# ACS800

## Supplement
## Test Bench Control Program

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## Supplement

ACS800

Code: 3AFE68444110 REV H
EN

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# Table of contents

# Introduction to this supplement

## Chapter overview

This chapter instructs where to read the safety instructions and gives general information on the manual.

## Safety instructions

Follow all safety instructions delivered with the drive.

- Read the complete safety instructions before you install, commission, or use the drive. The complete safety instructions are given at the beginning of the Hardware Manual.
- Read the software function specific warnings and notes before changing the default settings of the function. For each function, the warnings and notes are given in the subsection describing the related user-adjustable parameters.

## Compatibility

The manual is compatible with the ACS800 Test Bench control program AQTB7300 and later. See signal 04.01 SW PACKAGE VER.

## Reader

The reader of the manual is expected to know the standard electrical wiring practices, electronic components, and electrical schematic symbols.

## Contents

This supplement describes the operation and the settings of the Test Bench control program. The rest of the program is similar to the ACS800 System control program, which is documented in *ACS800 System Control Program 7.x Firmware Manual* (3AFE64670646 [English]).

The supplement contains the following chapters:

- *Program features* describes the specific features of the Test Bench control program.
- *Actual signals and parameters* explains valid selections of the parameters.
- *Fault tracing* describes special alarms and faults of the Test Bench control program.
- *Fieldbus control* describes differences between the fieldbus control interfaces of the System control program and the Test Bench control program.

## Related documents

- *ACS800 System Control Program 7.x Firmware Manual* (3AFE64670646 [English])
- *Hardware Manual* (appropriate Hardware Manual is delivered with the drive)
- Fieldbus Adapter and I/O Extension Module User's Manuals

# Program features

## Chapter overview

The chapter describes the features specific to the ACS800 Test Bench control program. The features of the System control program are also mostly available.

**Note:** In Test Bench control program parameters cannot be copied with panel as described in *ACS800 System control program 7.x Firmware manual* (3AFE64670646 [English].

## Main features

The main features of the Test Bench control program are:

- Support for RTAC-03 and RRIA modules
- Second pulse encoder interface
- Fast analogue interface for torque feedback utilisation
- Calculation of the motor shaft actual acceleration
- Acceleration damping function
- Standstill heating function
- Maximum output frequency 400 Hz; consult ABB if a frequency higher than 300 Hz is needed
- Possibility to use fast speed and torque references via fieldbus communication.

## Support for RTAC-03 and RRIA modules

One RTAC-03 or RRIA module can be connected to drive option Slot 1, Slot 2 or via DDCS. RTAC-03 and RRIA modules are not supported as a second encoder or resolver.

### Settings

| Parameter | Additional information |
|---|---|
| 10.04 SYNC CMD | Syncronisation of the position count |
| 31.09 ENC1 CABLE CHECK | RTAC-03 cable checking enable |
| 50 SPEED MEASUREMENT | Settings of the encoder and processing position counter |
| 98.01 ENCODER MODULE | Pulse encoder 1 interface module selection |

### Diagnostics

| Parameter | Additional information |
|---|---|
| 01.03 SPEED MEASURED | Measured motor speed |
| 03.07 … 03.10 | Position counter values |
| 07.02 AUX CTRL WORD 1 | B9 … 11 Commands for the position count |
| 08.02 AUX STATUS WORD | B12 Speed feedback mode |

## Second pulse encoder interface

A second pulse encoder can be connected to DDCS channel 2. Only one module can be connected to channel 2 at a time, so the fast analogue extension module and the second pulse encoder cannot be used simultaneously.

