

# **Bardac Drives Catalog 2026**

**Issue 1**



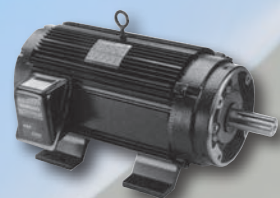
**drive.web AUTOMATION**



**AC DRIVES**



**DC DRIVES**



**MOTORS**

**AutomationThings**

**Everything is...**

- ... Internet accessible**
- ... Ethernet workable, peer-to-peer**
- ... Configurable from anywhere**
- ... IIoT ready**

**AutomationThings.com**

**Everything normally in stock!**



**SERVICE**

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**

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To 400 HP - pages 34 - 38

#### **ECO fan & pump**

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To 1.5 HP - page 46 - 47

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Modulus pre-engineered  
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**POWER QUALITY ~ MOTORS ~ ENGINEERING ~ SERVICE ~ SUPPORT ~ TRAINING**

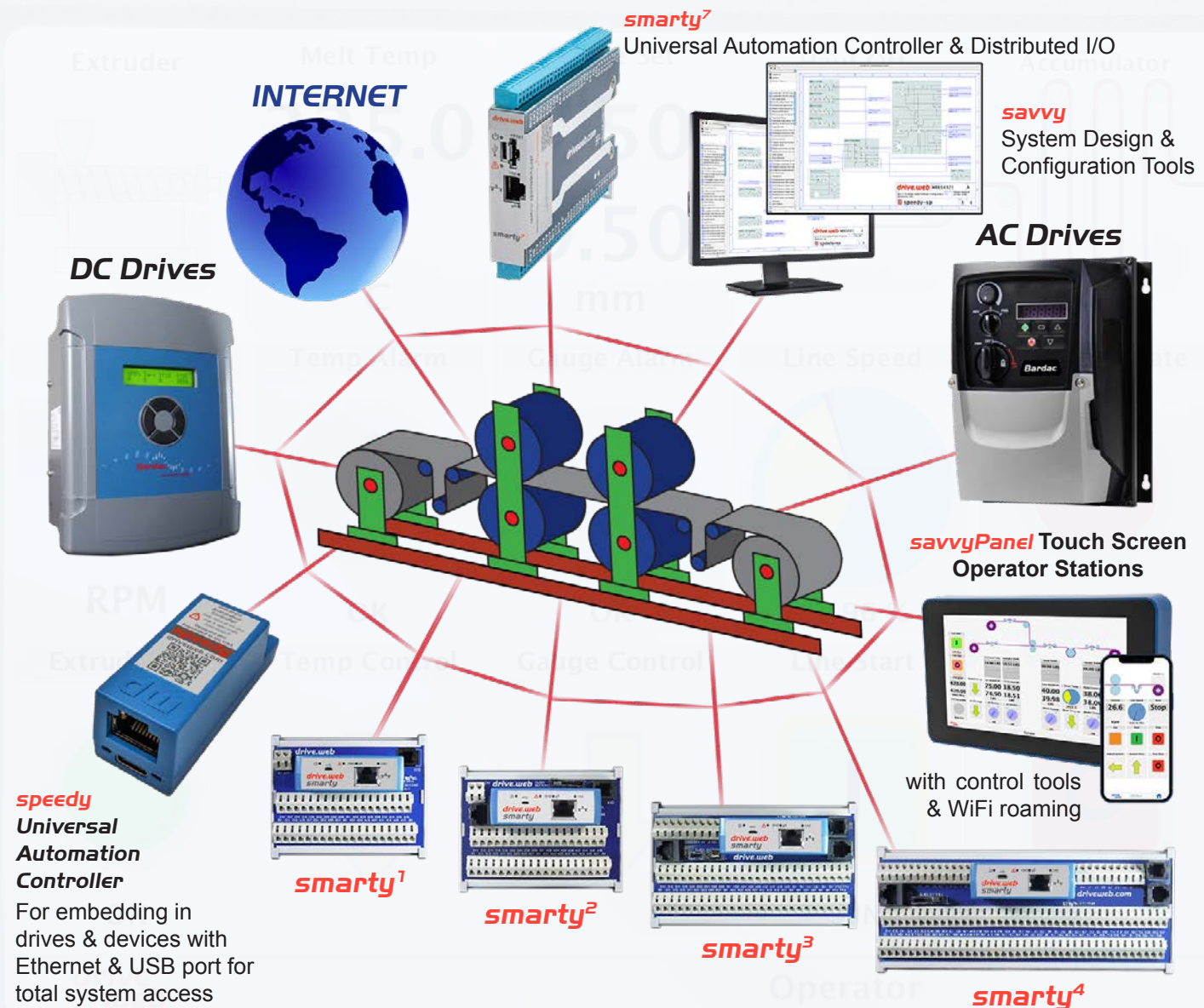
**drive.web smart technology ... Designed and engineered in the USA to International Standards: UL, cUL, CE, FCC, UK CA**

**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** smart technology ... Designed and engineered in the USA to International Standards: UL, cUL, CE, FCC, UK CA

# 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!

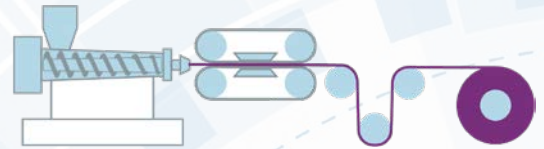
**5** A *speedy* embedded in a drive takes over the entire drive; its setup, control, & memory management. It becomes an integral part of the drive and now looks just like the drive. Any actions from the drive keypad or terminals or serial ports are instantly synchronized.

**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.

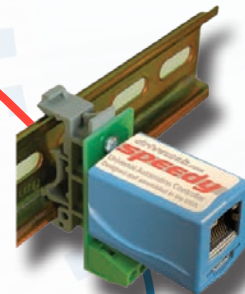
#### Vector Drives

Easy setup & full featured, programmable control onboard drives



#### USB Port

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



*drive.web* smart technology designed and engineered in the USA to International Standards: UL, cUL, CE, FCC, UK CA



Sensors



Meters & Displays



Instrumentation



Internet Remote system 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

# 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



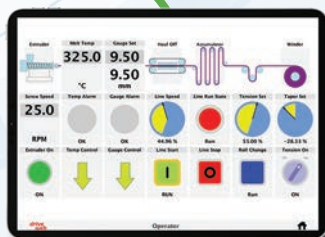
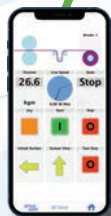
## NEW! smarty<sup>7</sup>



## smarty

### Universal Automation Controllers

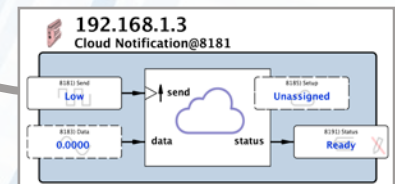
- Easy sensor interface
- Precision analog I/O
- Fast logic I/O with powerful state machine programming
- 16 precision analog & logic I/O
- Encoder I/O for indexing, registration, and shaft lock
- Multiple communications options
- Unlimited expansion with no loss of system bandwidth



## savvyPanel

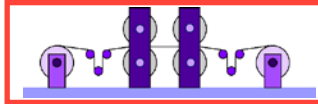
### Integrated touch screen HMI technology

For touch screen PC, Android or iOS devices



## 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

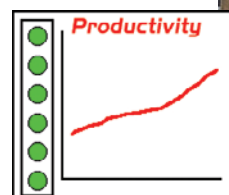
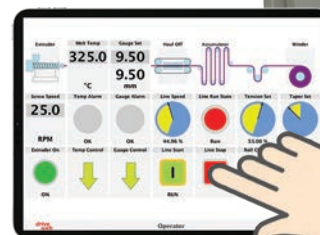
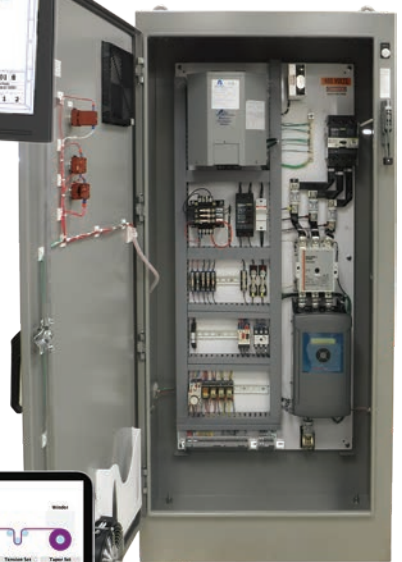
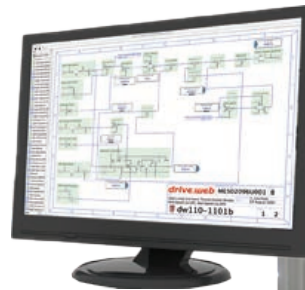
Use **drive.web savvy** to provide real time monitoring and control of your entire system from any location. No running from drive to drive to check the setup or operational state! Use **savvyPanel** operator station technology to provide smart touch and roaming control from anywhere.

### 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.

**drive.web smart technology ... Designed and engineered in the USA to International Standards: UL, cUL, CE, FCC, UK CA**

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

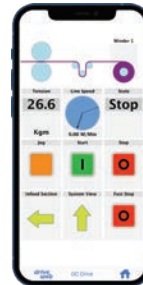
### savvy Tools

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 Wi-Fi 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.

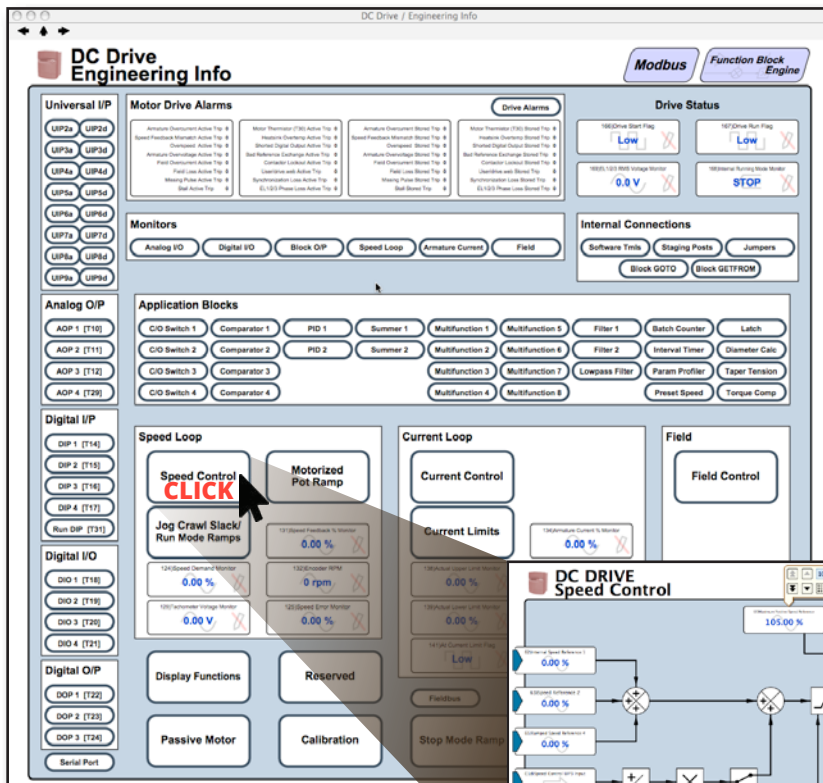


Only 0.91"W x 0.89"H x 2.42"D!



**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

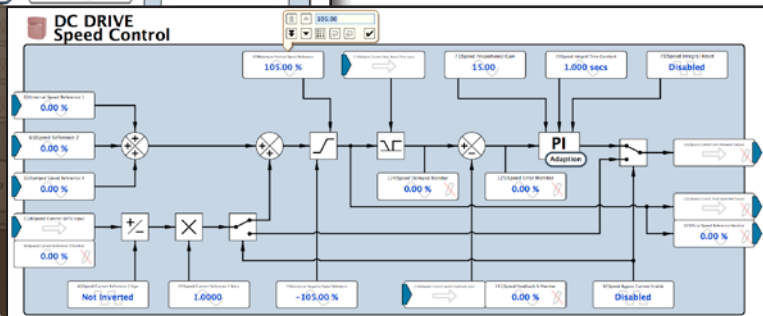


## Engineering Info

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](http://www.driveweb.com)

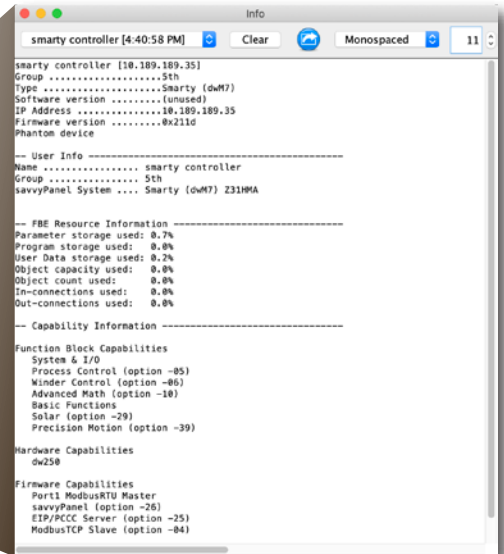
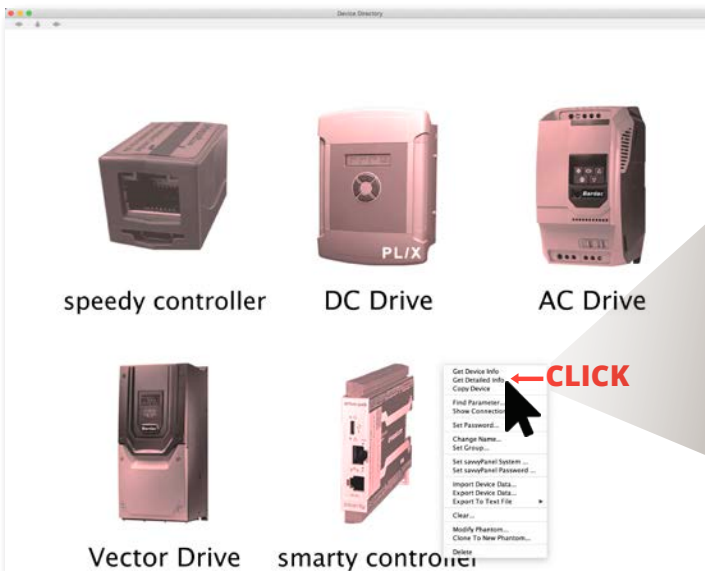
The **savvy** tools and utilities are platform independent and run on Windows, macOS, Unix, Linux, and Solaris and they are all automatically updated as new features before release.

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

## Engineering Info

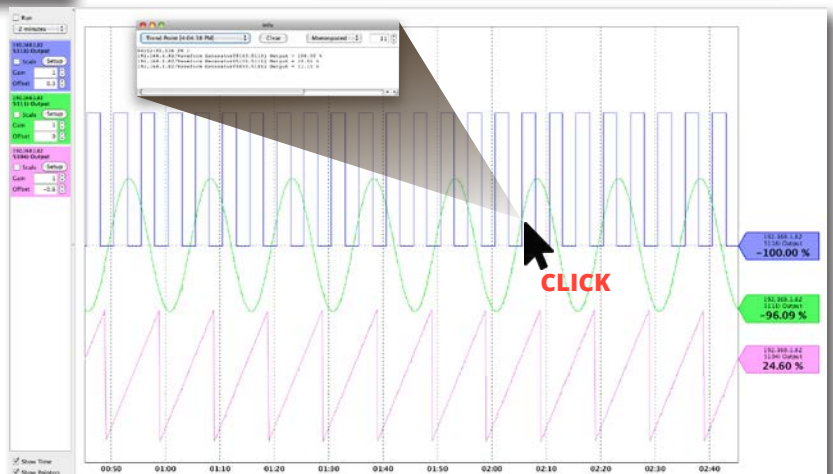
Anywhere in the system you will have easy instant access to the information you need with several different types of resource...

- 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.



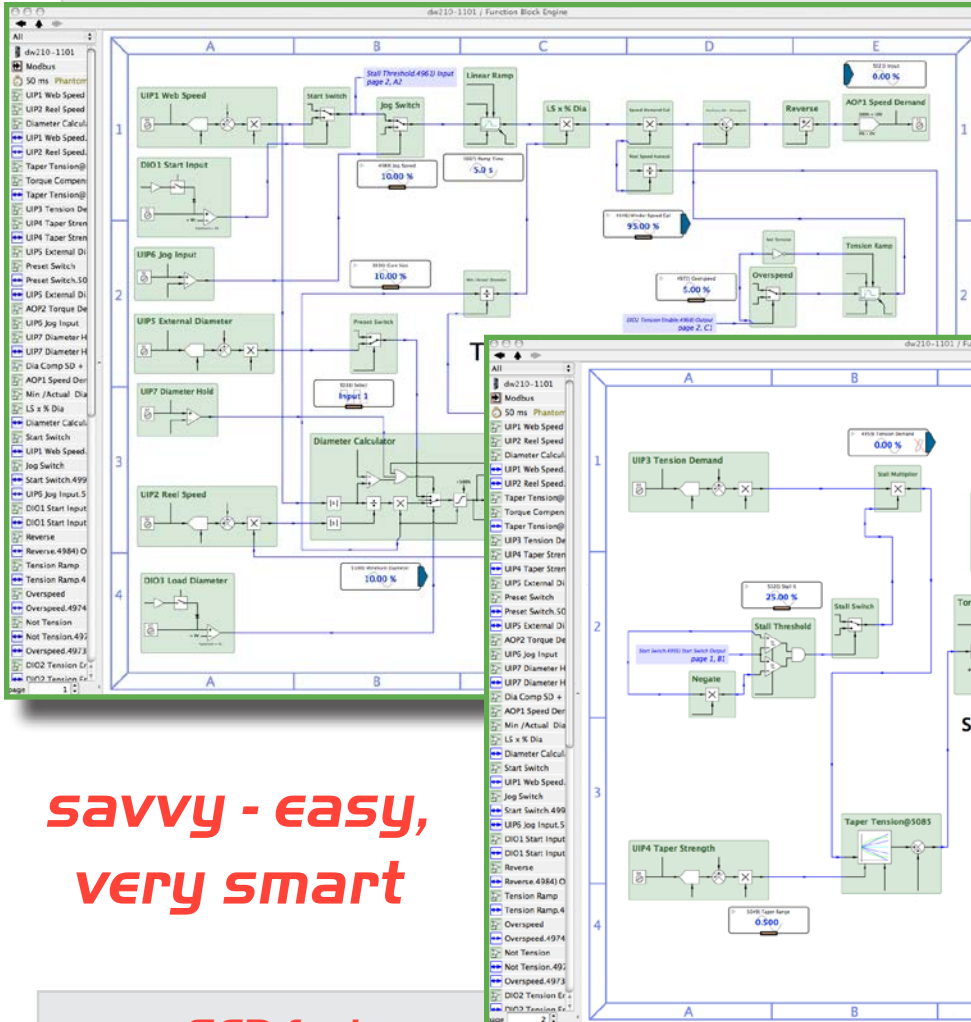
## Trend Charting

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



### 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.

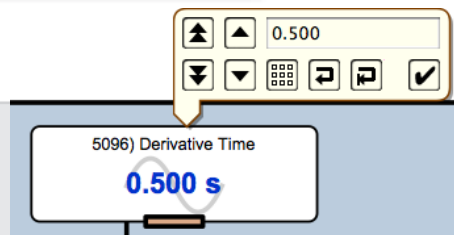
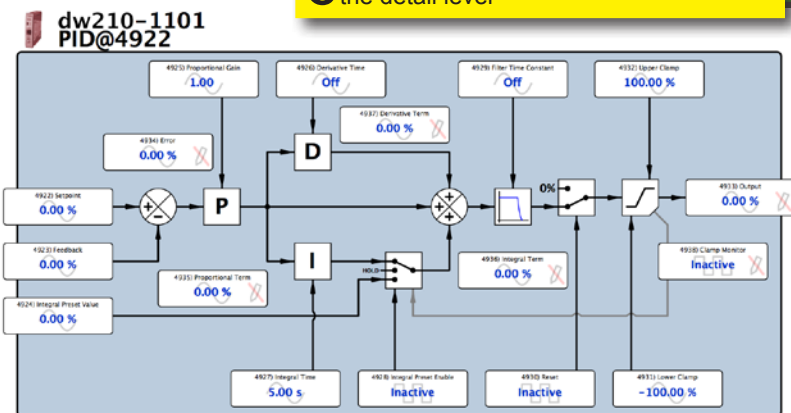
A few simple steps are all that is needed to build a complete control scheme with signal flow documentation that is clear and easy to understand. Powerful navigation tools ensure that you will never get lost!

**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

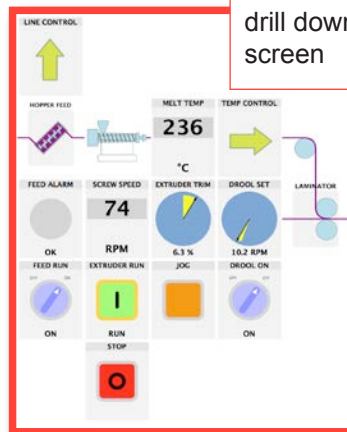
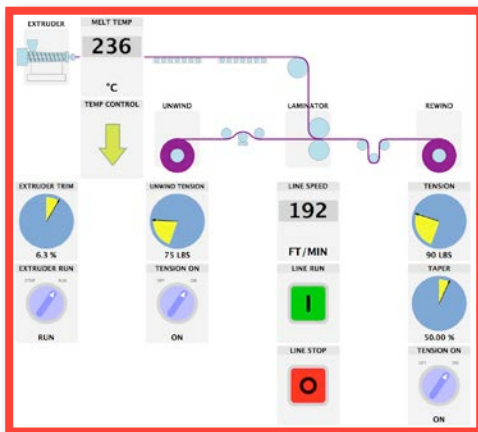
Provides unprecedented flexibility in instrumentation, control and monitoring.

- 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.

### Example - Extrusion Coating Line

#### Master System Control Station

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



#### Operator Screen

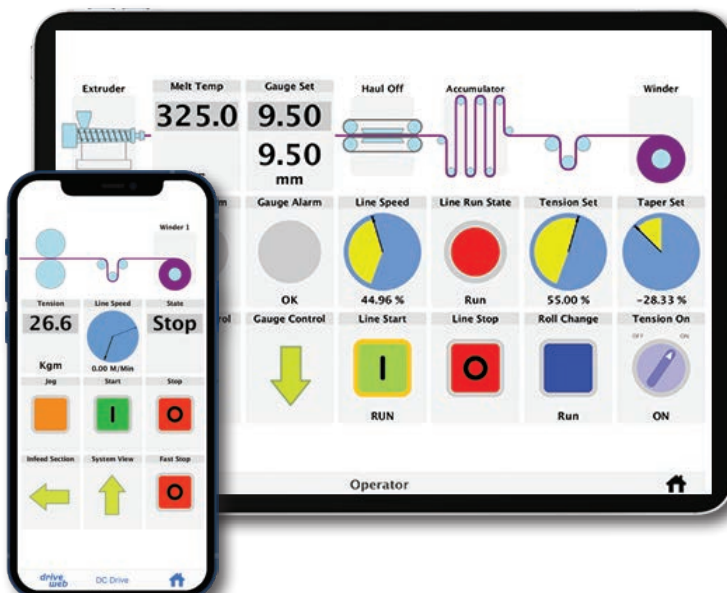
Touch a graphic tile such as the “EXTRUDER” to drill down to the detail screen



#### Total Control

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

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



## 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

# savvyPanel touch *Color Touch Screens*

- Plug & Play, **drive.web** natively
- Competitively priced
- Crisp, high visibility graphics
- IP65 front
- IP20 rear
- Easy setup
- 1 Ethernet port 1000BASE-T
- 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

## dw260

7" - bright, 800 x 480p

**savvyPanel** touch screen operator station

- Easy surface mount - no big cut outs required
- Easy **savvy** programming tools
- Front sealed for indoor use
- **drive.web** Ethernet port for system wide access
- 24V power supply, 6W
- Slim size: 7.9" x 6.6" x 0.8" (200 x 117 x 20 mm)

**Optional Mounting Enclosure**

dwOPTION-66-070

Gray ABS, 8.75"x5.75"x2.2"  
(222x146x56 mm)



**dw230-101** 10.1" - 1280x800p 10.8"x7.6"x1.8"

**dw230-070** 7" - 1024x600p 8.1"x5.5"x1.2"

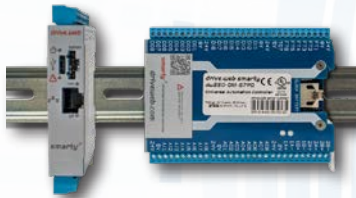
**dw230-050** 5" - 800x480p 5.9"x4.4"x1.1"

## dw250 smarty<sup>7</sup>

Our most advanced Universal Automation Controller yet

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

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



### \$\$ BIG cost savings with the **smarty dw250** \$\$

Example savings, using a **smarty<sup>7</sup>**

**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 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!**

The **smarty dw250 series** comes fully loaded:

- Compact DIN-rail or panel-mount controller with 60 plug-in screw terminals.
- Peer-to-peer 100BASE-TX Ethernet plus USB-C system-wide access.
- Floating-point or integer math for process, machine, and motion calculations.
- Encoder pulses up to 1 MHz with 64-bit count.
- Two encoder inputs for quadrature A/B or ABZ, 5 V or 24 V.
- Six fast I/O channels: 100 kHz input or 500 kHz output.
- Standard I/O: 8 analog inputs, 8 analog outputs, 8 digital inputs, and 8 configurable digital outputs.
- Built-in ModbusRTU, ModbusTCP/IP, and EIP/PCCC support.
- XIO builds add AC digital I/O, extended digital I/O, relay outputs, isolated millivolt analog inputs and more.

# dw250 smarty<sup>7</sup>

Our most advanced Universal Automation Controller yet



Standard DIN Mounting

Alternate Panel Mounting



Flex DIN Clip  
Option



No Limits!  
Outperforms any PLC!



| 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             | Common 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                                               |
| Digital Inputs                                          | 2A & 2B also configurable as marker/event 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)                      |
| Timing Outputs                                          | Configurable as Frequency input, Counter Input, Digital Input, Event Input |
|                                                         | [7] Timing (sinking) outputs                                               |
|                                                         | Up to 30V                                                                  |
| Frequency & Timing Output                               | 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)          |
| FI 1-6 & TO 1-6 share a wiring terminal, labeled FT 1-6 |                                                                            |

| Data                                                |
|-----------------------------------------------------|
| Dimensions: 0.7" x 3.5" x 4.5" (17.2 x 90 x 119 mm) |
| Weight: 0.38 LBS (17.3 g)                           |

## dw250 smarty<sup>7</sup>-XIO

*Universal Automation Controller with Extended I/O*

**dw250 smarty<sup>7</sup>-XIO** automation controllers all include all of the standard **smarty<sup>7</sup>** features with the addition of an extended I/O module.

