         | SET\OUT AO23  | ANALOG OUTPUT 2     | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | ke |
| 735 | 14.07  | INVERT WORD      |               | DIGITAL OUTPUTS     | 0x0000 to 0xFFFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | WORD | kf |
| 736 | 14.06  | INVERT 3         | SET\OUT OPD3  | DIGITAL OUTPUTS     | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | kg |
| 737 | 14.05  | DIGOUT 3         |               | DIGITAL OUTPUTS     | 0 to 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BOOL | kh |
| 738 | 14.08  | DIGOUT WORD      | DIAG DOUT     | DIGITAL OUTPUTS     | 0x0000 to 0xFFFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | WORD | ki |
| 739 | 30.08  | BASE VOLTS       |               | INJ BRAKING         | 0.00 to 115.47                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | REAL | kj |
| 740 | 50.04  | ACTIVE TRIPS+    |               | TRIPS STATUS        | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | WORD | kk |
| 741 | 50.06  | WARNINGS+        |               | TRIPS STATUS        | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | WORD | kl |
| 742 | 50.02  | DISABLE TRIPS+   | SET\TRIP OT   | TRIPS STATUS        | 0x0000 to 0xFFFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | WORD | km |
| 744 | 40.04  | TRIGGERS+        | SET\SETP ST24 | AUTO RESTART        | 0x0000 to 0xFFFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | WORD | ko |

## 2-14 Parameter Specification

| Tag  | Pref    | DSElite name     | MMI Name      | Function block name | Range                                                                                                           | Type | ID |
|------|---------|------------------|---------------|---------------------|-----------------------------------------------------------------------------------------------------------------|------|----|
| 747  | 66.02   | RESET            | SETVENC EN02  | ENCODER             | 0 to 1                                                                                                          | BOOL | kr |
| 748  | 66.07   | POSITION         |               | ENCODER             | Output                                                                                                          | REAL | ks |
| 749  | 27.08   | SPEED FBK %      |               | FEEDBACKS           | Output                                                                                                          | REAL | kt |
| 760  | 54.01   | INVERT THERMIST  |               | IO TRIPS            | 0 to 1                                                                                                          | BOOL | l4 |
| 769  | 31.05   | trim clamp       |               | STABILISATION       | 0.00 to 6.00                                                                                                    | REAL | ld |
| 770  | 23.14   | COMMS SETPOINT   |               | REFERENCE           | Output (2)                                                                                                      | REAL | le |
| 774  | 70.9.2  | SCALING          |               | APP MENU 9          | Same as 91                                                                                                      | ENUM | li |
| 775  | 70.9.3  | READ ONLY        |               | APP MENU 9          | 0 to 1                                                                                                          | BOOL | lj |
| 776  | 70.9.4  | IGNORE PASSWORD  |               | APP MENU 9          | 0 to 1                                                                                                          | BOOL | lk |
| 777  | 70.10.2 | SCALING          |               | APP MENU 10         | Same as 91                                                                                                      | ENUM | ll |
| 778  | 70.10.3 | READ ONLY        |               | APP MENU 10         | 0 to 1                                                                                                          | BOOL | lm |
| 779  | 70.10.4 | IGNORE PASSWORD  |               | APP MENU 10         | 0 to 1                                                                                                          | BOOL | ln |
| 780  | 70.11.2 | SCALING          |               | APP MENU 11         | Same as 91                                                                                                      | ENUM | lo |
| 781  | 70.11.3 | READ ONLY        |               | APP MENU 11         | 0 to 1                                                                                                          | BOOL | lp |
| 782  | 70.11.4 | IGNORE PASSWORD  |               | APP MENU 11         | 0 to 1                                                                                                          | BOOL | lq |
| 783  | 70.12.2 | SCALING          |               | APP MENU 12         | Same as 91                                                                                                      | ENUM | lr |
| 784  | 70.12.3 | READ ONLY        |               | APP MENU 12         | 0 to 1                                                                                                          | BOOL | ls |
| 785  | 70.12.4 | IGNORE PASSWORD  |               | APP MENU 12         | 0 to 1                                                                                                          | BOOL | lt |
| 786  | 70.13.2 | SCALING          |               | APP MENU 13         | Same as 91                                                                                                      | ENUM | lu |
| 787  | 70.13.3 | READ ONLY        |               | APP MENU 13         | 0 to 1                                                                                                          | BOOL | lv |
| 788  | 70.13.4 | IGNORE PASSWORD  |               | APP MENU 13         | 0 to 1                                                                                                          | BOOL | lw |
| 789  | 70.14.2 | SCALING          |               | APP MENU 14         | Same as 91                                                                                                      | ENUM | lx |
| 790  | 70.14.3 | READ ONLY        |               | APP MENU 14         | 0 to 1                                                                                                          | BOOL | ly |
| 791  | 70.14.4 | IGNORE PASSWORD  |               | APP MENU 14         | 0 to 1                                                                                                          | BOOL | lz |
| 792  | 70.15.2 | SCALING          |               | APP MENU 15         | Same as 91                                                                                                      | ENUM | m0 |
| 793  | 70.15.3 | READ ONLY        |               | APP MENU 15         | 0 to 1                                                                                                          | BOOL | m1 |
| 794  | 70.15.4 | IGNORE PASSWORD  |               | APP MENU 15         | 0 to 1                                                                                                          | BOOL | m2 |
| 795  | 70.16.2 | SCALING          |               | APP MENU 16         | Same as 91                                                                                                      | ENUM | m3 |
| 796  | 70.16.3 | READ ONLY        |               | APP MENU 16         | 0 to 1                                                                                                          | BOOL | m4 |
| 797  | 70.16.4 | IGNORE PASSWORD  |               | APP MENU 16         | 0 to 1                                                                                                          | BOOL | m5 |
| 877  | 21.03   | view reserved    |               | MMI ACCESS          | 0 to 1                                                                                                          | BOOL | od |
| 878  | 21.02   | DETAILED MENUS   | SET\SETP ST99 | MMI ACCESS          | 0 to 1                                                                                                          | BOOL | oe |
| 1016 | 7.06    | DIGIO 1 SOURCE   | SET\CONF DOP1 | APP CONFIG          | 0 : NONE<br>1 : HEALTH<br>2 : TRIPPED<br>3 : RUNNING<br>4 : AT ZERO<br>5 : AT SPEED<br>6 : AT LOAD<br>7 : READY | ENUM | s8 |
| 1017 | 27.09   | id               |               | FEEDBACKS           | Output (3)                                                                                                      | REAL | s9 |
| 1018 | 27.10   | iq               |               | FEEDBACKS           | Output (3)                                                                                                      | REAL | sa |
| 1020 | 27.05   | TERMINAL VOLTS   |               | FEEDBACKS           | Output                                                                                                          | REAL | sc |
| 1021 | 33.05   | vsd              |               | FLUXING             | Output                                                                                                          | REAL | sd |
| 1022 | 33.06   | vsq              |               | FLUXING             | Output                                                                                                          | REAL | se |
| 1023 | 53.05   | vsd              |               | VOLTAGE CONTROL     | Output                                                                                                          | REAL | sf |
| 1024 | 53.06   | vsq              |               | VOLTAGE CONTROL     | Output                                                                                                          | REAL | sg |
| 1025 | 63.03   | TEST DISABLE     |               | AUTOTUNE            | 0x0000 to 0xFFFF                                                                                                | WORD | sh |
| 1026 | 63.04   | autocal max rpm  |               | AUTOTUNE            | 0.0 to 30000.0 (0)                                                                                              | REAL | si |
| 1027 | 63.05   | imr int gain     |               | AUTOTUNE            | 0.00 to 10.00                                                                                                   | REAL | sj |
| 1028 | 63.06   | atn ramp time    |               | AUTOTUNE            | 0.0 to 600.0                                                                                                    | REAL | sk |
| 1029 | 63.07   | vdc filt gain    |               | AUTOTUNE            | 0.0000 to 1.0000                                                                                                | REAL | sl |
| 1030 | 63.08   | vterm filt gain  |               | AUTOTUNE            | 0.0000 to 1.0000                                                                                                | REAL | sm |
| 1031 | 63.10   | max spd rpm @cal |               | AUTOTUNE            | 0.0 to 30000.0 (0)                                                                                              | REAL | sn |
| 1033 | 68.01   | enable           |               | trace               | 0 to 1                                                                                                          | BOOL | sp |
| 1035 | 68.02   | hold             |               | trace               | 0 to 1                                                                                                          | BOOL | sr |
| 1036 | 68.03   | status           |               | trace               | Output                                                                                                          | INT  | ss |
| 1039 | 70.1.2  | SCALING          |               | APP MENU 1          | Same as 91                                                                                                      | ENUM | sv |
| 1040 | 70.1.3  | READ ONLY        |               | APP MENU 1          | 0 to 1                                                                                                          | BOOL | sw |
| 1041 | 70.1.4  | IGNORE PASSWORD  |               | APP MENU 1          | 0 to 1                                                                                                          | BOOL | sx |
| 1042 | 70.2.2  | SCALING          |               | APP MENU 2          | Same as 91                                                                                                      | ENUM | sy |
| 1043 | 70.2.3  | READ ONLY        |               | APP MENU 2          | 0 to 1                                                                                                          | BOOL | sz |
| 1044 | 70.2.4  | IGNORE PASSWORD  |               | APP MENU 2          | 0 to 1                                                                                                          | BOOL | t0 |
| 1046 | 70.3.2  | SCALING          |               | APP MENU 3          | Same as 91                                                                                                      | ENUM | t2 |
| 1047 | 70.3.3  | READ ONLY        |               | APP MENU 3          | 0 to 1                                                                                                          | BOOL | t3 |
| 1048 | 70.3.4  | IGNORE PASSWORD  |               | APP MENU 3          | 0 to 1                                                                                                          | BOOL | t4 |
| 1050 | 70.4.2  | SCALING          |               | APP MENU 4          | Same as 91                                                                                                      | ENUM | t6 |
| 1051 | 70.4.3  | READ ONLY        |               | APP MENU 4          | 0 to 1                                                                                                          | BOOL | t7 |
| 1052 | 70.4.4  | IGNORE PASSWORD  |               | APP MENU 4          | 0 to 1                                                                                                          | BOOL | t8 |
| 1053 | 70.5.4  | IGNORE PASSWORD  |               | APP MENU 5          | 0 to 1                                                                                                          | BOOL | t9 |
| 1054 | 70.5.2  | SCALING          |               | APP MENU 5          | Same as 91                                                                                                      | ENUM | ta |
| 1055 | 70.5.3  | READ ONLY        |               | APP MENU 5          | 0 to 1                                                                                                          | BOOL | tb |
| 1056 | 26.04   | igbt volt drop   |               | waveform gen        | 0.00 to 2.00                                                                                                    | REAL | tc |

# Parameter Specification 2-15

| Tag  | Pref  | DSElite name     | MMI Name      | Function block name | Range                                                                                                                                           | Type | ID |
|------|-------|------------------|---------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| 1057 | 62.20 | cl bandwidth     |               | mmas                | 0.1 to 3.0 (0)                                                                                                                                  | REAL | td |
| 1058 | 33.07 | 601 FLUXING      | SET\CTRL CL07 | FLUXING             | 0 to 1                                                                                                                                          | BOOL | te |
| 1059 | 18.07 | P3 PORT PROTOCOL | SET\SERL SE08 | COMMS PORTS         | Same as 117                                                                                                                                     | ENUM | tf |
| 1060 | 18.06 | OP PORT PROTOCOL | SET\SERL SE07 | COMMS PORTS         | Same as 117                                                                                                                                     | ENUM | tg |
| 1061 | 18.04 | PARITY           | SET\SERL SE05 | COMMS PORTS         | 0 : NONE<br>1 : ODD<br>2 : EVEN                                                                                                                 | ENUM | th |
| 1062 | 18.03 | BAUD RATE        | SET\SERL SE04 | COMMS PORTS         | 0 : 1200<br>1 : 2400<br>2 : 4800<br>3 : 7200<br>4 : 9600<br>5 : 14400<br>6 : 19200<br>7 : 38400<br>8 : 57600                                    | ENUM | ti |
| 1063 | 63.18 | small motor lim  |               | AUTOTUNE            | 0.00 to 355.00 (1)                                                                                                                              | REAL | tj |
| 1064 | 7.07  | APP LOCK         | SET\SETP ST98 | APP CONFIG          | 0 to 1                                                                                                                                          | BOOL | tk |
| 1065 | 0.25  | PHASE CUR SELECT |               | PROD DATA           | 0 to 2                                                                                                                                          | INT  | tl |
| 1066 | 0.26  | PHASE CUR AMPS   |               | PROD DATA           | Output (1)                                                                                                                                      | REAL | tm |
| 1067 | 0.01  | PRODUCT CODE ID  |               | PROD DATA           | 0 to 100                                                                                                                                        | INT  | tn |
| 1068 | 0.02  | 60Hz DEFAULT     |               | PROD DATA           | 0 to 1                                                                                                                                          | BOOL | to |
| 1069 | 0.03  | LINK VOLTS CAL   |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | tp |
| 1070 | 0.04  | LINK GAIN CAL    |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | tq |
| 1071 | 0.05  | DUMMY VARIABLE   |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | tr |
| 1072 | 0.06  | DUMMY VARIABLE   |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | ts |
| 1073 | 0.07  | IFB1 GAIN CAL    |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | tt |
| 1074 | 0.08  | IFB2 GAIN CAL    |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | tu |
| 1075 | 0.09  | VCC CAL          |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | tv |
| 1076 | 0.10  | ANIN1 ZERO CAL   |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | tw |
| 1077 | 0.11  | ANIN1 GAIN CAL   |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | tx |
| 1078 | 0.12  | ANIN2 ZERO CAL   |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | ty |
| 1079 | 0.13  | ANIN2 GAIN CAL   |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | tz |
| 1080 | 0.14  | ANIN2 M1 CAL     |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | u0 |
| 1081 | 0.15  | ANIN2 M2 CAL     |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | u1 |
| 1082 | 0.16  | ANIN2 K CAL      |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | u2 |
| 1083 | 0.17  | AOUT1 OFFSET CAL |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | u3 |
| 1084 | 0.18  | AOUT1 GAIN CAL   |               | PROD DATA           | 0 to 255                                                                                                                                        | INT  | u4 |
| 1085 | 0.19  | SECS POWERED     |               | PROD DATA           | Output                                                                                                                                          | INT  | u5 |
| 1086 | 0.20  | MINS POWERED     |               | PROD DATA           | Output                                                                                                                                          | INT  | u6 |
| 1087 | 0.21  | HRS POWERED      |               | PROD DATA           | Output                                                                                                                                          | INT  | u7 |
| 1088 | 0.22  | SECS RUNNING     |               | PROD DATA           | Output                                                                                                                                          | INT  | u8 |
| 1089 | 0.23  | MINS RUNNING     |               | PROD DATA           | Output                                                                                                                                          | INT  | u9 |
| 1090 | 0.24  | HRS RUNNING      |               | PROD DATA           | Output                                                                                                                                          | INT  | ua |
| 1091 | 7.01  | APPLICATION      | PAR 1         | APP CONFIG          | 0 : NULL<br>1 : STANDARD<br>2 : LOCAL/REM<br>3 : PRESETS<br>4 : RAISE/LOWER<br>5 : PID<br>6 : AUX COMMS<br>7 : APP 7<br>8 : APP 8<br>9 : CUSTOM | ENUM | ub |
| 1092 | 7.02  | ANOUT 1 SOURCE   | SET\CONF AOP1 | APP CONFIG          | 0 : NONE<br>1 : DEMAND<br>2 : CURRENT<br>3 : PID ERROR<br>4 : R/L OUTPUT                                                                        | ENUM | uc |
| 1093 | 7.04  | RELAY SOURCE     | SET\CONF DOP3 | APP CONFIG          | Same as 1016                                                                                                                                    | ENUM | ud |
| 1094 | 7.05  | DIGIO 2 SOURCE   | SET\CONF DOP2 | APP CONFIG          | Same as 1016                                                                                                                                    | ENUM | ue |
| 1095 | 52.01 | HYSTERISIS       |               | AT SPEED            | 0.0 to 300.0 (2)                                                                                                                                | REAL | uf |
| 1096 | 52.02 | AT SPEED         |               | AT SPEED            | Output                                                                                                                                          | BOOL | ug |
| 1097 | 41.07 | REMOTE SELECT    |               | LOCAL CONTROL       | Output                                                                                                                                          | BOOL | uh |
| 1098 | 46.11 | INTEGRAL DEFEAT  |               | PID                 | 0 to 1                                                                                                                                          | BOOL | ui |
| 1099 | 10.04 | FORCE TO ZERO    |               | ANALOG INPUT 1      | 0 to 1                                                                                                                                          | BOOL | uj |
| 1100 | 11.05 | FORCE TO ZERO    |               | ANALOG INPUT 2      | 0 to 1                                                                                                                                          | BOOL | uk |
| 1109 | 7.03  | ANOUT 2 SOURCE   | SET\CONF AOP2 | APP CONFIG          | Same as 1092                                                                                                                                    | ENUM | ut |
| 1110 | 22.03 | DISP 2 VERSION   |               | DISPLAY/KEYPAD      | Output                                                                                                                                          | WORD | uu |
| 1111 | 58.01 | i loop prop gain |               | current loop        | 0.00 to 10.00                                                                                                                                   | REAL | uv |
| 1112 | 58.02 | i loop int gain  |               | current loop        | 0.00 to 1.00                                                                                                                                    | REAL | uw |
| 1114 | 58.04 | test mode        |               | current loop        | 0 to 1                                                                                                                                          | BOOL | uy |
| 1115 | 58.05 | test period      |               | current loop        | 2 to 1000                                                                                                                                       | INT  | uz |
| 1116 | 58.06 | test amplitude   |               | current loop        | 0.00 to 2.00                                                                                                                                    | REAL | v0 |

# 2-16 Parameter Specification

| Tag  | Pref  | DSElite name     | MMI Name      | Function block name | Range                                                                                              | Type | ID |
|------|-------|------------------|---------------|---------------------|----------------------------------------------------------------------------------------------------|------|----|
| 1117 | 58.07 | test offset      |               | current loop        | 0.00 to 2.00                                                                                       | REAL | v1 |
| 1118 | 58.08 | test phase       |               | current loop        | 0 : U PHASE<br>1 : V PHASE<br>2 : W PHASE<br>3 : V -U PHASES<br>4 : W -V PHASES<br>5 : U -W PHASES | ENUM | v2 |
| 1119 | 60.01 | imr prop gain    |               | flux control        | 0.0 to 10.0                                                                                        | REAL | v3 |
| 1120 | 60.02 | rated id         |               | flux control        | Output                                                                                             | REAL | v4 |
| 1121 | 60.03 | rated iq         |               | flux control        | Output                                                                                             | REAL | v5 |
| 1122 | 60.04 | imr demand       |               | flux control        | Output                                                                                             | REAL | v6 |
| 1123 | 60.05 | imr              |               | flux control        | Output                                                                                             | REAL | v7 |
| 1124 | 60.06 | imr from feedbk  |               | flux control        | 0 to 1                                                                                             | BOOL | v8 |
| 1125 | 60.07 | id dmd hdroom    |               | flux control        | 0.0 to 100.0                                                                                       | REAL | v9 |
| 1126 | 60.08 | min id demand    |               | flux control        | -80.0 to 0.0                                                                                       | REAL | va |
| 1137 | 60.09 | mag i scale 0    |               | flux control        | 100.0 to 100.0                                                                                     | REAL | vl |
| 1138 | 60.10 | mag i scale 1    |               | flux control        | 0.0 to 100.0                                                                                       | REAL | vm |
| 1139 | 60.11 | mag i scale 2    |               | flux control        | 0.0 to 100.0                                                                                       | REAL | vn |
| 1140 | 60.12 | mag i scale 3    |               | flux control        | 0.0 to 100.0                                                                                       | REAL | vo |
| 1141 | 60.13 | mag i scale 4    |               | flux control        | 0.0 to 100.0                                                                                       | REAL | vp |
| 1142 | 60.14 | mag i scale 5    |               | flux control        | 0.0 to 100.0                                                                                       | REAL | vq |
| 1143 | 60.15 | mag i scale 6    |               | flux control        | 0.0 to 100.0                                                                                       | REAL | vr |
| 1148 | 32.01 | AIMING POINT     |               | INVERSE TIME        | 50.0 to 105.0 (2)                                                                                  | REAL | vw |
| 1149 | 32.02 | DELAY            |               | INVERSE TIME        | 5.0 to 30.0                                                                                        | REAL | vx |
| 1150 | 32.03 | DOWN TIME        |               | INVERSE TIME        | 1.0 to 10.0                                                                                        | REAL | vy |
| 1151 | 32.04 | UP TIME          |               | INVERSE TIME        | 1.0 to 600.0                                                                                       | REAL | vz |
| 1152 | 32.05 | IT LIMITING      |               | INVERSE TIME        | Output                                                                                             | BOOL | w0 |
| 1153 | 32.06 | INVERSE TIME OP  |               | INVERSE TIME        | Output (2)                                                                                         | REAL | w1 |
| 1155 | 54.03 | THERMIST STATE   |               | IO TRIPS            | Output                                                                                             | BOOL | w3 |
| 1157 | 35.07 | CONTROL MODE     | SET\CTRL CL01 | MOTOR DATA          | 0 : VOLTS / Hz<br>1 : SENSORLESS VEC                                                               | ENUM | w5 |
| 1158 | 35.08 | POWER            | SET\CTRL CL15 | MOTOR DATA          | 0.00 to 355.00 (1)                                                                                 | REAL | w6 |
| 1159 | 35.01 | BASE FREQUENCY   | PAR 7         | MOTOR DATA          | 7.5 to 300.0                                                                                       | REAL | w7 |
| 1160 | 35.02 | MOTOR VOLTAGE    | SET\CTRL CL12 | MOTOR DATA          | 0.0 to 575.0                                                                                       | REAL | w8 |
| 1161 | 35.12 | inertia          |               | MOTOR DATA          | 0.0000 to 30.0000 (3)                                                                              | REAL | w9 |
| 1162 | 35.13 | viscous friction |               | MOTOR DATA          | 0.0 to 1000.0                                                                                      | REAL | wa |
| 1163 | 35.17 | ROTOR TIME CONST | SET\CTRL CL1A | MOTOR DATA          | 10.00 to 3000.00 (1)                                                                               | REAL | wb |
| 1164 | 35.11 | OVERLOAD         |               | MOTOR DATA          | 1.0 to 5.0                                                                                         | REAL | wc |
| 1166 | 62.11 | speed %          |               | mras                | Output                                                                                             | REAL | we |
| 1167 | 62.12 | speed rev/s      |               | mras                | Output (0)                                                                                         | REAL | wf |
| 1168 | 62.13 | field angle      |               | mras                | Output                                                                                             | REAL | wg |
| 1169 | 62.14 | field frequency  |               | mras                | Output                                                                                             | REAL | wh |
| 1170 | 62.15 | torque %         |               | mras                | Output                                                                                             | REAL | wi |
| 1171 | 62.16 | torque nm        |               | mras                | Output                                                                                             | REAL | wj |
| 1172 | 62.18 | high speed op    |               | mras                | Output                                                                                             | BOOL | wk |
| 1173 | 62.17 | low speed op     |               | mras                | Output                                                                                             | BOOL | wl |
| 1174 | 62.01 | coupling kc      |               | mras                | 0.0000 to 300.0000 (3)                                                                             | REAL | wm |
| 1175 | 62.02 | coupling ti      |               | mras                | 0.0000 to 10.0000 (3)                                                                              | REAL | wn |
| 1176 | 62.03 | adaptive kc      |               | mras                | 0.0000 to 300.0000 (3)                                                                             | REAL | wo |
| 1177 | 62.04 | adaptive ti      |               | mras                | 0.0000 to 10.0000 (3)                                                                              | REAL | wp |
| 1178 | 62.05 | adaptive td      |               | mras                | 0.0000 to 3.0000                                                                                   | REAL | wq |
| 1179 | 62.06 | wmr slw lim @ bs |               | mras                | 5 to 5000                                                                                          | INT  | wr |
| 1181 | 9.01  | address hi word  |               | peek data           | 0x0000 to 0xFFFF                                                                                   | WORD | wt |
| 1182 | 9.03  | enable           |               | peek data           | 0 to 1                                                                                             | BOOL | wu |
| 1184 | 9.04  | access size      |               | peek data           | 0 : 8-BIT<br>1 : 16-BIT<br>2 : REAL                                                                | ENUM | ww |
| 1186 | 9.06  | output as real   |               | peek data           | Output (2)                                                                                         | REAL | wy |
| 1187 | 59.01 | SPEED PROP GAIN  | SET\CTRL CL91 | SPEED LOOP          | 0.00 to 300.00                                                                                     | REAL | wz |
| 1188 | 59.02 | SPEED INT TIME   | SET\CTRL CL92 | SPEED LOOP          | 1. to 15000.                                                                                       | REAL | x0 |
| 1189 | 59.03 | INT DEFEAT       |               | SPEED LOOP          | 0 to 1                                                                                             | BOOL | x1 |
| 1190 | 59.04 | SPEED INT PRESET |               | SPEED LOOP          | -500.00 to 500.00 (1)                                                                              | REAL | x2 |
| 1191 | 59.05 | SPEED DMD FILTER |               | SPEED LOOP          | 0.0 to 14.0                                                                                        | REAL | x3 |
| 1192 | 59.06 | SPEED FBK FILTER |               | SPEED LOOP          | 0.0 to 15.0                                                                                        | REAL | x4 |
| 1193 | 59.07 | (AUX) TORQUE DMD |               | SPEED LOOP          | -300.00 to 300.00                                                                                  | REAL | x5 |
| 1194 | 59.11 | ADAPTIVE THRESH  |               | SPEED LOOP          | 0.00 to 10.00                                                                                      | REAL | x6 |
| 1195 | 59.12 | ADAPTIVE P-GAIN  |               | SPEED LOOP          | 0.00 to 300.00                                                                                     | REAL | x7 |
| 1200 | 59.08 | SPEED POS LIM    | SET\CTRL CL93 | SPEED LOOP          | -110.00 to 110.00                                                                                  | REAL | xc |
| 1201 | 59.09 | SPEED NEG LIM    | SET\CTRL CL94 | SPEED LOOP          | -110.00 to 110.00                                                                                  | REAL | xd |
| 1202 | 59.10 | TORQ CTRL MODE   |               | SPEED LOOP          | 0 to 1                                                                                             | BOOL | xe |
| 1203 | 59.13 | TOTL SPD DMD RPM |               | SPEED LOOP          | Output (0)                                                                                         | REAL | xf |
| 1204 | 59.16 | TORQUE DEMAND    |               | SPEED LOOP          | Output                                                                                             | REAL | xg |
| 1206 | 59.14 | TOTAL SPD DMD %  |               | SPEED LOOP          | Output                                                                                             | REAL | xi |

