

# Silver Series Operator Interface Terminal

## Watlow® Offers the Silver Series Operator Interface Terminal to Give Your System an Easy-to-Use, Reliable, Affordable Interface

The Silver Series is a rugged, touchscreen operator interface terminal (OIT). Available in three sizes (4.3, 7 and 10 inch diagonal display sizes), the OIT's feature serial and Ethernet communications with multiple controllers, universal serial bus (USB), secure digital (SD) card, data logging, flexible password security and multiple languages. The small bezel size and two-inch depth make mounting in tight spots easy.

The Silver Series programming software, EasyBuilder5000, is easy to use and features a large variety of built-in screen objects that makes it powerful. When creating screens, the user can call upon extensive graphics libraries, import custom graphics and add numeric displays, entry fields, analog meters, bar graphs and trend graphs with just a few mouse clicks. Screen objects are highly customizable, and the user can create libraries of their own objects for repeat use. The online simulator, Ethernet and USB support make testing and downloading fast. EasyBuilder5000 is part of the EZware-5000 software suite and is available as a FREE download on [www.watlow.com](http://www.watlow.com) and on the DVD-ROM found in the accessories list on page six.

The Silver Series OIT paired with Watlow® controllers is the perfect solution for your industrial process or machine control application.

### Features and Benefits

#### Bright, 65,536 color, high resolution, graphic, touchscreen, thin film transistor (TFT) display

- Maximizes display space in the OIT footprint
- Allows application specific interface design
- Allows viewing from a distance and at an angle
- Highlights important process information with color and animation

#### User selectable portrait or landscape operation

- Fits in tight spots

#### Ethernet, serial, USB and SD Card ports<sup>①</sup>

- Allows options for connecting to controllers
- Provides options for downloading projects
- Expands memory for recipe and data log storage
- Supports external keyboard, mouse and printers
- Supports monitoring from a personal computer (PC) with free VNC Client software



#### Supports dozens of serial and Ethernet protocols and up to four simultaneously

- Connects to a wide range of industrial controllers and devices
- Integrates a variety of devices to simplify complex operation tasks

#### Data logging, display and trending

- Helps operators monitor processes
- Reduces labor and increases accuracy by automating time-stamped data collection
- Stores captured data for future retrieval in multiple files
- Saves time by exporting data to Excel®-compatible comma separated value (CSV) files
- Improves process understanding by allowing live and historical data to be viewed on the OIT

#### Alarm and event monitoring and recording

- Reduces downtime by helping troubleshoot equipment and processes
- Simplifies troubleshooting by recording time and date-stamped alarm and event history
- Organizes and prioritizes alarms and events in up to 255 categories and 4 priority levels

#### Recipe management

- Reduces errors by automating process setting changes

#### Offline and online simulation

- Speeds up development by making it faster and easier to test projects
- Allows faster creation of fine-tuned interfaces by speeding up iterations

#### Time or trigger-based data exchange

- Simplifies integration by allowing the OIT to copy data from one controller or OIT to another

#### Internal, piezoelectric buzzer

- Provides audible alarms and key chirp

#### Two-year warranty

- Provides product support and reliability

<sup>①</sup> Not all ports are available on 4.3 inch models. See specifications.

## Features and Benefits (cont.)

### Audio output to third-party, amplified speakers<sup>②</sup>

- Alerts operators with sound even in noisy environments

### Screen object password security with programmable hierarchy and multiple users

- Prevents errors and tampering by allowing only authorized users to access restricted items on the screen
- Allows flexible hierarchies by letting the developer assign each screen object to any of six groups and grant each user access to any combination of groups
- Provides password protection for upload, download and access to local setup
- Supports up to twelve users

### Screen object invisibility and/or interlock control

- Prevents errors by guiding operators

### Powerful, easy-to-use EasyBuilder5000, programming software

- Requires only a small investment in time to create a useful interface
- Provides the ability to learn additional features as needed
- Provides advanced interface features such as animation and pop-up windows

- Reduces development time by providing extensive graphical libraries and facilitating reuse with user-created libraries
- Simplifies development by allowing import of common graphic formats: bitmaps, JPEGs and animated GIFs

