drive.web speedy®



Distributed Process Controller

EMA
Drives and Automation
Call 800-848-2504
www.emainc.net

models **dw220, dw222, dw223, dw225 & dw226**

Installation & Operation Manual

for firmware version 0x2019

Contents **Page**

CE, UL, FCC, IC, warnings, copyright notice	2
speedy identification and standard features	3
speedy options listing	3
speedy specials	4
speedy installation	4, 5
speedy power and serial port connections	6, 7
speedy drive-dedicated models, drive setup info	7, 8
speedy Ethernet networking, system setup	8
Get started with *savvy*® engineering & design software	9 - 11
Upgrade *savvy* and *speedy*, *savvy-SFD* upgrade	12
savvyPanel® touch screen operator station	13, 14
speedy Comms Interfaces Modbus and EIP/PCCC	15 - 17
Option 06 winder control library	17
savvy - *savvyPanel* diagrammatic overview	18, 19
drive.web® product line highlights	20
Free *drive.web* online training seminars	20

speedy, savvy, savvyPanel, smarty, Bardac and drive.web are trade marks of Bardac Corporation, registered in the U.S. and other countries.

This product is designed to conform to CE and UL standards:

EMC Standard, EN 61326-1: 2006, Electrical Equipment for Measurement, Control and Laboratory Use.

Emissions Class A, Commercial Equipment.

Immunity Table 2, Industrial Equipment.

LVD Standards, EN 61010-1: 2010, Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use and;

EN 61010-2-030: Particular Requirements for Testing and Measuring Circuits.

speedy is an industrial controller designed for permanent installation by qualified professionals. If it is used in a manner not specified herein the protection provided may be impaired.

speedy and its packaging contain recyclable materials.

This device is designed to comply with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1)This device may not cause harmful interference, and (2)this device must accept any interference received, including interference that may cause undesired operation.

This Class [A] digital apparatus is designed to comply with Canadian ICES-003. Cet appareil numerique de la classe [A] est conçu conformer à la norme NMB-003 du Canada.

Warning! It is essential that you read and understand this entire manual and the entire contents of the **savvy** software ***Help*** menu before proceeding with your installation and configuration. See page 9 for **savvy** installation instructions. For more information and to download manuals and software, go to **www.driveweb.com** or contact us. See page 24.

Warning! Your use of **savvy** software and **drive.web** devices may cause motors and machinery to power up with high Voltages or start or operate in an unexpected, dangerous or lethal way. It is essential that you are completely familiar with all of the equipment and the system design before attempting to program or edit a program or connect to any live device. It is also essential that a risk assessment is conducted to identify hazards. Risks must be reduced to tolerable levels.

Warning! You are entirely responsible for the configuration or use of any **drive.web** product. By configuring or using these products you agree to indemnify and hold harmless Bardac Corporation, its' employees, directors, officers, distributors and resellers against the consequences of your configuration or use of the products.

Warning! Information in this manual is subject to change without notice. You are responsible for verifying the proper operation of your **speedy** module. Special care must be taken after loading new firmware or installing new options.

Warning! Avoid permanent damage to your **speedy**, never exceed any **min** or **max** values. Do not connect any **speedy** terminal to mains circuits. See page 8 for IO ratings.

lwIP is incorporated into **speedy** firmware. lwIP Copyright (c) 2001-2004 Swedish Institute of Computer Science. All rights reserved.
Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:
1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.
THIS SOFTWARE IS PROVIDED BY THE AUTHOR ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Product identification, speedy model number

speedy is a range of programmable devices using **drive.web** distributed control over Ethernet for industrial process automation. To program and use a **speedy** you must get the **savvy** software tools from **www.driveweb.com**. Please see pages 9 to 12.

To find the **speedy**'s firmware version, launch **savvy**, choose ***Get Detailed Info*** from the **speedy** contextual menu. See pages 11, 12.

dw220 generic ModbusRTU master up to 500kbps.
dw222 for ODE-2 variable frequency drive.
dw223 for ODP open-loop vector drive.
dw225 for YaskawaF7 inverter drive.
dw226 for HVAC variable-torque AC pump and fan drive.



Basic speedy standard features

- **drive.web** distributed process control.
- 10/100Base-T(X) Ethernet, page 6
- Field upgradeable firmware
- Ultra-compact design may be permanently bonded inside equipment.
- High-speed ModbusRTU on EIA485. Up to 500kb/s.
- Drive-dedicated models can bus-share EIA485 network to control or monitor additional servers at different addresses. See page
- E-Mail Notify block, outgoing SMTP mail server support, page 11.
- Basic Control Function Block Library. See **savvy** User Manual for listing.

speedy options

Software options may be added using **savvy**. See page 13. See **savvy** User Manual, Appendix A for function block listings.