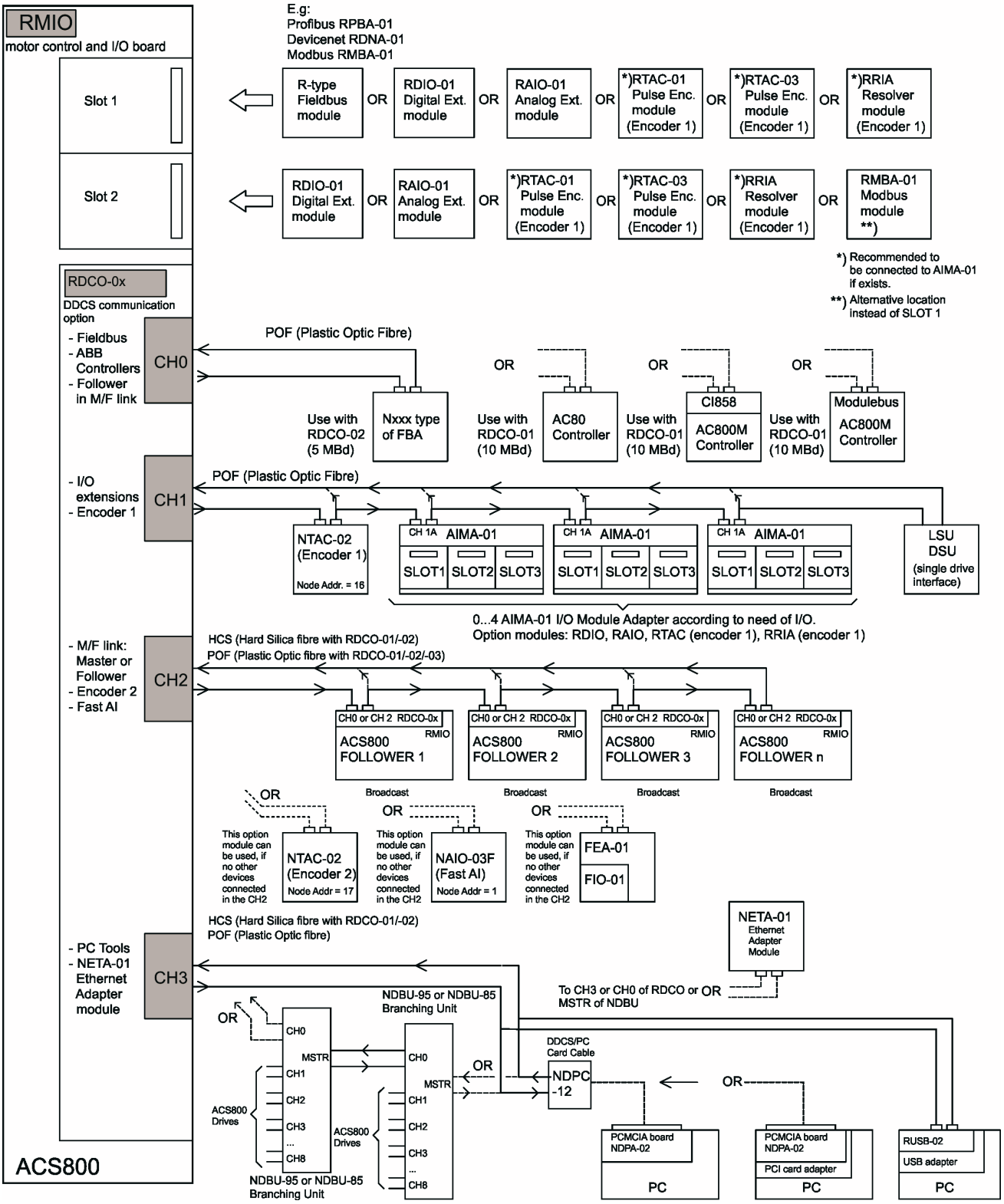
### Settings

| Parameter | Additional information |
|---|---|
| 50.15 ENCODER2 PULSE NR | Number of second encoder pulses per revolution |
| 50.16 SP MEAS MODE ENC2 | Selects a measurement type for the second encoder. |
| 50.17 ENCODER2 ALM/FLT | Defines operation in communication with the second encoder. |
| 50.18 ENC2 FILTER TIME | Medium filter time for speed measuremet in the second encoder module |
| 50.19 ENC2 CHANNEL | Defines a DDCS channel for the second encoder. |
| 98.16 ENCODER2 MODULE | Second pulse encoder interface module selection |

### Diagnostics

| Parameter | Additional information |
|---|---|
| 02.38 SPEED MEASUR ENC2 | Speed measured by the second encoder |

## Option I/O, Fieldbus and PC tool configurations



# Fast analogue interface for torque feedback utilisation

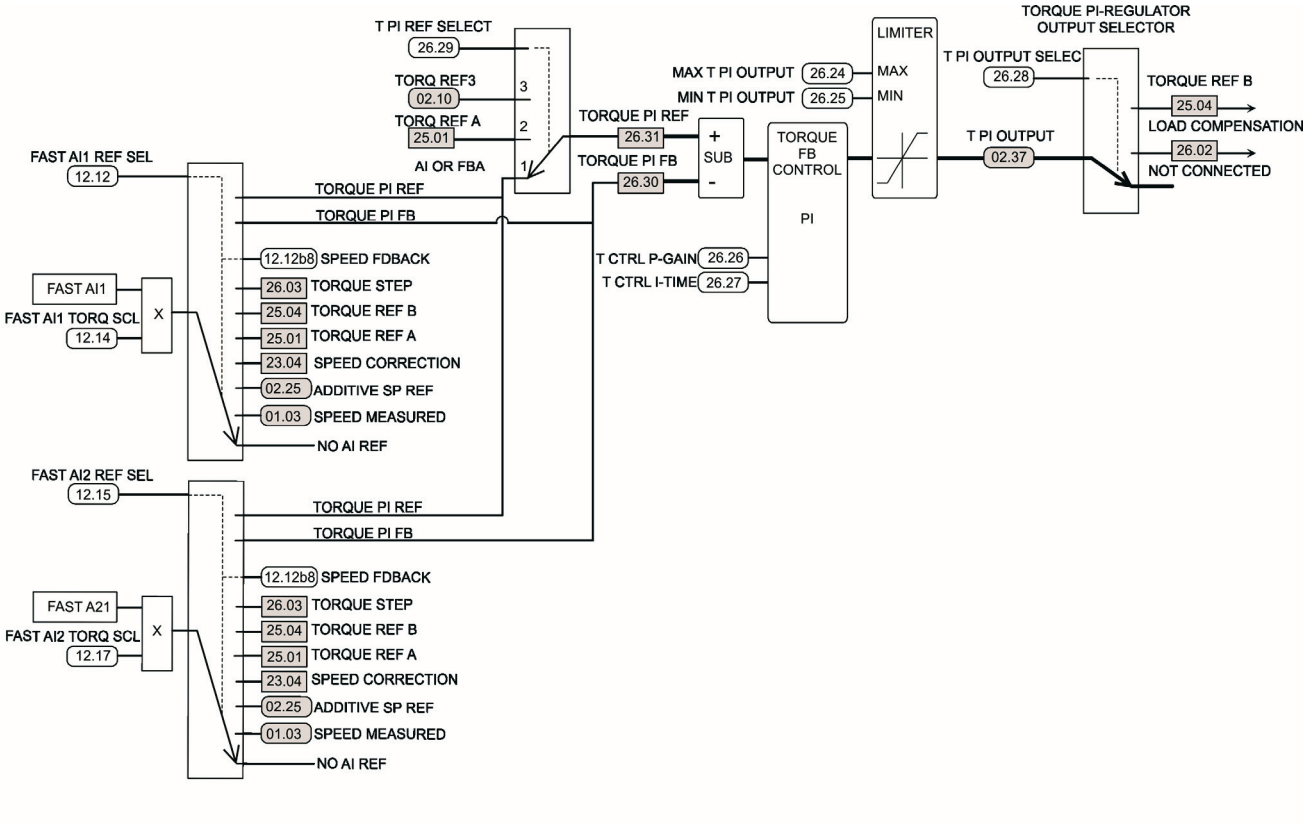
The actual shaft torque read via a fast analogue input or fieldbus can be used to correct the internal torque reference. The actual shaft torque is compared to the desired torque reference and the torque error is fed to the PI regulator, which corrects the internal torque reference. See the block diagram on page 13.