# Parameter Specification 2-17

| Tag  | Pref    | DSElite name     | MMI Name      | Function block name | Range                 | Type | ID |
|------|---------|------------------|---------------|---------------------|-----------------------|------|----|
| 1207 | 59.15   | SPEED ERROR      |               | SPEED LOOP          | Output                | REAL | xj |
| 1208 | 38.01   | POS TORQUE LIM   | SET\CTRL CL82 | TORQUE LIMIT        | -500.0 to 500.0       | REAL | xk |
| 1209 | 38.02   | NEG TORQUE LIM   | SET\CTRL CL83 | TORQUE LIMIT        | -500.0 to 500.0       | REAL | xl |
| 1210 | 38.03   | MAIN TORQUE LIM  |               | TORQUE LIMIT        | 0.0 to 500.0          | REAL | xm |
| 1211 | 38.04   | SYMMETRIC LIM    |               | TORQUE LIMIT        | 0 to 1                | BOOL | xn |
| 1212 | 38.05   | ACTUAL POS LIM   |               | TORQUE LIMIT        | Output (2)            | REAL | xo |
| 1213 | 38.06   | ACTUAL NEG LIM   |               | TORQUE LIMIT        | Output (2)            | REAL | xp |
| 1214 | 61.01   | tvols int range  |               | tr adaptation       | 0.0 to 100.0          | REAL | xq |
| 1215 | 61.02   | iq @ tv intgn =0 |               | tr adaptation       | 0.1 to 2.0            | REAL | xr |
| 1216 | 61.03   | iq @max tv intgn |               | tr adaptation       | 0.1 to 4.0            | REAL | xs |
| 1217 | 61.04   | loop respnse=ntr |               | tr adaptation       | 3. to 50.             | REAL | xt |
| 1218 | 61.05   | spd @tv int =0   |               | tr adaptation       | 20. to 90.            | REAL | xu |
| 1219 | 61.06   | load at base spd |               | tr adaptation       | 0. to 20.             | REAL | xv |
| 1220 | 61.07   | term v integral  |               | tr adaptation       | Output                | REAL | xw |
| 1221 | 61.08   | max avail volts  |               | tr adaptation       | Output (0)            | REAL | xx |
| 1222 | 67.02   | filtered ripple  |               | vdc ripple          | Output                | REAL | xy |
| 1223 | 67.01   | max ripple       |               | vdc ripple          | 10.0 to 500.0         | REAL | xz |
| 1229 | 26.03   | underlap comp    |               | waveform gen        | 0 to 1                | BOOL | y5 |
| 1230 | 26.01   | vsd              |               | waveform gen        | Output                | REAL | y6 |
| 1231 | 26.02   | vsq              |               | waveform gen        | Output                | REAL | y7 |
| 1232 | 26.05   | trip events      |               | waveform gen        | Output                | INT  | y8 |
| 1233 | 49.03   | AT ZERO SPEED    |               | ZERO SPEED          | Output                | BOOL | y9 |
| 1235 | 24.05   | CONTACTOR CLOSED |               | SEQUENCING LOGIC    | 0 to 1                | BOOL | yb |
| 1239 | 63.11   | lkge l test cmnt |               | AUTOTUNE            | 0.00 to 1.00          | REAL | yf |
| 1240 | 63.12   | lkge l test freq |               | AUTOTUNE            | 0.0 to 100.0 (2)      | REAL | yg |
| 1241 | 63.13   | lkge exctn p gn  |               | AUTOTUNE            | 0.0000 to 1.0000      | REAL | yh |
| 1242 | 63.14   | lkge exctn i gn  |               | AUTOTUNE            | 0.0000 to 1.0000      | REAL | yi |
| 1243 | 63.15   | lkge dc offset   |               | AUTOTUNE            | 0.000 to 1.000        | REAL | yj |
| 1246 | 63.16   | psd filter gn    |               | AUTOTUNE            | 0.000 to 1.000        | REAL | ym |
| 1247 | 46.01   | SETPOINT         |               | PID                 | -300.00 to 300.00     | REAL | yn |
| 1248 | 46.03   | FEED FWD         |               | PID                 | -300.00 to 300.00     | REAL | yo |
| 1249 | 46.05   | FEED FWD GAIN    |               | PID                 | -10.00 to 10.00       | REAL | yp |
| 1250 | 46.06   | P GAIN           |               | PID                 | 0.00 to 100.00        | REAL | yq |
| 1251 | 46.07   | I GAIN           |               | PID                 | 0.00 to 100.00        | REAL | yr |
| 1252 | 46.08   | D GAIN           |               | PID                 | 0.00 to 100.00        | REAL | ys |
| 1253 | 46.09   | LIMIT            |               | PID                 | 0.00 to 300.00        | REAL | yt |
| 1254 | 46.10   | ENABLE PID       |               | PID                 | 0 to 1                | BOOL | yu |
| 1255 | 46.12   | D FILTER TC      |               | PID                 | 0.05 to 5.00          | REAL | yv |
| 1256 | 46.13   | OUTPUT           |               | PID                 | Output                | REAL | yw |
| 1257 | 46.15   | LIMITING         |               | PID                 | Output                | BOOL | yx |
| 1258 | 46.16   | OUTPUT SCALING   |               | PID                 | -3.0000 to 3.0000     | REAL | yy |
| 1259 | 65.03   | ABSOLUTE         | SET\SETP ST43 | AT LOAD             | 0 to 1                | BOOL | yz |
| 1260 | 18.05   | REPLY DELAY ms   | SET\SERL SE06 | COMMS PORTS         | 0 to 200              | INT  | z0 |
| 1296 | 15.11.1 | INPUT A          |               | VALUE FUNC 11       | -32768.00 to 32767.00 | REAL | aA |
| 1297 | 15.11.2 | INPUT B          |               | VALUE FUNC 11       | -32768.00 to 32767.00 | REAL | aB |
| 1298 | 15.11.3 | INPUT C          |               | VALUE FUNC 11       | -32768.00 to 32767.00 | REAL | aC |
| 1299 | 15.11.5 | OUTPUT           |               | VALUE FUNC 11       | Output                | REAL | aD |
| 1300 | 15.11.4 | TYPE             |               | VALUE FUNC 11       | Same as 134           | ENUM | aE |
| 1301 | 15.12.1 | INPUT A          |               | VALUE FUNC 12       | -32768.00 to 32767.00 | REAL | aF |
| 1302 | 15.12.2 | INPUT B          |               | VALUE FUNC 12       | -32768.00 to 32767.00 | REAL | aG |
| 1303 | 15.12.3 | INPUT C          |               | VALUE FUNC 12       | -32768.00 to 32767.00 | REAL | aH |
| 1304 | 15.12.5 | OUTPUT           |               | VALUE FUNC 12       | Output                | REAL | aI |
| 1305 | 15.12.4 | TYPE             |               | VALUE FUNC 12       | Same as 134           | ENUM | aJ |
| 1306 | 15.13.1 | INPUT A          |               | VALUE FUNC 13       | -32768.00 to 32767.00 | REAL | aK |
| 1307 | 15.13.2 | INPUT B          |               | VALUE FUNC 13       | -32768.00 to 32767.00 | REAL | aL |
| 1308 | 15.13.3 | INPUT C          |               | VALUE FUNC 13       | -32768.00 to 32767.00 | REAL | aM |
| 1309 | 15.13.5 | OUTPUT           |               | VALUE FUNC 13       | Output                | REAL | aN |
| 1310 | 15.13.4 | TYPE             |               | VALUE FUNC 13       | Same as 134           | ENUM | aO |
| 1311 | 15.14.1 | INPUT A          |               | VALUE FUNC 14       | -32768.00 to 32767.00 | REAL | aP |
| 1312 | 15.14.2 | INPUT B          |               | VALUE FUNC 14       | -32768.00 to 32767.00 | REAL | aQ |
| 1313 | 15.14.3 | INPUT C          |               | VALUE FUNC 14       | -32768.00 to 32767.00 | REAL | aR |
| 1314 | 15.14.5 | OUTPUT           |               | VALUE FUNC 14       | Output                | REAL | aS |
| 1315 | 15.14.4 | TYPE             |               | VALUE FUNC 14       | Same as 134           | ENUM | aT |
| 1316 | 15.15.1 | INPUT A          |               | VALUE FUNC 15       | -32768.00 to 32767.00 | REAL | aU |
| 1317 | 15.15.2 | INPUT B          |               | VALUE FUNC 15       | -32768.00 to 32767.00 | REAL | aV |
| 1318 | 15.15.3 | INPUT C          |               | VALUE FUNC 15       | -32768.00 to 32767.00 | REAL | aW |
| 1319 | 15.15.5 | OUTPUT           |               | VALUE FUNC 15       | Output                | REAL | aX |
| 1320 | 15.15.4 | TYPE             |               | VALUE FUNC 15       | Same as 134           | ENUM | aY |
| 1346 | 16.11.1 | INPUT A          |               | LOGIC FUNC 11       | 0 to 1                | BOOL | bY |
| 1347 | 16.11.2 | INPUT B          |               | LOGIC FUNC 11       | 0 to 1                | BOOL | bZ |
| 1348 | 16.11.3 | INPUT C          |               | LOGIC FUNC 11       | 0 to 1                | BOOL | cA |
| 1349 | 16.11.5 | OUTPUT           |               | LOGIC FUNC 11       | Output                | BOOL | cB |
| 1350 | 16.11.4 | TYPE             |               | LOGIC FUNC 11       | Same as 184           | ENUM | cC |

# 2-18 Parameter Specification

| Tag  | Pref    | DSElite name | MMI Name | Function block name | Range       | Type | ID |
|------|---------|--------------|----------|---------------------|-------------|------|----|
| 1351 | 16.12.1 | INPUT A      |          | LOGIC FUNC 12       | 0 to 1      | BOOL | cD |
| 1352 | 16.12.2 | INPUT B      |          | LOGIC FUNC 12       | 0 to 1      | BOOL | cE |
| 1353 | 16.12.3 | INPUT C      |          | LOGIC FUNC 12       | 0 to 1      | BOOL | cF |
| 1354 | 16.12.5 | OUTPUT       |          | LOGIC FUNC 12       | Output      | BOOL | cG |
| 1355 | 16.12.4 | TYPE         |          | LOGIC FUNC 12       | Same as 184 | ENUM | cH |
| 1356 | 16.13.1 | INPUT A      |          | LOGIC FUNC 13       | 0 to 1      | BOOL | cI |
| 1357 | 16.13.2 | INPUT B      |          | LOGIC FUNC 13       | 0 to 1      | BOOL | cJ |
| 1358 | 16.13.3 | INPUT C      |          | LOGIC FUNC 13       | 0 to 1      | BOOL | cK |
| 1359 | 16.13.5 | OUTPUT       |          | LOGIC FUNC 13       | Output      | BOOL | cL |
| 1360 | 16.13.4 | TYPE         |          | LOGIC FUNC 13       | Same as 184 | ENUM | cM |
| 1361 | 16.14.1 | INPUT A      |          | LOGIC FUNC 14       | 0 to 1      | BOOL | cN |
| 1362 | 16.14.2 | INPUT B      |          | LOGIC FUNC 14       | 0 to 1      | BOOL | cO |
| 1363 | 16.14.3 | INPUT C      |          | LOGIC FUNC 14       | 0 to 1      | BOOL | cP |
| 1364 | 16.14.5 | OUTPUT       |          | LOGIC FUNC 14       | Output      | BOOL | cQ |
| 1365 | 16.14.4 | TYPE         |          | LOGIC FUNC 14       | Same as 184 | ENUM | cR |
| 1366 | 16.15.1 | INPUT A      |          | LOGIC FUNC 15       | 0 to 1      | BOOL | cS |
| 1367 | 16.15.2 | INPUT B      |          | LOGIC FUNC 15       | 0 to 1      | BOOL | cT |
| 1368 | 16.15.3 | INPUT C      |          | LOGIC FUNC 15       | 0 to 1      | BOOL | cU |
| 1369 | 16.15.5 | OUTPUT       |          | LOGIC FUNC 15       | Output      | BOOL | cV |
| 1370 | 16.15.4 | TYPE         |          | LOGIC FUNC 15       | Same as 184 | ENUM | cW |
| 1400 | 1.51.1  | SOURCE       |          | LINK 51             | 0 to 1686   | PREF | eA |
| 1401 | 1.51.2  | DESTINATION  |          | LINK 51             | 0 to 1686   | PREF | eB |
| 1402 | 1.52.1  | SOURCE       |          | LINK 52             | 0 to 1686   | PREF | eC |
| 1403 | 1.52.2  | DESTINATION  |          | LINK 52             | 0 to 1686   | PREF | eD |
| 1404 | 1.53.1  | SOURCE       |          | LINK 53             | 0 to 1686   | PREF | eE |
| 1405 | 1.53.2  | DESTINATION  |          | LINK 53             | 0 to 1686   | PREF | eF |
| 1406 | 1.54.1  | SOURCE       |          | LINK 54             | 0 to 1686   | PREF | eG |
| 1407 | 1.54.2  | DESTINATION  |          | LINK 54             | 0 to 1686   | PREF | eH |
| 1408 | 1.55.1  | SOURCE       |          | LINK 55             | 0 to 1686   | PREF | eI |
| 1409 | 1.55.2  | DESTINATION  |          | LINK 55             | 0 to 1686   | PREF | eJ |
| 1410 | 1.56.1  | SOURCE       |          | LINK 56             | 0 to 1686   | PREF | eK |
| 1411 | 1.56.2  | DESTINATION  |          | LINK 56             | 0 to 1686   | PREF | eL |
| 1412 | 1.57.1  | SOURCE       |          | LINK 57             | 0 to 1686   | PREF | eM |
| 1413 | 1.57.2  | DESTINATION  |          | LINK 57             | 0 to 1686   | PREF | eN |
| 1414 | 1.58.1  | SOURCE       |          | LINK 58             | 0 to 1686   | PREF | eO |
| 1415 | 1.58.2  | DESTINATION  |          | LINK 58             | 0 to 1686   | PREF | eP |
| 1416 | 1.59.1  | SOURCE       |          | LINK 59             | 0 to 1686   | PREF | eQ |
| 1417 | 1.59.2  | DESTINATION  |          | LINK 59             | 0 to 1686   | PREF | eR |
| 1418 | 1.60.1  | SOURCE       |          | LINK 60             | 0 to 1686   | PREF | eS |
| 1419 | 1.60.2  | DESTINATION  |          | LINK 60             | 0 to 1686   | PREF | eT |
| 1420 | 1.61.1  | SOURCE       |          | LINK 61             | 0 to 1686   | PREF | eU |
| 1421 | 1.61.2  | DESTINATION  |          | LINK 61             | 0 to 1686   | PREF | eV |
| 1422 | 1.62.1  | SOURCE       |          | LINK 62             | 0 to 1686   | PREF | eW |
| 1423 | 1.62.2  | DESTINATION  |          | LINK 62             | 0 to 1686   | PREF | eX |
| 1424 | 1.63.1  | SOURCE       |          | LINK 63             | 0 to 1686   | PREF | eY |
| 1425 | 1.63.2  | DESTINATION  |          | LINK 63             | 0 to 1686   | PREF | eZ |
| 1426 | 1.64.1  | SOURCE       |          | LINK 64             | 0 to 1686   | PREF | fA |
| 1427 | 1.64.2  | DESTINATION  |          | LINK 64             | 0 to 1686   | PREF | fB |
| 1428 | 1.65.1  | SOURCE       |          | LINK 65             | 0 to 1686   | PREF | fC |
| 1429 | 1.65.2  | DESTINATION  |          | LINK 65             | 0 to 1686   | PREF | fD |
| 1430 | 1.66.1  | SOURCE       |          | LINK 66             | 0 to 1686   | PREF | fE |
| 1431 | 1.66.2  | DESTINATION  |          | LINK 66             | 0 to 1686   | PREF | fF |
| 1432 | 1.67.1  | SOURCE       |          | LINK 67             | 0 to 1686   | PREF | fG |
| 1433 | 1.67.2  | DESTINATION  |          | LINK 67             | 0 to 1686   | PREF | fH |
| 1434 | 1.68.1  | SOURCE       |          | LINK 68             | 0 to 1686   | PREF | fI |
| 1435 | 1.68.2  | DESTINATION  |          | LINK 68             | 0 to 1686   | PREF | fJ |
| 1436 | 1.69.1  | SOURCE       |          | LINK 69             | 0 to 1686   | PREF | fK |
| 1437 | 1.69.2  | DESTINATION  |          | LINK 69             | 0 to 1686   | PREF | fL |
| 1438 | 1.70.1  | SOURCE       |          | LINK 70             | 0 to 1686   | PREF | fM |
| 1439 | 1.70.2  | DESTINATION  |          | LINK 70             | 0 to 1686   | PREF | fN |
| 1440 | 1.71.1  | SOURCE       |          | LINK 71             | 0 to 1686   | PREF | fO |
| 1441 | 1.71.2  | DESTINATION  |          | LINK 71             | 0 to 1686   | PREF | fP |
| 1442 | 1.72.1  | SOURCE       |          | LINK 72             | 0 to 1686   | PREF | fQ |
| 1443 | 1.72.2  | DESTINATION  |          | LINK 72             | 0 to 1686   | PREF | fR |
| 1444 | 1.73.1  | SOURCE       |          | LINK 73             | 0 to 1686   | PREF | fS |
| 1445 | 1.73.2  | DESTINATION  |          | LINK 73             | 0 to 1686   | PREF | fT |
| 1446 | 1.74.1  | SOURCE       |          | LINK 74             | 0 to 1686   | PREF | fU |
| 1447 | 1.74.2  | DESTINATION  |          | LINK 74             | 0 to 1686   | PREF | fV |
| 1448 | 1.75.1  | SOURCE       |          | LINK 75             | 0 to 1686   | PREF | fW |
| 1449 | 1.75.2  | DESTINATION  |          | LINK 75             | 0 to 1686   | PREF | fX |
| 1450 | 1.76.1  | SOURCE       |          | LINK 76             | 0 to 1686   | PREF | fY |
| 1451 | 1.76.2  | DESTINATION  |          | LINK 76             | 0 to 1686   | PREF | fZ |
| 1452 | 1.77.1  | SOURCE       |          | LINK 77             | 0 to 1686   | PREF | gA |

| Tag  | Pref    | DSElite name     | MMI Name      | Function block name | Range                 | Type   | ID |
|------|---------|------------------|---------------|---------------------|-----------------------|--------|----|
| 1453 | 1.77.2  | DESTINATION      |               | LINK 77             | 0 to 1686             | PREF   | gB |
| 1454 | 1.78.1  | SOURCE           |               | LINK 78             | 0 to 1686             | PREF   | gC |
| 1455 | 1.78.2  | DESTINATION      |               | LINK 78             | 0 to 1686             | PREF   | gD |
| 1456 | 1.79.1  | SOURCE           |               | LINK 79             | 0 to 1686             | PREF   | gE |
| 1457 | 1.79.2  | DESTINATION      |               | LINK 79             | 0 to 1686             | PREF   | gF |
| 1458 | 1.80.1  | SOURCE           |               | LINK 80             | 0 to 1686             | PREF   | gG |
| 1459 | 1.80.2  | DESTINATION      |               | LINK 80             | 0 to 1686             | PREF   | gH |
| 1460 | 70.1.5  | NAME             |               | APP MENU 1          |                       | STRING | gI |
| 1461 | 70.2.5  | NAME             |               | APP MENU 2          |                       | STRING | gJ |
| 1462 | 70.3.5  | NAME             |               | APP MENU 3          |                       | STRING | gK |
| 1463 | 70.4.5  | NAME             |               | APP MENU 4          |                       | STRING | gL |
| 1464 | 70.5.5  | NAME             |               | APP MENU 5          |                       | STRING | gM |
| 1465 | 70.6.5  | NAME             |               | APP MENU 6          |                       | STRING | gN |
| 1466 | 70.7.5  | NAME             |               | APP MENU 7          |                       | STRING | gO |
| 1467 | 70.8.5  | NAME             |               | APP MENU 8          |                       | STRING | gP |
| 1468 | 70.9.5  | NAME             |               | APP MENU 9          |                       | STRING | gQ |
| 1469 | 70.10.5 | NAME             |               | APP MENU 10         |                       | STRING | gR |
| 1470 | 70.11.5 | NAME             |               | APP MENU 11         |                       | STRING | gS |
| 1471 | 70.12.5 | NAME             |               | APP MENU 12         |                       | STRING | gT |
| 1472 | 70.13.5 | NAME             |               | APP MENU 13         |                       | STRING | gU |
| 1473 | 70.14.5 | NAME             |               | APP MENU 14         |                       | STRING | gV |
| 1474 | 70.15.5 | NAME             |               | APP MENU 15         |                       | STRING | gW |
| 1475 | 70.16.5 | NAME             |               | APP MENU 16         |                       | STRING | gX |
| 1551 | 60.16   | link v cmpnsat'n |               | flux control        | 0 to 1                | BOOL   | jV |
| 1552 | 60.17   | link v filt gain |               | flux control        | 0.001 to 1.000        | REAL   | jW |
| 1553 | 57.02   | VECTOR ENABLE    | SET\CTRL CL03 | FLY CATCHING        | 0 to 1                | BOOL   | jX |
| 1554 | 38.07   | FAST STOP T-LIM  |               | TORQUE LIMIT        | -300.00 to 300.00     | REAL   | jY |
| 1555 | 62.09   | flux corr kc     |               | mras                | 0.0000 to 30.0000 (3) | REAL   | jZ |
| 1556 | 62.10   | alt volts model  |               | mras                | 0 to 1                | BOOL   | kA |
| 1557 | 62.07   | ls low thresh    |               | mras                | 0.00 to 500.00 (1)    | REAL   | kB |
| 1558 | 62.08   | ls high thresh   |               | mras                | 0.00 to 500.00 (1)    | REAL   | kC |
| 1603 | 64.01   | RESET            |               | ENERGY METER        | 0 to 1                | BOOL   | lV |
| 1604 | 64.02   | POWER            |               | ENERGY METER        | Output (1)            | REAL   | lW |
| 1605 | 64.03   | POWER            |               | ENERGY METER        | Output (1)            | REAL   | lX |
| 1606 | 64.04   | REACTIVE POWER   |               | ENERGY METER        | Output (1)            | REAL   | lY |
| 1607 | 64.05   | ENERGY USED      |               | ENERGY METER        | Output                | REAL   | lZ |
| 1608 | 64.06   | kW min           |               | ENERGY METER        | Output                | REAL   | mA |
| 1615 | 62.19   | al bandwidth     |               | mras                | 0 to 10               | INT    | mH |
| 1616 | 60.18   | L0 scale range   |               | flux control        | 0.0 to 90.0           | REAL   | mI |
| 1617 | 60.19   | L0 scale 0       |               | flux control        | 100.0 to 100.0        | REAL   | mJ |
| 1618 | 60.20   | L0 scale 1       |               | flux control        | 10.0 to 190.0         | REAL   | mK |
| 1619 | 60.21   | L0 scale 2       |               | flux control        | 10.0 to 190.0         | REAL   | mL |
| 1620 | 60.22   | L0 scale 3       |               | flux control        | 10.0 to 190.0         | REAL   | mM |
| 1621 | 60.23   | L0 scale 4       |               | flux control        | 10.0 to 190.0         | REAL   | mN |
| 1622 | 60.24   | L0 scale 5       |               | flux control        | 10.0 to 190.0         | REAL   | mO |
| 1623 | 60.25   | L0 scale 6       |               | flux control        | 10.0 to 190.0         | REAL   | mP |
| 1627 | 63.17   | last measured pt |               | AUTOTUNE            | 0 to 9                | INT    | mT |
| 1628 | 58.03   | int frze enabled |               | current loop        | 0 to 1                | BOOL   | mU |
| 1629 | 25.04   | reduced freq     |               | PATTERN GEN         | 500 to 3000           | INT    | mV |
| 1630 | 58.09   | interrupt margin |               | current loop        | Output                | INT    | mW |
| 1631 | 58.10   | margin count     |               | current loop        | Output                | INT    | mX |
| 1632 | 56.03   | STALL LIMIT TYPE | SET\CTRL CL84 | STALL TRIP          | 0 to 1                | BOOL   | mY |
| 1633 | 25.06   | max stack freq   |               | PATTERN GEN         | 2000 to 4000          | INT    | mZ |
| 1651 | 61.10   | low spd Tr comp  |               | tr adaptation       | 0 to 1                | BOOL   | nR |
| 1652 | 61.11   | lspd comp p gain |               | tr adaptation       | 0.00 to 100.00        | REAL   | nS |
| 1653 | 61.12   | lspd comp i gain |               | tr adaptation       | 0.00 to 100.00        | REAL   | nT |
| 1654 | 61.13   | actual Tr        |               | tr adaptation       | Output (0)            | REAL   | nU |
| 1655 | 33.08   | ENERGY SAVING    | SET\CTRL CL09 | FLUXING             | 0 to 1                | BOOL   | nV |
| 1656 | 33.09   | ACCEL BOOST      |               | FLUXING             | 0.00 to 25.00         | REAL   | nW |
| 1657 | 33.10   | USER FREQ 1      |               | FLUXING             | 0.0 to 100.0 (2)      | REAL   | nX |
| 1658 | 33.11   | USER VOLTAGE 1   |               | FLUXING             | 0.0 to 100.0 (2)      | REAL   | nY |
| 1659 | 33.12   | USER FREQ 2      |               | FLUXING             | 0.0 to 100.0 (2)      | REAL   | nZ |
| 1660 | 33.13   | USER VOLTAGE 2   |               | FLUXING             | 0.0 to 100.0 (2)      | REAL   | oA |
| 1661 | 33.14   | USER FREQ 3      |               | FLUXING             | 0.0 to 100.0 (2)      | REAL   | oB |
| 1662 | 33.15   | USER VOLTAGE 3   |               | FLUXING             | 0.0 to 100.0 (2)      | REAL   | oC |
| 1663 | 33.16   | USER FREQ 4      |               | FLUXING             | 0.0 to 100.0 (2)      | REAL   | oD |
| 1664 | 33.17   | USER VOLTAGE 4   |               | FLUXING             | 0.0 to 100.0 (2)      | REAL   | oE |
| 1679 | 33.18   | LOW ENERGY LIM   |               | FLUXING             | 0.0 to 100.0 (2)      | REAL   | oT |
| 1686 | 24.25   | START DELAY      |               | SEQUENCING LOGIC    | 0.000 to 30.000       | REAL   | pA |