04 ModbusTCP/IP Slave/Server. See page 18.
05 Process Control. Function Block Library 1.
06 Winder Control. Function Block Library 2. See page 19.
10 Advanced Math. Function Block Library 3.
25 EIP/PCCC Slave/Server. See page 18.
26 **savvyPanel** Operator Station Interface. See pages 14 to 17.
29 Solar with ***Sun Position*** calculator.
50 DIN rail mount with terminal block wiring.



speedy Specials

Generic engineered solutions include required options (in parentheses), system configuration and wiring diagram. Contact us for many other engineered solutions. Options may be added.

-1101 Open-loop Constant Tension Center Winder (**05**, **06**)

-1102 Closed-loop Dancer Control Center Winder (**05**, **06**)

-1103 Closed-loop Loadcell Control Center Winder (**05**, **06**)

-1104 Slip Core Winder (**05**, **06**)

speedy Installation

speedy is designed for permanent installation by qualified professionals.

Warning! Dangerous, High Voltages that may cause **injury or death** are present on drives, motor controllers and other industrial devices!

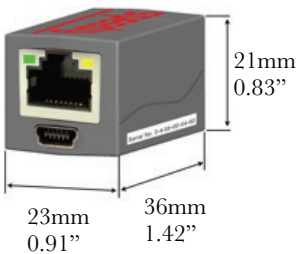
Only qualified personnel who are completely familiar with the system that the speedy will connect to should proceed!

Environment: UL/IEC Pollution Degree 2, Operating temperature, 0°C min., 50°C max. Altitude 3000m max. Storage temp, -20°C to 60°C. Humidity 95% max. non-condensing. Install in metal enclosure with no RF noise source

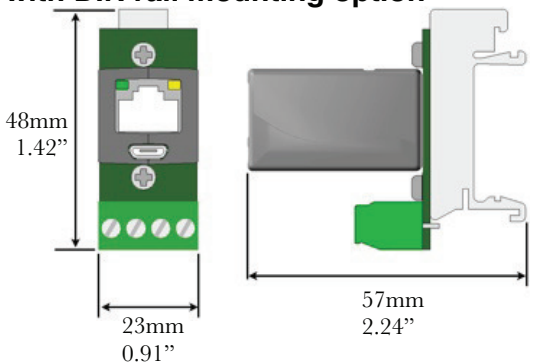
Dimensions & Clearances:

1" clearances must be provided on three long sides to promote airflow.

Standard model



with DIN rail mounting option



speedy Installation continued...

Weight: Standard-19g(0.7oz). w/ DIN rail & terminals - 28g(1.0oz)

Power requirements: Regulated 24VDC ±10%, 40mA. Do not connect to a distributed DC power network.

Serial port EIA485(RS485) 0.1 to 500Kbps. Unisolated, power and serial circuits must have compatible common-mode Voltages.

Ethernet port MDI 8P8C, "RJ45" jack, 100baseTX, 10BaseT, Full Duplex, Auto Negotiation, Auto-MDIX, IEEE 802.3ab.

USB port Peripheral-type Micro-B jack.

Ethernet LEDs For setup, troubleshooting and monitoring:

100 Green LED indicates 100BaseTX Ethernet connection.

Link / Activity Yellow LED. On for Link, flashing for activity.

Adhesive Mounting. Clean adhering surfaces with alcohol first. Use caution, bond is permanent. Adhere on or near the drive or EIA485 device. Do not obstruct air vents, access points or product labels. Do not attach speedy near hot spots such as heatsinks, cooling fans, etc., nor near to AC power lines.

DIN rail option. Use 35x7.5mm rail per IEC 60715, EN50022.

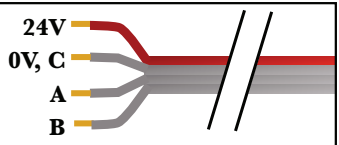
Terminal wiring: Strip 7mm(0.28") or use ferrules. Use 0.2mm^2 (AWG24) minimum. One wire, 2.5mm^2 (AWG12) maximum. Two wires, 1.5mm^2(AWG14) maximum. Two wires with ferrules, 1mm^2 (AWG18) maximum.

Terminal tightening torque: 0.5 Nm (4.4 in·lbs)

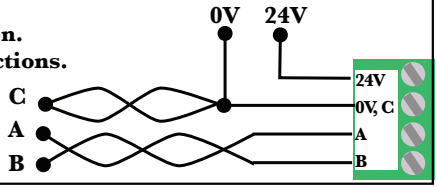
Signal wiring notes. Use twisted-pair wiring. All wiring outside of the metal enclosure should be shielded cable with individually shielded twisted-pairs such as **Belden 8163**. Ground the shield at only one end with a 360° clamp where the shield enters your metal enclosure. Separate all wiring from RF noise sources and AC power cabling.

speedy power and serial connections

dw220
standard 15”, 24AWG, solid-wire connections.