### User-programmable macros with math functions and support for floating point

- Extends functionality
- Automates processes

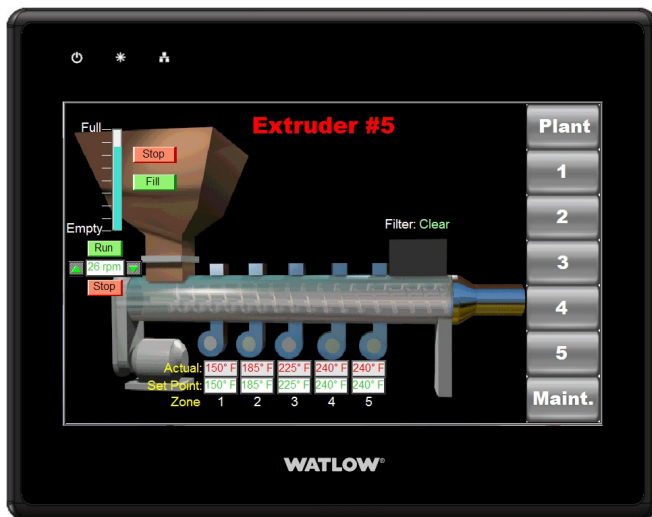
### TrueType fonts with Unicode (international) characters and language switching feature

- Makes screens easy to read by allowing bold, italic, underlined, scrolling and blinking text to direct operator's eyes
- Prevents errors by communicating with users in their native languages
- Reduces development and support by allowing inclusion of up to eight user-selectable languages in a project

### UL®, NEMA 4, CE, RoHS

- Allows use in harsh industrial environments
- Assures prompt product acceptance

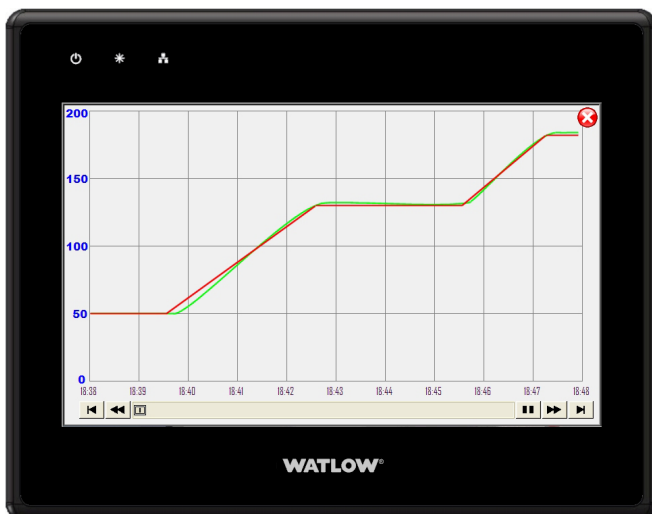
② Not available on all models. See specifications.



Integrate multiple devices to simplify operation of complex systems



Include the types of displays users understand such as gauges, sliders and bar graphs to make screens intuitive



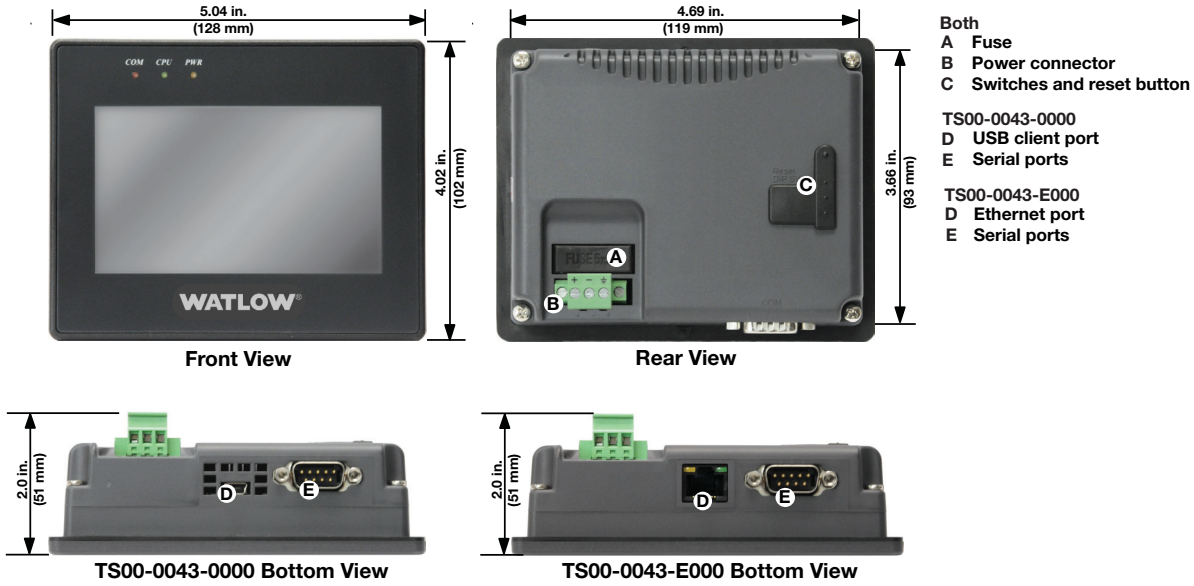
Log and graph process data for quality records and better process control



