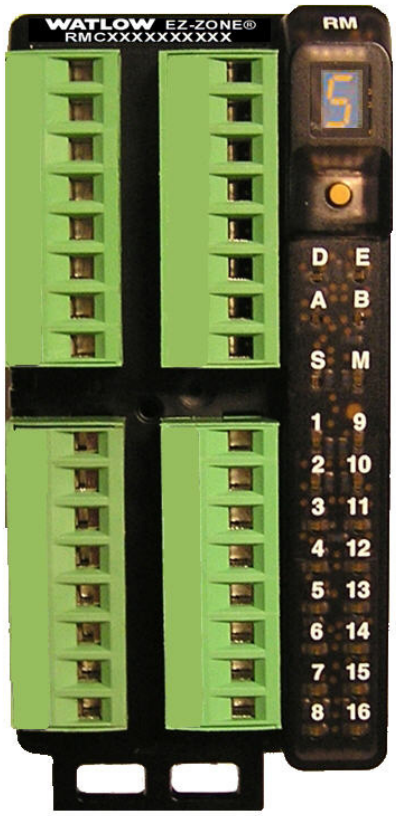
EZ-ZONE® RMC (Control) Module
User's Guide



Control Module

WATLOW

TOTAL CUSTOMER SATISFACTION
3 Year Warranty

ISO 9001
Registered Company
Winona, Minnesota USA

1241 Bundy Boulevard., Winona, Minnesota USA 55987
Phone: +1 (507) 454-5300, Fax: +1 (507) 452-4507 http://www.watlow.com

0600-0070-0000 Rev. D

December 2013

Made in the U.S.A.

Safety Information

We use note, caution and warning symbols throughout this book to draw your attention to important operational and safety information.

A "NOTE" marks a short message to alert you to an important detail.

A "CAUTION" safety alert appears with information that is important for protecting your equipment and performance. Be especially careful to read and follow all cautions that apply to your application.

A "WARNING" safety alert appears with information that is important for protecting you, others and equipment from damage. Pay very close attention to all warnings that apply to your application.

The safety alert symbol, ⚠ (an exclamation point in a triangle) precedes a general CAUTION or WARNING statement.

The electrical hazard symbol, ⚠ (a lightning bolt in a triangle) precedes an electric shock hazard CAUTION or WARNING safety statement. Further explanations follow:

Symbol	Explanation
	CAUTION – Warning or Hazard that needs further explanation than label on unit can provide. Consult User's Guide for further information.
	ESD Sensitive product, use proper grounding and handling techniques when installing or servicing product.
	Unit protected by double/reinforced insulation for shock hazard prevention.
	Do not throw in trash, use proper recycling techniques or consult manufacturer for proper disposal.
	Enclosure made of Polycarbonate material. Use proper recycling techniques or consult manufacturer for proper disposal.
	Unit can be powered with either alternating current (ac) voltage or direct current (dc) voltage.
	Unit is a Listed device per Underwriters Laboratories®. It has been evaluated to United States and Canadian requirements for Process Control Equipment. UL 61010 and CSA C22.2 No. 61010. File E185611 QUYX, QUYX7. See: www.ul.com
	Unit is a Listed device per Underwriters Laboratories®. It has been evaluated to United States and Canadian requirements for Hazardous Locations Class 1 Division II Groups A, B, C and D. ANSI/ISA 12.12.01-2007. File E184390 QUZW, QUZW7. See: www.ul.com
	Unit is compliant with European Union directives. See Declaration of Conformity for further details on Directives and Standards used for Compliance.
	Unit has been reviewed and approved by Factory Mutual as a Temperature Limit Device per FM Class 3545 standard. See: www.fmglobal.com
	Unit has been reviewed and approved by CSA International for use as Temperature Indicating-Regulating Equipment per CSA C22.2 No. 24. See: www.csa-international.org

Warranty

The EZ-ZONE® RMC (Control) module is manufactured by ISO 9001-registered processes and is backed by a three-year warranty to the first purchaser for use, providing that the units have not been misapplied. Since Watlow has no control over their use, and sometimes misuse, we cannot guarantee against failure. Watlows' obligations hereunder, at Watlows' option, are limited to replacement, repair or refund of purchase price, and parts which upon examination prove to be defective within the warranty period specified. This warranty does not apply to damage resulting from transportation, alteration, misuse or abuse. The purchaser must use Watlow parts to maintain all listed ratings.