## MMI Parameters

| MMI Name                      | ASCII MMI Name   | Function Block Name | DSELITE Name     | Notes         | TAG  | ID |
|-------------------------------|------------------|---------------------|------------------|---------------|------|----|
| <b>DIAG Menu (Diagnostic)</b> |                  |                     |                  |               |      |    |
| DIAG 1                        | DRIVE FREQUENCY  | PATTERN GEN         | DRIVE FREQUENCY  |               | 591  | gf |
| DIAG 2                        | SPEED SETPOINT   | REFERENCE           | SPEED SETPOINT   |               | 254  | 72 |
| DIAG 3                        | DC LINK VOLTS    | FEEDBACKS           | DC LINK VOLTS    |               | 75   | 23 |
| DIAG 4                        | MOTOR CURRENT    | FEEDBACKS           | MOTOR CURRENT A  |               | 67   | 1v |
| DIAG DIN                      | DIGIN WORD       | DIGITAL INPUTS      | INPUT WORD       |               | 730  | ka |
| DIAG IPA1                     | ANIN 1 VALUE     | ANALOG INPUT 1      | VALUE            |               | 16   | 0g |
| DIAG IPA2                     | ANIN 2 VALUE     | ANALOG INPUT 2      | VALUE            |               | 25   | 0p |
| DIAG DOUT                     | DIGOUT WORD      | DIGITAL OUTPUTS     | DIGOUT WORD      |               | 738  | ki |
| DIAG OPA1                     | ANOUT 1 VALUE    | ANALOG OUTPUT       | VALUE            |               | 45   | 19 |
| DIAG OPA2                     | ANOUT 2 VALUE    | ANALOG OUTPUT       | VALUE            |               | 731  | kb |
| DIAG TH1                      | TRIP 1 (NEWEST)  | TRIPS HISTORY       | TRIP 1 (NEWEST)  |               | 500  | dw |
| DIAG TH2                      | TRIP 2           | TRIPS HISTORY       | TRIP 2           |               | 501  | dx |
| DIAG TH3                      | TRIP 3           | TRIPS HISTORY       | TRIP 3           |               | 502  | dy |
| DIAG TH4                      | TRIP 4           | TRIPS HISTORY       | TRIP 4           |               | 503  | dz |
| DIAG TH5                      | TRIP 5           | TRIPS HISTORY       | TRIP 5           |               | 504  | e0 |
| DIAG TH6                      | TRIP 6           | TRIPS HISTORY       | TRIP 6           |               | 505  | e1 |
| DIAG TH7                      | TRIP 7           | TRIPS HISTORY       | TRIP 7           |               | 506  | e2 |
| DIAG TH8                      | TRIP 8           | TRIPS HISTORY       | TRIP 8           |               | 507  | e3 |
| DIAG TH9                      | TRIP 9           | TRIPS HISTORY       | TRIP 9           |               | 508  | e4 |
| DIAG TH10                     | TRIP 10 (OLDEST) | TRIPS HISTORY       | TRIP 10 (OLDEST) |               | 509  | e5 |
| <b>PAR Menu (Parameter)</b>   |                  |                     |                  |               |      |    |
| PAR 1                         | APPLICATION      | APP CONFIG          | APPLICATION      |               | 1091 | ub |
| PAR 2                         | MAX SPEED        | REFERENCE           | MAX SPEED        | <b>M</b>      | 57   | 1l |
| PAR 3                         | MIN SPEED        | MINIMUM SPEED       | MINIMUM          |               | 337  | 9d |
| PAR 4                         | ACCEL TIME       | REFERENCE RAMP      | ACCEL TIME       |               | 258  | 76 |
| PAR 5                         | DECEL TIME       | REFERENCE RAMP      | DECEL TIME       |               | 259  | 77 |
| PAR 6                         | MOTOR CURRENT    | MOTOR DATA          | MOTOR CURRENT    | <b>M</b>      | 64   | 1s |
| PAR 7                         | BASE FREQUENCY   | MOTOR DATA          | BASE FREQUENCY   | <b>M</b>      | 1159 | w7 |
| PAR 8                         | JOG SETPOINT     | REFERENCE JOG       | SETPOINT         |               | 246  | 6u |
| PAR 9                         | RUN STOP MODE    | REFERENCE STOP      | RUN STOP MODE    |               | 279  | 7r |
| PAR 11                        | V/F SHAPE        | FLUXING             | V/F SHAPE        |               | 104  | 2w |
| PAR 12                        | NORMAL DUTY      | FEEDBACKS           | NORMAL DUTY      |               | 50   | 1e |
| PAR 13                        | FIXED BOOST      | FLUXING             | FIXED BOOST      | <b>M VF</b>   | 107  | 2z |
| PAR 14                        | AUTO BOOST       | FLUXING             | AUTO BOOST       | <b>M VF</b>   | 108  | 30 |
| PAR 99                        | PASSWORD         | MMI ACCESS          | PASSWORD         |               | 8    | 08 |
| <b>CTRL Menu (Control)</b>    |                  |                     |                  |               |      |    |
| SET\CTRL CL01                 | CONTROL MODE     | MOTOR DATA          | CONTROL MODE     |               | 1157 | w5 |
| SET\CTRL CL02                 | NAMEPLATE RPM    | MOTOR DATA          | NAMEPLATE RPM    | <b>M</b>      | 83   | 2b |
| SET\CTRL CL03                 | FLY-CATCH ENABLE | FLYCATCHING         | VHz ENABLE       | <b>VF</b>     | 570  | fu |
| SET\CTRL CL03                 | FLY-CATCH ENABLE | FLYCATCHING         | VECTOR ENABLE    | <b>SV</b>     | 1553 | jX |
| SET\CTRL CL04                 | SLIP COMP ENABLE | SLIP COMP           | ENABLE           | <b>VF</b>     | 82   | 2a |
| SET\CTRL CL05                 | STAB ENABLE      | STABILISATION       | ENABLE           | <b>VF</b>     | 128  | 3k |
| SET\CTRL CL06                 | VOLTS CTRL MODE  | VOLTAGE CONTROL     | VOLTAGE MODE     | <b>VF</b>     | 595  | gj |
| SET\CTRL CL07                 | BOOST MODE       | FLUXING             | 601 FLUXING      | <b>F M VF</b> | 1058 | te |
| SET\CTRL CL08                 | AUTO BOOST       | FLUXING             | AUTO BOOST       | <b>M VF</b>   | 108  | 30 |
| SET\CTRL CL09                 | ENERGY SAVING    | FLUXING             | ENERGY SAVING    | <b>F VF</b>   | 1655 | nV |
| SET\CTRL CL10                 | MOTOR CURRENT    | MOTOR DATA          | MOTOR CURRENT    | <b>M SV</b>   | 64   | 1s |
| SET\CTRL CL11                 | MOTOR POLES      | MOTOR DATA          | MOTOR POLES      | <b>M SV</b>   | 84   | 2c |
| SET\CTRL CL12                 | MOTOR VOLTAGE    | MOTOR DATA          | MOTOR VOLTAGE    | <b>M</b>      | 1160 | w8 |
| SET\CTRL CL14                 | MAG CURRENT      | MOTOR DATA          | MAG CURRENT      | <b>M</b>      | 65   | 1t |
| SET\CTRL CL15                 | POWER            | MOTOR DATA          | POWER            | <b>M SV</b>   | 1158 | w6 |
| SET\CTRL CL16                 | MOTOR CONNECTION | MOTOR DATA          | MOTOR CONNECTION | <b>M SV</b>   | 124  | 3g |
| SET\CTRL CL17                 | STATOR RES       | MOTOR DATA          | STATOR RES       | <b>F M SV</b> | 119  | 3b |
| SET\CTRL CL18                 | LEAKAGE INDUC    | MOTOR DATA          | LEAKAGE INDUC    | <b>F M SV</b> | 120  | 3c |

| MMI Name                 | ASCII MMI Name      | Function Block Name | DSELITE Name        | Notes  | TAG  | ID |
|--------------------------|---------------------|---------------------|---------------------|--------|------|----|
| SET\CTRL CL19            | MUTUAL INDUC        | MOTOR DATA          | MUTUAL INDUC        | F M SV | 121  | 3d |
| SET\CTRL CL1A            | ROTOR TIME<br>CONST | MOTOR DATA          | ROTOR TIME<br>CONST | F M SV | 1163 | wb |
| SET\CTRL CL20            | AUTOTUNE MODE       | AUTOTUNE            | MODE                | SV     | 689  | j5 |
| SET\CTRL CL21            | AUTOTUNE ENABLE     | AUTOTUNE            | ENABLE              | SV     | 603  | gr |
| SET\CTRL CL81            | CURRENT LIMIT       | CURRENT LIMIT       | CURRENT LIMIT       | F      | 365  | a5 |
| SET\CTRL CL82            | POS TORQUE LIMIT    | TORQUE LIMIT        | POS TORQUE LIM      | F      | 1208 | xk |
| SET\CTRL CL83            | NEG TORQUE LIMIT    | TORQUE LIMIT        | NEG TORQUE LIM      | F      | 1209 | xl |
| SET\CTRL CL84            | STALL TRIP TYPE     | STALL TRIP          | STALL LIMIT TYPE    | F      | 1632 | mY |
| SET\CTRL CL91            | SPEED PROP GAIN     | SPEED LOOP          | SPEED PROP GAIN     | F M SV | 1187 | wz |
| SET\CTRL CL92            | SPEED INT TIME      | SPEED LOOP          | SPEED INT TIME      | F M SV | 1188 | x0 |
| SET\CTRL CL93            | SPEED POS LIMIT     | SPEED LOOP          | SPEED POS LIM       | F SV   | 1200 | xc |
| SET\CTRL CL94            | SPEED NEG LIMIT     | SPEED LOOP          | SPEED NEG LIM       | F SV   | 1201 | xd |
| <b>IN Menu (Input)</b>   |                     |                     |                     |        |      |    |
| SET\IN IP01              | DIGIN 1 INVERT      | DIGITAL INPUTS      | INVERT 1            |        | 30   | 0u |
| SET\IN IP02              | DIGIN 2 INVERT      | DIGITAL INPUTS      | INVERT 2            |        | 33   | 0x |
| SET\IN IP03              | DIGIN 3 INVERT      | DIGITAL INPUTS      | INVERT 3            |        | 36   | 10 |
| SET\IN IP04              | DIGIN 4 INVERT      | DIGITAL INPUTS      | INVERT 4            |        | 39   | 13 |
| SET\IN IP05              | DIGIN 5 INVERT      | DIGITAL INPUTS)     | INVERT 5            |        | 42   | 16 |
| SET\IN IP06              | DIGIN 6 INVERT      | DIGITAL INPUTS      | INVERT 6            |        | 725  | k5 |
| SET\IN IP07              | DIGIN 7 INVERT      | DIGITAL INPUTS      | INVERT 7            |        | 727  | k7 |
| SET\IN IP11              | ANIN 1 SCALE        | ANALOG INPUT 1      | SCALE               |        | 14   | 0e |
| SET\IN IP12              | ANIN 1 OFFSET       | ANALOG INPUT 1      | OFFSET              |        | 15   | 0f |
| SET\IN IP13              | ANIN 1 TYPE         | ANALOG INPUT 1      | TYPE                |        | 13   | 0d |
| SET\IN IP21              | ANIN 2 SCALE        | ANALOG INPUT 2      | SCALE               |        | 23   | 0n |
| SET\IN IP22              | ANIN 2 OFFSET       | ANALOG INPUT 2      | OFFSET              |        | 24   | 0o |
| SET\IN IP23              | ANIN 2 TYPE         | ANALOG INPUT 2      | TYPE                |        | 22   | 0m |
| SET\IN IPD1              | DIGIN 1 VALUE       | DIGITAL INPUTS      | INPUT 1             | F      | 31   | 0v |
| SET\IN IPD2              | DIGIN 2 VALUE       | DIGITAL INPUTS      | INPUT 2             | F      | 34   | 0y |
| SET\IN IPD3              | DIGIN 3 VALUE       | DIGITAL INPUTS      | INPUT 3             | F      | 37   | 11 |
| SET\IN IPD4              | DIGIN 4 VALUE       | DIGITAL INPUTS      | INPUT 4             | F      | 40   | 14 |
| SET\IN IPD5              | DIGIN 5 VALUE       | DIGITAL INPUTS      | INPUT 5             | F      | 43   | 17 |
| SET\IN IPD6              | DIGIN 6 VALUE       | DIGITAL INPUTS      | INPUT 6             | F      | 726  | k6 |
| SET\IN IPD7              | DIGIN 7 VALUE       | DIGITAL INPUTS      | INPUT 7             | F      | 728  | k8 |
| SET\IN IPA1              | ANIN 1 VALUE        | ANALOG INPUT 1      | VALUE               | F      | 16   | 0g |
| SET\IN IPA2              | ANIN 2 VALUE        | ANALOG INPUT 2      | VALUE               | F      | 25   | 0p |
| <b>OUT Menu (Output)</b> |                     |                     |                     |        |      |    |
| SET\OUT OPD3             | RELAY INVERT        | DIGITAL OUTPUTS     | INVERT 3            |        | 736  | kg |
| SET\OUT A011             | ANOUT 1 SCALE       | ANALOG OUTPUT       | SCALE               |        | 46   | 1a |
| SET\OUT A012             | ANOUT 1 OFFSET      | ANALOG OUTPUT       | OFFSET              |        | 47   | 1b |
| SET\OUT A013             | ANOUT 1 ABS         | ANALOG OUTPUT       | ABSOLUTE            |        | 48   | 1c |
| SET\OUT AO14             | ANOUT 1 VALUE       | ANALOG OUTPUT       | VALUE               | F      | 45   | 19 |
| SET\OUT AO21             | ANOUT 2 SCALE       | ANALOG OUTPUT       | SCALE               |        | 732  | kc |
| SET\OUT AO22             | ANOUT 2 OFFSET      | ANALOG OUTPUT       | OFFSET              |        | 733  | kd |
| SET\OUT AO23             | ANOUT 2 ABS         | ANALOG OUTPUT       | ABSOLUTE            |        | 734  | ke |
| SET\OUT AO24             | ANOUT 2 VALUE       | ANALOG OUTPUT       | VALUE               | F      | 731  | kb |
| SET\CONF DIN1            | DIGIN 1 DEST        | APP CONFIG          | DIGIN 1 DEST        | F      | 310  | 8m |
| SET\CONF DIN2            | DIGIN 2 DEST        | APP CONFIG          | DIGIN 2 DEST        | F      | 311  | 8n |
| SET\CONF DIN3            | DIGIN 3 DEST        | APP CONFIG          | DIGIN 3 DEST        | F      | 312  | 8o |
| SET\CONF DIN4            | DIGIN 4 DEST        | APP CONFIG          | DIGIN 4 DEST        | F      | 313  | 8p |
| SET\CONF DIN5            | DIGIN 5 DEST        | APP CONFIG          | DIGIN 5 DEST        | F      | 314  | 8q |
| SET\CONF DIN6            | DIGIN 6 DEST        | APP CONFIG          | DIGIN 6 DEST        | F      | 315  | 8r |
| SET\CONF DIN7            | DIGIN 7 DEST        | APP CONFIG          | DIGIN 7 DEST        | F      | 316  | 8s |
| SET\CONF DOP1            | DIGOUT 1 SOURCE     | APP CONFIG          | DIGIO 1 SOURCE      | F      | 1016 | s8 |
| SET\CONF DOP2            | DIGOUT 2 SOURCE     | APP CONFIG          | DIGIO 2 SOURCE      | F      | 1094 | ue |
| SET\CONF DOP3            | RELAY SOURCE        | APP CONFIG          | RELAY SOURCE        | F      | 1093 | ud |
| SET\CONF AOP1            | ANOUT 1 SOURCE      | APP CONFIG          | ANOUT 1 SOURCE      | F      | 1092 | uc |
| SET\CONF AOP2            | ANOUT 2 SOURCE      | APP CONFIG          | ANOUT 2 SOURCE      | F      | 1109 | ut |

## 2-22 Parameter Specification

| MMI Name                                 | ASCII MMI Name   | Function Block Name | DSELITE Name      | Notes | TAG  | ID |
|------------------------------------------|------------------|---------------------|-------------------|-------|------|----|
| <b>TRIP Menu (Trips)</b>                 |                  |                     |                   |       |      |    |
| SET\TRIP LOOP                            | 4 TO 20ma LOOP   | TRIPS STATUS        | DISABLE TRIPS     |       | 231  | 6f |
| SET\TRIP T 3                             | ANIN 2 OVERLOAD  | TRIPS STATUS        | DISABLE TRIPS     |       | 231  | 6f |
| SET\TRIP STLL                            | MOTOR STALLED    | TRIPS STATUS        | DISABLE TRIPS     |       | 231  | 6f |
| SET\TRIP OT                              | MOTOR OVERTEMP   | TRIPS STATUS        | DISABLE TRIPS +   |       | 742  | km |
| SET\TRIP -OT-                            | MOTOR OVERTEMP   | IO TRIPS            | INVERT THERMIST   | Res   | 760  | 14 |
| SET\TRIP IT                              | INVERSE TIME     | TRIPS STATUS        | DISABLE TRIPS     |       | 231  | 6f |
| SET\TRIP DB R                            | BRAKE RESISTOR   | TRIPS STATUS        | DISABLE TRIPS     |       | 231  | 6f |
| SET\TRIP DB S                            | BRAKE SWITCH     | TRIPS STATUS        | DISABLE TRIPS     |       | 231  | 6f |
| SET\TRIP SPD                             | SPEED FEEDBACK   | TRIPS STATUS        | DISABLE TRIPS     |       | 231  | 6f |
| SET\TRIP OSPD                            | OVERSPEED        | TRIPS STATUS        | DISABLE TRIPS +   |       | 742  | km |
| SET\TRIP DISP                            | DISPLAY / KEYPAD | TRIPS STATUS        | DISABLE TRIPS     |       | 231  | 6f |
| SET\TRIP DCRP                            | VDC RIPPLE       | TRIPS STATUS        | DISABLE TRIPS +   | F     | 742  | km |
| <b>SERL Menu (Serial Communications)</b> |                  |                     |                   |       |      |    |
| SET\SERL SE01                            | REMOTE COMMS SEL | COMMS CONTROL       | REMOTE COMMS SEL  | F     | 300  | 8c |
| SET\SERL SE02                            | COMMS TIMEOUT    | COMMS CONTROL       | COMMS TIMEOUT     | F     | 309  | 8l |
| SET\SERL SE03                            | COMMS ADDRESS    | COMMS PORTS         | COMMS ADDRESS     | F     | 103  | 2v |
| SET\SERL SE04                            | COMMS BAUD RATE  | COMMS PORTS         | BAUD RATE         | F     | 1062 | ti |
| SET\SERL SE05                            | COMMS PARITY     | COMMS PORTS         | PARITY            | F     | 1061 | th |
| SET\SERL SE06                            | REPLY DELAY ms   | COMMS PORTS         | REPLY DELAY ms    | F     | 1260 | z0 |
| SET\SERL SE07                            | PROTOCOL, (OP)   | COMMS PORTS         | OP PORT PROTOCOL  | F     | 1060 | tg |
| SET\SERL SE08                            | PROTOCOL, (P3)   | COMMS PORTS         | P3 PORT PROTOCOL  | F     | 1059 | tf |
| <b>SETP Menu (Setup)</b>                 |                  |                     |                   |       |      |    |
| SET\SETP ST01                            | JOG ACCEL TIME   | REFERENCE JOG       | ACCEL TIME        |       | 261  | 79 |
| SET\SETP ST02                            | JOG DECEL TIME   | REFERENCE JOG       | DECEL TIME        |       | 262  | 7a |
| SET\SETP ST03                            | RAMP TYPE        | REFERENCE RAMP      | RAMP TYPE         |       | 244  | 6s |
| SET\SETP ST04                            | S RAMP JERK      | REFERENCE RAMP      | SRAMP JERK 1      |       | 694  | ja |
| SET\SETP ST05                            | S RAMP CONT      | REFERENCE RAMP      | SRAMP CONTINUOUS  |       | 691  | j7 |
| SET\SETP ST06                            | MIN SPEED MODE   | MINIMUM SPEED       | MODE              |       | 338  | 9e |
| SET\SETP ST11                            | SKIP FREQ 1      | SKIP FREQUENCIES    | FREQUENCY 1       |       | 342  | 9i |
| SET\SETP ST12                            | SKIP FREQ 1 BAND | SKIP FREQUENCIES    | BAND 1            |       | 341  | 9h |
| SET\SETP ST13                            | SKIP FREQ 2      | SKIP FREQUENCIES    | FREQUENCY 2       |       | 343  | 9j |
| SET\SETP ST14                            | SKIP FREQ 2 BAND | SKIP FREQUENCIES    | BAND 2            |       | 680  | iw |
| SET\SETP ST21                            | AR ATTEMPTS      | AUTO RESTART        | ATTEMPTS          |       | 612  | h0 |
| SET\SETP ST22                            | AR DELAY         | AUTO RESTART        | ATTEMPT DELAY 1   |       | 613  | h1 |
| SET\SETP ST23                            | AR TRIGGERS      | AUTO RESTART        | TRIGGERS 1        |       | 609  | gx |
| SET\SETP ST24                            | AR TRIGGERS+     | AUTO RESTART        | TRIGGERS 1 +      |       | 744  | ko |
| SET\SETP ST31                            | DB ENABLE        | DYNAMIC BRAKING     | ENABLE            |       | 80   | 28 |
| SET\SETP ST32                            | DB RESISTANCE    | DYNAMIC BRAKING     | BRAKE RESISTANCE  |       | 77   | 25 |
| SET\SETP ST33                            | DB POWER         | DYNAMIC BRAKING     | BRAKE POWER       |       | 78   | 26 |
| SET\SETP ST34                            | DB OVER-RATING   | DYNAMIC BRAKING     | 1 SEC OVER RATING |       | 79   | 27 |
| SET\SETP ST41                            | TORQUE FEEDBACK  | FEEDBACKS           | TORQUE FEEDBACK   |       | 70   | 1y |
| SET\SETP ST42                            | TORQUE LEVEL     | AT LOAD             | LEVEL             |       | 621  | h9 |
| SET\SETP ST43                            | USE ABS TORQUE   | AT LOAD             | ABSOLUTE          | F     | 1259 | yz |
| SET\SETP ST51                            | LOCAL MIN SPEED  | REFERENCE           | LOCAL MIN SPEED   | F     | 251  | 6z |
| SET\SETP ST52                            | DISABLED KEYS    | DISPLAY/KEYPAD      | DISABLED KEYS     | F     | 127  | 3j |
| SET\SETP ST98                            | APPLICATION LOCK | APP CONFIG          | APP LOCK          | F     | 1064 | tk |
| SET\SETP ST99                            | DETAILED MENUS   | MMI ACCESS          | DETAILED MENUS    |       | 878  | oe |
| <b>ENC Menu (Encoder)</b>                |                  |                     |                   |       |      |    |
| SET\ENC EN01                             | ENC MODE         | ENCODER             | MODE              | F     | 565  | fp |
| SET\ENC EN02                             | ENC RESET        | ENCODER             | RESET             | F     | 747  | kr |
| SET\ENC EN03                             | ENC INVERT       | ENCODER             | INVERT            | F     | 567  | fr |
| SET\ENC EN04                             | ENC LINES        | ENCODER             | LINES             | F     | 566  | fq |
| SET\ENC EN05                             | ENC SPEED SCALE  | ENCODER             | SPEED SCALE       | F     | 110  | 32 |
| SET\ENC EN06                             | ENC SPEED        | ENCODER             | SPEED             | F     | 111  | 33 |

## Pref Cross Reference Table

Pref is a unique identifier used internally by the MMI, for use by SSD Drives' engineers. When communicating over Comms, always use the Tag Number.

