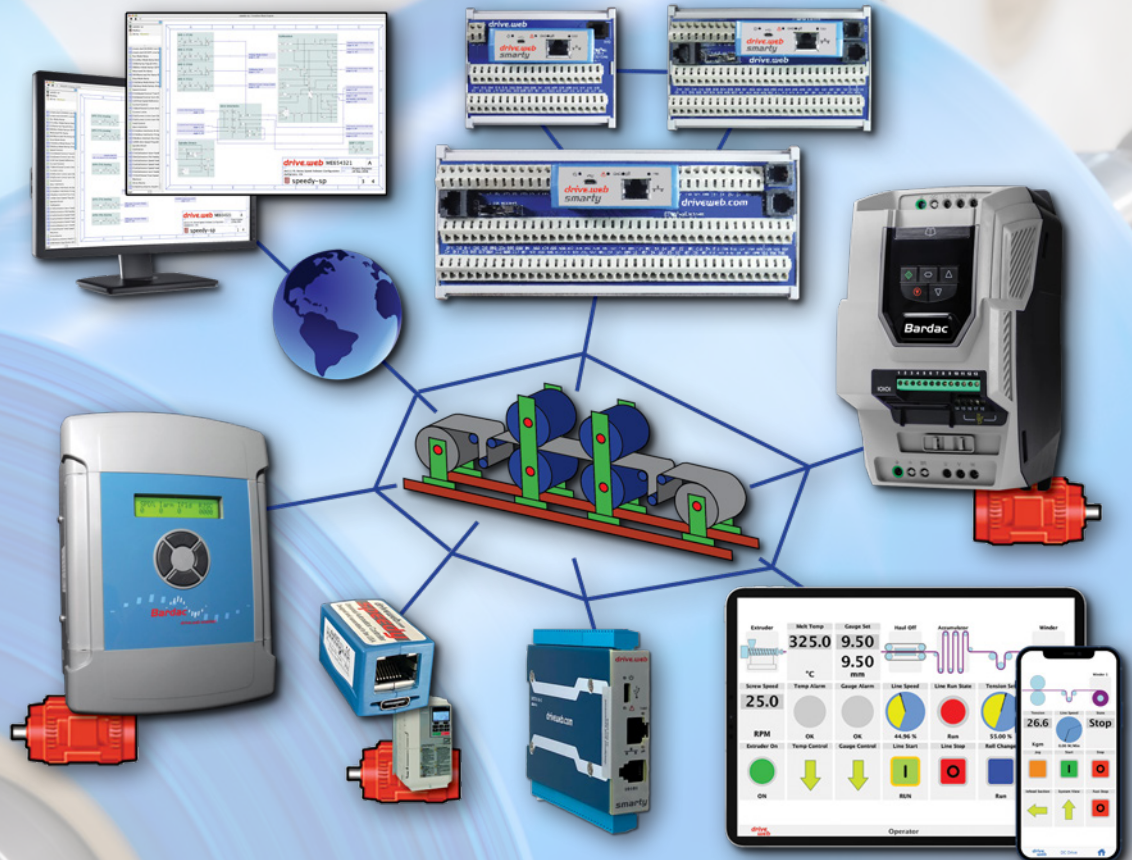
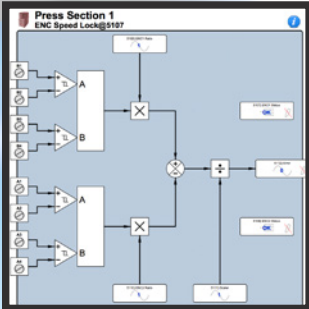


drive.web *automation Catalog 2023*

issue 1



Automation Things for the IIoT
Smart devices
Internet accessible
Ethernet, peer-to-peer
Configurable from anywhere
Everything normally in stock!

Since our founding in 1992 we have worked hard to build our reputation around key goals:

- Innovative technologies.
- Reliable products.
- Unrelenting customer support.
- All catalog items normally in stock.
- Competitive pricing.



Our Company President: Paul Crowhurst

Bardac ...the safe bet!

Seamlessly Integrated Automation



AC DRIVES

Vector Systems
To 350 HP - pages 36 - 38

ECO fan & pump
To 350 HP - pages 39 - 41

General Purpose
To 30 HP - pages 42 - 43

NEMA 4X (IP66)
To 15 HP - page 44

Single Phase
To 1.5 HP - page 46 - 47

CONTROLLERS

drive.web
Ethernet Distributed Control
pages 3 - 33

smarty
Universal Automation Controllers
with I/O - pages 14 - 19

speedy
Embedded & onboard Controllers
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Motion
smart motion controllers
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TOOLS

savvy
Drive & controller configuration
pages 8 - 9

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Signal Flow Diagram tools for
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third party drives - pages 26 - 33

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savvyPanel
For industrial PC touch screens
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savvyPanel touch
Hi Res industrial touch screens
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savvyPanel mobile
HMI app for iPhone, & iPad
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DC DRIVES

Single Phase
To 10 HP - pages 48 - 50

DC Servo
Up to 12 A, 48VDC - page 51

3-Phase Digital
To 2000+ HP - pages 52 - 57

Stack Controller
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Packaged Drives
Modulus pre-engineered
page 58

POWER QUALITY ~ MOTORS ~ ENGINEERING ~ SERVICE ~ SUPPORT ~ TRAINING

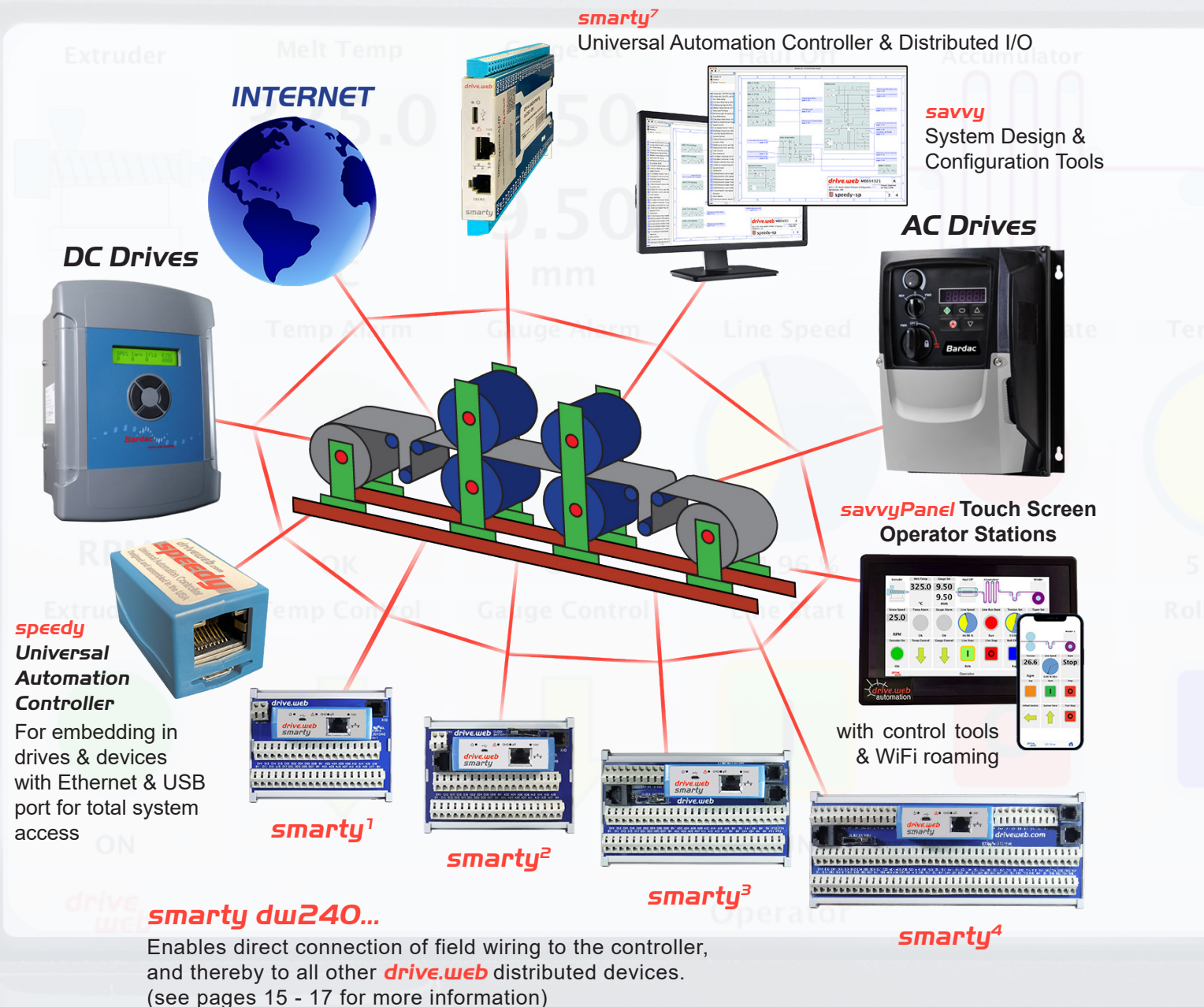
pages 58 - 59

Specifications ... At the time of going to press we believe the information in this catalog to be accurate. However, the specifications of products may be amended at any time, so please check with us when ordering to ensure that such changes will not affect your requirements.

drive.web

SMART AUTOMATION

Configure, connect & control everything ... in one environment
Internet accessible, peer-to-peer Ethernet with savvy tools
Cost effective for systems of any size or complexity



Automation Things ... smart ... connected ... IIoT ready

drive.web automation

total connectivity

enterprise management - machine operators - system engineering

drive.web

A Unique Architecture

1 *drive.web* devices connect peer-to-peer over ethernet to form a completely homogenous control environment.

2 *drive.web* devices provide a full featured programmable control environment. Each device processor contributes to the total system processing capacity so that as the system gets bigger it's capacity increases.

3 An unlimited number of *drive.web* devices can be incorporated into a system to provide an unlimited amount of processing capacity and I/O with undiminished performance.

4 The *drive.web* devices store all the device and complete system configuration data including touch screen PC, iOS & Android display data - everything!

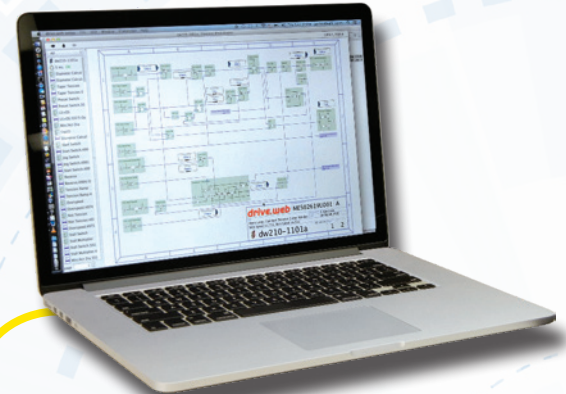
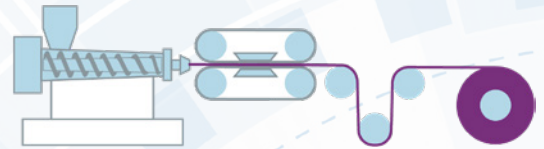
5 A *speedy* embedded in a drive takes over the entire drive; its setup, control, & memory management. It becomes an integral part of the drive and now looks just like the drive. Any actions from the drive keypad or terminals or serial ports are instantly synchronized.

6 *savvyPanel* touch screen PC, iOS & Android display graphics and configuration data all resides in the *drive.web* devices so that you can roam to any WiFi location with your iPad and view a system (subject to access permission).

7 Easily create a graphical interface to almost any control device to bring it into your unique, homogenous, *drive.web* environment.

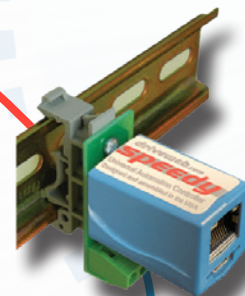
Vector Drives

Easy setup & full featured, programmable control onboard drives



USB Port

- Easy drive configuration
- Plug & play drive interface
- System wide programming access



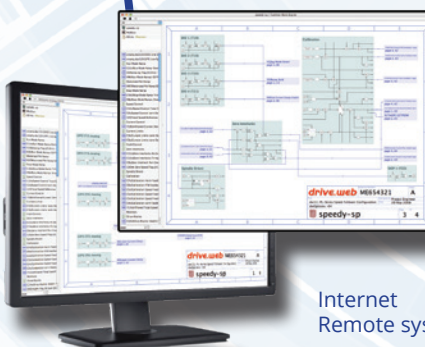
Sensors



Meters & Displays



Instrumentation



savvy

Graphical, function block tools

1. Easy drive configuration
2. Powerful systems design & integration
3. Trend charts
4. Signal flow diagrams
5. Internet access
6. Intuitive system navigation tools

Internet
Remote system access

smart automation

production control - maintenance - tech support

speedy

Universal Automation Controllers

- Embedded available
- Easy gateway to instrumentation
- Fast data collection
- Mount anywhere DIN option



DC Regen Drives

save time



High efficiency
ECO
drives

speedy

Integrated Universal Automation Controller

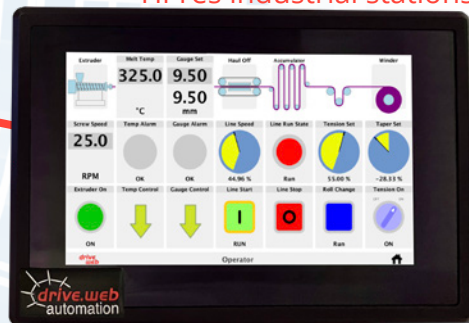
- provides easy coordination of ECO drives in building energy systems
- easily interfaces to existing third party drives & controls
- add ethernet and USB device access
- boost network performance
- add full featured programmable control

save energy



savvyPanel touch

Hi-res industrial stations



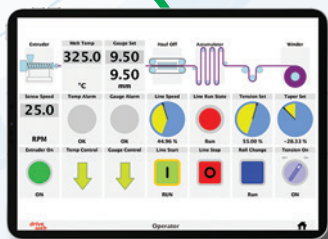
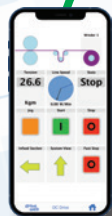
NEW! smarty⁷



smarty

Universal Automation Controllers

- Easy sensor interface
- Precision analog I/O
- Fast logic I/O with powerful state machine programming
- 16 precision analog & logic I/O
- Encoder I/O for indexing, registration, and shaft lock
- Multiple communications options
- Unlimited expansion with no loss of system bandwidth



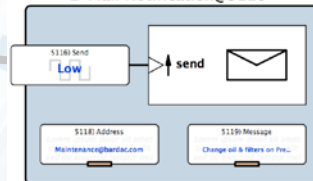
savvyPanel

Integrated touch screen HMI technology

For touch screen PC, Android or iOS devices

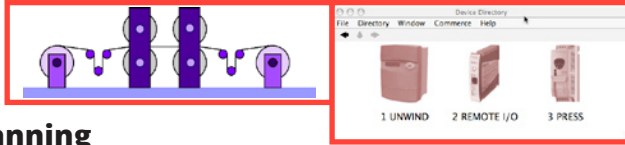
Color Press #4

E-Mail Notification@5116



drive.web

drive.web uses distributed control over Ethernet to provide cost effective, high performance integration of drives & controls in systems of any size or complexity.