Technical Assistance

If you encounter a problem with your Watlow controller, review your configuration information to verify that your selections are consistent with your application: inputs, outputs, alarms, limits, etc. If the problem persists, you can get technical assistance from your local Watlow representative (see back cover), by e-mailing your questions to wintechsupport@watlow.com or by dialing +1 (507) 494-5656 between 7 a.m. and 5 p.m., Central Standard Time (CST). Ask for for an Applications Engineer. Please have the following information available when calling:

- Complete model number
- All configuration information
- User's Guide
- Factory Page

Return Material Authorization (RMA)

1. Call Watlow Customer Service, (507) 454-5300, for a Return Material Authorization (RMA) number before returning any item for repair. If you do not know why the product failed, contact an Application Engineer or Product Manager. All RMA's require:
   - Ship-to address
   - Bill-to address
   - Contact name
   - Phone number
   - Method of return shipment
   - Your P.O. number
   - Detailed description of the problem
   - Any special instructions
   - Name and phone number of person returning the product.
2. Prior approval and an RMA number from the Customer Service Department is required when returning any product for credit,

repair or evaluation. Make sure the RMA number is on the outside of the carton and on all paperwork returned. Ship on a Freight Prepaid basis.

3. After we receive your return, we will examine it and try to verify the reason for returning it.
4. In cases of manufacturing defect, we will enter a repair order, replacement order or issue credit for material returned. In cases of customer misuse, we will provide repair costs and request a purchase order to proceed with the repair work.
5. To return products that are not defective, goods must be in new condition, in the original boxes and they must be returned within 120 days of receipt. A 20 percent restocking charge is applied for all returned stock controls and accessories.
6. If the unit cannot be repaired, you will receive a letter of explanation. and be given the option to have the unit returned to you at your expense or to have us scrap the unit.
7. Watlow reserves the right to charge for no trouble found (NTF) returns.

TC Table of Contents

TC Table of Contents (cont.)

TC Table of Contents (cont.)

1 Chapter 1: Overview

Available EZ-ZONE RM System Literature and Resources

Document Title and Part Number	Description
EZ-ZONE Rail Mount Access (RMA) User's Guide, part number: 0600-0072-0000	Describes how to connect the RM system into an industrial network, how to use data logging, module backup and the real-time clock.
EZ-ZONE Rail Mount Expansion (RME) User's Guide, part number: 0600-0073-0000	When additional I/O is needed the Expansion module fills the gap. This document describes common usage and the various types of I/O available.
EZ-ZONE Rail Mount High Density (RMH) User's Guide, part number: 0600-0074-0000	This module extends the density of the standard RM modules (number of control loops and I/O points). The User Guide describes common usage, communications and the number I/O points available.
EZ-ZONE Rail Mount Scanner (RMS) User's Guide, part number: 0600-0071-0000	This module adds monitoring points to the RM system. This document describes common usage and the various types of I/O available.
EZ-ZONE Rail Mount Limit (RML) User's Guide, part number: 0600-0075-0000	This module will protect against unwanted thermal runaway and over temperature conditions. The User Guide describes configuration, programming and communications capabilities.
EZ-ZONE Remote User Interface (RUI) User's Guide, part number: 0600-0060-0000	The RUI provides a visual LED display to the RM configuration and setup menus. This document illustrates and describes connections and also describes the Home Page for each RM module as viewed from the RUI.
EZ-ZONE RM Specification Sheet, part number: WIN-EZRM-1113	Describes RM hardware options, features, benefits and technical specifications.
Watlow Support Tools DVD, part number: 0601-0001-0000	Contains all related user documents, tutorial videos, application notes, utility tools, etc...

The DVD described above ships with the product and as stated contains all of the literature above as well as much more. If the DVD is not available one can be acquired by contacting Watlow Customer Service at 1-507-454-5300.

As an alternative to the DVD, all of the user documentation described above can also be found on the Watlow website. Click on the following link to find your document of choice: http://www.watlow.com/literature/index.cfm. Once there, simply type in the desired part number (or name) into the search box and download free copies. Printed versions of all user documents can also be purchased here as well.

