

# SPRINT ELECTRIC

## Industrial Internet of Things (IIOT) SMART AUTOMATION

Sprint Electric's Digital PL/X DC Drive series features Drive.Web distributed control technology. Fitted as an optional extra, Drive.Web uses Ethernet and powerful graphical tools to provide robust Programmable Peer Control (PPC) for drives and systems.

The Drive.Web technology is infinitely scalable and cost effective for systems of any size and complexity. For typical motor control systems, Drive.Web beats using any PLC on cost, performance and ease of use.

- Build and operate complete control systems over Ethernet
- Program individual drives, controllers & operator stations
- Make drag & drop connections between devices
- Configure touch screen PC operator stations
- Create roaming HMIs in iOS devices - iPad, iPhone, etc.
- Provide Internet access to your entire system
- Add utilities such as watchdogs, event emails, loggers, etc.
- Support interfaces to existing devices via Modbus, EIP, etc.

### PL/X Digital DC Drive Series IIOT enabled

Ultra-high performance Digital 2Q / 4Q DC Drives up to 2250Amps / 980KW output power. The PL/X series can be supplied with:

#### SPEEDY controller

This miniature smart controller is fitted onto the PL/X control board and features 100base TX Ethernet, Modbus TCP/IP, distributed control, USB port and a wide range of communications options. Offering full Drive.Web functionality, it is programmed using Sprint Electric's Savvy programming tool.

#### SMARTY controller

This DIN-rail mounted controller offers the same features as SPEEDY including 16 I/O terminals.

*Please see brochure for more detail.*



#### SAVVY

System Design & Configuration Tools



#### SAVVY PANEL

Touch screen operator stations with control tools & WiFi "roaming". For PC, iPad or iPhone



#### SMARTY

Programmable controller with comms ports and distributed i/o



#### SPEEDY

Deterministic Ethernet  
Modbus TCP/IP  
Programmable smart controller with USB port



#### SPEEDY

PL/X Digital DC Drive Series - fitted with SPEEDY miniature smart controller  
- peer-to-peer deterministic Ethernet networking with fully programmable control functions

#### SPEEDY

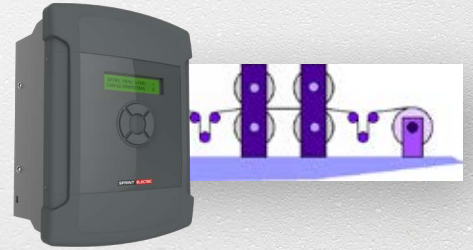
The SPEEDY miniature programmable controller can be used to control or interface with any Ethernet-configured device such as: AC Drives | Servo drives | Stepper drives | Pneumatic control | Hydraulic control | Sensors | PLC's | HMI's | Other devices...



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

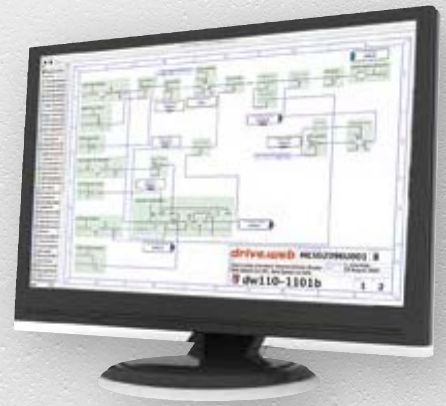
### CONCEPT & PLANNING

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 set up or operational state! Use **savvyPanel** operator station technology to provide smart touch and roaming control from anywhere.



