

Operator Interfaces

Product	Description	Communication Protocols	Display Height	Page
Silver Series	Rugged, touchscreen operator interface terminal	Ethernet, Modbus® RTU, Modbus® TCP	4.3, 7 or 10.2 in. (109, 178 or 259 mm) diagonal	345
EZ-ZONE® RUI and Gateway	Remote user interface and communications device	Standard Bus, Modbus® RTU, EtherNet/IP™, Modbus® TCP, DeviceNet™ and PROFIBUS DP	Upper: 0.40 in. (10 mm) Lower: 0.24 in. (6 mm)	351

Note: The specifications in the table above are best available values in each category. Not all combinations of these values are available in a single model number.





Operator Interfaces

Silver Series

The Silver Series is a rugged, touchscreen operator interface terminal (OIT). Available in three sizes (4.3, 7 and 10.2 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 and on the DVD-ROM found in the accessories list on page 350.

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^①

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

^① Not all ports are available on 4.3 inch models. See specifications.

Operator Interfaces

Silver Series

Features and Benefits (Continued)

Audio output to third-party, amplified speakers[Ⓜ]

- 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 allowing import of common graphic formats: bitmaps, JPGs and animated GIFs

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

- Extends functionality
- Automates processes

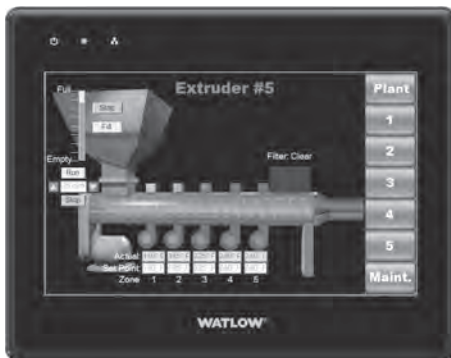
TrueType fonts with Unicode (international) characters and language switching feature