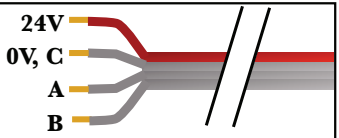


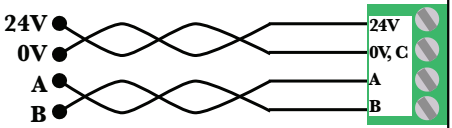
with DIN rail mount option.
Single, local device connections.



dw225
standard 15”, 24AWG, solid-wire connections.

YF7 terminal	Wire name
SP	24V
IG and SN	0V, C
S- and R-	A
S+ and R+	B





with DIN rail option.
Single, local device connections.

speedy serial port connections continued...

Name	EIA485 name	Modbus name	Description
A	A or Data −	D0	Inverting Pin
B	B or Data +	D1	Non-Inverting Pin
C	SC or Data 0V	Common	Common Reference

- ***A*** and ***B*** must share a single twisted-pair. ***C*** may use one or both conductors in another pair. Do NOT pair ***C*** with other signals.
- EIA485 Common Reference is required. It is named ***C*** so that it is not confused with other common, ground or shield connections.
- Correct multipoint topology is daisy-chain or trunk with device at each end and additional devices on short stub branches. Star, ring, or extended branch topologies are NOT recommended.
- Connect line termination between ***A*** and ***B*** at both physical ends of a ModbusRTU network, typically 150Ω, 0.5W or for networks with line polarization, 120Ω, 0.25W and 1nF, 10V cap in series. Do NOT provide line termination on any network with an ***Optidrive***.

Drive setup

speedy model	Supported drive	Required drive settings	Related drive settings
dw220	Generic	Baud-rate, framing	Serial loss behavior
dw222	OptidriveE2	P-36; Address = 1, Baud rate= 115.2Kbps	P-36, Comms Loss Trip Enable
dw223	OptidrivePlus	P2-26, Baudrate = 115.2Kbps P2-27, Address = 1	P2-26, T, trip or R, ramp on serial loss
dw225	YaskawaF7	H5-01 = 1F, decimal 31 H5-02 = 4, 19.2Kbps H5-03 = 00, No parity H5-06 = 05, Min. delay 5ms	H5-04 Stopping Method H5-05 Serial Fault Detect
dw226	OptidriveHVAC	P-36; Address = 1, Baud rate= 115.2Kbps	P-36, Comms Loss Trip Enable

dw223 *Optidrive Plus* Notes

- Check drive **model number** and **firmware version**. **P0-28** and **P0-29** should indicate 2.2 or higher. Model number must end in **-M** for firmware versions prior to 3.0.

Drive setup continued...

dw225 Yaskawa YF7 Notes

- Check **Flash ID**, U1-14 = 3020.
- Check internal line termination switch **S1-1**.
- You must cycle the **YF7**'s power, waiting for the screen to blank, before re-powering, in order for parameter changes to take effect.

speedy Ethernet Networking & Programming

Before proceeding, it is important to have a basic understanding of Ethernet TCP/IP networks. Assigning an invalid or duplicate IP address will cause serious network malfunctions! **speedy**s are all shipped with the **same IP address, 10.189.189.189**. Consult your company's IT department for an appropriate, unique IP address.



- Find useful networking information. Under the ***Help*** menu click on ***User Manual***. Scroll down to the ***Basic Network Administration*** section.

Set up Your Physical Ethernet Network - You Will Need:

- A standard Category 5e cable with 8P8C/RJ-45 connectors on both ends for each **drive.web** device and your computer.
- For systems with more than one **drive.web** device, an Ethernet switch with ports for all **drive.web** devices and your computer.

Set up Your Computer - Get savvy

With free **drive.web savvy** software, easily program and monitor your **speedy**, perform data trending and create distributed control systems.



- To download the latest version of **savvy** go to ***www.driveweb.com*** and click on ***Get savvy***.
- **Java Runtime Environment** must be installed to run **savvy**. There is a link on the ***Get savvy*** page to download Java for free.
- If you do not have internet access, install **savvy** and Java from the **Bardac** **Infodisk**. Browse to the **savvy** link, off-line installation. Contact us for the files or **Infodisk**.