### MANAGEMENT & MAINTENANCE

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





**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

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

### SAVVYPANEL

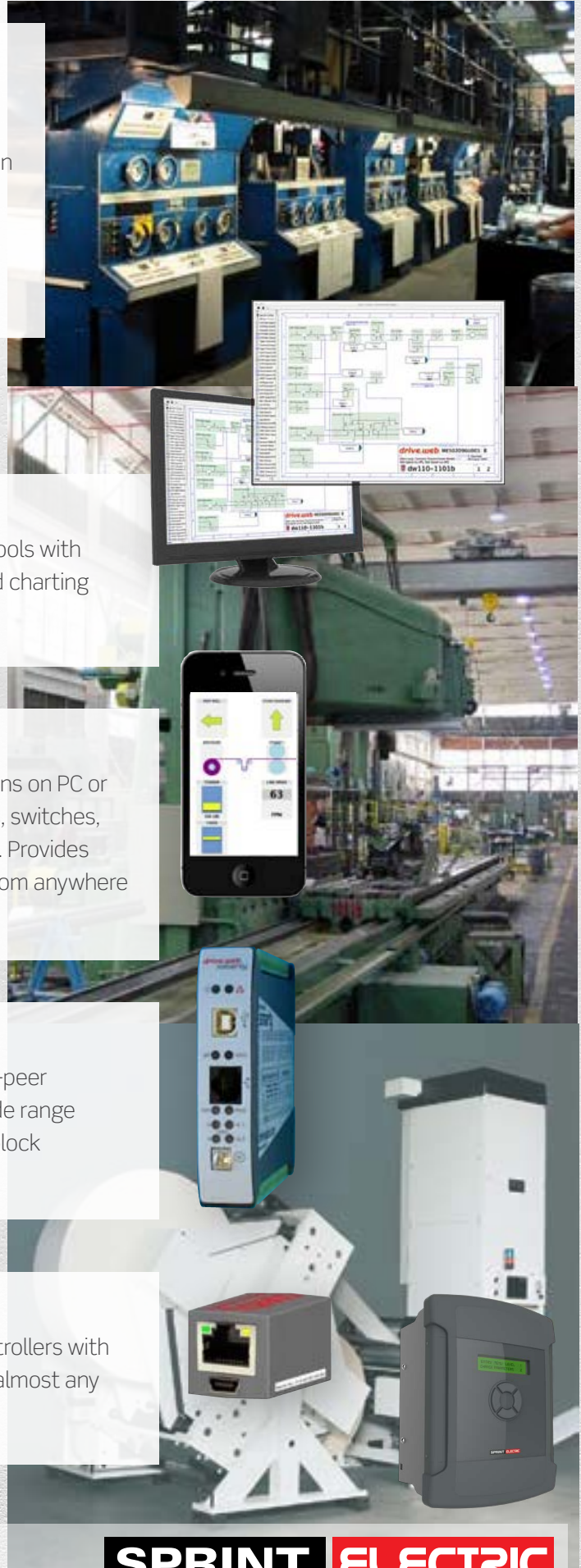
Innovative, touch screen operator station technology that runs on PC or iOS (iPad, iPhone, etc.). Build clear machine graphics, buttons, switches, meters and instrumentation and link to your control scheme. Provides multi-user, multi-level, password protected access via WiFi from anywhere to any system.

### SMARTY

A range of **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

A range of miniature, low cost, **drive.web** programmable controllers with peer-to-peer networking over Ethernet. Easily interfaced to almost any drive or control device.





