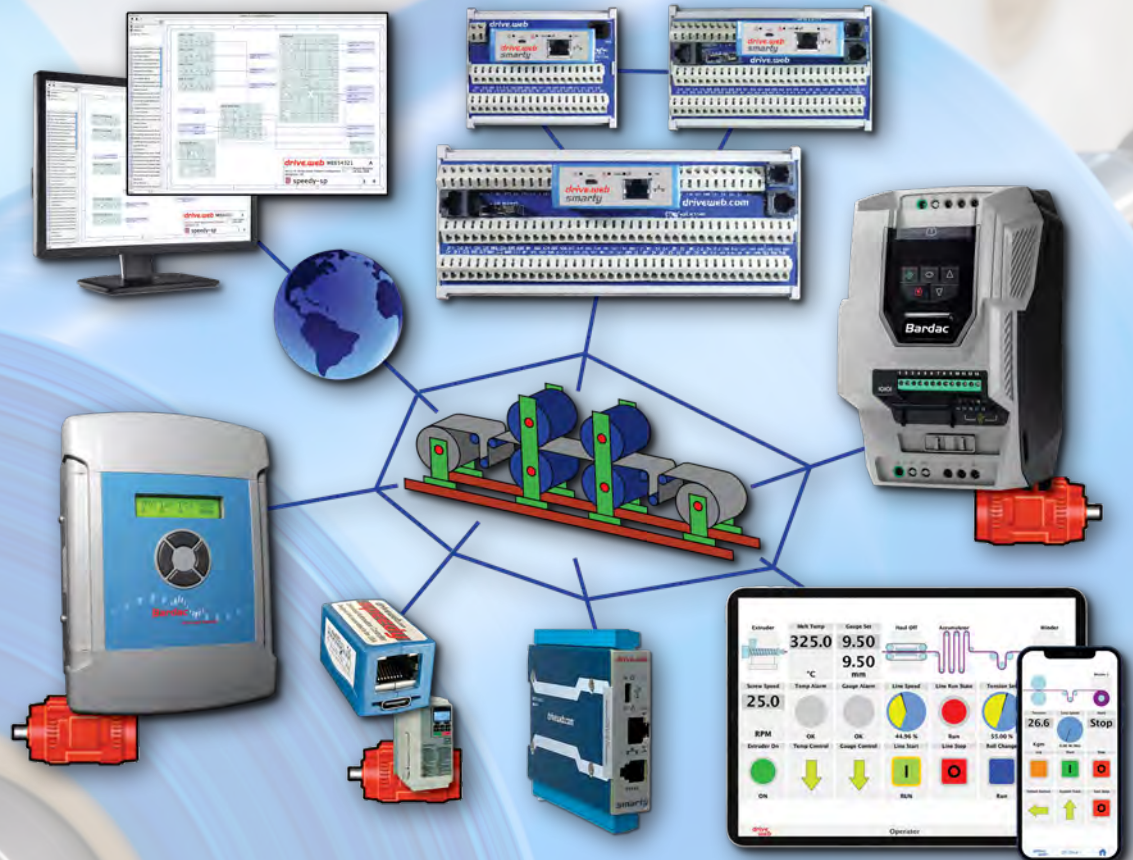
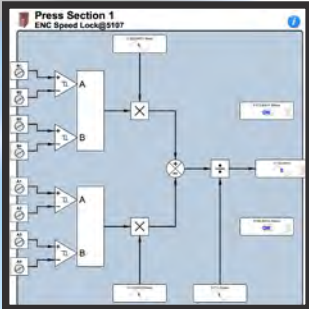


