drive.web smarty

dw210 - Installation & Operation Manual

for firmware version 0x2012

Contents **Page**

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. For information and to download manuals and software, go to ***www.driveweb.com***.

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 **savvy** and all of the equipment and the system design before attempting to program or edit a program or connect to any live device.

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!

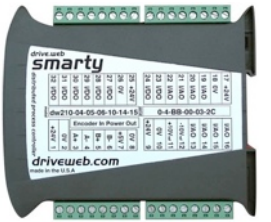
Information in this manual is subject to change without notice. You are responsible for verifying the proper operation of your **smarty** module. Special care must be taken after loading new firmware or installing new options.

Warning!

To avoid permanent damage to your **smarty**, never exceed any **min** or **max** values in this manual.

Product Identification Basic *smarty* Model dw210

Find firmware version in ***savvy***, choose ***Get Detailed Info*** from the ***smarty*** Contextual Menu. See page 10.



Basic *smarty* Standard Features

drive.web distributed process control.

10/100Base-T(X) Ethernet, pages 6-8

Field upgradeable firmware

8 flexible I/O: ±10V 16-bit analog in, ±10V 14-bit analog out, digital. in.

8 flexible I/O: 0-10V 16-bit analog in, 24V digital out, digital in. Page 13.

Plug-in Terminal Blocks

Compact DIN rail enclosure, pages 5, 6.

±10V Control Reference Outputs, 20mA max, page 7.

Four +24V & Four 0V terminals for power and control reference, page 7.

Real Time/Date Clock with SNTP network time server synchronization.

E-Mail Notify function block, outgoing SMTP mail server support, page 10.

Basic Control Function Block Library with arithmetic, logic, PI, clamps, more. See ***savvy*** User Manual, Appendix A, function block listing.

smarty Software Options

Software options may be added using ***savvy***. See page 12. See ***savvy*** User Manual, Appendix A for up-to-date function block listings.

04 ModbusTCP/IP Slave. See page 13.

05 Process Control. Function Block Library 1.

06 Winder Control. Function Block Library 2. See page 15.

10 Advanced Math. Function Block Library 3.

11 Encoder Control. Function Block Library 4. Requires encoder options **15** or **16, 18, 22** or **23** and **40** or **42**. Pages 15, 16.

smarty Internal Hardware Options 14-24 pages 16-19

Factory installed. Contact us for availability. ***15-24** are mutually exclusive.

14 Power over Ethernet. See separate manual HG502612.

15 Isolated Internal Incremental Encoder.

16 External Encoder Module Port.

17 ModbusRTU Slave (RS485) isolated port (OEM only option)

18 ModbusRTU Slave(RS485) isolated port + External Encoder i2i port

19 ModbusRTU Master, unisolated and ModbusRTU Slave, isolated

20 ModbusRTU Master (RS485), unisolated (OEM only option)

21 ModbusRTU Master (RS485), isolated (OEM only option)

22 ModbusRTU Master unisolated+External Encoder Port (OEM only)

22 ModbusRTU Master isolated + External Encoder Module Port

24 Add Six Digital Inputs.

*

smarty External Module Options see pages 19, 20

40 & **42** mutually exclusive. **45** & **46** mutually exclusive & require **40** or **42**

30 115V Digital Input, Relay Output Isolator . See manual HG502622.

31 230V Digital Input, Relay Output Isolator . See manual HG502622.

40 Single Encoder Module 2-24V + marker, 5VDC enc. supply, 2x24V input

42 Dual Encoder Module 2-24V + marker, 5VDC enc. supplies, 2x24V input

45 Encoder Retransmit EIA(RS)485 & 422 compliant.

46 Encoder Retransmit ±24V differential signal out.

smarty Specials

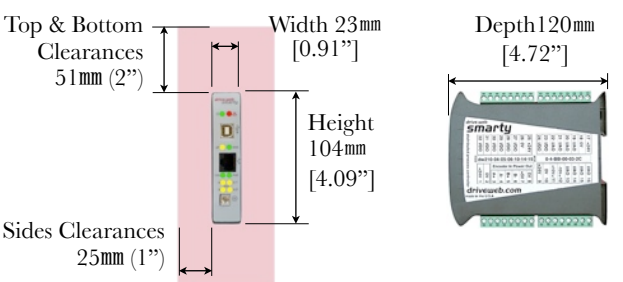
Generic engineered solutions include required options (in parentheses), system configuration and wiring diagram. Contact us for other engineered solutions. All options may be added.