Concept & Planning

From your initial sketches and notes create **drive.web savvy** "Phantoms" offline to identify all your drives, remote I/O, MMI interfaces, gateways, etc.

Design & Configuration

Place any control function blocks you need then drag & drop between parameters in your "Phantoms" to make all your device interconnections. The **savvy** Signal Flow Diagrams and powerful navigation aids give you a clear intuitive view of your work. Information and help is always on the spot with hover text, links to the manual, and contextual menus.

Construction & Testing

Simply connect all your drives and devices together over Ethernet and load your complete design into the devices from just one location. The System immediately comes alive for testing and monitoring.

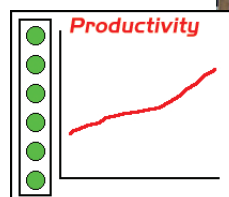
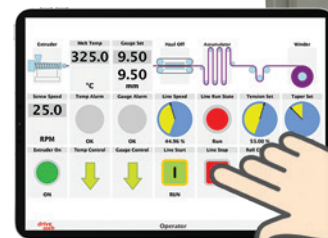
Installation & Operation

Use **drive.web savvy** to provide real time monitoring and control of your entire system from any location. No running from drive to drive to check the setup or operational state! Use **savvyPanel** operator station technology to provide smart touch and roaming control from anywhere.

Management & Maintenance

Use **savvy** utilities to setup system performance criteria and monitor your productivity, machine state, and process trends locally or remotely over the internet.

FROM THE INITIAL CONCEPT,
THROUGH PLANNING,
DESIGN, CONSTRUCTION,
TESTING, INSTALLATION, AND
OPERATION, THE
DRIVE.WEB SAVVY TOOLS
PROVIDE ALL THE VISION,
INSIGHT, AND HELP YOU
NEED FOR A SUCCESSFUL
PROJECT!



smart automation

The innovative **drive.web** technology provides total control in one homogeneous environment with the entire system database resident in the **drive.web** devices.

- Configure & control individual drives & devices
- Design and operate complete drive systems
- Provide fast, peer-to-peer networking over ethernet
- Create clear, graphical signal flow system documentation
- Easily interface to most other drives, MMIs, PLCs, etc.
- Build cost effective systems of any size or complexity
- Add internet accessibility to your system
- Support worldwide enterprise integration

products

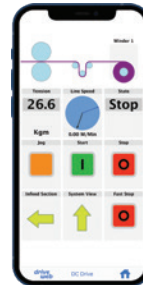
savvy Tools

Intuitive, graphical system design and device configuration tools with powerful navigation features, drag & drop connections, trend charting, online help.



savvyPanel Touch Screens

Innovative, touch screen operator station technology that runs on PC or iOS (iPad, iPhone, etc.) & Android. Build clear machine graphics, buttons, switches, meters, and instrumentation and link to your control scheme. Provides multi-user, multi-level, password protected access via WiFi from anywhere to any system.



smarty Universal Controller

A range of DIN mount **drive.web** programmable controllers with peer-to-peer networking over ethernet or stand alone capability and a wide range of I/O and communications options. Intuitive, easy function block configurations are stored on board for instant field access.



speedy Embedded Controller

Miniature, low cost, **drive.web**, programmable controllers for easy embedding in drives & devices. Includes peer-to-peer networking over Ethernet & USB port.



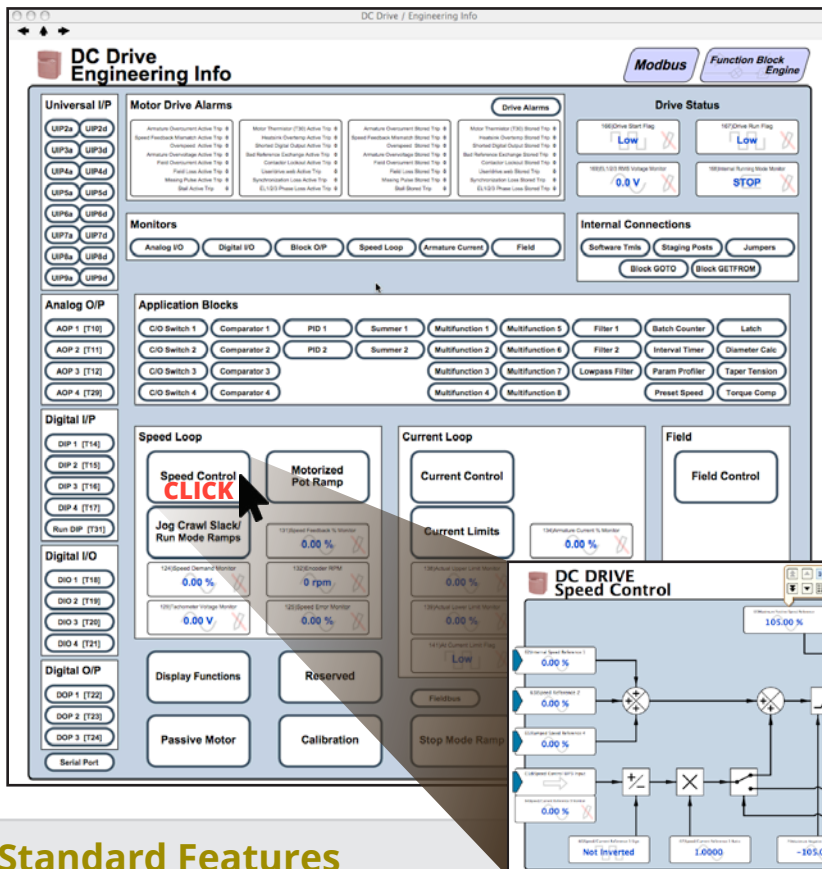
Only 0.91"W x 0.83"H x 1.42"D!



drive.web automation

savvy... the smart automation tool.

- Configure drives, controllers & operator stations
- Design & build complete systems of any size or complexity
- Network & operate drives & systems over ethernet
- Provide multi-user, system wide access from anywhere

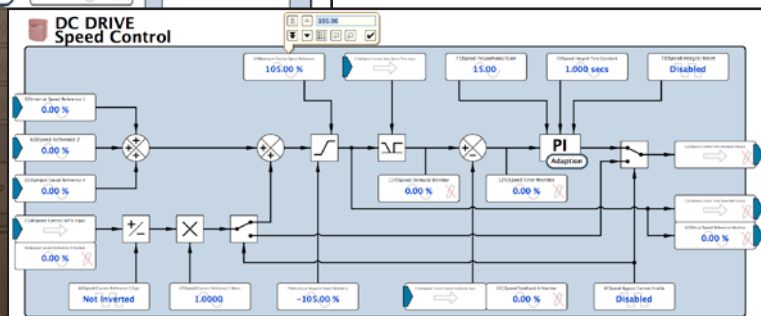


Engineering Info

In Complex products with a fixed set of features, such as drives, an "Engineering Info" window gives an organized overview of the key parameters, I/O, and controls features.

Graphical Function Blocks

Simply click on any function button to drill down to the detailed graphical function block and view or change parameter values.



Standard Features

- Online or offline design of drive systems using intuitive tools with pre-engineered function blocks.
- Internet access to drives and systems for remote configuration, monitoring, and process training.
- Provides easy import, export, and cloning of device configurations.
- Dynamic graphics show real time state of switches, indicators, parameter values, etc.
- Low cost, full featured, distributed control capability with peer-to-peer networking.
- Multiple users, local or remote, can have concurrent real-time access to drives or systems.
- Function Block Libraries for winder controls, PID, drive synchronization, arithmetic, logic, etc.
- Deterministic connections provide high performance links between drives, PLCs, Operator Stations, SCADA computer, and other control products.
- "drag & drop" techniques make easy parameter connections between drives, control devices, etc.
- "Dock" feature enables key system parameters to be monitored and trended from one location.
- Powerful navigation features include drill down (to detail layers in drives and controllers), search, connection tags, jump, browse, pan, and zoom for easy visual system comprehension.
- VPN (Virtual Private Networking) for secure Internet connectivity is supported.
- Password protection is provided at many levels for secure use.


Get **savvy** free online: www.driveweb.com

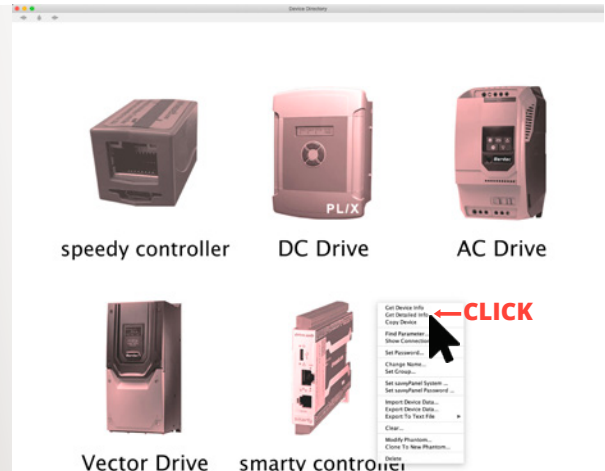
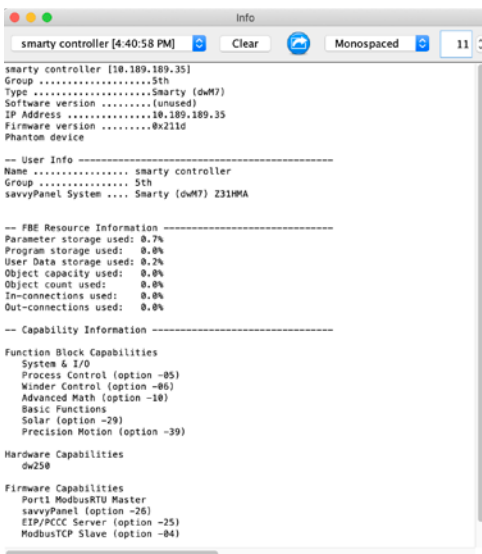
The **savvy** tools and utilities are platform independent and run on Windows, macOS, Unix, Linux, and Solaris and they are all automatically updated as new features before release.

Drives, programmable controllers, operator stations, and complete systems are configured by making simple drag & drop connections between graphical function blocks.

Engineering Info

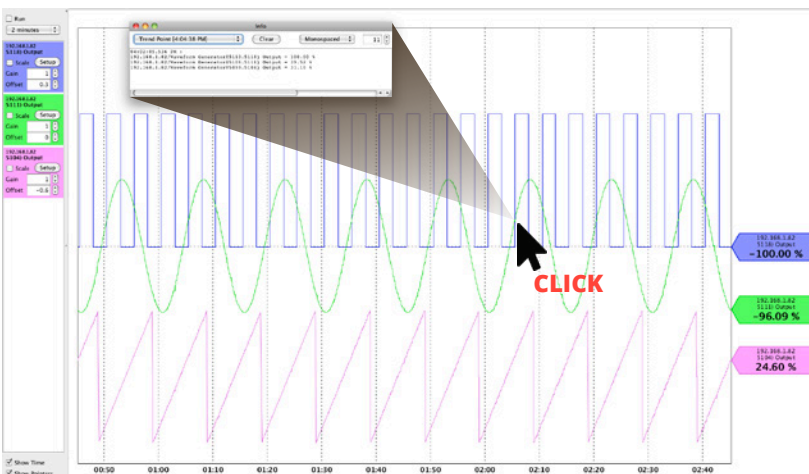
Anywhere in the system you will have easy instant access to the information you need with several different types of resource...

- Right click on any active object such as a device, connection, parameter, or function block to open the contextual menu.
- "Hover" over any active object and see its key data appear at the top of the window.
- "Hover" over a button to see its function described.
-  Look for the information button. This will jump you to the relevant location in the user manual.
- The "Help" menu links you to the full user manual, and other getting started guides.



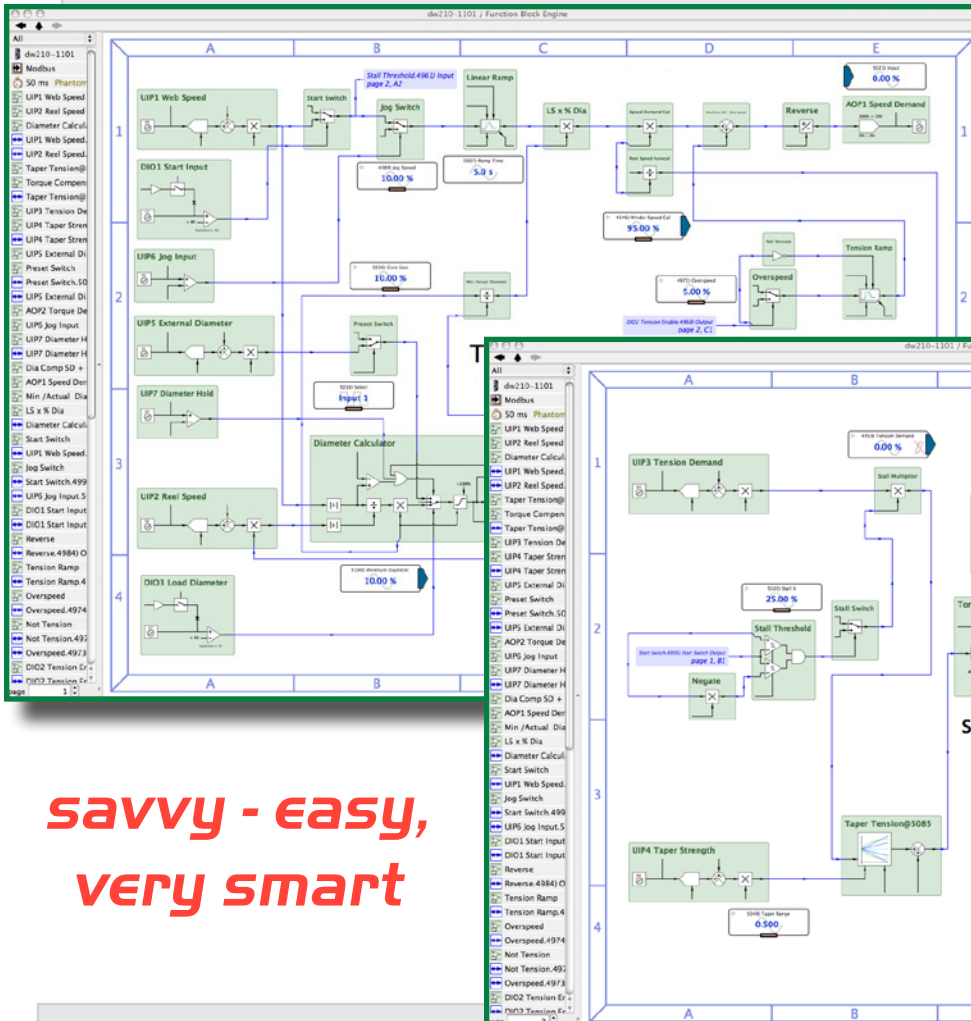
Trend Charting

You can collect any parameters of interest in a "dock" window and display as a trend chart. The trend time scale can be adjusted from 10 seconds to 2 days and the data can be exported in a .csv format for separate spreadsheet analysis. Click on a point of interest to get the instantaneous, time stamped data values.



savvy-SFD ... Signal Flow Diagram

The **savvy-SFD** option provides a powerful, graphical, Signal Flow Diagram interface with enhanced system wide navigation and the ability to produce clear, annotated, device and system documentation.