drive.web *automation Catalog 2023*

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
pages 20 - 22

Motion
smart motion controllers
pages 30 - 31

TOOLS

savvy
Drive & controller configuration
pages 8 - 9

savvy-SFD
Signal Flow Diagram tools for
system design
pages 10 - 11

drive.web Apps
Pre-Engineered Apps
pages 26 - 33

device Apps
Pre-Engineered interfaces for
third party drives - pages 26 - 33

HMI

savvyPanel
For industrial PC touch screens
pages 12 - 13

savvyPanel touch
Hi Res industrial touch screens
pages 12-13

savvyPanel mobile
HMI app for iPhone, & iPad
pages 12 - 13

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
6 & 12 pulse - page 56

Packaged Drives
Modulus pre-engineered
page 58

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

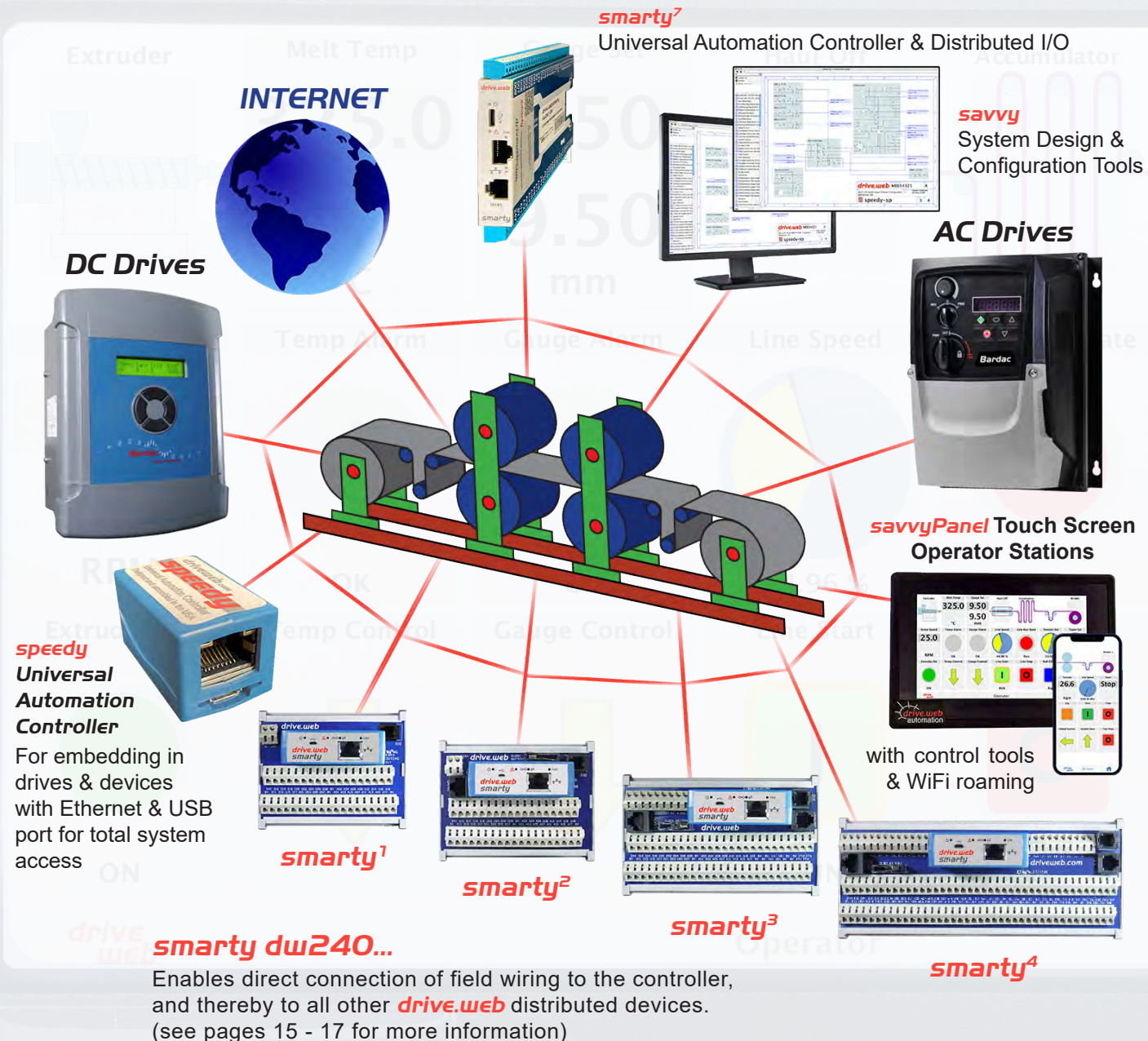
pages 58 - 59

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.

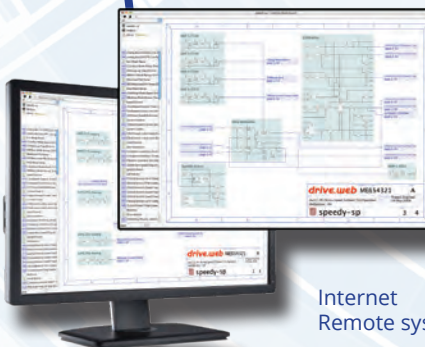
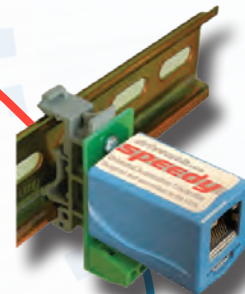
Vector Drives

Easy setup & full featured, programmable control onboard drives



USB Port

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



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

save energy

speedy

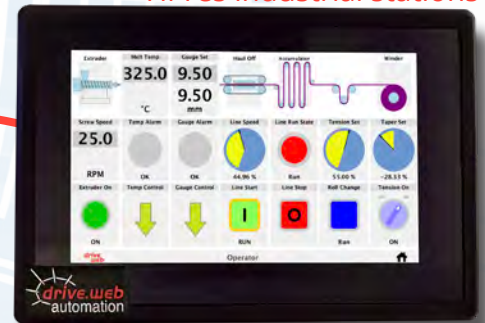
Integrated Universal Automation Controller