Get started with savvy

- We strongly recommend attending our free on-line training seminars. To register and get your invitation, call or e-mail **training@driveweb.com**.
- Before proceeding with your systems designs it is very important to familiarize yourself with **savvy**, the configuration software.
- We strongly recommend you read the ***User Manual*** and ***Getting Started Guides*** under the ***Help*** menu.
- Use ***Create Phantom*** in the ***Directory*** menu to practice, explore all **drive.web** products and options and design and configure off-line. Design systems in Phantom devices and ***Export Data*** under the ***Directory*** menu for later use in live devices. ***Import Data*** into phantoms to work off-line.

The savvy window title bar indicates the current view.

The status bar above the viewing area provides object and location data and ***navigation arrows***.

- **savvy** views are hierarchical with the ***Directory*** view at top. Use the ***navigation arrows*** to view the next higher level or go backward and forward through views. Note that window menus change as you navigate.



Hover mouse cursor over any active object, device, function block, connection or parameter icon to view object information in the status bar and reveal a *hover-button*.

Click a hover-button or right-click anywhere in an active object to access a *contextual menu*. See below.

savvy functionality may be limited if you do not have the required password-protected capability level (see ***File > Capability...***) or a device is locked with a password (see contextual menu below).

Warning! Changing a device IP address **WILL** disrupt its network connections! If a **speedy** is communicating with other devices or drives you must be prepared for system disruption and to remap connections in those devices when changing an IP address. In the ***File*** menu choose ***Utility > Remap Export File*** to remap a ***dw-system*** file with different IP address(es).

Get started with *speedy* continued...

Device Directory* window,** select ***File > Administrate > Set IP Addresses for System. The serial number marked on your ***speedy*** is its ***MAC Address***. Enter a unique IP address within your computer's subnetwork, click OK.

- A ***speedy*** icon should appear with IP address beneath.



- If the icon at right appears, a network connection problem exists. Check connections, LEDs and that the ***speedy*** IP address is within your computer's Ethernet subnet mask.

Device Directory* window,** select ***Directory menu.

10.189.189.189

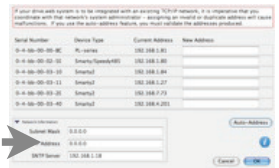
- ***Discover All Local Devices***. When ***speedy*** is powered up and connected to the same local network as your computer, an icon should appear.



- ***Discover Device...*** Anywhere on the internet via a public IP address, VPN or similar.

192.168.1.25

- Advanced Users: At the bottom of the ***Set IP Addresses*** window, click the arrow next to ***Network Information*** to set subnet mask, router, SMTP mail server and SNTP time server IP addresses. See the ***savvy*** user manual. **Note!** If the ***Network Information*** box is expanded, this network information will be set in the device(s) whose IP address(es) are changed.



Warning! Importing a configuration into your ***speedy*** will result in immediate execution of that configuration. **Dangerous Voltages and rotating machinery may result!**.Use a phantom to preview a configuration.

- ***Directory > Import / Export Data.*** All device configurations and ***drive.web*** connections between devices in the directory.

***speedy* contextual menu** (via right-click or hover-button)



- ***Change Name.*** Name your ***speedy*** for easy identification.
- ***Import Device Data / Export Device Data...*** Load / save configuration data to / from this ***speedy*** only.

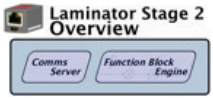
Laminator Stage 2

Get started with savvy - speedy contextual menu continued...

Find Parameter... Enter parameter number, name or partial name to view it.

Unlock, Lock, Set Password. The **speedy** at right is locked to ***Restrict Modification***. Viewing configuration is possible. The **speedy** below it is locked to ***Restrict All Access***. Select lock type when setting password.

Click the speedy icon to view the ***Device Overview*** screen (Standard **savvy**, no **SFD**). Click the ***Function Block Engine*** icon or, if you have options **04** , **17** to **19**, **25**, the ***Comms Server*** icon to view.



Function Block Engine* Window.** Select ***FBE menu (Standard **savvy**, no **SFD**), and add function blocks in the order to be processed. Processing order is from left to right, then top to bottom.

Click on function block to view parameters and function detail.

Warning! Making a connection will result in immediate execution of that connection. **Dangerous Voltages and rotating machinery may result!**.

Connect between parameters and to parameters in other **drive.web** devices over Ethernet.

Under the ***File*** menu, choose ***New Viewer...*** and then ***Open Device Directory***. With two viewer windows, click on a parameter, **drag** a connection and **drop** onto a destination parameter in the other viewer.

Parameter contextual menus (via right-click or hover-button)

Most parameter data is 16-bit. Raw decimal integer values **0 to 65535 or ±32767.** Data is formatted, limited and scaled depending on the parameter. Use ***Get Info*** or ***Re-Scale...*** to verify or change.

Click parameters to open a setter box. Adjust value with convenient graphical buttons or keyboard entry. Also find buttons for return to default or last state.



Click blue connection block or arrow to jump to other end.