Use **savvy** “phantoms” to create systems which can be downloaded later into the real devices.

**savvy - easy,
very smart**

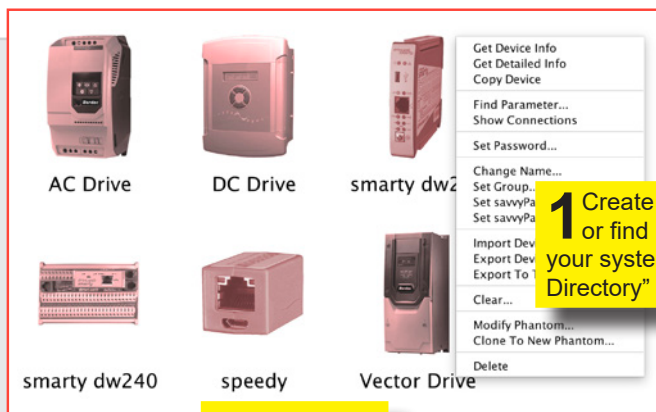
savvy Signal Flow Diagram option with:

- Multiple page drawings with easy navigation
- Clear page-to-page & device-to-device connections
- Complete drawings & annotations stored in devices
- Choice of ANSI, ISO or custom drawing sizes and borders
- Easy pan, zoom, jump, drill down and home commands
- Browse forward, back and up features for easy working
- Easy drag and drop connections
- Context menus, “hover text” and tags keep you informed

drive.web ME502096U003 B
 Open Loop, Constant Tension Center Winder designed by T. Courmow
 Catalog Number dw210-1101 Date 26 January 2019
 dw210-1101 192.168.1.25 Page 2 of 2

savvy-SFD features

- Basic **savvyPanel** operator station functions included
- Create your own customized drawing sheets with choice of ISO or ANSI formats
- Signal flow diagrams provide a clear vision of your control scheme and its functionality
- Tags clearly specify the source, destination and location of connections between multiple pages.
- Entire drawing is stored in the **drive.web** devices for instant access in the field.
- Key parameters can be shown at the Signal Flow Diagram level for enhanced monitoring and control
- Connections are “rubber banded” so that function blocks can be moved on pages or between pages
- Drag and drop connections can be made between any parameter anywhere in a system.
- Drawings can be user annotated.
- Powerful navigation features ensure fast searches and that you will never get lost.
- Password protection is provided at many levels for secure use.



1 Create "phantom" devices or find real devices in your system in the "Device Directory" window

2 Right click on any device or object to open its contextual menu and get information, change names, import/export data, etc.

3 Click on a "Phantom" or device to drill down to the "Function Block Engine"

savvy programming

It could not be easier, whether simply configuring a drive or designing a complete integrated system.

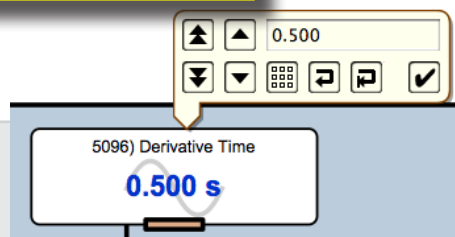
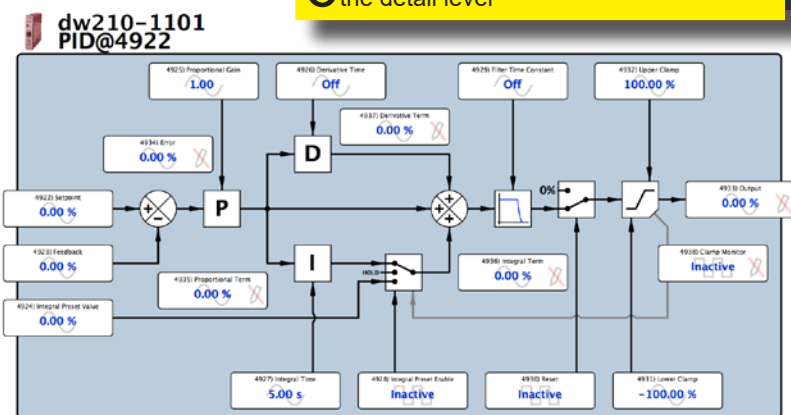
A few simple steps are all that is needed to build a complete control scheme with signal flow documentation that is clear and easy to understand. Powerful navigation tools ensure that you will never get lost!

4 Right click to open the Function Block selector

5 Drag and drop to make connections

6 Click on a Function Block to drill down to the detail level

7 Click on a parameter to change its value or state



Function Blocks are complete engineered system components. Their graphics are dynamic so that objects such as switches, indicators, etc., show their instantaneous state. A function block such as the PID above includes all the presets, resets, scaling, filters, clamps, etc., that you need for reliable implementation in the real world.

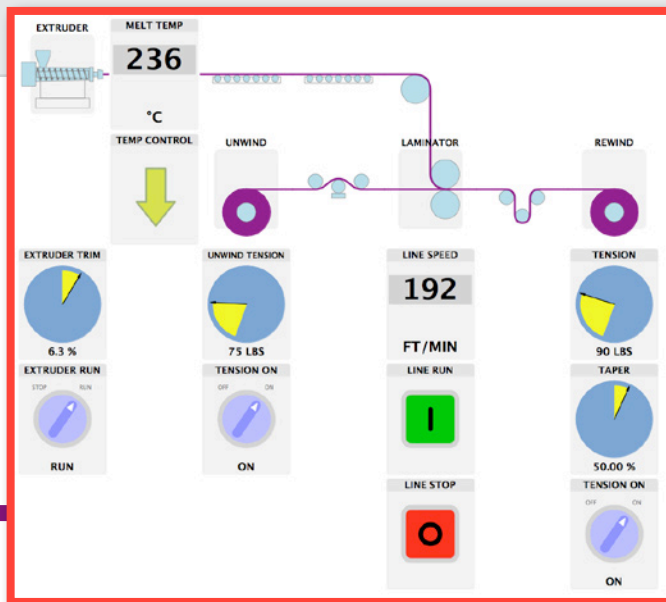
savvy is your smart friend! With a few simple clicks you can build a system, set up a drive and document your work in a thoroughly professional manner - there is no equal!

savvyPanel

Smart, touch screen operator station technology

Provides unprecedented flexibility in instrumentation, control and monitoring.

- Runs native on a **savvyPanel station** high resolution, touch screen display.
- Also runs on any full featured, touch screen PC, Android, and iOS devices (iPad, iPhone, etc.)
- Extensive library of objects such as pushbuttons, switches, meters, indicators, lamps, buzzers, etc.
- Extensive library of graphical image “tiles” to build smart machine and process graphics.
- Machine graphic “tiles” can be linked to detail control screens.
- Full **savvyPanel** configuration is stored in the **drive.web** devices for instant WiFi roaming access.
- Supports multiple screens with multiple pages.
- Provides hierarchal access to system groups, individual systems and multiple operator levels.
- Powerful multi-level password protection.



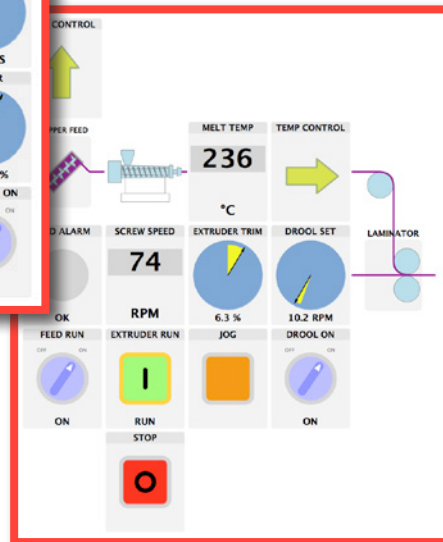
Operator Screen

Touch a graphic tile such as the “EXTRUDER” to drill down to the detail screen

Example - Extrusion Coating Line

Master System Control Station

Easily build your graphics and controls and link them to any location in your drives or process control system.



Total Control

Touch an arrow link such as the “TEMP CONTROL” tile to drill down to the temperature control system

Touch the “MELT TEMP” tile in any screen to set the master temperature setpoint.



savvyPanel touch

Color Touch Screens

dw230-050

5" - 800x480p

5.9"x4.4"x1.1"

dw230-070

7" - 1024x600p

8.1"x5.5"x1.2"

dw230-097

9.7" - 1024x768p

9.9"x8.1"x1.3"



- Plug & Play, **drive.web** natively
- Competitively priced
- Easy setup
- Crisp, high visibility graphics
- IP65, NEMA 4 splash-proof front

- IP20 rear
- 1 Ethernet port 10/100baseTX
- Power supply 24VDC
- Working Temp: -20°C to 70°C

- Connect directly to any single **drive.web** device or to multiple devices with an Ethernet switch

savvy programming

No separate **savvyPanel** programming required.

The **savvyPanel touch** display configuration resides in the **drive.web** drives or automation controllers. Everything is set up and accessed from the **drive.web** network using the intuitive **savvy** tools.



enclosure for savvyPanel touch

- Impact resistant, flame retardant, polycarbonate industrial enclosure
- NEMA 4 (IP65), light gray.

Dimensions:

5" model dwOPTION-54-052

7" model dwOPTION-54-070

9.7" model dwOPTION-54-097

8.4x5.8x2.2" (213x142x56mm)

9.5x6.3x3.6" (241x160x92mm)

11.8x9.05x3.4" (300x230x86mm)



savvyPanel

app for iOS & Android



Go mobile

Get secure machine access anywhere

Try it out now!

Download **savvyPanel** free from the Apple App Store or Google Play Store and get immediate access to a real, live drive system in Stevensville, Maryland, USA.

- ✓ Touch the "Roll Change" button to reset the length to zero
- ✓ Turn on all the section "On/Off" switches
- ✓ Touch the "Line Start" button - see the line run its auto cycle
- ✓ Touch the "Set Speed" indicator to change the line speed
 - ✎ Touch the parameter name to get info
 - ✎ Touch the square display symbol to close the setter

drive.web automation

dw250 smarty⁷

Our most advanced Universal Automation Controller yet



Standard DIN Mounting



Alternate Panel Mounting



Outperforms any PLC! No Limits!

| Features | | |
|----------------|------------------|--|
| USB | USB-C | savvy |
| Ethernet | 8P8C | 100baseTX Ethernet drive.web & savvy ModbusTCP Client & Server EIP/PCCC Server |
| Communications | 6P6C | CANbus: Bardac P2 & E3, CANopen Client EIA-485: ModbusRTU Client or Server Both CANbus & EIA-485 may be active simultaneously |
| 0V | Ground Reference | All 0V terminals connected together |
| 24V | Power In | +24V±5%, consumes ≈ 100mA plus loads Supply from a SELV Class 2 LPS (Limited power source) only All 24V terminals connected together |
| 5V | Power Out | +5V±5%, up to 250mA Do not apply external power to 5V |
| LED Indicators | blue | Power & heartbeat |
| | red | Fault |
| | yellow | Ethernet link + activity |
| | green | Ethernet 100 full duplex |
| Clock Battery | | CR2032 coin cell |
| | | Used only for real-time clock backup Typically only one required per system, if NTP is not available |

| Inputs and Outputs | |
|---------------------------|--|
| Analog Input | [8] Analog (±10V) inputs 16-bit resolution, ≈100kΩ impedance Also configurable as Digital Input (5V or 24V logic) |
| Analog Output | [8] Analog (±10V) outputs 16-bit resolution Each AO can source or sink up to 10mA |
| AB (Encoder Inputs) | [2] Encoder inputs RS-422, RS-485, 5V, 12V, and 24V encoders supported Differential or single-ended 2A & 2B also configurable as marker/event inputs |
| Digital Inputs | [8] Digital (24V logic) inputs Also configurable as event inputs |
| Digital Outputs | [8] Digital (24V sourcing) outputs Up to 300mA (shared by all DOs); with overcurrent fault detection Also configurable as Digital Inputs (24V logic) |
| Frequency Inputs | [6] Frequency Inputs Configurable for 5V logic or 24V logic Configurable for pull-down or pull-up (5V logic only) Configurable as Frequency input, Counter Input, Digital Input, Event Input |
| Timing Outputs | [7] Timing (sinking) outputs Up to 24V Each TO can sink up to 20mA Configurable as Frequency Output, Stepper Output, or Digital Output TO7 also configurable as a Digital Input, Analog Input (unipolar) |
| Frequency & Timing Output | FI 1-6 & TO 1-6 share a wiring terminal, labeled FT 1-6 |

| XIO Option Cards | |
|--|--|
| One or zero option cards are supported | |
| See separate sketch for dimensions and pinout | |
| Typically factory installed | |
| Field installation of CLIO & XDIO may be feasible with appropriate precautions | |
| High Voltage Digital I/O (HVIO) | [10] 120/240 VAC Digital Inputs [6] 120/240 VAC Digital Outputs |
| Current Loop I/O (CLIO) | [16] 4-20mA Analog Inputs |
| | [8] 4-20mA Analog Outputs |
| Extended Digital I/O (XDIO) | [8] 24VDC Digital Outputs, also configurable as Digital Inputs |
| | [16] 24VDC Digital Inputs [16] 24VDC Digital Outputs, also configurable as Digital Inputs |

smarty dw240

smarty¹

smarty²

smarty³

smarty⁴

smarty⁶



100% compatible with all existing **speedys**, **smartys**, and **savvyPanels**!