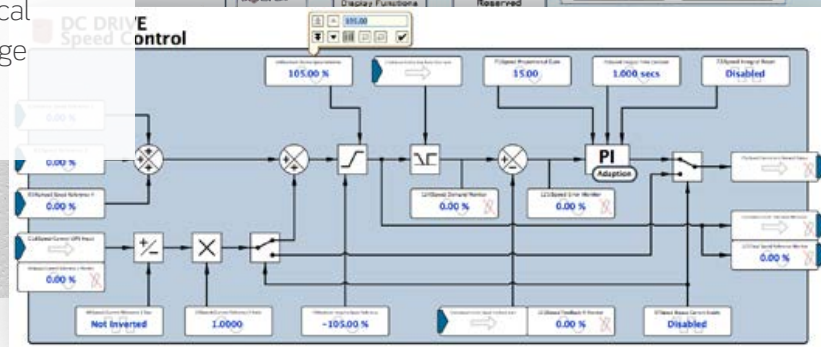
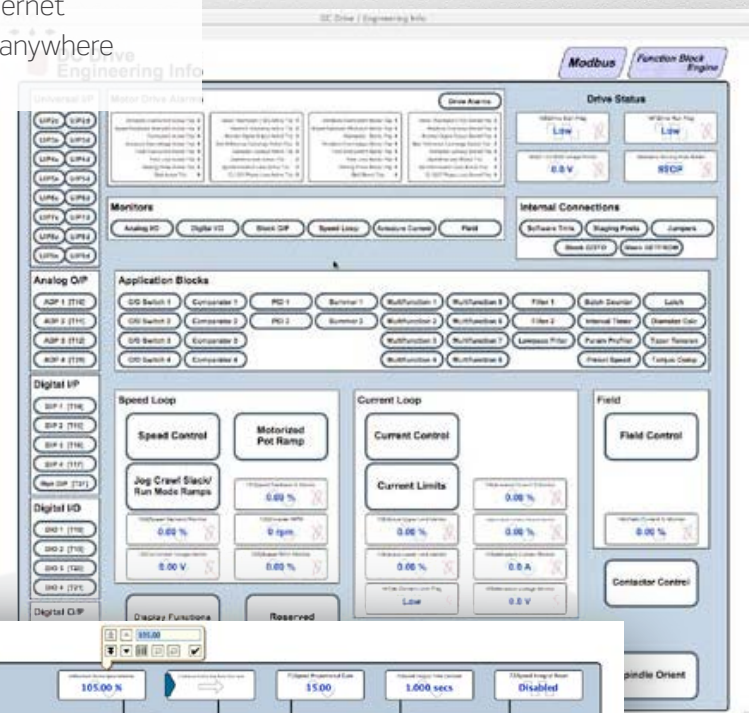
- Configure drives, controllers & operator stations
- Design & build complete systems of any size or complexity
- Network & operate drives & systems over Ethernet
- Provide multi-user, system wide access from anywhere

### ENGINEERING INFO

In complex products with a fixed set of features, such as drives, an “Engineering Info” window provides an organized overview of the key parameters, i/o and control 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 computers 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 from [www.driveweb.com](http://www.driveweb.com)** The savvy tools and utilities are platform independent and run on Windows, Mac OSX, Unix, Linux and Solaris and they are all automatically updated as new features are released.

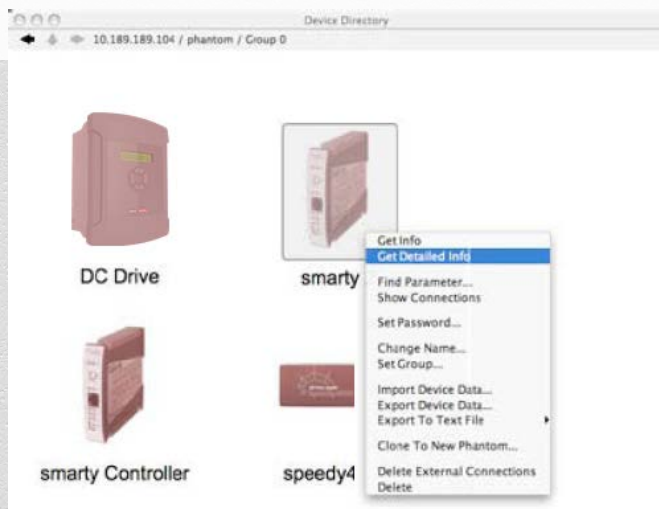
Drives, programmable controllers, operator stations and complete systems are configured by making simple drag & drop connections between clear graphical function blocks.

## Information always at your finger tips

### INFORMATION ALWAYS AT YOUR FINGER TIPS

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 out 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.