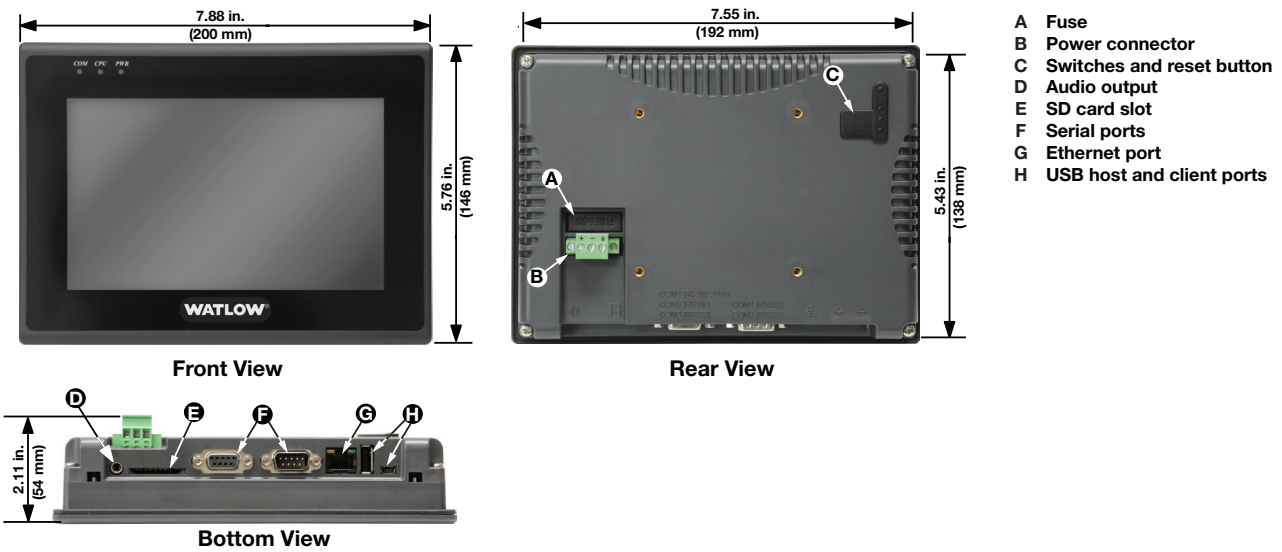
Create screens that guide work flow

## Dimension and Connection Diagrams

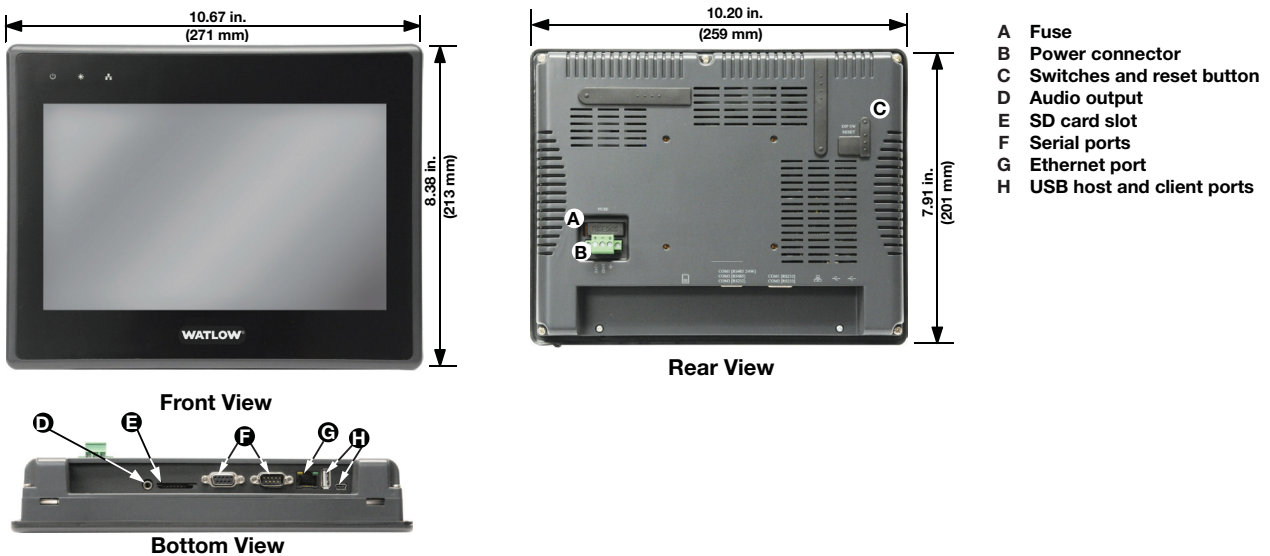
Models TS00-0043-0000 and TS00-0043-E000



### Model TS00-0070-0000



### Model TS00-0100-0000



## Specifications

Feature	Model Number			
	TS00-0043-0000	TS00-0043-E000	TS00-0070-0000	TS00-0100-0000
Processor Type	400 MHz, 32-bit, RISC, fanless			
Memory	128MB Flash, 64MB DRAM			
Ethernet Port	None	10/100 Base-T (RJ45)		
Serial Ports	COM1: RS-232 or RS-485 (2-wire or 4-wire) COM3: RS-485 (2-wire)		COM1: RS-232 or RS-485 (2-wire or 4-wire) COM2: RS-232, COM3: RS-232 or RS-485 (2-wire)	
USB Host (Type A) Version 1.1	None		1 each	
USB Client (Type B) Version 2.0	1 each	None		1 each
SD Card Slot	None		1 each	
Real Time Clock	None		Built-in	
Audible Alarm and Key Chirp	Piezoelectric buzzer			
Audio Output	None		Line out	
Display Size (W x H)	3.74 x 2.12 in. (95 x 54 mm)		6.1 x 3.4 in. (154 x 87 mm)	8.75 x 5.25 in. (222 x 133 mm)
Display Type	TFT LCD			
Resolution (Pixels)	480 x 272		800 x 480	
Colors	65,536 (16-bit) min.			
LED Backlight Brightness	500 cd/m <sup>2</sup>		375 cd/m <sup>2</sup>	300 cd/m <sup>2</sup>