- ✓ Advanced Motion Control
- ✓ Distributed, deterministic processing over Ethernet
- ✓ **savvy** system design tools
- ✓ Easy, intuitive, affordable, expandable
- ✓ Smart Process Control
- ✓ Homogeneous integration for drives, HMIs, remote I/O
- ✓ Right for the IIoT future
- ✓ For systems of any size or complexity

\$\$ BIG cost savings with the **smarty dw240** \$\$

Example savings, using a **smarty¹** or **smarty²**

smarty eliminates all the wiring, terminals, and hardware normally required to connect your control devices (such as drives, PLCs, etc.) to your enclosure terminals!



The installation cost for either of these **smartys** can be as low as \$20, and the possible savings are huge!

Assuming an average 6ft wire runs from your devices to your terminals, you save:

- Wire, lugs, wire numbers, DIN terminals, terminal numbers, duct, hardware **\$83 savings**
- Assembly time (4.5 minutes per wire @ \$85/hour) **\$235 savings**
- Wiring continuity testing (45 seconds per wire @ \$85/hour) **\$39 savings**

Possible net savings of over \$300!

drive.web smarty is powerful!

The **smarty dw240 series** comes fully loaded:

Install a dw240 on the customer interface terminal rail to save on wiring and installation costs!

- Floating point math for accurate and complex calculations.
- Count and Frequency with 64-bit count for precision positioning; to 1MHz input, 500kHz output.
- High speed event inputs for position markers and registration.
- Processing and networking speeds that are up to 10 times faster than the dw210, especially with larger configurations.
- Increased storage; four times more capacity.
- Up to six frequency inputs with multiple modes.
- Up to two current inputs; 0 to 20mA, 4-20mA.
- Up to two encoder inputs.
- Up to seven timing outputs with multiple modes to 500kHz; frequency, stepper, and digital.
- Real-time clock with optional battery back up. Low-power mode allows real time clock to run without power from coin cell battery, USB power, or 24-hour internal storage.
- Sensor bus for large, smarty-dedicated networks to be announced.
- XIO, Extended I/O port for up to 10 fast-updating modules with up to 16 I/O on each. Modules for high current, high voltage, precision analog, load cells and more are planned.

Every **dw240** comes fully equipped with dw build options
-04 -05 -06 -10 -25 -26 -29 -39
as standard! (**smarty²** and above)

Call for customized OEM builds!

Bardac.com

phone +410-604-3400

The **smarty dw240 series** controller consists of a "cassette" that connects directly to system field wiring via four alternative, passive "terminal carriers". This means big installation savings! The **smarty dw240** is available in four models...

smarty¹

basic UAC - 37 terminals - Analog & Digital I/O

Core Stock Build Includes:

100baseTX Ethernet, auto-negotiating, USB microB

Power: 24VDC

dw build options -04 -05 -25 -26, Clamp Terminals, DIN Rail Mounting

- 8 AI analog in, -11V to +11VDC, 100KΩ, up to 1KHz (can be used as digital inputs)
- 8 AO analog out, ~0.2 to +10.5VDC, 10mA, up to 1KHz (can be used as DO or reference voltages)
- 8 DI digital in, 100KΩ, 8V threshold, ±3V hysteresis, 50V max, up to 1KHz (can also be used as event inputs)
- 8 DO digital out, 24V source, up to 350mA (shared), over current protected



dw241-BX-C1CD
only 4.11" wide x 3.5" high x 3.0" deep
(105mm x 89mm x 76mm)

smarty²

advanced UAC - 37 terminals - Analog & Digital I/O

Core Stock Build Includes:

100baseTX Ethernet, auto-negotiating, USB microB

XIO Port for extended I/O options

Battery back up for realtime clock

Port options for CAN & ModbusRTU

Power: 24VDC

dw build options -04 -05 -06 -10 -25 -26 -29 -39,

Master Modbus RTU (unisolated), Clamp Terminals, DIN Rail Mounting

- 8 AI analog in, -11V to +11VDC, 100KΩ, up to 1KHz (can be used as digital inputs)
- 8 AO analog out, ±10.5VDC, 10mA, up to 1KHz (can be used as DO or reference voltages)
- 8 DI digital in, 100KΩ, 8V threshold, ±3V hysteresis, 50V max, up to 1KHz (can also be used as event inputs)
- 8 DO, digital out, 24V source, up to 350mA (shared), internally current limited



dw240-DM-C2CD
only 4.11" wide x 3.5" high x 3.0" deep
(105mm x 89mm x 76mm)

smarty³ advanced UAC - 61 terminals - with encoder and steppers

Core Stock Build Includes: 100baseTX, auto-negotiating, USB microB | XIO Port for extended I/O options | Battery back up for realtime clock
Port options for CAN & ModbusRTU | Power: 24VDC | dw build options -04 -05 -06 -10 -25 -26 -29 -39 | Master Modbus RTU (unisolated)
Clamp Terminals | DIN Rail Mounting



dw240-DM-C3CD
only 5.51" wide x 3.43" high x 3.0" deep
(140mm x 87mm x 76mm)

- 8 AI analog in, -11V to +11VDC, 100KΩ, up to 1KHz (can be used as digital inputs)
- 8 AO analog out, ±10.5VDC, 10mA, up to 1KHz (can be used as DO or reference voltages)
- 8 DI digital in, 100KΩ, 8V threshold, ±3V hysteresis, 50V max, up to 1KHz (can be used as event inputs)
- 8 DO digital out, 24V source, up to 350mA (shared) internally current limited
- 4 FT Frequency/Timing
Frequency/event input: 5V max, up to 100KHz
Frequency/Stepper output: 5V sinking, up to 350mA (shared)
F inputs can be used as event inputs or digital inputs
F outputs can be used to generate frequency to 500kHz, control stepper amplifiers or as digital outputs
- 1 AB Encoder, differential inputs (5.5V max), up to 1MHz

smarty⁴ advanced UAC - 103 terminals - with encoders, steppers, and more!

Core Stock Build Includes: 100baseTX Ethernet, auto-negotiating, USB microB | XIO Port for extended I/O options

Battery back up for realtime clock | Port options for CAN & ModbusRTU | Power: 24VDC | dw build options -04 -05 -06 -10 -25 -26 -29 -39

Master Modbus RTU (unisolated) | Clamp Terminals | DIN Rail Mounting



dw240-DM-C4CD
only 8.27" wide x 3.5" high x 3.0" deep
(210mm x 89mm x 76mm)

- 8 AI analog in, -11V to +11VDC, 100K Ω , up to 1KHz
(can be used as digital inputs)
- 8 AO analog out, ± 10.5 VDC, 10mA, up to 1KHz
(can be used as DO or reference voltages)
- 8 DI digital in, 100K Ω , 8V threshold, ± 3 V hysteresis,
50V max, up to 1 KHz (can also be used as event inputs)
- 8 DO digital out, 24V source, up to 350mA (shared),
internally current limited
- 2 CI Current Input, 4-20mA, 0-20mA, 20-4mA, 20-0mA, 100 Ω
- 6 FI Frequency in: up to 100KHz, 30V max, 100K Ω
with pull-up or pull-down. Can be event or digital inputs.
- 7 TO Timing Output, up to 500KHz, 30V max, sinking, pull-up,
up to 350mA (shared). For frequencies, steppers or DO
- 2 ABZ Encoders, EIA-422/485 differential (5V max), up to 1MHz
- 2 AB Reconnect terminals for encoders

smarty⁶ advanced UAC - 103 terminals - with encoders, steppers, and more!

Core Stock Build Includes: 100baseTX Ethernet, auto-negotiating, USB microB | XIO Port for extended I/O options

Battery back up for realtime clock | Port options for CAN & ModbusRTU | Power: 24VDC | dw build options -04 -05 -06 -10 -25 -26 -29 -39

Master Modbus RTU (unisolated) | Clamp Terminals | DIN Rail Mounting



- 8 AI analog in, -11V to +11VDC, 100K Ω , up to 1KHz
(can be used as digital inputs)
- 8 AO analog out, ± 10.5 VDC, 10mA, up to 1KHz
(can be used as DO or reference voltages)
- 8 DI digital in, 100K Ω , 8V threshold, ± 3 V hysteresis,
50V max, up to 1 KHz (can also be used as event inputs)
- 8 DO digital out, 24V source, up to 350mA (shared),
internally current limited
- 2 CI Current Input, 4-20mA, 0-20mA, 20-4mA, 20-0mA, 100 Ω
- 6 FI Frequency in: up to 100KHz, 30V max, 100K Ω
with pull-up or pull-down. Can be event or digital inputs.
- 7 TO Timing Output, up to 500KHz, 30V max, sinking, pull-up,
up to 350mA (shared). For frequencies, steppers or DO
- 2 ABZ Encoders, EIA-422/485 differential (5V max), up to 1MHz

only 1.06" wide x 4.09" high x 4.96" deep
(27mm x 104mm x 126mm)

Universal Automation Controllers - smarty dw210

Standard Features:

- USB port for easy system wide programming and control
- Easy interface to most drives
- Use networked or stand alone
- Internet accessible
- Peer to peer deterministic Ethernet networking:
 - * 100baseTX or 10baseT Ethernet with auto-negotiation
 - * Full duplex supported
 - * Auto-MDIX per IEEE802.3ab (auto-crossover resolution)
 - * Optional Power over Ethernet (PoE, IEEE 802.3af)
- **drive.web** distributed control
- Intuitive, graphical function block programming tools
- Complete graphical configuration & documentation data stored in devices
- 16 basic I/O terminals each configurable includes:
 - * 8: $\pm 10V$, 16 bit analog in or out or 24V digital in
 - * 8: 0-10V 16 bit analog in or 24/12/5V dig in or 24V dig out, source or sink
- Firmware field upgradable
- All circuit boards conformal coated for very high reliability
- SNTP server time/date synchronization support
- 100% backward compatible with all existing **drive.web** installations

Smart distributed control concept:

- No system bandwidth degradation with systems of any size
- One completely homogeneous environment for drives, controls, operator stations, I/O - everything!
- Complete data consistency throughout a system
- The ability to store the entire system configuration in the controllers for easy field total access
- The ability to manage total system program thread and hierarchy
- Consistent multi-level password protection

Key Features:

- Ethernet peer-to-peer networking
- Gateway options for ModbusTCP/IP, EIP CANopen, and others
- Internet access
- Graphical Signal Flow Diagram system documentation
- Additional I/O
- Easy interface to most operator stations, PLCs, SCADA, etc.
- Event driven emails from devices

Optional Features:

- Full **savvyPanel** touch screen PC and iOS device capability
- Encoder input without marker
- 1 or 2 encoder inputs with marker and retransmit via external module
- 1 or 2 isolated or unisolated RS485 ports
- High voltage digital I/O isolator
- 6 additional digital inputs
- 4 channel 20KHz frequency I/O
- 24 channel extended digital I/O
- 2 channel stepper drive controller - pulse, direction & fast event inputs
- External thermocouple and RTD inputs
- ModbusTCP/IP, ModbusRTU, EIP/PPCC
- USB port for system wide programming



Key Features:

- Ethernet peer-to-peer networking
- Gateway options for ModbusTCP/IP, EIP CANopen and others
- Internet access
- Graphical Signal Flow Diagram system documentation
- Additional I/O
- Easy interface to most operator stations, PLCs, SCADA, etc.
- Event driven emails from devices

Precision

- 16 bit integer basic arithmetic
- 32 bit floating point calculator functions
- 64 bit encoder pulse counting



Standard **savvyPanel** library

For iPad, iPhone, Android and touch screen PC operator stations with arrows, meters, start and stop pushbuttons.

Standard function block library

- Adders, Subtractors, Multipliers, Dividers, Clamps, Switches, Logic
- Event driven email messages
- Full featured PI controllers



Optional function block libraries

- Advanced Process Control & PLC
- Winder Control
- Advanced Math
- Encoder Position & Indexing

automation without limits

Smart, compact packaging
0.91" wide x 4.09" high x 4.72" deep
(23 x 104 x 120 mm)

smarty¹ smarty² smarty³ smarty⁴ smarty⁶ smarty⁷



Universal Automation Controllers

| | | | | | | |
|---|--|--|--|---|---|--|
| Full Featured PLC Functions | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Advanced Process Control | ✓ | + Winders | + Winders | + Winders | + Winders | + Winders |
| Basic Motion Control | — | ✓ | — | — | — | — |
| Advanced Motion Control | — | — | ✓ | ✓ | ✓ | ✓ |
| drive.web distributed control | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 100baseTX Ethernet | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Modbus TCP/IP & EIP/PCCC | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| USB microB port | ✓ | ✓ | ✓ | ✓ | ✓ | USB-C |
| 8 analog inputs | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 8 analog outputs | (unipolar outputs) | (bipolar outputs) | (bipolar outputs) | (bipolar outputs) | (bipolar outputs) | (bipolar outputs) |
| 8 digital inputs | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 8 digital outputs | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 4 status LEDs | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Floating-point numbers and math | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Battery backup for clock (battery not included) | — | ✓ | ✓ | ✓ | ✓ | ✓ |
| ModbusRTU master (slave optional) | — | ✓ | ✓ | ✓ | ✓ | ✓ |
| Optional drive interface | — | ✓ | ✓ | ✓ | ✓ | ✓ |
| Frequency/events inputs, timing/stepper outputs | — | — | 4 selectable inputs or outputs | 6 inputs, 7 outputs | 6 inputs, 7 outputs | 6 inputs, 7 outputs |
| Encoder | — | — | 1 encoder, diff. AB | 2 encoders, diff. ABZ + reconnect terminals | 2 encoders, diff. ABZ | 2 encoders, diff. ABZ |
| drive.web options included | -04, -05, -25, -26 | -04, -05, -06, -10, -25, -26, -29, -39 | -04, -05, -06, -10, -25, -26, -29, -39 | -04, -05, -06, -10, -25, -26, -29, -39 | -04, -05, -06, -10, -25, -26, -29, -39 | -04, -05, -06, -10, -25, -26, -29, -39 |
| Core UAC | dw241-BX-C1CD | dw240-DM-C2CD | dw240-DM-C3CD | dw240-DM-C4CD | dw240-DM-C6PD | dw250-DM-S7PD |
| P2 Vector Drive UAC | — | dw244-DM-C2CD | dw244-DM-C3CD | dw244-DM-C4CD | dw244-DM-C6PD | dw254-DM-S7PD |
| E3 Industrial Drive UAC | — | dw248-DM-C2CD | dw248-DM-C3CD | dw248-DM-C4CD | dw248-DM-C6PD | dw258-DM-S7PD |
| CANopen UAC | — | dw249-DM-C2CD | dw249-DM-C3CD | dw249-DM-C4CD | dw249-DM-C6PD | dw259-DM-S7PD |
| Dimensions (WxHxD) | 4.11" x 3.50" x 3.00" (105 x 89 x 76mm) | 4.11" x 3.50" x 3.00" (105 x 89 x 76mm) | 5.51" x 3.43" x 3.00" (140 x 87 x 76mm) | 8.27" x 3.50" x 3.00" (210 x 89 x 76mm) | 1.06" x 4.09" x 4.96" (27 x 104 x 126mm) | 0.70" x 3.50" x 4.70" (17.2 x 90 x 119mm) |

smarty7 certification is still in process, please contact the factory to check status.

faster » compact » versatile » expansive » intelligent » easily wirable » ... Available!

speedy

Embedded & onboard controllers

for total systems integration

so small it's easy to miss,
so smart it's impossible to beat!