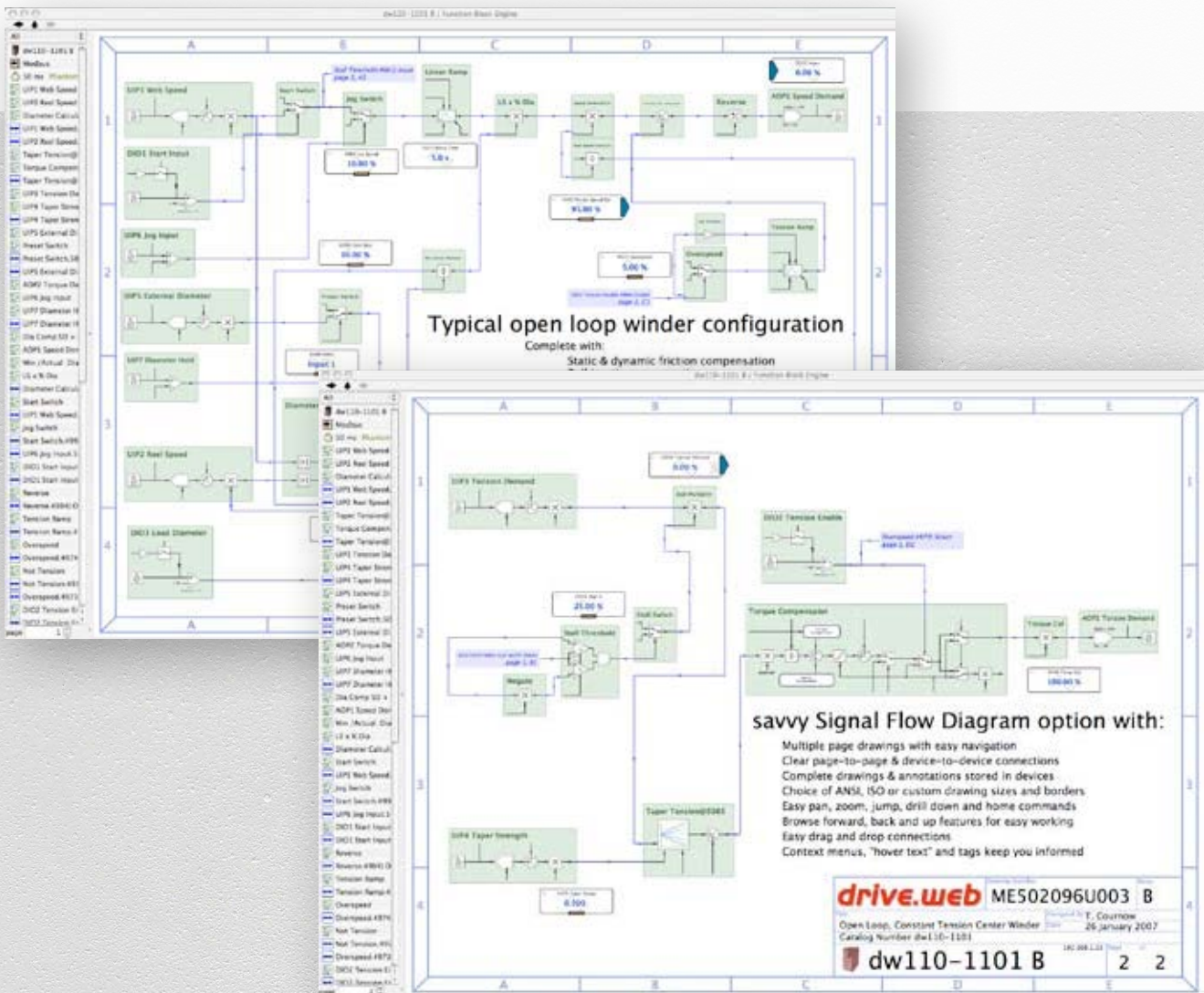


**savvy-SFD : Signal Flow Diagram** The savvy-SFD option provides a powerful, graphical, Signal Flow Diagram interface with enhanced system wide navigation and the ability to produce clear, annotated, device and system documentation