Contrast Ratio	600:1		500:1	
Viewing Angle	Top: 50°, bottom, right, left: 70°		Top: 45°, bottom, right, left: 65°	
Backlight Longevity	30,000 hours			
Touchscreen Type	4-wire analog resistive			
Touchscreen Resolution	Continuous			
Touchscreen Light Transmission	Greater than 80%			
Touchscreen Lifespan	1,000,000 activations min.			
Operating Temperature	32 to 122°F (0 to 50°C)			
Storage Temperature	-4 to 140°F (-20 to 60°C)			
Relative Humidity	10 to 90% @ 40°C (non-condensing)			
Operating Shock Resistance	10 to 25 Hz (X, Y, Z direction 2G, 30 min.)			
Environmental Ratings	IP65, NEMA 4, NEMA 4X (indoor only)			
Agency	CE, RoHS, UL®, FCC Class A			
Enclosure	Plastic molded			
Mounting	Panel		Panel/VESA 75 compatible	
Dimensions Cutout (W x H)	4.69 x 3.66 in. (119 x 93 mm)		7.55 x 5.43 in. (192 x 138 mm)	10.20 x 7.91 in. (259 x 201 mm)
Dimensions Overall (W x H x D)	5.04 x 4.02 x 2.00 in. (128 x 102 x 51 mm)		7.88 x 5.76 x 2.11 in. (200 x 146 x 54 mm)	10.67 x 8.38 x 2.20 in. (271 x 213 x 56 mm)
Weight	0.7 lbs (0.3 kg)		1.8 lbs (0.85 kg)	3.4 lbs (1.6 kg)
Input Power: Voltage	24VDC			
Input Power: Current	100mA max.		250mA max.	300mA max.