- Flex mount allows either end mount DIN rail for high density or optional side mount for low profile
- Plug in screw terminals
- Easy monitoring and diagnostics

### **smarty<sup>7</sup>-XD Extended Digital I/O**

#### **model dw250-DM-XDPD**

- 16, 5-24VDC Digital Inputs
- 16, 24VDC Digital Outputs also configurable as Digital Inputs
- All I/O have common 0V
- Compact package only 1.0" x 3.5" x 4.8" (26 x 90 x 121 mm)

### **smarty<sup>7</sup>-HV Extended High Voltage Digital I/O**

#### **model dw250-DM-HVPD**

- 10, 120/240VAC Digital Inputs
- 6, 120/240VAC Digital Outputs
- For use with common power supply lines
- 1.3" x 3.5" x 4.8" (33 x 90 x 121 mm)

### **smarty<sup>7</sup>-RL Extended Relay I/O**

#### **model dw250-DM-RLPD**

Four relay outputs rated 120/240VAC or 30VDC, 5 Amps

- 2, Form C (changeover) contacts
- 2, Form A, (single contact, normally open)
- For use with common power supply lines
- 1.4" x 3.5" x 4.8" (36 x 90 x 121 mm)

### **smarty<sup>7</sup>-XA Extended Precision Analog Inputs**

#### **model dw250-DM-XAPD**

Four precision analog inputs, each isolated from each other and the controller.

Each channel is individually configurable for:

- Thermocouple (most common types supported) with cold junction compensation
- RTD temperature sensor (2, 3 & 4 wire)
- Strain gauge loadcell (Wheatstone bridge type)
- Semiconductor tension transducer, full bridge & half bridge
- mV sensing with ranges from 10mV to 2048mV
- Compact package only 1.0" x 3.5" x 4.8" (26 x 90 x 121 mm)

**drive.web smart technology ... Designed and engineered in the USA to International Standards: UL, cUL, CE, FCC, UK CA**



# dw250 smarty<sup>7</sup>-T

smart, 4-zone temperature controller

Model: dw250-1200 Series - Quad Temperature Controller



dw250-1201

- 4 zone, isolated temperature controller channels
- All common thermocouples and RTDs supported
- Cold junction compensation
- Easy configurable power controller and chiller output options



dw250-1201 with dw260 display



dw250-1201 & system with dw260 display

## Core Features

- Masses of extra analog and logic I/O in every module
- No backplane restrictions - every module linked peer-to-peer over Ethernet
- No CPU limitations - every module provides parallel processing for infinite expansion
- Seamless integration into systems with drives, PLC, motion control & HMIs
- Add your process details and graphics to the basic Quad Controller display
- Easy configurable controller output options
- Easy data logging, trend charts and smart diagnostics
- Easy, password protected set up
- Internet accessible with cloud functions
- Communications options include ModbusTCP/IP, ModbusRTU, CANopen, EthernetIP/PCC
- DIN mount with full featured programmable control in every module

## Mode Settings

### Manual Mode

Power output is forced to manual setting, 0 to 100%

### On-Off Mode

PID is not used for digital output. This is a typical thermostat with hysteresis; heater turns off at setpoint and back on at SP-hysteresis.

### Fixed-Time Mode

Digital output is controlled by the PID output via an oscillator with variable duty cycle. Typical oscillator fixed time is 1s.

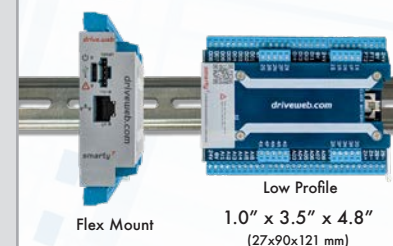
### Power Demand

0 - 10 VDC = 0-100% Power Demand

## ThermoPanel Bundle



dw250-1201 with dw260 display



Flex Mount

Low Profile  
1.0" x 3.5" x 4.8"  
(27x90x121 mm)

## Easy **savvy** configuration and set up tools

Use USB-C or Ethernet to connect to **savvy** tools for complete system configuration and documentation - including controllers, drives, HMIs:

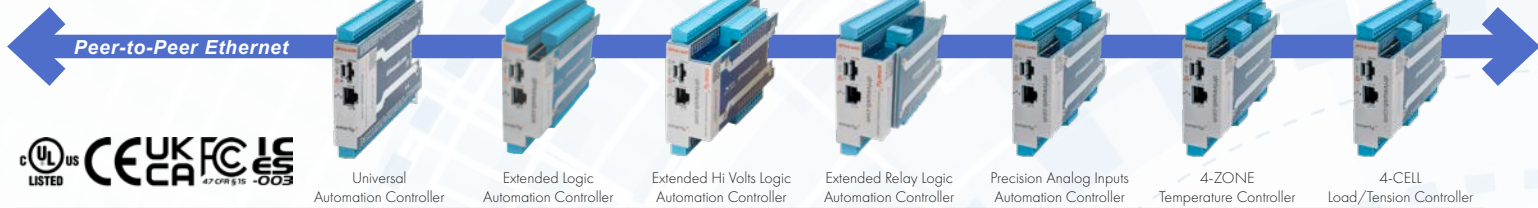
- Pair with a **dw260** HMI for both control and set up
- Password protected access to operator and set up levels
- Add internet access
- Get **savvy** tools from <https://driveweb.com/get-savvy/>
- Run **savvyPanel** display on any PC, tablet or phone

- Add your complete process system configuration
- Add other temperature controllers and I/O
- Add other load controllers and I/O
- Add power controllers and drives
- Add touch screens
- Easy drag & drop connections between all devices
- Powerful logic and signal processing functions
- Internet access and cloud functions
- Everything in one homogeneous environment
- Smart system wide navigation features.

# drive.web Universal Automation Controllers

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

smarty<sup>7</sup> smarty<sup>7</sup>-XD smarty<sup>7</sup>-HV smarty<sup>7</sup>-RL smarty<sup>7</sup>-XA smarty<sup>7</sup>-T smarty<sup>7</sup>-L



|                                                                    | Universal<br>Automation Controller           | Extended Logic<br>Automation Controller   | Extended Hi Volts Logic<br>Automation Controller | Extended Relay Logic<br>Automation Controller | Precision Analog Inputs<br>Automation Controller | 4-ZONE<br>Temperature Controller          | 4-CELL<br>Load/Tension Controller         |
|--------------------------------------------------------------------|----------------------------------------------|-------------------------------------------|--------------------------------------------------|-----------------------------------------------|--------------------------------------------------|-------------------------------------------|-------------------------------------------|
| Full Featured PLC Functions                                        | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| Advanced Process Control                                           | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| Basic Motion Control                                               | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| Advanced Motion Control                                            | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| Extended I/O                                                       | -                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| Smart Configuration                                                | -                                            | -                                         | -                                                | -                                             | -                                                | ✓                                         | ✓                                         |
| drive.web distributed control                                      | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| 100baseTX Ethernet                                                 | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| Modbus TCP/IP & EIP/PCCC                                           | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| USB-C port                                                         | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| 8 analog inputs: +/- 10VDC                                         | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| 8 analog outputs: +/- 10VDC                                        | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| 8 digital inputs: 24VDC                                            | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| 8 digital outputs: 24VDC                                           | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| 4 status LEDs                                                      | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| 24VDC Logic: 16 Inputs & 16<br>configurable input/outputs          | -                                            | ✓                                         | -                                                | -                                             | -                                                | -                                         | -                                         |
| 120/240VAC Logic: 6 x outputs<br>& 10 x inputs (with line/neutral) | -                                            | -                                         | ✓                                                | -                                             | -                                                | -                                         | -                                         |
| Relay Outputs: 30VDC, 240VAC,<br>5A: 2 x Form A, 2 x Form C        | -                                            | -                                         | -                                                | ✓                                             | -                                                | -                                         | -                                         |
| 4 Precision Analog Inputs: isolat-<br>ed, 2000mV                   | -                                            | -                                         | -                                                | -                                             | ✓                                                | ✓                                         | ✓                                         |
| Floating-point numbers and math                                    | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| Battery backup for clock<br>(battery not included)                 | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| ModbusRTU master (slave op-<br>tional)                             | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| Optional drive interface                                           | ✓                                            | ✓                                         | ✓                                                | ✓                                             | ✓                                                | ✓                                         | ✓                                         |
| Frequency/events inputs,<br>timing/stepper outputs                 | 6 inputs, 7 outputs                          | 6 inputs, 7 outputs                       | 6 inputs, 7 outputs                              | 6 inputs, 7 outputs                           | 6 inputs, 7 outputs                              | 6 inputs, 7 outputs                       | 6 inputs, 7 outputs                       |
| Encoder                                                            | 2 encoders, diff. AB                         | 2 encoders, diff. AB                      | 2 encoders, diff. AB                             | 2 encoders, diff. AB                          | 2 encoders, diff. AB                             | 2 encoders, diff. AB                      | 2 encoders, diff. AB                      |
| drive.web options included                                         | -04, -05, -06, -10,<br>-25, -26, -29, -39    | -04, -05, -06, -10,<br>-25, -26, -29, -39 | -04, -05, -06, -10,<br>-25, -26, -29, -39        | -04, -05, -06, -10,<br>-25, -26, -29, -39     | -04, -05, -06, -10,<br>-25, -26, -29, -39        | -04, -05, -06, -10,<br>-25, -26, -29, -39 | -04, -05, -06, -10,<br>-25, -26, -29, -39 |
| Core UAC                                                           | dw250-DM-S7PD                                | dw250-DM-XDPD                             | dw250-DM-HVPD                                    | dw250-DM-RLPD                                 | dw250-DM-XAPD                                    | dw250-1201                                | dw250-1301                                |
| P2 Vector Drive UAC                                                | dw254-DM-S7PD                                | dw254-DM-XDPD                             | dw254-DM-HVPD                                    | dw254-DM-RLPD                                 | dw254-DM-XAPD                                    | dw254-1201                                | dw254-1301                                |
| E3 Industrial Drive UAC                                            | dw258-DM-S7PD                                | dw258-DM-XDPD                             | dw258-DM-HVPD                                    | dw258-DM-RLPD                                 | dw258-DM-XAPD                                    | dw258-1201                                | dw258-1301                                |
| CANopen UAC                                                        | dw259-DM-S7PD                                | dw259-DM-XDPD                             | dw259-DM-HVPD                                    | dw259-DM-RLPD                                 | dw259-DM-XAPD                                    | dw259-1201                                | dw259-1301                                |
| Dimensions (WxHxD)                                                 | 0.70" x 3.50" x 4.70"<br>(17.2 x 90 x 119mm) | 1.0" x 3.5" x 4.8"<br>(27 x 90 x 121mm)   | 1.3" x 3.5" x 4.8"<br>(33 x 90 x 121mm)          | 1.4" x 3.5" x 4.8"<br>(36 x 90 x 121mm)       | 1.0" x 3.5" x 4.8"<br>(27 x 90 x 121mm)          | 1.0" x 3.5" x 4.8"<br>(27 x 90 x 121mm)   | 1.0" x 3.5" x 4.8"<br>(27 x 90 x 121mm)   |

drive.web smart technology ... Designed and engineered in the USA to International Standards: UL, cUL, CE, FCC, UK CA

\* The smarty<sup>7</sup>-RL does not currently have UL Certification

# smarty dw240

Compact distributed control for motion, process, and IIoT applications

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

**smarty<sup>1</sup>**

**smarty<sup>2</sup>**

**smarty<sup>3</sup>**

**smarty<sup>4</sup>**



## Key Features

- Advanced Motion & Smart Process Control
- Distributed, deterministic processing over Ethernet
- Homogeneous integration for drives, HMI's, remote I/O
- Powerful *savvy* system design tools
- Easy, intuitive, affordable, expandable
- Scalable IIoT-ready architecture
- For systems of any size or complexity

## Specifications

- 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 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.

## drive.web Options Included

(smarty<sup>2</sup> and above)

- 04 Modbus TCP/IP
- 05 Process Control
- 06 Winders
- 10 Modbus RTU
- 25 Advanced Math
- 26 savvyPanel
- 29 Solar Position
- 39 Advanced Motion

| Model       | smarty <sup>1</sup> | smarty <sup>2</sup> | smarty <sup>3</sup> | smarty <sup>4</sup> |
|-------------|---------------------|---------------------|---------------------|---------------------|
| Height (in) | 3.4"                | 3.4"                | 3.4"                | 3.4"                |
| Height (mm) | 87                  | 87                  | 87                  | 87                  |
| Width (in)  | 4.2"                | 4.2"                | 5.5"                | 8.3"                |
| Width (mm)  | 105                 | 105                 | 140                 | 210                 |
| Depth (in)  | 3.1"                | 3.1"                | 3.1"                | 3.1"                |
| Depth (mm)  | 77                  | 77                  | 77                  | 77                  |



# drive.web automation smarty dw240



smarty<sup>1</sup>



smarty<sup>2</sup>



smarty<sup>3</sup>



smarty<sup>4</sup>



smarty<sup>1</sup>

smarty<sup>2</sup>

smarty<sup>3</sup>

smarty<sup>4</sup>

|                                                    |                                            |                                            |                                            |                                                |
|----------------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|------------------------------------------------|
| Full Featured PLC Functions                        | ✓                                          | ✓                                          | ✓                                          | ✓                                              |
| Advanced Process Control                           | ✓<br>- Winders                             | ✓                                          | ✓                                          | ✓                                              |
| Basic Motion Control                               | -                                          | ✓                                          | -                                          | -                                              |
| Advanced Motion Control                            | -                                          | -                                          | ✓                                          | ✓                                              |
| Extended I/O                                       | -                                          | -                                          | -                                          | -                                              |
| Smart Configuration                                | -                                          | -                                          | -                                          | -                                              |
| drive.web distributed control                      | ✓                                          | ✓                                          | ✓                                          | ✓                                              |
| 100baseTX Ethernet                                 | ✓                                          | ✓                                          | ✓                                          | ✓                                              |
| Modbus TCP/IP & EIP/PCCC                           | ✓                                          | ✓                                          | ✓                                          | ✓                                              |
| USB-C port                                         | ✓                                          | ✓                                          | ✓                                          | ✓                                              |
| 8 analog inputs: +/- 10VDC                         | ✓                                          | ✓                                          | ✓                                          | ✓                                              |
| 8 analog outputs: +/- 10VDC                        | ✓<br>(unipolar outputs)                    | ✓                                          | ✓                                          | ✓                                              |
| 8 digital inputs: 24VDC                            | ✓                                          | ✓                                          | ✓                                          | ✓                                              |
| 8 digital outputs: 24VDC                           | ✓                                          | ✓                                          | ✓                                          | ✓                                              |
| 4 status LEDs                                      | ✓                                          | ✓                                          | ✓                                          | ✓                                              |
| Floating-point numbers and math                    | ✓                                          | ✓                                          | ✓                                          | ✓                                              |
| Battery backup for clock<br>(battery not included) | -                                          | ✓                                          | ✓                                          | ✓                                              |
| ModbusRTU master (slave optional)                  | -                                          | ✓                                          | ✓                                          | ✓                                              |
| Optional drive interface                           | -                                          | ✓                                          | ✓                                          | ✓                                              |
| Frequency/events inputs,<br>timing/stepper outputs | -                                          | -                                          | 4 selectable inputs or outputs             | 6 inputs, 7 outputs                            |
| Encoder                                            | -                                          | -                                          | 1 encoder, diff. AB                        | 2 encoders, diff. ABZ<br>+ reconnect terminals |
| drive.web options included                         | -04, -05, -25, -26                         | -04, -05, -06, -10,<br>-25, -26, -29, -39  | -04, -05, -06, -10,<br>-25, -26, -29, -39  | -04, -05, -06, -10,<br>-25, -26, -29, -39      |
| Core UAC                                           | dw241-BX-C1CD                              | dw240-DM-C2CD                              | dw240-DM-C3CD                              | dw240-DM-C4CD                                  |
| P2 Vector Drive UAC                                | -                                          | dw244-DM-C2CD                              | dw244-DM-C3CD                              | dw244-DM-C4CD                                  |
| E3 Industrial Drive UAC                            | -                                          | dw248-DM-C2CD                              | dw248-DM-C3CD                              | dw248-DM-C4CD                                  |
| CANopen UAC                                        | -                                          | dw249-DM-C2CD                              | dw249-DM-C3CD                              | dw249-DM-C4CD                                  |
| Dimensions (WxHxD)                                 | 4.11" x 3.50" x 3.00"<br>(105 x 89 x 76mm) | 4.11" x 3.50" x 3.00"<br>(105 x 89 x 76mm) | 5.51" x 3.43" x 3.00"<br>(140 x 87 x 76mm) | 8.27" x 3.50" x 3.00"<br>(210 x 89 x 76mm)     |

Call for customized OEM builds!

#### Core Stock Build Includes:

100baseTX Ethernet, auto-negotiating,  
USB-C  
Power: 24VDC  
dw build options -04 -05 -25 -26  
Clamp Terminals, DIN Rail Mounting

Every **dw240** comes fully equipped  
with dw build options  
-04 -05 -06 -10 -25 -26 -29 -39  
as standard! (**smarty<sup>2</sup>** and above)



# *speedy Automation Controller*

## Embedded & Onboard Control

### Affordable distributed control for all devices

Serial interface on-board to drives and third party devices via ModbusRTU or CANopen to provide:

- Low cost, peer-to-peer Ethernet networking
- Full featured programmable control functions.
- Improve system performance by reducing your RS485 load
- Parallel processing provides extra system performance & memory
- Ethernet gateway to ModbusRTU or CANopen



Film line winder

### *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.
- Customized forms for embedding into drives and devices



Cyclic indexing system

### *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*

**model dw270 series**  
take a closer look ...

for embedded or onboard  
control

only 0.91" x 0.89" x 2.42"  
(23x23x62mm)



### *speedy*

**model dw271 / dw221**  
embedded controller for  
PL/X Series DC drives



## speedy dw270 series



0.91" x 0.89" x 2.42"  
(23 x 23 x 62 mm)

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 1MB/s), full-featured savvyPanel HMI, & communications options

- dw270 **speedy** generic interface controller with 500kbps ModbusRTU master & 7" wire interface
  - dw271 **speedy** plug-in automation controller for PL/X Series DC drive
  - dw274 **speedy** plug-in automation controller for P2 Vector Drives
  - dw278 **speedy** plug-in automation controller for E3 Series General Purpose drive
  - dw279 **speedy** automation controller with generic CANopen device with 7" wired interface
- see page 24 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!**

## speedy dw220 series



0.91" x 0.83" x 1.42"  
(23 x 21 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 7" wired interface
  - dw228 **speedy** plug-in automation controller for E3 Series General Purpose drive
  - dw229 **speedy** automation controller with generic CANopen device with 7" wired interface
- see page 24 for other drive and device integration apps



High performance film winder



21 section embossing line



Airport transit car load sharing system

# Model Numbers



## smarty & speedy Product build options

|                                 |                                                                                                                                      | smarty |       | speedy |       |       |       |       |       |       |       |       |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
|                                 |                                                                                                                                      | dw240  | dw250 | dw220  | dw221 | dw222 | dw223 | dw224 | dw225 | dw228 | dw229 | dw27X |
| <b>Function Block Libraries</b> |                                                                                                                                      |        |       |        |       |       |       |       |       |       |       |       |
| -05                             | Advanced Process Control Function Block Library (FBL)<br>(comparators, profilers, presets, latches, filters, counters, timers, PIDs) | S      | S     | X      | X     | X     | X     | X     | X     | X     | X     | S     |
| -06                             | Winder Control FBL (dia. calc., taper tension, torque comp.)                                                                         | S      | S     | X      | X     | X     | X     | X     | X     | X     | X     | S     |
| -10                             | Advanced Math FBL (trigonometric, log, exponential)                                                                                  | S      | S     | X      | X     | X     | X     | X     | X     | X     | X     | S     |
| -11                             | Encoder Control FBL (shaft lock, indexing, registration for Options 40-44)                                                           |        |       |        |       |       |       |       |       |       |       |       |
| -29                             | Solar FBL with sun position calculator                                                                                               | S      | S     | X      | X     | X     | X     | X     | X     | X     | X     | S     |
| -35                             | Cloud Functions / Notification                                                                                                       | X      | X     | X      | X     | X     | X     | X     | X     | X     | X     | X     |
| -39                             | Precise Motion Control FBL with Linear Positional, Shaft Lock, etc.                                                                  | S      | S     | X      | X     | X     | X     | X     | X     | X     | X     | S     |
| <b>Communications Options</b>   |                                                                                                                                      |        |       |        |       |       |       |       |       |       |       |       |
| -04                             | Ethernet Modbus TCP/IP slave                                                                                                         | S      | S     | S      | S     | S     | S     | S     | S     | S     | S     | S     |
| -25                             | Ethernet EIP/PCCC interface for AB PLCs                                                                                              | S      | S     | X      | X     | X     | X     | X     | X     | X     | X     | S     |
| <b>I/O Options</b>              |                                                                                                                                      |        |       |        |       |       |       |       |       |       |       |       |
| -26                             | <b>savvyPanel</b> iPad/iPhone/Android & touch screen PC operator station interface                                                   | S      | S     | S      | S     | S     | S     | S     | S     | S     | S     | S     |
| <b>Mounting Options</b>         |                                                                                                                                      |        |       |        |       |       |       |       |       |       |       |       |
| -50                             | DIN rail mount with screw terminal connections                                                                                       |        |       | X      |       |       |       |       |       |       |       |       |

X = Optional Add-on    S = Standard feature

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

### 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



### pack 2 - speedy & smarty dwOPTION -1122 for

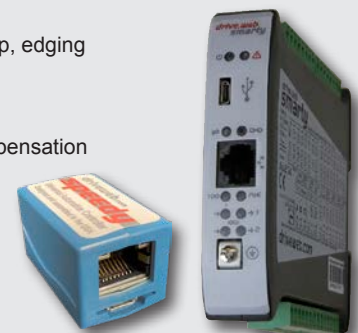
- Full featured winder control with single or multi cores, turret indexing, auto splicing, open and closed loop, edging
- Web handling, tension control, accumulators, infeeds, center winding, slip core, surface winding

#### 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



**drive.web** smart technology ... Designed and engineered in the USA to International Standards: UL, cUL, CE, FCC, UK CA

## Free Online Training Videos

The **drive.web savvy-SFD** Introductory Seminar provides an overview of the **drive.web** distributed control technology and its products.

In this video, new users can expect to learn how to:

- Create a “phantom” drive system with AC & DC drives
- Navigate around drive block diagrams and drive systems
- Create signal flow diagrams & system documentation
- Find information and identify object attributes
- Make connections between devices
- Monitor and set parameter values
- Create and use parameter “docks”
- Show parameter value trend charts, etc.

## PL/X Series Training

Configuration | Monitoring | Interfacing



Scan QR for free resources



## P2 Series Training

V/Hz Mode | Open Loop | Closed Loop

More scheduled training videos are upcoming! Please watch for announcements.

## 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:

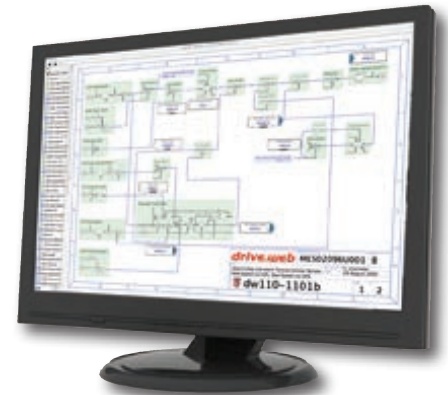
- Full featured programmable control functions
- Ethernet networking
- USB port access

“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



**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.

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.

# 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



## 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
- 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
- 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
- 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
- 1132 Time control programer (with option 1121 + 47)

| smarty |        |        |        | speedy |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| dwl240 | dwl250 | dwl220 | dwl221 | dwl222 | dwl223 | dwl224 | dwl225 | dwl228 | dwl229 | dwl27X |
| X      | X      | X      | X      |        | X      | X      | X      | X      |        | X      |
| X      | X      | X      | X      |        | X      | X      | X      | X      |        | X      |
| X      | X      | X      | X      |        | X      | X      | X      | X      |        | X      |
| X      | X      | X      | X      |        | X      | X      | X      | X      |        | X      |
| X      | X      |        |        |        |        |        |        |        |        |        |
| X      | X      | X      | X      |        | X      | X      | X      | X      |        | X      |
| X      | X      |        |        |        |        |        |        |        |        |        |
| X      | X      |        |        |        |        |        |        |        |        |        |
| X      | X      |        |        |        |        |        |        |        |        |        |
| X      | X      |        |        |        |        |        |        |        |        |        |
| X      | X      |        |        |        |        |        |        |        |        |        |
| X      | X      |        |        |        |        |        |        |        |        |        |
| X      | X      | X      |        |        |        | X      | X      | X      | X      | X      |



**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.

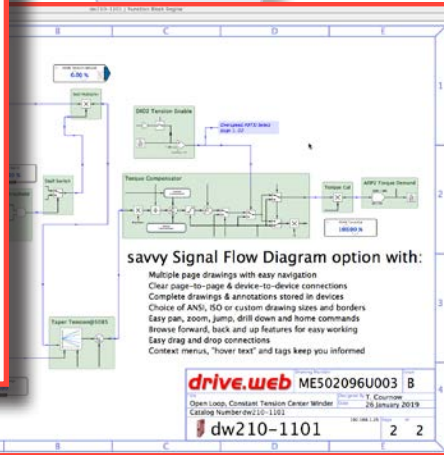
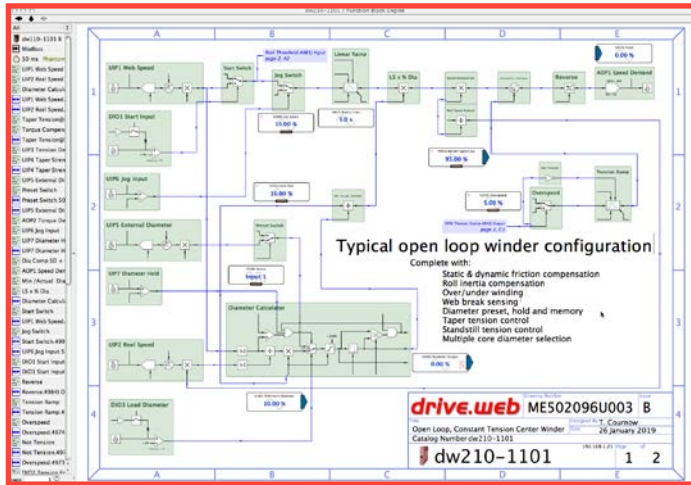
**smarty apps** are pre-configured generic packages for common applications:

**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

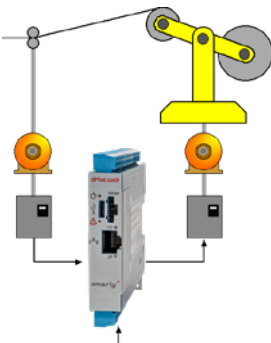
**smarty** OPTION-1104 Closed Loop Slip Core Winder



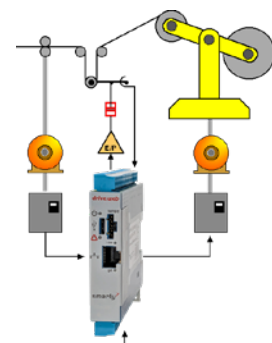
web handling excellence

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.