Upgrade savvy and speedy

Upgrade **savvy** with **SFD** Signal Flow Diagram.

Upgrade **speedy** with software options.

Process credit cards or ***Vouchers*** on-line or ***Coupons*** off-line.

- To upgrade **savvy** go to the ***Commerce*** menu, select ***Upgrade savvy***, check the desired option and click OK.
- To upgrade **speedy**, right-click on the **speedy** icon, choose ***Upgrade Device…,*** check the desired option and click OK.
- Your selected options will appear in the Shopping Cart. Select your method of payment.
- To process ***Vouchers,*** choose ***Pay>Online Via Vouchers*** in the ***Shopping Cart***. Enter ***Voucher*** codes on separate lines.
- To process ***Coupons*** click ***Buy*** and forward the code to your **drive.web** distributor. When you receive your coupons go to the ***Commerce*** menu and choose ***Coupon Manager***. Enter codes in the top box and click the ***Add*** button. Click ***Apply***.

savvy-SFD Signal Flow Diagram Upgrade



- With **savvy-SFD**, build systems graphically while creating live drawings that are stored in your **speedy**.
- Set borders with user attributes, drag and drop connections, zoom, pan, cross-reference and annotate multi-page drawings.
- Right-click in an empty area of the SFD to zoom, add a new function block or note or to paste a parameter for convenient viewing.
- A filterable list of function blocks and connections is at the left of the Signal Flow Diagram showing **program execution order** from top down. The order in which function blocks are processed can greatly influence system performance and the function of logic engines. Change execution order by dragging function blocks up or down the list. In this picture, ***ENC1 Speed*** function block and its outgoing connection will be moved so that they are processed after ***ENC Phase Lock***.

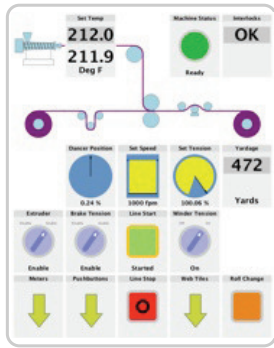
savvyPanel Operator Station

Computers, Apple® mobile digital devices; iPad®, iPhone® & iPod Touch® are operator touch stations with **savvyPanel**. Requires Windows(XP, Vista, 7), Mac OSX, Linux(Solaris, Umbuntu, etc) or iOS.

- Operator station data is located in the **drive.web** devices so setup is easy.
- Editing and building **savvyPanel** systems requires **savvy SFD** upgrade.
- **savvyPanel** **dwOption-26** must be installed in **drive.web** devices to enable the full suite of tiles. A limited set is available without the option.
- Find complete information on **savvyPanel** in the **savvy** User Manual.

Get savvyPanel Free from the Apple App Store℠

- When your iPad or iPhone is connected to the internet with WiFi you are connected live to a real drive system in our plant in Maryland, USA.
- Touch ***Roll Change*** button to reset the roll length.
- Enable all section switches; extruder, brake, winder
- Touch the ***Line Start*** button and watch the line accelerate, run and then automatically slow to stop at the required length.
- Touch ***Set Speed, Set Temp*** or ***Set Tension*** to open the setter and make changes.
- Touch the parameter name in the setter to get info
- Touch page-link arrows to browse demo pages.
- Drive the demo with **savvy** in your computer. In the ***File*** menu > ***Demo Mode***, choose ***Discover Internet Demo Devices***.



Three savvyPanel Page Types

Systems Page present with multiple **savvyPanel** systems discovered.

- A **savvyPanel** system may contain tiles from **many devices**.
- A **drive.web** device may contribute to **only one** **savvyPanel** system.
- Touch the systems button, or , in the window bar to access the systems page from home page. Lock this button with home password.

Home Page is the first operator page in a **savvyPanel** System.

- Access home page from any operator page with the home button, . This may be locked with the home password.

Operator Pages show graphic, page-link and parameter tiles.

- Pages can be renamed. The name appears in the window title bar.
- View zooms to show all tiles, so layout strongly affects appearance.

Apple, iPad, iPhone and iPod touch are trademarks of Apple Inc., registered in the U.S. and other countries. App Store is a a service mark of Apple Inc.

Three savvyPanel Tile Types



Parameter Tiles. Touch a settable parameter to see its **savvyPanel** setter. Includes; slider, keypad, 1x, 10x increment, default & revert.

- A parameter is settable if it is not read-only and has no incoming **drive.web** connection.



- **Meter** tiles; digital panel meter, dial or bar meter. Unipolar or bipolar. Full-scale or percentage.
- **Indicator** tiles. Variety of colors. Shows on/off, true/false state.
- **Pushbutton** tiles; colored momentary and lighted Start/Stop.
- **Multi-position Switch** tiles for enumerated parameters.