## Settings

| Parameter | Additional information |
|---|---|
| 12.12 FAST AI1 REF SEL | Signal source for analogue input AI1 |
| 12.15 FAST AI2 REF SEL | Signal source for analogue input AI2 |
| 26.24 … 26.25 | Output limitations |
| 26.26 … 26.27 | Regulator tuning parameters |
| 26.28 T PI OUTPUT SELEC | Selection for PI regulator output connection |
| 26.29 T PI REF SELECT | Selection for reference input |

## Diagnostics

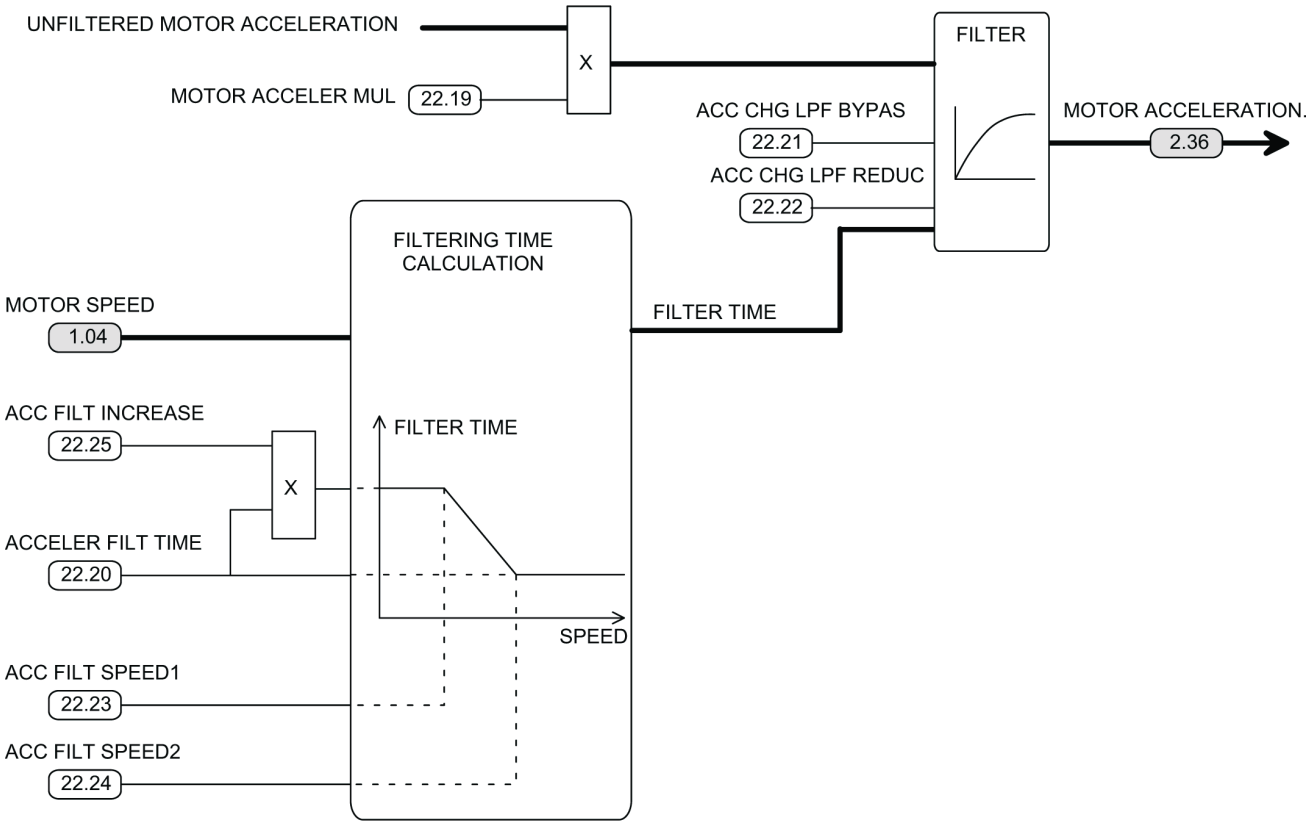
| Signal | Additional information |
|---|---|
| 26.30 TORQUE PI FB | Actual value for PI regulator. This signal can be used as an input from fieldbus or adaptive program. |
| 26.31 TORQUE PI REF | Reference value for PI regulator. This signal can be used as an input from fieldbus or adaptive program. |
| When values are written via fieldbus or from the application program, the fast analogue inputs must not be connected to the reference or actual torque. | |




Fast PI regulator for torque correction (running at 1 ms time level). Extracted from the complete speed and torque control chain. For the complete control chart, see *ACS800 System Control Program 7.x Firmware manual* (3AFE64670646 [English]).

## Calculation of the motor shaft actual acceleration

The calculated motor shaft acceleration is filtered by three low pass filters. The filtering time is defined as a function of the speed. At a lower speed, a higher filtering time is used. In rapid changes, the delay of filters is reduced by bypassing the first filter and reducing filtering time constant of the last two filters.



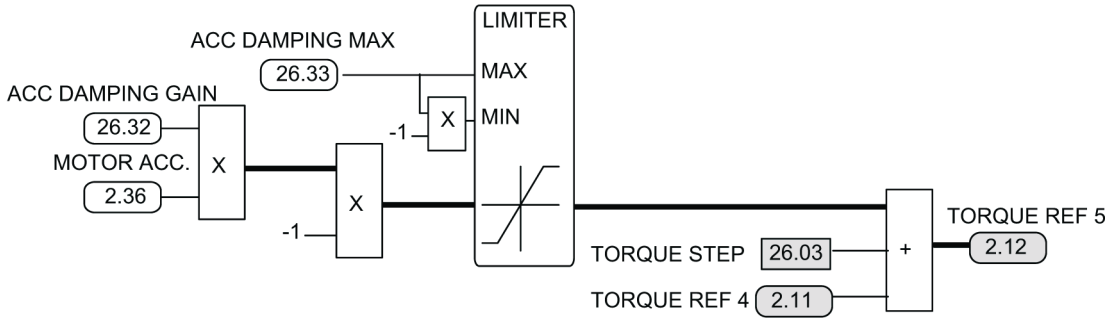

### Settings

| Parameter | Additional information |
|---|---|
| 22.19 MOTOR ACCELER MUL | Scaling factor for signal 02.36 MOTOR ACCELERATION |
| 22.20 ACCELER FILT TIME | Filtering time for all three filters |
| 22.21 ACC CHG LPF BYPAS | Upper limit for difference between the outputs of first and third filters |
| 22.22 ACC CHG LPF REDUC | Reduction of the filtering time of last two filters, if difference between the outputs of first and third filters exceeds parameter 22.21 ACC CHG LPF BYPAS. |
| 22.23 ACC FILT SPEED1 | Below this speed, a longer filtering time is used. |
| 22.24 ACC FILT SPEED2 | Above this speed, the filtering time defined by parameter 22.20 ACCELER FILT TIME is used. |
| 22.25 ACC FILT INCREASE | Defines how much the filtering time is increased below the speed defined by parameter 22.23 ACC FILT SPEED1. |

## Diagnostics

| Signal | Additional information |
|---|---|
| 02.36 MOTOR ACCELERATION | Filtered motor acceleration |

## Acceleration damping function




In the block diagram above, the Acceleration damping function is extracted from the complete speed and torque control chain. For a more detailed control chart, see the *ACS800 System Control Program 7.x Firmware Manual* (3AFE64670646 [English]). See also section *Calculation of the motor shaft actual acceleration* on page 13.