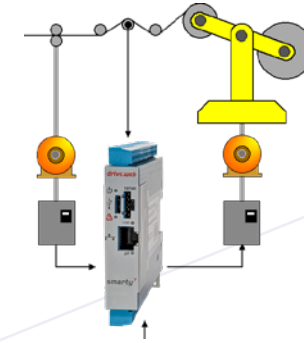
#### smarty OPTION-1101 OPEN LOOP CENTER WINDER



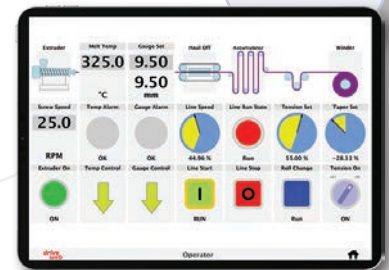
#### smarty OPTION-1102 DANCER CONTROLLED CENTER WINDER



#### 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

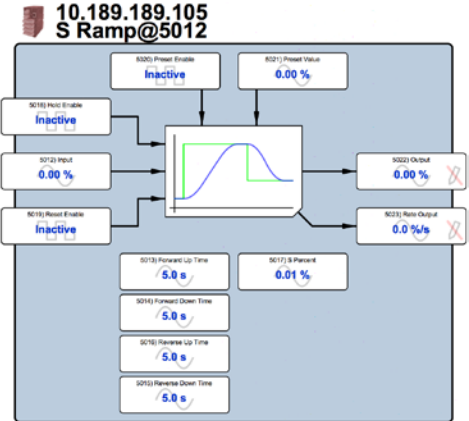
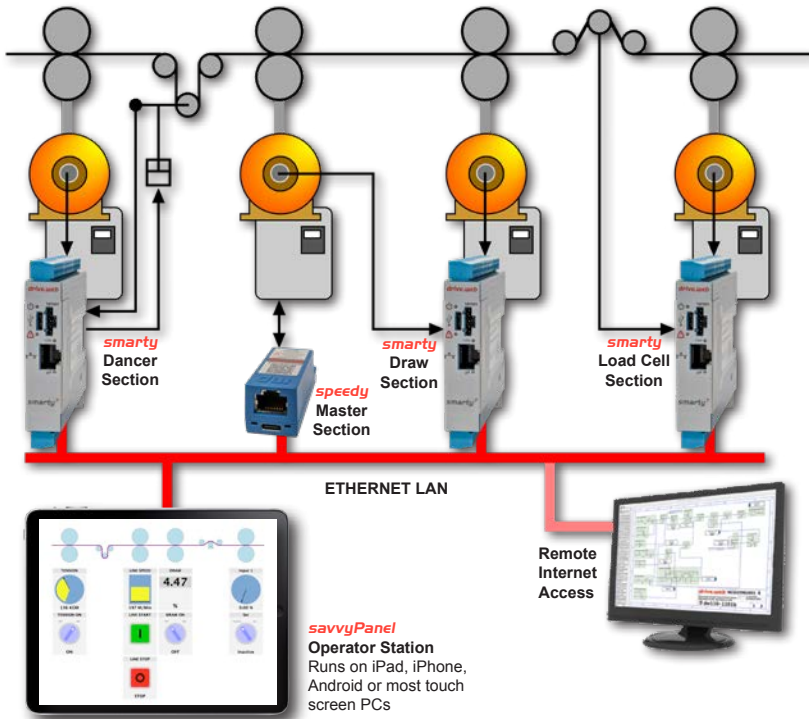
#### Optional features include:

- 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

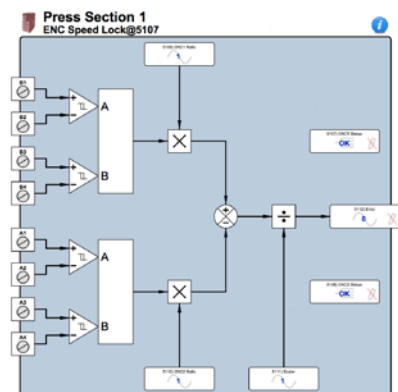
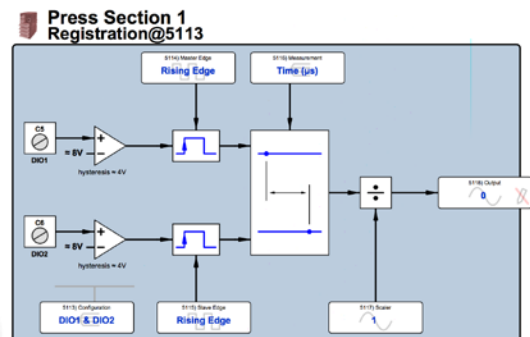
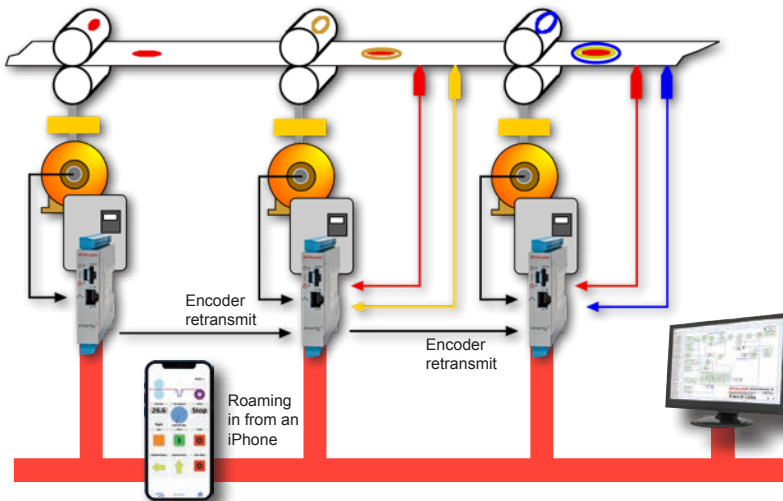
Standard function blocks used in combinations of *smartys* and *speedys* can be easily configured to provide line drive coordination in systems of any size or complexity.



- 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:

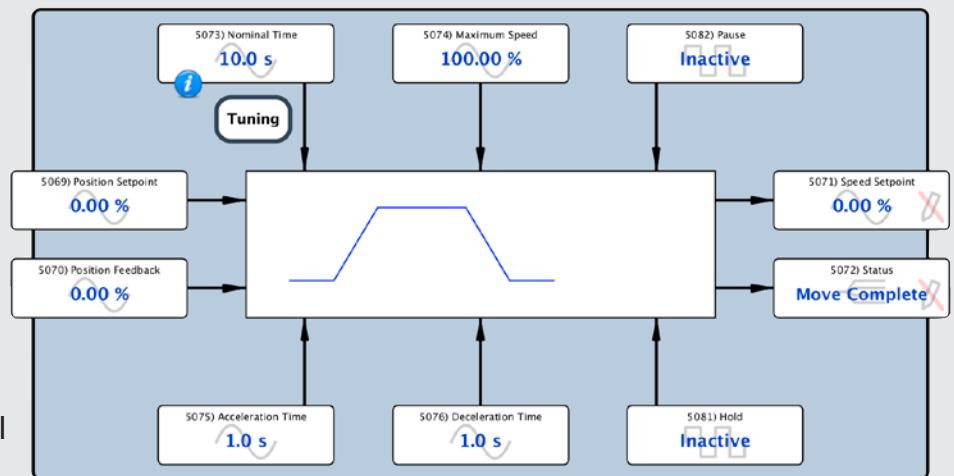
- Pick & place machines
- Packaging machines
- Painting robots
- Cut to length
- Automated assembly processes

## 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

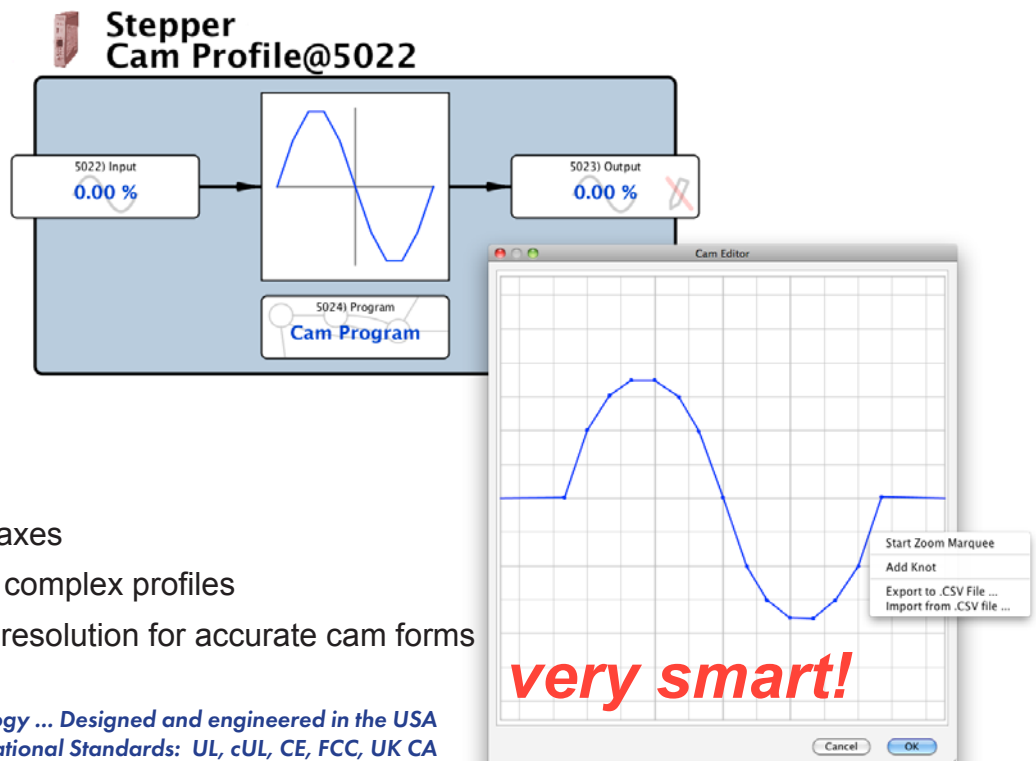


## Cam Profile

**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



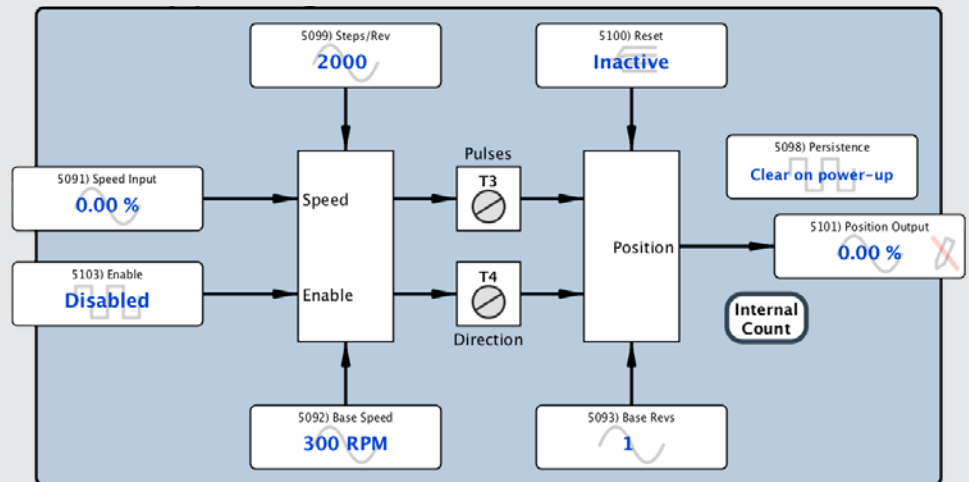
## motion control

## Stepper Drive Controllers

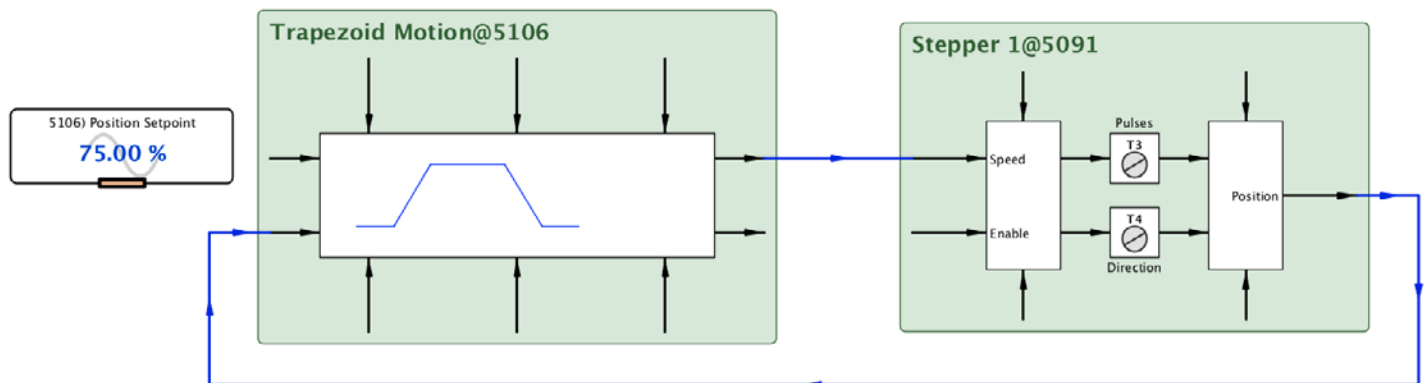
These stepper drive controller options are available for most versions of the **smarty** (see option selection table, page 25).

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”

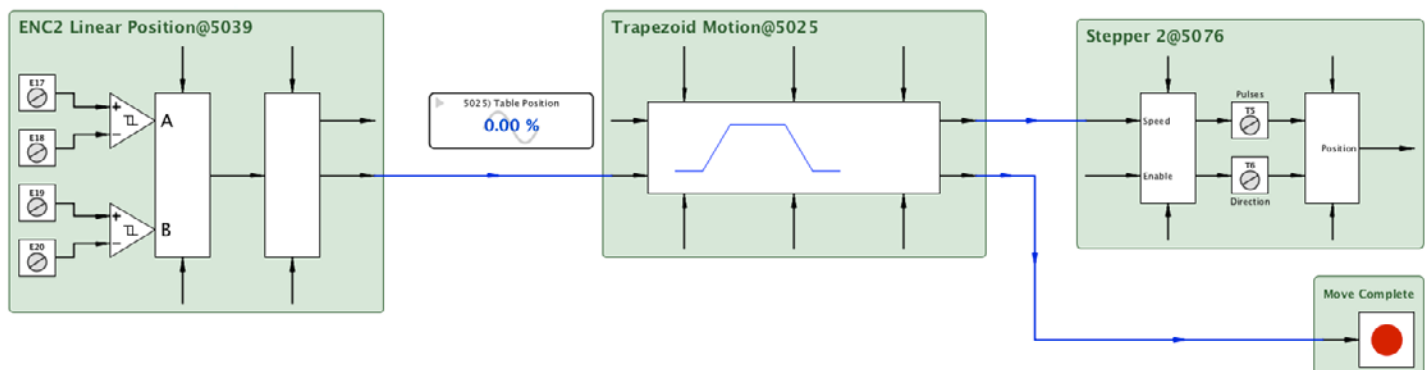


### Open Loop Stepper Drive Controller



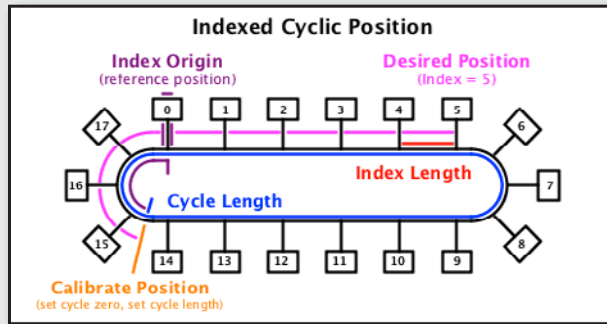
In a typical open loop stepper drive application the “Position” parameter (derived from the pulse count) can be used to close the position control loop.

### 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

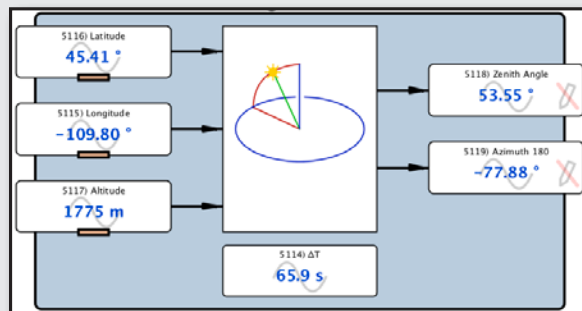


The optional Encoder Function Block Library available in the **smarty** includes a set of engineered function blocks for use in precision positioning applications such as packaging machines, machine center tool loaders, inventory carousels, stackers, etc.

### 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

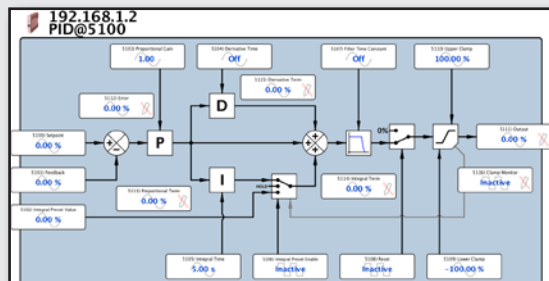


The Solar Function Block Library provides precise calculation of the sun zenith and azimuth angles in solar energy systems. It can be synchronized with the SNTP server time and date and include a  $\Delta T$  input parameter to compensate for the difference between UTC and Terrestrial Time for precise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

## smart function blocks

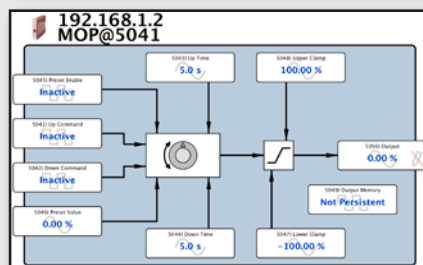


### smart PID

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.

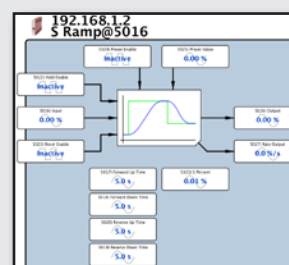
*Saves a lot of time and heartache!*



### 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

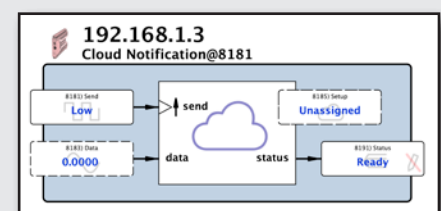
Ever tried to create an S-Ramp that works predictably in a typical PLC? We make it easy, intuitive and reliable!

*No problem!*

## smart utilities cloud functions dwOPTION -35

The Cloud Notification 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.



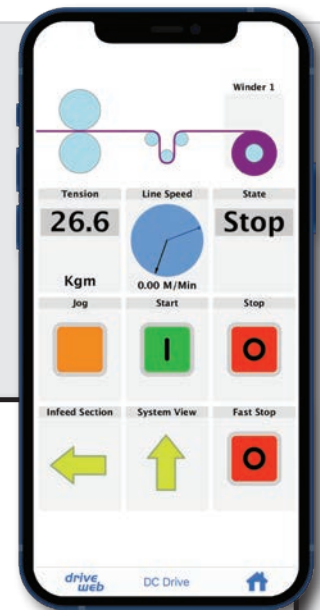
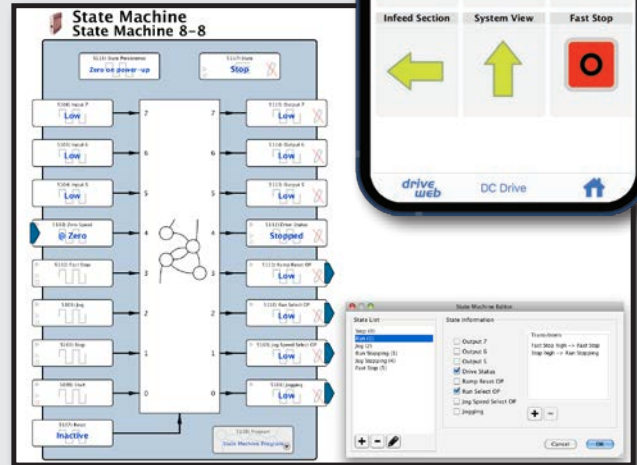
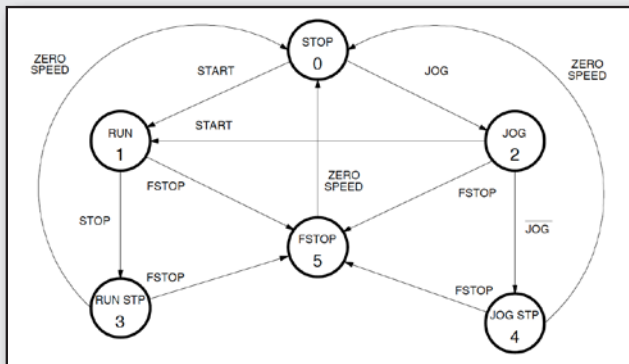
## smart function blocks State Machine Logic

### Logic made easy and reliable!

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!**

## 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!



**drive.web smart technology ... Designed and engineered in the USA to International Standards: UL, cUL, CE, FCC, UK CA**



## GENERIS dw4Q Smart Drive

~ The Ultimate Systems Drive ~

4-Quadrant Regenerative  
Ultra-low harmonics  
Full torque at zero speed  
**drive.web** distributed control

Up to 30 HP at 480 volts

### IP20 package

\* Approvals: CE, UL (pending)

Closed-loop speed accuracy: ~0.02%  
Open-loop speed accuracy: ~2%  
150% for 30 seconds (heavy duty)  
110% for 30 seconds (normal duty)  
AC Induction & PM motors  
Full torque at zero speed  
Safe Torque Off (pending)  
Regenerative energy returned to supply  
EMC filter  
Quiet - with switching up to 32KHz  
DC Bus sharing  
ModbusTCP/IP, Ethernet/IP  
Plug-in control terminals  
Remote keypad with LCD display

### Options

**drive.web** programmable control  
Extended I/O and USB  
CANopen, Profinet, DeviceNet & more.  
**savvyPanel** touch screen HMI



## P2 Series Closed Loop Vector

High performance coordinated drive for:  
Process automation  
Converting  
Printing  
Machine tools

Up to 100 HP at 230 volts  
Up to 400 HP at 460 volts  
Up to 150 HP at 600 volts

IP20 package up to 400 HP - 50°C \*  
Optional NEMA 4X (IP66) to 30HP - 40°C \*  
NEMA 12 (IP55) 15 to 400 HP - 40°C \*  
\* Approvals: UL, cUL, EAC, RCM

Closed loop speed better than 0.1%  
150% overload, 60 secs (200%, 4 secs)  
Up to 200% torque at zero speed  
AC Induction, PM & Sync Rel motor modes  
Built in brake transistor  
EMC filter  
Quiet - with switching up to 32KHz  
Bright TFT display  
DC Bus sharing  
Safe Torque Off function  
(IEC61508 SIL 2 & IEC62062 SIL 2)  
ModbusRTU, CANopen  
Plug-in control terminals

### Options

**drive.web** programmable control  
Extended I/O and USB  
EIP, ModbusTCP, ProfibusDP, DeviceNet  
Remote keypad with TFT display  
**savvyPanel** touch screen HMI



## V3 Series - Energy Efficient Drives For Fans & Pumps

Variable torque, fan & pump drive for:  
HVAC  
Water treatment  
Building systems  
Climate control  
Flow control  
Swimming pool control

Up to 100 HP at 230 volts  
Up to 400 HP at 460 volts  
Up to 175 HP at 600 volts

IP20 package up to 400 HP - 50°C \*  
NEMA 4X (IP66) to 30HP - 40°C (indoor) \*  
NEMA 12 (IP55) 15 to 400HP - 40°C \*  
\* Approvals: UL, cUL, EAC, RCM

**Motor options:** Standard Induction -  
PM AC - Brushless DC - Synchronous  
Reluctance

110% overload, 60 secs  
Motor flux braking  
Power loss ride through  
ModbusRTU, BACnet  
Bright TFT display  
Safe Torque Off function  
(IEC61508 SIL 2 & IEC62062 SIL 2)

### Options

**drive.web** programmable control  
Extended I/O and USB  
EIP, ModbusTCP, ProfibusDP, DeviceNet  
Remote keypad with TFT display  
Power disconnect  
**savvyPanel** touch screen HMI



# TOUGH DRIVES FOR INDUSTRY



## E3 Series General Purpose VFD

Constant torque, heavy duty drive for:  
General purpose machine control  
Pumps and blowers  
Conveyors  
Mixers

To 1.5 HP at 110V in, 230V 3Ø out  
To 25 HP at 230 volts  
To 50 HP at 460 volts

Sensorless vector control for:  
High starting torque & accurate speed  
Motors: Induction, PM, BLDC, SynRM

**Standard IP20 - 50°C**  
**Optional NEMA 4X (IP66) to 30 HP, 40°C**  
**Approvals: UL, cUL, CE, RCM**

Industrial, Pump & Fan control modes  
150% overload, 60 secs (175%, 2 secs)  
Spinstart into rotating motor  
Built in brake transistor (sizes 2, 3 & 4)  
Motor flux braking  
Adjustable skip frequency  
Quiet - with switching up to 32KHz  
Power loss ride through  
ModbusRTU port  
Configurable I/O  
Simple programming  
On board help card  
DIN rail and foot mount (IP20) (size 1 & 2)  
NEMA 4X

### Options

**drive.web** programmable control  
Extended I/O  
EIP, ModbusTCP, ProfibusDP, DeviceNet  
Remote keypad with TFT display  
**savvyPanel** touch screen HMI



## NEMA 4X - IP66 Series For Harsh Environments

**P2 Series Open/Closed Loop Vector Drives**  
**E3 Series General Purpose VFDs**  
**V3 Series Energy Efficient Drives**