Graphic Tiles - create diagrams with a variety of process elements.

Page-Link Tiles - A graphic tile that is also a touch page-link.

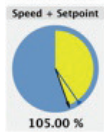


Function Blocks Enable savvyPanel Actions

- **Enumerated Parameter** block in ***Utility*** group. Only custom enumerations appear in the setter and multi-position switch.
- In the **savvyPanel** function block group:

  Latch and **SR Latch** support lighted start-stop pushbuttons.

  Setpoint & Monitor blocks control meter range. **Setpoint** clamps setter. Dual blocks enable dual display meters



savvyPanel Launch, Setup and Important Notes

- See the **savvy** User manual for detailed instructions.
- Launch **savvyPanel** from a command line or batch file.
- Limit operators to **savvyPanel**-only, specify start system & page.
- Discover devices specifically by discovery file, automatically or filtered by group and/or **savvyPanel** name.
- Operator's Note: If communication with a **drive.web** device is interrupted, affected tiles indicate a yellow bar at top with an exclamation warning. The displayed value is not updated.



⚠ Important Design Note: An over-range enumeration is required if misreading an out-of-range value could cause a hazard.

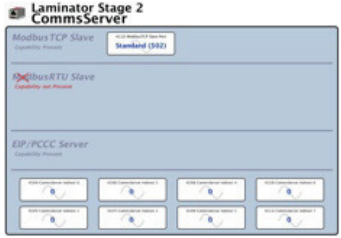
speedy Comms Interfaces-Modbus & EIP/PCCC

Warning! Use of speedy comms interfaces, ModbusTCP, ModbusRTU and EIP/PCCC, may cause motors and machinery to power up with high Voltages or start or operate in an unexpected, dangerous or lethal way. It is essential that you are completely familiar with the Ethernet server protocol and all of the equipment and the system design you are working with before attempting to use this option. It is also essential that a risk assessment is conducted to identify hazards. Risks must be reduced to tolerable levels.

- For info on Modbus specifications go to http://modbus.org/specs.php
- Boolean values are 0 or 1. Non-zero values are Boolean true.

speedy Ethernet Server Support, Options 04 & 25

- Click the ***Comms Server*** icon in the ***FBE*** or ***SFD*** view to configure.



- ***Comms Server Indirect*** parameters are sequentially numbered. Enter any parameter numbers to read or write them all with one operation. Add more with ***Comms Server Indirect*** function blocks in the ***Utility*** list set. You can directly address any parameter. You are **NOT** required to use them.
- ***Comms Watchdog*** function block, available in the ***Utility*** function block list group, can only be written via Modbus comms. Write non-zero value to ***Input*** to keep ***Output = OK***
- **Note!** You cannot write or force parameters that are read-only or have incoming drive.web connections.

speedy Option 04 ModbusTCP/IP Slave/Server

- Standard option, included.
- ***ModbusTCP Slave Port*** 502 is standard specified in protocol. Change it in the unusual case that the master is non-standard.
- Modbus Function Codes **FC 01-06, 15** and **16** are supported.
- Supports up to **five simultaneous clients/masters.**

speedy Option 25 EIP/PCCC Server

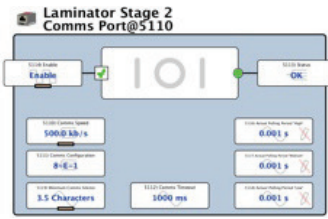
- Supports EIP/PCCC Typed-Write and Typed-Read functions.
- See Appendix B of savvy User Manual for information, examples and drive.web to PLC parameter mapping.
- Supports up to **two simultaneous clients.**

ModbusRTU Master & bus-share drive interface

Adding network devices may affect dedicated drive's serial link performance.

- Modbus Function Codes **FC 01-06** and **16** are supported. Also Yaskawa Holding Register function.
- **Note**: Modbus address 1 is the dedicated drive's address for dw222, dw223 and dw226. dw225's dedicated drive is address 0x1F or 31. Bus-sharing Modbus servers must use different addresses.

Comms Port function block



Comms Speed Read-only for drive-dedicated speedy's. dw220, choose standard speeds are enter baud rate 0.1 to 500Kbps.

Comms Configuration Read-only in dedicated speedy's.
Character frame is **1-8-Parity-Stop**:
Parity is ***N*** None, ***O*** Odd, ***E*** Even,
S Space(0) or ***M*** Mark(1).
Number of **Stop** bits; ***1***, ***1.5*** or ***2***.

Minimum Comms Silence. Idle on-the-wire time before a new request is sent. Some devices require longer than minimum 3.5 characters. Longer times decrease comms efficiency.

Bandwidth. Drive-dedicated models only. The portion of the bandwidth allocated for all ***Modbus Data*** blocks.