## EZware-5000 Software System Requirements

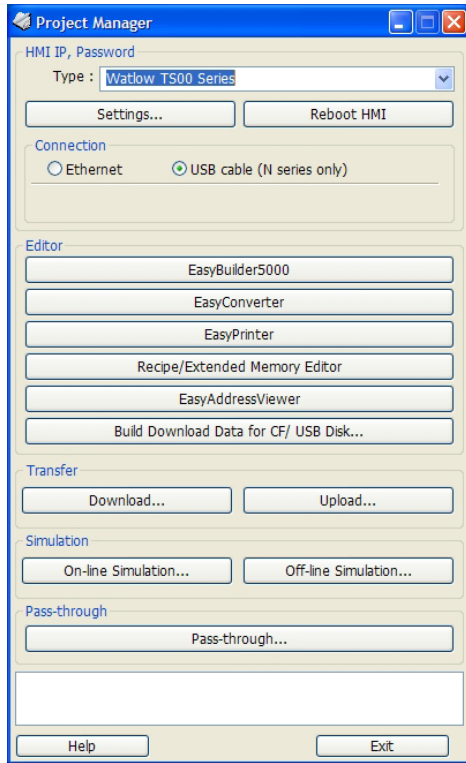
### Compatible Operating Systems:

- Windows® 8, 7, Vista and XP



## EZware-5000 Software Suite

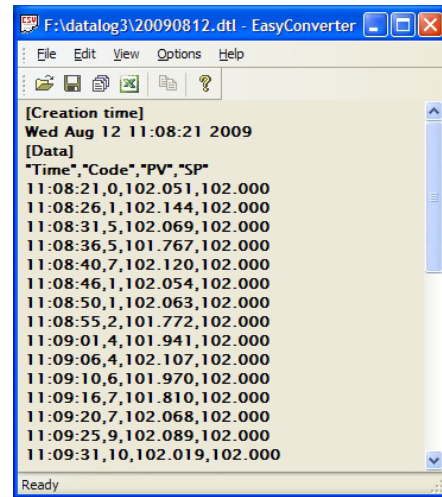
The EZware-5000 software suite includes EasyConverter, EasyBuilder5000, Project Manager and Recipe/Extended Memory Editor programs.