Your Comments are Appreciated

In an effort to continually improve our technical literature and ensure that we are providing information that is useful to you, we would very much appreciate your comments and suggestions. Please send any comments you may have to the following e-mail address: TechlitComments@watlow.com

Introduction

The EZ-ZONE® Rail Mount Control module (RMC) takes the pain out of solving your thermal loop requirements whether it be for a single loop, multi-loop, stand-alone or distributed control applications.

It just got a whole lot easier to solve the thermal requirements of your system. The RMC module is provided in a space-saving, rail-mount package and is highly scalable where you only pay for what you need. For those applications that require the ability to configure/monitor the control over a network, Modbus RTU communications is an option. Other communications protocols are also available (e.g., EtherNet/IP, DeviceNet, Modbus TCP and Profibus DP) when used in conjunction with an RM Access (RMA) module or when using a Remote User Interface/ Gateway (RUI/GTW).

Standard Features and Benefits

Integrated PID and over/under safety limit controller in one package

- Provides two mounting options (DIN rail, chassis mount)
- Reduces wiring time and termination complexity compared to connecting discrete products
- Reduces panel space and installation cost
- Increases user and equipment safety for over/under temperature conditions

Integrated power controller output

- Includes the patented NO-ARC, which drives up to 15 amp resistive loads directly
- Reduces component count and cost of ownership
- Saves panel space and simplifies wiring

Current monitoring (traditional or algorithm)

- Detects heater current flow and provides alarm indication of a failed output device or heater load
- For use in single phase loads

Communication Capabilities

- Supports network connectivity to a PC or PLC
- Watlow Standard Bus or Modbus® RTU
- Provides plug and play capabilities with Remote User Interface (RUI's) and RMA module
- Free standard bus communications port and free PC software (EZ-ZONE Configurator)

Additional Control Integration Options

- Provides a sequencer function
- Includes programmable timer functions
- Includes programmable counter functions
- Allows for simple math and logic programming options

Advanced PID Control Algorithm

- Offers TRU-TUNE®+ adaptive control to provide tighter control for demanding applications
- Provides auto-tune for fast, efficient startup

Integrated Thermal Loop Diagnostics

- Users can easily tell that the entire thermal system is functioning properly
- Provides complete system diagnostics that are far superior to simple discrete level diagnostics
- Allows for flexible synergistic use of hardware, such as using one loop's sensor as a backup to another loop in the event of sensor failure.
- Helps prevent load loss or allow for maintenance to be scheduled when more convenient.
- Provides notification of system problems to help reduce maintenance and service costs

Off-the-Shelf Designed System Solution

- Improves system reliability with a factory integrated solution that minimizes inter-module connections and potential problems at screw termination points.
- Reduces installation cost
- Eliminates compatibility headaches often encountered with using many different components and brands

Controller Handles High Ambient Temperatures

- Operates in an unprecedented temperature range of -18 to 65°C (0 to 149°F) for cabinets and panel enclosures with elevated temperature levels

Memory for Saving and Restoring User-Defined Parameter Default Settings

- Allows customers to save and restore their own defined defaults for machine parameter settings
- Reduces service calls and downtime due to inadvertent end user parameter adjustments

RMC Modules Allow for Greater Design Flexibility

- Allows PID loops to be added in increments of one.
- Saves money because you do not pay for any more than you need and don't settle for any less functionality than you need

Synergistic Module Control (SMC)

- Allows outputs selected for control (heat/cool), alarms or events to be located in any physical module, regardless of which module is connected to the input sensor

Split-Rail Control (SRC)

- Allows modules to be mounted together or mounted remotely from one another (maximum distance 200 feet or 61 meters)
- Shares control operation via Synergistic Module Control (SMC) capability
- Allows individual modules to be mounted closer to the physical input and output devices to which they are wired
- Improves system reliability and lowers wiring costs

Factory Mutual (FM) Approved Safety Limit

- Increases user and equipment safety for over/under temperature conditions
- Supports SEMI S2 specification

Agency Approvals: UL® listed, CE, RoHS, W.E.E.E. FM, SEMI F47-0200, Class 1 Div. 2 Rating on Selected Models