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

**SAVVY-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 & 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.

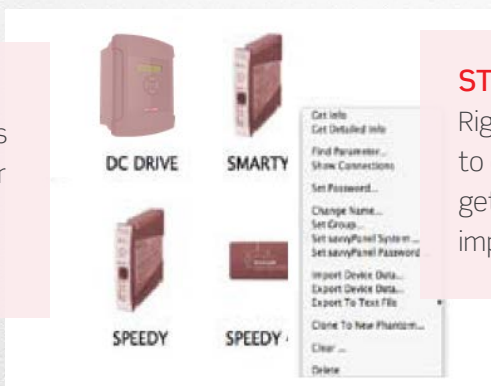




## savvy-SFD : Signal Flow Diagram (continued)

### STEP 1.

Create “phantom” devices or find real devices in your system in the “Device Directory” window.

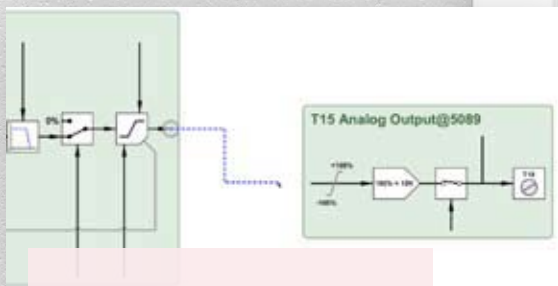


### STEP 2.

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

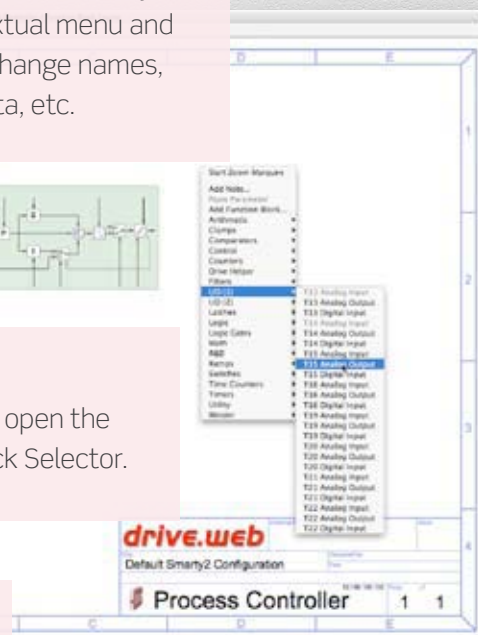
### STEP 3.

Click on a “Phantom” or device to drill down to the “Function Block Engine”



### STEP 4.

Right click to open the Function Block Selector.

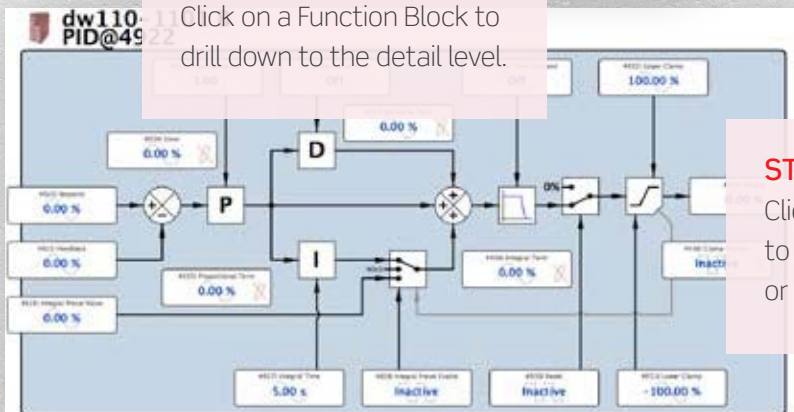


### STEP 5.

Drag and drop to make connections.