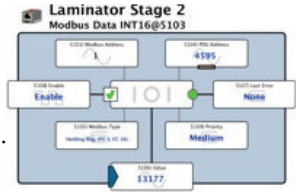
Actual Polling Period. Read-Only. Time required to poll all parameters in all Modbus Data blocks with that priority. Period is directly affected by number of parameters, silence times and any errors or timeouts.

Comms Timeout. 10 to 30000ms waits for a reply. ***Status*** indicates ***Timeout*** if no reply is received.

ModbusRTU Master - *Comms Port* function block continued..

Status. Any ***Last Error*** in Modbus Data blocks. Click to ***Reset*** all.
Enable. Globally enable and disable all Modbus Data blocks.

Modbus Data blocks, *Boolean, INT16, UINT16*



Define the data point, register, discrete or coil and the slave or server device. Create up to 32 data blocks. Addresses can be changed dynamically.
Boolean block's ***Value*** can be True(1) or False(0).
INT16, 16-bit Integer, ***Value*** is ±32767.
UINT16, Unsigned 16-bit Integer, ***Value,*** 0 to 65535.
Modbus Address. Unique address, **1 to 247** of individual server device.
PDU Address identifies the parameter, coil, discrete or register number in your server to read and/or write to/from.
Enable Dynamically disable block when unneeded to reduce polling periods.
Last Error enumerates last error detected. Click to ***Reset***.
Modbus Type. ModbusRTU function supported by your server.
Priority Three levels. Round-robin scheduler processes all ***High*** priority data blocks plus one other every round. All ***Medium*** priority blocks are processed, one per round, then first ***Low*** priority block. Following rounds process all ***Medium*** priority blocks again then next ***Low*** priority.
Value. Raw decimal read/written to/from the remote parameter.

speedy Option 06 Winder Control Library

Accurate speed calibration of all components in a winder system is essential before commissioning.

Diameter Calculator Block. An instance of this block is required for ***Taper Tension*** and ***Torque Compensator*** blocks. Associate a ***Diameter Calculator*** in those blocks.

Taper Tension Function Block. A positive setpoint reduces web tension as the roll diameter increases.

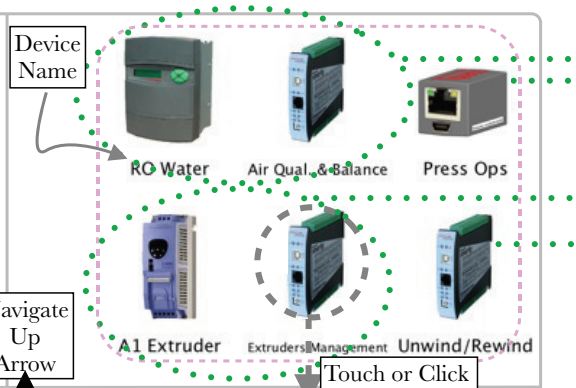
Torque Compensator Block. Set Forward/Reverse Line Direction friction compensation, Unwind/Rewind and Wind Forward/Wind Reverse modes. ***Friction*** and ***Inertia Compensator*** buttons set ***Stiction, Static Friction*** & more.

savvy overview

Device Group
savvyPanel System
Example

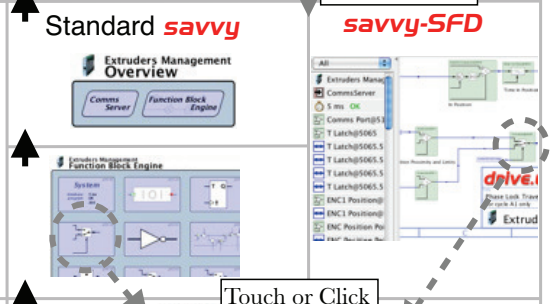
Device Directory

Discover devices when **savvy** launches or by using the ***Directory*** menu. Discover by; group, **savvyPanel** system, Discovery file or all local devices automatically or by request.



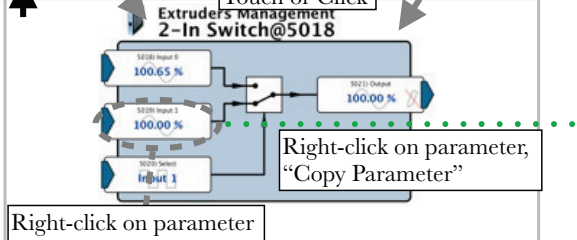
Function Block Engine

With standard **savvy**, the device overview screen gives access to Comms Server setup, Function Block Engine and native device functions where applicable. With **savvy-SFD** place function blocks graphically, use function block list to review and arrange execution order.