*Only 0.91" wide x 0.83" high x 1.42" deep
(23 x 21 x 36mm)*

take a closer look ...

- The easiest, affordable way to get all your drives & devices up onto peer to peer Ethernet
- Improve your system bandwidth by reducing your RS485 network load
- Add full featured programmable control
- Same huge processing power as a *smarty*
- 100baseTX Ethernet peer to peer networking
- USB port for easy system wide programming
- Fast ModbusRTU or CAN bus device interface
- Very smart, very fast!



Universal Automation Controller

Unbeatable Performance

speedy

miniature, full featured controllers

Serial interfaced on-board drives and third party devices via ModbusRTU or CANopen to provide low cost, improved performance, peer-to-peer Ethernet networking and full featured programmable control functions.

A small package with big performance!

Includes USB port for system wide programming, Ethernet ModbusTCP/IP and **savvyPanel** interface. Available forms:

- Tether interface with either plug-in or 4-wire serial connection
- Optional DIN rail mount with screw terminals
- Customized form for embedding into drives and devices

configure, connect & control ... everything!

- Provides full featured **savvyPanel** operator station interface
- Add unlimited processing muscle to your system
- Add peer to peer Ethernet networking
- Add easy USB system access
- Use as a gateway



speedy

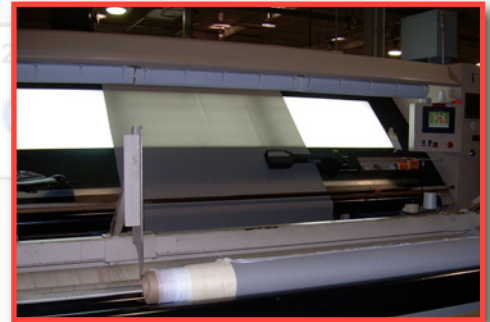
DIN mount, free standing controller

- Provide an Ethernet to ModbusRTU gateway to third party devices
- Provide extra system processing capacity & memory



speedy

for embedded or onboard control



Film line winder



Cyclic indexing system



speedy

embedded control

smarty dw210 - Universal Automation Controllers

Industry leader since 2008

100% compatible with new dw240 and dw250

Smart controllers, DIN mount with 100baseTX Ethernet distributed control, USB port and wide range of I/O & communications options

16 standard I/O, each configurable as:

8: $\pm 10V$, 16 bit analog in or out or 24V digital in

8: 0-10V, 16 bit analog in or 24/12/5V dig in or 24V dig out, source or sink

dw210 smarty for standalone or networked applications

General purpose programmable controller or drive interface controller



See page 26 for other drive and device integration apps

0.91" wide x 4.09" high x 4.72" deep
(23 x 104 x 120 mm)

speedy dw220 series



Only 21 x 22 x 36 mm!



DIN mount dwOPTION -50

Mini smart controllers for use on-board or embedded in drives & devices with **drive.web** distributed control over 100baseTX Ethernet, ModbusTCP/IP, USB port, fast serial port (up to 500kbps), full-featured savvyPanel HMI, & communications options

dw220 speedy generic interface controller with 500kbps ModbusRTU master & 15" wire interface

dw221 speedy plug-in automation controller for PL/X Series DC drive

dw222 speedy plug-in automation controller for ODE2 General Purpose VFD

dw223 speedy plug-in automation controller for ODP Sensorless Vector drive

dw224 speedy plug-in automation controller for P2 Closed Loop Vector drive

dw224S speedy plug-in automation controller for SEW Eurodrive MLTP Closed Loop Vector drive

dw225 speedy automation controller for Yaskawa F7 drive with 15" wired interface

dw228 speedy plug-in automation controller for E3 Series General Purpose drive

dw229 speedy automation controller with generic CANopen device with 15" wired interface

see page 26 for other drive and device integration apps

Easy, on-board & embedded automation for drives & devices
Very small, very smart, very affordable
Goes anywhere - does everything!



High performance film winder



21 section embossing line



Airport transit car load sharing system

Model Numbers



smarty

speedy

dw210

dw220

dw221

dw222

dw223

dw224

dw225

dw228

dw229

smarty & speedy Product build options

Function Block Libraries

| | | | | | | | | | | |
|-----|--|---|---|---|---|---|---|---|---|---|
| -05 | Advanced Process Control Function Block Library (FBL) (comparators, profilers, presets, latches, filters, counters, timers, PIDs) | X | X | X | X | X | X | X | X | X |
| -06 | Winder Control FBL (dia. calc., taper tension, torque comp.) | X | X | X | X | X | X | X | X | X |
| -10 | Advanced Math FBL (trigonometric, log, exponential) | X | X | X | X | X | X | X | X | X |
| -11 | Encoder Control FBL (shaft lock, indexing, registration for Options 40-44) | X | | | | | | | | |
| -29 | Solar FBL with sun position calculator | X | X | X | X | X | X | X | X | X |
| -36 | Motion Control FBL with Trapezoidal Motion & Cam Profile | X | X | X | X | X | X | X | X | X |

Communications Options

| | | | | | | | | | | |
|------|---|---|---|---|---|---|---|---|---|---|
| -04 | Ethernet Modbus TCP/IP slave | X | S | S | S | S | S | S | S | S |
| -25 | Ethernet EIP/PCCC interface for AB PLCs | X | X | X | X | X | X | X | X | X |
| -17* | ModbusRTU slave (RS485) isolated port | X | | | | | | | | |
| -18* | ModbusRTU slave (RS485) isolated port + external encoder module port | X | | | | | | | | |
| -19* | ModbusRTU slave (RS485) isolated port + ModbusRTU master non-iso | X | | | | | | | | |
| -23* | ModbusRTU master (RS485) isolated port + external encoder module port | X | | | | | | | | |

I/O Options

| | | | | | | | | | | |
|------|--|---|---|---|---|---|---|---|---|---|
| -24* | 6 extra digital inputs, 24V | X | | | | | | | | |
| -26 | savvyPanel iPad/iPhone/Android & touch screen PC operator station interface | X | S | S | S | S | S | S | S | S |
| -27* | Frequency I/O, up to 100KHz. 2 ~in, 2 ~I/O, with 12V, 400mA pwr supply | X | | | | | | | | |
| -30 | 115VAC digital I/O voltage isolator, up to 2/smart (not CE or UL Listed) (each with 2, NO contacts + common and 4, 115VAC inputs +common) | X | | | | | | | | |
| -31 | 230VAC digital I/O voltage isolator, up to 2/smart (not CE or UL Listed) (each with 2, NO contacts + common and 4, 230VAC inputs +common) | X | | | | | | | | |
| -37* | 2-Channel, Open Loop Stepper Drive Controller with 2 fast event inputs | X | | | | | | | | |
| -38* | 2-Channel, Closed Loop Stepper Drive Controller, i2i port for OPT-42-45 | X | | | | | | | | |

Encoder I/O Option

| | | | | | | | | | | |
|--------|---|---|--|--|--|--|--|--|--|--|
| -15* | Internal encoder input 2-24V, differential A & B (no marker) w/5VDC | X | | | | | | | | |
| -16* | External encoder module interface port | X | | | | | | | | |
| | smarty external encoder module (needs a smarty dw210 option -16, -18, -23) | | | | | | | | | |
| -42-45 | 2 ext encoder, 2-24V, marker, 5VDC o/p, 2x 24V event in, RS422 RTX | X | | | | | | | | |
| -42-46 | 2 ext encoder, 24V retransmit outputs ($\pm 1A$, $\pm 1B$, $\pm 2A$, $\pm 2B$) | X | | | | | | | | |



dwOPTION -42-46
Encoder module

Mounting Options

| | | | | | | | | | | |
|-----|--|---|--|--|--|--|--|---|--|---|
| -50 | DIN rail mount with screw terminal connections | X | | | | | | X | | X |
|-----|--|---|--|--|--|--|--|---|--|---|

* Options are mutually exclusive X = Available if not excluded S = Standard feature



drive.web automation

smarty & speedy - stock controller options (un-configured)

speedy & smarty standard programmable controller dwOPTION -00

- Basic drive coordination and peer to peer networking over Ethernet
- Basic machine control

Includes 100baseTX Ethernet and USB port with system wide access together with:

basic arithmetic, logic, PI control, clamp, switches, basic *savvyPanel* touch screen PC, iOS & Android control, systems utilities, event email

smart systems controller - pack 1

speedy & smarty dwOPTION -1121 for

- Process line drive coordination
- General purpose machine control

Includes all standard controller features together with:

advanced arithmetic, logic, process control, counters, timers, touch screen PC, iOS & Android control, systems utilities

Incorporates standard *drive.web* options

- 04, ModbusTCP/IP slave Ethernet
- 05, Advanced Process control Function Block Library
- 25, EIP/PCCC Ethernet slave for Allen Bradley interface
- 26, *savvyPanel* full featured, touch screen PC, iOS & Android operator station controller



smart systems, winders & motion - pack 2

speedy & smarty dwOPTION -1122 for

- Full featured winder control with single or multi cores, turret indexing, auto splicing, open and closed loop, edging
- Web handling, tension control, accumulators, infeeds, center winding, slip core, surface winding

Includes all *pack 1*, dwOPTION -1121 features together with:

diameter calculation, linear and hyperbolic taper control, static/dynamic friction compensation, inertia compensation

Incorporates standard *drive.web* options

- 04, ModbusTCP/IP slave Ethernet
- 05, Advanced Process control Function Block Library
- 06, Winder Control Function Block Library
- 25, EIP/PCCC Ethernet slave for Allen Bradley interface
- 26, *savvyPanel* full featured, touch screen PC, iOS & Android operator station controller
- 36, Motion Control Function Block Library with trapezoidal & cam motion



precision smart control with 1 encoder - pack 3

smarty dwOPTION -1123 for

- Basic precision speed, position or winder control
- Basic encoder count control

Includes all *pack 2*, dwOPTION -1122 features together with:

cyclic position, linear position, indexing

Incorporates standard *drive.web* options

- 04, ModbusTCP/IP slave Ethernet
- 05, Advanced Process control Function Block Library
- 06, Winder Control Function Block Library
- 11, Encoder Control Function Block Library
- 15, Single bidirectional encoder input
- 25, EIP/PCCC Ethernet slave for Allen Bradley interface
- 26, *savvyPanel* full featured, touch screen PC, iOS & Android operator station controller
- 36, Motion Control Function Block Library with trapezoidal & cam motion



precision smart control with 2 encoders - pack 4

smarty dwOPTION -1124 for

- Precision speed, position or winder control, registration, phase lock, fast event counting
- Encoder count control with home auto calibration
- Dual axis pick & place with trapezoidal motion
- Cut to length with cam motion control

Includes all **pack 3**, dwOPTION -1123 features together with:

registration, fast event counting, speed lock, phase lock, precision ratio

Incorporates standard **drive.web** options

- 04, ModbusTCP/IP slave Ethernet
- 05, Advanced Process control Function Block Library
- 06, Winder Control Function Block Library
- 11, Encoder Control Function Block Library
- 16, External encoder module interface port
- 25, EIP/PCCC Ethernet slave for Allen Bradley interface
- 26, **savvyPanel** full featured, touch screen PC, iOS & Android operator station controller
- 36, Motion Control Function Block Library with trapezoidal & cam motion
- 42-45, External dual, bidirectional encoder module with marker, fast event inputs, buffered encoder retransmit, 5VDC encoder supply



precision stepper control with 2 encoders - pack 5

smarty dwOPTION -1125 for stepper drive control

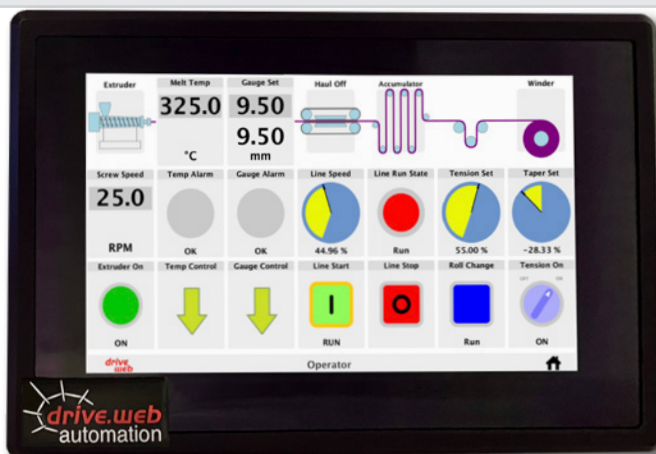
- Precision speed, position or winder control, registration, phase lock, fast event counting
- Encoder count control with home auto calibration
- Dual axis pick & place with trapezoidal motion
- Cut to length with cam motion control

Includes all **pack 3**, dwOPTION -1123 features together with:

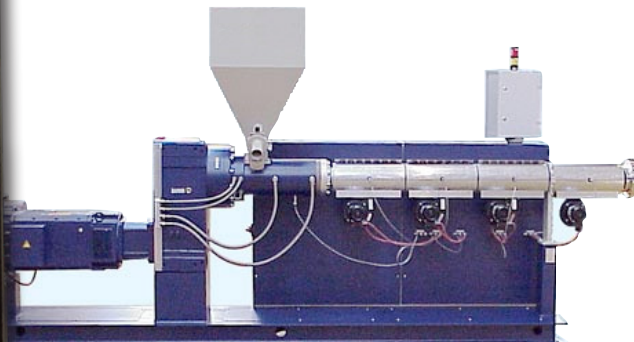
registration, fast event counting, speed lock, phase lock, precision ratio

Incorporates standard **drive.web** options

- 04, ModbusTCP/IP slave Ethernet
- 05, Advanced Process control Function Block Library
- 06, Winder Control Function Block Library
- 11, Encoder Control Function Block Library
- 25, EIP/PCCC Ethernet slave for Allen Bradley interface
- 26, **savvyPanel** full featured, touch screen PC, iOS & Android operator station controller
- 36, Motion Control Function Block Library with trapezoidal & cam motion
- 38, Dual stepper drive controller with external encoder module interface port
- 42-45, External dual, bidirectional encoder module with marker, fast event inputs, buffered encoder retransmit, 5VDC encoder supply



dw230 ... **savvyPanel touch**



drive.web device apps

These apps can be installed in **drive.web speedy** and **smarty** Universal Automation Controllers to provide a plug & play interface to the key features of “other” drives or devices. The **smarty** or **speedy** then brings those “other” drives alive with:

- Full featured programmable control functions
- Ethernet networking
- USB port access

“Other” devices include almost any device that has a ModbusRTU port, including:

- AC drives • DC Drives • PLCs • Process Controllers •
- Temperature Controllers • Smart I/O • Power Controllers •

Current “Other” device app list includes:

dwOPTION -4001 for Yaskawa A1000 Drives (with dwOPTION-1121)
dwOPTION -4002 for Yaskawa V1000 Drives (with dwOPTION-1121)
dwOPTION -4003 for V2 Series Fan & Pump Drives
dwOPTION -4004 for Schneider Altivar 312 Series Drives
dwOPTION -4005 for ABB ACS310 Series Drives
dwOPTION -4006 for Sanyo Denki Stepper Drives
dwOPTION -4007 for Thermal Edge Temperature Controllers
dwOPTION -4008 for V3 Series Eco Drives
dwOPTION -4009 for Fuji Frenic Mega Vector Drives
dwOPTION -4011 for Yaskawa A1000 (with dwOPTION-1124)
dwOPTION -4012 for ABB ACS310
dwOPTION -4013 for Fairford Electronics Synergy Soft Start

These **drive.web device apps** are easy for us to create, so don't hesitate to contact if you have a new request.

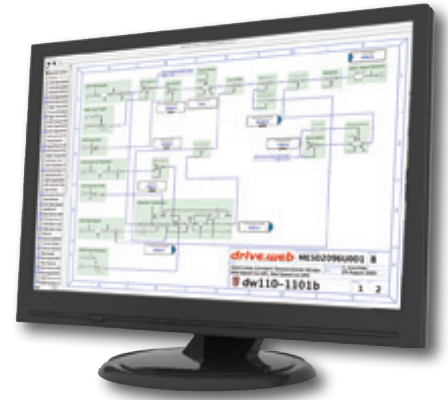
Please call +410-604-3400 for the latest list or a new “other” app.

speedy device app

Connect a **speedy** to your “other” device via its ModbusRTU port to provide immediate **drive.web savvy** access to all its key parameters. Add any additional parameters you require to make **savvy** the only tool you need for your “other” drive configuration, control, systems integration and monitoring. The **speedy** is so small (about half the size of your thumb!) that it can easily be mounted unobtrusively onboard almost any drive or device.

smarty device app

Connect a **smarty** to your “other” device via its ModbusRTU port to provide immediate **drive.web savvy** access to all its key parameters together with 16 extra precision I/O (configurable analog or digital), and with options such as encoder inputs, (see the options lists on pages 23 - 25). Add any additional parameters you require to make **savvy** the only tool you need for your drive configuration, control and monitoring.



drive apps come complete with a user guide and application notes.

The configurations can easily be edited and additional drive parameters can be added using only the **savvy** tools.

drive.web apps

CONFIGURED OPTIONS FOR *smarty* & *speedy*

These options are pre-programmed units with generic solutions for key applications. The packages are a great design aid.

These generic configurations are easily edited to suit your specific installation using *savvy* with the *SFD* Signal Flow Diagram option and include the following features:

- detail signal flow diagram documentation
- *savvyPanel* touch screen PC, iOS & Android operator station configuration
- basic wiring drawing



smarty

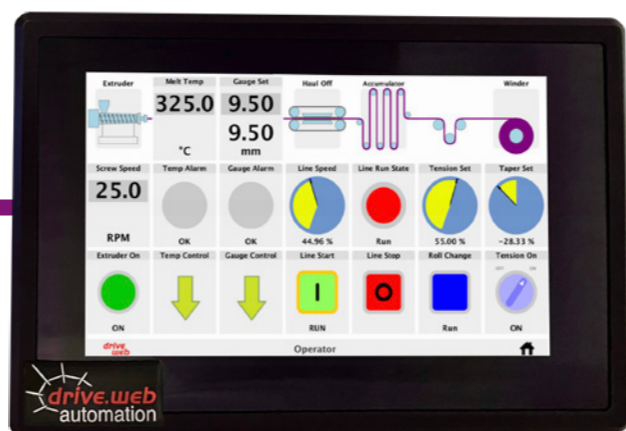


speedy

ADD CONFIGURED OPTIONS

- 1101 Open loop constant tension center winder (with option 1122)
- 1102 Closed loop dancer controlled winder (with option 1122)
- 1103 Closed loop load cell controlled winder (with option 1122)
- 1104 Slip core winder controller (with option 1122)
- 1105 Speed lock w/encoder feedback (with option 1124)
- 1106 Coordinated drive, line master controller (with option 1121)
- 1107 Controller with networking for analog drives (with option 1121)
- 1109 Phase lock, line shaft with registration (with option 1124)
- 1110 Three PID Controllers with integral reset and hold (with option 1121)
- 1113 2 channel pulse train follower (with options 05, 26, 27)
- 1117 Encoder cyclic position/indexing (with option 1124)
- 1118 Sun tracking for solar energy (with opts 05, 11, 16, 26, 29, 42 & 45 or 46)
- 1131 Encoder analog out, T13, Calibrated 1024PPR @1800RPM = 10V

| | dw210 | dw220 | dw221 | dw222 | dw223 | dw224 | dw225 | dw228 | dw229 |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X | X | X | X | X | X | X | X | | |
| X | X | X | X | X | X | X | X | | |
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| X | | | | | | | | | |
| X | | | | | | | | | |
| X | | | | | | | | | |



Please call +410-604-3400 for dw240 & dw250 pre-engineered solutions



drive.web accessories

- Industrial Ethernet switches
- Interconnection cables, connectors
- Touch screen PCs
- Wireless access points
- Communications gateways
- *drive.web* software & firmware upgrade vouchers

Please call +410-604-3400 for details

drive.web automation

drive.web apps



WINDERS & UNWINDERS

smarty automation controllers use the **drive.web** distributed control technology to bring easy, cost effective intelligence to high performance drive systems.

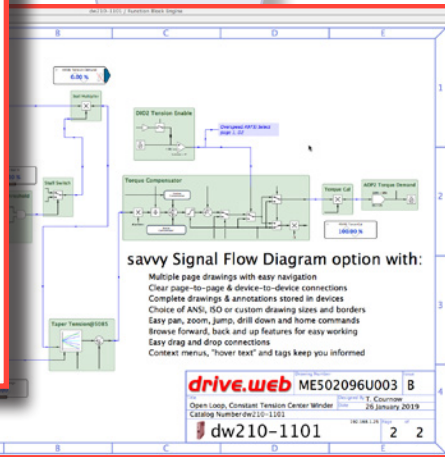
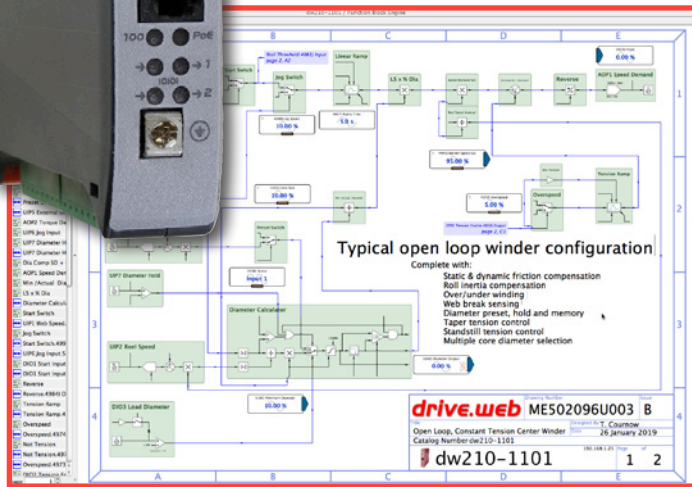
smarty apps are pre-configured generic packages for common applications:

- smarty** OPTION-1101 Open Loop Constant Tension Center Winder
- smarty** OPTION-1102 Closed Loop Dancer Controlled Center Winder
- smarty** OPTION-1103 Closed Loop Load Cell Controlled Center Winder
- smarty** OPTION-1104 Closed Loop Slip Core Winder

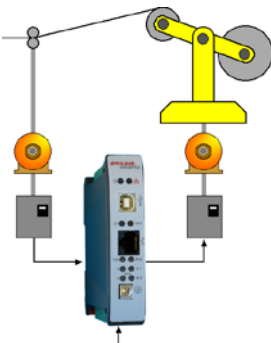


web handling excellence

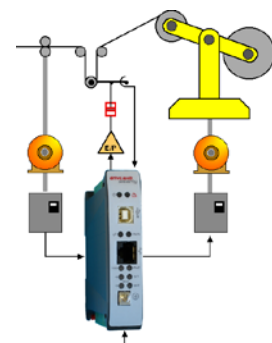
These generic configurations can easily be edited by the intuitive **drive.web savvy** graphical tools to suit the particular application. The clear signal flow diagrams are stored in the controllers for reliable access in the field.



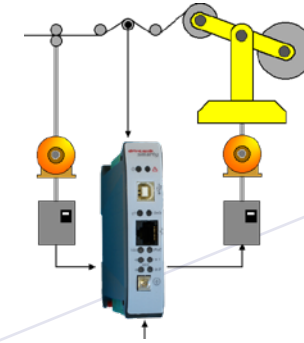
smarty OPTION-1101 OPEN LOOP CENTER WINDER



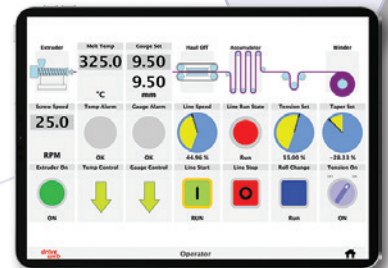
smarty OPTION-1102 DANCER CONTROLLED CENTER WINDER



smarty OPTION-1103 LOAD CELL CONTROLLED CENTER WINDER



savvyPanel touch screen control

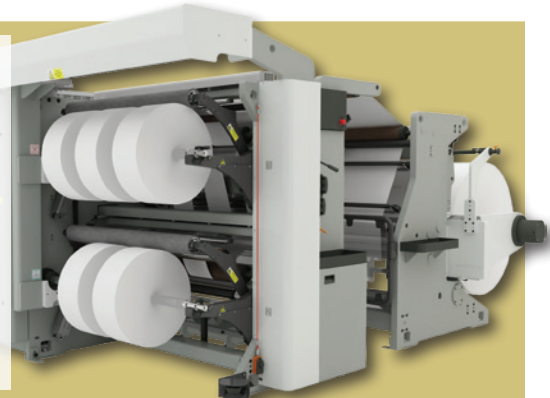


Standard features include:

- Fully editable configurations and drawings
- Drive Interface either serial port or analog
- Process control & winder function block libraries
- Web break sensing
- Diameter calculation, memory, preset and hold
- Linear or hyperbolic taper tension
- Friction, inertia & torque compensation
- Multiple core presets
- Integral reset
- Adaptive control for high speed systems
- Standstill tension mode
- Jog/run/slack take up modes
- Turret indexing mode
- Anti-reverse clamps
- Core speed matching

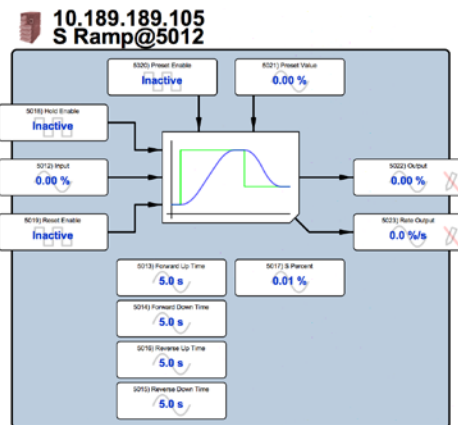
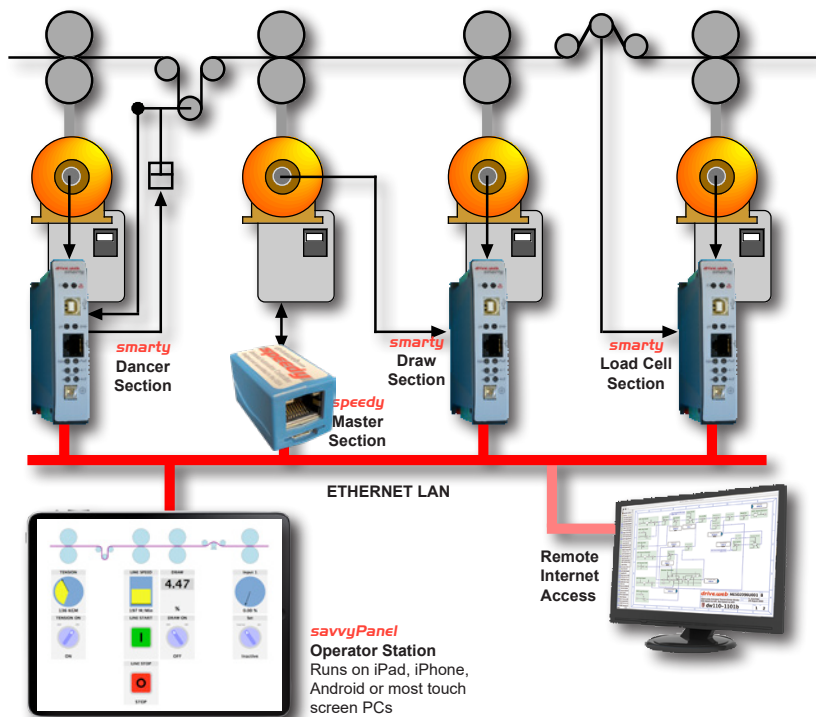
Optional features include:

- Over/under winding
- Line drive coordination
- Manual or auto-splicing modes
- Turret indexing
- Air pressure control
- Length & mass calculation
- Edge guide control
- Encoder inputs
- ModbusTCP/IP over Ethernet
- Serial communications
- ... and more.



smarty app OPTION-1106 Process Line Coordination

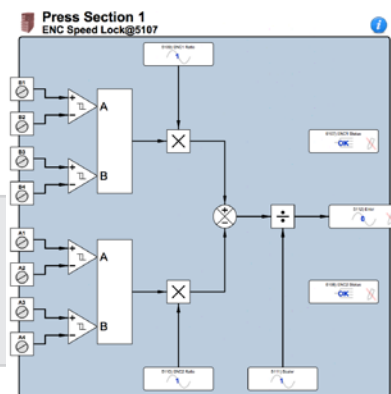
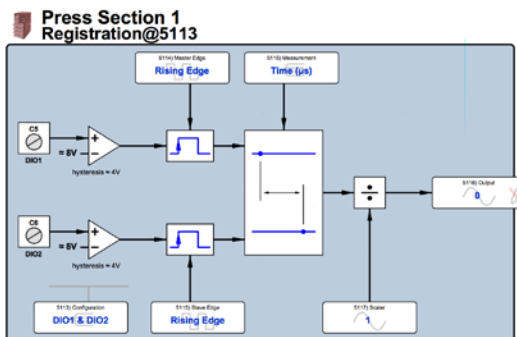
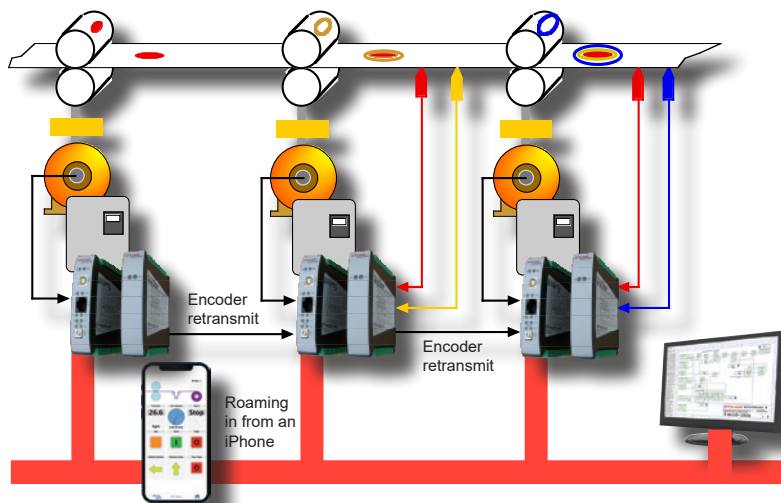
Standard function blocks used in combinations of *smartys* and *speedys* can be easily configured to provide line drive coordination in systems of any size or complexity.



- Functions such as linear, S and hyperbolic ramps are used to provide master references.
- Programmable logic and switch functions are used to provide line run, line jog, local jog, interlocks, etc.
- PIDs, profilers, registration, indexing, phase lock and arithmetic blocks provide precise section control.

smarty app OPTION-1109 Registration & Electronic Line Shaft

The Registration & Electronic Line Shaft package is designed for applications such as print registration, synchronized component handling, position control, cut-to-length, etc., where precision drive coordination and spindle orientation are required.



Standard graphical function blocks for registration and speed locking make these complex processes quick and easy to configure and use.

The encoder retransmit option provides buffered encoder signals for secure use in multiple locations.

For multi-axis motion control of all types of drives - AC drives, DC drives, servos, steppers, hydraulic, linear actuator, etc., in a wide variety of general industrial position control applications including:

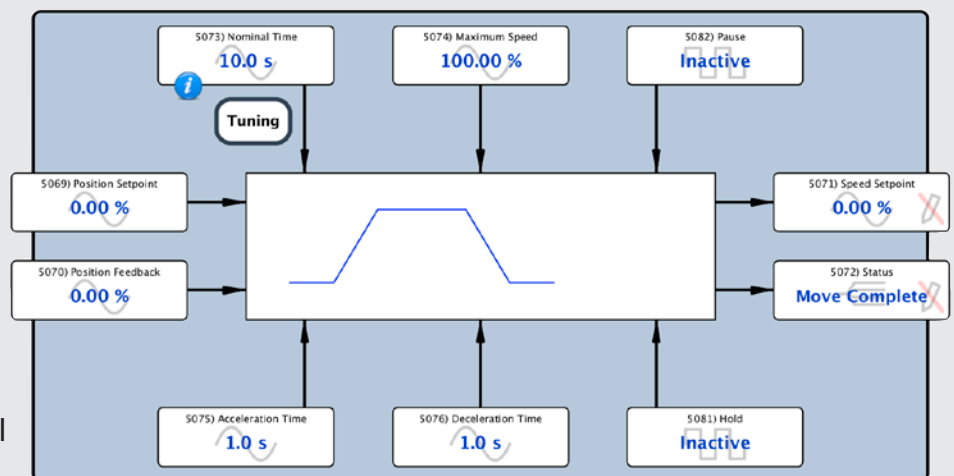
- Pick & place machines
- Packaging machines
- Painting robots
- Cut to length
- Automated assembly processes

Trapezoidal Motion

A key requirement for numerous machine controls

Key Features:

- Continuous target recalculation
- Easy system set up
- Easy performance optimization
- Pause with controlled accel/decel
- Hold with fast stop

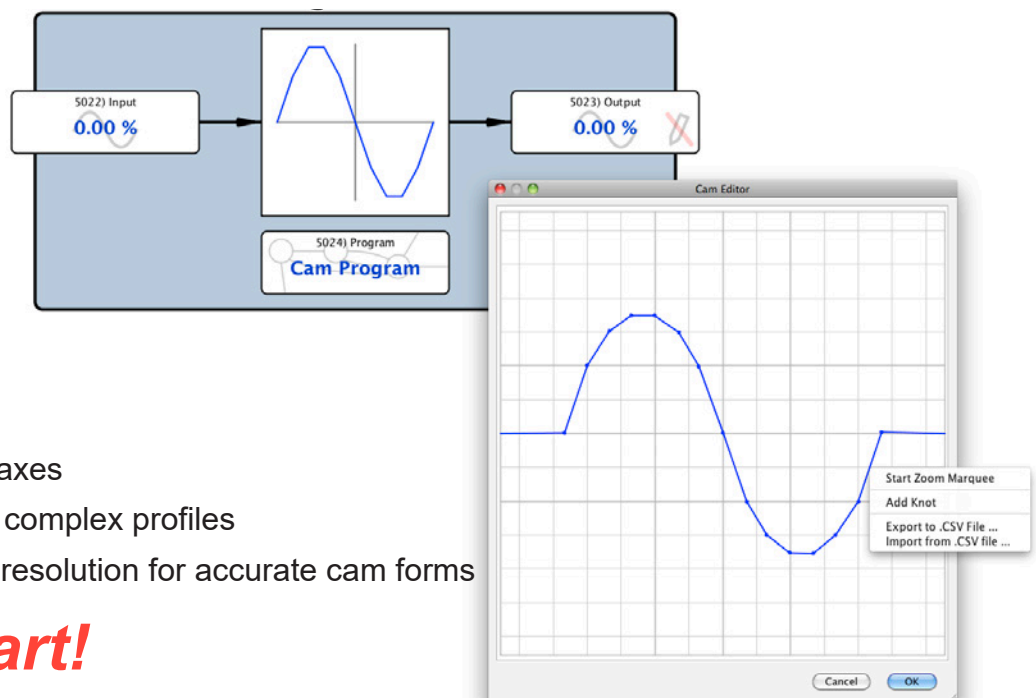


Cam Profile

A key requirement for numerous machine controls

Key Features:

- Easy graphical profile editor
- Optional .csv file import
- Easy .csv file export
- Easy system set up
- Easy integration with multiple axes
- Up to 100 “knots” or points for complex profiles
- 16 bit signed input and output resolution for accurate cam forms



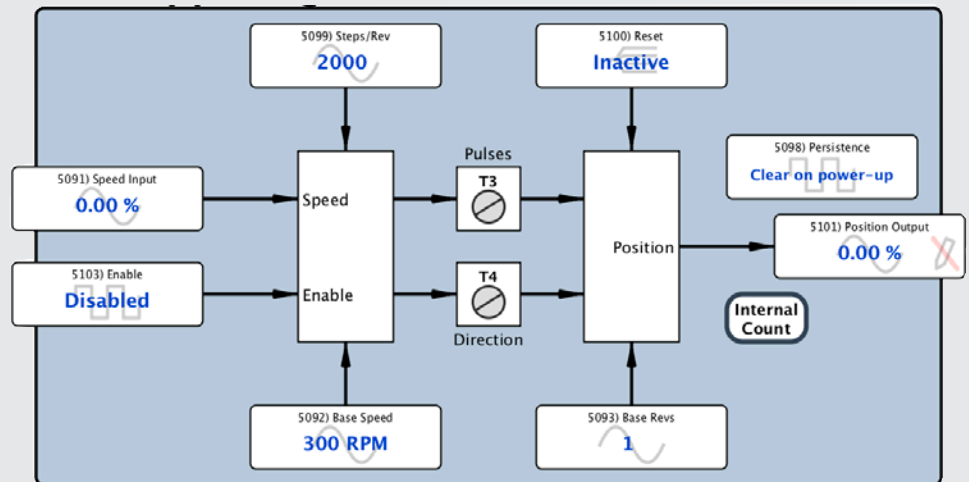
very smart!

motion control Stepper Drive Controllers

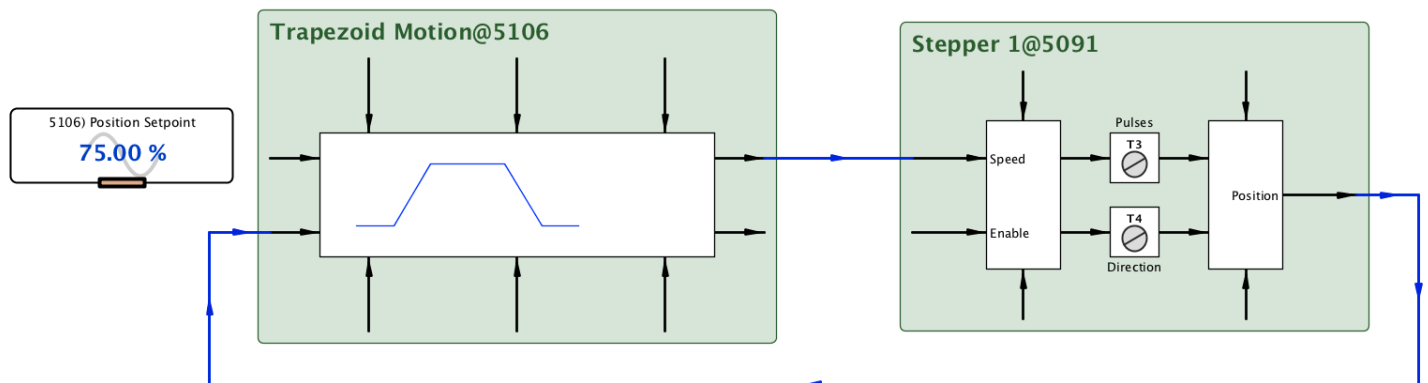
These stepper drive controller options are available for most versions of the **smarty** (see option selection table, page 23).

Both options include:

- 2 channels of pulse & direction
- 2 fast event inputs for count reset
- 64 bit pulse counts
- Automatic datum reset
- Easy set up
- Selectable count persistence with “clear on power up”

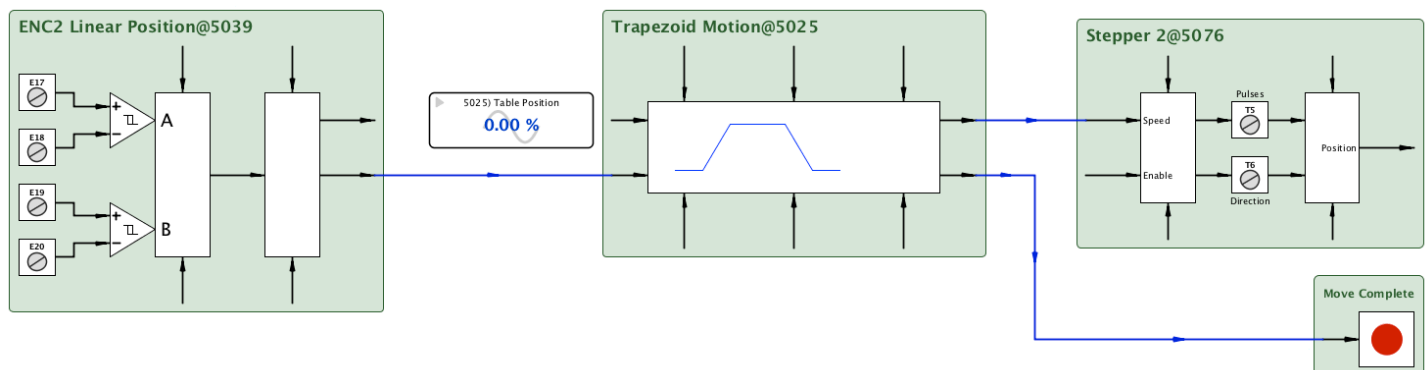


dwOPTION -37 Open Loop Stepper Drive Controller



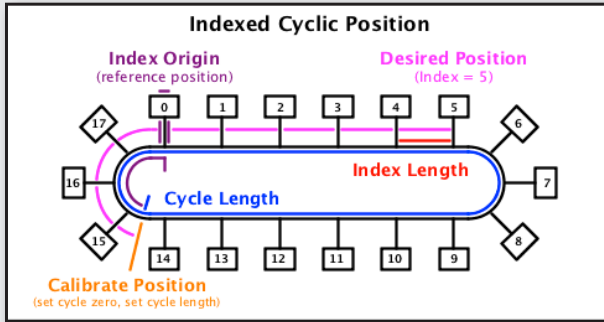
In a typical open loop stepper drive application the “Position” parameter (derived from the pulse count) can be used to close the position control loop.

dwOPTION -38 Closed Loop Stepper Drive Controller



In a typical closed loop stepper drive application the position feedback can be provided by an encoder. The dwOPTION-42-45 encoder module also has two fast event inputs for auto count reset.

smarty app OPTION-1117 Indexing & Cyclic Positioning

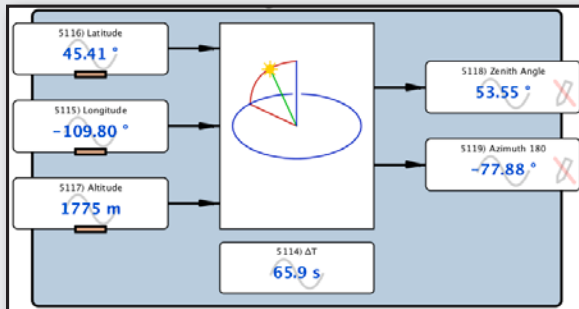


The optional Encoder Function Block Library available in the **smarty** includes a set of engineered function blocks for use in precision positioning applications such as packaging machines, machine center tool loaders, inventory carousels, stackers, etc.