Food processing  
Agricultural, water treatment  
Mining, cement, petrochemical

To 1.5 HP at 110V in, 230V 3Ø out (E3)  
To 15 HP at 230 volts (E3, P2, V3)  
To 30 HP at 460 volts (E3, P2, V3)

**NEMA 4X (IP66) - 40°C**  
**(outdoor rated)**

**Approvals: V3 - UL, cUL, EAC, RCM**  
**P2 - UL, cUL, EAC, RCM**  
**E3 - UL, cUL, CE, RCM**

Open & closed loop vector or V/Hz  
Washdown, dust tight  
Chemical resistant ABS enclosure  
Corrosion protected heat sink  
Spinstart into rotating motor  
Built in brake transistor (P2 & E3, sizes 2 & 3)  
Motor flux braking  
Adjustable skip frequency  
Quiet - with switching up to 32KHz  
Power loss ride through  
ModbusRTU port  
Compact packaging

### Options

**drive.web** programmable control  
Power isolator switch, speed pot, F/R switch  
EIP, ModbusTCP, ProfibusDP, DeviceNet  
Remote keypad with TFT display  
**savvyPanel** touch screen HMI



## E3 Single Phase VFD For SP & PSC motors

Variable torque, fan & pump drive for:  
Fans & blowers  
Centrifugal pumps  
Fume extractors  
Air flow control

To 0.75 HP at 110 volts  
To 1.5 HP at 230 volts

**Standard IP20 - 50°C**  
**Optional NEMA 4X (IP66) - 40°C**  
**(outdoor rated)**

**Approvals: UL, CE, RCM**

For motor types:  
Shaded Pole (SP)  
Permanent Split Capacitor (PSC)  
Built in brake transistor (size 2)  
Motor flux braking  
Adjustable skip frequency  
Quiet - with switching up to 32KHz  
Power loss ride through  
ModbusRTU port  
Innovative smart boost start  
Simple programming  
DIN rail and foot mount (IP20)

### Options

**drive.web** programmable control  
Extended I/O  
EIP, ModbusTCP, ProfibusDP, DeviceNet  
Remote keypad with TFT display  
**savvyPanel** touch screen HMI



## GENERIS

~ THE ULTIMATE SYSTEMS DRIVE ~

- 4-Quadrant Regenerative AC Drive
- AC Induction & PM Motor Control
- 380 - 500 volts
- IP20 units up to 30HP

## 10 TO 30HP\*

### FEATURES

Multiple Modes:

- Open-loop V/f
- Closed-loop Vector
- Speed Control

Near unity power factor

Input current THD <4%

No DC link circuit and no electrolytic capacitors

Full torque at zero speed

Continuous operation at 0 speed with no derating required

Safe Torque Off function (pending)

Output to 200Hz

Current loop autotune

**drive.web savvy** function block programming

Modbus TCP/IP

Full featured programmable control with:

- Analog Logic, PID's, Advanced Math, Winder Control, Motion Control, and Position Control

Comprehensive set of user I/O

3 x  $\pm 10V$  configurable reference supplies (10mA max) plus

1 x 4/20mA or  $\pm 10V$  configurable reference

24V logic digital I/O and two configurable relay outputs

Run and powered hours diagnostics

Single or dual incremental encoder inputs

Internal EMC filter

2 x 20-character backlit LCD operator station

IP20 enclosure

Air-cooled with temperature-controlled fans

CE & UL (pending)

Options:

savvyPanel

Extended I/O

Optional fieldbus networks: PROFIBUS, PROFINET, DeviceNet, EtherCAT, CAN/CANopen, and other major industrial networks

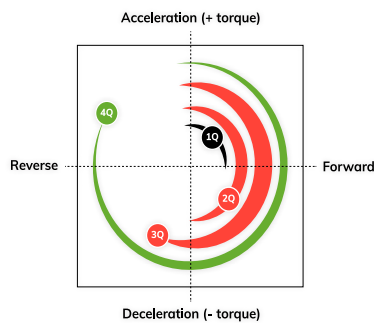


High performance motor control and energy regeneration using single stage power conversion

- Artificial lifts
- Centrifuges
- Converting Lines
- Energy generation / transfer & recovery
- Extrusion & Molding
- Flywheels
- Hydrokinetic (tidal / bi-directional) river flow
- Low harmonic or regen fans
- Low harmonic or regen pumps
- Material handling equipment
- Packaging
- Printing & Coating
- Process control
- Pumped hydro
- Textiles
- Wind turbines
- Winding / Unwinding

\* Higher Ratings coming 2026-2027





## drive.web Enabled

The **drive.web** automation technology uses distributed control over Ethernet to provide cost effective systems integration for systems of any size or complexity.

### drive.web dw281



On-board **drive.web dw281** facilitates seamless integration with the **drive.web** ecosystem enabling full **savvy** support.

- Fast, deterministic, peer-to-peer control over Ethernet
- 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
- Multi-level password protection

## GENERIS Specifications

|                   |                         |                                                                                                                    |
|-------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------|
| Input Ratings     | Power configuration     | 4-quadrant regenerative AC Drive                                                                                   |
|                   | Supply Voltage          | 380–500 Vac, three-phase                                                                                           |
|                   | Supply Frequency        | 50/60 Hz                                                                                                           |
|                   | Auxiliary Supply        | Optional 24 VDC input                                                                                              |
|                   | EMC Filter              | Internal EMC Filter                                                                                                |
| Output Ratings    | Power Range             | 10, 15, 20, 25, 30 HP<br>(7.5, 11, 15, 18.5, 22 kW)                                                                |
|                   | Normal Duty Current     | 18, 26, 35, 44, 52 A; 110% overload for 30 s                                                                       |
|                   | Heavy Duty Current      | 15, 22, 30, 37, 44 A; 150% overload for 30 s                                                                       |
|                   | Output voltage          | Vout ≤ 0.86 Vin                                                                                                    |
|                   | Maximum Output Freq.    | 200Hz                                                                                                              |
|                   | Speed Accuracy          | 2% in open-loop V/f; 0.02% in closed-loop vector                                                                   |
| Ambient Ratings   | Temperature             | Storage: -25 to +55°C<br>Operating: 0–50°C (derate above 40°C)                                                     |
|                   | Altitude                | Up to 1000m                                                                                                        |
|                   | Humidity                | ≤85%, non-condensing                                                                                               |
| Enclosures        | Ingress Protection      | IP20 - Frame sizes 1-2                                                                                             |
|                   | Cooling                 | Air-cooled with temperature-controlled fans                                                                        |
|                   | Mounting                | Keyhole slot mounting                                                                                              |
|                   | Control Connection      | Two-part control connections                                                                                       |
| Standards         | Low Voltage Directive   | EN 61800-5-1:2007, CE - Low Voltage Directive                                                                      |
|                   | EMC                     | EN 61800-3:2017, CE - EMC                                                                                          |
| Programming       | Keypad                  | Standard: built in keypad<br>Optional: Remote keypad<br><b>drive.web savvy</b> software                            |
|                   | Display                 | Multi-language TFT Display (sizes 2 - 8)                                                                           |
| Control           | Control Modes           | Open-loop V/F<br>Closed-loop Vector                                                                                |
|                   | Motor Type              | Control Induction Motors                                                                                           |
|                   | Torque / Power Modes    | Open-loop constant torque or quadratic torque                                                                      |
|                   | Tuning                  | Current loop autotune                                                                                              |
|                   | Ramp function           | Linear or S-ramp                                                                                                   |
|                   | Brake / Motion function | Brake control; Job/Crawl/Slack                                                                                     |
|                   | PID                     | 2 x PIDs                                                                                                           |
|                   | Automation              | <b>drive.web</b> Ethernet distributed control + programmable control, extra I/O, operator stations                 |
|                   | Communications Options  | <b>drive.web</b> , ModbusTCP, EIP, DeviceNet, Profibus                                                             |
| I/O Specification | Analog I/O              | Inputs: 3 × ±10 V configurable reference supplies<br>Outputs: ±10 V range; two configurable                        |
|                   | Digital I/O             | Inputs: 24 V logic; current sinking; 4 dedicated; 4 configurable<br>Outputs: 5 configurable; 24 V logic; 400mA max |
|                   | Relay Outputs           | 240 VAC volt-free contacts; two configurable                                                                       |
|                   | Encoder Inputs          | Single or dual incremental encoder inputs                                                                          |
|                   | Motor Temperature Input | 1 × PT100 input; external sensor required                                                                          |

## P2 Series SYSTEMS VECTOR DRIVES

- High performance
- Induction, PM & Sync Rel Motor Control
- 230, 460, 600 volts models
- IP20 units up to 400HP
- NEMA12 units 15 - 400HP
- NEMA 4X up to 30HP

## 1 TO 400HP

### FEATURES

#### Multiple Modes:

- Closed Loop Vector for high performance
- Open loop PM Motor Control
- Sensorless vector & V/Hz control

Up to 200% torque at zero speed

Sensorless speed regulation better than 1%

Torque control

DC bus sharing

Safe Torque Off function

Output to 500Hz (V/F Mode), 100Hz (Vector Mode)

Built-in 100% rated DB transistor up to 400HP

Integral PI controller

**drive.web savvy** function block programming

Silent running with up to 32KHz switching

200% starting torque

Bipolar 12 bit analog input (isolated +/-10V or 4-20mA)

ModbusRTU, RS485 port

CANopen port

EMC Filters

Bright TFT Display

DC chokes in frame sizes 5 to 8

Single phase input up to 200HP

Power loss ride through

Process control options

Programmable I/O

Hours run log & trip log

Cartridge fans for easy maintenance (NEMA12 drives)

#### Options:

- Encoder feedback
- Additional basic & **smarty** I/O options
- EIP, Modbus TCP/IP, Profibus, DeviceNet, BACnet
- Memory stick with bluetooth interface
- Remote keypad with bright TFT display
- 2Khz output in V/Hz mode
- Through panel mount for NEMA 12 versions



Smart drives for  
high performance  
coordinated drive  
systems and  
precision machine  
control

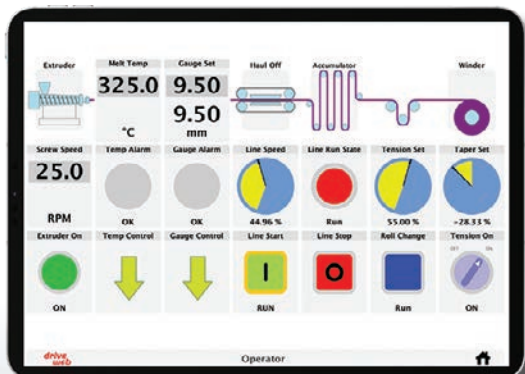
- Printing presses
- Extrusion & coating lines
- Automated assembly
- Indexing & registration
- Winders & web tension
- Material handling
- Cranes & hoists
- Textiles & fibres
- Metals industry
- Paper & cement mills
- Mining

NEMA 4X washdown models - see page 44



## P2 very smart drives

The **drive.web** automation technology uses distributed control over Ethernet to provide cost effective systems integration for systems of any size or complexity.



### savvyPanel touch

Easy, high resolution, NEMA4, touch screen operator stations.

Also run **savvyPanel** on PCs, Android or iOS devices



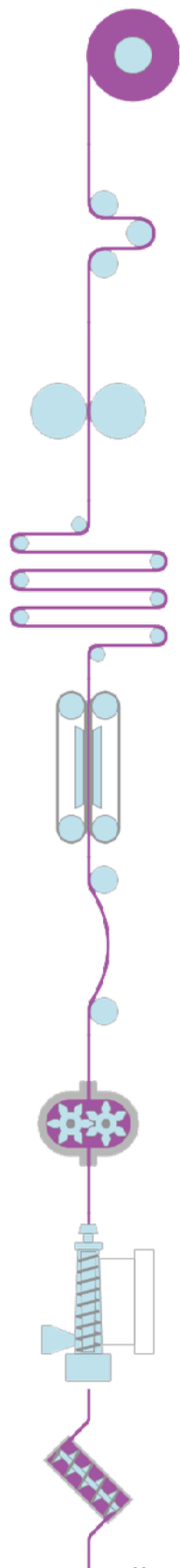
### drive.web smart automation

- powerful programmable control functions
- peer-to-peer over Ethernet
- smart iPad/Android or touch screen PC operation
- Easy system wide Internet access



## P2 Specifications

|                      |                          |                                                                                                                                                                                             |
|----------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input Ratings        | Supply Voltage           | 200 - 240 $\pm$ 10%<br>380 - 480 $\pm$ 10%<br>500-600V $\pm$ 10%                                                                                                                            |
|                      | Supply Frequency         | 48 - 62 Hz                                                                                                                                                                                  |
|                      | Displacement PF          | > 0.98                                                                                                                                                                                      |
|                      | Phase Imbalance          | 3% Maximum allowed                                                                                                                                                                          |
|                      | Inrush Current           | < Rated current                                                                                                                                                                             |
| Output Ratings       | Power Output             | 230V, 1-ph in: 1-10 HP (0.75-7.5 kW)<br>230V, 3-ph in: 1-100 HP (0.75-75 kW)<br>400V, 3-ph in: 1-400 HP (0.75-250kW)<br>460V, 3-ph in: 1-400 HP (0.75-250kW)                                |
|                      | Overload Capacity        | 150% for 60 secs, 200% for 4 secs.                                                                                                                                                          |
|                      | Output Frequency         | 0-500Hz in V/Hz mode (0.1 Hz res) (optional 2KHz)<br>0-100Hz in vector mode                                                                                                                 |
| Ambient Ratings      | Temperature              | Storage: -40°C to 60°C<br>Operating: -10°C to 40°C (IP55 & IP66)<br>-10°C to 50°C (IP20)                                                                                                    |
|                      | Altitude                 | Up to 1000m ASL without de-rating<br>Up to 2000m Max UL Approved<br>Up to 4000m Max (non UL)<br>Above 1000m, de-rate 1% per 100m                                                            |
|                      | Humidity                 | 95% non-condensing                                                                                                                                                                          |
| Enclosures           | Ingress Protection       | IP20 - Frame sizes 2 - 6, & 8<br>IP55 (NEMA 12) - Frame sizes 4 - 8<br>IP66 (NEMA 4X) - Optional sizes 2 - 4                                                                                |
| Programming          | Keypad                   | Standard: built in keypad<br>Optional: Remote keypad<br>Optistick memory stick<br><b>drive.web savvy</b> software                                                                           |
|                      | Display                  | Multi-language TFT Display (sizes 2 - 8)                                                                                                                                                    |
| Control              | Control Modes            | Closed Loop (encoder) speed control<br>Closed Loop (encoder) torque control<br>Open Loop PM vector control<br>Sensorless vector speed control<br>V/F Voltage vector<br>Energy optimized V/F |
|                      | Modulation               | 4 - 32 kHz effective                                                                                                                                                                        |
|                      | Stop Mode                | Ramp to stop - adjustable 0.1-600 secs<br>Safe Torque Off mode                                                                                                                              |
|                      | Braking                  | Motor flux braking (DC injection)<br>Built in brake transistor                                                                                                                              |
|                      | Skip Frequency           | Single point user adjustable                                                                                                                                                                |
|                      | Analog Setpoint Control  | 0-10v, 10-0v, $\pm$ 10v<br>0-20mA, 20-0mA, 4-20mA, 20-4mA                                                                                                                                   |
|                      | Preset Speeds            | Up to 8                                                                                                                                                                                     |
|                      | Digital Setpoint Control | Keypad<br>ModbusRTU<br>CANopen                                                                                                                                                              |
|                      | Automation               | Optional <b>drive.web</b> Ethernet distributed control + programmable control, extra I/O, operator stations                                                                                 |
|                      | Communications Options   | <b>drive.web</b> , ModbusTCP, EIP, DeviceNet, Profibus                                                                                                                                      |
| I/O Specification    | Power Supply             | 24VDC, 100mA short protected<br>10VDC, 5mA for setpoint potentiometer                                                                                                                       |
|                      | Programmable Inputs      | 3 x Digital 10 to 30 VDC, response <4ms<br>2 x Analog/digital                                                                                                                               |
|                      | Programmable outputs     | 2 x Analog, 0-10V, 0-20mA, 4-20mA<br>2 x Relay NO, 6A @ 250VAC, 5A @ 30VDC                                                                                                                  |
| Control & Monitoring | PID                      | Internal PID with feedback display                                                                                                                                                          |
|                      | Fault Memory             | Last 4 trips stored with time stamp                                                                                                                                                         |
|                      | Data Logging             | Current, temperature, DC Bus volts prior to trip                                                                                                                                            |
|                      | Maintenance Indicator    | Service life monitor with user adjustable interval                                                                                                                                          |
|                      | Monitoring               | Hours run<br>Resettable and non-resettable kWh meters                                                                                                                                       |



## P2 Series Models & Ratings

### Standard IP20 Packages

With EMC Filter & DB transistor

200-240V  $\pm$  10%, 1-ph in, 230V, 3-ph motor

| Model            | HP | Amps | Size |
|------------------|----|------|------|
| P2-22010-1HF42-T | 1  | 4.3  | 2    |
| P2-22020-1HF42-T | 2  | 7    | 2    |
| P2-22030-1HF42-T | 3  | 10.5 | 2    |

200-240V  $\pm$  10%, 3-ph in, 230V, 3-ph motor

| Model            | HP  | Amps | Size |
|------------------|-----|------|------|
| P2-22010-3HF42-T | 1   | 4.3  | 2    |
| P2-22020-3HF42-T | 2   | 7    | 2    |
| P2-22030-3HF42-T | 3   | 10.5 | 2    |
| P2-32050-3HF42-T | 5   | 18   | 3    |
| P2-32075-3HF42-T | 7.5 | 24   | 3    |

380-480V  $\pm$  10%, 3-ph in, 460V, 3-ph motor

| Model            | HP  | Amps | Size |
|------------------|-----|------|------|
| P2-24010-3HF42-T | 1   | 2.2  | 2    |
| P2-24020-3HF42-T | 2   | 4.1  | 2    |
| P2-24030-3HF42-T | 3   | 5.8  | 2    |
| P2-24050-3HF42-T | 5   | 9.5  | 2    |
| P2-34075-3HF42-T | 7.5 | 14   | 3    |
| P2-34100-3HF42-T | 10  | 18   | 3    |
| P2-34150-3HF42-T | 15  | 24   | 3    |

### NEMA12 (IP55) Packages

With EMC Filter, DB transistor

200-240V  $\pm$  10%, 3-ph in, 230V, 3-ph motor

| Model              | HP  | Amps | Size |
|--------------------|-----|------|------|
| P2-42075-3HF4N-T   | 7.5 | 24   | 4    |
| P2-42100-3HF4N-T ‡ | 10  | 30   | 4    |
| P2-42150-3HF4N-T ‡ | 15  | 46   | 4    |
| P2-52020-3HF4N-T ‡ | 20  | 61   | 5    |
| P2-52025-3HF4N-T ‡ | 25  | 72   | 5    |
| P2-62030-3HF4N-T ‡ | 30  | 90   | 6A   |
| P2-62040-3HF4N-T ‡ | 40  | 110  | 6A   |
| P2-62050-3HF4N-T ‡ | 50  | 150  | 6B   |
| P2-62060-3HF4N-T ‡ | 60  | 180  | 6B   |
| P2-72075-3HF4N-T   | 75  | 202  | 7    |
| P2-72100-3HF4N-T   | 100 | 248  | 7    |

380-480V  $\pm$  10%, 3-ph in, 460V, 3-ph motor

| Model              | HP  | Amps | Size |
|--------------------|-----|------|------|
| P2-44150-3HF4N-T   | 15  | 24   | 4    |
| P2-44200-3HF4N-T ‡ | 20  | 30   | 4    |
| P2-44250-3HF4N-T ‡ | 25  | 39   | 4    |
| P2-44300-3HF4N-T ‡ | 30  | 46   | 4    |
| P2-54040-3HF4N-T ‡ | 40  | 61   | 5    |
| P2-54050-3HF4N-T ‡ | 50  | 72   | 5    |
| P2-64060-3HF4N-T ‡ | 60  | 90   | 6A   |
| P2-64075-3HF4N-T ‡ | 75  | 110  | 6A   |
| P2-64120-3HF4N-T ‡ | 120 | 150  | 6B   |
| P2-64150-3HF4N-T ‡ | 150 | 180  | 6B   |
| P2-74175-3HF4N-T ‡ | 175 | 202  | 7    |
| P2-74200-3HF4N-T   | 200 | 240  | 7    |
| P2-74250-3HF4N-T   | 250 | 302  | 7    |
| P2-84300-3HF4N-T ‡ | 300 | 370  | 8    |
| P2-84400-3HF4N-T ‡ | 400 | 480  | 8    |

#### Note:

Drives marked ‡ are also available in IP20 form. Please call for details, pricing, and availability.

For single phase supply derate to 50%

## P2 Series 600 Volts Drives

### 600VAC DRIVES

#### Standard IP20 Packages to 20 HP

500-600V  $\pm$  10%, 3-ph in, 500-600V, 3-ph motor

| Model            | HP  | Amps | Size |
|------------------|-----|------|------|
| P2-26010-3H042-T | 1   | 2.1  | 2    |
| P2-26020-3H042-T | 2   | 3.1  | 2    |
| P2-26030-3H042-T | 3   | 4.1  | 2    |
| P2-26050-3H042-T | 5   | 6.5  | 2    |
| P2-26075-3H042-T | 7.5 | 9    | 2    |
| P2-36100-3H042-T | 10  | 12   | 3    |
| P2-36150-3H042-T | 15  | 17   | 3    |
| P2-36200-3H042-T | 20  | 22   | 3    |

#### NEMA12 (IP55) Packages to 150 HP

500-600V  $\pm$  10%, 3-ph in, 500-600V, 3-ph motor

| Model              | HP  | Amps | Size |
|--------------------|-----|------|------|
| P2-46200-3H04N-T ‡ | 20  | 22   | 4    |
| P2-46250-3H04N-T ‡ | 25  | 28   | 4    |
| P2-46300-3H04N-T ‡ | 30  | 34   | 4    |
| P2-46400-3H04N-T ‡ | 40  | 43   | 4    |
| P2-56050-3H04N-T ‡ | 50  | 54   | 5    |
| P2-56060-3H04N-T ‡ | 60  | 65   | 5    |
| P2-66075-3H04N-T ‡ | 75  | 78   | 6    |
| P2-66100-3H04N-T ‡ | 100 | 105  | 6    |
| P2-66125-3H04N-T ‡ | 125 | 130  | 6    |
| P2-66150-3H04N-T ‡ | 150 | 150  | 6    |

#### P2 OPTIONS

- T2-ENCOD-IN Encoder feedback module
- T2-OPORT-IN Remote keypad & display
- T3-OPPAD-IN Remote keypad w/TFT display



#### Dimensions

| Size         | 2    | 3     | 4     | 5     | 6     | 7     | 8     |
|--------------|------|-------|-------|-------|-------|-------|-------|
| Height (ins) | 8.7" | 10.3" | 17.3" | 21.3" | 34.1" | 50.4" | 52.5" |
| Height (mm)  | 221  | 261   | 440   | 540   | 865   | 1280  | 1334  |
| Width (ins)  | 4.4" | 5.2"  | 6.8"  | 9.3"  | 13.0" | 13.0" | 17.5" |
| Width (mm)   | 112  | 131   | 173   | 235   | 330   | 330   | 444   |
| Depth (ins)  | 7.3" | 8.1"  | 9.1"  | 10.6" | 13.4" | 14.6" | 16.7" |
| Depth (mm)   | 185  | 205   | 230   | 270   | 340   | 370   | 423   |
| Weight (LBS) | 4    | 7.7   | 25.4  | 49.6  | 111   | 177   | 440   |
| Weight (KG)  | 1.8  | 3.5   | 11.5  | 22.5  | 50    | 80    | 200   |

# V3 ECO DRIVES

## Energy Efficient Drives

Variable torque, fan & pump drive for:

HVAC

Building systems

Climate control

Flow control

## Up to 400HP at 460 Volts

IP20 up to 400HP - 50°C

NEMA12 (IP55) 10 to 400HP - 40°C \*

NEMA4X (IP66) to 30HP - 40°C (indoor) \*

- Low input harmonic current distortion
- Compliant with EN61000-3-12
- >98% drive efficiency
- Low audible motor noise
- Clear, TFT, multi-language display
- Internal EMC filter
- Smart energy optimization
- Smart pump & fan functions
- Resonance avoidance
- Sleep/wake functions
- Intelligent maintenance intervals
- 110% overload, 60 secs
- Motor flux braking
- ModbusRTU, BACnet
- Energy optimization for max efficiency
- DC bus chokes in frames 5 - 8

### Options

**drive.web savvy** smart programmable automation

Easy off site Internet access to complete systems

Ethernet peer-to-peer networking

Extended I/O

EIP, ModbusTCP, ProfibusDP, DeviceNet

Remote keypad with bright TFT display

Power disconnect, sizes 2 & 3

**savvyPanel** touch screen HMI



### Motor compatibility:

- Induction motors
- PM AC motors
- Brushless DC motors
- Synchronous reluctance

## V3 ECO DRIVE

With Smart Energy Optimization

*Typically saves 2 to 4% energy over standard VFDs*

**Every 1% saves 1100 kWh per year for 50HP running 60 hours a week, 50 weeks a year!**

### How much energy could you save?

Estimate potential energy savings, CO<sub>2</sub> emissions and financial savings for your application with the Bardac Drives Energy Savings Calculator tool.  
[bardac.com/calculator](http://bardac.com/calculator)





## VARIABLE TORQUE FAN & PUMP DRIVES



### UP TO 400 HP

- Fan & pump features
- IP20 units to 400 HP
- NEMA 4X (IP66) units to 30 HP
- NEMA 12 (IP55) units to 400 HP
- BACnet & ModbusRTU

### FEATURES

Dedicated HVAC and centrifugal pump controller  
 Built in EMC filter standard  
 DC bus chokes built in, sizes 6 - 7  
 Multi-language, plain text TFT display for ease of use  
 Energy optimization for maximum efficiency  
 BACnet and ModbusRTU as standard  
 Built-in hours run and kWh meters  
 Built-in PID controller  
 Advanced application functions for easy programming  
 High frequency switching (up to 32kHz) for quiet running  
 Built-in motor flux braking  
 Programmable I/O  
 Power loss ride through  
 40°C ambient  
 HVAC functions:  
     Bi-directional Fire Mode for emergency ventilation  
     Drive fault bypass select  
     Sleep mode with auto boost  
 Pump functions:  
     Blockage detection/clear/stir  
     Adjustable cleaning cycle  
     Multi-pump cascade control  
     Dry run protection  
     Pump pre-heat anti condensation mode  
 Standards - UL, cUL, EAC and RCM

#### Options:

**drive.web savvy** smart programmable automation  
**savvyPanel** graphical, touch screen operator technology  
 Easy, off site Internet access to the complete system  
 Remote keypad with bright TFT display  
 Ethernet ModbusTCP and EIP  
 3 additional relay outputs for cascade control  
 Additional **smarty** I/O option  
 Built in power isolator switch sizes 2 & 3