- 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



savvyPanel touch

Hi-res industrial stations



NEW! smarty⁷



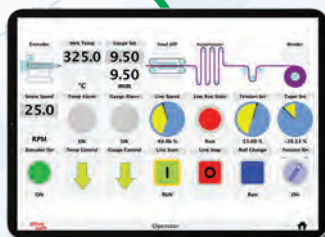
smarty

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

Color Press #4

E-Mail Notification@5116



savvyPanel

Integrated touch screen HMI technology

For touch screen PC, Android or iOS devices

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

1 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

2 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

3 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.

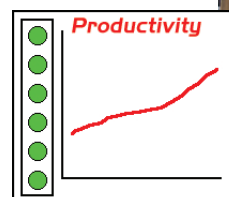
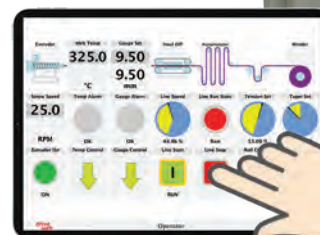
Installation & Operation

4 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

5 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

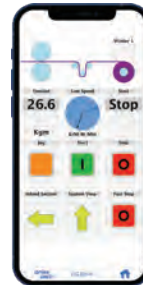
savvy Tools

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

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

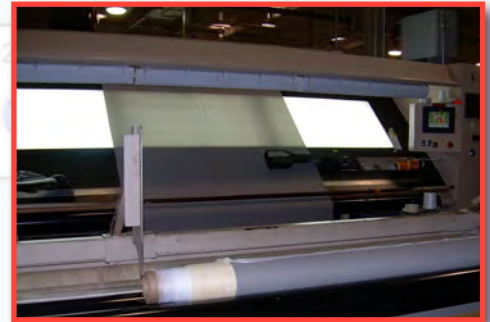
DIN mount, free standing controller

- 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

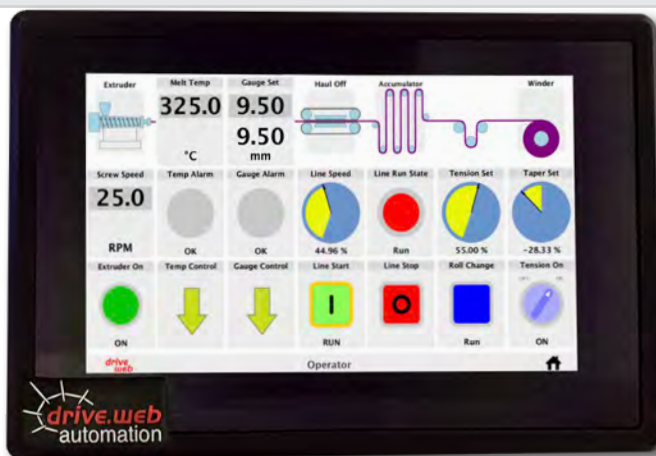
- Precision speed, position or winder control, registration, phase lock, fast event counting
- Encoder count control with home auto calibration
- Dual axis pick & place with trapezoidal motion
- Cut to length with cam motion control

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

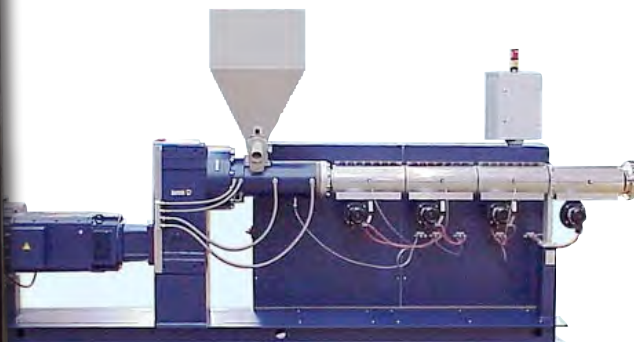
registration, fast event counting, speed lock, phase lock, precision ratio

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.

CONFIGURED OPTIONS FOR *smarty* & *speedy*

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:

-



speedy

[illegible]

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



- **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

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.

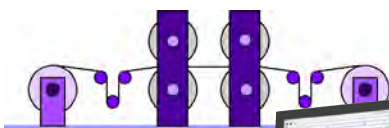


User manuals for all products are available from www.bardac.com

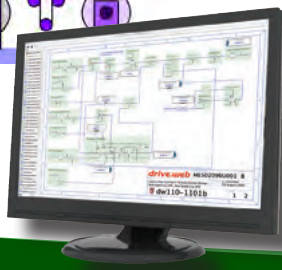
Online Product Support

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!



Your plant view



Internet

Unbeatable!

Our support 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.



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