### Settings

| Parameter | Additional information |
|---|---|
| 26.32 ACC DAMPING GAIN | Multiplier amplifying measured acceleration |
| 26.33 ACC DAMPING MAX | The limit for damping term |

## Standstill heating function

The Standstill heating function feeds a small DC current to the motor to prevent condensation inside the motor. The current can be fed only between two phases.

The function can be activated when all the following conditions are fulfilled:

1. Parameter 17.07 STANDSTILL HEATING is activated. However, this does not start Standstill heating if the digital input defined with parameter 10.15 START STANDSTILL is already active.
2. The motor is not running and/or motor start command is not active.
3. The digital input defined with parameter 10.15 START STANDSTILL is active. A rising edge is recognised as the standstill heating activation command.

### Settings

| Parameter | Additional information |
|---|---|
| 10.15 START STANDSTILL | Activates Standstill heating based on the rising edge on DI or fieldbus after the interlocks are satisfied. |
| 17.07 STANDSTILL HEATING | Activates the Standstill heating function. |
| 17.08 STANDSTILL I REF | Sets the Standstill heating current reference. |

# Actual signals and parameters

## Chapter overview

This chapter explains valid selections of the parameters.

## Terms and abbreviations

| Term | Definition |
|---|---|
| Actual signal | Signal measured or calculated by the drive. Can be monitored by the user. No user setting possible. |
| B | Boolean |
| D | Dynamic signal effects only in RAM. The value is reset in power down. |
| Def. | Default value |
| FbEq | Fieldbus equivalent. Shows how the value on the control panel is converted to an integer value when communicated over a serial communication link (fieldbus interface). |
| F | The signal is saved to flash and value remains over power down. |
| I | Integer |
| Parameter | A user-adjustable operation instruction of the drive |
| Pb | Packed boolean |
| PB | PROFIBUS equivalent for drive parameters communicating through the NPBA-12 PROFIBUS Adapter. (Add 4000 in FMS Mode.) |
| R | Real |
| RO | Read only |
| T | Data type (see B, D, F, I, R, RO, Pb) |

# Actual signals table

| Index | Name/Selection | Description | FbEq | PB | T |
|---|---|---|---|---|---|
| 02 | **ACTUAL SIGNALS** | Additional signals for the Test Bench control | | | |
| 02.36 | MOTOR ACCELERATION | Scaled and filtered motor acceleration. See parameter 22.19 MOTOR ACCELER MUL. | 100 = 1 rpm/s | | R, RO |
| | rpm/s | Acceleration | | | |
| 02.37 | T PI OUTPUT | Output of the PI controller with torque feedback. This is the error signal to be used as a correction to the drive internal torque reference. | 100 = 1% | | R, RO |
| | % | Torque | | | |
| 02.38 | SPEED MEASUR ENC2 | Speed as measured by the second encoder | | | R, RO |
| | rpm | Speed | | | |
| 07 | **CONTROL WORDS** | ABB Drive Profile Control Words | | | |
| 07.01 | MAIN CTRL WORD | Main Control Word (MCW) | | | Pb |
| | **Bit** / **Name** / **Description** | | | | Pb |
| | 11 / FLUX ON | Flux ON (zero torque) | | | |
| | 0...65535 | Control word value | | | |
| 07.03 | AUX CTRL WORD 2 | Auxiliary Control Word 2 (ACW 2) | | | Pb |
| | **Bit** / **Name** / **Description** | | | | |
| | 4 / FAST FBA COMM ENA | Controls the faster fieldbus references.<br>If this bit is set and<br>• drive is not a follower (70.08),<br>• 98.02 COMM.MODULE = FIELDBUS,<br>then speed and torque references can be written within less than 2 ms. See chapter *Fieldbus control*. | | | |
| | 14 / STANDSTILL HEATING | Activates Standstill heating when selected with parameter 10.15 START STANDSTILL. MCW bits 0, 1, and 2 must also be set on before Standstill heating can be activated via fieldbus. | | | |
| | 0...65535 | Control word value | | | |