# V3 ECO PUMP & FAN

## Specifications

|                       |                          |                                                                                                                                                              |
|-----------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input Ratings         | Supply Voltage           | 200 - 240 ± 10%<br>380 - 480 ± 10%<br>500 - 600 ± 10%                                                                                                        |
|                       | Supply Frequency         | 48 - 62 Hz                                                                                                                                                   |
|                       | Displacement PF          | > 0.98                                                                                                                                                       |
|                       | Phase Imbalance          | 3% Maximum allowed                                                                                                                                           |
|                       | Inrush Current           | < Rated current                                                                                                                                              |
|                       | Power Cycles             | 120 per hour max, evenly spaced                                                                                                                              |
| Output Ratings        | Power Output             | 230V, 1-ph in: 1-10 HP (0.75-7.5 kW)<br>230V, 3-ph in: 1-100 HP (0.75-75 kW)<br>460V, 3-ph in: 1-400 HP (0.75-250kW)<br>575V, 3-ph in: 1-175 HP (0.75-110kW) |
|                       | Overload Capacity        | 110% for 60 secs, 165% for 4 secs.                                                                                                                           |
|                       | Output Frequency         | 0-250Hz, 0.1 Hz resolution                                                                                                                                   |
| Ambient Ratings       | Temperature              | Storage: -40°C to 60°C<br>Operating: -10°C to 40°C                                                                                                           |
|                       | Altitude                 | Up to 1000m ASL without de-rating<br>Up to 2000m Max UL Approved<br>Up to 4000m Max (non UL)<br>Above 1000m, de-rate 1% per 100m                             |
|                       | Humidity                 | 95% non-condensing                                                                                                                                           |
| Enclosures            | Ingress Protection       | NEMA4X sizes 2 - 4; NEMA12 sizes 4 - 8                                                                                                                       |
| Programming           | Keypad                   | Standard: built in keypad<br>Optional: Remote keypad<br><b>drive.web savvy</b> software                                                                      |
|                       | Display                  | Multi-Language TFT Display                                                                                                                                   |
| Control               | Control Modes            | ECO sensorless vector for: motor options:<br>Standard Induction, PMAC, BLDC, Sync Rel                                                                        |
|                       | Modulation               | 4 - 32 kHz effective                                                                                                                                         |
|                       | Stop Mode                | Ramp to stop - adjustable 0.1-600 secs<br>Coast to stop                                                                                                      |
|                       | Braking                  | Motor flux braking (DC injection)                                                                                                                            |
|                       | Skip Frequency           | Single point user adjustable                                                                                                                                 |
|                       | Analog Setpoint Control  | 0-10V, 10-0V, ±10V<br>0-20mA, 20-0mA, 4-20mA, 20-4mA                                                                                                         |
|                       | Digital Setpoint Control | Keypad<br>ModbusRTU<br>BACnet                                                                                                                                |
|                       | Automation               | Optional <b>drive.web</b> Ethernet distributed control +<br>programmable control, extra I/O, operator stations                                               |
|                       | Communications Options   | <b>drive.web</b> , ModbusTCP, EIP, DeviceNet, Profibus                                                                                                       |
|                       |                          |                                                                                                                                                              |
| I/O Specification     | Power Supply             | 24VDC, 100mA short protected<br>10VDC, 10mA for setpoint potentiometer                                                                                       |
|                       | Programmable Inputs      | 3 x Digital 8 to 30 VDC, response <4ms<br>2 x Analog / digital                                                                                               |
|                       | Programmable outputs     | 2 x Analog, 0-10V, 0-20mA, 4-20mA<br>2 x Relay NO, 6A @ 250VAC, 5A @ 30VDC                                                                                   |
| Control & Monitoring  | PID                      | Internal PID with feedback display                                                                                                                           |
|                       | Fault Memory             | Last 4 trips stored with time stamp                                                                                                                          |
|                       | Data Logging             | Current, temperature, DC Bus volts prior to trip                                                                                                             |
|                       | Maintenance Indicator    | Service life monitor with user adjustable interval                                                                                                           |
|                       | Monitoring               | Drive hours run & cooling fan run time<br>Resettable and non-resettable kWh meters                                                                           |
| Application functions | HVAC Functions           | Fire mode for emergency ventilation                                                                                                                          |
|                       | Pump functions           | Pump blockage detection<br>Pump cleaning cycles<br>Multi-pump cascade control<br>Pump stir mode                                                              |

**The harder they work, the more you save!**

**200-240V ± 10%, 1-ph in, 230V, 3-ph motor**

**Model HP Amps Size NEMA**

size 2 - IP20, TFT display & EMC Filter:

|                  |   |      |   |      |
|------------------|---|------|---|------|
| V3-220043-1F12-T | 1 | 4.3  | 2 | IP20 |
| V3-220070-1F12-T | 2 | 7    | 2 | IP20 |
| V3-220105-1F12-T | 3 | 10.5 | 2 | IP20 |

size 2 - NEMA 4X, TFT display & EMC Filter:

|                  |   |      |   |    |
|------------------|---|------|---|----|
| V3-220043-1F1#-T | 1 | 4.3  | 2 | 4X |
| V3-220070-1F1#-T | 2 | 7    | 2 | 4X |
| V3-220105-1F1#-T | 3 | 10.5 | 2 | 4X |

**200-240V ± 10%, 3-ph in, 230V, 3-ph motor**

**Model HP Amps Size NEMA**

sizes 2 & 3 - IP20, TFT display & EMC Filter:

|                  |     |      |   |      |
|------------------|-----|------|---|------|
| V3-220043-3F12-T | 1   | 4.3  | 2 | IP20 |
| V3-220070-3F12-T | 2   | 7    | 2 | IP20 |
| V3-220105-3F12-T | 3   | 10.5 | 2 | IP20 |
| V3-320180-3F12-T | 5   | 18   | 3 | IP20 |
| V3-320240-3F12-T | 7.5 | 24   | 3 | IP20 |

sizes 2 & 3 - NEMA 4X, TFT display & EMC Filter:

|                  |     |      |   |    |
|------------------|-----|------|---|----|
| V3-220043-3F1#-T | 1   | 4.3  | 2 | 4X |
| V3-220070-3F1#-T | 2   | 7    | 2 | 4X |
| V3-220105-3F1#-T | 3   | 10.5 | 2 | 4X |
| V3-320180-3F1#-T | 5   | 18   | 3 | 4X |
| V3-320240-3F1#-T | 7.5 | 24   | 3 | 4X |

sizes 4-7 - NEMA 12, TFT display, EMC filter:

|                    |     |     |   |    |
|--------------------|-----|-----|---|----|
| V3-420300-3F1N-T ‡ | 10  | 30  | 4 | 12 |
| V3-420460-3F1N-T ‡ | 15  | 46  | 4 | 12 |
| V3-520610-3F1N-T ‡ | 20  | 61  | 5 | 12 |
| V3-520720-3F1N-T ‡ | 25  | 72  | 5 | 12 |
| V3-520900-3F1N-T ‡ | 30  | 90  | 5 | 12 |
| V3-621100-3F1N-T ‡ | 40  | 110 | 6 | 12 |
| V3-621500-3F1N-T ‡ | 50  | 150 | 6 | 12 |
| V3-621800-3F1N-T ‡ | 60  | 180 | 6 | 12 |
| V3-722020-3F1N-T   | 75  | 202 | 7 | 12 |
| V3-722480-3F1N-T   | 100 | 248 | 7 | 12 |

**380-480V ± 10%, 3-ph in, 460V, 3-ph motor**

**Model HP Amps Size NEMA**

sizes 2 & 3 - IP20, TFT display & EMC Filter:

|                  |     |     |   |      |
|------------------|-----|-----|---|------|
| V3-240022-3F12-T | 1   | 2.2 | 2 | IP20 |
| V3-240041-3F12-T | 2   | 4.1 | 2 | IP20 |
| V3-240058-3F12-T | 3   | 5.8 | 2 | IP20 |
| V3-240095-3F12-T | 5   | 9.5 | 2 | IP20 |
| V3-340140-3F12-T | 7.5 | 14  | 3 | IP20 |
| V3-340180-3F12-T | 10  | 18  | 3 | IP20 |
| V3-340240-3F12-T | 15  | 24  | 3 | IP20 |

sizes 2 & 3 - NEMA 4X, TFT display & EMC Filter:

|                  |     |     |   |    |
|------------------|-----|-----|---|----|
| V3-240022-3F1#-T | 1   | 2.2 | 2 | 4X |
| V3-240041-3F1#-T | 2   | 4.1 | 2 | 4X |
| V3-240058-3F1#-T | 3   | 5.8 | 2 | 4X |
| V3-240095-3F1#-T | 5   | 9.5 | 2 | 4X |
| V3-240140-3F1#-T | 7.5 | 14  | 2 | 4X |
| V3-340180-3F1#-T | 10  | 18  | 3 | 4X |
| V3-340240-3F1#-T | 15  | 24  | 3 | 4X |

sizes 4-7 - NEMA 12, TFT display & EMC filter:

|                    |     |     |   |    |
|--------------------|-----|-----|---|----|
| V3-440300-3F1N-T ‡ | 20  | 30  | 4 | 12 |
| V3-440390-3F1N-T ‡ | 25  | 39  | 4 | 12 |
| V3-440460-3F1N-T ‡ | 30  | 46  | 4 | 12 |
| V3-540610-3F1N-T ‡ | 40  | 61  | 5 | 12 |
| V3-540720-3F1N-T ‡ | 50  | 72  | 5 | 12 |
| V3-540900-3F1N-T ‡ | 60  | 90  | 5 | 12 |
| V3-641100-3F1N-T ‡ | 75  | 110 | 6 | 12 |
| V3-641500-3F1N-T ‡ | 100 | 150 | 6 | 12 |
| V3-641800-3F1N-T ‡ | 150 | 180 | 6 | 12 |
| V3-742020-3F1N-T ‡ | 175 | 202 | 7 | 12 |
| V3-742400-3F1N-T   | 200 | 240 | 7 | 12 |
| V3-743020-3F1N-T   | 250 | 302 | 7 | 12 |
| V3-843700-3F1N-T ‡ | 300 | 370 | 8 | 12 |
| V3-844800-3F1N-T ‡ | 400 | 480 | 8 | 12 |



**Optional onboard speedy**

Ethernet networking  
USB programming  
smart automation

**Size 2 & 3 drives  
# = A or E**

A = no disconnect switch

E = with power disconnect switch

**ECO  
Efficient  
Economical  
Smart  
Solutions**



**Note:**  
Drives marked ‡ are also available in IP20 form. Please call for details, pricing, and availability.

**Dimensions & Weights**

| Size                         | 2       | 3        | 4      | 5      | 6       | 7 | 8       |
|------------------------------|---------|----------|--------|--------|---------|---|---------|
| <b>IP20 Drives</b>           |         |          |        |        |         |   |         |
| Height (ins)                 | 8.7"    | 10.3"    | 16.6"  | 19.1"  |         |   | 38.3"   |
| Height (mm)                  | 221     | 261      | 418    | 486    |         |   | 974     |
| Width (ins)                  | 4.4"    | 5.2"     | 6.7"   | 9.2"   |         |   | 17.5"   |
| Width (mm)                   | 110     | 131      | 233    | 233    |         |   | 444     |
| Depth (ins)                  | 7.3"    | 8.1"     | 10.2"  | 10.2"  |         |   | 16.6"   |
| Depth (mm)                   | 185     | 205      | 260    | 260    |         |   | 423     |
| Weight LB/KG                 | 4/1     | 7/3      | 20/9   | 40/18  |         |   | 274/125 |
| <b>NEMA 4X (IP66) Drives</b> |         |          |        |        |         |   |         |
| Height (ins)                 | 10.1"   | 12.2"    | 14.2"  |        |         |   |         |
| Height (mm)                  | 257     | 310      | 360    |        |         |   |         |
| Width (ins)                  | 7.4"    | 8.3"     | 9.5"   |        |         |   |         |
| Width (mm)                   | 188     | 211      | 240    |        |         |   |         |
| Depth (ins)                  | 7.2"    | 9.3"     | 10.7"  |        |         |   |         |
| Depth (mm)                   | 182     | 235      | 271    |        |         |   |         |
| Weight LB/KG                 | 7.7/3.5 | 14.6/6.6 | 21/9.5 |        |         |   |         |
| <b>NEMA 12 (IP55) Drives</b> |         |          |        |        |         |   |         |
| Height (ins)                 | 17.8"   | 21.3"    | 34.1"  | 50.4"  | 52.5"   |   |         |
| Height (mm)                  | 450     | 540      | 865    | 1280   | 1334    |   |         |
| Width (ins)                  | 6.7"    | 9.3"     | 13.0"  | 13.0"  | 17.5    |   |         |
| Width (mm)                   | 171     | 235      | 330    | 330    | 444     |   |         |
| Depth (ins)                  | 9.9"    | 10.6"    | 13.1"  | 14.2"  | 16.6    |   |         |
| Depth (mm)                   | 252     | 270      | 332    | 360    | 423     |   |         |
| Weight LB/KG                 | 25/12   | 51/23    | 121/55 | 196/89 | 317/144 |   |         |

**600 Volts Drives**

**500-600V ± 10%, 3-ph in  
500-600V, 3-ph motor**

| Model                        | HP  | Amps | Size | NEMA |
|------------------------------|-----|------|------|------|
| <b>IP20 with TFT display</b> |     |      |      |      |
| V3-260021-3012-T             | 1   | 2.1  | 2    | IP20 |
| V3-260031-3012-T             | 2   | 3.1  | 2    | IP20 |
| V3-260041-3012-T             | 3   | 4.1  | 2    | IP20 |
| V3-260065-3012-T             | 5   | 6.5  | 2    | IP20 |
| V3-260090-3012-T             | 7.5 | 9    | 2    | IP20 |
| V3-360120-3012-T             | 10  | 12   | 3    | IP20 |
| V3-360170-3012-T             | 15  | 17   | 3    | IP20 |
| V3-360220-3012-T             | 20  | 22   | 3    | IP20 |

**NEMA 4X (IP66), with TFT text display**

|                     |     |     |   |    |
|---------------------|-----|-----|---|----|
| <b>Unswitched</b>   |     |     |   |    |
| V3-260021-301A-T    | 1   | 2.1 | 2 | 4X |
| V3-260031-301A-T    | 2   | 3.1 | 2 | 4X |
| V3-260041-301A-T    | 3   | 4.1 | 2 | 4X |
| V3-260065-301A-T    | 5   | 6.5 | 2 | 4X |
| V3-260090-301A-T    | 7.5 | 9   | 2 | 4X |
| V3-360120-301A-T    | 10  | 12  | 3 | 4X |
| V3-360170-301A-T    | 15  | 17  | 3 | 4X |
| <b>w/Disconnect</b> |     |     |   |    |
| V3-260021-301E-T    | 1   | 2.1 | 2 | 4X |
| V3-260031-301E-T    | 2   | 3.1 | 2 | 4X |
| V3-260041-301E-T    | 3   | 4.1 | 2 | 4X |
| V3-260065-301E-T    | 5   | 6.5 | 2 | 4X |
| V3-260090-301E-T    | 7.5 | 9   | 2 | 4X |
| V3-360120-301E-T    | 10  | 12  | 3 | 4X |
| V3-360170-301E-T    | 15  | 17  | 3 | 4X |

**NEMA 12 (IP55) with TFT text display**

|                    |     |     |   |    |
|--------------------|-----|-----|---|----|
| V3-460220-301N-T ‡ | 20  | 22  | 4 | 12 |
| V3-460280-301N-T ‡ | 25  | 28  | 4 | 12 |
| V3-460340-301N-T ‡ | 30  | 34  | 4 | 12 |
| V3-460430-301N-T ‡ | 40  | 43  | 4 | 12 |
| V3-560540-301N-T ‡ | 50  | 54  | 5 | 12 |
| V3-560650-301N-T ‡ | 60  | 65  | 5 | 12 |
| V3-660780-301N-T ‡ | 75  | 78  | 6 | 12 |
| V3-661050-301N-T ‡ | 100 | 105 | 6 | 12 |
| V3-661300-301N-T ‡ | 125 | 130 | 6 | 12 |
| V3-661500-301N-T ‡ | 175 | 150 | 6 | 12 |

## E3 Sensorless Vector

General purpose drives with all purpose features

Up to 50 HP

Basic IP20 or NEMA 4X (IP66)

Basic control or full featured systems drive

3-Phase & single phase motor versions

*Basic or loaded, the new E3 is designed to give the best in value, performance and ease of use.*

Sensorless vector control for:

- High efficiency operation
- Selectable motor types  
Standard Induction, AC PM, BLDC, Sync Reluctance
- 3 selectable operating modes:  
Industrial, Fan, & Pump

Expandable

Economical

Easy

Enduring

Efficient



**speedy dwi278**  
Programmable control  
& Ethernet networking



**T3-STICK**  
Plug-in upload/download  
configuration memory stick



**T3-OPPAD**  
Remote keypad  
& TFT display



**savvyPanel touch**  
7" touch screen  
Auto-connects to all drives  
& devices on your LAN



### KEY FEATURES

Compact packaging  
Simple mechanical and electrical installation  
50°C ambient rating (IP20), 40°C ambient rating (NEMA 4X)  
150% rating for 60 seconds, 175% for 2 seconds  
Simple 14 parameter basic set up  
Integral brake transistor, sizes 2, 3, 4, and 5 (100% continuous rated)  
ModbusRTU serial port

### Options:

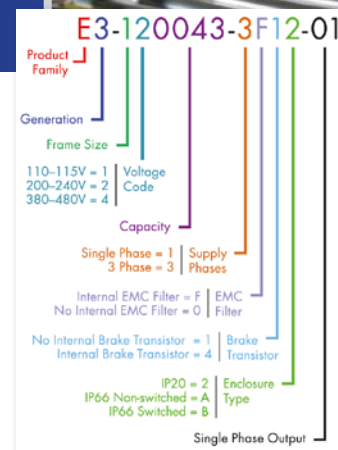
Remote keypad and display  
T3-STICK plug in unit for fast up/down load of parameters  
**smarty** remote I/O, programmable control & Ethernet networking  
**speedy** programmable control & Ethernet networking  
**savvyPanel** smart touch screen operator station technology  
Integral RFI filter option

**For NEMA 4X versions, see Page 44**



## SPECIFICATION

|                  |                    |                                                                                                                                                                                        |
|------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output           | Frequency          | 0 to 500Hz. (Please call for special builds up to 2000Hz)                                                                                                                              |
|                  | Supply options     | 48 - 62 Hz                                                                                                                                                                             |
| Environment      | Voltage/Phases     | 100 - 132 volts max, single phase (0.5 - 1.5HP)<br>180 - 264 volts max, 1-phase (0.5 - 10HP)<br>180 - 264 volts max, 3-phase (0.5 - 25HP)<br>342 - 528 volts max, 3-phase (0.5 - 50HP) |
|                  | Temperature        | IP20: Operating, -10 to 50°C max   Storage, -40 to 60°C<br>NEMA 4X: Operating, -10 to 40°C max   Storage, -40 to 60°C                                                                  |
|                  | Altitude           | 0-2000M, derate 1% per 100M above 1000M                                                                                                                                                |
|                  | Humidity           | up to 95%, non condensing                                                                                                                                                              |
|                  | Ingress Protection | Basic IP20, Optional IP66 (NEMA 4X outdoor rated)                                                                                                                                      |
| Control          | Mode               | Voltage vector                                                                                                                                                                         |
|                  | PWM frequency      | 4 to 32KHz (effective)                                                                                                                                                                 |
|                  | V/Hz ratio         | Linear                                                                                                                                                                                 |
|                  | Boost              | Yes                                                                                                                                                                                    |
|                  | Stop modes         | Coast / ramp / DC brake                                                                                                                                                                |
|                  | Skip frequency     | One point, adjustable frequency band                                                                                                                                                   |
|                  | Setpoint reference | 0-10VDC, 4-20mA, 20-4mA, 0-20mA, Keypad, Modbus                                                                                                                                        |
|                  | Preset speeds      | 4                                                                                                                                                                                      |
|                  | PI control         | Direct & analog input trim                                                                                                                                                             |
|                  | Spin start         | Starts safely into rotating motor                                                                                                                                                      |
| Configurable I/O | Accel/Decel        | 0 - 600 seconds + Ramp stop decel 0 - 600 seconds                                                                                                                                      |
|                  | Input 1            | Programmable digital input                                                                                                                                                             |
|                  | Input 2            | Programmable digital input                                                                                                                                                             |
|                  | Input 3            | Configurable analog or digital input                                                                                                                                                   |
|                  | Input 4            | Configurable analog or digital input                                                                                                                                                   |
| Protection       | Output 1           | Configurable analog or digital output                                                                                                                                                  |
|                  | Output 2           | Normally open relay contact 30VDC 5A, 250VAC 6A                                                                                                                                        |
|                  | Drive trip         | Over/under volts, over current, external trip,                                                                                                                                         |
|                  | Motor              | Overload, over temperature, short circuit, ground fault                                                                                                                                |
|                  | Trip memory        | Last 4 trips stored                                                                                                                                                                    |



**Cost effective either stand alone or networked in coordinated systems**

## Standard IP20 Protected

Ambient Rating 50°C except where marked  
\* Ambient Rating 45°C

**IP20**

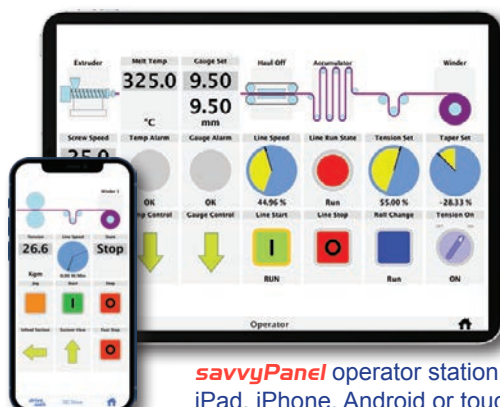


| Size   | 1   |     | 2    |     | 3    |     | 4    |     | 5    |      |
|--------|-----|-----|------|-----|------|-----|------|-----|------|------|
|        | in  | mm  | in   | mm  | in   | mm  | in   | mm  | in   | mm   |
| High   | 6.8 | 173 | 8.7  | 221 | 10.3 | 261 | 16.5 | 420 | 19.1 | 486  |
| Wide   | 3.3 | 83  | 4.3  | 110 | 5.2  | 131 | 6.7  | 171 | 8.7  | 222  |
| Deep   | 4.8 | 123 | 5.9  | 150 | 6.9  | 175 | 8.4  | 212 | 8.9  | 226  |
| Weight | lbs | kg  | lbs  | kg  | lbs  | kg  | lbs  | kg  | lbs  | kg   |
|        | 2.2 | 1.0 | 3.75 | 1.7 | 7.0  | 3.2 | 20.0 | 9.1 | 39.9 | 18.1 |

## STANDARD IP20 DRIVES

| Model          | Supply   | Motor    | Power | Amps | Size |
|----------------|----------|----------|-------|------|------|
| E3-110023-1012 | 1Ø, 115V | 3Ø, 230V | 0.5HP | 2.3  | 1    |
| E3-110043-1012 | 1Ø, 115V | 3Ø, 230V | 1.0HP | 4.3  | 1    |
| E3-210058-1042 | 1Ø, 115V | 3Ø, 230V | 1.5HP | 5.8  | 2    |
| E3-120023-1012 | 1Ø, 230V | 3Ø, 230V | 0.5HP | 2.3  | 1    |
| E3-120043-1012 | 1Ø, 230V | 3Ø, 230V | 1HP   | 4.3  | 1    |
| E3-120070-1012 | 1Ø, 230V | 3Ø, 230V | 2HP   | 7    | 1    |
| E3-220070-1042 | 1Ø, 230V | 3Ø, 230V | 2HP   | 7    | 2    |
| E3-220105-1042 | 1Ø, 230V | 3Ø, 230V | 3HP   | 10.5 | 2    |
| E3-320153-1042 | 1Ø, 230V | 3Ø, 230V | 5HP   | 15.3 | 3    |
| E3-120023-3012 | 3Ø, 230V | 3Ø, 230V | 0.5HP | 2.3  | 1    |
| E3-120043-3012 | 3Ø, 230V | 3Ø, 230V | 1HP   | 4.3  | 1    |
| E3-120070-3012 | 3Ø, 230V | 3Ø, 230V | 2HP   | 7    | 1    |
| E3-220070-3042 | 3Ø, 230V | 3Ø, 230V | 2HP   | 7    | 2    |
| E3-220105-3042 | 3Ø, 230V | 3Ø, 230V | 3HP   | 10.5 | 2    |
| E3-320180-3042 | 3Ø, 230V | 3Ø, 230V | 5HP   | 18   | 3    |
| E3-320240-3042 | 3Ø, 230V | 3Ø, 230V | 7.5HP | 24   | 3    |
| E3-420300-3042 | 3Ø, 230V | 3Ø, 230V | 10HP  | 30   | 4    |
| E3-420460-3042 | 3Ø, 230V | 3Ø, 230V | 15HP  | 46   | 4    |
| E3-520610-3F42 | 3Ø, 230V | 3Ø, 230V | 20HP  | 61   | 5    |
| E3-520720-3F42 | 3Ø, 230V | 3Ø, 230V | 25HP  | 72   | 5    |
| E3-140022-3012 | 3Ø, 460V | 3Ø, 460V | 1HP   | 2.2  | 1    |
| E3-140041-3012 | 3Ø, 460V | 3Ø, 460V | 2HP   | 4.1  | 1    |
| E3-240041-3042 | 3Ø, 460V | 3Ø, 460V | 2HP   | 4.1  | 2    |
| E3-240058-3042 | 3Ø, 460V | 3Ø, 460V | 3HP   | 5.8  | 2    |
| E3-240095-3042 | 3Ø, 460V | 3Ø, 460V | 5HP   | 9.5  | 2    |
| E3-340140-3042 | 3Ø, 460V | 3Ø, 460V | 7.5HP | 14   | 3    |
| E3-340180-3042 | 3Ø, 460V | 3Ø, 460V | 10HP  | 18   | 3    |
| E3-340240-3042 | 3Ø, 460V | 3Ø, 460V | 15HP  | 24   | 3    |
| E3-440300-3042 | 3Ø, 460V | 3Ø, 460V | 20HP  | 30   | 4    |
| E3-440390-3042 | 3Ø, 460V | 3Ø, 460V | 25HP  | 39   | 4    |
| E3-440460-3042 | 3Ø, 460V | 3Ø, 460V | 30HP  | 46   | 4    |
| E3-540610-3F42 | 3Ø, 460V | 3Ø, 460V | 40HP  | 61   | 5    |
| E3-540720-3F42 | 3Ø, 460V | 3Ø, 460V | 50HP  | 72   | 5    |