### STEP 6.

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



### STEP 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.

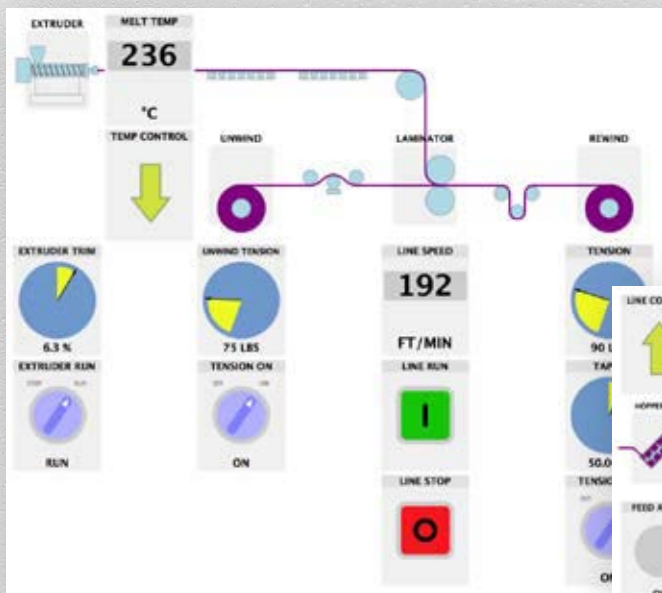


**savvyPanel:**  
**Smart, touch screen operator station technology**

Provides unprecedented flexibility in instrumentation, control and monitoring.

- Runs on any full featured, touch screen PC or on iOS devices (iPad, iPhone, iPod touch, 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**