dw210-1101 Open-loop Constant Tension Center Winder (**05**, **06**)
dw210-1102 Closed-loop Dancer Control Center Winder (**05**, **06**)
dw210-1103 Closed-loop Loadcell Control Center Winder (**05**, **06**)
dw210-1104 Slip Core Winder (**05**, **06**)
dw210-1105 Electronic Line Shaft, Speed Lock (**05**, **11**, **16**, **42** & **45** or **46**)
dw210-1106 Coordinated Drive, Line Master Controller (**05**)
dw210-1107 Analog Drive Front-End Upgrade (**05**)
dw210-1108 Electronic Line Shaft, Phase Lock (**05**, **11**, **16**, **42** & **45** or **46**)
dw210-1109 Electronic Line Shaft, Registration (**05**, **11**, **16**, **42** & **45** or **46**)
dw210-1110 3 PID Controller w/ integral reset & hold (**05**)

smarty Installation

Dimensions & Clearances:

Clearances **must** be provided to promote airflow. Lesser clearances may be possible. Monitor the ***Temperature*** parameter in the ***System*** function block. It should not exceed 70°C. Forced air circulation may be required.



smarty Installation continued...

Weight: No hardware opts.-176g(6.2oz). W/ PoE & Serial Ports-213g(7.5oz)

DIN Rail Mounting. Use 35x7.5mm rail per IEC 60715 or EN50022.

Power Requirements: Regulated 24VDC ±10%, 100mA plus loads. External **1A fuse or current limiting is required!**

Environment: Clean air, Operating temperature, 0C min. to 50C max. Storage temp, -20C to 60C. Humidity less than 95% non-condensing. UL/IEC Pollution Degree 2. Install in a metal enclosure with no RF noise sources.

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

USB Port,Currently not used. Support is planned, please call for information

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)

Indicator LEDs in front panel. For setup, troubleshooting and monitoring:

Power On Green LED

Fault Red LED. Check power supply, connect with savvy or contact us at drive.web for more information.

Ethernet Link Green LED indicates Ethernet connection.

Ethernet Activity Yellow LED-Data transmitted or received.

100BaseTX Green LED connection with 100Base-TX.

PoE Option **14** only, see page 16, product manual, HG502612

Four Yellow Serial Port LEDs, see page 16, 17.

Ground (Earth) Do NOT use for 0V power or control wiring. Observe local electrical codes and best wiring practices.

smarty Terminals and Layout

smarty Ethernet Networking & Programming

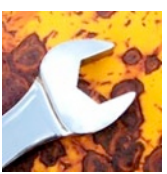
Before proceeding, it is important to have a basic understanding of Ethernet TCP/IP networks. Assigning an invalid or duplicate IP address will cause serious network malfunctions! **smarty**s are all shipped with the **same IP address, 10.189.189.189**. Consult your company's IT department for an appropriate,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

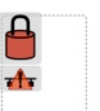


With free **drive.web savvy** software, easily program and monitor your **smarty**, perform data trending and create distributed control systems.

- To download the latest version of **savvy** and to view the **savvy** user manual, 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 you attend our free on-line training seminars. To register, e-mail **training@driveweb.com** or **call**.
- Before proceeding with your systems designs it is very important to familiarize yourself with **savvy**, the configuration software.
- We strongly recommend you read the introductory guides under the ***Help*** menu; ***Getting Started with savvy***, ***Getting Started with savvy-SFD***, ***savvy-SFD and the PL series drive***.
- 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.
- Under the ***Directory*** menu, click on ***Discover All Local Devices***. If your **smarty** is powered up and on the same local network as your computer, an icon should appear.
- Discover **drive.web** devices anywhere on the internet unless they are protected by firewalls or other network security devices. Assign a public IP address or use a VPN. Under the ***Directory*** menu, click on ***Discover Device...***
- If the icon at right appears with the red padlock and comms-fail indication, a network connection problem exists. Check connections, LEDs and that the **smarty** IP address is within your computer's subnet mask.



Warning! Changing a device IP address **WILL** disrupt its network connections! If a **smarty** 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 *savvy* continued...