| Pref   | Tag  | Pref    | Tag  | Pref    | Tag  | Pref    | Tag  | Pref   | Tag  | Pref  | Tag  | Pref  | Tag  |
|--------|------|---------|------|---------|------|---------|------|--------|------|-------|------|-------|------|
| 7.01   | 1091 | 15.10.1 | 175  | 15.9.2  | 171  | 16.5.5  | 203  | 18.12  | 561  | 24.24 | 274  | 33.14 | 1661 |
| 7.02   | 1092 | 15.11.1 | 1296 | 15.7.5  | 163  | 16.6.4  | 209  | 18.13  | 562  | 24.25 | 1686 | 33.15 | 1662 |
| 7.03   | 1109 | 15.12.1 | 1301 | 15.8.4  | 169  | 16.7.3  | 212  | 18.14  | 563  | 24.26 | 620  | 33.16 | 1663 |
| 7.04   | 1093 | 15.13.1 | 1306 | 15.9.3  | 172  | 16.8.2  | 216  | 18.15  | 564  | 25.01 | 98   | 33.17 | 1664 |
| 7.05   | 1094 | 15.14.1 | 1311 | 16.1.1  | 180  | 16.9.1  | 220  | 17.3.9 | 397  | 25.02 | 100  | 33.18 | 1679 |
| 7.06   | 1016 | 15.15.1 | 1316 | 16.10.1 | 225  | 16.6.5  | 208  | 17.4.8 | 516  | 25.03 | 591  | 34.01 | 60   |
| 7.07   | 1064 | 15.1.2  | 131  | 16.11.1 | 1346 | 16.7.4  | 214  | 17.4.9 | 517  | 25.04 | 1629 | 34.02 | 62   |
| 7.08   | 310  | 15.2.1  | 135  | 16.12.1 | 1351 | 16.8.3  | 217  | 19.01  | 300  | 25.05 | 99   | 34.03 | 61   |
| 7.09   | 311  | 15.10.2 | 176  | 16.13.1 | 1356 | 16.9.2  | 221  | 19.02  | 307  | 25.06 | 1633 | 34.04 | 63   |
| 7.10   | 312  | 15.11.2 | 1297 | 16.14.1 | 1361 | 16.7.5  | 213  | 19.03  | 308  | 26.01 | 1230 | 35.01 | 1159 |
| 7.11   | 313  | 15.12.2 | 1302 | 16.15.1 | 1366 | 16.8.4  | 219  | 19.04  | 309  | 26.02 | 1231 | 35.02 | 1160 |
| 7.12   | 314  | 15.13.2 | 1307 | 15.8.5  | 168  | 16.9.3  | 222  | 19.05  | 271  | 26.03 | 1229 | 35.03 | 64   |
| 7.13   | 315  | 15.14.2 | 1312 | 15.9.4  | 174  | 17.1.1  | 355  | 19.06  | 295  | 26.04 | 1056 | 35.04 | 65   |
| 7.14   | 316  | 15.15.2 | 1317 | 16.1.2  | 181  | 17.1.10 | 356  | 19.07  | 270  | 26.05 | 1232 | 35.05 | 83   |
| 8.01   | 94   | 15.1.3  | 132  | 16.2.1  | 185  | 17.1.11 | 372  | 19.08  | 272  | 27.01 | 50   | 35.06 | 84   |
| 8.02   | 95   | 15.2.2  | 136  | 16.10.2 | 226  | 16.8.5  | 218  | 19.09  | 273  | 27.02 | 75   | 35.07 | 1157 |
| 8.03   | 96   | 15.3.1  | 140  | 16.11.2 | 1347 | 16.9.4  | 224  | 20.01  | 246  | 27.03 | 66   | 35.08 | 1158 |
| 9.01   | 1181 | 15.10.3 | 177  | 16.12.2 | 1352 | 17.1.2  | 347  | 20.02  | 261  | 27.04 | 67   | 35.09 | 124  |
| 9.02   | 19   | 15.11.3 | 1298 | 16.13.2 | 1357 | 17.2.1  | 388  | 20.03  | 262  | 27.05 | 1020 | 35.10 | 242  |
| 9.03   | 1182 | 15.12.3 | 1303 | 16.14.2 | 1362 | 17.2.10 | 389  | 21.01  | 8    | 27.06 | 569  | 35.11 | 1164 |
| 9.04   | 1184 | 15.13.3 | 1308 | 16.15.2 | 1367 | 17.2.11 | 373  | 21.02  | 878  | 27.07 | 568  | 35.12 | 1161 |
| 9.05   | 20   | 15.14.3 | 1313 | 15.9.5  | 173  | 16.9.5  | 223  | 21.03  | 877  | 27.08 | 749  | 35.13 | 1162 |
| 9.06   | 1186 | 15.15.3 | 1318 | 16.1.3  | 182  | 17.1.3  | 348  | 21.04  | 91   | 27.09 | 1017 | 35.14 | 119  |
| 10.01  | 14   | 15.1.4  | 134  | 16.2.2  | 186  | 17.2.2  | 380  | 21.05  | 92   | 27.10 | 1018 | 35.15 | 120  |
| 10.02  | 15   | 15.2.3  | 137  | 16.3.1  | 190  | 17.3.1  | 398  | 21.06  | 93   | 27.11 | 70   | 35.16 | 121  |
| 10.03  | 13   | 15.3.2  | 141  | 16.10.3 | 227  | 17.3.10 | 399  | 22.01  | 127  | 27.12 | 73   | 35.17 | 1163 |
| 10.04  | 1099 | 15.4.1  | 145  | 16.11.3 | 1348 | 17.3.11 | 374  | 22.02  | 230  | 28.01 | 365  | 36.01 | 80   |
| 10.05  | 16   | 15.10.4 | 179  | 16.12.3 | 1353 | 17.1.4  | 349  | 22.03  | 1110 | 28.02 | 686  | 36.02 | 76   |
| 11.01  | 23   | 15.11.4 | 1300 | 16.13.3 | 1358 | 17.2.3  | 381  | 23.01  | 245  | 29.01 | 367  | 36.03 | 81   |
| 11.02  | 24   | 15.12.4 | 1305 | 16.14.3 | 1363 | 17.3.2  | 390  | 23.02  | 248  | 29.02 | 368  | 36.04 | 77   |
| 11.03  | 22   | 15.13.4 | 1310 | 16.15.3 | 1368 | 17.4.1  | 518  | 23.03  | 57   | 29.03 | 369  | 36.05 | 78   |
| 11.04  | 26   | 15.14.4 | 1315 | 16.1.4  | 184  | 17.4.10 | 519  | 23.04  | 252  | 29.04 | 370  | 36.06 | 79   |
| 11.05  | 1100 | 15.15.4 | 1320 | 16.2.3  | 187  | 17.4.11 | 520  | 23.05  | 253  | 30.01 | 710  | 37.01 | 683  |
| 11.06  | 25   | 15.1.5  | 133  | 16.3.2  | 191  | 17.1.5  | 350  | 23.06  | 243  | 30.02 | 577  | 38.01 | 1208 |
| 12.1.1 | 45   | 15.2.4  | 139  | 16.4.1  | 195  | 17.2.4  | 382  | 23.07  | 249  | 30.03 | 578  | 38.02 | 1209 |
| 12.1.2 | 46   | 15.3.3  | 142  | 16.10.4 | 229  | 17.3.3  | 391  | 23.08  | 269  | 30.04 | 579  | 38.03 | 1210 |
| 12.2.1 | 731  | 15.4.2  | 146  | 16.11.4 | 1350 | 17.4.2  | 510  | 23.09  | 255  | 30.05 | 580  | 38.04 | 1211 |
| 12.1.3 | 47   | 15.5.1  | 150  | 16.12.4 | 1355 | 17.1.6  | 351  | 23.10  | 254  | 30.06 | 581  | 38.05 | 1212 |
| 12.2.2 | 732  | 15.10.5 | 178  | 16.13.4 | 1360 | 17.2.5  | 383  | 23.11  | 56   | 30.07 | 582  | 38.06 | 1213 |
| 12.1.4 | 48   | 15.11.5 | 1299 | 16.14.4 | 1365 | 17.3.4  | 392  | 23.12  | 256  | 30.08 | 739  | 38.07 | 1554 |
| 12.2.3 | 733  | 15.12.5 | 1304 | 16.15.4 | 1370 | 17.4.3  | 511  | 23.13  | 247  | 30.09 | 583  | 39.01 | 82   |
| 12.2.4 | 734  | 15.13.5 | 1309 | 16.1.5  | 183  | 17.1.7  | 352  | 23.14  | 770  | 31.01 | 128  | 39.02 | 85   |
| 13.01  | 30   | 15.14.5 | 1314 | 16.2.4  | 189  | 17.2.6  | 384  | 23.15  | 250  | 31.02 | 602  | 39.03 | 86   |
| 13.02  | 33   | 15.15.5 | 1319 | 16.3.3  | 192  | 17.3.5  | 393  | 23.16  | 251  | 31.03 | 684  | 39.04 | 87   |
| 13.03  | 36   | 15.2.5  | 138  | 16.4.2  | 196  | 17.4.4  | 512  | 24.01  | 291  | 31.04 | 685  | 39.05 | 88   |
| 13.04  | 39   | 15.3.4  | 144  | 16.5.1  | 200  | 17.1.8  | 353  | 24.02  | 292  | 31.05 | 769  | 40.01 | 612  |
| 13.05  | 42   | 15.4.3  | 147  | 16.10.5 | 228  | 17.2.7  | 385  | 24.03  | 293  | 31.06 | 687  | 40.02 | 613  |
| 13.06  | 725  | 15.5.2  | 151  | 16.11.5 | 1349 | 17.3.6  | 394  | 24.04  | 280  | 31.07 | 688  | 40.03 | 609  |
| 13.07  | 727  | 15.6.1  | 155  | 16.12.5 | 1354 | 17.4.5  | 513  | 24.05  | 1235 | 32.01 | 1148 | 40.04 | 744  |
| 13.08  | 729  | 15.3.5  | 143  | 16.13.5 | 1359 | 17.1.9  | 354  | 24.06  | 276  | 32.02 | 1149 | 40.05 | 608  |
| 13.09  | 31   | 15.4.4  | 149  | 16.14.5 | 1364 | 17.2.8  | 386  | 24.07  | 277  | 32.03 | 1150 | 40.06 | 616  |
| 13.10  | 34   | 15.5.3  | 152  | 16.15.5 | 1369 | 17.3.7  | 395  | 24.08  | 278  | 32.04 | 1151 | 40.07 | 614  |
| 13.11  | 37   | 15.6.2  | 156  | 16.2.5  | 188  | 17.4.6  | 514  | 24.09  | 294  | 32.05 | 1152 | 40.08 | 615  |
| 13.12  | 40   | 15.7.1  | 160  | 16.3.4  | 194  | 18.01   | 102  | 24.10  | 282  | 32.06 | 1153 | 40.09 | 611  |
| 13.13  | 43   | 15.4.5  | 148  | 16.4.3  | 197  | 18.02   | 103  | 24.11  | 290  | 33.01 | 104  | 40.10 | 610  |
| 13.14  | 726  | 15.5.4  | 154  | 16.5.2  | 201  | 18.03   | 1062 | 24.12  | 283  | 33.02 | 107  | 41.01 | 298  |
| 13.15  | 728  | 15.6.3  | 157  | 16.6.1  | 205  | 18.04   | 1061 | 24.13  | 289  | 33.03 | 108  | 41.02 | 265  |
| 13.16  | 730  | 15.7.2  | 161  | 16.3.5  | 193  | 18.05   | 1260 | 24.14  | 285  | 33.04 | 109  | 41.03 | 299  |
| 14.01  | 52   | 15.8.1  | 165  | 16.4.4  | 199  | 18.06   | 1060 | 24.15  | 302  | 33.05 | 1021 | 41.04 | 281  |
| 14.02  | 51   | 15.5.5  | 153  | 16.5.3  | 202  | 18.07   | 1059 | 24.16  | 303  | 33.06 | 1022 | 41.05 | 297  |
| 14.03  | 55   | 15.6.4  | 159  | 16.6.2  | 206  | 18.08   | 117  | 24.17  | 286  | 33.07 | 1058 | 41.06 | 257  |
| 14.04  | 54   | 15.7.3  | 162  | 16.7.1  | 210  | 18.09   | 129  | 24.18  | 288  | 33.08 | 1655 | 41.07 | 1097 |
| 14.05  | 737  | 15.8.2  | 166  | 16.4.5  | 198  | 18.10   | 90   | 24.19  | 306  | 33.09 | 1656 | 42.01 | 244  |
| 14.06  | 736  | 15.9.1  | 170  | 16.5.4  | 204  | 17.2.9  | 387  | 24.20  | 287  | 33.10 | 1657 | 42.02 | 258  |
| 14.07  | 735  | 15.6.5  | 158  | 16.6.3  | 207  | 17.3.8  | 396  | 24.21  | 305  | 33.11 | 1658 | 42.03 | 259  |
| 14.08  | 738  | 15.7.4  | 164  | 16.7.2  | 211  | 17.4.7  | 515  | 24.22  | 301  | 33.12 | 1659 | 42.04 | 694  |
| 15.1.1 | 130  | 15.8.3  | 167  | 16.8.1  | 215  | 18.11   | 560  | 24.23  | 296  | 33.13 | 1660 | 42.05 | 691  |

# 2-24 Parameter Specification

| Pref  | Tag  | Pref  | Tag  | Pref  | Tag  | Pref    | Tag  | Pref    | Tag  |
|-------|------|-------|------|-------|------|---------|------|---------|------|
| 42.06 | 260  | 48.17 | 672  | 59.05 | 1191 | 63.04   | 1026 | 70.2.3  | 1043 |
| 42.07 | 698  | 49.01 | 359  | 59.06 | 1192 | 63.05   | 1027 | 70.3.2  | 1046 |
| 43.01 | 279  | 49.02 | 357  | 59.07 | 1193 | 63.06   | 1028 | 70.11.4 | 782  |
| 43.02 | 263  | 49.03 | 1233 | 59.08 | 1200 | 63.07   | 1029 | 70.12.4 | 785  |
| 43.03 | 266  | 50.01 | 231  | 59.09 | 1201 | 63.08   | 1030 | 70.13.4 | 788  |
| 43.04 | 284  | 50.02 | 742  | 59.10 | 1202 | 63.09   | 604  | 70.14.4 | 791  |
| 43.05 | 304  | 50.03 | 4    | 59.11 | 1194 | 63.10   | 1031 | 70.15.4 | 794  |
| 43.06 | 275  | 50.04 | 740  | 59.12 | 1195 | 63.11   | 1239 | 70.16.4 | 797  |
| 43.07 | 264  | 50.05 | 5    | 59.13 | 1203 | 63.12   | 1240 | 70.5.1  | 628  |
| 43.08 | 126  | 50.06 | 741  | 59.14 | 1206 | 63.13   | 1241 | 70.2.4  | 1044 |
| 44.01 | 327  | 50.07 | 6    | 59.15 | 1207 | 63.14   | 1242 | 70.3.3  | 1047 |
| 44.02 | 328  | 50.08 | 640  | 59.16 | 1204 | 63.15   | 1243 | 70.4.2  | 1050 |
| 44.03 | 326  | 50.09 | 237  | 60.01 | 1119 | 63.16   | 1246 | 70.1.5  | 1460 |
| 44.04 | 330  | 50.10 | 238  | 60.02 | 1120 | 63.17   | 1627 | 70.10.5 | 1469 |
| 44.05 | 329  | 51.01 | 500  | 60.03 | 1121 | 63.18   | 1063 | 70.11.5 | 1470 |
| 44.06 | 331  | 51.02 | 501  | 60.04 | 1122 | 64.01   | 1603 | 70.12.5 | 1471 |
| 44.07 | 332  | 51.03 | 502  | 60.05 | 1123 | 64.02   | 1604 | 70.13.5 | 1472 |
| 44.08 | 325  | 51.04 | 503  | 60.06 | 1124 | 64.03   | 1605 | 70.14.5 | 1473 |
| 45.01 | 336  | 51.05 | 504  | 60.07 | 1125 | 64.04   | 1606 | 70.15.5 | 1474 |
| 45.02 | 337  | 51.06 | 505  | 60.08 | 1126 | 64.05   | 1607 | 70.16.5 | 1475 |
| 45.03 | 338  | 51.07 | 506  | 60.09 | 1137 | 64.06   | 1608 | 70.6.1  | 629  |
| 45.04 | 335  | 51.08 | 507  | 60.10 | 1138 | 65.01   | 621  | 70.3.4  | 1048 |
| 46.01 | 1247 | 51.09 | 508  | 60.11 | 1139 | 65.02   | 622  | 70.4.3  | 1051 |
| 46.02 | 617  | 51.10 | 509  | 60.12 | 1140 | 65.03   | 1259 | 70.5.2  | 1054 |
| 46.03 | 1248 | 52.01 | 1095 | 60.13 | 1141 | 66.01   | 565  | 70.2.5  | 1461 |
| 46.04 | 618  | 52.02 | 1096 | 60.14 | 1142 | 66.02   | 747  | 70.7.1  | 630  |
| 46.05 | 1249 | 53.01 | 595  | 60.15 | 1143 | 66.03   | 567  | 70.6.2  | 700  |
| 46.06 | 1250 | 53.02 | 112  | 60.16 | 1551 | 66.04   | 566  | 70.4.4  | 1052 |
| 46.07 | 1251 | 53.03 | 594  | 60.17 | 1552 | 66.05   | 110  | 70.5.3  | 1055 |
| 46.08 | 1252 | 53.04 | 597  | 60.18 | 1616 | 66.06   | 111  | 70.3.5  | 1462 |
| 46.09 | 1253 | 53.05 | 1023 | 60.19 | 1617 | 66.07   | 748  | 70.8.1  | 631  |
| 46.10 | 1254 | 53.06 | 1024 | 60.20 | 1618 | 67.01   | 1223 | 70.6.3  | 701  |
| 46.11 | 1098 | 54.01 | 760  | 60.21 | 1619 | 67.02   | 1222 | 70.7.2  | 703  |
| 46.12 | 1255 | 54.02 | 234  | 60.22 | 1620 | 68.01   | 1033 | 70.5.4  | 1053 |
| 46.13 | 1256 | 54.03 | 1155 | 60.23 | 1621 | 68.02   | 1035 | 70.4.5  | 1463 |
| 46.14 | 619  | 55.01 | 340  | 60.24 | 1622 | 68.03   | 1036 | 70.9.1  | 632  |
| 46.15 | 1257 | 55.02 | 341  | 60.25 | 1623 | 69.01   | 584  | 70.6.4  | 702  |
| 46.16 | 1258 | 55.03 | 342  | 61.01 | 1214 | 69.02   | 585  | 70.7.3  | 704  |
| 46.17 | 318  | 55.04 | 680  | 61.02 | 1215 | 69.03   | 586  | 70.8.2  | 706  |
| 46.18 | 319  | 55.05 | 343  | 61.03 | 1216 | 69.04   | 587  | 70.5.5  | 1464 |
| 47.01 | 641  | 55.06 | 346  | 61.04 | 1217 | 69.05   | 588  | 70.7.4  | 705  |
| 47.02 | 642  | 56.01 | 241  | 61.05 | 1218 | 69.06   | 589  | 70.8.3  | 707  |
| 47.03 | 643  | 56.02 | 240  | 61.06 | 1219 | 69.07   | 590  | 70.9.2  | 774  |
| 47.04 | 644  | 56.03 | 1632 | 61.07 | 1220 | 70.1.1  | 74   | 70.6.5  | 1465 |
| 47.05 | 645  | 57.01 | 570  | 61.08 | 1221 | 70.10.1 | 633  | 71.1.1  | 334  |
| 47.06 | 646  | 57.02 | 1553 | 61.09 | 97   | 70.11.1 | 634  | 70.8.4  | 708  |
| 47.07 | 647  | 57.03 | 571  | 61.10 | 1651 | 70.12.1 | 635  | 70.9.3  | 775  |
| 47.08 | 648  | 57.04 | 572  | 61.11 | 1652 | 70.13.1 | 636  | 70.7.5  | 1466 |
| 47.09 | 649  | 57.05 | 573  | 61.12 | 1653 | 70.14.1 | 637  | 71.1.2  | 125  |
| 47.10 | 650  | 57.06 | 32   | 61.13 | 1654 | 70.15.1 | 638  | 71.2.1  | 379  |
| 47.11 | 651  | 57.07 | 574  | 62.01 | 1174 | 70.16.1 | 639  | 70.9.4  | 776  |
| 47.12 | 652  | 57.08 | 575  | 62.02 | 1175 | 70.2.1  | 371  | 70.8.5  | 1467 |
| 47.13 | 653  | 57.09 | 709  | 62.03 | 1176 | 70.10.2 | 777  | 71.1.3  | 321  |
| 47.14 | 654  | 57.10 | 35   | 62.04 | 1177 | 70.1.2  | 1039 | 71.2.2  | 676  |
| 47.15 | 655  | 57.11 | 38   | 62.05 | 1178 | 70.11.2 | 780  | 70.9.5  | 1468 |
| 47.16 | 656  | 57.12 | 41   | 62.06 | 1179 | 70.12.2 | 783  | 71.1.4  | 44   |
| 47.17 | 598  | 57.13 | 29   | 62.07 | 1557 | 70.13.2 | 786  | 71.2.3  | 375  |
| 48.01 | 599  | 57.14 | 576  | 62.08 | 1558 | 70.14.2 | 789  | 71.1.5  | 322  |
| 48.02 | 657  | 57.15 | 28   | 62.09 | 1555 | 70.15.2 | 792  | 71.2.4  | 673  |
| 48.03 | 658  | 58.01 | 1111 | 62.10 | 1556 | 70.16.2 | 795  | 71.1.6  | 101  |
| 48.04 | 659  | 58.02 | 1112 | 62.11 | 1166 | 70.3.1  | 626  | 71.2.5  | 376  |
| 48.05 | 660  | 58.03 | 1628 | 62.12 | 1167 | 70.10.3 | 778  | 71.1.7  | 53   |
| 48.06 | 661  | 58.04 | 1114 | 62.13 | 1168 | 70.1.3  | 1040 | 71.2.6  | 674  |
| 48.07 | 662  | 58.05 | 1115 | 62.14 | 1169 | 70.2.2  | 1042 | 71.1.8  | 323  |
| 48.08 | 663  | 58.06 | 1116 | 62.15 | 1170 | 70.11.3 | 781  | 71.2.7  | 675  |
| 48.09 | 664  | 58.07 | 1117 | 62.16 | 1171 | 70.12.3 | 784  | 71.2.8  | 377  |
| 48.10 | 665  | 58.08 | 1118 | 62.17 | 1173 | 70.13.3 | 787  |         |      |
| 48.11 | 666  | 58.09 | 1630 | 62.18 | 1172 | 70.14.3 | 790  |         |      |
| 48.12 | 667  | 58.10 | 1631 | 62.19 | 1615 | 70.15.3 | 793  |         |      |
| 48.13 | 668  | 59.01 | 1187 | 62.20 | 1057 | 70.16.3 | 796  |         |      |
| 48.14 | 669  | 59.02 | 1188 | 63.01 | 603  | 70.4.1  | 627  |         |      |
| 48.15 | 670  | 59.03 | 1189 | 63.02 | 689  | 70.10.4 | 779  |         |      |
| 48.16 | 671  | 59.04 | 1190 | 63.03 | 1025 | 70.1.4  | 1041 |         |      |

## Product-Related Default Values

All examples given in this book are based on a UK, 400V, 50Hz, 11kW drive.

### \* Frequency Dependent Defaults

These parameter values (marked with “\*” in function block descriptions and Application diagrams) are dependent upon the drive’s “default frequency”.

Changing the “default frequency” parameter from 50Hz to 60Hz, and vice versa, causes the values of the parameters in the table below to be changed.

To change the “default frequency”, power-down the drive. Power-up the drive holding down the STOP and DOWN keys on the keypad. Release the keys to display the ° 0.01 parameter.

#### Caution

You are now in a menu containing some sensitive and important parameters.

Press the UP key to display the ° 0.02 parameter. Press the M key. The values for this parameter are: 0 = 50Hz default, 1 = 60Hz default. Select the setting using the UP/DOWN keys and then press the E key. Power-down the drive and power-up again holding down the UP and DOWN keys. This resets **ALL** parameters to their correct default values, including Motor Parameters.

| Frequency Dependent Defaults                                                                                                                                                                                      |                  |                |      |                |                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------|------|----------------|----------------|
| Display                                                                                                                                                                                                           | Parameter        | Function Block | Tag  | 50Hz Operation | 60Hz Operation |
|                                                                                                                                                                                                                   | BASE FREQUENCY   | MOTOR DATA     | 1159 | 50Hz           | 60Hz           |
|                                                                                                                                                                                                                   | NAMEPLATE RPM    | MOTOR DATA     | 83   | #              | 1750 RPM       |
|                                                                                                                                                                                                                   | MOTOR VOLTAGE    | MOTOR DATA     | 1160 | *              | *              |
|                                                                                                                                                                                                                   | MAX SPEED        | REFERENCE      | 57   | 50Hz           | 60Hz           |
|                                                                                                                                                                                                                   | MOTOR CONNECTION | MOTOR DATA     | 124  | STAR           | STAR           |
| # The correct value is selected for the size of drive - refer to the Power Dependent Parameters table below<br>* The correct value is selected for the drive, however, when 60Hz is selected the 400V unit = 460V |                  |                |      |                |                |

## 2-26 Parameter Specification

### \*\* Power Dependent Defaults

These parameters (marked with “\*\*\*” in function block descriptions and Application diagrams) are set to a value depending on the drive's overall “power-build” indicated by the Product Code. We recommend that you do not change the Product Code.