Please call +410-604-3400 for availability



**drive.web**  
**smart automation**

- powerful programmable control functions
- peer-to-peer over Ethernet
- smart iPad, Android or touch screen PC operation
- Internet access

**savvyPanel** operator station technology runs on iPad, iPhone, Android or touch screen PC

## NEMA 4X (IP66) Enclosed Drives

For harsh, wet & dirty environments

**Switched** version with keypad, display, speed pot, forward/off/reverse switch & power isolator switch.

**Unswitched** version with keypad & display.

### Key Features:

- 40°C ambient temperature
- Derate for operation > 40°C ≤ 50°C
- Conduit cable entry
- Padlockable power switch
- ModbusRTU port
- ABS moldings & corrosion resistant heat sink
- All standard drive features included
- Brake standard on sizes 2, 3 & 4
- Optional internal Ethernet



Embed a **speedy** in the drive to provide Ethernet networking & programmable control

### NEMA 4X (IP66) OUTDOOR RATED E3 SERIES GENERAL PURPOSE VFD\*

| SIZE                                                 | HP  | AMPS | UNSWITCHED     | SWITCHED       |
|------------------------------------------------------|-----|------|----------------|----------------|
| <b>115V, SINGLE PHASE IN, 230V, 3-PHASE MOTOR</b>    |     |      |                |                |
| 1                                                    | 0.5 | 2.3  | E3-110023-101A | E3-110023-101B |
| 1                                                    | 1.0 | 4.3  | E3-110043-101A | E3-110043-101B |
| 2                                                    | 1.5 | 5.8  | E3-210058-104A | E3-210058-104B |
| <b>230V, SINGLE PHASE IN, 230V, 3-PHASE MOTOR</b>    |     |      |                |                |
| 1                                                    | 0.5 | 2.3  | E3-120023-101A | E3-120023-101B |
| 1                                                    | 1   | 4.3  | E3-120043-101A | E3-120043-101B |
| 1                                                    | 2   | 7    | E3-120070-101A | E3-120070-101B |
| 2                                                    | 2   | 7    | E3-220070-104A | E3-220070-104B |
| 2                                                    | 3   | 10.5 | E3-220105-104A | E3-220105-104B |
| 3                                                    | 5   | 15.3 | E3-320153-104A | E3-320153-104B |
| 4                                                    | 7.5 | 24   | E3-420240-104A | E3-420240-104B |
| 4                                                    | 10  | 30   | E3-420300-104A | E3-420300-104B |
| <b>230V, 3-PHASE IN, 230V, 3-PHASE MOTOR</b>         |     |      |                |                |
| 1                                                    | 0.5 | 2.3  | E3-120023-301A | E3-120023-301B |
| 1                                                    | 1   | 4.3  | E3-120043-301A | E3-120043-301B |
| 1                                                    | 2   | 7    | E3-120070-301A | E3-120070-301B |
| 2                                                    | 2   | 7    | E3-220070-304A | E3-220070-304B |
| 2                                                    | 3   | 10.5 | E3-220105-304A | E3-220105-304B |
| 3                                                    | 5   | 18   | E3-320180-304A | E3-320180-304B |
| 3                                                    | 7.5 | 24   | E3-320240-304A | E3-320240-304B |
| 4                                                    | 10  | 30   | E3-420300-304A | E3-420300-304B |
| 4                                                    | 15  | 46   | E3-420460-304A | E3-420460-304B |
| <b>380/460V, 3-PHASE IN, 380/460V, 3-PHASE MOTOR</b> |     |      |                |                |
| 1                                                    | 1   | 2.2  | E3-140022-301A | E3-140022-301B |
| 1                                                    | 2   | 4.1  | E3-140041-301A | E3-140041-301B |
| 2                                                    | 2   | 4.1  | E3-240041-304A | E3-240041-304B |
| 2                                                    | 3   | 5.8  | E3-240058-304A | E3-240058-304B |
| 2                                                    | 5   | 9.5  | E3-240095-304A | E3-240095-304B |
| 3                                                    | 7.5 | 14   | E3-340140-304A | E3-340140-304B |
| 3                                                    | 10  | 18   | E3-340180-304A | E3-340180-304B |
| 3                                                    | 15  | 24   | E3-340240-304A | E3-340240-304B |
| 4                                                    | 20  | 30   | E3-440300-304A | E3-440300-304B |
| 4                                                    | 25  | 39   | E3-440390-304A | E3-440390-304B |
| 4                                                    | 30  | 46   | E3-440460-304A | E3-440460-304B |

Ethernet networking & basic programmable control option dw278

\*Outdoor Applications will require a Sun Shade (not included)

### NEMA 4X (IP66) OUTDOOR RATED P2 OPEN/CLOSED LOOP VECTOR DRIVES\*

With EMC filter, brake transistor +/- DC bus

| SIZE                                                 | HP  | AMPS | UNSWITCHED     | SWITCHED       |
|------------------------------------------------------|-----|------|----------------|----------------|
| <b>230V, SINGLE PHASE IN, 230V, 3-PHASE MOTOR</b>    |     |      |                |                |
| 2                                                    | 1   | 4.3  | P2-22010-1HF4A | P2-22010-1HF4B |
| 2                                                    | 2   | 7    | P2-22020-1HF4A | P2-22020-1HF4B |
| 2                                                    | 3   | 10.5 | P2-22030-1HF4A | P2-22030-1HF4B |
| <b>230V, 3-PHASE IN, 230V, 3-PHASE MOTOR</b>         |     |      |                |                |
| 2                                                    | 1   | 4.3  | P2-22010-3HF4A | P2-22010-3HF4B |
| 2                                                    | 2   | 7    | P2-22020-3HF4A | P2-22020-3HF4B |
| 2                                                    | 3   | 10.5 | P2-22030-3HF4A | P2-22030-3HF4B |
| 3                                                    | 5   | 18   | P2-32050-3HF4A | P2-32050-3HF4B |
| <b>380/460V, 3-PHASE IN, 380/460V, 3-PHASE MOTOR</b> |     |      |                |                |
| 2                                                    | 1   | 2.2  | P2-24010-3HF4A | P2-24010-3HF4B |
| 2                                                    | 2   | 4.1  | P2-24020-3HF4A | P2-24020-3HF4B |
| 2                                                    | 3   | 5.8  | P2-24030-3HF4A | P2-24030-3HF4B |
| 2                                                    | 5   | 9.5  | P2-24050-3HF4A | P2-24050-3HF4B |
| 3                                                    | 7.5 | 14   | P2-34075-3HF4A | P2-34075-3HF4B |
| 3                                                    | 10  | 18   | P2-34100-3HF4A | P2-34100-3HF4B |
| <b>500/600V, 3-PHASE IN, 500/600V, 3-PHASE MOTOR</b> |     |      |                |                |
| 2                                                    | 1   | 2.1  | P2-26010-3H04A | P2-26010-3H04B |
| 2                                                    | 2   | 3.1  | P2-26020-3H04A | P2-26020-3H04B |
| 2                                                    | 3   | 4.1  | P2-26030-3H04A | P2-26030-3H04B |
| 2                                                    | 5   | 6.5  | P2-26050-3H04A | P2-26050-3H04B |
| 2                                                    | 7.5 | 9    | P2-26075-3H04A | P2-26075-3H04B |
| 3                                                    | 10  | 12   | P2-36100-3H04A | P2-36100-3H04B |
| 3                                                    | 15  | 17   | P2-36150-3H04A | P2-36150-3H04B |
| 4                                                    | 25  | 28   | P2-46250-3H04A | P2-46250-3H04B |
| 4                                                    | 30  | 34   | P2-46300-3H04A | P2-46300-3H04B |
| 4                                                    | 40  | 43   | P2-46400-3H04A | P2-46400-3H04B |

### P2 Series NEMA 4X - Dimensions and Weight

| Size | Height        | Width        | Depth         | Weight          |
|------|---------------|--------------|---------------|-----------------|
| 2    | 10.1" (257mm) | 7.4" (188mm) | 6.8" (172mm)  | 7.7lbs (3.5kg)  |
| 3    | 12.2" (310mm) | 8.3" (211mm) | 9.3" (235mm)  | 14.6lbs (6.6kg) |
| 4    | 14.2" (360mm) | 9.5" (240mm) | 10.7" (271mm) | 21lbs (9.5kg)   |

### E3 Series NEMA 4X - Dimensions and Weight

| Size | Height        | Width        | Depth         | Weight          |
|------|---------------|--------------|---------------|-----------------|
| 1    | 9.1" (232mm)  | 6.4" (161mm) | 6.4" (162mm)  | 5.1lbs (2.3kg)  |
| 2    | 10.1" (257mm) | 7.4" (188mm) | 7.2" (182mm)  | 7.7lbs (3.5kg)  |
| 3    | 12.2" (310mm) | 8.3" (211mm) | 9.3" (235mm)  | 14.6lbs (6.6kg) |
| 4    | 14.2" (360mm) | 9.5" (240mm) | 10.7" (271mm) | 21lbs (9.5kg)   |

## AC Drive Options

| ITEM                                                                         | DESCRIPTION                                               | MODEL |    |    |
|------------------------------------------------------------------------------|-----------------------------------------------------------|-------|----|----|
|                                                                              |                                                           | P2    | V3 | E3 |
| Touch Screen Programmable Operator Stations                                  |                                                           |       |    |    |
| dw230                                                                        | <b>savvyPanel touch</b> , programmable NEMA 4 diplay      | ✓     | ✓  | ✓  |
| dw260                                                                        | <b>savvyPanel touch</b> , programmable NEMA 4 diplay      | ✓     | ✓  | ✓  |
| Remote Keypads                                                               |                                                           |       |    |    |
| T2-OPORT-IN                                                                  | Remote Keypad (with cable)                                | ✓     | ✓  | ✓  |
| T3-OPPAD-IN                                                                  | Remote keypad with TFT display (with cable)               | ✓     | ✓  | ✓  |
| Communications                                                               |                                                           |       |    |    |
| speedy dw22X-00                                                              | ModbusTCP/IP Interface Module                             | ✓     | ✓  | ✓  |
| speedy dw22X-1121                                                            | Onboard controller w/EIP/PCCC Ethernet, <b>savvyPanel</b> | ✓     | ✓  | ✓  |
| T2-DEVNT-IN                                                                  | DeviceNet Interface Module                                | ✓     | ✓  |    |
| T2-PFNET-IN                                                                  | ProfiNET Interface Module                                 | ✓     | ✓  |    |
| T2-PROFB-IN                                                                  | Profibus DPV-1 Interface Module                           | ✓     | ✓  |    |
| T2-BNTIP-IN                                                                  | Bacnet IP Interface Module                                | ✓     |    |    |
| T2-BNTSP-IN                                                                  | Bacnet RJ45 connector                                     |       | ✓  |    |
| LA503846                                                                     | Through-Door Ethernet Coupler RJ45-RJ45                   | ✓     | ✓  | ✓  |
| Programming Interface                                                        |                                                           |       |    |    |
| speedy dw21X                                                                 | USB Interface Module                                      | ✓     | ✓  | ✓  |
| T3-STICK-IN                                                                  | Optistick parameter copying stick with Bluetooth          | ✓     | ✓  |    |
| Encoder Feedback                                                             |                                                           |       |    |    |
| T2-ENCOD-IN                                                                  | 5v Encoder feedback module for P2                         | ✓     |    |    |
| T2-ENCHT-IN                                                                  | 24v Encoder feedback module for P2                        | ✓     |    |    |
| EMC Filters                                                                  |                                                           |       |    |    |
| T2-E3300-00                                                                  | Optifilter, EMC input filter, 3-phase, 300A, IP00         | ✓     |    |    |
| Brake Resistors (Case Type)                                                  |                                                           |       |    |    |
| OD-BR100-IN                                                                  | DB Resistor, drive size 2 & 3, IP20, 100Ω, 200W           | ✓     |    | ✓  |
| OD-BRES4-IN                                                                  | DB Resistor, drive size 4 & 5, IP20, 33Ω, 500W            | ✓     |    | ✓  |
| Brake Resistors (Enclosed, ventilated with over temp switch)                 |                                                           |       |    |    |
| Intermittent duty 10%, 10 sec                                                |                                                           |       |    |    |
| CX503080                                                                     | 1 HP 460VAC, 750Ω, 12"x5"x5"                              | ✓     |    |    |
| CX503081                                                                     | 2 HP 460VAC, 375Ω, 12"x5"x5"                              | ✓     |    | ✓  |
| CX503082                                                                     | 3 HP 460VAC, 250Ω, 12"x5"x5"                              | ✓     |    | ✓  |
| CX503083                                                                     | 5 HP 460VAC, 150Ω, 12"x7"x5"                              | ✓     |    | ✓  |
| CX503084                                                                     | 7.5 HP 460VAC, 100Ω, 12"x7"x5"                            | ✓     |    | ✓  |
| CX503085                                                                     | 10 HP 460VAC, 75Ω, 12"x7"x5"                              | ✓     |    | ✓  |
| CX503086                                                                     | 15 HP 460VAC, 50Ω, 12"x10"x5"                             | ✓     |    | ✓  |
| CX503087                                                                     | 20 HP 460VAC, 38Ω, 12"x13"x5"                             | ✓     |    | ✓  |
| CX503088                                                                     | 25 HP 460VAC, 30Ω, 12"x16"x5"                             | ✓     |    | ✓  |
| CX503089                                                                     | 30 HP 460VAC, 25Ω, 19"x10"x5"                             | ✓     |    | ✓  |
| CX503090                                                                     | 40 HP 460VAC, 19Ω, 19"x13"x5"                             | ✓     |    | ✓  |
| CX503091                                                                     | 50 HP 460VAC, 15Ω, 19"x13"x5"                             | ✓     |    | ✓  |
| CX503092                                                                     | 60 HP 460VAC, 12.6Ω, 19"x13"x5"                           | ✓     |    | ✓  |
| CX503093                                                                     | 75 HP 460VAC, 10Ω, 26.5"x10"x5"                           | ✓     |    | ✓  |
| CX503094                                                                     | 100 HP 460VAC, 7.5Ω, 26.5"x16"x5"                         | ✓     |    | ✓  |
| CX503095                                                                     | 125 - 150 HP 460VAC, 6Ω, 28"x10"x10"                      | ✓     |    | ✓  |
| Output Filters                                                               |                                                           |       |    |    |
| T2-M3008-20                                                                  | Output filter, 8A, IP20                                   | ✓     | ✓  | ✓  |
| T2-M3008-66                                                                  | Output filter, 8A, IP66                                   | ✓     | ✓  | ✓  |
| T2-M3012-20                                                                  | Output filter, 12A, IP20                                  | ✓     | ✓  | ✓  |
| T2-M3012-66                                                                  | Output filter, 12A, IP66                                  | ✓     | ✓  | ✓  |
| T2-M3018-66                                                                  | Output filter, 18A, IP66                                  | ✓     | ✓  | ✓  |
| T2-M3030-20                                                                  | Output filter, 30A, IP20                                  | ✓     | ✓  |    |
| T2-M3075-20                                                                  | Output filter, 75A, IP20                                  | ✓     | ✓  |    |
| T2-M3180-00                                                                  | Output filter, 180A, IP00                                 | ✓     | ✓  |    |
| T2-M3300-00                                                                  | Output filter, 300A, IP00                                 | ✓     | ✓  |    |
| RJ45 Data Cables & Splitters for drive specific communications (no ethernet) |                                                           |       |    |    |
| T-J4505-IN                                                                   | Data cable, 0.5M, (RJ45 - RJ45)                           | ✓     | ✓  | ✓  |
| T-J4510-IN                                                                   | Data cable, 1M, (RJ45 - RJ45)                             | ✓     | ✓  | ✓  |
| T-J4530-IN                                                                   | Data cable, 3M, (RJ45 - RJ45)                             | ✓     | ✓  | ✓  |
| T-J45SP-IN                                                                   | Data cable 3-way splitter (RJ45)                          | ✓     | ✓  | ✓  |
| T2-BNTSP-IN                                                                  | RJ45 BacNet connector                                     |       | ✓  |    |
| I/O Boards                                                                   |                                                           |       |    |    |
| T-LOGIP-11                                                                   | 110VAC logic input isolator                               |       |    | ✓  |
| T-LOGIP-23                                                                   | 230VAC logic input isolator                               |       |    | ✓  |
| T3-2ROUT-IN                                                                  | Relay output module                                       |       |    | ✓  |
| T2-CASCD-IN                                                                  | Cascade control plug in option board                      | ✓     | ✓  |    |
| T2-EXTIO-IN                                                                  | Extended I/O, plug in option board                        | ✓     | ✓  |    |

Consult factory for 230VAC Brake Resistors.

## 3-Phase Reactors

3% Impedance  
For use as output or input reactors with AC drives

| 230V |           |      |            |       |                        |     |
|------|-----------|------|------------|-------|------------------------|-----|
| HP   | Model     | Amps | Watts Loss | mH    | Dimensions (W X H X D) | Lbs |
| 1    | LMAC321   | 4    | 14.5       | 3     | 4.3 X 2.7 X 4          | 4   |
| 2    | LMAC322   | 8    | 19.5       | 1.5   | 5.9 X 2.9 X 4.7        | 7   |
| 3    | LMAC323   | 12   | 26         | 1.25  | 5.9 X 3.2 X 5          | 9   |
| 5    | LMAC325   | 18   | 36         | 0.8   | 5.9 X 3.2 X 5.1        | 9   |
| 7.5  | LMAC327.5 | 25   | 48         | 0.5   | 7.2 X 3.5 X 5.8        | 11  |
| 10   | LMAC3210  | 35   | 49         | 0.4   | 7.2 X 3.7 X 5.8        | 14  |
| 15   | LMAC3215  | 45   | 54         | 0.3   | 9 X 4.6 X 7.2          | 22  |
| 20   | LMAC3220  | 55   | 64         | 0.25  | 9 X 5.4 X 6.9          | 24  |
| 25   | LMAC3225  | 80   | 82         | 0.2   | 9 X 5.7 X 6.9          | 25  |
| 35   | LMAC3235  | 100  | 94         | 0.15  | 9 X 6 X 7.0            | 29  |
| 50   | LMAC3250  | 130  | 108        | 0.1   | 9.6 X 5.9 X 7.2        | 29  |
| 60   | LMAC3260  | 160  | 116        | 0.075 | 9.6 x 6 x 7.3          | 41  |
| 75   | LMAC3275  | 200  | 124        | 0.055 | 9.6 x 7.1 x 7.3        | 38  |
| 100  | LMAC32100 | 250  | 154        | 0.045 | 9.6 x 8.1 x 7.3        | 47  |
| 125  | LMAC32125 | 320  | 224        | 0.04  | 10.8 x 7.9 x 8.5       | 80  |
| 150  | LMAC32150 | 400  | 213        | 0.03  | 11 x 8.6 x 8.5         | 84  |
| 200  | LMAC32200 | 500  | 226        | 0.025 | 10.8 x 9.5 x 8.5       | 93  |

| 460V |           |      |            |       |                        |     |
|------|-----------|------|------------|-------|------------------------|-----|
| HP   | Model     | Amps | Watts Loss | mH    | Dimensions (W X H X D) | Lbs |
| 1    | LMAC341   | 2    | 7.5        | 12    | 4.3 x 2.7 x 4          | 2.5 |
| 2    | LMAC342   | 4    | 20         | 6.5   | 4.3 x 2.7 x 4.1        | 4   |
| 5    | LMAC345   | 8    | 29         | 3     | 5.9 x 2.9 x 4.7        | 8   |
| 7.5  | LMAC347.5 | 12   | 31         | 2.5   | 5.9 x 3.2 x 5.1        | 10  |
| 10   | LMAC3410  | 18   | 43         | 1.5   | 5.9 x 3.6 x 5.1        | 12  |
| 15   | LMAC3415  | 25   | 52         | 1.2   | 7.2 x 3.5 x 5.8        | 14  |
| 25   | LMAC3425  | 35   | 54         | 0.8   | 7.2 x 3.7 x 5.8        | 16  |
| 30   | LMAC3430  | 45   | 62         | 0.7   | 9 x 4.6 x 7.3          | 26  |
| 40   | LMAC3440  | 55   | 67         | 0.5   | 9 x 5.4 x 7            | 26  |
| 60   | LMAC3460  | 80   | 86         | 0.4   | 9 x 5.8 x 7.1          | 33  |
| 75   | LMAC3475  | 100  | 84         | 0.3   | 9 x 6.6 x 7            | 37  |
| 100  | LMAC34100 | 130  | 180        | 0.2   | 9.6 x 6 x 7.3          | 43  |
| 125  | LMAC34125 | 160  | 149        | 0.15  | 10.8 x 6.9 x 8.5       | 54  |
| 150  | LMAC34150 | 200  | 168        | 0.11  | 9.6 x 7.9 x 7.2        | 54  |
| 200  | LMAC34200 | 250  | 231        | 0.09  | 10.8 x 7.6 x 8.5       | 80  |
| 250  | LMAC34250 | 320  | 264        | 0.075 | 10.8 x 8.9 x 8.4       | 102 |
| 300  | LMAC34300 | 400  | 571        | 0.06  | 14.3 x 9.4 x 11.2      | 118 |
| 400  | LMAC34400 | 500  | 694        | 0.05  | 14.3 x 10.5 x 11.2     | 160 |
| 500  | LMAC34500 | 600  | 689        | 0.04  | 14.3 x 11 x 11.1       | 175 |

Consult factory for additional ratings and enclosure options.

## drive.web smart drives

Add a **drive.web** Universal Automation Controller to any drive for unlimited automation capability (see pages 3-31):

- Powerful programmable control functions
- Peer-to-peer networking over Ethernet
- Smart iPad/Android or touch screen PC operation
- Internet access
- Unlimited additional I/O

|                | E3            | P2            |
|----------------|---------------|---------------|
| <b>smarty2</b> | dw248-DM-C2CD | dw244-DM-C2CD |
| <b>smarty3</b> | dw248-DM-C3CD | dw244-DM-C3CD |
| <b>smarty4</b> | dw248-DM-C4CD | dw244-DM-C4CD |
| <b>smarty7</b> | dw258-DM-S7PD | dw254-DM-S7PD |

Smart Control + Peer-to-Peer Networking + ModbusTCP/IP

dw270-4008 **drive.web speedy** interface for V3 models  
dw274 **drive.web speedy** interface for P2 models  
dw278 **drive.web speedy** interface for E3 models

## E3 SINGLE PHASE

### Single Phase Motor Controller

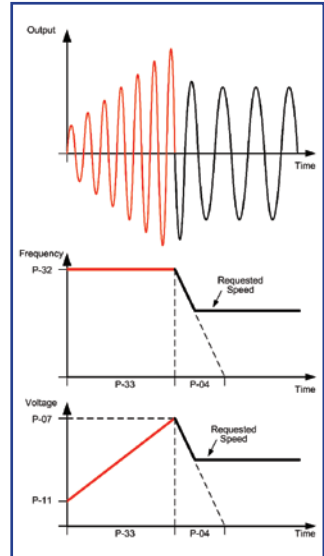
For Shaded Pole (SP) & Permanent Split Capacitor (PSC) motors used in direct drive, variable torque, fan and pump type applications only



The innovative E3 Single Phase motor controller, uses a unique boost control algorithm that ensures reliable starting and control.

- Energy saving
- Macros for fan & pump applications
- Built in PI control
- Bluetooth connectivity
- High frequency switching for quiet running in:
  - ~ Commercial and residential HVAC
  - ~ Fume extraction
  - ~ Laboratories
  - ~ Quiet locations

*Expandable • Versatile • Economical*



Basic IP20 or NEMA4X (outdoor rated) versions  
Basic or full featured systems drive  
Basic or peer-to-peer networking over Ethernet

#### SPECIFICATION

|                  |                |                                                                                                                          |
|------------------|----------------|--------------------------------------------------------------------------------------------------------------------------|
| Output           | Frequency      | 0 to 500Hz, 0.1Hz resolution                                                                                             |
| Supply options   | Frequency      | 48 - 62 Hz, >0.98PF, inrush current < rated current                                                                      |
|                  | Volts/Phases   | 100 - 132 volts max, 1-phase (0.5 - .75HP)<br>180 - 264 volts max, 1-phase (0.5 - 1.5HP)                                 |
| Environment      | Temperature    | IP20, operating, -10 to 50°C max, storage, -40 to 60°C<br>IP66, NEMA 4X, operating -10 to 40°C max, storage, -40 to 60°C |
|                  | Altitude       | 0-2000M, derate 1% per 100M above 1000M                                                                                  |
|                  | Humidity       | up to 95%, non condensing                                                                                                |
|                  | Ingress        | Basic IP20<br>Optional IP66 (NEMA 4X), outdoor rated                                                                     |
| Control          | Mode           | V/F voltage vector, with energy optimizer                                                                                |
|                  | PWM Hz         | 4 to 32kHz (effective)                                                                                                   |
|                  | Skip Freq      | Single point, user adjustable                                                                                            |
|                  | Boost          | Automatic boost phase operation                                                                                          |
|                  | Stop modes     | Coast / ramp / DC brake                                                                                                  |
|                  | Setpoint ref   | 0-10VDC, 4-20mA, 0-20mA, Keypad, Modbus                                                                                  |
|                  | Presets        | 8 preset speeds                                                                                                          |
|                  | PI control     | Direct & analog input trim                                                                                               |
| Configurable I/O | Accel/Decel    | 0 - 600 secs + Ramp stop decel 0 - 600 secs                                                                              |
|                  | Input 1        | Programmable digital input                                                                                               |
|                  | Input/output 2 | Selectable digital input / output                                                                                        |
|                  | Input 3        | Configurable analog or digital input                                                                                     |
|                  | Input 4        | Configurable analog or digital input                                                                                     |
|                  | Output 1       | Configurable analog or digital output                                                                                    |
|                  | Relay 1        | Normally open relay contact 30VDC 5A, 250VAC 6A                                                                          |
| Protection       | Drive trip     | Over/under volts, over current, external trip,                                                                           |
|                  | Motor          | Overload, over temp, short circuit, ground fault                                                                         |
|                  | Trip memory    | Last 4 trips stored                                                                                                      |

#### THE BASICS

Compact packaging  
Simple mechanical and electrical installation  
50°C ambient rating  
150% rating for 60 seconds, 175% for 2 seconds  
Simple basic set up  
Integral brake transistor (size 2, 100% rated)  
ModbusRTU serial port  
Remote keypad and display option  
T3-STICK plug-in for easy parameter up/down load



# E3 Single Phase IP20

Single phase motor controller for use only with Shaded Pole (SP) or Permanent Split Capacitor (PSC) type motors on variable torque, direct drive fans and centrifugal pumps

## STANDARD E3 1Ø IP20 DRIVES

| Model             | Supply   | Motor    | Power  | Amps | Size |
|-------------------|----------|----------|--------|------|------|
| E3-110070-1012-01 | 1Ø, 115V | 1Ø, 115V | 0.5HP  | 7.0  | 1    |
| E3-210105-1042-01 | 1Ø, 115V | 1Ø, 115V | 0.75HP | 10.5 | 2    |
| E3-120043-1012-01 | 1Ø, 230V | 1Ø, 230V | 0.5HP  | 4.3  | 1    |
| E3-120070-1012-01 | 1Ø, 230V | 1Ø, 230V | 1HP    | 7.0  | 1    |
| E3-220105-1042-01 | 1Ø, 230V | 1Ø, 230V | 1.5HP  | 10.5 | 2    |

### DIMENSIONS & WEIGHT

| Size | Height       | Width        | Depth        | Weight         |
|------|--------------|--------------|--------------|----------------|
| 1    | 6.8" (173mm) | 3.3" (83mm)  | 4.8" (123mm) | 2.2lbs (1kg)   |
| 2    | 8.7" (221mm) | 4.3" (110mm) | 5.9" (150mm) | 3.8lbs (1.7kg) |



speedy control

savvyPanel vision



## E3 SINGLE PHASE, NEMA 4X (IP66)

Single phase motor controller for use only with Shaded Pole (SP) or Permanent Split Capacitor (PSC) type motors in variable torque, fan and centrifugal pump applications

**Switched** version with keypad, display, speed pot, forward/off switch & power isolator switch

**Unswitched** version with keypad & display

### For outdoor and harsh, dirty indoor environments

- 40°C ambient temperature
- Conduit cable entry
- Padlockable power switch
- Wash down duty
- ModbusRTU port
- Compact packaging
- All standard drive features included
- Brake switch standard on 230V, size 2
- Optional internal Ethernet
- Optional internal **drive.web** smart control
- Sunshade required for outdoor use
- Derate for operation > 40°C <= 50°C

### NEMA 4X / IP66 DRIVES (outdoor rated)

| Model             | Supply   | Motor    | Power | Amps | Size |
|-------------------|----------|----------|-------|------|------|
| E3-120043-101#-01 | 1Ø, 230V | 1Ø, 230V | 0.5HP | 4.3  | 1    |
| E3-120070-101#-01 | 1Ø, 230V | 1Ø, 230V | 1HP   | 7.0  | 1    |
| E3-220105-104#-01 | 1Ø, 230V | 1Ø, 230V | 1.5HP | 10.5 | 2    |

# A = Unswitched, B = Switched

### DIMENSIONS & WEIGHT

| Size | Height        | Width        | Depth        | Weight        |
|------|---------------|--------------|--------------|---------------|
| 1    | 9.1" (232mm)  | 6.4" (161mm) | 6.4" (162mm) | 5.1lb (2.3kg) |
| 2    | 10.1" (257mm) | 7.4" (188mm) | 7.2" (182mm) | 7.7lb (3.5kg) |



## K-Series single phase DC drives - up to 2HP

### Regenerative & Non-regenerative

Enclosed, DIN rail mounting drives in elegant compact packages for both stand alone and systems applications.