Key Features

- Auto origin checking
- Auto index calculation
- Auto calculation of shortest move from point to point
- 64-bit encoder counts

smarty app OPTION-1118 Sun Position Calculator



The Solar Function Block Library provides precise calculation of the sun zenith and azimuth angles in solar energy systems. It can be synchronized with the SNTP server time and date and include a ΔT input parameter to compensate for the difference between UTC and Terrestrial Time for precise positioning of solar concentrators.

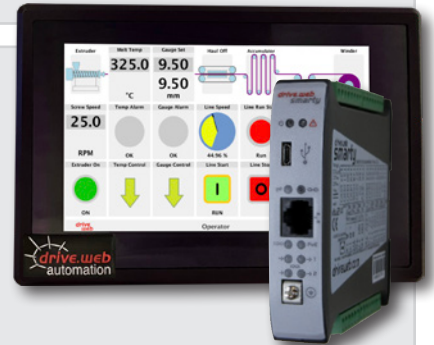
Key Features

- Set up for any latitude, longitude and altitude.
- Fast calculation for use in mobile systems.
- SNTP synchronization support.
- Terrestrial Time correction input.

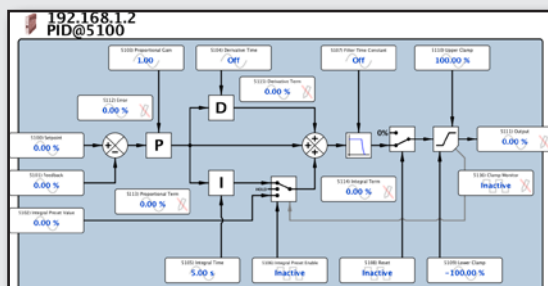
smarty app OPTION-1115 Temperature Measurement & Control

smarty controllers provide up to 4 temperature measurement or control loops using standard IEC751, Class A, 100 Ω RTD temperature sensors. Both 2 and 3-wire configurations are supported with programmable calibration, linearization, and filtering features. Use Application Note HG503599. Please call for other RTD or thermocouple options.

savvyPanel touch screens provide both your temperature control interface and your complete machine control functions.



smart function blocks

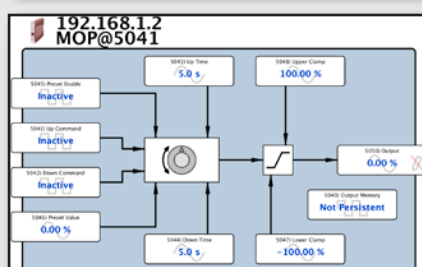


smart PID

One of the most commonly required functions in industrial control.

In most PLCs you get the basics but you are left to sweat the details required to make it work reliably in the real world. We cover the bases by including, integral preset, reset and hold, output filter, upper and lower clamps.

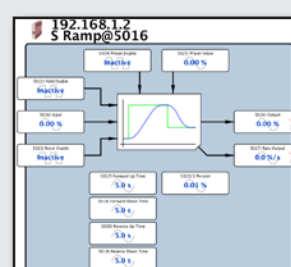
Saves a lot of time and heartache!



Motorized Pot

This MOP block makes short work of figuring out all the functions you need for raise/lower push button control

No sweat!



S-Ramps

Ever tried to create an S-Ramp that works predictably in a typical PLC? We make it easy, intuitive and reliable!

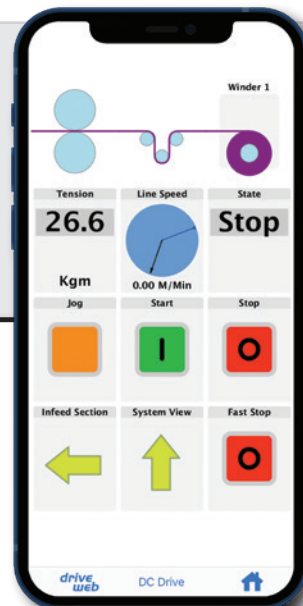
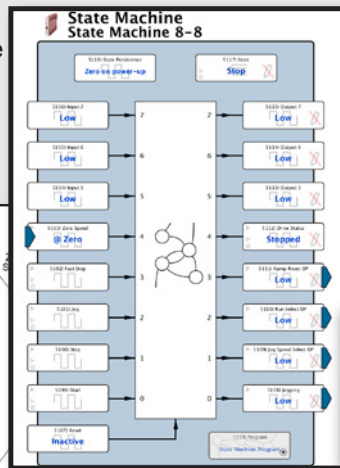
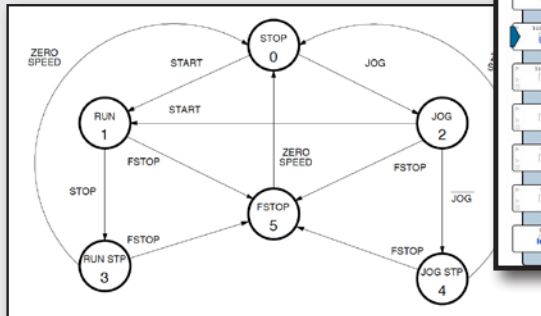
No problem!

smart function blocks State Machine Logic

This powerful, Intuitive, 21st. century technology takes the stress out of logic programming.
It's very simple ..

1. Define your machine states such as STOP, RUN, JOG, FAST STOP, etc.
2. Define the transitions that get you from one state to another, for example:
 - START button gets you from STOP state to RUN state
 - JOG button takes you from STOP state to JOG state
 - FAST STOP button takes you from any state to FSTOP state (this can then look for a transition to ZERO SPEED before returning you to the STOP state)

It's that simple! No more sweating over relay interlocks, contact races, etc!



So obvious!

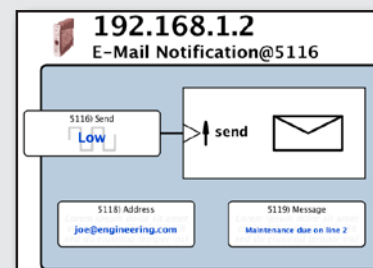
So smart!

So easy!

smart utilities event email

The E-Mail function block available in every **drive.web** device enables you to send alerts, event notices, status reports, etc., to management, quality controllers, plant engineers in any location.

It is easy to set up and it ensures that key process issues are delivered to the right place at the right time.



drive.web smart ideas

WiFi Roaming Interface

There are many inexpensive third party WiFi routers that when plugged into a [drive.web](#) Ethernet network provide secure, robust, roaming system access in an industrial environment using iOS or Android smart devices.



Enterprise Integration



The powerful system wide access inherent in the **drive.web** technology provides a great backbone on which to build integrated solutions in your entire global enterprise without additional complex data processing requirements. Multilevel password protection enables safe access for offsite accountants, production controllers and corporate management.

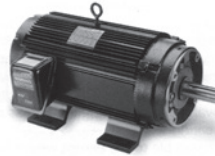
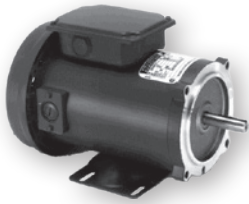


Online Training & System Support

The IP addressing capability in every **drive.web** device ensures easy support for field service and live online training for machine operators, system designers and plant maintenance engineers. If an internet connection is available near your machine or process it takes less than 1 minute to set up a live connection to our engineers or any other off site location. **drive.web** provides system wide access from any single location on your LAN - very smart, very easy!



Engineering & Support



AC and DC motors from fractional to over 2000 HP

All speed ranges, duties, enclosures and voltages complete with a full range of accessories such as encoders, tachs, thermal protection, brakes, blowers, filters, brushes and slide bases. Please call for details and competitive pricing.

Modulus Packaged Drives

Modulus solutions are a range of standard, pre-engineered drive packages with a selection of options for wide range common applications.

Using the flexible **drive.web** programmable automation technology it is possible to adapt a small range of hardware configurations to a wide range of applications thereby keeping design and manufacturing costs to a minimum.

Modulus drives are available either as packages mounted on an open panel, **Modulus P**, or as assemblies installed in an enclosure, **Modulus E**, to suit the type of operating environment and the control scheme required.

Every **Modulus** project is accompanied by a detailed, 50-point, Quality Control Report covering every facet of the product, its design, construction, testing and shipping.



User manuals for all products are available from www.bardac.com

Online Product Support

Using innovative, interactive, Internet online technologies we can provide either product training or product support through your browser from the comfort of your desk! Simply connect via your browser and get live interactive support where ever you are - with savvy running on your computer call +410-604-3400 and in less than a minute an engineer will be able to see your system live and give you the support you need.

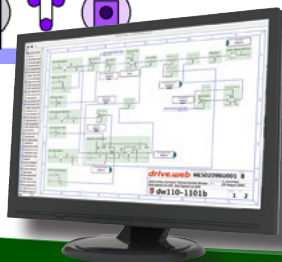
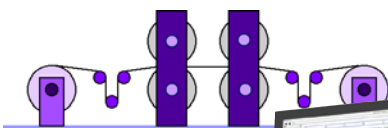
... it's as easy as that!

Our support view

Internet

Unbeatable!

Your plant view



Online Training

Online product training courses are scheduled every week with options for users of all levels of interest and ability.

Level 1 - drive.web introductory seminar - 1½ hours - Free!

This provides an overview of the **drive.web** automation technology. Learn how to connect to drives, create drive “phantoms”, navigate systems, create signal flow diagrams and system drawings, find information, identify object attributes, make connections, show trend charts, build **savvyPanel** operator stations, etc.

Level 2 - drive.web design technology course - 3 hours (Level 1 is a prerequisite)

Covers configuration of drives, basic system design concepts, Ethernet networking, password protection, system safety

Level 3 - drive.web system design and application courses (Level 2 is a prerequisite)

3a) Drive and device interfaces - 2 hours

Covers the use of “Templates” and “Helpers” for documented drives, generic ModbusRTU master interfaces to third party drives, operator stations, etc.

3b) Winder Control Systems - 3 hours

Covers standard solutions for open loop CTCW winders, closed loop dancer controlled winders and closed loop load cell controlled winders.

3c) Encoder Control Systems - 3 hours

Covers applications such as “electronic line shaft”, spindle orientation, registration and position control.

3d) Advanced Ethernet, Internet Access and Security - 3 hours

Covers local and wide area network configuration, IP addressing, user access and device and system password protection.

For course details, registration, international training options and charges please call us at 1-888-667-7333 (toll free USA 888-ON SPEED) or international at +410-604-3400. Alternatively please contact training@driveweb.com

Terms of Sale & Payment

Complete Terms & Conditions of Sale are shown at www.bardac.com. Net 30 day credit terms are available subject to prior approval. Credit card payments are only accepted for payments made at the time of service or shipment of products and will be subject to a 4% surcharge.

Field Service, Service Center Repair, Training and Start-up - Call +410-604-3400 Rates for the Continental United States

Charge Basis

Rates (US\$)

| | |
|--|------------------------|
| a. Basic Rate - Field Service, Training & Start-up Assistance - up to 8 hours daily Monday to Friday, 7am to 6pm | \$190 per hour |
| b. Standard Overtime - Weekdays 6pm to 7am & all day Saturday - Total work time not to exceed 12 hrs in any 24 hrs | \$285 per hour |
| c. Special Overtime - Sundays, Holidays and excess of 8 hours on Saturday | \$380 per hour |
| d. Overnight - Includes meals, and hotel accommodation | \$280 per night |
| e. Auto Travel - Covering cost of use of company or personal cars, distance to and from the local office | \$0.655 per mile |
| f. Public Transport - Rental cars, Air fares, etc. | At Cost |
| g. Holdover & Standby Time | Same as service |
| h. Travel Time - Time taken from Bardac to job site and return | Same as service |
| i. Basic Rate - Service Center Repair charges - Diagnosis & repair time | \$130 per hour + parts |
| j. Design or application engineering services | \$220 per hour |

Notes:

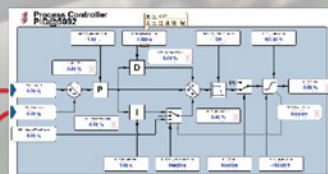
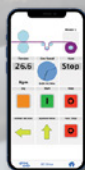
1. Minimum service billing is 4 hours for field services, 1 hour for service center services.
2. Parts, materials, special visas, duties, and extraordinary expenses will be charged extra.
3. Warranty credits will be identified on the Daily Field Service Report.

For rates and availability of sales and service outside the US, please call +410-604-3400

24/7 Tech Support

During normal business hours basic tech support will be provided free of charge

Outside normal business hours call +410-604-3535. Tech support will be provided at \$340/hour (minimum of 1/2 hour per call) and this must be paid for with a credit card at the time of service.



drive.web automation

- ~ distributed control over Ethernet
- ~ full featured programmable control
- ~ intuitive graphical programming tools
- ~ Internet accessible
- ~ cost effective systems any size or complexity
- ~ configure, connect & control
- ... everthing from anywhere

Everything normally in stock!

drive.web automation

from Bardac Corporation

40 Log Canoe Circle
Stevensville, MD 21666 USA

www.bardac.com

www.driveweb.com

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drive.web catalog 2023.1

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