| 230V Build Power Dependent Defaults |                 |      |             |             |             |             |             |             |
|-------------------------------------|-----------------|------|-------------|-------------|-------------|-------------|-------------|-------------|
| Parameter                           | Function Block  | Tag  | Frame 1     |             |             |             | Frame 2     |             |
|                                     |                 |      | 0.25kW      | 0.37kW      | 0.55kW      | 0.75kW      | 1.1kW       | 1.5kW       |
| POWER                               | MOTOR DATA      | 1158 | 0.25 kw     | 0.37 kw     | 0.55 kw     | 0.75 kw     | 1.10 kw     | 1.50 kw     |
| MOTOR CURRENT                       | MOTOR DATA      | 64   | 1.50 A      | 2.20 A      | 3.00 A      | 4.00 A      | 5.50 A      | 7.00 A      |
| MAG CURRENT                         | MOTOR DATA      | 65   | 0.80 A      | 0.80 A      | 1.04 A      | 1.36 A      | 2.50 A      | 3.41 A      |
| NAMEPLATE RPM                       | MOTOR DATA      | 83   | 1380.0 RPM  | 1380.0 RPM  | 1400.0 RPM  | 1400.0 RPM  | 1420.0 RPM  | 1420.0 RPM  |
| MOTOR VOLTAGE                       | MOTOR DATA      | 1160 | 230.0 V     | 230.0 V     | 230.0 V     | 230.0 V     | 230.0 V     | 230.0 V     |
| POWER FACTOR                        | MOTOR DATA      | 242  | 0.70        | 0.70        | 0.70        | 0.70        | 0.71        | 0.78        |
| STATOR RES                          | MOTOR DATA      | 119  | 5.2060 ohms | 5.2060 ohms | 3.8177 ohms | 2.9367 ohms | 1.5907 ohms | 1.1687 ohms |
| LEAKAGE INDUC                       | MOTOR DATA      | 120  | 110.47 mH   | 110.47 mH   | 81.01 mH    | 62.32 mH    | 33.76 mH    | 24.80 mH    |
| MUTUAL INDUC                        | MOTOR DATA      | 121  | 441.90 mH   | 441.90 mH   | 324.06 mH   | 249.28 mH   | 135.02 mH   | 99.20 mH    |
| ROTOR TIME CONST                    | MOTOR DATA      | 1163 | 91.17 ms    | 91.17 ms    | 109.40 ms   | 109.40 ms   | 136.75 ms   | 136.75 ms   |
| BRAKE POWER                         | DYNAMIC BRAKING | 78   | 0.1 kW      | 0.1 kW      | 0.1 kW      | 0.1 kW      | 0.1 kW      | 0.1 kW      |
| FREQUENCY                           | INJ BRAKING     | 577  | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      |
| DEFLUX TIME                         | INJ BRAKING     | 710  | 0.1 s       | 0.1 s       | 0.1 s       | 0.1 s       | 0.1 s       | 0.1 s       |
| BASE VOLTS                          | INJ BRAKING     | 739  | 100.00 %    | 100.00 %    | 100.00 %    | 100.00 %    | 100.00 %    | 100.00 %    |
| DC LEVEL                            | INJ BRAKING     | 581  | 10.0 %      | 10.0 %      | 10.0 %      | 10.0 %      | 3.0 %       | 3.0 %       |
| DC PULSE                            | INJ BRAKING     | 579  | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       |
| FINAL DC PULSE                      | INJ BRAKING     | 580  | 1.0 s       | 1.0 s       | 1.0 s       | 1.0 s       | 1.0 s       | 1.0 s       |
| FIXED BOOST                         | FLUXING         | 107  | 5.00%       | 5.00%       | 5.00%       | 5.00%       | 5.00%       | 5.00%       |
| ACCEL TIME                          | REFERENCE RAMP  | 258  | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      |
| DECEL TIME                          | REFERENCE RAMP  | 259  | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      |
| DEFLUX DELAY                        | PATTERN GEN     | 100  | 0.5 s       | 0.5 s       | 0.5 s       | 0.5 s       | 1.0 s       | 1.0 s       |
| SEARCH VOLTS                        | FLYCATCHING     | 573  | 9.00 %      | 9.00 %      | 9.00 %      | 9.00 %      | 9.00 %      | 9.00 %      |
| SEARCH BOOST                        | FLYCATCHING     | 32   | 40.00 %     | 40.00 %     | 40.00 %     | 40.00 %     | 40.00 %     | 40.00 %     |
| SEARCH TIME                         | FLYCATCHING     | 574  | 5.0 s       | 5.0 s       | 5.0 s       | 5.0 s       | 5.0 s       | 5.0 s       |
| REFLUX TIME                         | FLYCATCHING     | 709  | 3.0 s       | 3.0 s       | 3.0 s       | 3.0 s       | 3.0 s       | 3.0 s       |
| OVERLOAD                            | MOTOR DATA      | 1164 | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         |
| SPEED PROP GAIN                     | SPEED LOOP      | 1187 | 20          | 20          | 20          | 20          | 20          | 20          |
| SPEED INT TIME                      | SPEED LOOP      | 1188 | 500. ms     | 500. ms     | 500. ms     | 500. ms     | 500. ms     | 500. ms     |
| MOTOR CONNECTION                    | MOTOR DATA      | 124  | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    |
| BRAKE RESISTANCE                    | DYNAMIC BRAKING | 77   | 500         | 500         | 500         | 500         | 500         | 500         |
| BOOST MODE                          | FLUXING         | 1058 | 1           | 1           | 1           | 1           | 1           | 1           |

| 230V Build Power Dependent Defaults |                 |      |             |             |             |
|-------------------------------------|-----------------|------|-------------|-------------|-------------|
| Parameter                           | Function Block  | Tag  | Frame 3     |             |             |
|                                     |                 |      | 2.2kW       | 3.0kW       | 4.0kW       |
| POWER                               | MOTOR DATA      | 1158 | 2.2 kw      | 3.0 kw      | 4.0 kw      |
| MOTOR CURRENT                       | MOTOR DATA      | 64   | 9.60 A      | 12.30 A     | 16.40 A     |
| MAG CURRENT                         | MOTOR DATA      | 65   | 3.36 A      | 3.39 A      | 4.38 A      |
| NAMEPLATE RPM                       | MOTOR DATA      | 83   | 1420.0 RPM  | 1445.0 RPM  | 1450.0 RPM  |
| MOTOR VOLTAGE                       | MOTOR DATA      | 1160 | 230.0 V     | 230.0 V     | 230.0 V     |
| POWER FACTOR                        | MOTOR DATA      | 242  | 0.80        | 0.80        | 0.83        |
| STATOR RES                          | MOTOR DATA      | 119  | 2.0620 ohms | 1.3625 ohms | 1.0545 ohms |
| LEAKAGE INDUC                       | MOTOR DATA      | 120  | 43.76 mH    | 43.37 mH    | 33.57 mH    |
| MUTUAL INDUC                        | MOTOR DATA      | 121  | 175.03 mH   | 173.48 mH   | 134.27 mH   |
| ROTOR TIME CONST                    | MOTOR DATA      | 1163 | 136.75 ms   | 276.04 ms   | 303.65 ms   |
| BRAKE POWER                         | DYNAMIC BRAKING | 78   | 0.5 kW      | 0.5 kW      | 0.5 kW      |
| FREQUENCY                           | INJ BRAKING     | 577  | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      |
| DEFLUX TIME                         | INJ BRAKING     | 710  | 0.5 s       | 0.5 s       | 0.5 s       |
| BASE VOLTS                          | INJ BRAKING     | 739  | 100.00 %    | 100.00 %    | 100.00 %    |
| DC LEVEL                            | INJ BRAKING     | 581  | 3.0 %       | 3.0 %       | 3.0 %       |
| DC PULSE                            | INJ BRAKING     | 579  | 2.0 s       | 2.0 s       | 2.0 s       |
| FINAL DC PULSE                      | INJ BRAKING     | 580  | 1.0 s       | 1.0 s       | 1.0 s       |
| FIXED BOOST                         | FLUXING         | 107  | 3.00%       | 3.00%       | 3.00%       |
| ACCEL TIME                          | REFERENCE RAMP  | 258  | 10.0 s      | 10.0 s      | 10.0 s      |
| DECEL TIME                          | REFERENCE RAMP  | 259  | 10.0 s      | 10.0 s      | 10.0 s      |
| DEFLUX DELAY                        | PATTERN GEN     | 100  | 2.0 s       | 2.0 s       | 2.0 s       |
| SEARCH VOLTS                        | FLYCATCHING     | 573  | 9.00 %      | 9.00 %      | 9.00 %      |
| SEARCH BOOST                        | FLYCATCHING     | 32   | 40.00 %     | 40.00 %     | 40.00 %     |
| SEARCH TIME                         | FLYCATCHING     | 574  | 5.0 s       | 5.0 s       | 5.0 s       |
| REFLUX TIME                         | FLYCATCHING     | 709  | 3.0 s       | 3.0 s       | 3.0 s       |
| OVERLOAD                            | MOTOR DATA      | 1164 | 2.0         | 2.0         | 2.0         |
| SPEED PROP GAIN                     | SPEED LOOP      | 1187 | 20.00       | 20.00       | 20.00       |
| SPEED INT TIME                      | SPEED LOOP      | 1188 | 500. ms     | 500. ms     | 500. ms     |
| MOTOR CONNECTION                    | MOTOR DATA      | 124  | 1 : STAR    | 1 : STAR    | 1 : STAR    |
| BRAKE RESISTANCE                    | DYNAMIC BRAKING | 77   | 56          | 36          | 28          |
| BOOST MODE                          | FLUXING         | 1058 | 1           | 1           | 1           |

## 2-28 Parameter Specification

| 400V Build Power Dependent Defaults |                 |      |              |              |             |             |             |             |
|-------------------------------------|-----------------|------|--------------|--------------|-------------|-------------|-------------|-------------|
|                                     |                 |      | Frame 2      |              |             |             |             |             |
| Parameter                           | Function Block  | Tag  | 0.37kW       | 0.55kW       | 0.75kW      | 1.1kW       | 1.5kW       | 2.2kW       |
| POWER                               | MOTOR DATA      | 1158 | 0.37 kw      | 0.55 kw      | 0.75 kw     | 1.10 kw     | 1.50 kw     | 2.20 kw     |
| MOTOR CURRENT                       | MOTOR DATA      | 64   | 1.50 A       | 2.00 A       | 2.50 A      | 3.50 A      | 4.50 A      | 5.50 A      |
| MAG CURRENT                         | MOTOR DATA      | 65   | 0.44 A       | 0.60 A       | 0.78 A      | 1.00 A      | 1.44 A      | 1.96 A      |
| NAMEPLATE RPM                       | MOTOR DATA      | 83   | 1380.0 RPM   | 1400.0 RPM   | 1400.0 RPM  | 1420.0 RPM  | 1420.0 RPM  | 1420.0 RPM  |
| MOTOR VOLTAGE                       | MOTOR DATA      | 1160 | 400.0 V      | 400.0 V      | 400.0 V     | 400.0 V     | 400.0 V     | 400.0 V     |
| POWER FACTOR                        | MOTOR DATA      | 242  | 0.70         | 0.70         | 0.70        | 0.71        | 0.71        | 0.78        |
| STATOR RES                          | MOTOR DATA      | 119  | 15.7459 ohms | 11.5470 ohms | 8.8823 ohms | 1.5907 ohms | 4.8113 ohms | 3.5348 ohms |
| LEAKAGE INDUC                       | MOTOR DATA      | 120  | 334.14 mH    | 245.04 mH    | 188.49 mH   | 33.76 mH    | 102.10 mH   | 75.01 mH    |
| MUTUAL INDUC                        | MOTOR DATA      | 121  | 1336.55 mH   | 980.14 mH    | 753.95 mH   | 135.02 mH   | 408.39 mH   | 300.04 mH   |
| ROTOR TIME CONST                    | MOTOR DATA      | 1163 | 91.17 ms     | 109.40 ms    | 109.40 ms   | 136.75 ms   | 136.75 ms   | 136.75 ms   |
| BRAKE POWER                         | DYNAMIC BRAKING | 78   | 0.1 kW       | 0.1 kW       | 0.1 kW      | 0.1 kW      | 0.1 kW      | 0.1 kW      |
| FREQUENCY                           | INJ BRAKING     | 577  | 9.0 Hz       | 9.0 Hz       | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      |
| DEFLUX TIME                         | INJ BRAKING     | 710  | 0.1 s        | 0.1 s        | 0.1 s       | 0.1 s       | 0.1 s       | 0.1 s       |
| BASE VOLTS                          | INJ BRAKING     | 739  | 100.00 %     | 100.00 %     | 100.00 %    | 100.00 %    | 100.00 %    | 100.00 %    |
| DC LEVEL                            | INJ BRAKING     | 581  | 3.0 %        | 3.0 %        | 3.0 %       | 3.0 %       | 3.0 %       | 3.0 %       |
| DC PULSE                            | INJ BRAKING     | 579  | 2.0 s        | 2.0 s        | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       |
| FINAL DC PULSE                      | INJ BRAKING     | 580  | 1.0 s        | 1.0 s        | 1.0 s       | 1.0 s       | 1.0 s       | 1.0 s       |
| FIXED BOOST                         | FLUXING         | 107  | 5.00%        | 5.00%        | 5.00%       | 5.00%       | 5.00%       | 5.00%       |
| ACCEL TIME                          | REFERENCE RAMP  | 258  | 10.0 s       | 10.0 s       | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      |
| DECEL TIME                          | REFERENCE RAMP  | 259  | 10.0 s       | 10.0 s       | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      |
| DEFLUX DELAY                        | PATTERN GEN     | 100  | 1.0 s        | 1.0 s        | 1.0 s       | 1.0 s       | 1.0 s       | 1.0 s       |
| SEARCH VOLTS                        | FLYCATCHING     | 573  | 9.00 %       | 9.00 %       | 9.00 %      | 9.00 %      | 9.00 %      | 9.00 %      |
| SEARCH BOOST                        | FLYCATCHING     | 32   | 40.00 %      | 40.00 %      | 40.00 %     | 40.00 %     | 40.00 %     | 40.00 %     |
| SEARCH TIME                         | FLYCATCHING     | 574  | 5.0 s        | 5.0 s        | 5.0 s       | 5.0 s       | 5.0 s       | 5.0 s       |
| REFLUX TIME                         | FLYCATCHING     | 709  | 3.0 s        | 3.0 s        | 3.0 s       | 3.0 s       | 3.0 s       | 3.0 s       |
| OVERLOAD                            | MOTOR DATA      | 1164 | 2.0          | 2.0          | 2.0         | 2.0         | 2.0         | 2.0         |
| SPEED PROP GAIN                     | SPEED LOOP      | 1187 | 20           | 20           | 20          | 20          | 20          | 20          |
| SPEED INT TIME                      | SPEED LOOP      | 1188 | 500. ms      | 500. ms      | 500. ms     | 500. ms     | 500. ms     | 500. ms     |
| MOTOR CONNECTION                    | MOTOR DATA      | 124  | 1 : STAR     | 1 : STAR     | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    |
| BRAKE RESISTANCE                    | DYNAMIC BRAKING | 77   | 500          | 500          | 500         | 200         | 200         | 200         |
| BOOST MODE                          | FLUXING         | 1058 | 1            | 1            | 1           | 1           | 1           | 1           |

| 400V Build Power Dependent Defaults |                 |      |             |             |             |             |
|-------------------------------------|-----------------|------|-------------|-------------|-------------|-------------|
| Parameter                           | Function Block  | Tag  | Frame 3     |             |             |             |
|                                     |                 |      |             |             |             |             |
| POWER                               | MOTOR DATA      | 1158 | 3.00 kw     | 4.00 kw     | 5.50 kw     | 7.50 kw     |
| MOTOR CURRENT                       | MOTOR DATA      | 64   | 6.80 A      | 9.00 A      | 12.00 A     | 16.00 A     |
| MAG CURRENT                         | MOTOR DATA      | 65   | 2.36 A      | 3.36 A      | 3.39 A      | 4.38 A      |
| NAMEPLATE RPM                       | MOTOR DATA      | 83   | 1420.0 RPM  | 1420.0 RPM  | 1445.0 RPM  | 1450.0 RPM  |
| MOTOR VOLTAGE                       | MOTOR DATA      | 1160 | 400.0 V     | 400.0 V     | 400.0 V     | 400.0 V     |
| POWER FACTOR                        | MOTOR DATA      | 242  | 0.8         | 0.8         | 0.8         | 0.8         |
| STATOR RES                          | MOTOR DATA      | 119  | 2.0620 ohms | 2.0620 ohms | 1.3625 ohms | 1.0545 ohms |
| LEAKAGE INDUC                       | MOTOR DATA      | 120  | 43.76 mH    | 43.76 mH    | 43.37 mH    | 33.57 mH    |
| MUTUAL INDUC                        | MOTOR DATA      | 121  | 175.03 mH   | 175.03 mH   | 173.48 mH   | 134.27 mH   |
| ROTOR TIME CONST                    | MOTOR DATA      | 1163 | 136.75 ms   | 136.75 ms   | 276.04 ms   | 303.65 ms   |
| BRAKE POWER                         | DYNAMIC BRAKING | 78   | 0.2 kW      | 0.2 kW      | 0.5 kW      | 0.5 kW      |
| FREQUENCY                           | INJ BRAKING     | 577  | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      |
| DEFLUX TIME                         | INJ BRAKING     | 710  | 0.5 s       | 0.5 s       | 0.5 s       | 0.5 s       |
| BASE VOLTS                          | INJ BRAKING     | 739  | 100.00 %    | 100.00 %    | 100.00 %    | 100.00 %    |
| DC LEVEL                            | INJ BRAKING     | 581  | 3.0 %       | 3.0 %       | 3.0 %       | 3.0 %       |
| DC PULSE                            | INJ BRAKING     | 579  | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       |
| FINAL DC PULSE                      | INJ BRAKING     | 580  | 1.0 s       | 1.0 s       | 1.0 s       | 1.0 s       |
| FIXED BOOST                         | FLUXING         | 107  | 5.00%       | 5.00%       | 5.00%       | 5.00%       |
| ACCEL TIME                          | REFERENCE RAMP  | 258  | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      |
| DECEL TIME                          | REFERENCE RAMP  | 259  | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      |
| DEFLUX DELAY                        | PATTERN GEN     | 100  | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       |
| SEARCH VOLTS                        | FLYCATCHING     | 573  | 9.00 %      | 9.00 %      | 9.00 %      | 9.00 %      |
| SEARCH BOOST                        | FLYCATCHING     | 32   | 40.00 %     | 40.00 %     | 40.00 %     | 40.00 %     |
| SEARCH TIME                         | FLYCATCHING     | 574  | 5.0 s       | 5.0 s       | 5.0 s       | 5.0 s       |
| REFLUX TIME                         | FLYCATCHING     | 709  | 3.0 s       | 3.0 s       | 3.0 s       | 3.0 s       |
| OVERLOAD                            | MOTOR DATA      | 1164 | 2.0         | 2.0         | 2.0         | 2.0         |
| SPEED PROP GAIN                     | SPEED LOOP      | 1187 | 20          | 20          | 20          | 20          |
| SPEED INT TIME                      | SPEED LOOP      | 1188 | 500. ms     | 500. ms     | 500. ms     | 500. ms     |
| MOTOR CONNECTION                    | MOTOR DATA      | 124  | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    |
| BRAKE RESISTANCE                    | DYNAMIC BRAKING | 77   | 100         | 100         | 56          | 56          |
| BOOST MODE                          | FLUXING         | 1058 | 1           | 1           | 1           | 1           |

## 2-30 Parameter Specification

| 230V Build Power Dependent Defaults |                 |      |             |             |             |             |             |
|-------------------------------------|-----------------|------|-------------|-------------|-------------|-------------|-------------|
|                                     |                 |      | Frame C     |             | Frame D     |             |             |
| Parameter                           | Function Block  | Tag  | 5.5kW       | 7.5kW       | 11kW        | 15kW        | 18.5kW      |
| POWER                               | MOTOR DATA      | 1158 | 5.50 kw     | 7.50 kw     | 11.00 kw    | 15.00 kw    | 18.50 kw    |
| MOTOR CURRENT                       | MOTOR DATA      | 64   | 19.65 A     | 25.39 A     | 34.78 A     | 46.96 A     | 57.16 A     |
| MAG CURRENT                         | MOTOR DATA      | 65   | 5.90 A      | 7.62 A      | 10.43 A     | 14.09 A     | 17.15 A     |
| NAMEPLATE RPM                       | MOTOR DATA      | 83   | 1445.0 RPM  | 1450.0 RPM  | 1460.0 RPM  | 1470.0 RPM  | 1470.0 RPM  |
| MOTOR VOLTAGE                       | MOTOR DATA      | 1160 | 230.0 V     | 230.0 V     | 230.0 V     | 230.0 V     | 230.0 V     |
| POWER FACTOR                        | MOTOR DATA      | 242  | 0.80        | 0.83        | 0.86        | 0.87        | 0.87        |
| STATOR RES                          | MOTOR DATA      | 119  | 0.4505 ohms | 0.3487 ohms | 0.2545 ohms | 0.1885 ohms | 0.1543 ohms |
| LEAKAGE INDUC                       | MOTOR DATA      | 120  | 14.34 mH    | 11.10 mH    | 8.10 mH     | 6.00 mH     | 4.91 mH     |
| MUTUAL INDUC                        | MOTOR DATA      | 121  | 57.36 mH    | 44.39 mH    | 32.41 mH    | 24.00 mH    | 19.64 mH    |
| ROTOR TIME CONST                    | MOTOR DATA      | 1163 | 276.04 ms   | 303.65 ms   | 379.56 ms   | 506.08 ms   | 506.08 ms   |
| BRAKE POWER                         | DYNAMIC BRAKING | 78   | 0.1kw       | 0.1 kw      | 0.1 kw      | 0.1 kw      | 0.1 kw      |
| FREQUENCY                           | INJ BRAKING     | 577  | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      |
| DEFLUX TIME                         | INJ BRAKING     | 710  | 0.5 s       | 0.5 s       | 1.0 s       | 1.0 s       | 1.0 s       |
| BASE VOLTS                          | INJ BRAKING     | 739  | 100.00%     | 100.00%     | 100.00%     | 100.00%     | 100.00%     |
| DC LEVEL                            | INJ BRAKING     | 581  | 2.50%       | 2.50%       | 1.80%       | 1.80%       | 1.80%       |
| DC PULSE                            | INJ BRAKING     | 579  | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       |
| FINAL DC PULSE                      | INJ BRAKING     | 580  | 1.0 s       | 1.0 s       | 3.0 s       | 3.0 s       | 3.0 s       |
| FIXED BOOST                         | FLUXING         | 107  | 0.00%       | 0.00%       | 0.00%       | 0.00%       | 0.00%       |
| ACCEL TIME                          | REFERENCE RAMP  | 258  | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      |
| DECEL TIME                          | REFERENCE RAMP  | 259  | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      |
| DEFLUX DELAY                        | PATTERN GEN     | 100  | 2.0 s       | 2.0 s       | 3.0 s       | 3.0 s       | 3.0 s       |
| SEARCH VOLTS                        | FLYCATCHING     | 573  | 9.00%       | 9.00%       | 9.00%       | 9.00%       | 9.00%       |
| SEARCH BOOST                        | FLYCATCHING     | 32   | 40.00%      | 40.00%      | 15.00%      | 15.00%      | 15.00%      |
| SEARCH TIME                         | FLYCATCHING     | 574  | 10.0 s      | 10.0 s      | 15.0 s      | 15.0 s      | 15.0 s      |
| REFLUX TIME                         | FLYCATCHING     | 709  | 3.0 s       | 3.0 s       | 4.0 s       | 4.0 s       | 4.0 s       |
| OVERLOAD                            | MOTOR DATA      | 1164 | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         |
| SPEED PROP GAIN                     | SPEED LOOP      | 1187 | 20.00       | 20.00       | 20.00       | 20.00       | 20.00       |
| SPEED INT TIME                      | SPEED LOOP      | 1188 | 100 ms      | 100 ms      | 100 ms      | 100 ms      | 100 ms      |
| MOTOR CONNECTION                    | MOTOR DATA      | 124  | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    |
| BRAKE RESISTANCE                    | DYNAMIC BRAKING | 77   | 100         | 100         | 100         | 100         | 100         |
| BOOST MODE                          | FLUXING         | 1058 | 0           | 0           | 0           | 0           | 0           |

| 230V Build Power Dependent Defaults |                 |      |             |             |             |             |
|-------------------------------------|-----------------|------|-------------|-------------|-------------|-------------|
|                                     |                 |      | Frame E     | Frame F     |             |             |
| Parameter                           | Function Block  | Tag  | 22kW        | 30kW        | 37kW        | 45kW        |
| POWER                               | MOTOR DATA      | 1158 | 22.00 kw    | 30.00 kw    | 37.00 kw    | 45.00 kw    |
| MOTOR CURRENT                       | MOTOR DATA      | 64   | 65.82 A     | 93.53 A     | 114.32 A    | 136.83 A    |
| MAG CURRENT                         | MOTOR DATA      | 65   | 19.75 A     | 28.06 A     | 34.27 A     | 41.05 A     |
| NAMEPLATE RPM                       | MOTOR DATA      | 83   | 1470.0 RPM  | 1470.0 RPM  | 1470.0 RPM  | 1470.0 RPM  |
| MOTOR VOLTAGE                       | MOTOR DATA      | 1160 | 230.0 V     | 230.0 V     | 230.0 V     | 230.0 V     |
| POWER FACTOR                        | MOTOR DATA      | 242  | 0.87        | 0.87        | 0.87        | 0.87        |
| STATOR RES                          | MOTOR DATA      | 119  | 0.1340 ohms | 0.0943 ohms | 0.0771 ohms | 0.0644 ohms |
| LEAKAGE INDUC                       | MOTOR DATA      | 120  | 4.26 mH     | 3.00 mH     | 4.45 mH     | 2.05 mH     |
| MUTUAL INDUC                        | MOTOR DATA      | 121  | 17.06 mH    | 12.00 mH    | 9.82 mH     | 8.20 mH     |
| ROTOR TIME CONST                    | MOTOR DATA      | 1163 | 506.08 ms   | 506.08 ms   | 506.08 ms   | 506.08 ms   |
| BRAKE POWER                         | DYNAMIC BRAKING | 78   | 0.1 kw      | 0.1 kw      | 0.1 kw      | 0.1 kw      |
| FREQUENCY                           | INJ BRAKING     | 577  | 6.0 Hz      | 6.0 Hz      | 6.0 Hz      | 6.0 Hz      |
| DEFLUX TIME                         | INJ BRAKING     | 710  | 1.0 s       | 2.0 s       | 2.0 s       | 2.0 s       |
| BASE VOLTS                          | INJ BRAKING     | 739  | 75.00 %     | 75.00 %     | 75.00 %     | 75.00 %     |
| DC LEVEL                            | INJ BRAKING     | 581  | 1.3 %       | 1.3 %       | 1.3 %       | 1.3 %       |
| DC PULSE                            | INJ BRAKING     | 579  | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       |
| FINAL DC PULSE                      | INJ BRAKING     | 580  | 3.0 s       | 3.0 s       | 3.0 s       | 3.0 s       |
| FIXED BOOST                         | FLUXING         | 107  | 0.00%       | 0.00%       | 0.00%       | 0.00%       |
| ACCEL TIME                          | REFERENCE RAMP  | 258  | 20.0 s      | 30.0 s      | 30.0 s      | 30.0 s      |
| DECEL TIME                          | REFERENCE RAMP  | 259  | 20.0 s      | 30.0 s      | 30.0 s      | 30.0 s      |
| DEFLUX DELAY                        | PATTERN GEN     | 100  | 4.0 s       | 4.0 s       | 4.0 s       | 4.0 s       |
| SEARCH VOLTS                        | FLYCATCHING     | 573  | 8.00%       | 8.00%       | 8.00%       | 8.00%       |
| SEARCH BOOST                        | FLYCATCHING     | 32   | 15.00%      | 15.00%      | 15.00%      | 15.00%      |
| SEARCH TIME                         | FLYCATCHING     | 574  | 15.0 s      | 15.0 s      | 15.0 s      | 15.0 s      |
| REFLUX TIME                         | FLYCATCHING     | 709  | 5.0 s       | 6.0 s       | 6.0 s       | 6.0 s       |
| OVERLOAD                            | MOTOR DATA      | 1164 | 2.0         | 2.2         | 2.2         | 2.2         |
| SPEED PROP GAIN                     | SPEED LOOP      | 1187 | 20.00       | 20.00       | 20.00       | 20.00       |
| SPEED INT TIME                      | SPEED LOOP      | 1188 | 100 ms      | 100 ms      | 100 ms      | 100 ms      |
| MOTOR CONNECTION                    | MOTOR DATA      | 124  | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    |
| BRAKE RESISTANCE                    | DYNAMIC BRAKING | 77   | 100         | 100         | 100         | 100         |
| BOOST MODE                          | FLUXING         | 1058 | 0           | 0           | 0           | 0           |