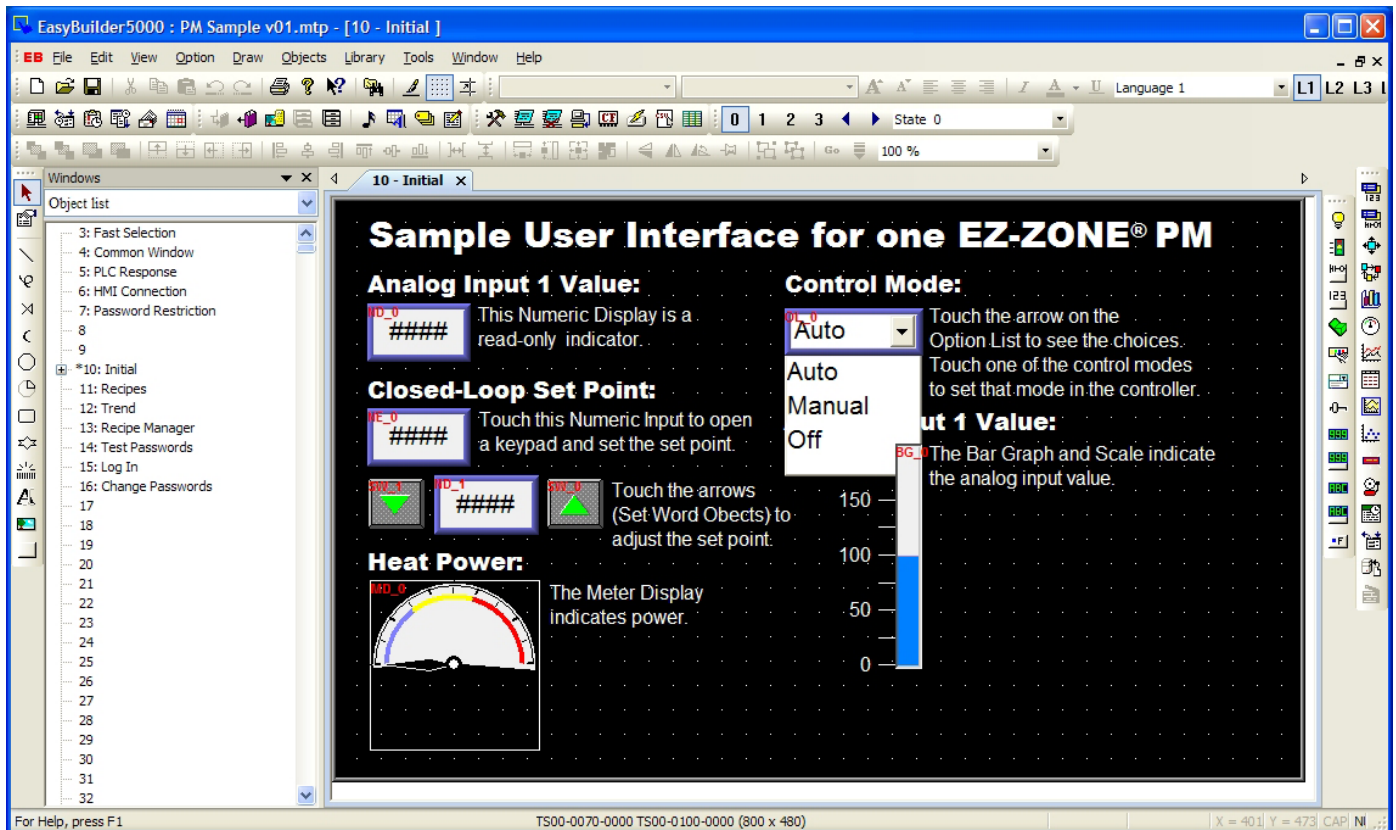
Project Manager uploads and downloads projects to and from the Silver Series OIT, opens compiled projects in simulation and launches the other EZware-5000 programs.

ID	ADDRESS	Recipe Name	Set Point 1	High Process Alarm 1	Set Point 2	High Process Alarm 2	Control
0	0	Standard Process	450.5	500	487	523	
1	19	Special for Customer	235	250	215	250	
2	38	Military Specificati	425.1	450	375	425	
3	57	FDA Test	140.3	175	150.7	180	
4	76	CE Test	50	65	75	100	
5	95		0	0	0	0	

The Recipe/Extended Memory Editor configures memory files for use with Silver Series OITs and allows offline creation of recipes.