- Under the ***File*** menu, click ***Administrate > Set IP Addresses for System***. Locate the serial number on the product label of your ***smarty***. Enter a unique IP address that is within your computer's subnet mask and click OK. A ***smarty*** icon should appear with IP address beneath.

- Hover cursor over a device icon, function block, connection or parameter to see contextual information in the Status Bar at the window top margin and reveal the Hover Button.

- Click a Hover Button or right-click elsewhere in an icon to access the Contextual Menu.

- In the ***smarty*** Contextual Menu, choose ***Change Name*** to name your ***smarty*** for easy identification. Also, a powerful ***Find Parameter...*** function locates and jumps views to a parameter. Simply enter its number, name or partial name.

- To Import or Export (load or save) configuration data to or from your ***smarty***, use its Contextual Menu.

- To Import or Export all configuration and connection data to or from all ***drive.web*** devices and phantoms in the directory use Directory Menu.

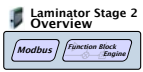
- Advanced Users: At the bottom of the ***Setup IP Addresses*** window, click the arrow next to ***Network Information*** to set Subnet Mask, Router, SMTP mail server and SNTP time server IP addresses. See the ***savvy*** user manual. **Note!** If the ***Network Information*** box is expanded, this network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

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

Get started with *savvy* continued...

- ***savvy*** function may be limited if you do not have the required capability level or a device is locked with a password.

- Click the ***smarty*** icon to view the ***Device Overview*** screen (Standard ***savvy***, no ***SFD***). Click the ***Function Block Engine*** icon and if you have options **04** , **17** to **19**, the ***Modbus*** icon to view.



- In the Function Block Engine view (Standard ***savvy***, no ***SFD***), click the ***FBE*** menu and select function blocks in the order that you want them to be processed. Processing order is from left to right, then top to bottom.

- Click on a function block to view its parameters and functional detail.

- Effortlessly 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***. Now you can click on a parameter, **drag** a connection and **drop** onto a destination parameter in the other viewer.

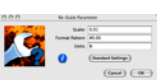
- Use parameter Contextual Menus for ***Get Info, Add to Dock, Copy, Connect to…*** start or end connections, ***Re-name...***, and ***Re-scale...***

- Click any blue connection to jump views to the other end.

- Use connection Contextual Menus to ***Change Sample Period…*** in ***drive.web***-over-Ethernet connections.

- Click on parameters to open the Setter Box. Adjust the value with convenient graphical buttons or keyboard entry.

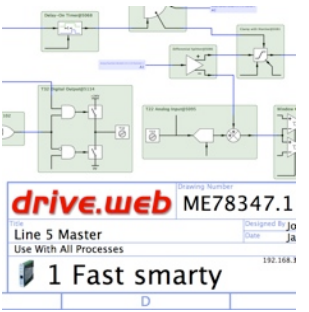
- Most ***drive.web*** parameters use 16 bit words allowing raw decimal integer values **0 to 65535 or ±32767.** These raw values are formatted, limited and scaled depending on the parameter. Use ***Get Info*** or ***Re-Scale*** to verify or change.



Get started with *savvy* continued...

- A blank rectangle connected to or from a parameter indicates a remote device is not discovered in ***savvy***.
- Very complex function block configurations with numerous Ethernet connections may produce ***Timebase Overrun*** indications at the ***System*** function block. Performance **WILL** be affected. In the ***System*** block Contextual Menu adjust the ***smarty***'s ***Timebase Setpoint***. Make a connection from the ***Program Status*** parameter to log these occurrences or provide warning signals.

savvy with Signal Flow Diagram Option - SFD Upgrade



- With ***savvy-SFD***, build systems graphically while creating live drawings that are stored in your ***smarty***.
- Set borders, drag and drop connections, zoom, pan, cross-reference and annotate multi-page drawings.
- A separate function block and connection listing shows program execution order from top down. Change execution order by dragging function blocks up or down.