- 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

- Ⓜ 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



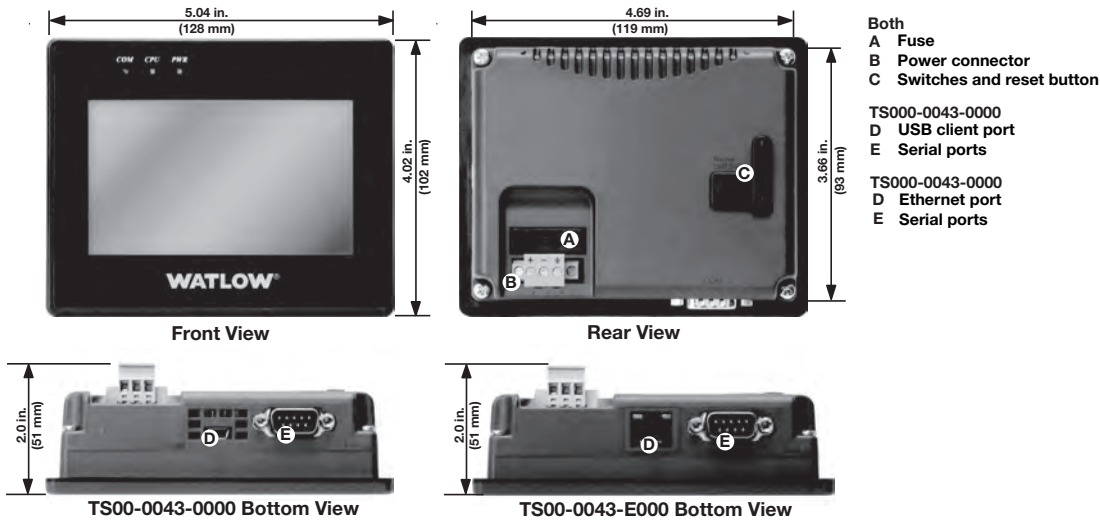
Create screens that guide work flow

Operator Interfaces

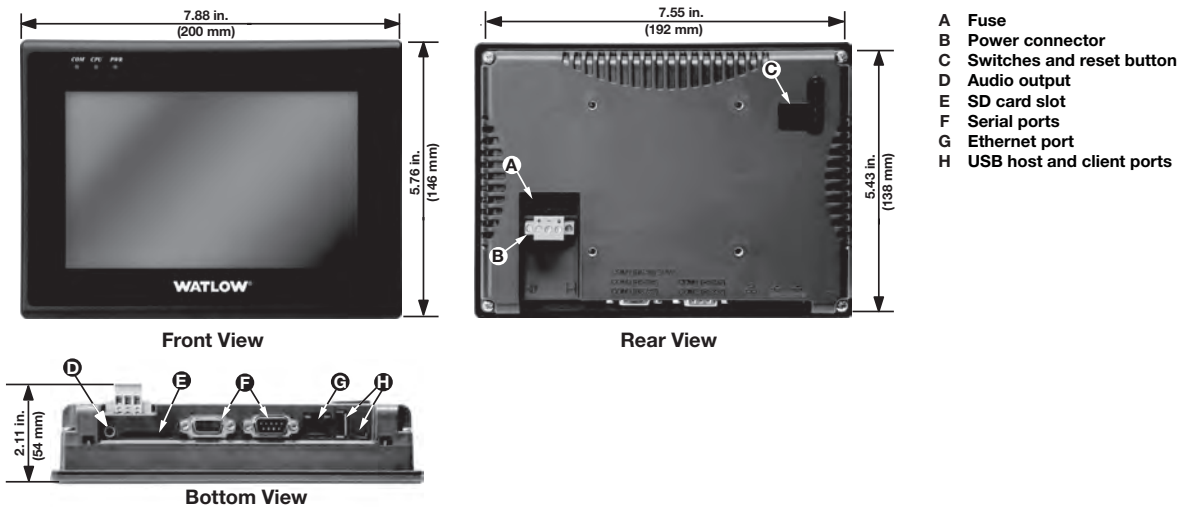
Silver Series

Dimension and Connection Diagrams

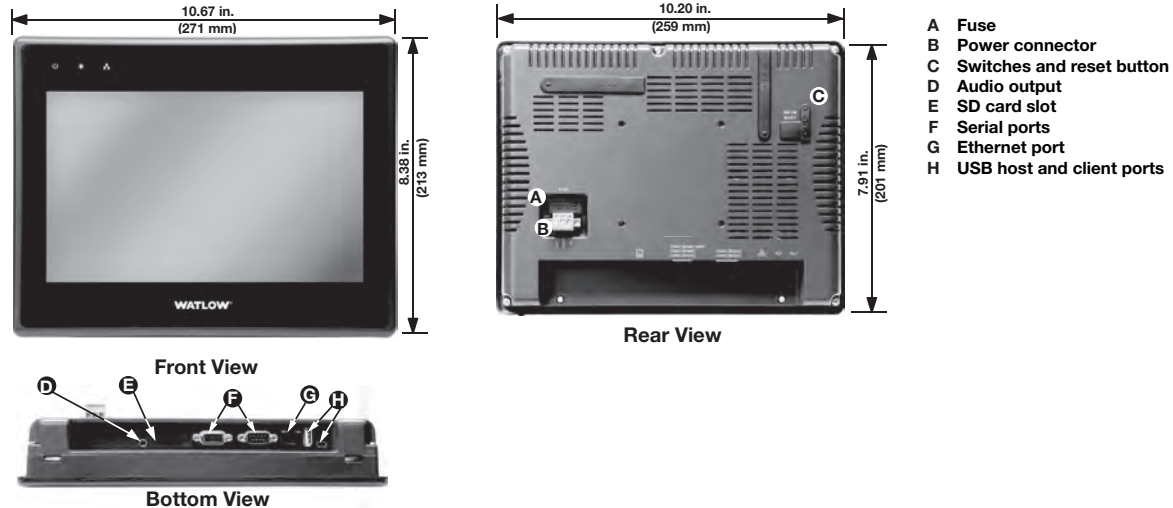
Models TS00-0043-0000 and TS00-0043-E000



Model TS00-0070-0000



Model TS00-0100-0000



Operator Interfaces

Silver Series

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 ²		375 cd/m ²	300 cd/m ²
Contrast Ratio	600:1		500:1	
Viewing Angle	Top, bottom, right, left: 50/70/70/70		Top: 45°, bottom, right, left: 65°	Top: 55°, bottom, right, left: 65°
Backlight Longevity	30,000 hours			50,000 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:

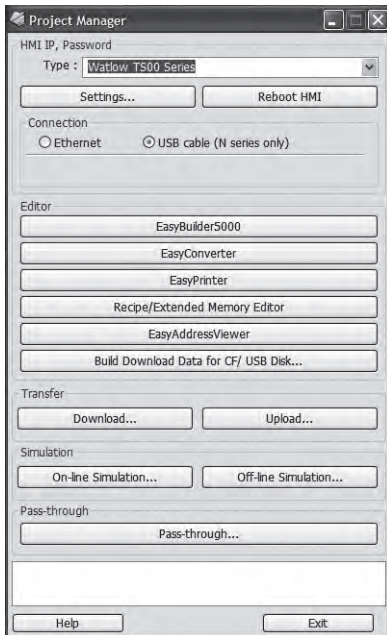
- Windows® 7 (32-bit and 64-bit)
- Windows® Vista (32-bit and 64-bit)
- Windows® XP

Operator Interfaces

Silver Series

EZware-5000 Software Suite

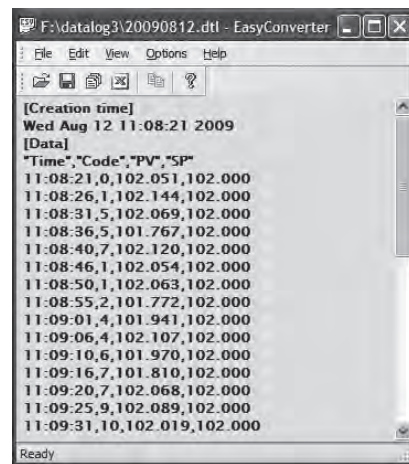
The EZware-5000 software suite includes EasyConverter, EasyBuilder5000, Project Manager and Recipe/Extended Memory Editor programs.



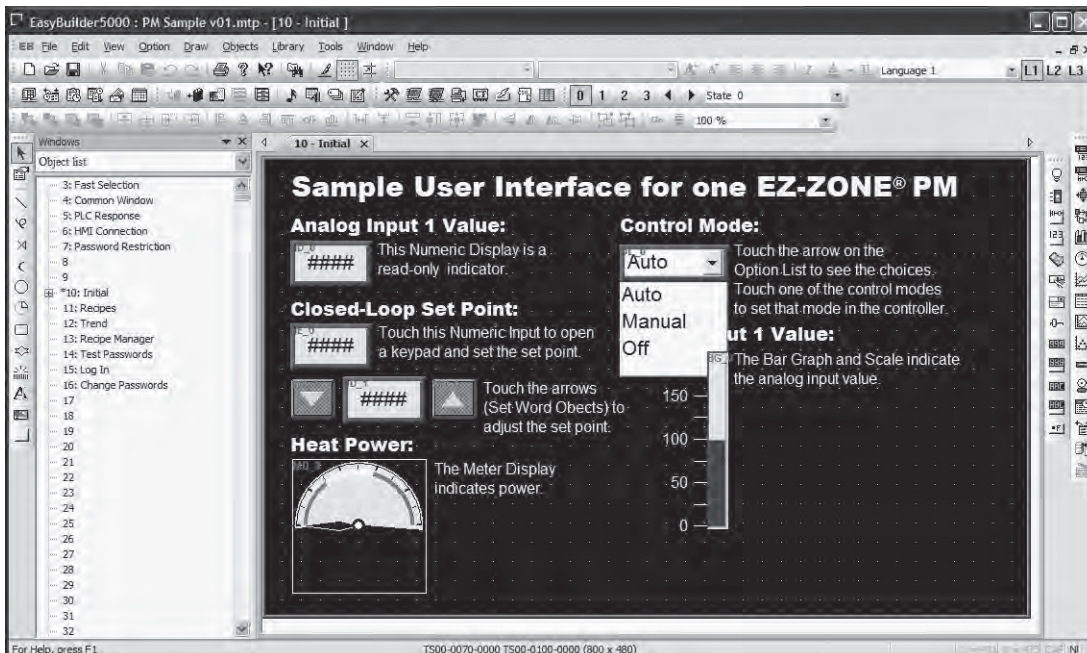
Project Manager uploads and downloads projects to and from the Silver Series OIT, opens compiled projects in simulation and launches the other EZware-5000 programs.