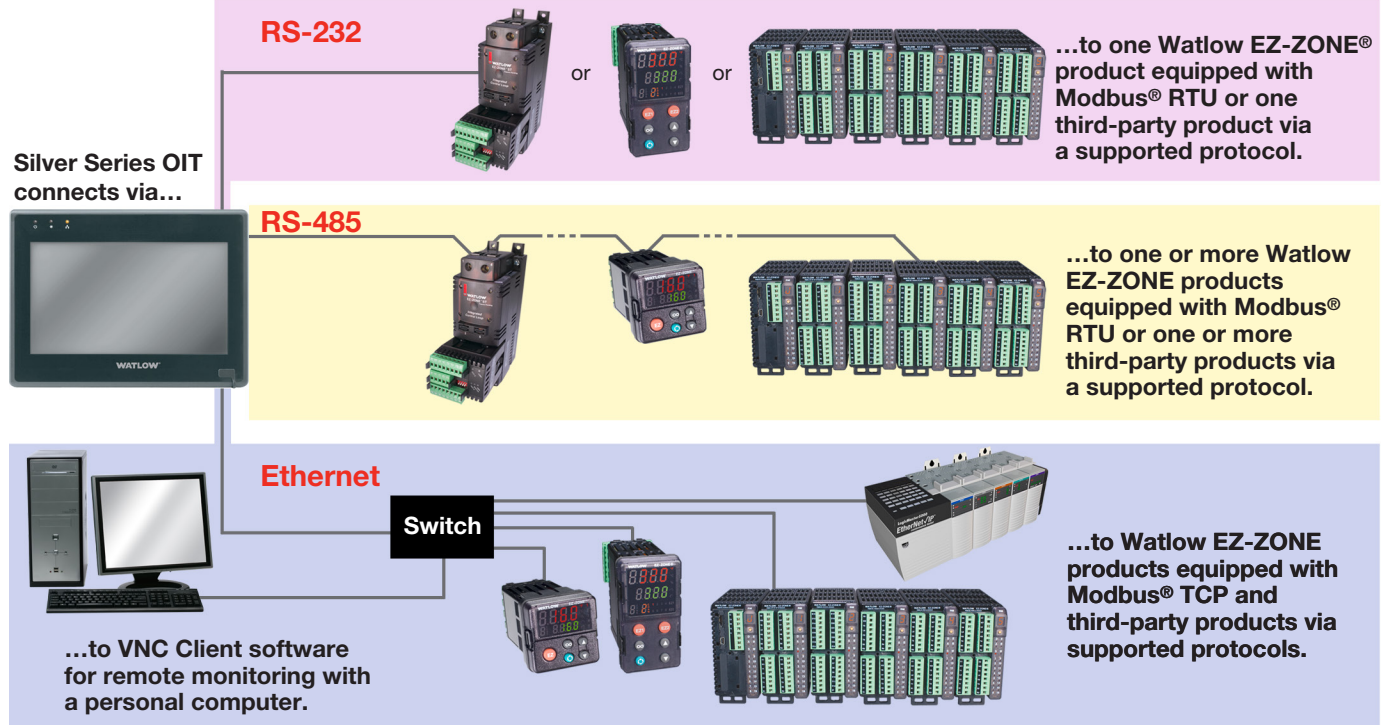


EasyConverter converts log files saved by the Silver Series OIT to file formats used by popular Windows® software such as Microsoft® Excel.



EasyBuilder5000 provides a graphical screen designing environment with point-and-click access to features and drag-and-drop ease.

## Connectivity



## Ordering Information

Part Number	Description
TS00-0043-0000	4.3 in. (480 x 272) 65,536 (16-bit) color TFT LCD touchscreen, USB programming and two serial ports
TS00-0043-E000	4.3 in. (480 x 272) 65,536 (16-bit) color TFT LCD touchscreen, two serial ports and Ethernet
TS00-0070-0000	7 in. (800 x 480) 65,536 (16-bit) color TFT LCD touchscreen, USB, three serial ports and Ethernet
TS00-0100-0000	10 in. (800 x 480) 65,536 (16-bit) color TFT LCD touchscreen, USB, three serial ports and Ethernet

## Accessories

Part Number	Description
0601-0001-0000	Controller support tools DVD-ROM with programming software and product manuals
0830-0750-0000	Power supply, Input: 85-264VAC, Output: 24VDC, 1.7A, 40W (not Class 2)
0847-0299-0000	Class 2 power supply, Input: 90-264VAC, Output: 24VDC, 1.3A, 31W
0219-0388-0000	TS00-0043-0000 or TS00-0043-E000 communication cable, 5-foot, COM1 (RS-485, 2-wire) to bare wires for Watlow EZ-ZONE® controller screw terminals
0219-0374-0000	TS00-0070-0000 or TS00-0100-0000 communication cable, 5-foot, COM1 (RS-485, 2-wire) to bare wires for Watlow EZ-ZONE controller screw terminals
0219-0382-0000	5-foot USB cable for downloading projects from a PC to the OIT
0830-0782-0000	Package of 5 ea. protective screen covers for the TS00-0043-0000 and TS00-0043-E000
0830-0753-0000	Package of 5 ea. protective screen covers for the TS00-0070-0000
0830-0754-0000	Package of 3 ea. protective screen covers for the TS00-0100-0000

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