# 2-32 Parameter Specification

| 400V Build Power Dependent Defaults |                 |      |             |             |             |             |             |             |             |
|-------------------------------------|-----------------|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Parameter                           | Function Block  | Tag  | Frame C     |             |             | Frame D     |             |             |             |
|                                     |                 |      | 7.5kW       | 11kW        | 15kW        | 15kW        | 18.5kW      | 22kW        | 30kW        |
| POWER                               | MOTOR DATA      | 1158 | 7.50 kw     | 11.00 kw    | 15.00 kw    | 15.00 kw    | 18.50 kw    | 22.00 kw    | 30.00 kw    |
| MOTOR CURRENT                       | MOTOR DATA      | 64   | 14.60A      | 20.00A      | 27.00A      | 27.00A      | 33.00A      | 38.00A      | 54.00A      |
| MAG CURRENT                         | MOTOR DATA      | 65   | 4.38 A      | 6.00 A      | 8.10 A      | 8.10 A      | 9.90 A      | 11.40A      | 16.20A      |
| NAMEPLATE RPM                       | MOTOR DATA      | 83   | 1450.0 RPM  | 1460.0 RPM  | 1470.0 RPM  | 1470.0 RPM  | 1460.0 RPM  | 1460.0 RPM  | 1470.0 RPM  |
| MOTOR VOLTAGE                       | MOTOR DATA      | 1160 | 400.0 V     | 400.0 V     | 400.0 V     | 400.0 V     | 400.0 V     | 400.0 V     | 400.0 V     |
| POWER FACTOR                        | MOTOR DATA      | 242  | 0.83        | 0.86        | 0.87        | 0.87        | 0.88        | 0.88        | 0.86        |
| STATOR RES                          | MOTOR DATA      | 119  | 1.0545 ohms | 0.7698 ohms | 0.5702 ohms | 0.5702 ohms | 0.4665 ohms | 0.4052 ohms | 0.2851 ohms |
| LEAKAGE INDUC                       | MOTOR DATA      | 120  | 33.57 mH    | 24.50 mH    | 18.15 mH    | 18.15 mH    | 14.85 mH    | 12.90 mH    | 9.08 mH     |
| MUTUAL INDUC                        | MOTOR DATA      | 121  | 134.27 mH   | 98.01 mH    | 72.60 mH    | 72.60 mH    | 59.40 mH    | 51.59 mH    | 36.30 mH    |
| ROTOR TIME CONST                    | MOTOR DATA      | 1163 | 303.65 ms   | 379.56 ms   | 506.08 ms   | 506.08 ms   | 379.56 ms   | 379.56 ms   | 506.08 ms   |
| BRAKE POWER                         | DYNAMIC BRAKING | 78   | 0.1kw       | 0.1kw       | 0.1kw       | 0.1kw       | 0.1kw       | 0.1kw       | 0.1kw       |
| FREQUENCY                           | INJ BRAKING     | 577  | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      |
| DEFLUX TIME                         | INJ BRAKING     | 710  | 0.5 s       | 0.5 s       | 0.5 s       | 1.0 s       | 1.0 s       | 1.0 s       | 1.0 s       |
| BASE VOLTS                          | INJ BRAKING     | 739  | 100.00%     | 100.00%     | 100.00%     | 100.00%     | 100.00%     | 100.00%     | 100.00%     |
| DC LEVEL                            | INJ BRAKING     | 581  | 2.50%       | 2.50%       | 2.50%       | 1.80%       | 1.80%       | 1.80%       | 1.80%       |
| DC PULSE                            | INJ BRAKING     | 579  | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       |
| FINAL DC PULSE                      | INJ BRAKING     | 580  | 1.0 s       | 1.0 s       | 1.0 s       | 3.0 s       | 3.0 s       | 3.0 s       | 3.0 s       |
| FIXED BOOST                         | FLUXING         | 107  | 0.00%       | 0.00%       | 0.00%       | 0.00%       | 0.00%       | 0.00%       | 0.00%       |
| ACCEL TIME                          | REFERENCE RAMP  | 258  | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      |
| DECEL TIME                          | REFERENCE RAMP  | 259  | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      |
| DEFLUX DELAY                        | PATTERN GEN     | 100  | 2.0 s       | 2.0 s       | 2.0 s       | 3.0 s       | 3.0 s       | 3.0 s       | 3.0 s       |
| SEARCH VOLTS                        | FLYCATCHING     | 573  | 9.00%       | 9.00%       | 9.00%       | 9.00%       | 9.00%       | 9.00%       | 9.00%       |
| SEARCH BOOST                        | FLYCATCHING     | 32   | 40.00%      | 40.00%      | 40.00%      | 15.00%      | 15.00%      | 15.00%      | 15.00%      |
| SEARCH TIME                         | FLYCATCHING     | 574  | 10.0 s      | 10.0 s      | 10.0 s      | 15.0 s      | 15.0 s      | 15.0 s      | 15.0 s      |
| REFLUX TIME                         | FLYCATCHING     | 709  | 3.0 s       | 3.0 s       | 3.0 s       | 4.0 s       | 4.0 s       | 4.0 s       | 4.0 s       |
| OVERLOAD                            | MOTOR DATA      | 1164 | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         |
| SPEED PROP GAIN                     | SPEED LOOP      | 1187 | 20.00       | 20.00       | 20.00       | 20.00       | 20.00       | 20.00       | 20.00       |
| SPEED INT TIME                      | SPEED LOOP      | 1188 | 100 ms      | 100 ms      | 100 ms      | 100 ms      | 100 ms      | 100 ms      | 100 ms      |
| MOTOR CONNECTION                    | MOTOR DATA      | 124  | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    |
| BRAKE RESISTANCE                    | DYNAMIC BRAKING | 77   | 100         | 100         | 100         | 100         | 100         | 100         | 100         |
| BOOST MODE                          | FLUXING         | 1058 | 0           | 0           | 0           | 0           | 0           | 0           | 0           |

| 400V Build Power Dependent Defaults |                 |      |             |             |             |             |             |             |
|-------------------------------------|-----------------|------|-------------|-------------|-------------|-------------|-------------|-------------|
|                                     |                 |      | Frame E     |             |             | Frame F     |             |             |
| Parameter                           | Function Block  | Tag  | 30kW        | 37kW        | 45kW        | 55kW        | 75kW        | 90kW        |
| POWER                               | MOTOR DATA      | 1158 | 30.00 kw    | 37.00 kw    | 45.00 kw    | 55.00 kw    | 75.00 kw    | 90.00 kw    |
| MOTOR CURRENT                       | MOTOR DATA      | 64   | 54.00A      | 66.00 A     | 79.00 A     | 97.00 A     | 132.00 A    | 151.00 A    |
| MAG CURRENT                         | MOTOR DATA      | 65   | 16.20A      | 19.80 A     | 23.70 A     | 29.10 A     | 39.60 A     | 45.30 A     |
| NAMEPLATE RPM                       | MOTOR DATA      | 83   | 1470.0 RPM  | 1470.0 RPM  | 1470.0 RPM  | 1475.0 RPM  | 1475.0 RPM  | 1480.0 RPM  |
| MOTOR VOLTAGE                       | MOTOR DATA      | 1160 | 400.0 V     | 400.0 V     | 400.0 V     | 400.0 V     | 400.0 V     | 400.0 V     |
| POWER FACTOR                        | MOTOR DATA      | 242  | 0.86        | 0.85        | 0.87        | 0.86        | 0.87        | 0.90        |
| STATOR RES                          | MOTOR DATA      | 119  | 0.2851 ohms | 0.2333 ohms | 0.1949 ohms | 0.1587 ohms | 0.1166 ohms | 0.1020 ohms |
| LEAKAGE INDUC                       | MOTOR DATA      | 120  | 9.08 mH     | 7.43 mH     | 6.20 mH     | 5.05 mH     | 3.71 mH     | 3.25 mH     |
| MUTUAL INDUC                        | MOTOR DATA      | 121  | 36.30 mH    | 29.70 mH    | 24.81 mH    | 20.21 mH    | 14.85 mH    | 12.98 mH    |
| ROTOR TIME CONST                    | MOTOR DATA      | 1163 | 506.08 ms   | 506.08 ms   | 506.08 ms   | 607.30 ms   | 607.30 ms   | 759.12 ms   |
| BRAKE POWER                         | DYNAMIC BRAKING | 78   | 0.1kw       | 0.1 kw      | 0.1 kw      | 0.1 kw      | 0.1 kw      | 0.1 kw      |
| FREQUENCY                           | INJ BRAKING     | 577  | 6.0 Hz      | 6.0 Hz      | 6.0 Hz      | 6.0 Hz      | 6.0 Hz      | 6.0 Hz      |
| DEFLUX TIME                         | INJ BRAKING     | 710  | 1.0 s       | 1.0 s       | 1.0 s       | 2.0 s       | 2.0 s       | 2.0 s       |
| BASE VOLTS                          | INJ BRAKING     | 739  | 75.00%      | 75.00%      | 75.00%      | 75.00%      | 75.00%      | 75.00%      |
| DC LEVEL                            | INJ BRAKING     | 581  | 1.30%       | 1.30%       | 1.30%       | 1.30%       | 1.30%       | 1.30%       |
| DC PULSE                            | INJ BRAKING     | 579  | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       |
| FINAL DC PULSE                      | INJ BRAKING     | 580  | 3.0 s       | 3.0 s       | 3.0 s       | 3.0 s       | 3.0 s       | 3.0 s       |
| FIXED BOOST                         | FLUXING         | 107  | 0.00%       | 0.00%       | 0.00%       | 0.00%       | 0.00%       | 0.00%       |
| ACCEL TIME                          | REFERENCE RAMP  | 258  | 20.0 s      | 20.0 s      | 20.0 s      | 30.0 s      | 30.0 s      | 30.0 s      |
| DECEL TIME                          | REFERENCE RAMP  | 259  | 20.0 s      | 20.0 s      | 20.0 s      | 30.0 s      | 30.0 s      | 30.0 s      |
| DEFLUX DELAY                        | PATTERN GEN     | 100  | 4.0 s       | 4.0 s       | 4.0 s       | 4.0 s       | 4.0 s       | 4.0 s       |
| SEARCH VOLTS                        | FLYCATCHING     | 573  | 8.00%       | 8.00%       | 8.00%       | 8.00%       | 8.00%       | 8.00%       |
| SEARCH BOOST                        | FLYCATCHING     | 32   | 15.00%      | 15.00%      | 15.00%      | 15.00%      | 15.00%      | 15.00%      |
| SEARCH TIME                         | FLYCATCHING     | 574  | 15.0 s      | 15.0 s      | 15.0 s      | 15.0 s      | 15.0 s      | 15.0 s      |
| REFLUX TIME                         | FLYCATCHING     | 709  | 5.0 s       | 5.0 s       | 5.0 s       | 6.0 s       | 6.0 s       | 6.0 s       |
| OVERLOAD                            | MOTOR DATA      | 1164 | 2.0         | 2.0         | 2.0         | 2.2         | 2.2         | 2.2         |
| SPEED PROP GAIN                     | SPEED LOOP      | 1187 | 20.00       | 20.00       | 20.00       | 20.00       | 20.00       | 20.00       |
| SPEED INT TIME                      | SPEED LOOP      | 1188 | 100 ms      | 100 ms      | 100 ms      | 100 ms      | 100 ms      | 100 ms      |
| MOTOR CONNECTION                    | MOTOR DATA      | 124  | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    |
| BRAKE RESISTANCE                    | DYNAMIC BRAKING | 77   | 100         | 100         | 100         | 100         | 100         | 100         |
| BOOST MODE                          | FLUXING         | 1058 | 0           | 0           | 0           | 0           | 0           | 0           |

## 2-34 Parameter Specification

| 460V Build Power Dependent Defaults (US) |                 |      |             |             |             |             |             |
|------------------------------------------|-----------------|------|-------------|-------------|-------------|-------------|-------------|
| Parameter                                | Function Block  | Tag  | Frame C     |             |             | Frame D     |             |
|                                          |                 |      | 10HP        | 15HP        | 20HP        | 30HP        | 40HP        |
| POWER                                    | MOTOR DATA      | 1158 | 7.50 kw     | 11.00 kw    | 15.00 kw    | 22.00 kw    | 30.00 kw    |
| MOTOR CURRENT                            | MOTOR DATA      | 64   | 14.00 A     | 20.00 A     | 27.00 A     | 38.00 A     | 52.00 A     |
| MAG CURRENT                              | MOTOR DATA      | 65   | 4.38 A      | 6.00 A      | 8.10 A      | 11.40 A     | 16.20 A     |
| NAMEPLATE RPM                            | MOTOR DATA      | 83   | 1750.0 RPM  | 1750.0 RPM  | 1750.0 RPM  | 1750.0 RPM  | 1750.0 RPM  |
| MOTOR VOLTAGE                            | MOTOR DATA      | 1160 | 460.0 V     | 460.0 V     | 460.0 V     | 460.0 V     | 460.0 V     |
| POWER FACTOR                             | MOTOR DATA      | 242  | 0.83        | 0.86        | 0.87        | 0.88        | 0.86        |
| STATOR RES                               | MOTOR DATA      | 119  | 1.0545 ohms | 0.7698 ohms | 0.5702 ohms | 0.4052 ohms | 0.2851 ohms |
| LEAKAGE INDUC                            | MOTOR DATA      | 120  | 33.57 mH    | 24.50 mH    | 18.15 mH    | 12.90 mH    | 9.08 mH     |
| MUTUAL INDUC                             | MOTOR DATA      | 121  | 134.27 mH   | 98.01 mH    | 72.60 mH    | 51.59 mH    | 36.30 mH    |
| ROTOR TIME CONST                         | MOTOR DATA      | 1163 | 303.65 ms   | 379.56 ms   | 506.08 ms   | 379.56 ms   | 506.08 ms   |
| BRAKE POWER                              | DYNAMIC BRAKING | 78   | 0.1 kw      | 0.1 kw      | 0.1 kw      | 0.1 kw      | 0.1 kw      |
| FREQUENCY                                | INJ BRAKING     | 577  | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      | 9.0 Hz      |
| DEFLUX TIME                              | INJ BRAKING     | 710  | 0.5 s       | 0.5 s       | 0.5 s       | 1.0 s       | 1.0 s       |
| BASE VOLTS                               | INJ BRAKING     | 739  | 100.00%     | 100.00%     | 100.00%     | 100.00%     | 100.00%     |
| DC LEVEL                                 | INJ BRAKING     | 581  | 2.50%       | 2.50%       | 2.50%       | 1.80%       | 1.80%       |
| DC PULSE                                 | INJ BRAKING     | 579  | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       |
| FINAL DC PULSE                           | INJ BRAKING     | 580  | 1.0 s       | 1.0 s       | 1.0 s       | 3.0 s       | 3.0 s       |
| FIXED BOOST                              | FLUXING         | 107  | 0.00%       | 0.00%       | 0.00%       | 0.00%       | 0.00%       |
| ACCEL TIME                               | REFERENCE RAMP  | 258  | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      |
| DECEL TIME                               | REFERENCE RAMP  | 259  | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      | 10.0 s      |
| DEFLUX DELAY                             | PATTERN GEN     | 100  | 2.0 s       | 2.0 s       | 2.0 s       | 3.0 s       | 3.0 s       |
| SEARCH VOLTS                             | FLYCATCHING     | 573  | 9.00%       | 9.00%       | 9.00%       | 9.00%       | 9.00%       |
| SEARCH BOOST                             | FLYCATCHING     | 32   | 40.00%      | 40.00%      | 40.00%      | 15.00%      | 15.00%      |
| SEARCH TIME                              | FLYCATCHING     | 574  | 10.0 s      | 10.0 s      | 10.0 s      | 15.0 s      | 15.0 s      |
| REFLUX TIME                              | FLYCATCHING     | 709  | 3.0 s       | 3.0 s       | 3.0 s       | 4.0 s       | 4.0 s       |
| OVERLOAD                                 | MOTOR DATA      | 1164 | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         |
| SPEED PROP GAIN                          | SPEED LOOP      | 1187 | 20.00       | 20.00       | 20.00       | 20.00       | 20.00       |
| SPEED INT TIME                           | SPEED LOOP      | 1188 | 100 ms      | 100 ms      | 100 ms      | 100 ms      | 100 ms      |
| MOTOR CONNECTION                         | MOTOR DATA      | 124  | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    |
| BRAKE RESISTANCE                         | DYNAMIC BRAKING | 77   | 100         | 100         | 100         | 100         | 100         |
| BOOST MODE                               | FLUXING         | 1058 | 0           | 0           | 0           | 0           | 0           |

| 460V Build Power Dependent Defaults (US) |                 |      |             |             |             |             |
|------------------------------------------|-----------------|------|-------------|-------------|-------------|-------------|
|                                          |                 |      | Frame F     |             |             |             |
| Parameter                                | Function Block  | Tag  | 75HP        | 100HP       | 125HP       | 150HP       |
| POWER                                    | MOTOR DATA      | 1158 | 55.00 kw    | 75.00 kw    | 90.00 kw    | 90.00 kw    |
| MOTOR CURRENT                            | MOTOR DATA      | 64   | 97.00 A     | 130.00 A    | 151.00 A    | 151.00 A    |
| MAG CURRENT                              | MOTOR DATA      | 65   | 29.10 A     | 39.60 A     | 45.30 A     | 45.30 A     |
| NAMEPLATE RPM                            | MOTOR DATA      | 83   | 1750.0 RPM  | 1750.0 RPM  | 1750.0 RPM  | 1750.0 RPM  |
| MOTOR VOLTAGE                            | MOTOR DATA      | 1160 | 460.0 V     | 460.0 V     | 460.0 V     | 460.0 V     |
| POWER FACTOR                             | MOTOR DATA      | 242  | 0.86        | 0.87        | 0.9         | 0.9         |
| STATOR RES                               | MOTOR DATA      | 119  | 0.1587 ohms | 0.1166 ohms | 0.1020 ohms | 0.1020 ohms |
| LEAKAGE INDUC                            | MOTOR DATA      | 120  | 5.05 mH     | 3.71 mH     | 3.25 mH     | 3.25 mH     |
| MUTUAL INDUC                             | MOTOR DATA      | 121  | 20.21 mH    | 14.85 mH    | 12.98 mH    | 12.98 mH    |
| ROTOR TIME CONST                         | MOTOR DATA      | 1163 | 607.30 ms   | 607.30 ms   | 759.12 ms   | 759.12 ms   |
| BRAKE POWER                              | DYNAMIC BRAKING | 78   | 0.1 kw      | 0.1 kw      | 0.1 kw      | 0.1 kw      |
| FREQUENCY                                | INJ BRAKING     | 577  | 6.0 Hz      | 6.0 Hz      | 6.0 Hz      | 6.0 Hz      |
| DEFLUX TIME                              | INJ BRAKING     | 710  | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       |
| BASE VOLTS                               | INJ BRAKING     | 739  | 75.00%      | 75.00%      | 75.00%      | 75.00%      |
| DC LEVEL                                 | INJ BRAKING     | 581  | 1.30%       | 1.30%       | 1.30%       | 1.30%       |
| DC PULSE                                 | INJ BRAKING     | 579  | 2.0 s       | 2.0 s       | 2.0 s       | 2.0 s       |
| FINAL DC PULSE                           | INJ BRAKING     | 580  | 3.0 s       | 3.0 s       | 3.0 s       | 3.0 s       |
| FIXED BOOST                              | FLUXING         | 107  | 0.00%       | 0.00%       | 0.00%       | 0.00%       |
| ACCEL TIME                               | REFERENCE RAMP  | 258  | 30.0 s      | 30.0 s      | 30.0 s      | 30.0 s      |
| DECEL TIME                               | REFERENCE RAMP  | 259  | 30.0 s      | 30.0 s      | 30.0 s      | 30.0 s      |
| DEFLUX DELAY                             | PATTERN GEN     | 100  | 4.0 s       | 4.0 s       | 4.0 s       | 4.0 s       |
| SEARCH VOLTS                             | FLYCATCHING     | 573  | 8.00%       | 8.00%       | 8.00%       | 8.00%       |
| SEARCH BOOST                             | FLYCATCHING     | 32   | 15.00%      | 15.00%      | 15.00%      | 15.00%      |
| SEARCH TIME                              | FLYCATCHING     | 574  | 15.0 s      | 15.0 s      | 15.0 s      | 15.0 s      |
| REFLUX TIME                              | FLYCATCHING     | 709  | 6.0 s       | 6.0 s       | 6.0 s       | 6.0 s       |
| OVERLOAD                                 | MOTOR DATA      | 1164 | 2.2         | 2.2         | 2.2         | 2.2         |
| SPEED PROP GAIN                          | SPEED LOOP      | 1187 | 20.00       | 20.00       | 20.00       | 20.00       |
| SPEED INT TIME                           | SPEED LOOP      | 1188 | 100 ms      | 100 ms      | 100 ms      | 100 ms      |
| MOTOR CONNECTION                         | MOTOR DATA      | 124  | 1 : STAR    | 1 : STAR    | 1 : STAR    | 1 : STAR    |
| BRAKE RESISTANCE                         | DYNAMIC BRAKING | 77   | 100         | 100         | 100         | 100         |
| BOOST MODE                               | FLUXING         | 1058 | 0           | 0           | 0           | 0           |



## Chapter 3

## SERIAL COMMUNICATIONS

## Communications Technology Options

These options provide a serial data port allowing drives to be linked to form a network. Using a PLC/SCADA or other intelligent device, this network can be continuously controlled to provide supervision and monitoring for each drive in the system

**Frames 1, 2 & 3 Option**

- RS232/RS485 Communication Module which fits to the front of the drive, replacing the keypad

**Frames C, D, E & F Option**

- RS485 programming port; a 3-way terminal located on the control board

Refer to the Communications Interface Technical Manual for further details.

**DSElite**

This is Parker SSD Drives' Windows-based block programming software. It has a graphical user-interface and drawing tools to allow you to create block programming diagrams quickly and easily. Go to [www.ssdDrives.com](http://www.ssdDrives.com) for update information.

## Connection to the P3 Port

The port is an un-isolated RS232, 19200 Baud, supporting the standard EI bisynch ASCII communications protocol. Contact Parker SSD Drives for further information.

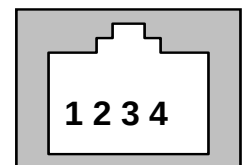
**Note:** *Frame C, D, E & F: There are two P3 ports - a port located on the control board and the port used by the keypad*

Using any P3 port on the drive, parameters can be monitored and updated by a suitable PC programming tool, i.e. DSElite.

**P3 Port**

A standard P3 lead is used to connect to the drive.

| P3 Port Pin | Lead   | Signal |
|-------------|--------|--------|
| 1           | Black  | 0V     |
| 2           | Red    | 5V     |
| 3           | Green  | TX     |
| 4           | Yellow | RX     |

**6-Way Lead to DB9/DB25 Connector**

**Note:** *There is 5V present on pin 2 of the P3 port - do not connect this to your PC.*

| P3 Port Pin | Lead   | Female DB9 Pin | Female DB25 Pin |
|-------------|--------|----------------|-----------------|
| 1           | Black  | 5              | 7               |
| 2           | Red    | not connected  | not connected   |
| 3           | Green  | 2              | 3               |
| 4           | Yellow | 3              | 2               |

## 3-2 Serial Communications

# SEQUENCING LOGIC STATES

## Principle State Machine

The drive's reaction to commands is defined by a state machine. This determines which commands provide the demanded action, and in which sequence.

### Main Sequencing States

The main sequencing state of the unit is indicated by an enumerated value given by the parameter SEQUENCER STATE under SEQUENCING LOGIC menu at level 3.

| Enumerated Value | Main Seq State | Standard Name      | Description                                      |
|------------------|----------------|--------------------|--------------------------------------------------|
| 0                | START DISABLED | Switch On Disabled | The Inverter will not accept a switch on command |
| 1                | START ENABLED  | Ready To Switch On | The Inverter will accept a switch on command     |
| 2                | SWITCHED ON    | Switched On        | The Inverter's stack is enabled                  |
| 3                | READY          | Ready              | Waiting for Contactor to be closed               |
| 4                | ENABLED        | Enabled            | The Inverter is enabled and operational          |
| 5                | F-STOP ACTIVE  | Fast-Stop Active   | Fast stop is active                              |
| 6                | TRIP ACTIVE    | Trip Active        | The Inverter is processing a trip event          |
| 7                | TRIPPED        | Tripped            | The Inverter is tripped awaiting trip reset      |

Table 4-1 Enumerated Values for the SEQUENCING LOGIC Function Block

### State Outputs of the SEQUENCING LOGIC Function Block

The following table shows the states of individual parameters for the SEQUENCING LOGIC function block required to produce the condition of the MAIN SEQ STATE parameter.

|                  | START DISABLED            | START ENABLED             | SWITCHED ON | READY | ENABLED | F-STOP ACTIVE | TRIP ACTIVE | TRIPPED      |
|------------------|---------------------------|---------------------------|-------------|-------|---------|---------------|-------------|--------------|
| Tripped          | FALSE                     | FALSE                     | FALSE       | FALSE | FALSE   | FALSE         | TRUE        | TRUE         |
| Running          | FALSE                     | FALSE                     | FALSE       | FALSE | TRUE    | FALSE         | FALSE       | FALSE        |
| Jogging          | FALSE                     | FALSE                     | FALSE       | FALSE | Note 1  | FALSE         | FALSE       | FALSE        |
| Stopping         | FALSE                     | FALSE                     | FALSE       | FALSE | Note 2  | TRUE          | FALSE       | FALSE        |
| Output Contactor | Depends on previous state | Depends on previous state | TRUE        | TRUE  | TRUE    | TRUE          | TRUE        | FALSE        |
| Switch On Enable | FALSE                     | TRUE                      | TRUE        | TRUE  | TRUE    | TRUE          | TRUE        | FALSE        |
| Switched On      | FALSE                     | FALSE                     | TRUE        | TRUE  | TRUE    | TRUE          | TRUE        | FALSE        |
| Ready            | FALSE                     | FALSE                     | FALSE       | TRUE  | TRUE    | TRUE          | TRUE        | FALSE        |
| Healthy          | TRUE                      | TRUE                      | TRUE        | TRUE  | TRUE    | TRUE          | FALSE       | FALSE Note 3 |

Table 4-2 Parameter States for the MAIN SEQ STATE Parameter

## 4-2 Sequencing Logic

- Note:**
1. *JOGGING is set TRUE once the jog cycle has started, and remains TRUE until the jog cycle has finished which is when either the stop delay has finished or another mode is demanded.*
  2. *STOPPING is set TRUE during the stopping cycles commanded by either RUNNING going low, JOGGING going low or if Fast Stop is active, i.e. SEQUENCING LOGIC is F-STOP ACTIVE.*
  3. *Once Run and Jog are both FALSE, HEALTHY O/P will be set TRUE.*

### Transition of States

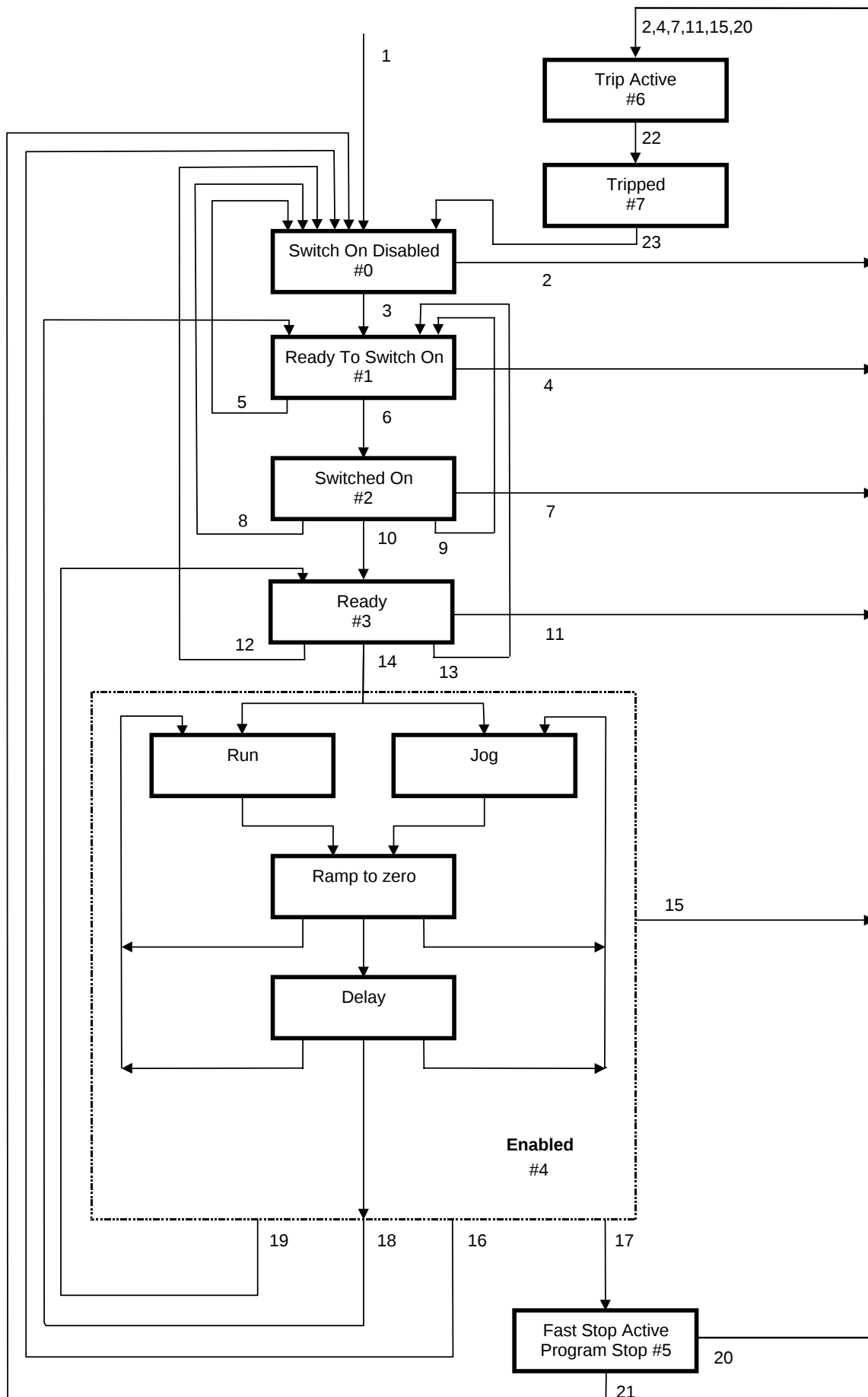
The transition matrix describes what causes the transition from one state to another, for example see no. 4 below: the transition from “Ready To Switch On” to “Trip Active” is triggered by “TRIP” going TRUE. Note – where a state has more than one exit transition, the transition with the lowest number has priority.