Upgrading *savvy* and *smarty*

- Process a credit card or ***Vouchers*** on-line or purchase ***Coupons*** for use off-line. Find the ***Shopping Cart*** under the ***Commerce*** menu.
- Select ***Upgrade savvy*** under the ***Commerce*** menu.
- Right-click on ***smarty*** icon and choose ***Upgrade Device…***
- To process ***Vouchers*** choose ***Pay>Online Via Vouchers*** in the ***Shopping Cart***. Enter each ***Voucher*** code on a separate line.
- Process ***Coupons*** in the ***Coupon Manager***, under the ***Commerce*** menu. Enter individual codes in the top box and click the ***Add*** button. The ***Coupon*** is recognized. Click ***Apply***.

smarty Multi-mode Analog and Digital I/O

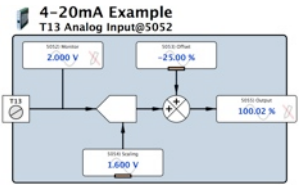
I/AO Terminals 13-16 and 19-22 +25V **max**, -13V **min**, 100kΩ input impedance. Any combinations; Bipolar Analog Out, Bipolar Analog In and/or Digital In.

I/DO Terminals 23-24 and 27-32 +25V **max**, -0.6V **min**, 100kΩ input impedance. Any combinations; 24V Digital Out, Unipolar Analog In and/or Digital In.

Analog Input Function Block

16 bit resolution.

4-20mA Input: Connect a **100Ω resistor** from the Input terminal to a 0V terminal, set ***Scaling*** **= 1.6V** and ***Offset*** **= -25%**



Bipolar Analog Output Function Block

±10.5V, 10mA max output. 14 bit resolution. ***Enable*** "on the fly" with the ***Output Enable*** parameter.

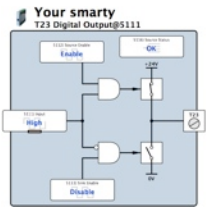
Digital Input Function Block

Selectable Ranges 5V, 12V & 24V.

Digital Input Range	Turn-On Threshold	Turn-Off Threshold
5V	2.5V	0.83V
12V	6V	2V
24V	12V	4V

Digital Output Function Block

+24V, **50mA max. Enable Source and/or Sink.**



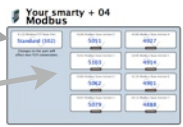
Source drivers shut down in case of overheating or over-current. A warning triangle appears in the function block and its ***Source Status*** parameter indicates ***Fault***. Connect ***Source Status*** to a fault contingency system for critical applications. Click the parameter to reveal a ***Reset*** button. **Note!** Resetting a Digital Output briefly resets **ALL** I/O!

Note! Sink circuits are **NOT** self-protecting. Digital outputs with ***Sink Enable*** **MUST** be connected to a load that is inherently impedance protected, current limiting or fuse protected with a **fast acting 0.1A fuse.**

smarty Option 04 ModbusTCP/IP Slave/Server

Warning! Use of *smarty* option **04** 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 ModbusTCP/IP protocol and all of the equipment and the system design you are working with before attempting to use this option.

- Supports up to **five simultaneous masters.** Further connection attempts are refused until a connection is ended.
- **Note!** You cannot write or force parameters that are read-only or have incoming *drive.web* connections.
- ***ModbusTCP Slave Port*** 502 is the standard specified in the protocol. You may change this to match the master in the unusual case that it is non-standard.
- ***Modbus Indirect*** function blocks with sequentially numbered parameters make best use of Modbus multiple read or write functions. Enter any parameter numbers to read or write with one Modbus operation.



- Directly address any numbered parameter individually. You are NOT required to use ***Indirect*** parameters.

Supported Modbus Function Codes:

FC	Name	Effect with drive.web parameters
1	Read Coils	Single or sequential parameters. Non-zero = 1, On or True
2	Read Input Discretes	Single or sequential parameters. Non-zero = 1, On or True
3	Read Holding Registers	Read single or sequentially numbered parameters
4	Read Input Registers	Read single or sequentially numbered parameters
5	Write Coil	Any single parameter. True or On=1, False or Off=0
6	Write Single Register	Write any valid value to any single parameter.
15	Force Multiple Coils	Single or sequential parameters. True/On=1, False/Off=0
16	Preset Multiple Registers	Write to a single or sequentially numbered parameters

smarty 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.

smarty Option 11 Encoder Control Library

Speed Lock and ***Phase Lock*** require dual encoders **Option 42**

ENC Position Set the origin and ***Base Revs*** granular resolution for a **64-bit** traverse. ***Output*** position around the origin as 16-bit percentage of ***Base Revs*** setting, 1 to 65,535.

ENC Position Point Pinpoint **64-bit** positions by event or calculation. ***Output*** has same ***Base Revs*** resolution as defined in the associated ***ENC Position*** block.