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		524
1	19	Special for Customer	235	250	215		250
2	38	Military Specifica	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®.

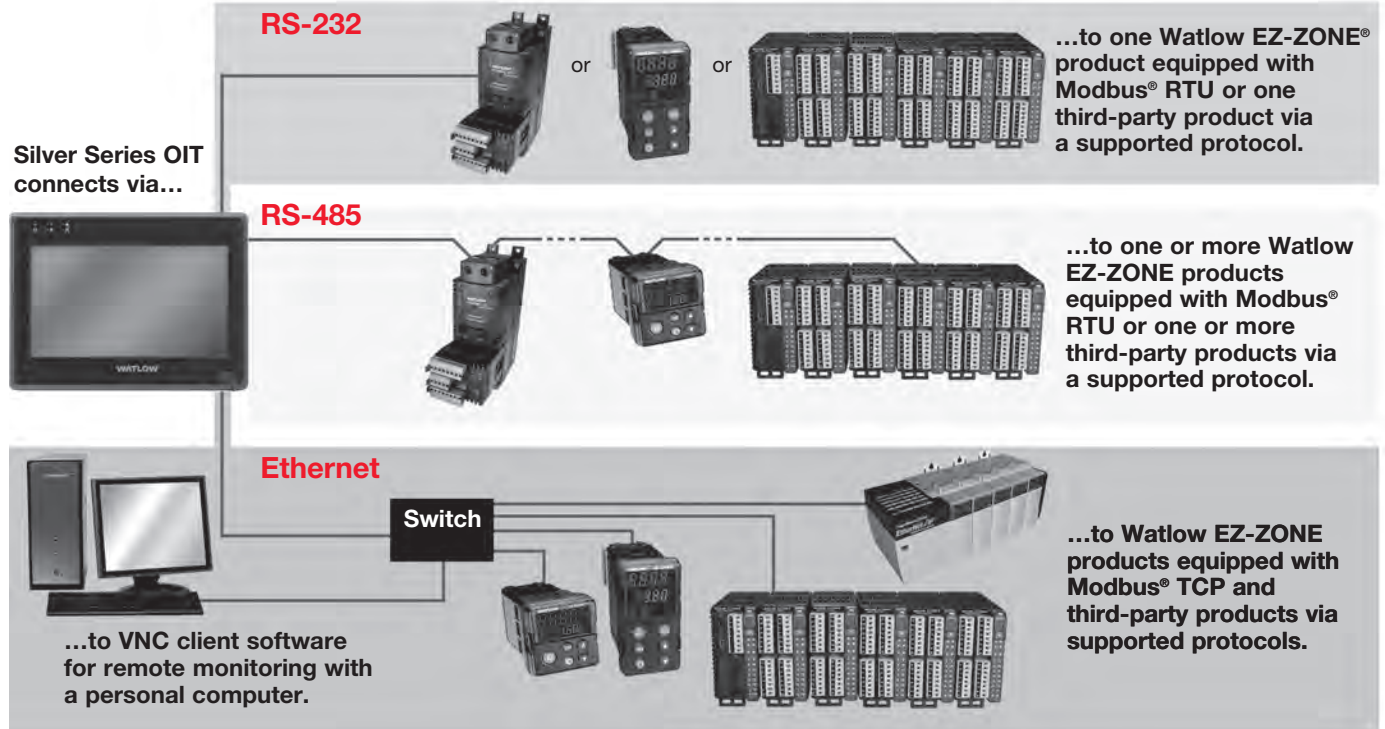


EasyBuilder5000 provides a graphical screen designing environment with point-and-click access to features and drag-and-drop ease.