## Parameters table

| Index | Name/Selection | Description | FbEq | Def. | PB | T |
|---|---|---|---|---|---|---|
| 10 | **DIGITAL INPUTS** | | | | | |
| 10.15 | START STANDSTILL | Activates the Standstill heating function based on the rising edge on DI or fieldbus after the interlocks are satisfied. | 1 = 1 | | | I,F |
| | = DI3 | Setting DI3 high activates Standstill heating. | | | | |
| | = DI4 | Setting DI4 high activates Standstill heating. | | | | |
| | = DI5 | Setting DI5 high activates Standstill heating. | | | | |
| | = DI6 | Setting DI6 high activates Standstill heating. | | | | |
| | = EXT DI1 | Setting DI1 high activates Standstill heating. | | | | |
| | = EXT DI2 | Setting DI2 high activates Standstill heating. | | | | |
| | = FB | Setting 07.03 AUX CTRL WORD 2, bit 14 (STANDSTILL HEATING) activates the Standstill heating function. MCW bits 0, 1, and 2 must also be set on before Standstill heating can be activated via fieldbus. | | | | |
| 12 | **FAST IO** | Fast IO interface | | | | |
| 12.12 | FAST AI1 REF SEL | Signal source for analogue input AI1. For other selections, see *ACS800 System Control Program 7.x Firmware Manual* (3AFE64670646 [English]). | 1 = 1 | 0 | 152 | I,F |
| | 6 = TORQ PI FB | AI1 of the fast AI module is connected internally to input 26.30 TORQ PI FB. | | | | |
| | 7 = TORQ PI REF | AI1 of the fast AI module is connected internally to input 26.31 TORQ PI REF. | | | | |
| | 8 = SPEED FDBACK | External speed feedback. | | | | |
| 12.15 | FAST AI2 REF SEL | Signal source for analogue input AI2. For other selections, see *ACS800 System Control Program 7.x Firmware Manual* (3AFE64670646 [English]). | 1 = 1 | 0 | 153 | I,F |
| | 6 = TORQ PI FB | AI2 of the fast AI module is connected internally to input 26.30 TORQ PI FB. | | | | |
| | 7 = TORQ PI REF | AI2 of the fast AI module is connected internally to input 26.31 TORQ PI REF. | | | | |
| | 8 = SPEED FDBACK | External speed feedback. | | | | |
| 12.18 | FAST AI1 FILT T | Defines the HW filtering time for FIO module analogue input AI1. | 1 = 1 | 1 | 168 | I,F |
| | 1 = NO FILTERING | The analogue input is not filtered. | | | | |
| | 2 = 150 µs | The filtering time for the analogue input is 150 µs. | | | | |
| | 3 = 300 µs | The filtering time for the analogue input is 300 µs. | | | | |
| | 4 = 600 µs | The filtering time for the analogue input is 600 µs. | | | | |
| | 5 = 1.2 ms | The filtering time for the analogue input is 1.2 ms. | | | | |
| | 6 = 2.4 ms | The filtering time for the analogue input is 2.4 ms. | | | | |
| | 7 = 4.8 ms | The filtering time for the analogue input is 4.8 ms. | | | | |
| | 8 = 9.6 ms | The filtering time for the analogue input is 9.6 ms. | | | | |
| 12.19 | FAST AI2 FILT T | Defines the HW filtering time for FIO module analogue input AI2. | 1 = 1 | 1 | 169 | I,F |
| | 1 = NO FILTERING | The analogue input is not filtered. | | | | |
| | 2 = 150 µs | The filtering time for the analogue input is 150 µs. | | | | |
| | 3 = 300 µs | The filtering time for the analogue input is 300 µs. | | | | |

| Index | Name/Selection | Description | FbEq | Def. | PB | T |
|---|---|---|---|---|---|---|
| | 4 = 600 µs | The filtering time for the analogue input is 600 µs. | | | | |
| | 5 = 1.2 ms | The filtering time for the analogue input is 1.2 ms. | | | | |
| | 6 = 2.4 ms | The filtering time for the analogue input is 2.4 ms. | | | | |
| | 7 = 4.8 ms | The filtering time for the analogue input is 4.8 ms. | | | | |
| | 8 = 9.6 ms | The filtering time for the analogue input is 9.6 ms. | | | | |
| 12.20 | FAST AI SPFB OFFS | Fast AI speed feedback offset. Change the value to compensate for the offset error in external AI speed feedback. | 1 = 1 rpm | 0 | 168 | R |
| | -60000… 60000 rpm | | | | | |
| 17 | **DC HOLD** | DC hold and Standstill heating functions | | | | |
| 17.07 | STANDSTILL HEATING | Activates the Standstill heating function. | 1 = 1 | OFF | | B,F |
| | 0 = NO | Activated | | | | |
| | 1 = YES | Not activated | | | | |
| 17.08 | STANDSTILL I REF | Sets the Standstill heating current reference. | 100 = 1% | | | I,F |
| | 4% … 30% | | | | | |
| 22 | **ACCEL/DECEL** | | | | | |
| 22.19 | MOTOR ACCELER MUL | Multiplier for signal 02.36 MOTOR ACCELERATION. With this parameter, the signal range can be tuned to a suitable level. For example, with this parameter set to 10, the signal value 1 rpm/s actually corresponds to 0.1 rpm/s. | 100 = 1 | 1 | 419 | R,F |
| | 0 … 256 | Scaling factor | | | | |
| 22.20 | ACCELER FILT TIME | Filtering time for all three filters | 1 = 1 ms | 5 ms | 420 | R,F |
| | 2 … 20000 ms | Filtering time | | | | |
| 22.21 | ACC CHG LPF BYPAS | This parameter limits the acceleration difference between the outputs of filters 1 and 3, thus reducing the delay of the filter when acceleration is changing quickly. If the difference is greater than this parameter, the first LPF is bypassed and the filtering time coefficient of the two remaining filters is reduced by a factor defined with parameter 22.12 ACC CHG LPF REDUC. The default value of this parameter is 100 rpm/s, but it must be tuned according to the process. | 1 = 1 rpm/s | 100 rpm/s | 421 | R,F |
| | | Acceleration limit | | | | |
| 22.22 | ACC CHG LPF REDUC | This parameter defines the amount of reduction of the filtering time constant of two last LPFs in case the acceleration difference between filters 1 and 3 exceeds parameter 22.21 ACC CHG LPF BYPAS.<br>For example, if 22.20 ACCELER FILT TIME = 30 ms, and 22.22 ACC CHG LPF REDUC = 2, then, during a sudden acceleration change, the actual filtering time is reduced to 15 ms. | 1 = 1 | 2 | 422 | I,F |
| | 1 … 24 | Multiplier | | | | |
| 22.23 | ACC FILT SPEED1 | Below this speed, a longer filtering time defined with par. 22.25 ACC FILT INCREASE is used when filtering the acceleration signal 02.36. | See Par. 50.01 | 2% of motor sync. speed | 423 | R,F |
| | 0 … 10 · sync. Speed | Speed | | | | |