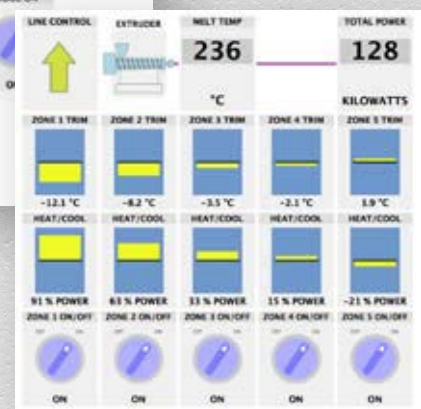
**MASTER SYSTEM CONTROL STATION**

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



**OPERATOR SCREEN**

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



**TOTAL CONTROL**

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

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



**savvyPanel:** Application for iOS.

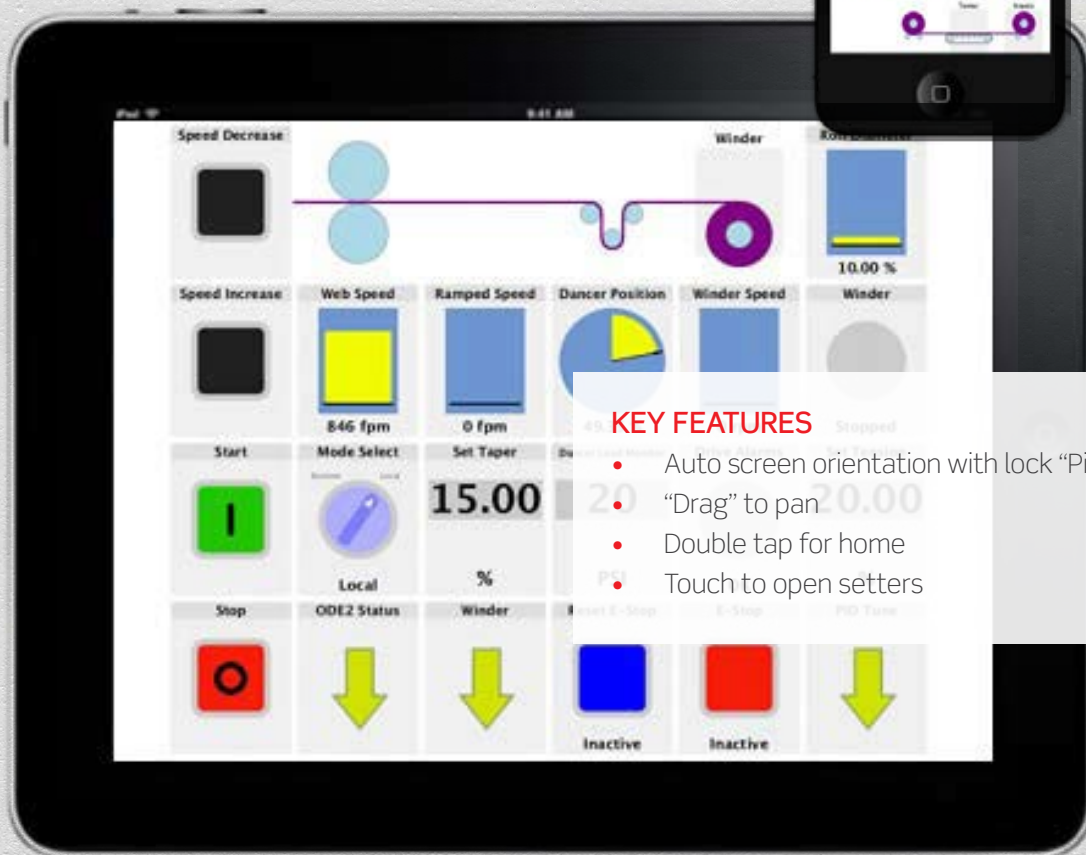
## SAVVYPANEL RUNNING ON A WIFI DEVICE IS A POWERFUL ASSET IN YOUR AUTOMATION TOOLBOX.

- Walk around your machine with complete control at your finger tips.
- Roam around your plant and access every machine and process with ease.
- View your operations live, anywhere in the world, any time you like

### GET STARTED

Download the FREE iOS **savvyPanel** app for your iPad, iPhone or iPod from the Apple iTunes store and you will immediately be able to access a real live drive system located in a plant in Stevensville, Maryland, USA.

- Touch the “Roll Change” button to reset the roll length to zero
- Turn on all the section “On/Off” switches
- Touch the “Line Start” button and watch the line accelerate, run and automatically slow down to stop at the required length.
- Touch the “Set Speed” indicator at any time to change the line speed
- Touch the parameter name to get info
- Touch the square display symbol to close the setter



#### KEY FEATURES

- Auto screen orientation with lock “Pinch” to zoom
- “Drag” to pan
- Double tap for home
- Touch to open setters



# Smarty & Speedy

The **drive.web smarty & speedy** Universal Automation Controllers use distributed control over Ethernet to provide cost effective, high performance integration in systems of any size or complexity.

## SMART DISTRIBUTED CONTROL CONCEPT:

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

## KEY FEATURES:

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

## PRECISION

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

## STANDARD SAVVYPANEL LIBRARY

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

## STANDARD FUNCTION BLOCK LIBRARY

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



Smarty



Speedy





## SMARTY - CONTROLLERS WITH A WIDE RANGE OF I/O

Used for all programmable control, peer-to-peer Ethernet networking and system integration tasks

### STANDARD FEATURES:

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

### OPTIONAL FEATURES:

- Full savvyPanel touch screen PC and iOS device capability
- Encoder input without marker
- 1 or 2 encoder inputs with marker and retransmit via external module
- 1 or 2 isolated or unisolated RS485 ports • High voltage digital i/o isolator
- 6 additional digital inputs
- 4 channel 20KHz frequency i/o
- 24 channel extended digital i/o
- External thermocouple and RTD inputs
- ModbusTCP/IP, ModbusRTU, EIP/PCCC
- USB port for system wide programming coming soon

## SPEEDY - MINIATURE CONTROLLERS WITHOUT I/O

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

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

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



## Smarty Models

Smart controllers with 100baseTX Ethernet, distributed control, 16 configurable analog/digital i/o and a wide range of i/o and communications options.