Operator Interfaces

Silver Series

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, 1.1A, 25W (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

Operator Interfaces

EZ-ZONE® RUI and Gateway

The EZ-ZONE® Remote User Interface (RUI and communications gateway) can be utilized as a communication gateway device to save cost, space and wiring when digital communications is being used with two or more EZ-ZONE controllers. The EZ-ZONE RUI can also serve as a display for showing all parameter values for up to 16 EZ-ZONE controllers, again saving cost, space and wiring expenses.

Indicator Features and Benefits—Remote User Interface (RUI)

Single user interface device or location to access multiple controllers

- Easy accessibility to all controllers and all parameters from a central location by using one RUI display
- Reduces component material costs by using a single RUI to display multiple control zones
- Eliminates cost and complexity from bringing all controller related input and output wiring to the front panel

Flexible use of a display interface

- Can be used when needed during normal machine production, for OEM prototype design purposes or for remote troubleshooting scenarios
- Ability to use more than one RUI indicator to display additional data including temperature and current (ammeter) to improve user system interface

Communications Gateway Features and Benefits

A single RUI and gateway provides field bus access for up to 16 EZ-ZONE controllers

- Lowers solution cost when field bus communications is required for multiple loops

Expand communication protocols to all EZ-ZONE controllers

- Ability to utilize multiple communication protocols for different user preferences. Flex between different communication protocols while still maintaining a reduced level of inventory

Delivers multiple communication protocol options

- Ability to connect EZ-ZONE controllers to communication networks utilizing
 - Modbus® RTU
 - DeviceNet™
 - EtherNet/IP™
 - Modbus® TCP
 - PROFIBUS DP



Additional Features

EZ-ZONE P3T Armor Sealing System

- Complies with NEMA 4X, IP65 RUI
- Offers water and dust resistance, can be cleaned and washed down

EZ-KEY (RUI)

- Programmable EZ-Key is a functional key programmable by the user to perform simple one-touch operation of repetitive user activities

Compact package

- Reduces required panel size for 1/16 DIN
- Utilizes less depth behind panel allowing for mounting in tight spaces

Touch-safe package

- Complies with IP2X which increases safety for user

Agency approvals: UL®, CSA, CE, RoHS, W.E.E.E.

- Meets applications requiring agency approvals

Three-year warranty

- Provides product support and protection

Operator Interfaces

EZ-ZONE RUI and Gateway

Specifications

Line Voltage/Power

- Universal high voltage 100 to 240VAC, +10%/-15%; (85-264VAC), 50/60Hz, ±5%
- Low voltage 20 to 28VAC or 25 to 40VDC, 50/60Hz, ±5% for RUI only in short case version
- Low voltage 20 to 28VAC or 12 to 40VDC, 50/60Hz, ±5% for RUI and Gateway in long case version
- Data retention upon failure via nonvolatile memory

Environment

- 0 to 149°F (-18 to 70°C) operating temperature
- -40 to 185°F (-40 to 85°C) storage temperature
- 0 to 90% RH, non-condensing

Agency Approvals

- UL®, CSA, CE, IP66/NEMA 4X indoor use, RoHS, W.E.E.E.
- SEMI F47-0200 when powered at 24V or greater