| Index | Name/Selection | Description | FbEq | Def. | PB | T |
|---|---|---|---|---|---|---|
| 22.24 | ACC FILT SPEED2 | Above this speed, the normal filtering time defined with par. 22.20 ACCELER FILT TIME is used. When the motor speed is between SPEED1 and SPEED2, the filtering time is calculated as a linear function and is between 22.20 ACCELER FILT TIME and the higher value defined with par. 22.25 ACC FILT INCREASE. | See Par. 50.01 | 4% of motor sync. speed | 424 | R,F |
| | 0 … 10 · sync. Speed | Speed | | | | |
| 22.25 | ACC FILT INCREASE | Defines how much the filtering time constant 22.20 ACCELER FILT TIME is increased by multiplication at a low speed. The low speed is defined with par. 22.23 ACC FILT SPEED1. | 1 = 1 | 4 | 425 | I,F |
| | 1 … 1000000 | Multiplier for filtering time. | | | | |
| 24 | **SPEED CONTROL** | | | | | |
| 24.31 | ACC CMP DTIM SCALE | This is the scaling for 24.14 ACC COMP DER TIME. | 100 = 0.1 | 1 | | R,F |
| | 0.01 … 16 | Scaling factor | | | | |
| 26 | **TORQ REF HANDLING** | Torque reference and inertia compensation | | | | |
| 26.24 | MAX T PI OUTPUT | Maximum value for the fast PI regulator output. This output is then used for correction of the final torque reference. | 100 = 1% | 0 % | 524 | R,F |
| | -x% … x% | Torque limit. Maximum and minimum values depend on the defined motor parameters (99 START-UP DATA). | | | | |
| 26.25 | MIN T PI OUTPUT | Minimum value for the fast PI regulator output. This output is then used for correction of the final torque reference. | 100 = 1% | 0 % | 525 | R,F |
| | -x% … x% | Torque limit. Maximum and minimum values depend on the defined motor parameters (99 START-UP DATA). | | | | |
| 26.26 | T CTRL P-GAIN | Gain for the fast PI regulator for torque reference correction | 100 = 1.0 | | | R,F |
| | 0 … 128 | Gain | | | | |
| 26.27 | T CTRL I-TIME | Integration time for the fast PI regulator for torque reference correction. Value zero deactivates the integration part. | 100 = 1.0 s | 0 s | | R,F |
| | 0 … 10000 s | Integration time | | | | |
| 26.28 | T PI OUTPUT SELEC | This parameter selects where the PI regulator output is connected. | 1 = 1 | 0 | | I,F |
| | 0 = NOT CONNECTD | The output is not used for torque correction. | | | | |
| | 1 = LOAD COMPENS | The output updates parameter 26.02 LOAD COMPENSATION. | | | | |
| | 2 = TORQ REF B | The output updates parameter 25.04 TORQUE REF B. | | | | |
| 26.29 | T PI REF SELECT | This parameter selects where the PI reference input is connected. | 1 = 1 | 0 | | I,F |
| | 0 = AI OR FBA | The torque reference is read via a fast analogue input or it is written directly to parameter 26.31 TORQUE PI REF via fieldbus. | | | | |
| | 1 = TORQ REF A | 25.01 TORQ REF A is used as torque reference. | | | | |
| | 2 = TORQ REF3 | 02.10 TORQ REF3 is used as torque reference. | | | | |
| 26.30 | TORQUE PI FB | Actual Torque Feedback to be connected with the help of dataset to the desired source (eg. fieldbus) other than Fast AI signal.<br>**Note** that the connection for Fast AI torque feedback and feedback via dataset should not be activated at the same time since this leads to mutual overwriting. | 100 = 1% | 0 % | | R,D |
| | -x% … x% | Torque. Maximum and minimum values depend on the defined motor parameters (99 START-UP DATA). | | | | |

| Index | Name/Selection | Description | FbEq | Def. | PB | T |
|---|---|---|---|---|---|---|
| 26.31 | TORQUE PI REF | Actual Torque Set point to be connected with the help of dataset to the desired source (eg. fieldbus) other than Fast AI signal.<br>**Note** that the connection for Fast AI torque setpoint and setpoint via dataset should not be activated at the same time since this leads to mutual overwriting. | 100 = 1% | 0 % | | R,D |
| | -x% … x% | Torque. Maximum and minimum values depend on the defined motor parameters (99 START-UP DATA). | | | | |
| 26.32 | ACC DAMPING GAIN | Multiplier amplifying the measured actual acceleration 02.36 MOTOR ACCELERATION to torque reference correction. The calculation is added after torque reference 4, signal 02.11 TORQUE REF 4. Positive acceleration means negative torque correction. See parameters 22.20 … 22.26 for tuning of signal 02.36 MOTOR ACCELERATION. | 10000 = max | 0 $\%s^2$ | | R,F |
| | -x $\%s^2$ … x $\%s^2$ | Maximum and minimum values depend on the defined motor parameters (99 START-UP DATA). | | | | |
| 26.33 | ACC DAMPING MAX | The absolute maximum / minimum allowed torque correction based on ACC DAMPING GAIN and Actual acceleration. | 100 = 1% | 10 % | | R,F |
| | 0 … 300% | Torque limit | | | | |
| 31 | **FAULT FUNCTIONS** | Programmable protection functions | | | | |
| 31.09 | ENC1 CABLE CHECK | Defines the operation when a disconnection of encoder 1 is detected. The parameter is effective only when RTAC-03 is used. | 1 = 1 | 0 | 626 | I,F |
| | 0 = DISABLED | The connection is not checked. | | | | |
| | 1 = WARNING | The drive generates alarm ENC1 CABLE. | | | | |
| | 2 = FAULT | The drive trips on fault ENC1 CABLE. | | | | |
| 50 | **SPEED MEASUREMENT** | | | | | |
| 50.15 | ENCODER2 PULSE NR | Number of encoder 2 pulses per revolution | | 2048 | 1018 | R,F |
| | 0 … 30000 | | | | | |
| 50.16 | SP MEAS MODE ENC2 | Selects the measurement type for pulse encoder 2. | 1 = 1 | 3 | 1019 | I,F |
| | 0 = A_-B DIR | Channel A: positive edges are used for speed calculation. Channel B: direction. | | | | |
| | 1= A_-_ | Channel A: positive and negative edges are used for speed calculation. Channel B: not used. | | | | |
| | 2 = A_-_B DIR | Channel A: positive and negative edges are used for speed calculation. Channel B: direction. | | | | |
| | 3 = A_-_B_-_ | All edges of the signals are used for speed calculation (recommended setting). | | | | |
| 50.17 | ENCODER2 ALM/FLT | Defines the operation of the drive if a failure is detected in the communication between the pulse encoder 2 and the pulse encoder interface module, or between the module and the drive. | 1 = 1 | ALM | 1020 | B,F |
| | 0 = ALARM | The drive generates a warning indication. | | | | |
| | 1 = FAULT | The drive trips on a fault, gives a fault indication and stops the motor. | | | | |
| 50.18 | ENC2 FILTER TIME | Medium filtering time for the speed measurement in the second encoder module. | 1 = 1 ms | 2 ms | 1022 | R,F |
| | 0 … 10000 ms | Setting range. | | | | |