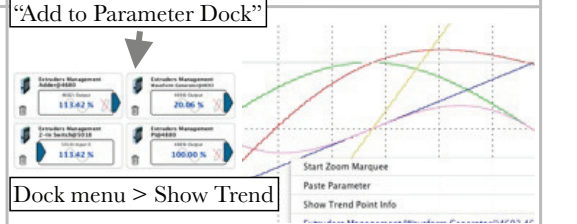
Function Block

View functional elements and signal paths in relation to parameters. Parameters show type, **drive.web** connections, read-only and not at default adornments.

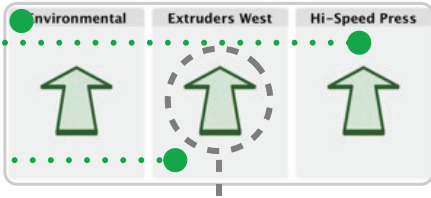


Parameter Dock

Add parameters of interest to set, view, create trend graphs and export .csv files for spreadsheets. Save docks and open multiple docks in different viewer windows.



savvyPanel overview



savvyPanel Systems

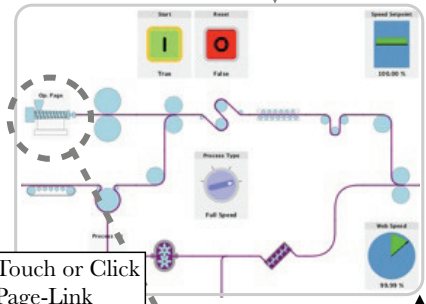
savvyPanel Password is not set in savvyPanel operator station. No savvyPanel data is shown.

Touch or Click

Systems Page

View all available savvyPanel systems. Assign a savvyPanel system in each device's contextual menu, one per device. If a savvyPanel password is set in the device, it must also be added in savvyPanel operator station software under the savvyPanel menu

Systems Button.
Requires Home Password if set.

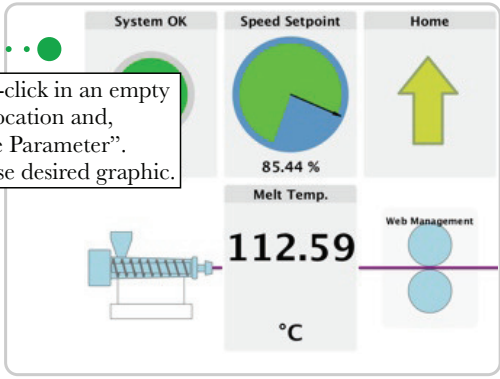


Home Page

The master page for a savvyPanel system. Similar to operator pages except that it may be accessed from any operator page by pressing the home button. Graphic tiles can be page links.

Touch or Click Page-Link

Home Button.
Requires Home Password if set.



Right-click in an empty grid location and, "Paste Parameter". Choose desired graphic.

Operator Pages

Up to 256 possible. May be page-linked in any way. Set savvy preferences so that operators view a specific page at launch. Use this preference and the home password to restrict access to the home page and pages linked only from the home page. Provide links to the home page to bypass the home password. home password then only restricts access to the systems page.

EMA
Drives and Automation
Call 800-848-2504
www.emainc.net



drive.web product line highlights

Drive-dedicated *smarty* and *speedy* models are available with complete, one-cable drive interfaces.

Supported Drive	smarty Model	speedy Model
Generic	dw210	dw220
PL/X Digital DC Drive	dw211	dw221
Optidrive P2	dw214	dw224
Optidrive Plus	dw213	dw223
Optidrive HVAC	dw216	dw226
Optidrive E2	dw212	dw222
Optidrive E2 Single Phase Output	dw212	dw222
YaskawaF7	dw215	dw225

Peer-to-peer *drive.web* connections over Ethernet enable distributed control and open scalability.

smarty® DIN rail *drive.web* controller.

- Sixteen flexible, bipolar-analog / digital I/O
- Hardware options; dual serial-ports, add six digital inputs, frequency I/O, relay-rack control, remote module comms.
- External options; dual encoder module with re-transmit, high-Voltage I/O.
- Encoder control library with cyclic and linear positioning and electronic line shaft support



savvy-SFD ***Signal Flow Diagram*** upgrade, see page 13.

savvyPanel operator touch station app, see pages 14 to 17.

All *drive.web* products are designed & assembled in the **U.S.A.**

Get expert *drive.web* help. Call or email **techsupport@driveweb.com**

drive.web training courses

Free online interactive training seminars take about one hour.
Specialized online and factory training sessions are also available.
To register email **training@driveweb.com** or call.

drive.web 40 Log Canoe Circle, Stevensville, MD 21666 USA.
Ph. 410-604-3400, Fax 410-604-3500, *www.driveweb.com*