#### Standard features include:

- Plug-in screw terminals
- Dual 115 & 230 volts, 50/60Hz supply
- Armature volts or tach feedback
- IP20 enclosure
- Output for ramps, speed demand, current demand
- Inputs for ramped speed, unramped speed, torque (current)
- Logic outputs for overload & trip
- Configurable level comparator & sign changer
- Standards: UL, cUL, CE



| MODEL                                                | RATING                                                                                                        | FEATURES                                                                                           | TERMINALS                                                  |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| <b>NON-ISOLATED</b>                                  |                                                                                                               |                                                                                                    |                                                            |
| <b>K340</b>                                          | <b>Armature current 3.4 amps</b><br>1/4HP 0.25kW @90Vdc<br>1/2HP 0.55kW @180Vdc<br>Size 1.4"W x 4.2"H x 4.7"D | Max Speed<br>Min Speed<br>Up Ramp<br>IR Comp                                                       | +10V<br>Min<br>Input +<br>Common                           |
| <b>K680</b>                                          | <b>Armature current 6.8 amps</b><br>1/2HP 0.55kW @90Vdc<br>1HP 0.75kW @180Vdc<br>Size 1.8"W x 4.2"H x 4.7"D   | I max<br>AVF/Tach switch<br>Speed range switch<br>AC voltage selector<br>Field 1Amp 0.9x ac supply | Run<br>Tach f/b                                            |
| <b>K1220</b>                                         | <b>Armature current 12.2 amps</b><br>1HP 0.75kW @90Vdc<br>2HP 1.8kW @180Vdc<br>Size 1.8"W x 4.2"H x 4.7"D     |                                                                                                    |                                                            |
| <b>ISOLATED</b>                                      |                                                                                                               |                                                                                                    |                                                            |
| <b>K340i</b>                                         | <b>Armature current 3.4 amps</b><br>1/4HP 0.25kW @90Vdc<br>1/2HP 0.55kW @180Vdc<br>Size 2.4"W x 4.2"H x 4.7"D | Max Speed<br>Min Speed<br>Up Ramp<br>Down Ramp<br>Stability                                        | +10V ref<br>Min speed<br>Input +<br>Output +/-<br>Common   |
| <b>K680i</b>                                         | <b>Armature current 6.8 amps</b><br>1/2HP 0.55kW @90Vdc<br>1HP 0.75kW @180Vdc<br>Size 2.8"W x 4.2"H x 4.7"D   | I max<br>IR Comp<br>AVF/Tach switch<br>Speed range switch<br>AC voltage selector                   | Input +/-<br>Pushbutton +<br>Pushbutton -<br>Run<br>Common |
| <b>K1220i</b>                                        | <b>Armature current 12.2 amps</b><br>1HP 0.75kW @90Vdc<br>2HP 1.8kW @180Vdc<br>Size 2.8"W x 4.2"H x 4.7"D     | Level comparator                                                                                   | Tach f/b                                                   |
| <b>4-QUADRANT, REGENERATIVE, REVERSING, ISOLATED</b> |                                                                                                               |                                                                                                    |                                                            |
| <b>K340XRI</b>                                       | <b>Armature current 3.4 amps</b><br>1/4HP 0.25kW @90Vdc<br>1/2HP 0.55kW @180Vdc<br>Size 2.4"W x 4.2"H x 4.7"D | Max Speed<br>Min Speed<br>Up Ramp<br>Down Ramp<br>Stability                                        | +10V ref<br>Min speed<br>Input +<br>Output +/-<br>Common   |
| <b>K680XRI</b>                                       | <b>Armature current 6.8 amps</b><br>1/2HP 0.55kW @90Vdc<br>1HP 0.75kW @180Vdc<br>Size 2.8"W x 4.2"H x 4.7"D   | I max<br>IR Comp<br>AVF/Tach switch<br>Speed range switch<br>AC voltage selector                   | Input +/-<br>Pushbutton +<br>Pushbutton -<br>Run<br>Common |
| <b>K1220XRI</b>                                      | <b>Armature current 12.2 amps</b><br>1HP 0.75kW @90Vdc<br>2HP 1.8kW @180Vdc<br>Size 2.8"W x 4.2"H x 4.7"D     | Level comparator                                                                                   | Tach f/b                                                   |



#### Optional **drive.web smarty**

For complete process automation Model dw250-XAIO uses discrete I/O interface to provide:

- Ethernet networking
- Internet access
- Powerful function blockprogramming
- ModbusRTU and ModbusTCP/IP
- Additional remote I/O
- **savvyPanel** smart touch screens (see page 13)

#### High Speed Fuse Kits - DIN Rail Mounting

|          |                          |                 |
|----------|--------------------------|-----------------|
| FLN-6.3  | Line fuse kit            | K340/i          |
| FLL-6.3  | Line/line fuse kit       | K340/i          |
| FLNR-6.3 | Line & arm fuse kit      | K340XRI         |
| FLLR-6.3 | Line/line & arm fuse kit | K340XRI         |
| FLN-20   | Line fuse kit            | all non-regen K |
| FLL-20   | Line/line fuse kit       | all non-regen K |
| FLNR-20  | Line & arm fuse kit      | all regen K     |
| FLLR-20  | Line/line & arm fuse kit | all regen K     |

# Single Phase DC Systems Drives

This family of single phase DC drives with isolated control circuitry, is designed to meet the most exacting requirements of high performance systems builders. It is a range of full featured products using advanced manufacturing technologies to give unequalled value and functionality to OEMs and System Integrators with world wide markets and demanding applications.

## NON-REGEN MODELS

## FUSE KIT

|                        |                |                |          |
|------------------------|----------------|----------------|----------|
|                        | 230VAC, 180VDC | 115VAC, 90VDC  |          |
| 400i (4 amps)          | 0.75HP         | 0.4HP          | included |
| 1600i (16 amps)        | 3HP            | 1.5HP          | F2-30    |
| 3200i/32 (32 amps)     | 6HP            | 3HP            | F2-60    |
|                        |                |                |          |
|                        | 415VAC, 320VDC | 240VAC, 180VDC |          |
| 3200i/48LL (48 amps)   | 7.5HP          | 4HP            | F2-80    |
|                        |                |                |          |
|                        | 460VAC, 360VDC | 230VAC, 180VDC |          |
| 3200i/32C109 (32 amps) | 8HP            | 5HP            | F2-60    |

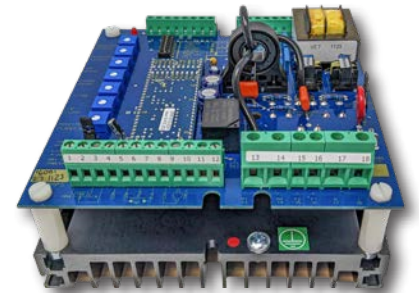
## 4-Q REGEN, REVERSING MODELS

## FUSE KIT

|                |                |                |       |
|----------------|----------------|----------------|-------|
|                | 230VAC, 180VDC | 115VAC, 90VDC  |       |
| 3600XRI/16     | 3HP            | 1.5HP          | F3-30 |
| 3600XRI/32     | 6HP            | 3HP            | F3-60 |
| 3600XRI/36     | 6.5HP          | 3HP            | F3-60 |
|                |                |                |       |
|                | 415VAC, 320VDC | 240VAC, 180VDC |       |
| 3600XRI/36LL   | 10HP           | 6HP            | F3-60 |
|                |                |                |       |
|                | 480VAC, 360VDC | 240VAC, 180VDC |       |
| 3600XRI/32C132 | 10HP           | 6HP            | F3-60 |



Model 400i, up to 0.75HP  
4" x 6.25" x 2" (100 x 160 x 50mm)



Model 1600i, up to 3HP  
6.1" x 6.1" x 3.4" (150 x 150 x 85 mm)



Model 3200i, up to 7.5HP  
6.1" x 8.0" x 4.2" (150 x 200 x 105 mm)



Model 3600XRI  
Up to 32 amps - 6.9"x 8"x 3.2" (175x200x80 mm)  
36 amps unit - 6.9"x 8"x 3.8" (175x200x95 mm)

## Standard Features

Approvals: CE  
Linear torque control  
Armature voltage or tach feedback  
Calibration range switches  
Speed reference 0-10V or 4-20mA  
Maximum and minimum speed settings  
Adjustable current limit  
Current range switch selectable (not on 400i)  
Independently adjustable up and down ramps  
150% overload capacity, 30 second stall timer  
Stall relay contact output (transistor on 400i)  
Zero speed relay contact (transistor on 400i)  
Control fuses fitted (Power fuse on 400i)  
Start inhibit after power loss  
Power on and stall indicator LEDs  
Speed signal output  
Current signal output  
Ramp signal output  
Total demand signal output  
Dual supply voltage 110 / 230 VAC, 50/60Hz  
Suitable for shunt or PM motors  
IR compensation  
Stability adjustment

## Additional Regen Drive Features

Speed reference +/-10V or 4-20mA  
Speed trim input  
Independent up & down ramps in FWD & REV  
Separate adjustable current limits motor/brake  
Torque control in either 2 or 4 quadrants  
Relay for Stall, Zero speed, Reverse, Overload  
Control fuses fitted  
Fast, ramped or coast stop  
LEDs for + current, - current, stall & stall timer  
Momentary contact for reversing applications

## Optional drive.web smarty

For complete process automation  
Model dw250-1107 uses discrete I/O interface to the drive and to provide:

- Ethernet networking
- Internet access
- Powerful function blockprogramming
- ModbusRTU and ModbusTCP/IP
- Additional remote I/O
- **savvyPanel** smart touch screens (see page 13 for details)

dw260 screen with dw250 smarty



## Enclosed Drives

Enclosed wall mounting versions of these drives and a wide range of other options are detailed in the "Modulus Drive Units" section of this catalog

## Single Phase DC Drives for OEMs

### Model 370 ... OEM Chassis Drives

Compact, DC drives designed for low cost, non-regenerative, non-isolated machine controls.

#### Basic Specification:

Rating: 1/4HP at 90VDC, 1/2HP at 180VDC

Maximum and minimum speed settings

Current limit

Acceleration pot

Suitable 110 or 230 volts, single phase, 50 or 60Hz (not isolated)

For use with permanent magnet or shunt field motors



#### Dimensions

4" x 4" x 1.6" (100 x 100 x 40mm)

### Models 400, 800, 1200 ... OEM DC Drives (up to 2HP)

Versatile, basic, low cost drives suitable for wide range of machine control applications

| Model  | Amps    | Description                                 | @ 180VDC | @ 90VDC | Dimensions                     |
|--------|---------|---------------------------------------------|----------|---------|--------------------------------|
| 400    | 4 amps  | Open chassis with screw terminals           | 0.75HP   | 0.38HP  | 5.2"x4.0"x1.6" (130x100x40mm)  |
| 800    | 8 amps  | Open chassis with screw terminals           | 1.5HP    | 0.75HP  | 5.2"x4.0"x2.8" (130x100x70mm)  |
| 1200   | 12 amps | Open chassis with screw terminals           | 2.0HP    | 1.0HP   | 5.2"x4.0"x2.8" (130x100x70mm)  |
| 400E   | 4 amps  | Enclosed NEMA 1 with pot, switch, fuse      | 0.75HP   | 0.38HP  | 9.9"x7.0"x3.8" (250x177x95 mm) |
| 800E   | 8 amps  | Enclosed NEMA 1 with pot, switch, fuse      | 1.5HP    | 0.75HP  | 9.9"x7.0"x3.8" (250x177x95 mm) |
| 1200E  | 12 amps | Enclosed NEMA 1 with pot, switch, fuse      | 2.0HP    | 1.0HP   | 9.9"x7.0"x3.8" (250x177x95 mm) |
| 400ER  | 4 amps  | Enclosed, pot, switch, brake, reverse, fuse | 0.75HP   | 0.38HP  | 9.9"x7.0"x3.8" (250x177x95 mm) |
| 800ER  | 8 amps  | Enclosed, pot, switch, brake, reverse, fuse | 1.5HP    | 0.75HP  | 9.9"x7.0"x3.8" (250x177x95 mm) |
| 1200ER | 12 amps | Enclosed, pot, switch, brake, reverse, fuse | 2.0HP    | 1.0HP   | 9.9"x7.0"x3.8" (250x177x95 mm) |

#### Standard features:

Linear torque control

Armature voltage or tach feedback with IR compensation

Calibration range switches (no component changes)

Speed reference 0-10V or 4-20mA

Maximum and minimum speed settings

Adjustable current limit

Independently adjustable up and down ramps

150% overload capacity with 30 second stall timer

Stall and Zero Speed relay driver outputs

Power fuse (up to 12 amps)

Power on and stall indicator LEDs

Stability adjustment

Speed, Ramp Speed and Current signal outputs

International supply voltages 110 / 230 VAC, 50/60hz (not isolated)

Suitable for shunt wound or permanent magnet motors



Model 1200E

# DC Servo Drives

These drives are designed for small, high performance position and speed control applications such as robotics, mechanical handling, automated assembly, packaging processes, machine tool axis, etc.

The units are miniature, fast response, reversing, linear transistor drives for brushed DC motors with armatures up to 48 volts. They operate from either a smoothed, unregulated, rectified DC, or battery supply, and include built in thermal protection, current limit with short term overcurrent capacity and resettable overload trip.

The control circuits are designed to ensure extremely low noise emissions, and will meet the most stringent of EMC (Electro-Magnetic Compliance) requirements.

## Model 200XLV 4-Quadrant DC Drive

Miniature linear amplifier with built in "P" or "P+I" or "PID" (Proportional, Integral, Derivative) for closed loop position, speed or torque control.

### Optional configurations:

1. Speed control, armature voltage feedback with IR compensation.
2. Speed control, tach feedback.
3. Position control, position feedback.
4. Torque control with armature current feedback

### Specifications

| Model  | Max Amps | Dimensions                         |
|--------|----------|------------------------------------|
| 200XLV | 2        | 3.25" x 1.65" x 1.65" (82x40x40mm) |



## Models 400XLV, 800XLV & 1200XLV 4-Quadrant DC, PWM Servo Drives

These products are designed for small, high performance position and speed control applications such as robotics, mechanical handling, automated assembly, packaging processes, machine tool axis, etc.



| Model   | Max Amps | Dimensions                                 |
|---------|----------|--------------------------------------------|
| 400XLV  | 4        | 4.2"h x 2.4"w x 4.75"d (106 x 61 x 120mm)  |
| 800XLV  | 8        | 4.2"h x 2.75"w x 4.75"d (106 x 70 x 120mm) |
| 1200XLV | 12       | 4.2"h x 2.75"w x 4.75"d (106 x 70 x 120mm) |



### Standard Features

- Speed, or Torque control modes
- Extremely low RF noise emissions
- Ready indicator light
- Motor voltage range: +/-6 VDC to +/-48 VDC
- Armature current (see specifications below)
- Supply voltage 12 to 48 VDC
- Precision 5v and 10v references
- Differential setpoint inputs (300K ohms)
- Overload trip
- Thermal protection
- Adjustable Maximum Speed
- Adjustable IR Compensation for arm volts f/b
- Plug-in terminals
- DIN rail mounting (optional on 200XLV)

### smarty Motion Control Options

Full featured motion controller with:

- Trapezoidal and cam motion functions
- Encoder speed & position feedback
- Ethernet, multi-axis networking
- **savvyPanel touch** industrial displays (see page 13)



## PL Series ...digital dc drives



up to  
**2000+HP**



**LA503846**  
dw Ethernet  
Through-Panel  
Port for closed  
door system  
access



### Standard Features

- Total digital control
- Basic peer-to-peer link
- 40 character backlit display
- Friendly, easy menu structure
- Modern, compact packaging
- Extensive, flexible, plug-in I/O
- RS232 serial port
- Easy configuration saving & cloning
- Built-in automatic field controller
- Built in programmable control functions for PID, winders, orientation, etc.
- Tach, encoder & arm volts feedback
- Easy reliable autotune

All suffix d PL/X drives include an embedded **speedy** Automation Controller (dw271/dw221) for safe, doors closed, start up & operation with:

- Easy USB port interface
- Peer-to-peer Ethernet communications
- **drive.web** programmable control
- ModbusTCP over Ethernet
- Easy, safe, **savvyPanel** "Quick Start"  
- see pages 21 & 22 for dw271 details -

### Optional:

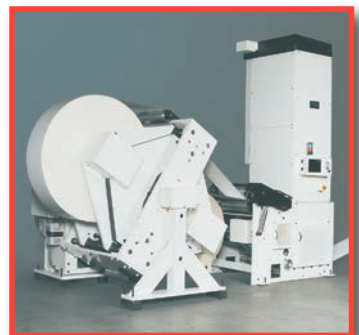
- ModbusRTU RS485 serial port
- Devicenet, Profibus DP, fieldbus



### powerDRIVE Packages

PL/X DC drives up to 1200 horsepower are available in compact **powerDRIVE** packages complete with:

- Main contactor
- High speed 3-phase line fuses
- High speed armature fuse
- High speed control/field fuses
- Line filter (100HP & up)
- USB & Ethernet interface with **speedy dw271/dw221**
- Optional motor blower starter (100HP & up)



# Key Features

## Analog Inputs & Outputs

8 analog inputs & 4 analog outputs (12 bits)  
All outputs short circuit protected  
All inputs over voltage protected up to +50v  
Inputs configurable 5 to 30v  
Input volts programmable up to +/-30v

## Digital Inputs & Outputs

17 digital inputs & 7 digital outputs  
Digital I/O short circuit protected  
Digital inputs over volts protected to +50v  
(with settable switching levels)  
Digital outputs over volts protected to +50v

## Speed Feedback - Standard

Analog tach  
Encoder  
Armature voltage  
Encoder + armature volts  
Encoder + analog tach

## Field Configurations

Fixed Current  
Fixed voltage  
Automatic field weakening  
Delayed field quench  
Standby field setting  
Field economy

## Diagnostic Monitoring

Scope terminal monitors selectable values  
All analog input voltages  
All digital input states  
All analog output voltages  
All digital output states  
Tach volts  
Motor arm volts & amps  
Field current  
Output power Kw  
AC supply volts

## User Configurable Software Functions

PID blocks, Parameter profiler, Winder reel diameter calculator, Winder taper tension calculator, Winder torque/inertia/friction compensator, Preset speed function, Two summers, Software "motorized pot", Interval timer, Current profiling, Zero speed with shaft position lock, Jog / crawl functions, Two filters, Dual motor swap, Latch, Sample & hold function, Auto self-tune current loop, Linear and S-ramps, Slack take-up, Batch Counter, Draw control.

## Engineered Configuration Packages

Pre-configured generic apps are available for Open & Closed Loop Winders, Position Controls, Coordinated Line Drives, Indexing, registration and others.

## Safe, "Doors Closed" Start Up & Operation

The *dw271/dw221* Automation Controller is embedded as standard providing isolated USB and Ethernet ports with full access for remote configuration & control.

## Protection

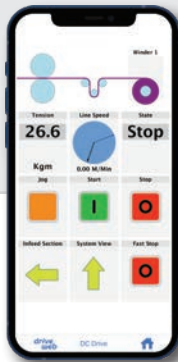
Interline device networks  
High energy MOV's  
Instantaneous overcurrent  
Overcurrent ( inverse time)  
Field fail and overcurrent  
Motor over temperature  
SCR (thyristor) over temp  
Main power phase loss  
Armature over volts  
Over speed protection  
Speed feedback mismatch  
Stall protection  
Standstill logic  
SCR (Thyristor) trigger failure  
Digital output short circuit

## Communications Ports

*drive.web* peer-to-peer Ethernet  
ModbusTCP/IP Ethernet  
USB port for easy network wide set up  
Serial port (RS232)

## Optional Communications

Ethernet: EIP (PCCC)  
ModbusRTU  
Profibus DP



Easily add a **savvyPanel** touch screen HMI with secure WiFi interface

- Simple, intuitive configuration techniques with clear display of information
- No pots or switches to set
- Accurate display of voltages and currents
- Positive displacement pushbuttons for tactile feel
- High power processor and large memory will ensure ease of product enhancement in the future
- 2-button reset gets users back to OEM set up
- Powerful **savvy** graphical configuration, diagnostics & system design tools



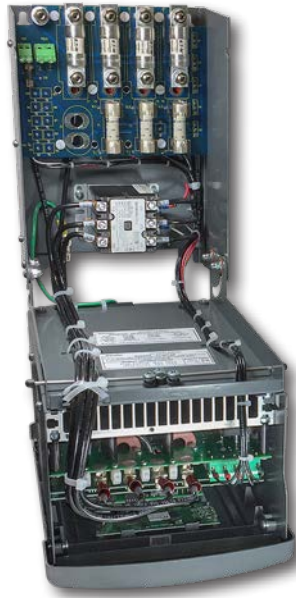
Reliable, easy plug-in control terminals

The powerful **savvy** configuration tools are used for the PL Series DC drives, AC drives, **drive.web** programmable controllers, **savvyPanel** operator stations & complete systems.