| Index | Name/Selection | Description | FbEq | Def. | PB | T |
|---|---|---|---|---|---|---|
| 50.19 | ENC2 CHANNEL | Defines the optic fibre channel of the control board from which the drive program reads the signals coming from the pulse encoder 2 interface module. | 1 = 1 | CH 2 | 1021 | I,F |
| | 1 = CH 1 | Signals via Channel 1 (CH1). The pulse encoder 2 module must be connected to CH1 instead of CH2 in applications where CH2 is reserved by a master station (eg, a Master/Follower application). See also parameter 70.03 CH0 BAUD RATE. | | | | |
| | 2 = CH 2 | Signals via Channel 2 (CH2). Can be used in most cases. | | | | |
| 50.20 | FREQUENCY SCALING | Defines the frequency reference which corresponds to integer value 20000 used in fieldbus control or I/O control. The scaling is used for frequency references and actual values. | 100 = 1 Hz | 200 Hz | | R,F |
| | 0 … 500 Hz | Setting range | | | | |
| 98 | **OPTION MODULES** | | | | | |
| 98.01 | ENCODER MODULE | Activates the communication to the optional pulse encoder module. For other selections, see *ACS800 System Control Program 7.x Firmware Manual* (3AFE64670646 [English]). | 1 = 1 | NO | 1901 | I,F |
| | 5 = RRIA-SLOT1 | RRIA module connected to Slot 1 | | | | |
| | 6 = RRIA-SLOT2 | RRIA module connected to Slot 2 | | | | |
| | 7 = RRIA-DDCS | RRIA module connected via DDCS | | | | |
| | 8 = RTAC03-SLOT1 | RTAC-03 module connected to Slot 1 | | | | |
| | 9 = RTAC03-SLOT2 | RTAC-03 module connected to Slot 2 | | | | |
| | 10 = RTAC03-DDCS | RTAC-03 module connected via DDCS | | | | |
| 98.16 | ENCODER 2 MODULE | Activates the communication to the optional second pulse encoder module. | 1 = 1 | NO | 1916 | I,F |
| | 0 = NTAC | Communication active. Module type: NTAC. Connection interface: Fibre optic DDCS link.<br>**Note:** Module node number must be set to 17 for the second encoder. For directions, see *Installation and Start-up Guide for NTAC-0x/NDIO-0x/NAIO-0x Modules* (3AFY58919730 [English]). | | | | |
| | 1 = NO | Inactive | | | | |

# Fault tracing

## Chapter overview

This chapter describes special alarms and faults of the Test Bench control program.

## Alarm messages generated by the drive

Alarm messages described in *ACS800 System Control Program 7.x Firmware Manual* (3AFE64670646 [English]) are also available.

| Alarm | Cause | What to do |
|---|---|---|
| ENC1 CABLE | A conductor in the cable to encoder 1 is broken or disconnected. | Check the connections of encoder 1.<br>Alarm function selectable; see parameter 31.09 ENC1 CABLE CHECK. |

## Fault messages generated by the drive

Fault messages described in *ACS800 System Control Program 7.x Firmware Manual* (3AFE64670646 [English]) are also available.

| Fault | Cause | What to do |
|---|---|---|
| ENC1 CABLE | A conductor in the cable to encoder 1 is broken or disconnected. | Check the connections of encoder 1.<br>Fault function selectable; see parameter 31.09 ENC1 CABLE CHECK. |

# Fieldbus control

## Chapter overview

This chapter describes differences between the fieldbus control interfaces of the System control program and the Test Bench control program.

## External control interface

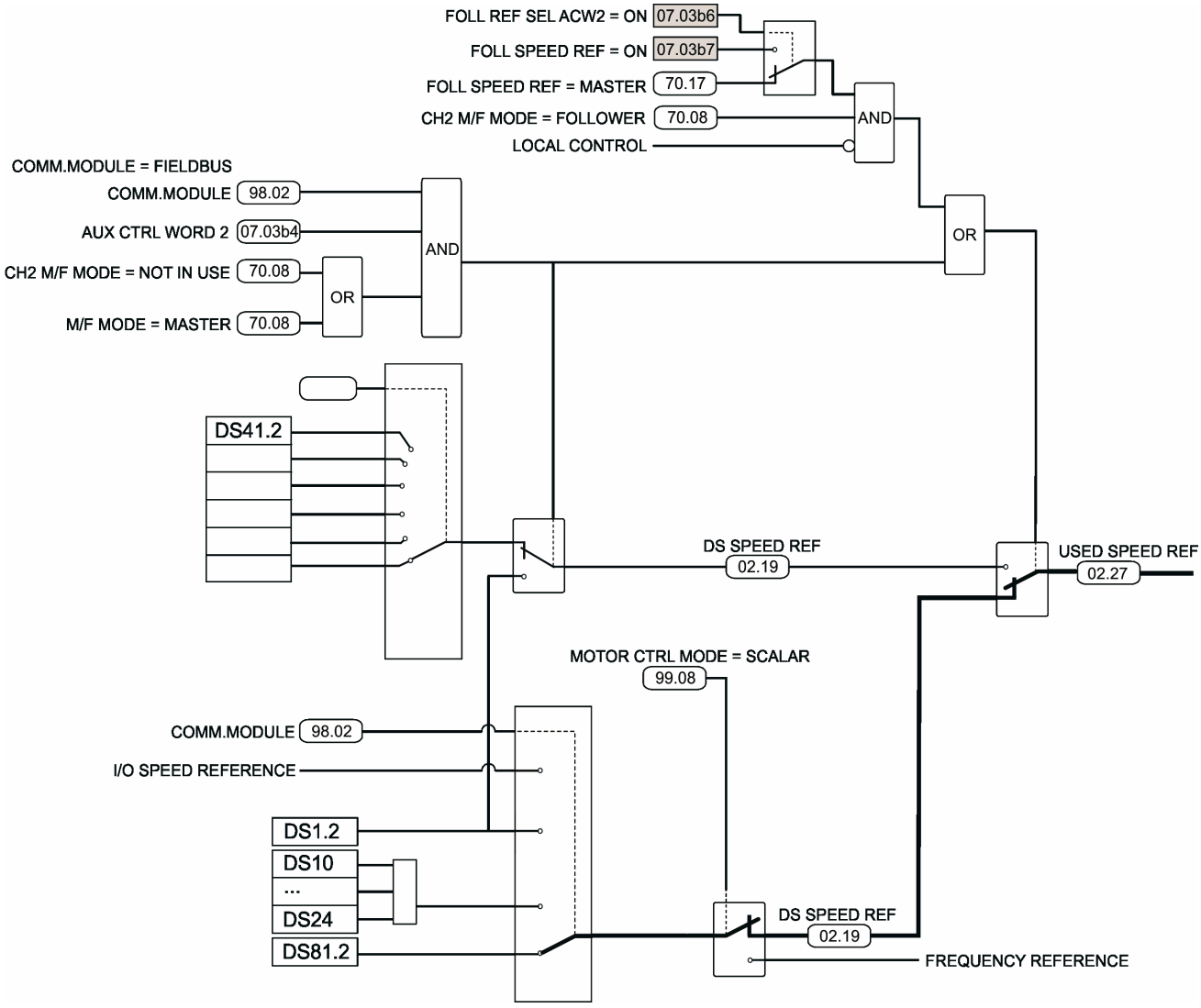
When Nxxx fieldbus adapter or RMBA-01 is selected, actual signal 2 of dataset 2 is 01.07 MOTOR TORQ FILT2. Now the user can adjust the filtering time of the actual torque transmitted via fieldbus by parameter 25.07 TORQ ACT FILT TIM. For other signals and settings, see *ACS800 System Control Program 7.x Firmware Manual* (3AFE64670646 [English]).