Wiring Termination—Touch Save Terminals

- Terminals touch safe, removable, 12 to 22 AWG

DIN Sizes

- ¼ DIN

Display Update Rate

- 1HZ

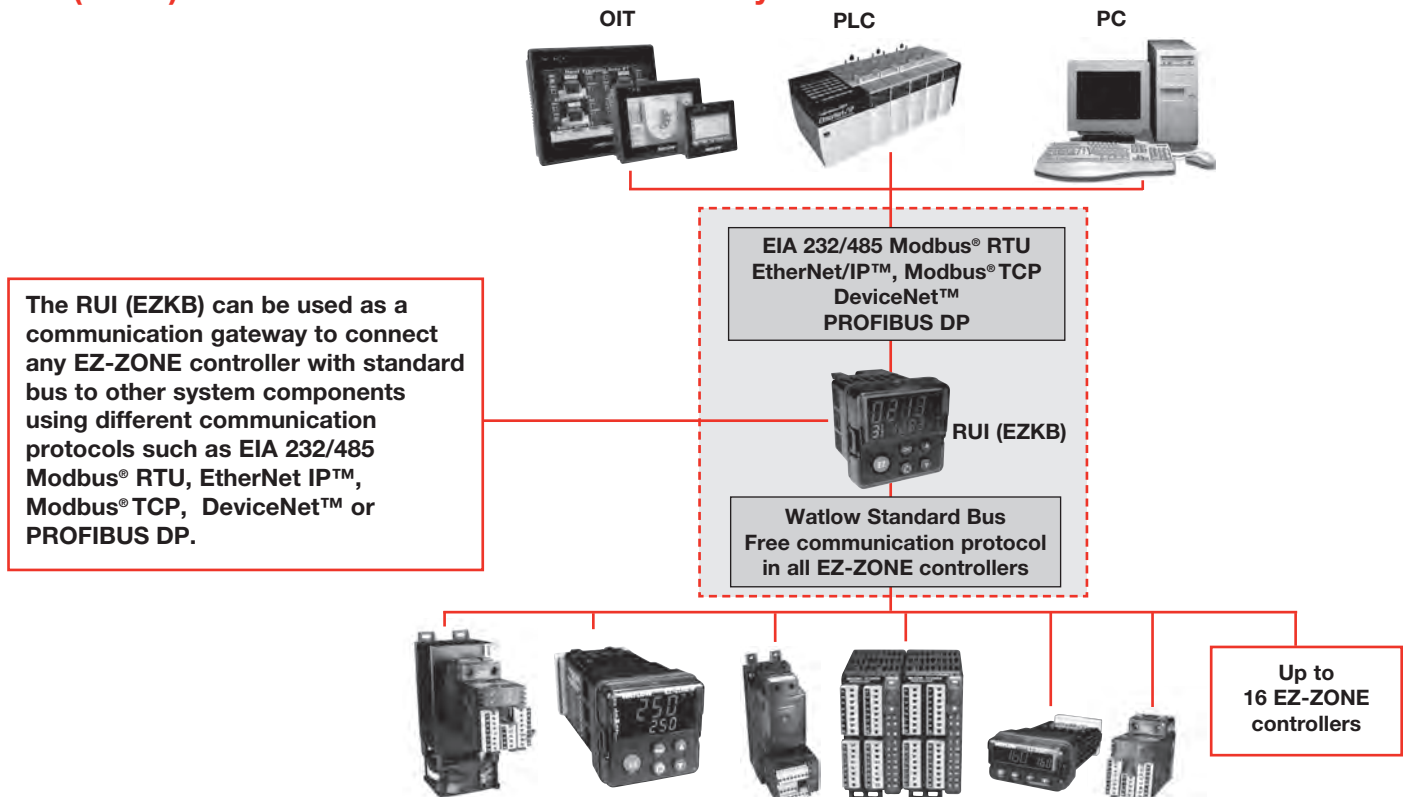
Operator Interface

- Dual 4 digit, 7 segment LED displays
- Forward, backward, up and down keys plus a customer-programmable function key - EZ key

Communication Options

- Standard bus - ships with all EZ-ZONE products
- EIA 235/485, Modbus® RTU
- EtherNet/IP™, Modbus® TCP, 10 BASE-T/100 BASE-TX
- DeviceNet™
- PROFIBUS DP