↑ 75 HP, PLX50/123

powerPLX50/123 →  
With fuses, contactor  
& power components  
(shown hinged open  
for easy access)



↑ 400 HP, PL265/630

powerPL265/630 →  
With fuses, contactor  
& power components  
(shown with optional  
motor blower starter)



## Models & Ratings

### 4-Quadrant, Regenerative Drives

| HP @<br>500V arm<br>460VAC | HP @<br>240V arm<br>230VAC | Armature<br>Amps DC<br>@ 40°C power(basic) | Field<br>Amps DC<br>@ 40°C power(basic) | powerDRIVE<br>Model | Dimensions<br>W x H x D (weight)<br>inches (LBS) | basicDRIVE<br>Model | Dimensions<br>W x H x D (weight)<br>inches (LBS) | Line<br>Reactor<br>Model |
|----------------------------|----------------------------|--------------------------------------------|-----------------------------------------|---------------------|--------------------------------------------------|---------------------|--------------------------------------------------|--------------------------|
| 20                         | 10                         | 36                                         | 5(8)                                    | powerPLX15/36d      | 8.5 x 11.4 x 11.7 (26)                           | PLX15/36d           | 8.5 x 11.4 x 6.9 (16)                            | LM37                     |
| 30                         | 10                         | 51                                         | 5(8)                                    | powerPLX20/51d      | 8.5 x 11.4 x 11.7 (26)                           | PLX20/51d           | 8.5 x 11.4 x 6.9 (16)                            | LM52                     |
| 60                         | 25                         | 99                                         | 5(8)                                    | powerPLX40/99d      | 8.5 x 11.4 x 11.7 (30)                           | PLX40/99d           | 8.5 x 11.4 x 6.9 (17)                            | LM120                    |
| 75                         | 35                         | 123                                        | 5(8)                                    | powerPLX50/123d     | 8.5 x 11.4 x 11.7 (30)                           | PLX50/123d          | 8.5 x 11.4 x 6.9 (17)                            | LM120                    |
| 100                        | 50                         | 164                                        | 10(16)                                  | powerPLX65/164d     | 16 x 33 x 9.7 (80)                               | PLX65/164d          | 8.5 x 16.2 x 8.6 (27)                            | LM150                    |
| 125                        | 60                         | 205                                        | 10(16)                                  | powerPLX85/205d     | 16 x 33 x 9.7 (80)                               | PLX85/205d          | 8.5 x 16.2 x 8.6 (27)                            | LM195                    |
| 150                        | 75                         | 270                                        | 10(16)                                  | powerPLX115/270d    | 16 x 33 x 9.7 (82)                               | PLX115/270d         | 8.5 x 16.2 x 8.6 (28)                            | LM240                    |
| 200                        | 100                        | 330                                        | 10(16)                                  | powerPLX145/330d    | 16 x 33 x 9.7 (89)                               | PLX145/330d         | 8.5 x 16.2 x 8.6 (28)                            | LM300                    |
| 250                        | 125                        | 405                                        | 20(32)                                  | powerPLX185/405d    | 16 x 43.5 x 14.4 (143)                           | PLX185/430d         | 8.5 x 19.9 x 14.4 (43)                           | LM375                    |
| 300                        | 150                        | 480                                        | 20(32)                                  | powerPLX225/480d    | 16 x 43.5 x 14.4 (145)                           | PLX225/530d         | 8.5 x 19.9 x 14.4 (45)                           | LM480                    |

### 2-Quadrant, Non-Reversing Drives

| HP @<br>500V arm<br>460VAC | HP @<br>240V arm<br>230VAC | Armature<br>Amps DC<br>@ 40°C power(basic) | Field<br>Amps DC<br>@ 40°C power(basic) | powerDRIVE<br>Model | Dimensions<br>W x H x D (weight)<br>inches (LBS) | basicDRIVE<br>Model | Dimensions<br>W x H x D (weight)<br>inches (LBS) | Line<br>Reactor<br>Model |
|----------------------------|----------------------------|--------------------------------------------|-----------------------------------------|---------------------|--------------------------------------------------|---------------------|--------------------------------------------------|--------------------------|
| 20                         | 10                         | 36                                         | 5(8)                                    | powerPL15/36d       | 8.5 x 11.4 x 11.7 (26)                           | PL15/36d            | 8.5 x 11.4 x 6.9 (16)                            | LM37                     |
| 30                         | 10                         | 51                                         | 5(8)                                    | powerPL20/51d       | 8.5 x 11.4 x 11.7 (26)                           | PL20/51d            | 8.5 x 11.4 x 6.9 (16)                            | LM52                     |
| 60                         | 25                         | 99                                         | 5(8)                                    | powerPL40/99d       | 8.5 x 11.4 x 11.7 (30)                           | PL40/99d            | 8.5 x 11.4 x 6.9 (17)                            | LM120                    |
| 75                         | 35                         | 123                                        | 5(8)                                    | powerPL50/123d      | 8.5 x 11.4 x 11.7 (30)                           | PL50/123d           | 8.5 x 11.4 x 6.9 (17)                            | LM120                    |
| 100                        | 50                         | 164                                        | 10(16)                                  | powerPL65/164d      | 16 x 33 x 9.7 (80)                               | PL65/164d           | 8.5 x 16.2 x 8.6 (27)                            | LM150                    |
| 125                        | 60                         | 205                                        | 10(16)                                  | powerPL85/205d      | 16 x 33 x 9.7 (80)                               | PL85/205d           | 8.5 x 16.2 x 8.6 (27)                            | LM195                    |
| 150                        | 75                         | 270                                        | 10(16)                                  | powerPL115/270d     | 16 x 33 x 9.7 (82)                               | PL115/270d          | 8.5 x 16.2 x 8.6 (28)                            | LM240                    |
| 200                        | 100                        | 330                                        | 10(16)                                  | powerPL145/330d     | 16 x 33 x 9.7 (89)                               | PL145/330d          | 8.5 x 16.2 x 8.6 (28)                            | LM300                    |
| 250                        | 125                        | 405                                        | 20(32)                                  | powerPL185/405d     | 16 x 43.5 x 14.4 (143)                           | PL185/430d          | 8.5 x 19.9 x 14.4 (43)                           | LM375                    |
| 300                        | 150                        | 480                                        | 20(32)                                  | powerPL225/480d     | 16 x 43.5 x 14.4 (143)                           | PL225/530d          | 8.5 x 19.9 x 14.4 (45)                           | LM480                    |
| 400                        | 200                        | 630                                        | 20(32)                                  | powerPL265/630d     | 16 x 43.5 x 14.4 (154)                           | PL265/630d          | 8.5 x 19.9 x 14.4 (45)                           | LM600                    |

basicDRIVES must be installed with new contactor and the correct high speed SCR fuses to maintain the warranty

drive.web options see pages 25 - 29

USB cable for programming (USB A to USB-C), 2M long - part number LA504302

USB cable for programming (USB C to USB-C), 2M long - part number LA504758

Computer RS232 Communications Cable - Drive to DB9 - part number LA102595

For details of Drive Isolation Transformers, Line Reactors and Line Filters

Consult  
Factory  
+410-604-3400

# PL-Series Drives to 2000HP

## Models & Ratings

DC drives 400 HP to 2000 HP are normally available as **basicDRIVES** but can be supplied with **powerKITS** including:

- High speed fuses for line, armature & field
- Main contactor
- Line filter
- Flexible bus bar kits

(**basicDRIVES** must be installed with new power components to maintain the warranty)

Drives are available for either 6-pulse or 12-pulse, 460, 600 or 690 VAC configurations - please call for further information.

SAFE, "DOORS CLOSED" START UP AND OPERATION

Drive models with suffix "d" include a speedy dw271/dw221 onboard controller with drive.web



### DC Drives - 500 VDC Armature, 480VAC Supply

| HP @ | ARMATURE<br>AMPS DC<br>@ 40°C | FIELD<br>AMPS DC<br>Basic(Optional) | <b>basicDRIVE</b><br>4-QUAD REGEN<br>REVERSING | <b>basicDRIVE</b><br>NON-REVERSING | DIMENSIONS<br>W x H x D (weight)<br>INCHES (LBS)<br>TOP CABLE ENTRY | OVERLOAD<br>RATING |
|------|-------------------------------|-------------------------------------|------------------------------------------------|------------------------------------|---------------------------------------------------------------------|--------------------|
| 400  | 650                           | 32 (50)                             | PLX275/650d                                    | PL275/650d                         | 10 x 30 x 13.8 (120)                                                | 150%, 25 SECS      |
| 450  | 750                           | 32 (50)                             | PLX315/750d                                    | PL315/750d                         | 10 x 30 x 13.8 (120)                                                | 150%, 25 SECS      |
| 500  | 850                           | 32 (50)                             | PLX360/850d                                    | PL360/850d                         | 10 x 30 x 13.8 (120)                                                | 150%, 25 SECS      |
| 575  | 950                           | 32 (50)                             | PLX400/950d                                    | PL400/950d                         | 10 x 30 x 13.8 (120)                                                | 150%, 25 SECS      |
| 650  | 1050                          | 32 (50)                             | PLX440/1050d                                   | PL440/1050d                        | 10 x 30 x 13.8 (120)                                                | 100%, CONT         |
| 750  | 1250                          | 64                                  | PLX520/1250d                                   | PL520/1250d                        | 20 x 30 x 13.8 (285)                                                | 150%, 25 SECS      |
| 895  | 1450                          | 64                                  | PLX600/1450d                                   | PL600/1450d                        | 20 x 30 x 13.8 (285)                                                | 150%, 25 SECS      |
| 1000 | 1650                          | 64                                  | PLX700/1650d                                   | PL700/1650d                        | 20 x 30 x 13.8 (285)                                                | 150%, 25 SECS      |
| 1140 | 1850                          | 64                                  | PLX800/1850d                                   | PL800/1850d                        | 20 x 30 x 13.8 (285)                                                | 150%, 25 SECS      |
| 1260 | 2050 @35°C                    | 64                                  | PLX900/2050d                                   | PL900/2050d                        | 20 x 30 x 13.8 (285)                                                | 150%, 25 SECS      |
| 1380 | 2250 @35°C                    | 64                                  | PLX980/2250d                                   | PL980/2250d                        | 20 x 30 x 13.8 (285)                                                | 100%, CONT         |

### DC Drives - 600 VDC Armature, 600VAC Supply

|      |            |         |                |               |                      |               |
|------|------------|---------|----------------|---------------|----------------------|---------------|
| 480  | 650        | 32 (50) | PLX275MV/650d  | PL275MV/650d  | 10 x 30 x 13.8 (120) | 150%, 25 SECS |
| 550  | 750        | 32 (50) | PLX315MV/750d  | PL315MV/750d  | 10 x 30 x 13.8 (120) | 150%, 25 SECS |
| 630  | 850        | 32 (50) | PLX360MV/850d  | PL360MV/850d  | 10 x 30 x 13.8 (120) | 150%, 25 SECS |
| 700  | 950        | 32 (50) | PLX400MV/950d  | PL400MV/950d  | 10 x 30 x 13.8 (120) | 150%, 25 SECS |
| 775  | 1050       | 32 (50) | PLX440MV/1050d | PL440MV/1050d | 10 x 30 x 13.8 (120) | 100%, CONT    |
| 925  | 1250       | 64      | PLX520MV/1250d | PL520MV/1250d | 20 x 30 x 13.8 (285) | 150%, 25 SECS |
| 1075 | 1450       | 64      | PLX600MV/1450d | PL600MV/1450d | 20 x 30 x 13.8 (285) | 150%, 25 SECS |
| 1220 | 1650       | 64      | PLX700MV/1650d | PL700MV/1650d | 20 x 30 x 13.8 (285) | 150%, 25 SECS |
| 1370 | 1850       | 64      | PLX800MV/1850d | PL800MV/1850d | 20 x 30 x 13.8 (285) | 150%, 25 SECS |
| 1510 | 2050 @35°C | 64      | PLX900MV/2050d | PL900MV/2050d | 20 x 30 x 13.8 (285) | 150%, 25 SECS |
| 1660 | 2250 @35°C | 64      | PLX980MV/2250d | PL980MV/2250d | 20 x 30 x 13.8 (285) | 100%, CONT    |

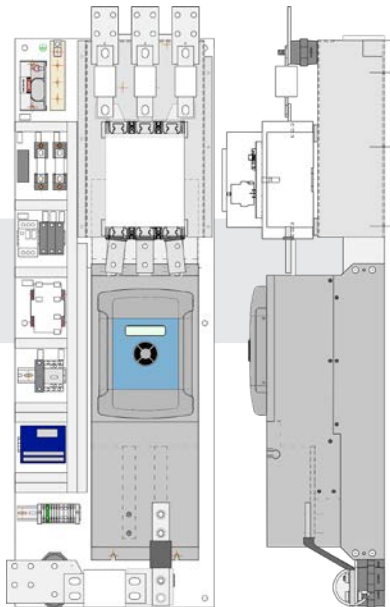
### DC Drives - 700 VDC Armature, 690VAC Supply

|      |            |         |                |               |                      |               |
|------|------------|---------|----------------|---------------|----------------------|---------------|
| 550  | 650        | 32 (50) | PLX275HV/650d  | PL275HV/650d  | 10 x 30 x 13.8 (120) | 150%, 25 SECS |
| 650  | 750        | 32 (50) | PLX315HV/750d  | PL315HV/750d  | 10 x 30 x 13.8 (120) | 150%, 25 SECS |
| 735  | 850        | 32 (50) | PLX360HV/850d  | PL360HV/850d  | 10 x 30 x 13.8 (120) | 150%, 25 SECS |
| 820  | 950        | 32 (50) | PLX400HV/950d  | PL400HV/950d  | 10 x 30 x 13.8 (120) | 150%, 25 SECS |
| 900  | 1050       | 32 (50) | PLX440HV/1050d | PL440HV/1050d | 10 x 30 x 13.8 (120) | 100%, CONT    |
| 1080 | 1250       | 64      | PLX520HV/1250d | PL520HV/1250d | 20 x 30 x 13.8 (285) | 150%, 25 SECS |
| 1250 | 1450       | 64      | PLX600HV/1450d | PL600HV/1450d | 20 x 30 x 13.8 (285) | 150%, 25 SECS |
| 1420 | 1650       | 64      | PLX700HV/1650d | PL700HV/1650d | 20 x 30 x 13.8 (285) | 150%, 25 SECS |
| 1600 | 1850       | 64      | PLX800HV/1850d | PL800HV/1850d | 20 x 30 x 13.8 (285) | 150%, 25 SECS |
| 1770 | 2050 @35°C | 64      | PLX900HV/2050d | PL900HV/2050d | 20 x 30 x 13.8 (285) | 150%, 25 SECS |
| 1940 | 2250 @35°C | 64      | PLX980HV/2250d | PL980HV/2250d | 20 x 30 x 13.8 (285) | 100%, CONT    |

## DC powerDRIVES - 500 VDC Armature, 480 VAC Supply

| HP @<br>500 VDC<br>460 VAC                        | ARMATURE<br>AMPS DC<br>@40°C | FIELD<br>AMPS DC | FRAME<br>SIZE | powerDRIVE<br>& <i>dw271 speedy</i> | Fan Supply Kit<br>460/230V Transfmr<br>Fuses + h/w |
|---------------------------------------------------|------------------------------|------------------|---------------|-------------------------------------|----------------------------------------------------|
| <b>REGENERATIVE, REVERSING, 4-QUADRANT DRIVES</b> |                              |                  |               |                                     |                                                    |
| 400                                               | 650                          | 32 (50)          | 4             | powerPLX275/650v2d                  | FANSUPPLY4                                         |
| 450                                               | 750                          | 32 (50)          | 4             | powerPLX315/750v2d                  | FANSUPPLY4                                         |
| 500                                               | 850                          | 32 (50)          | 4             | powerPLX360/850v2d                  | FANSUPPLY4                                         |
| 575                                               | 950                          | 32 (50)          | 4             | powerPLX400/950v2d                  | FANSUPPLY4                                         |
| 600                                               | 1000                         | 64               | 5             | powerPLX520/1000d                   | FANSUPPLY5                                         |
| 700                                               | 1150                         | 64               | 5             | powerPLX520/1150d                   | FANSUPPLY5                                         |
| 800                                               | 1350                         | 64               | 5             | powerPLX600/1350d                   | FANSUPPLY5                                         |
| 1000                                              | 1650                         | 64               | 5             | powerPLX700/1650d                   | FANSUPPLY5                                         |
| 1100                                              | 1750                         | 64               | 5             | powerPLX800/1750d                   | FANSUPPLY5                                         |
| 1200                                              | 1950                         | 64               | 5             | powerPLX900/1950d                   | FANSUPPLY5                                         |
| <b>NON-REGENERATIVE, 2-QUADRANT DRIVES</b>        |                              |                  |               |                                     |                                                    |
| 400                                               | 650                          | 32 (50)          | 4             | powerPL275/650v2d                   | FANSUPPLY4                                         |
| 450                                               | 750                          | 32 (50)          | 4             | powerPL315/750v2d                   | FANSUPPLY4                                         |
| 500                                               | 850                          | 32 (50)          | 4             | powerPL360/850v2d                   | FANSUPPLY4                                         |
| 575                                               | 950                          | 32 (50)          | 4             | powerPL400/950v2d                   | FANSUPPLY4                                         |
| 700                                               | 1150                         | 64               | 5             | powerPL520/1150d                    | FANSUPPLY5                                         |
| 800                                               | 1350                         | 64               | 5             | powerPL600/1350d                    | FANSUPPLY5                                         |
| 1000                                              | 1650                         | 64               | 5             | powerPL700/1650d                    | FANSUPPLY5                                         |
| 1100                                              | 1750                         | 64               | 5             | powerPL800/1750d                    | FANSUPPLY5                                         |
| 1200                                              | 1950                         | 64               | 5             | powerPL900/1950d                    | FANSUPPLY5                                         |

Consult Factory for powerkits



Size 4 powerPL/X315 - 400

### NOTE 1:

To encourage "doors closed", safe start up & maintenance practices, all suffix d PL/X drives are fitted with a *dw221/dw271 speedy* with isolated USB and Ethernet ports as standard for full remote configuration & control access.

### NOTE 2:

Due to the weight and dimensions, size 5 powerDRIVES are shipped in two parts (basic drive & power package panel) that will need to be assembled on site

| Frame 4 Dimensions |       |       |       |
|--------------------|-------|-------|-------|
| Drive              | OW    | OH    | OD    |
| powerPL275         | 18.5" | 53.0" | 14.9" |
| powerPLX275        | 18.5" | 53.0" | 14.9" |
| powerPL315         | 18.5" | 56.0" | 16.0" |
| powerPLX315        | 19.3" | 56.0" | 16.0" |
| powerPL360         | 18.5" | 60.0" | 16.9" |
| powerPLX360        | 19.3" | 60.0" | 16.9" |
| powerPL400         | 18.5" | 60.0" | 16.9" |
| powerPLX400        | 19.3" | 63.9" | 16.9" |
| Frame 5 Dimensions |       |       |       |
| All frame 5 drives | 30.0" | 67.0" | 16.9" |



Size 5 powerPL/X520 - 900

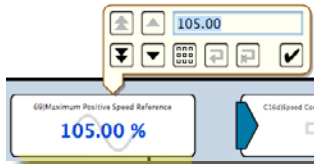
## PLXDd Separate Stack Controller

The PLXDd is a great retrofit option for controlling large separate SCR stacks in either 6 or 12-pulse DC drive configurations and also for wound rotor motor SCR stack control. The unit has all the standard PL/X series drive features together with:

- Available for stacks up to 690 volts AC, 700 volts DC
  - Built-in 32 amps fully automatic field controller (optional 50 amps rating)
  - Separate gate pulse driver unit for greater noise immunity and reliability
  - Ethernet and *drive.web* distributed control
  - Optional current transformers
- Please call for details



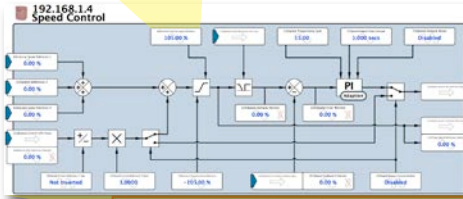
## savvy tools for the PL/X DC drives



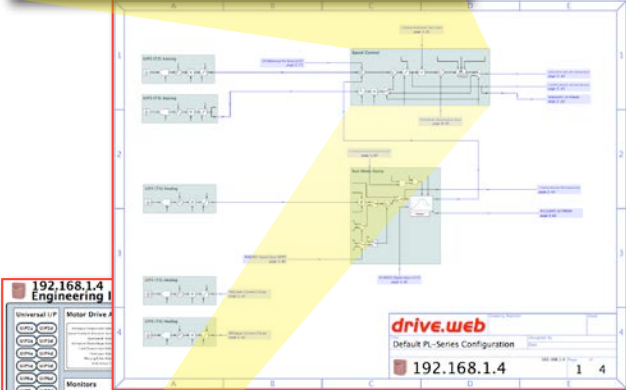
### drive.web automation

- Intuitive
- Easy
- Reliable
- Very smart!

click on a parameter to open the setter



click on a function block to drill down to the detail



↑ View the drive Signal Flow Diagram  
or  
← View the drive in Engineering Info

- Import or export data
- Monitor trend charts
- Edit the configuration
- Drag & drop links
- Access multiple drives

## Line Reactors For 3-Phase DC Drives

### 3% Impedance 3-Phase Input Reactors

| HP  | Model     | AC Amps | 230V       |       |                        |     |
|-----|-----------|---------|------------|-------|------------------------|-----|
|     |           |         | Watts Loss | mH    | Dimensions (W X H X D) | Lbs |
| 1   | LMAC321   | 4       | 14.5       | 3     | 4.3 X 2.7 X 4          | 4   |
| 2   | LMAC322   | 8       | 19.5       | 1.5   | 5.9 X 2.9 X 4.7        | 7   |
| 3   | LMAC323   | 12      | 26         | 1.25  | 5.9 X 3.2 X 5          | 9   |
| 5   | LMAC325   | 18      | 36         | 0.8   | 5.9 X 3.2 X 5.1        | 9   |
| 7.5 | LMAC327.5 | 25      | 48         | 0.5   | 7.2 X 3.5 X 5.8        | 11  |
| 10  | LMAC3210  | 35      | 49         | 0.4   | 7.2 X 3.7 X 5.8        | 14  |
| 15  | LMAC3215  | 45      | 54         | 0.3   | 9 X 4.6 X 7.2          | 22  |
| 20  | LMAC3220  | 55      | 64         | 0.25  | 9 X 5.4 X 6.9          | 24  |
| 25  | LMAC3225  | 80      | 82         | 0.2   | 9 X 5.7 X 6.9          | 25  |
| 35  | LMAC3235  | 100     | 94         | 0.15  | 9 X 6 X 7.0            | 29  |
| 50  | LMAC3250  | 130     | 108        | 0.1   | 9.6 X 5.9 X 7.2        | 29  |
| 60  | LMAC3260  | 160     | 116        | 0.075 | 9.6 X 6 X 7.3          | 41  |
| 75  | LMAC3275  | 200     | 124        | 0.055 | 9.6 X 7.1 X 7.3        | 38  |
| 100 | LMAC32100 | 250     | 154        | 0.045 | 9.6 X 8.1 X 7.3        | 47  |
| 125 | LMAC32125 | 320     | 224        | 0.04  | 10.8 X 7.9 X 8.5       | 80  |
| 150 | LMAC32150 | 400     | 213        | 0.03  | 11 X 8.6 X 8.5         | 84  |
| 200 | LMAC32200 | 500     | 226        | 0.025 | 10.8 X 9.5 X 8.5       | 93  |

### 460V

| HP  | Model     | AC Amps | Watts Loss | mH    | Dimensions (W X H X D) | Lbs |
|-----|-----------|---------|------------|-------|------------------------|-----|
| 1   | LMAC341   | 2       | 7.5        | 12    | 4.3 x 2.7 x 4          | 2.5 |
| 2   | LMAC342   | 4       | 20         | 6.5   | 4.3 x 2.7 x 4.1        | 4   |
| 5   | LMAC345   | 8       | 29         | 3     | 5.9 x 2.9 x 4.7        | 8   |
| 7.5 | LMAC347.5 | 12      | 31         | 2.5   | 5.9 x 3.2 x 5.1        | 10  |
| 10  | LMAC3410  | 18      | 43         | 1.5   | 5.9 x 3.6 x 5.1        | 12  |
| 15  | LMAC3415  | 25      | 52         | 1.2   | 7.2 x 3.5 x 5.8        | 14  |
| 25  | LMAC3425  | 35      | 54         | 0.8   | 7.2 x 3.7 x 5.8        | 16  |
| 30  | LMAC3430  | 45      | 62         | 0.7   | 9 x 4.6 x 7.3          | 26  |
| 40  | LMAC3440  | 55      | 67         | 0.5   | 9 x 5.4 x 7            | 26  |
| 60  | LMAC3460  | 80      | 86         | 0.4   | 9 x 5.8 x 7.1          | 33  |
| 75  | LMAC3475  | 100     | 84         | 0.3   | 9 x 6.6 x 7            | 37  |
| 100 | LMAC34100 | 130     | 180        | 0.2   | 9.6 x 6 x 7.3          | 43  |
| 125 | LMAC34125 | 160     | 149        | 0.15  | 10.8 x 6.9 x 8.5       | 54  |
| 150 | LMAC34150 | 200     | 168        | 0.11  | 9.6 x 7.9 x 7.2        | 54  |
| 200 | LMAC34200 | 250     | 231        | 0.09  | 10.8 x 7.6 x 8.5       | 80  |
| 250 | LMAC34250 | 320     | 264        | 0.075 | 10.8 x 8.9 x 8.4       | 102 |
| 300 | LMAC34300 | 400     | 571        | 0.06  | 14.3 x 9.4 x 11.2      | 118 |
| 400 | LMAC34400 | 500     | 694        | 0.05  | 14.3 x 10.5 x 11.2     | 160 |
| 500 | LMAC34500 | 600     | 689        | 0.04  | 14.3 x 11 x 11.1       | 175 |

Consult Factory for 1.5% impedance or additional enclosure options.

## Power Quality For DC Drives

### Drive Isolation Transformers

#### Standard specification:

NEMA 3R enclosed (indoor use, sprinkler protection)  
K-factor 4  
Windings: Delta Primary, Wye Secondary  
Aluminum or Copper windings as indicated  
Taps at ± 5%  
Approvals: UL, cUL

#### Options

Outdoor enclosures  
Frequencies other than 60Hz  
Voltages other than 230/460/575 pri, 230/460 sec  
Special Taps  
Fungus Proofing  
80°C & 115°C Rise  
Copper Windings  
Electrostatic Shield  
K-13, K-20, K-30

Discount Schedule SX-1

Consult factory for additional enclosure options

#### Model

DIT3\*\*  
DIT6\*\*  
DIT11\*\*  
DIT14\*\*  
DIT20\*\*  
DIT27\*\*  
DIT34\*\*  
DIT40\*\*  
DIT51\*\*  
DIT63\*\*  
DIT75\*\*  
DIT93\*\*  
DIT118\*\*  
DIT145\*\*  
DIT175\*\*  
DIT220\*\*  
DIT275\*\*  
DIT330\*\*  
DIT440\*\*  
DIT550\*\*  
DIT660\*\*

#### Specification

3KVA - Cu (2HP)  
6KVA - Cu (5HP)  
11KVA - Al (7.5HP)  
14KVA - Al (10HP)  
20KVA - Al (15HP)  
27KVA - Al (20HP)  
34KVA - Al (25HP)  
40KVA - Al (30HP)  
51KVA - Al (40HP)  
63KVA - Al (50HP)  
75KVA - Al (60HP)  
93KVA - Al (75HP)  
118KVA - Al (100HP)  
145KVA - Al (125HP)  
175KVA - Al (150HP)  
220KVA - Al (200HP)  
275KVA - Al (250HP)  
330KVA - Al (300HP)  
440KVA - Al (400HP)  
550KVA - Al (500HP)  
660KVA - Al (600HP)

## powerSL Series

### Analog DC drives - up to 200HP

powerSLX Regen, reversing drive + field controller  
powerSL Non-reversing drive + field controller  
powerSLE Non-reversing OEM drive.

Call for details



## drive.web smart drives



Add a **drive.web** module to any drive for unlimited automation capability

### Line Filter



LF3 Line Filter

LF3-FK Line Filter Fuse Kit

# 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](http://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.

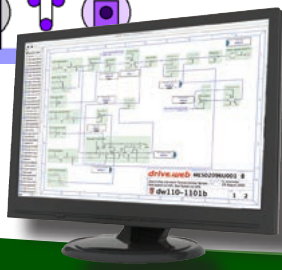
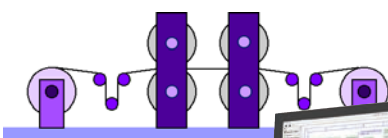
*... it's as easy as that!*

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](mailto:training@driveweb.com)

## Terms of Sale & Payment

Complete Terms & Conditions of Sale are shown at [www.bardac.com](http://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   | \$220 per hour         |
| b. Standard Overtime - Weekdays 6pm to 7am & all day Saturday - Total work time not to exceed 12 hrs in any 24 hrs | \$330 per hour         |
| c. Special Overtime - Sundays, Holidays and excess of 8 hours on Saturday                                          | \$440 per hour         |
| d. Overnight - Includes meals, and hotel accommodation                                                             | \$400 per night        |
| e. Auto Travel - Covering cost of use of company or personal cars, distance to and from the local office           | \$0.75 per mile        |
| f. Public Transport - Rental cars, Air fares, etc.                                                                 | Cost + 10%             |
| 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                                            | \$150 per hour + parts |
| j. Design or application engineering services                                                                      | \$240 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 \$440/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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