**dw210 smarty** for standalone or networked applications  
General purpose programmable controller or drive interface controller  
**dw211 smarty-sp** dedicated interface controller for PL/X series DC Drives



## Speedy Models

Miniature smart controllers with 100baseTX Ethernet, ModbusTCP/IP, distributed control, USB port, serial port and a wide range of communications options

**dw220 speedy** generic interface controller with ModbusRTU master, DIN mount, w/terminals  
**dw221 speedy** plug-in controller for PL/X series DC drive



## Speedy-SP

Open card, mounts internal to drive and plugs directly onto the high speed option bus to provide high performance peer-to-peer networking over Ethernet and drive.web programmable control functions.

**dw221 speedy-sp** for PL/X Series Digital DC Drives

Available Options: 02, ModbusRTU Slave also, 04, 05, 06, 10





		SMARTY		SPEEDY	
		dw210	dw211	dw220	dw221
<b>OPTIONS</b>					
<b>Function</b>	<b>Block Libraries</b>				
-05	Advanced Process Control Function Block Library (FBL) (comparators, profilers, presets, latches, filters, counters, timers, PIDs and more)	x	x	x	x
-06	Winder Control FBL (dia. calc., taper tension., torque comp.)	x	x	x	x
-10	Advanced Math FBL (trigonometric, log, exponential)	x	x	x	x
-11	Encoder Control FBL (shaft lock, indexing, registration for Options 40-44)	x	x		
-29	Solar FBL with sun position calculator	x	x	x	x

<b>Communication Options</b>					
-04	Ethernet Modbus TCP/IP slave	x	x	s	s
-25	Ethernet EIP/PCCC interface for AB PLCs	x	x	x	x
-14	Power over Ethernet (2W max external load)	x			
-17*	ModbusRTU slave (RS485) isolated port	x	x		
-18*	ModbusRTU slave (RS485) isolated port + external encoder module interface port	x	x		
-19*	ModbusRTU slave (RS485) isolated port + ModbusRTU (RS485) master unisolated	x	x		
-23*	ModbusRTU master (RS485) isolated port + external encoder module interface port	x	x		

<b>I/O Options</b>					
-24*	6 extra digital inputs, 24V	x	x		
-26	savvyPanel iPad/iPhone & touch screen PC operator station interface	x	x	x	x
-27*	Frequency i/o, up to 20KHz. 2 ~in, 2 ~i/o, with 12V, 400mA regulated power supply	x	x		
-28*	Extended digital i/o interface for Opto22 racks (24 channels)	x			
-30	115VAC digital i/o voltage isolator, up to 2 per smarty (each with 2, NO contacts + common and 4, 115VAC inputs +common)	x			
-31	230VAC digital i/o voltage isolator, up to 2 per smarty (each with 2, NO contacts + common and 4, 230VAC inputs +common)	x			

<b>Encoder I/O Options</b>					
-15*	Internal encoder input (2-24V, differential A & B (no marker) w/5VDC encoder supply	x	x		
-16	External encoder module interface port smarty external encoder module (needs a smarty dw210 option -16, -18, -22 or -23)	x	x		
-40	1 external encoder, 2-24V + marker, 5VDC encoder supply & two 24V event inputs	x	x		
or -42	2 external encoder, 2-24V + marker, 5VDC encoder supply & two 24V event inputs	x	x		
-45	External encoder module RS422 retransmit outputs (±1A, ±1B, ±2A, ±2B)	x	x		
or -46	External encoder module 24V retransmit outputs (±1A, ±1B, ±2A, ±2B)	x	x		

\* Options are mutually exclusive

X = Available if not excluded

S = Standard feature