Refer to the following table and state diagram.

|    | Current State      | Next State         | Cause (FALSE to TRUE)                                                               |
|----|--------------------|--------------------|-------------------------------------------------------------------------------------|
| 1  | Power Up           | Switch On Disabled | Power-Up, Restore Configuration or exit from Configuration mode.                    |
| 2  | Switch On Disabled | Trip Active        | Trip                                                                                |
| 3  | Switch On Disabled | Ready To Switch On | RUN = FALSE, JOG = FALSE, NOT FAST STOP = TRUE and NOT COAST STOP = TRUE            |
| 4  | Ready To Switch On | Trip Active        | Trip                                                                                |
| 5  | Ready To Switch On | Switch On Disabled | NOT COAST STOP = FALSE or NOT FAST STOP = FALSE                                     |
| 6  | Ready To Switch On | Switched On        | RUN = TRUE or JOG = TRUE                                                            |
| 7  | Switched On        | Trip Active        | Trip (includes CONTACTOR CLOSED = FALSE after 10 seconds)                           |
| 8  | Switched On        | Switch On Disabled | NOT COAST STOP = FALSE or NOT FAST STOP = FALSE                                     |
| 9  | Switched On        | Ready To Switch On | RUN = FALSE and JOG = FALSE                                                         |
| 10 | Switched On        | Ready              | CONTACTOR CLOSED = TRUE and defluxed                                                |
| 11 | Ready              | Trip Active        | Trip (includes CONTACTOR CLOSED = FALSE)                                            |
| 12 | Ready              | Switch On Disabled | NOT COAST STOP = FALSE or NOT FAST STOP = FALSE                                     |
| 13 | Ready              | Ready To Switch On | RUN = FALSE and JOG = FALSE                                                         |
| 14 | Ready              | Enabled            | ENABLE = TRUE                                                                       |
| 15 | Enabled            | Trip Active        | Trip (includes CONTACTOR CLOSED = FALSE)                                            |
| 16 | Enabled            | Switch On Disabled | NOT COAST STOP = FALSE                                                              |
| 17 | Enabled            | Fast Stop Active   | NOT FAST STOP = FALSE                                                               |
| 18 | Enabled            | Ready To Switch On | RUN = FALSE, JOG = FALSE and stopping complete                                      |
| 19 | Enabled            | Ready              | ENABLE = FALSE                                                                      |
| 20 | Fast Stop Active   | Trip Active        | Trip (includes CONTACTOR CLOSED = FALSE)                                            |
| 21 | Fast Stop Active   | Switch On Disabled | Fast Stop timer expired or FAST STOP MODE = Coast Stop OR Inverter at zero setpoint |
| 22 | Trip Active        | Tripped            | Stack quenched                                                                      |
| 23 | Tripped            | Switch On Disabled | Trip = FALSE and TRIP RESET 0->1 transition                                         |

**Table 4-3 Transition Matrix**

## State Diagram



## External Control of the Drive

### Communications Command

When sequencing is in the Remote Comms mode, the sequencing of the Inverter is controlled by writing to the hidden parameter COMMS COMMAND (Tag 271). This parameter can only be written to using a communications interface. The output parameter (Tag 273) COMMS COMMAND of the COMMS CONTROL function block is provided as a diagnostic.

The COMMS COMMAND parameter is a 16-bit word based on standard fieldbus drive profiles. Some bits are not implemented in this release (see “Supported” column of the table below).

| Bit | Name                  | Description                   | Supported | Required Value |
|-----|-----------------------|-------------------------------|-----------|----------------|
| 0   | Switch On             | OFF1 Operational              | √         |                |
| 1   | (Not) Disable Voltage | OFF2 Coast Stop               | √         |                |
| 2   | (Not) Quick Stop      | OFF3 Fast Stop                | √         |                |
| 3   | Enable Operation      |                               | √         |                |
| 4   | Enable Ramp Output    | =0 to set ramp output to zero |           | 1              |
| 5   | Enable Ramp           | =0 to hold ramp               |           | 1              |
| 6   | Enable Ramp Input     | =0 to set ramp input to zero  |           | 1              |
| 7   | Reset Fault           | Reset on 0 to 1 transition    | √         |                |
| 8   |                       |                               |           | 0              |
| 9   |                       |                               |           | 0              |
| 10  | Remote                | =1 to control remotely        |           | 1              |
| 11  |                       |                               |           | 0              |
| 12  |                       |                               |           | 0              |
| 13  |                       |                               |           | 0              |
| 14  |                       |                               |           | 0              |
| 15  |                       |                               |           | 0              |

### Switch On

Replaces the RUN FWD, RUN REV and NOT STOP parameters of the SEQUENCING LOGIC function block. When Set (=1) is the same as :

|          |   |       |
|----------|---|-------|
| RUN FWD  | = | TRUE  |
| RUN REV  | = | FALSE |
| NOT STOP | = | FALSE |

When Cleared (= 0) is the same as :

|          |   |       |
|----------|---|-------|
| RUN FWD  | = | FALSE |
| RUN REV  | = | FALSE |
| NOT STOP | = | FALSE |

### (Not) Disable Voltage

ANDed with the NOT COAST STOP parameter of the SEQUENCING LOGIC function block. When both Set (=1) is the same as:

|                |   |      |
|----------------|---|------|
| NOT COAST STOP | = | TRUE |
|----------------|---|------|

When either or both Cleared (= 0) is the same as :

|                |   |       |
|----------------|---|-------|
| NOT COAST STOP | = | FALSE |
|----------------|---|-------|

**(Not) Quick Stop**

ANDed with the NOT FAST STOP parameter on the SEQUENCING LOGIC function block.  
When both Set (=1) is the same as:

NOT FAST STOP = TRUE

When either or both Cleared (= 0) is the same as :

NOT FAST STOP = FALSE

**Enable Operation**

ANDed with the DRIVE ENABLE parameter on the SEQUENCING LOGIC function block.  
When both Set (=1) is the same as:

DRIVE ENABLE = TRUE

When either or both Cleared (= 0) is the same as :

DRIVE ENABLE = FALSE

**Enable Ramp Output, Enable Ramp, Enable Ramp Input**

Not implemented. The state of these bits must be set (=1) to allow this feature to be added in the future.

**Reset Fault**

Replaces the REM TRIP RESET parameter on the SEQUENCING LOGIC function block.  
When Set (=1) is the same as:

REM TRIP RESET = TRUE

When Cleared (= 0) is the same as :

REM TRIP RESET = FALSE

**Remote**

Not implemented. It is intended to allow the PLC to toggle between local and remote. The state of this must be set (=1) to allow this feature to be added in the future.

**Example Commands**

047F hexadecimal to tag 271 to RUN

047E hexadecimal to tag 271 to STOP

Control the setpoint by writing to tag 269, (see Reference Block).

## 4-6 Sequencing Logic

### Communications Status

The COMMS STATUS parameter (Tag 272) in the COMMS CONTROL function block monitors the sequencing of the Inverter. It is a 16-bit word based on standard fieldbus drive profiles. Some bits are not implemented in the initial release and are set to 0 (see “Supported” column of the table below).

| Bit | Name                   | Description                                                                | Supported |
|-----|------------------------|----------------------------------------------------------------------------|-----------|
| 0   | Ready To Switch On     |                                                                            | √         |
| 1   | Switched On            | Ready for operation (refer control bit 0)                                  | √         |
| 2   | Operation Enabled      | (refer control bit 3)                                                      | √         |
| 3   | Fault                  | Tripped                                                                    | √         |
| 4   | (Not) Voltage Disabled | OFF 2 Command pending                                                      | √         |
| 5   | (Not) Quick Stop       | OFF 3 Command pending                                                      | √         |
| 6   | Switch On Disable      | Switch On Inhibited                                                        | √         |
| 7   | Warning                |                                                                            |           |
| 8   | SP / PV in Range       |                                                                            |           |
| 9   | Remote                 | = 1 if Drive will accept Command Word                                      | √         |
| 10  | Setpoint Reached       | The input is True if the system ramp output matches the demanded setpoint. | √         |
| 11  | Internal Limit Active  | This input is True if the internal current limit is active.                | √         |
| 12  |                        |                                                                            |           |
| 13  |                        |                                                                            |           |
| 14  |                        |                                                                            |           |
| 15  |                        |                                                                            |           |

#### Ready To Switch On

Same as the SWITCH ON ENABLE output parameter of the SEQUENCING LOGIC function block.

#### Switched On

Same as the SWITCHED ON output parameter of the SEQUENCING LOGIC function block.

#### Operation Enabled

Same as the RUNNING output parameter of the SEQUENCING LOGIC function block.

#### Fault

Same as the TRIPPED output parameter of the SEQUENCING LOGIC function block.

#### (Not) Voltage Disabled

If in Remote Comms mode, this is the same as Bit 1 of the COMMS COMMAND parameter. Otherwise it is the same as the NOT COAST STOP input parameter of the SEQUENCING LOGIC function block.

#### (Not) Quick Stop

If in Remote Comms mode, this is the same as Bit 2 of the COMMS COMMAND parameter. Otherwise it is the same as the NOT FAST STOP input parameter of the SEQUENCING LOGIC function block.

#### Switch On Disable

Set (=1) only when in START DISABLED state, refer to Table 4-1.

#### Remote

This bit is set (= 1) if the Inverter is in Remote mode **AND** the parameter REMOTE COMMS SEL of the COMMS CONTROL function block is Set (= 1).

## Chapter 5 APPLICATIONS

### The Default Application

DEFAULT

The drive is supplied with 6 Applications, Application 0 to Application 5. Each Application recalls a pre-programmed set of parameters and internal links when it is loaded.

- Application 0 will not control a motor. Loading Application 0 removes all internal links.
- Application 1 is the factory default application, providing for basic speed control
- Application 2 supplies speed control using a manual or auto setpoint
- Application 3 supplies speed control using preset speeds
- Application 4 is a set-up providing speed control with Raise/Lower Trim digital inputs
- Application 5 supplies speed control with PID control
- Application 6 simplifies control of the drive via communications.

### How to Load an Application

The Applications are stored in the **PAR** menu.

From the **PAR** menu, go to parameter **P 1** by pressing the **M** key twice.

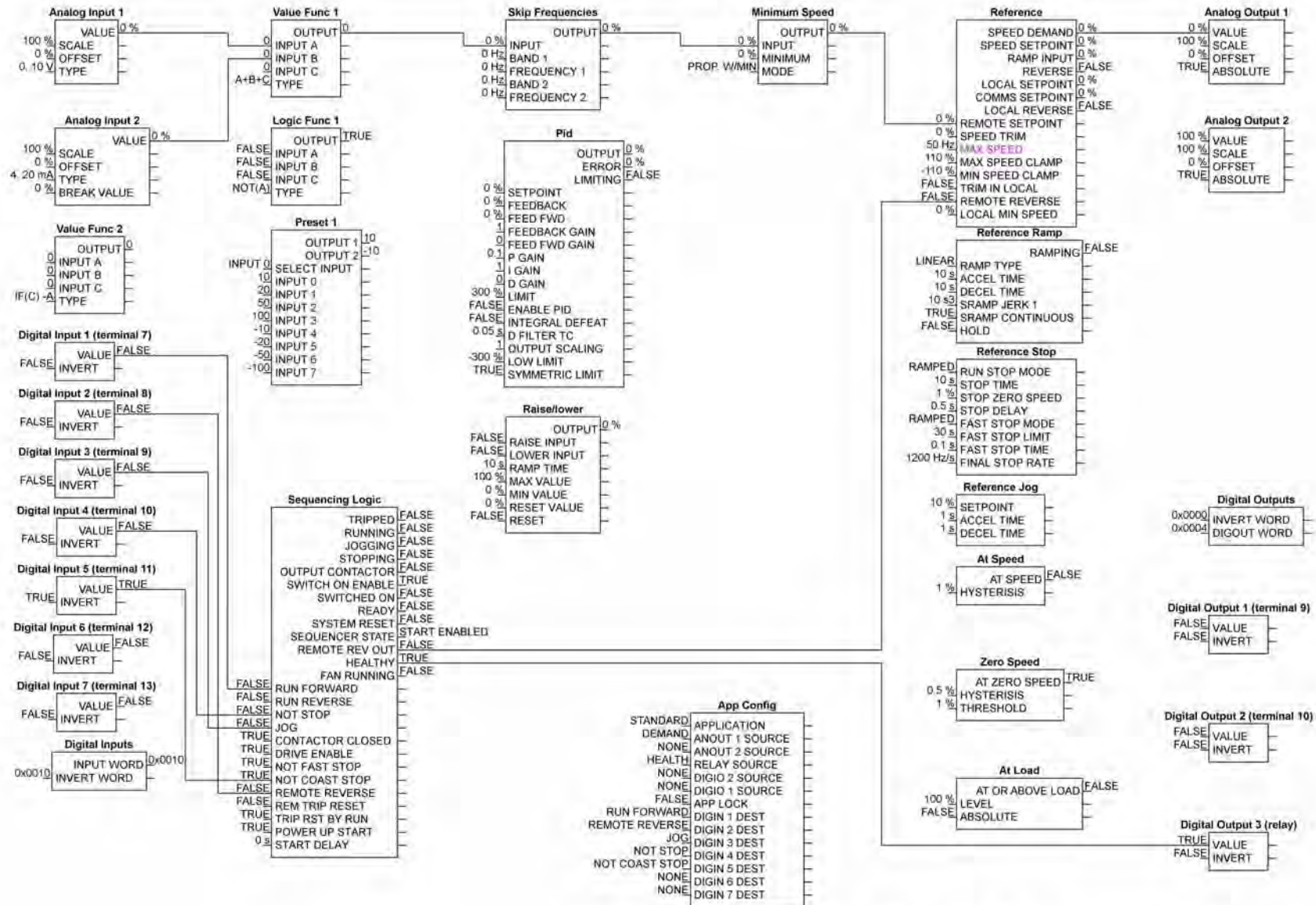
Use the **▲** **▼** keys to select the appropriate Application by number.

Press the **E** key to load the Application.

### Application Description

**Note:** Parameters whose default values are product-related are indicated in the block diagrams with \* or \*\*. Refer to Chapter 2: "Parameter Specification" - Product-Related Default Values.

## 5-2 Applications



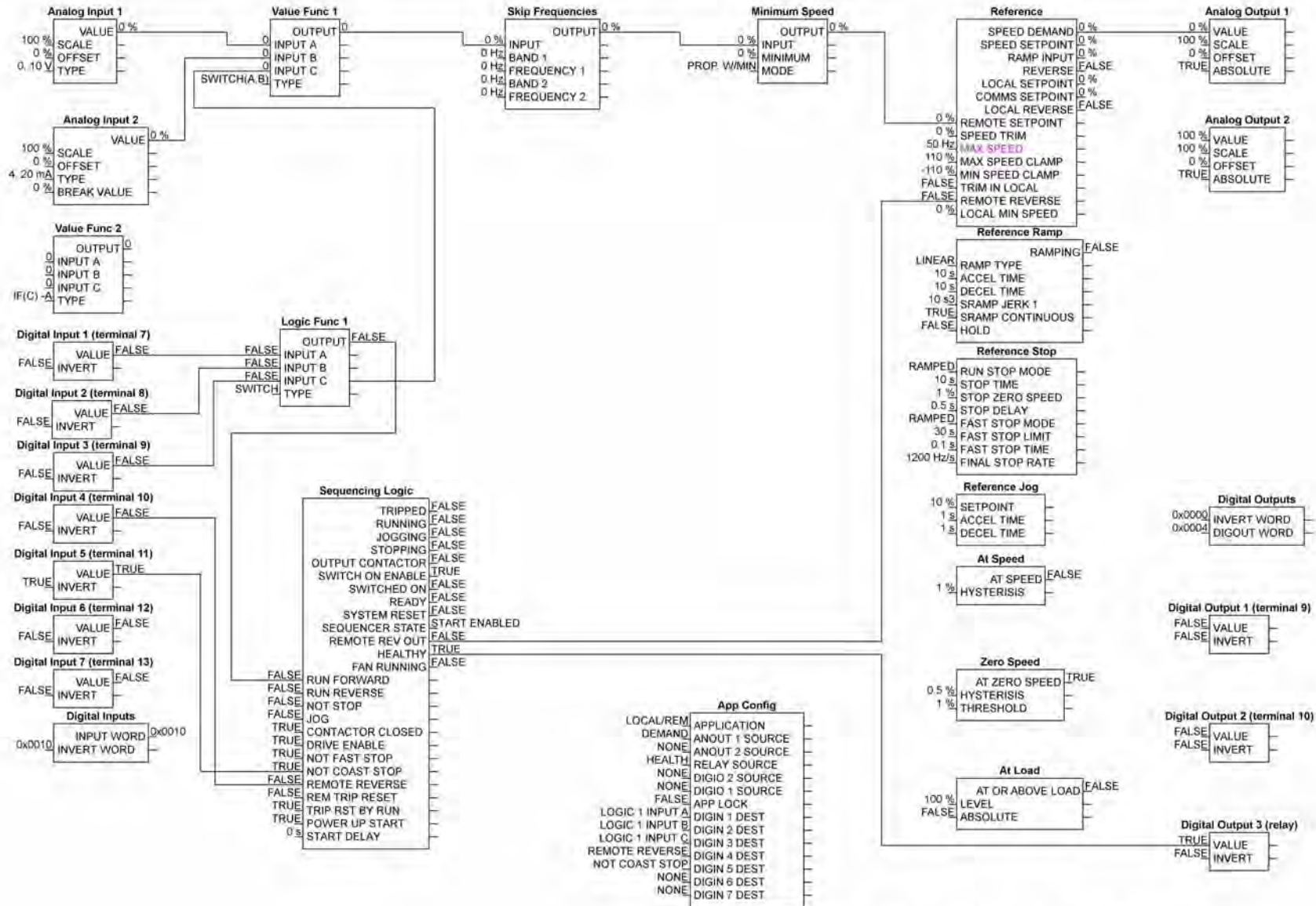
Application 1: Basic Speed Control, (default)

**Application 1: Basic Speed Control (default)**

This Application is ideal for general purpose applications. It provides push-button or switched start/stop control. The setpoint is the sum of the two analogue inputs AIN1 and AIN2, providing Speed Setpoint + Speed Trim capability

| Control Wiring I/O |                 |                           |                                                                                           |
|--------------------|-----------------|---------------------------|-------------------------------------------------------------------------------------------|
| Terminal           | Name            | Purpose                   | Comment                                                                                   |
| 13                 | DIGITAL INPUT 7 | <i>Not configured</i>     | <i>Not Used</i>                                                                           |
| 12                 | DIGITAL INPUT 6 | <i>Not configured</i>     | <i>Not Used</i>                                                                           |
| 11                 | DIGITAL INPUT 5 | Not Coast Stop (inverted) | 24V = coast to stop<br>0V = drive may run                                                 |
| 10                 | DIGITAL INPUT 4 | Not Stop                  | 24V = RUN FWD and RUN REV signals latched<br>0V = RUN FWD and RUN REV signals not latched |
| 9                  | DIGITAL INPUT 3 | Jog                       | 24V = jog                                                                                 |
| 8                  | DIGITAL INPUT 2 | Direction                 | 0V = remote forward<br>24V = remote reverse                                               |
| 7                  | DIGITAL INPUT 1 | Run Forward               | 24V = run forward                                                                         |
| 6                  |                 | 24v                       |                                                                                           |
| 5                  | ANALOG OUTPUT 1 | Ramp Output               | absolute speed demand<br>0V = 0%, 10V = 100%                                              |
| 4                  | ANALOG OUTPUT 2 | 10v ref                   |                                                                                           |
| 3                  | ANALOG INPUT 2  | Speed Trim                | 4mA = 0%, 20mA = 100%                                                                     |
| 2                  | ANALOG INPUT 1  | Speed Setpoint            | 0V = 0%, 10V = 100%                                                                       |
| 1                  |                 | 0v                        |                                                                                           |

## 5-4 Applications



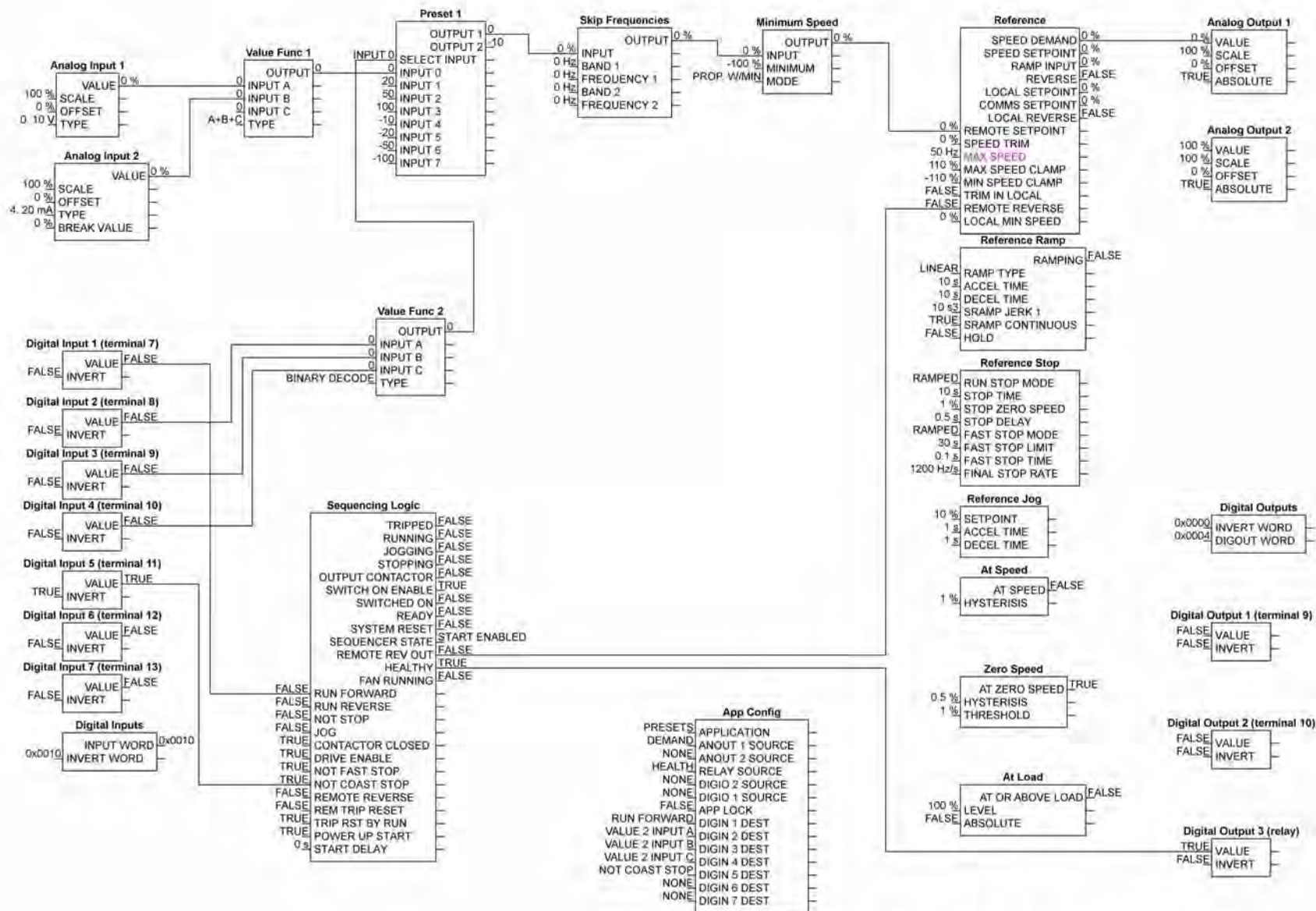
Application 2: Auto / Manual Control

**Application 2: Auto/Manual**

Two Run inputs and two Setpoint inputs are provided. The Auto/Manual switch selects which pair of inputs is active. The Application is sometimes referred to as Local/Remote.

| Control Wiring I/O |                          |                           |                                              |
|--------------------|--------------------------|---------------------------|----------------------------------------------|
| Terminal           | Name                     | Purpose                   | Comment                                      |
| 13                 | DIGITAL INPUT 7          | <i>Not configured</i>     | <i>Not Used</i>                              |
| 12                 | DIGITAL INPUT 6          | <i>Not configured</i>     | <i>Not Used</i>                              |
| 11                 | DIGITAL INPUT 5          | Not Coast Stop (inverted) | 24V = coast to stop<br>0V = drive may run    |
| 10                 | DIGITAL INPUT 4          | Remote Reverse            | 0V = remote forward<br>24V = remote reverse  |
| 9                  | DIGITAL INPUT 3          | Select                    | 0V = Manual<br>24V = Auto                    |
| 8                  | DIGITAL INPUT 2          | Auto Run                  | 24V = run forward                            |
| 7                  | DIGITAL INPUT 1          | Manual Run                | 24V = run forward                            |
| 6                  |                          | 24V                       |                                              |
| 5                  | ANALOG OUTPUT 1          | Ramp Output               | absolute speed demand<br>0V = 0%, 10V = 100% |
| 4                  | ANALOG OUTPUT 2          | 10v ref                   |                                              |
| 3                  | ANALOG INPUT 2           | Auto Setpoint             | 4mA = 0%, 20mA = 100%                        |
| 2                  | ANALOG INPUT 1           | Manual Setpoint           | 0V = 0%, 10V = 100%                          |
| 1                  |                          | 0V                        |                                              |
| RL1A<br>RL1B       | DIGITAL OUTPUT 3 (relay) | HEALTH                    | Open = tripped, i.e. not healthy             |

## 5-6 Applications



Application 3: Preset Speeds

### Application 3: Preset Speeds

This is ideal for applications requiring multiple discrete speed levels.