ENC Position Monitor Select ***ENC Position Point***s or current location. Adjustable ***Output*** resolution.

ENC Speed Lock Easily implement a **Speed Matched Line Shaft** or **Precision Draw** application.

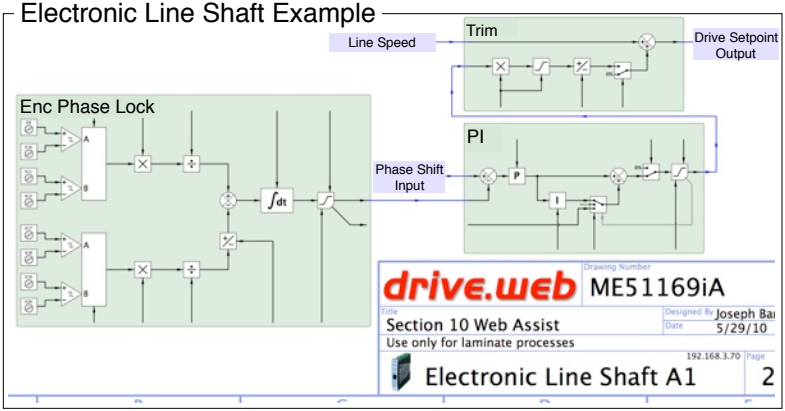
Enc Phase Lock Easily implement a **Shaft Angle Follower** or **Line Shaft Lock** application.

ENC Registration (Call for availability) Align encoder Z markers and/or digital input events from photo-eyes in a printing press for example.

smarty Option 11 Encoder Control Library continued...

Electronic Line Shaft Examples - Connect ***Output*** of ***ENC Speed Lock*** or ***ENC Phase Lock*** to the ***Feedback*** parameter in a ***PI*** block or similar. Connect the ***PI Output*** to ***Trim Input*** in a ***Trim*** block (option **05**) or similar which controls the follower drive's speed setpoint. Input speed or phase offsets at the ***Setpoint*** parameter in the ***PI*** block.

Electronic Line Shaft Example



smarty Internal Hardware Options 14 - 23

14 Power over Ethernet

Use with a PoE Injector or PoE Ethernet switch. Power your ***smarty*** and connected devices without a separate power supply. Use with a 24VDC power supply for fail-safe power.

Serial Ports LEDs

LEDs in ***smarty*** front panel indicate data received and transmitted at Ports 1 and 2. More on Ports, page 18. Custom LED control with option **24**, see page 19.

Serial Port LEDs
Receive Transmit

smarty Internal Hardware Options 14-23 continued...

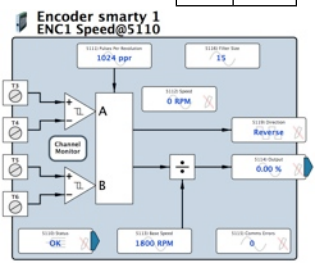
Encoder options, **15, 16, 18, 22** and **23** transmit to Port 2. The Receive 2 LED is always lit with option **15** or it is lit when the remote **i2i** device is powered-up and connected.

15 Internal Incremental Encoder

Terminals

T3	A
T4	$\overline{A}$
T5	B
T6	$\overline{B}$
T7	+5Vi
T8	0Vi

- Terminals ***T3-T8*** are isolated from the **smarty**.
- **Encoder Supply Output, *+5Vi,* 200mA max.** If the encoder is powered from a different source, a connection from 0V on the encoder to ***T8 0Vi***, is **required**.
- Differential inputs **±2V to ±24V max** to **500kHz max**
- **Wiring:** Always use twisted pair. Outside metal enclosure, use shielded cable with individually shielded twisted pairs such as **Belden 8163**. Ground the shield at one end with a 360° ground clamp where cable enters your metal enclosure. Route wiring away from AC power or RF noise sources.



- Click ***Channel Monitor*** button to show the actual state of each channel. ***High*** indicates A or B Voltage is higher than its complement, /A or /B.
- The ***Status*** parameter must read ***OK*** for proper function. All other indications will result in the speed ***Output*** = 0.00 %. ***Channel Fault*** conditions are listed at right.
- For critical applications connect from ***Status*** to a fault contingency system.

Encoder Fault Detection
Short Circuit or Open Circuit
-10V<V Common Mode<13.2V
|Vdifferential| < 275~475mV

smarty Internal Hardware Options 14-23 continued...