## References in fast fieldbus communication

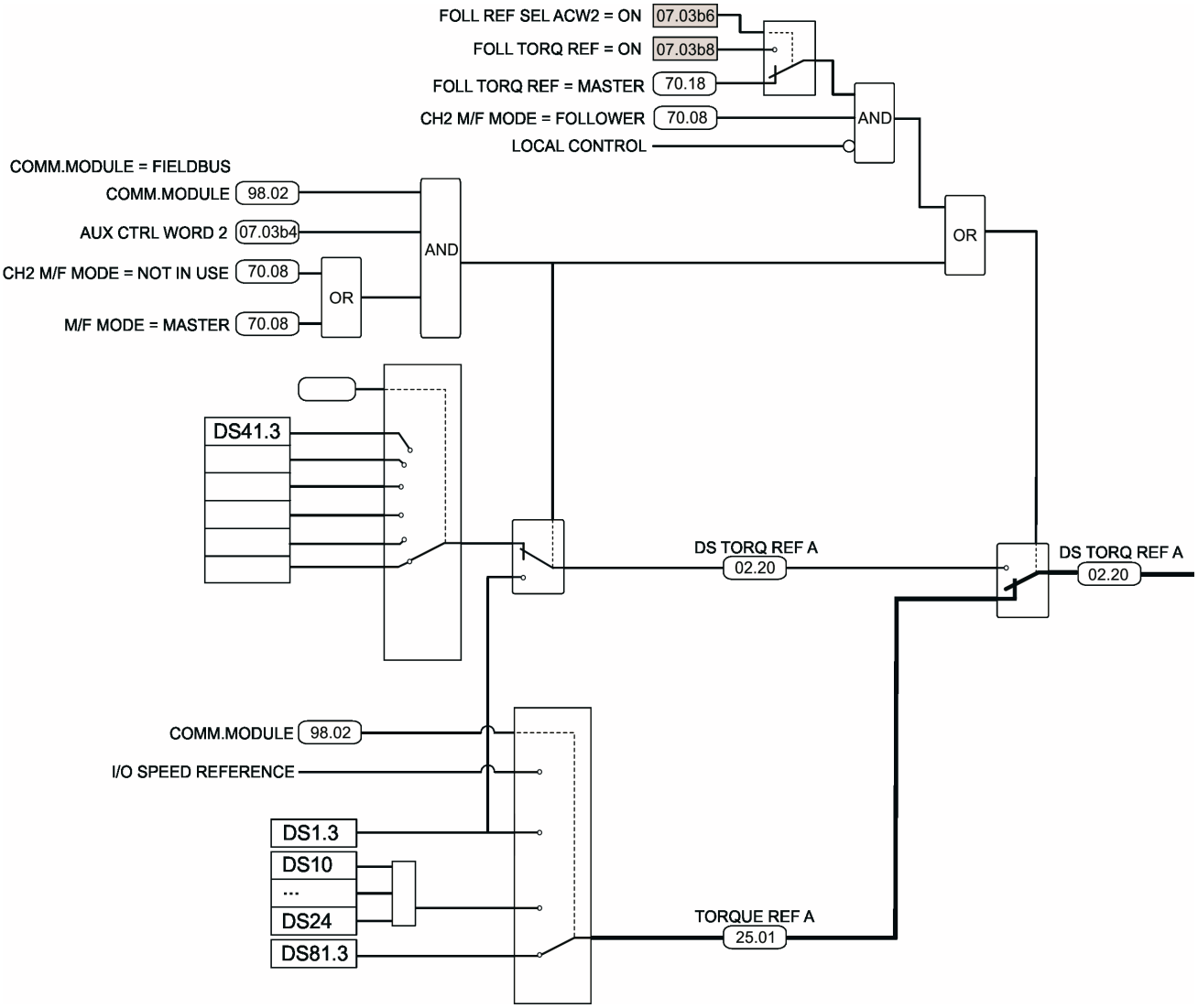
- Fast communication is available for applications with communication through fieldbusses that use data set 1 (98.02 COMM.MODULE = FIELDBUS).
- Fast communication can be activated/deactivated with 07.03 AUX CTRL WORD 2 bit 4 FAST FBA COMM ENA.
- In fast communication mode, speed reference is written via data set DS1.2. The advantage is that the reference is handled at a faster timelevel (2 ms) than normally (10 ms).
- In fast communication mode, torque reference is written via data set DS1.3. The advantage is that the reference is handled at a faster timelevel (2 ms) than normally (10 ms).
  (Fast communication is not available in applications that require the use of 25.04 TORQ REF B.)
- Fast communication is not active when drive is a Follower.

The following block diagrams illustrate the reference selection part with fast communication. See also the block diagrams in *ACS800 System Control Program 7.x Firmware Manual* (3AFE64670646 [English]) chapter *Control block diagrams*.

## Speed reference



## Torque reference



# Further information

## Product and service inquiries

Address any inquiries about the product to your local ABB representative, quoting the type designation and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to www.abb.com/drives and selecting *Sales, Support and Service network*.

## Product training

For information on ABB product training, navigate to www.abb.com/drives and select *Training courses*.

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