RUI (EZKB) Utilized as a Communication Gateway Device

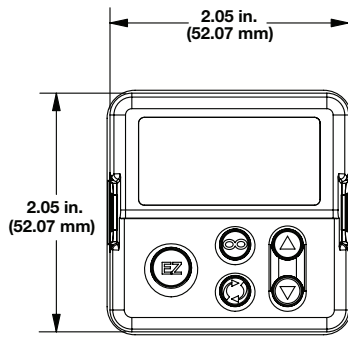


Operator Interfaces

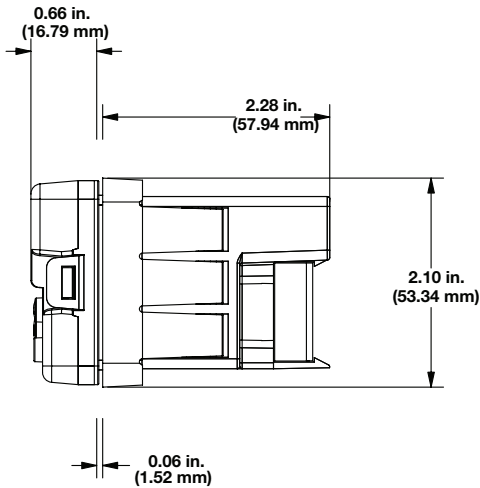
EZ-ZONE RUI and Gateway

Remote User Interface (RUI)— Dimensional Drawings

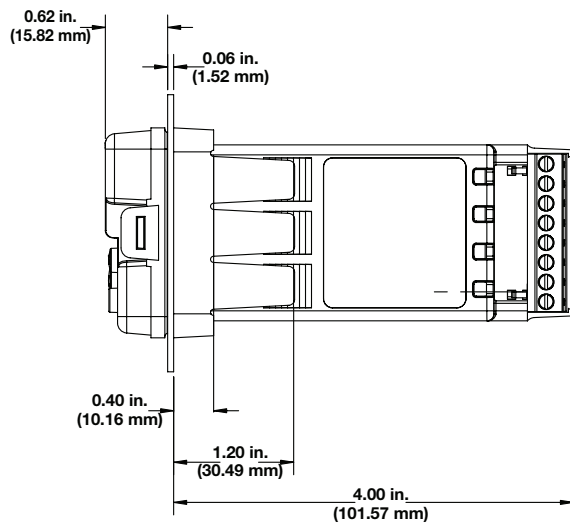
Front View



Short Case Version



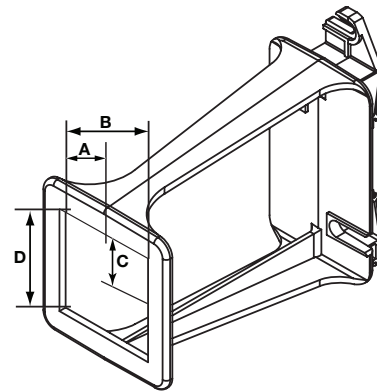
Long Case Version



Accessory—DIN-Rail Mounting Bracket

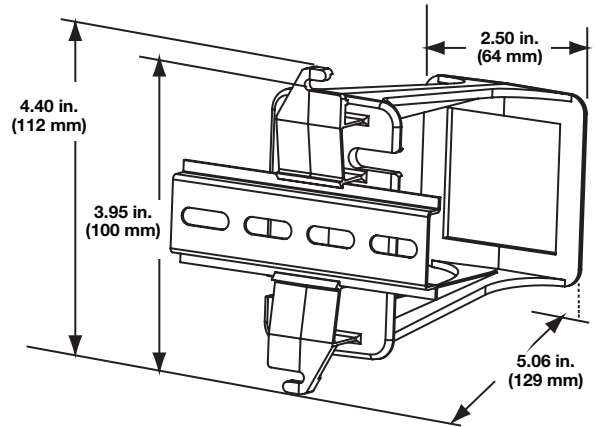
Part Number: 0822-0586-P002

Front View



Dim. A	Dim. B	Dim. C	Dim. D
0.886 in. (23 mm)	1.772 in. (45 mm)	0.886 in. (23 mm)	1.772 in. (45 mm)

Rear View



Operator Interfaces

EZ-ZONE RUI and Gateway

Ordering Information

Part Number

① ② ③	④	⑤	⑥	⑦ ⑧	⑨ ⑩ ⑪ ⑫
	Remote User Interface	Power Supply Voltage for RUI	Comm. Gateway Options	Custom RUI	Future Options
EZK		-			- AAAA

④ Remote User Interface (RUI)	
B =	Basic 1/16 DIN

⑤ Power Supply Voltage for RUI	
L =	Low voltage 24-28VAC/VDC
H =	Universal high voltage 100-240VAC/VDC

⑥ Communication Gateway Options* (Standard Bus Always Included)	
A =	None
2 =	EIA232/485 Modbus® RTU
3 =	EtherNet/IP™/Modbus® TCP
5 =	DeviceNet™
6 =	PROFIBUS DP
* Options 2 through 6 require the long case dimensions	

⑦ ⑧ Custom RUI	
AA =	None
XX =	Custom options, contact factory