15 Internal Incremental Encoder continued...

If ***Comms Fault*** is indicated or if the ***Comms Errors*** parameter shows increasing values, there may be an overload at ***+5Vi***, extreme RF noise coupling or an internal hardware fault. Check ***Wiring*** notes above or contact us at ***drive.web*** for assistance.

A Moving Average Filter is incorporated in the function block to reduce quantization noise. Higher PPR encoders or speeds may allow the filter size to be reduced. The default 15 ***Filter Size*** indicates the speed is filtered over a period of 15 • 4.78ms time intervals.

16 Port 2 *i2i* External Encoder(s)

Intelligent **2**-wire **I**nterface receiver. Unpolarized & isolated for easy hook-up to option **40** or **42**, External Encoder Module. See pages 19, 20 and separate manual, HG502613.

17-23 *smarty* Serial Ports See product manual HG502421Iss2.0

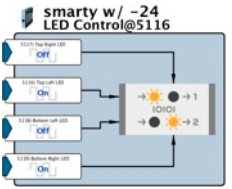
ModbusRTU for EIA(RS)485 serial networks. Speeds to **500kb/s.**

Isolated options provide greater rejection of common-mode noise.

Option	Port 1 T3, T4, T5	Port2 T6, T7, T8
17*	Not Used	Isolated ModbusRTU Slave
18	Isolated ModbusRTU Slave	***i2i*** Encoder **T7, T8**
19	ModbusRTU Master	Isolated ModbusRTU Slave
20*	Not Used	ModbusRTU Master
21*	Not Used	Isolated ModbusRTU Master
22*	ModbusRTU Master	***i2i*** Encoder **T7, T8**
23	Isolated ModbusRTU Master	***i2i*** Encoder **T7, T8**

* Indicates OEM-Only options. Please call for availability.

smarty Internal Hardware Options continued….



24 Add Six Digital Inputs at *T3-T8*.

- **+25V max, -0.6V min,** 8.2kΩ input impedance.
- Includes function block for custom LED action. Find ***LED Control*** in the ***I/O (1)*** list set.
- See page 12 for ***Digital Input*** function block and threshold info.

smarty External Module Options

30 & 31 High Voltage Digital I/O Isolator

- See separate product manual HG502622 for details.
- Replace terminal block plugs ***T17-T24*** or ***T25-T32***.
- 2 NO relay contacts up to **3A max** with shared common
- 4 AC Digital Inputs, optically isolated from ***smarty*** with shared common
- Option **30** has 110VAC inputs, **31** has 220VAC inputs.

40 or 42 Intelligent External Encoder Module Choose only one.

- See separate product manual HG502613 for details.
- **Differential Incremental Receivers** with markers, and fault detection
  ±2V min. to ±24V max.
- A and B channels, **500kHz max**.
- Z Markers, **6000RPM max**.
- Two digital event inputs, **50Hz max**. Threshold is 8.2VDC ± 7%.

40 or **42 Intelligent External Encoder Module** continued...

- Markers and Digital Event Inputs are only used with ***Enc Registration***, option **11**, Encoder Control Library. Call for availability.
- Convenient DIN rail mounting. Enclosure matches ***smarty***.
- ***i2i*** Intelligent 2-Wire Interface transmitter. Easy non-polarized connection transmits up to 500 feet on twisted pair wiring. Requires ***smarty*** option **16, 18, 22** or **23**.
- Green, power and yellow, ***i2i*** transmit LEDs in front panel.
- Add only one option **45** or **46**. Retransmits A & B channels.

40 External Single Incremental Encoder Module One encoder and 5V, 200mA auto-reset fused power output.

42 External Dual Incremental Encoders Module Two encoders & two 5V, 200mA auto-reset fused power outputs.

45 Encoder Retransmit EIA(RS)485 & 422 compliant.

46 Encoder Retransmit ±24V differential signal out.

drive.web Product Line Overview

dw213 ***smarty-o*** with Optidrive Plus AC Drive serial link.

dw215 ***smarty-yf7***(Call for availability) with Yaskawa F7 serial link.

speedy sp Add ***drive.web*** power, Modbus comms to a **PL/X** DC drive.

speedy485 Add ***drive.web*** power and ModbusTCP via ModbusRTU.

savvy-sfd **Signal Flow Diagram Option** see page 12.

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

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