- Assures prompt product acceptance
- Reduces panel builder's documentation and agency costs

Removable Connectors

- Assures reliable wiring and reduces service calls
- Simplifies installation

Profile Capability

- Allows ramp/soak programming
- Provides 25 profiles and 400 total steps

Remote Set Point Operation

- Supports efficient set point manipulation from a remote device such as a master control or PLC
- Allows one or more loops to be programmed to control based on another loop's set point eliminating the cost of purchasing additional retransmit and remote set point hardware

Retransmit

- Supports industry needs for process recording

Three-Year Warranty

- Demonstrates Watlow’s reliability and product support

A Conceptual View of the RMC Module

The flexibility of the RMC software and hardware allows a large range of configurations. Acquiring a better understanding of the controller's overall functionality and capabilities while at the same time planning out how the controller can be used will deliver maximum effectiveness in your application.

The RMC can be connected at the system level to as many as 17 modules, one of which can be an Access module and the others (16 maximum) can be any combination of available modules. The user will define each address via the button on the face of each module. Each installed RMC module must have a unique Standard Bus address ranging from 1-9, A-F, where the factory defaults for each is Standard Bus address 1.

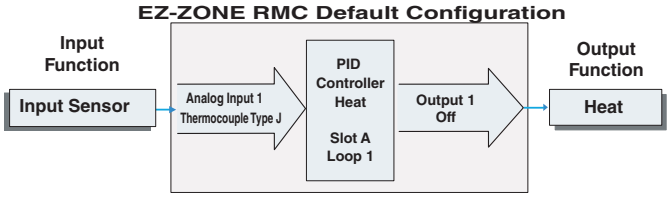
Getting Started Quickly

The RMC (Controller) can be ordered with up to four PID loops with default loop configurations (all loops) out of the box as follows:

- Analog Input functions set to thermocouple, type J
- Control loops 1-4 use Analog Inputs 1-4
- Heat algorithm set for PID, Cool set to off
- Outputs set to off
- Control mode set to Auto
- Set point set to 75 °F

To enable a loop for heat simply follow the steps below:

1. Navigate to the Setup Page
2. Once on the Setup Page navigate to the Output Menu and then the output of choice
3. Change the default setting of Off to Heat Power
4. Select the desired loop instance



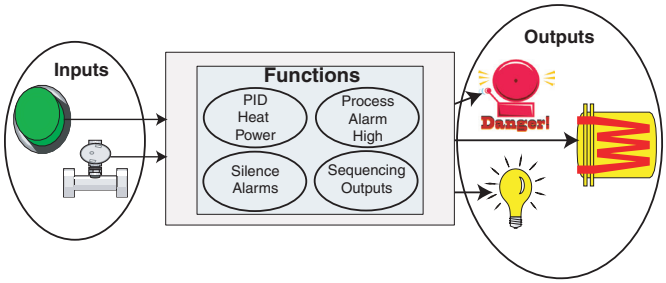
Note:
Zones can communicate with one another over the backplane (local and split rail). Once the system is configured and running, changing zone addresses without careful deliberation may cause disruption in operation.

Some of the user selectable ordering options are listed below:

1. Class 2 or SELV (Safety Extra Low Voltage) equivalent Power Supplies:
   - 90-264 Vac to 24Vdc @ 31 watts
   - 90-264 Vac to 24Vdc @ 60 watts
   - 90-264 Vac to 24Vdc @ 91 watts
2. RMC Module can provide:
   - 1 to 4 control loops, limits or CT inputs
   - 1 to 9 inputs (various types)
   - 1 to 12 outputs (various types)
   - Modbus RTU communications

As can be seen above the RMC module is fully scalable with regards to power requirements, number of loops, inputs, and outputs.

It is useful to think of the controller in three parts: inputs, functions and outputs. Information flows from an input to a function to an output when the controller is properly configured. An RMC module can carry out several functions at the same time, e.g., PID control, monitoring for several different alarm situations, monitoring and acting upon Digital Inputs and driving output devices such as heaters, audible alarms, lights. Each process needs to be thought out carefully and the controller's inputs, functions and outputs set up properly.