The setpoint is selected from either the sum of the analogue inputs, (as in Application 1 and known here as PRESET 0), or as one of up to seven other pre-defined speed levels. These are selected using DIN2, DIN3 and DIN4, refer to the Truth Table below. Edit parameters AP02 to AP08 on the keypad to re-define the speed levels of PRESET 1 to PRESET 7. Reverse direction is achieved by entering a negative speed setpoint.

| Control Wiring I/O |                          |                           |                                              |
|--------------------|--------------------------|---------------------------|----------------------------------------------|
| Terminal           | Name                     | Purpose                   | Comment                                      |
| 13                 | DIGITAL INPUT 7          | <i>Not configured</i>     | <i>Not Used</i>                              |
| 12                 | DIGITAL INPUT 6          | <i>Not configured</i>     | <i>Not Used</i>                              |
| 11                 | DIGITAL INPUT 5          | Not Coast Stop (inverted) | 24V = coast to stop<br>0V = drive may run    |
| 10                 | DIGITAL INPUT 4          | Preset Select 3           | Preset Speed Select                          |
| 9                  | DIGITAL INPUT 3          | Preset Select 2           | Preset Speed Select                          |
| 8                  | DIGITAL INPUT 2          | Preset Select 1           | Preset Speed Select                          |
| 7                  | DIGITAL INPUT 1          | Run Forward               | 24V = run forward                            |
| 6                  |                          | 24V                       |                                              |
| 5                  | ANALOG OUTPUT 1          | Ramp Output               | absolute speed demand<br>0V = 0%, 10V = 100% |
| 4                  | ANALOG OUTPUT 2          | 10V ref                   |                                              |
| 3                  | ANALOG INPUT 2           | Speed Trim                | 4mA = 0%, 20mA = 100%                        |
| 2                  | ANALOG INPUT 1           | Speed Setpoint            | 0V = 0%, 10V = 100%                          |
| 1                  |                          | 0V                        |                                              |
| RL1A<br>RL1B       | DIGITAL OUTPUT 3 (relay) | HEALTH                    | Open = tripped, i.e. not healthy             |

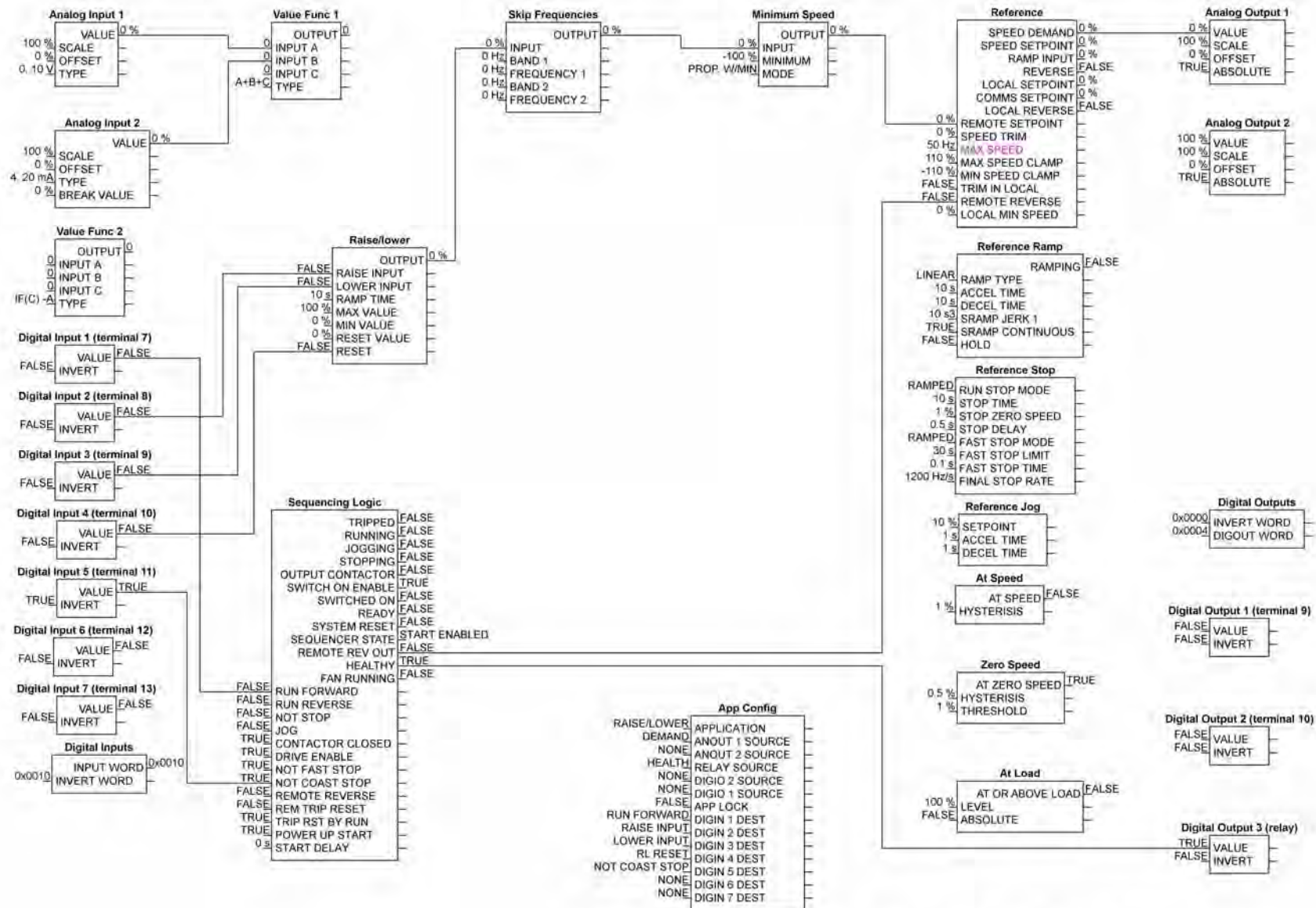
### Preset Speed Truth Table

| DIN4/DOUT2 | DIN3 | DIN2 | Preset |
|------------|------|------|--------|
| 0V         | 0V   | 0V   | 0      |
| 0V         | 0V   | 24V  | 1      |
| 0V         | 24V  | 0V   | 2      |
| 0V         | 24V  | 24V  | 3      |
| 24V        | 0V   | 0V   | 4      |
| 24V        | 0V   | 24V  | 5      |
| 24V        | 24V  | 0V   | 6      |
| 24V        | 24V  | 24V  | 7      |

### Application Menu Parameters

|      |                                 |
|------|---------------------------------|
| AP01 | PRESET SPEED 0, (ANIN1 + ANIN2) |
| AP02 | PRESET SPEED 1                  |
| AP03 | PRESET SPEED 2                  |
| AP04 | PRESET SPEED 3                  |
| AP05 | PRESET SPEED 4                  |
| AP06 | PRESET SPEED 5                  |
| AP07 | PRESET SPEED 6                  |
| AP08 | PRESET SPEED 7                  |

## 5-8 Applications



Application 4: Raise/Lower Trim

**Application 4: Raise/Lower Trim**

This Application mimics the operation of a motorised potentiometer. Digital inputs allow the setpoint to be increased and decreased between limits. The limits and ramp rate can be set using the keypad.

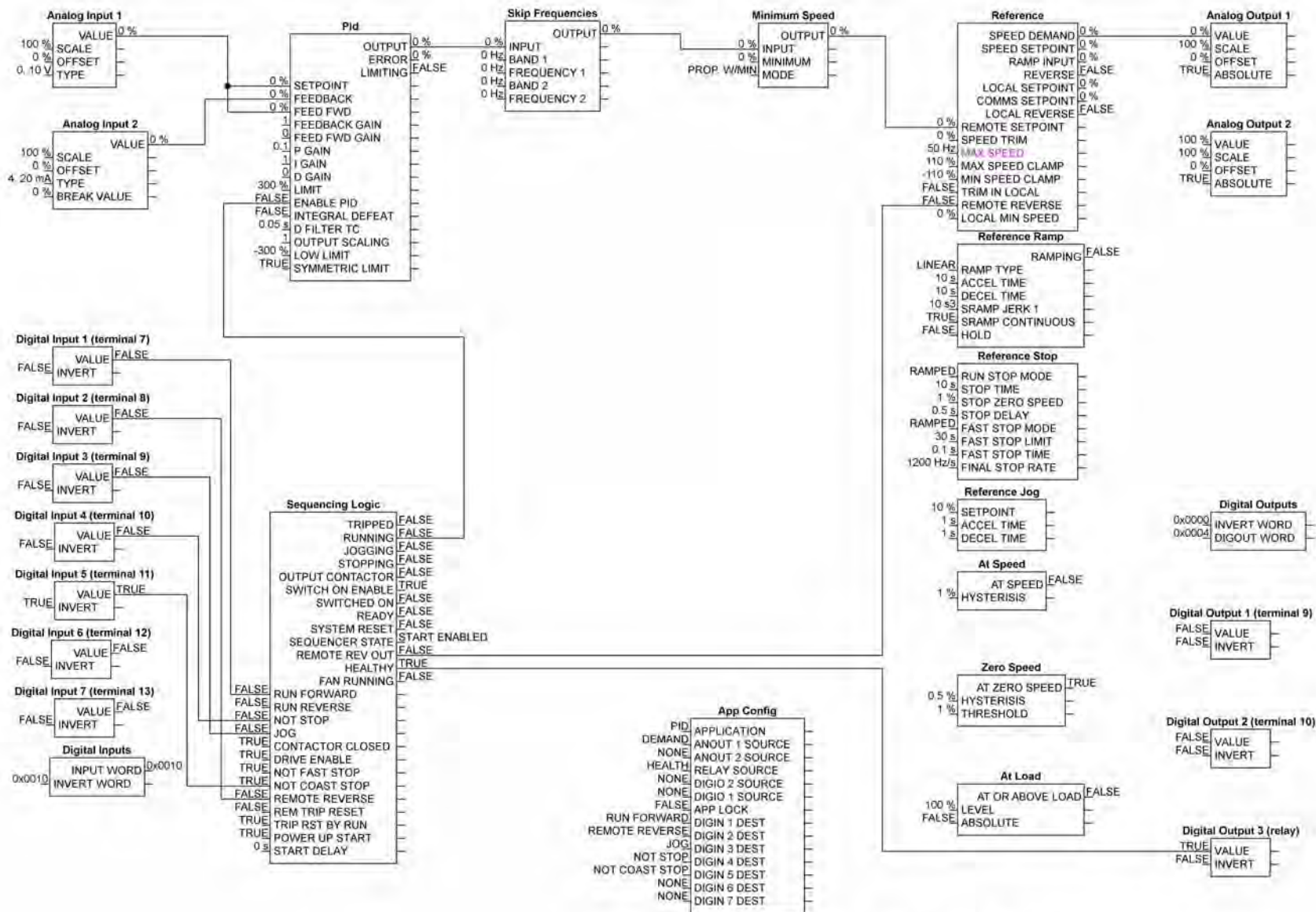
The Application is sometimes referred to as Motorised Potentiometer.

| Control Wiring I/O |                          |                           |                                              |
|--------------------|--------------------------|---------------------------|----------------------------------------------|
| Terminal           | Name                     | Purpose                   | Comment                                      |
| 13                 | DIGITAL INPUT 7          | <i>Not configured</i>     | <i>Not Used</i>                              |
| 12                 | DIGITAL INPUT 6          | <i>Not configured</i>     | <i>Not Used</i>                              |
| 11                 | DIGITAL INPUT 5          | Not Coast Stop (inverted) | 24V = coast to stop<br>0V = drive may run    |
| 10                 | DIGITAL INPUT 4          | Reset                     | 24V = Reset Raise/Lower                      |
| 9                  | DIGITAL INPUT 3          | Lower input               | 24V = Lower                                  |
| 8                  | DIGITAL INPUT 2          | Raise input               | 24V = Raise                                  |
| 7                  | DIGITAL INPUT 1          | Run Forward               | 24V = run forward                            |
| 6                  |                          | 24V                       |                                              |
| 5                  | ANALOG OUTPUT 1          | Ramp Output               | absolute speed demand<br>0V = 0%, 10V = 100% |
| 4                  | ANALOG OUTPUT 2          | 10V ref                   |                                              |
| 3                  | ANALOG INPUT 2           |                           |                                              |
| 2                  | ANALOG INPUT 1           |                           |                                              |
| 1                  |                          | 0V                        |                                              |
| RL1A<br>RL1B       | DIGITAL OUTPUT 3 (relay) | HEALTH                    | Open = tripped, i.e. not healthy             |

**Application Menu Parameters**

|      |                         |
|------|-------------------------|
| AP01 | RAISE/LOWER RAMP RATE   |
| AP02 | RAISE/LOWER MAX VALUE   |
| AP03 | RAISE/LOWER MIN VALUE   |
| AP04 | RAISE/LOWER RESET VALUE |

# 5-10 Applications



Application 5: PID

**Application 5: PID**

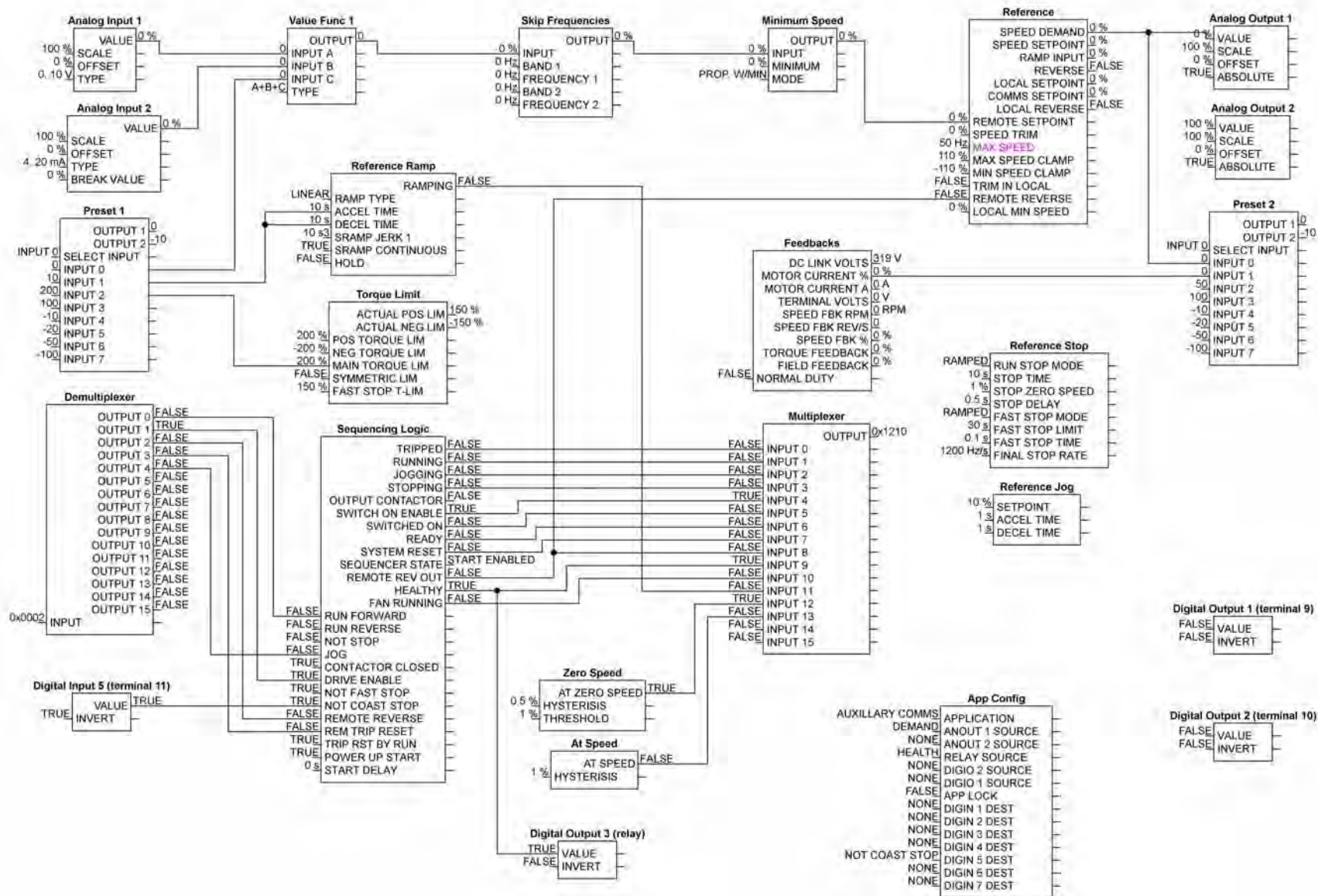
A simple application using a Proportional-Integral-Derivative 3-term controller. The setpoint is taken from AIN1, with feedback signal from the process on AIN2. The scale and offset features of the analogue input blocks may be used to correctly scale these signals. The difference between these two signals is taken as the PID error. The output of the PID block is then used as the drive setpoint.

| Control Wiring I/O |                          |                           |                                                                                           |
|--------------------|--------------------------|---------------------------|-------------------------------------------------------------------------------------------|
| Terminal           | Name                     | Purpose                   | Comment                                                                                   |
| 13                 | DIGITAL INPUT 7          | <i>Not configured</i>     | <i>Not Used</i>                                                                           |
| 12                 | DIGITAL INPUT 6          | <i>Not configured</i>     | <i>Not Used</i>                                                                           |
| 11                 | DIGITAL INPUT 5          | Not Coast Stop (inverted) | 24V = coast to stop<br>0V = drive may run                                                 |
| 10                 | DIGITAL INPUT 4          | Not Stop                  | 24V = RUN FWD and RUN REV signals latched<br>0V = RUN FWD and RUN REV signals not latched |
| 9                  | DIGITAL INPUT 3          | Jog                       | 24V = Jog                                                                                 |
| 8                  | DIGITAL INPUT 2          | Remote Reverse            | 24V = Reverse                                                                             |
| 7                  | DIGITAL INPUT 1          | Run Forward               | 24V = run forward                                                                         |
| 6                  |                          | 24V                       |                                                                                           |
| 5                  | ANALOG OUTPUT 1          | Ramp Output               | absolute speed demand<br>0V = 0%, 10V = 100%                                              |
| 4                  | ANALOG OUTPUT 2          | 10V ref                   |                                                                                           |
| 3                  | ANALOG INPUT 2           | Process feedback          | 0V = 0%, 10V = 100%                                                                       |
| 2                  | ANALOG INPUT 1           | Process Setpoint          | 0V = 0%, 10V = 100%                                                                       |
| 1                  |                          | 0V                        |                                                                                           |
| RL1A<br>RL1B       | DIGITAL OUTPUT 3 (relay) | HEALTH                    | Open = tripped, i.e. not healthy                                                          |

**Application Menu Parameters**

|      |                 |
|------|-----------------|
| AP01 | P gain          |
| AP02 | I gain          |
| AP03 | D gain          |
| AP04 | D filter TC     |
| AP05 | Feedback gain   |
| AP06 | Limit           |
| AP07 | Low limit       |
| AP08 | Symmetric limit |
| AP09 | Output scaling  |
| AP10 | Error           |
| AP11 | Output          |

# 5-12 Applications



Application 6: Aux Comms

**Application 6: Aux Comms**

This application provides a method of controlling the drive from a communications master, without using the Communications Control mode. The drive is configured in the remote terminal mode, but the signals to the setpoint and sequencing logic are taken from parameters that may be written to in a compact way from a communications master.

The drive sequencing is controlled tag 599, (Demultiplexer input).

The drive status may be read from tag 598, (Multiplexer output).

The drive setpoint may be set from tag 347, (Preset speeds 1, input 0). This is added to analog input 1 and analog input 2. Tie these inputs to 0 if no speed trim is required.

| Control Wiring I/O |                          |                           |                                              |
|--------------------|--------------------------|---------------------------|----------------------------------------------|
| Terminal           | Name                     | Purpose                   | Comment                                      |
| 13                 | DIGITAL INPUT 7          | <i>Not configured</i>     | <i>Not Used</i>                              |
| 12                 | DIGITAL INPUT 6          | <i>Not configured</i>     | <i>Not Used</i>                              |
| 11                 | DIGITAL INPUT 5          | Not Coast Stop (inverted) | 24V = coast to stop<br>0V = drive may run    |
| 10                 | DIGITAL INPUT 4          | <i>Not configured</i>     | <i>Not Used</i>                              |
| 9                  | DIGITAL INPUT 3          | <i>Not configured</i>     | <i>Not Used</i>                              |
| 8                  | DIGITAL INPUT 2          | <i>Not configured</i>     | <i>Not Used</i>                              |
| 7                  | DIGITAL INPUT 1          | <i>Not configured</i>     | <i>Not Used</i>                              |
| 6                  |                          | 24V                       |                                              |
| 5                  | ANALOG OUTPUT 1          | Ramp Output               | absolute speed demand<br>0V = 0%, 10V = 100% |
| 4                  | ANALOG OUTPUT 2          | 10V ref                   |                                              |
| 3                  | ANALOG INPUT 2           | Speed Trim 2              | 0V = 0%, 10V = 100%                          |
| 2                  | ANALOG INPUT 1           | Speed Trim 1              | 0V = 0%, 10V = 100%                          |
| 1                  |                          | 0V                        |                                              |
| RL1A<br>RL1B       | DIGITAL OUTPUT 3 (relay) | HEALTH                    | Open = tripped, i.e. not healthy             |

**Application Menu Parameters**

|      |                              |
|------|------------------------------|
| AP01 | Demux input, (Command word)  |
| AP02 | Preset 0 input 0, (Setpoint) |
| AP03 | Mux output, (Status word)    |

**Command word, (Tag 599)**

|       |              |
|-------|--------------|
|       | Command word |
| Bit 4 | Jog          |
| Bit 3 | Trip reset   |
| Bit 2 | Reverse      |
| Bit 1 | Enable       |
| Bit 0 | Run forward  |

**Status word, (Tag 598)**

|        |                   |
|--------|-------------------|
|        | Status word       |
| Bit 13 | At speed          |
| Bit 12 | Zero speed        |
| Bit 11 | Ramping           |
| Bit 10 | Fan running       |
| Bit 9  | Healthy           |
| Bit 8  | Reversed          |
| Bit 7  | System reset      |
| Bit 6  | Ready             |
| Bit 5  | Switched on       |
| Bit 4  | Switch on enabled |
| Bit 3  | Stopping          |
| Bit 2  | Jogging           |
| Bit 1  | Running           |
| Bit 0  | Tripped           |

**Parker Hannifin Ltd., Automation Group, SSD Drives Europe**  
New Courtwick Lane, Littlehampton, West Sussex BN17 7RT  
Tel: +1(0)903 737000 Fax: +1(0)903 737100

**CANADA**

Parker Hannifin Canada  
Motion & Control Division  
160 Chisholm Drive  
Milton, Ontario L9T 3G9  
Tel: +1(905) 693-3000  
Fax: +1(905) 876-1958

**GERMANY**

Parker Hannifin GmbH  
Von-Humboldt-Strasse 10  
64646 Heppenheim  
Tel: +49 (6252) 798200  
Fax: +49(6252) 798205

**CHINA**

Parker Hannifin Motion &  
Control (Shanghai) Co. Ltd.,  
280 Yungqiao Road  
Jinqiao Export Processing Zone,  
Pudong District,  
Shanghai 201206  
Tel: +86(21)5031 2525  
Fax: +86(21)5854 7599

**ITALY**

Parker Hannifin SPA  
Via C. Gounod,  
Cinisello Balsamo  
1-20092, Milano  
Tel: +39(0236) 1081  
Fax: +39(0236) 108400

**FRANCE**

Parker SSD Parvex  
8 Avenue du Lac  
B.P. 249  
21007 Dijon Cedex  
Tel: +33(0)80 42 41 40  
Fax: +33(0)80 42 41 23

**USA**

Parker Hannifin Corporation  
SSD Drives  
9225 Forzyth Park Drive  
Charlotte  
North Carolina 28273  
Tel: +1(704)588 3246  
Fax: +1(704)588 3249

Also availability and service support also in:

Argentina • Australia • Austria • Bangladesh • Belgium • Brazil • Chile • Columbia • Costa Rica • Cyprus • Czech Republic • Denmark • Ecuador • Egypt • Finland • Greece • Hong Kong • Hungary • India • Indonesia • Iran • Ireland • Israel • Japan • Jordan • Kenya • Korea • Kuwait • Lithuania • Malaysia • Netherlands • New Zealand • Nigeria • Norway • Peru • Philippines • Poland • Portugal • Qatar • Romania • Russia • Saudi Arabia • Singapore • Slovenia • Slovakia • South Africa • Spain • Sri Lanka • Sweden • Switzerland • Taiwan • Turkey • United Arab Emirates • Vietnam • Zimbabwe

[www.ssddrives.com](http://www.ssddrives.com)