Functions

Functions use input signals to calculate a value. A function may be as simple as reading a digital input to set a state to true or false, or reading a temperature to set an alarm state to on or off. Alternatively, if a failure with the primary sensing device should occur, sensor backup could be utilized to avoid an unwanted shutdown.

To set up a function, one of the first things that must be considered is the function source and instance. For example, if the control is equipped with Digital Inputs (source) and it was decided to use DI 9 (instance) it can then be associated with an Action to reset an individual alarm or all alarms. To configure as such, follow the steps below:

Setup Page (Digital I/O Menu)

1. Navigate to the Setup Page and then to the Digital I/O menu.
2. Select the desired instance and set the direction to input voltage or input dry contact.

Setup Page (Action Menu)

3. Navigate to the Setup Page and then the Action menu.
4. Set the Action Function to Alarm
5. Select which alarm instance will be reset (0 equals all)
6. Select the Source Function to Digital I/O
7. Select the Source Instance (step 2 above)
8. Select the Source Zone (0 equals the module being configured).
9. Select the Active Level to execute the desired function.

This configuration is now complete. When the selected digital input is active the alarm or all alarms that are latched without a currently existing alarm condition will be reset. If a specific alarm instance (1 - 8) is selected (step 5) it will be that instance alone that will be reset.

Note:

Alarms will reset automatically when the condition that caused the alarm goes back to a non-alarm state if the alarm latching prompt is set to non-latching (Setup Page, Alarm Menu).

Keep in mind that a function is a user-programmed internal process that does not execute any action outside of the controller. To have any effect outside of the controller, an output must be configured to respond to a function.

Inputs

The inputs provide the information that any given programmed function can act upon. In a simple form, this information may come from an operator pushing a button, or as part of a more complex function it may represent a remote set point being received from another zone.

Each analog input can be configured for thermistors, thermocouples, or RTDs to read the process variable. It can also read mV/volts, current or resistance, enabling usage of various devices to read humidity, air pressure, operator inputs and other values. The settings in the Analog Input Menu (Setup Page) for each analog input must be configured to match the device connected to that input.

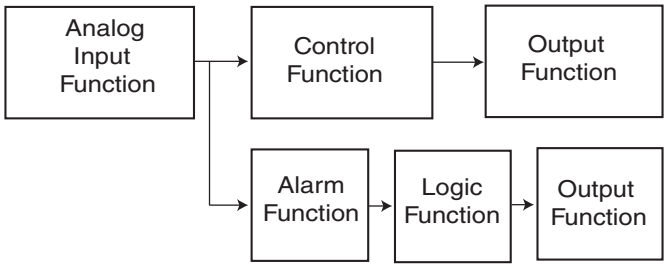
Each digital input reads whether a device is active or inactive. A RM system can be equipped with multiple digital I/O. Each I/O point must be configured to function as either an input or output with the direction parameter in the digital I/O Menu (Setup Page).

Another concept that needs to be understood is the difference between an input tied to a real-world device such as a thermocouple and one that is tied to an internal function.

In the example above the analog input function on the left is tied directly to the control function where its internal output is routed to a real-world output. With a slight modification of the graphic above the example below now ties the real-world inputs directly to the control and alarm functions. For the sake of this example the following is true:

- Two unique high process alarms are configured for analog inputs 1 and 2
- The logic block is configured as an OR function
- The output function is tied to the internal output of the logical OR function

When either process alarm is true (analog input value is greater than the alarm high set point, the real-world output will be driven on.



Outputs

Outputs can perform various functions or actions in response to information provided by a function such as: heat power from the output of the control, using a digital output to serve as a profile event, drive a light on or off, unlocking a door or turning on a buzzer.

Assign an output to a function in the Output Menu or Digital I/O Menu. Then select which instance of that function will drive the selected output. For example, you might assign an output to respond to an internal output of a compare function or to retransmit the value of analog input 2 (instance 2).

You can assign more than one output to respond to a single instance of a function. For example, alarm 2 could be used to trigger a light connected to output 1 and a siren connected to digital output 5.

Input Events and Output Events

Input and output events are internal states that are used exclusively by profiles. The source of an event input can come from a real-world digital input or an output from another function. Likewise, event outputs may control a physical output such as an output function block or be used as an input to another function.

Actions

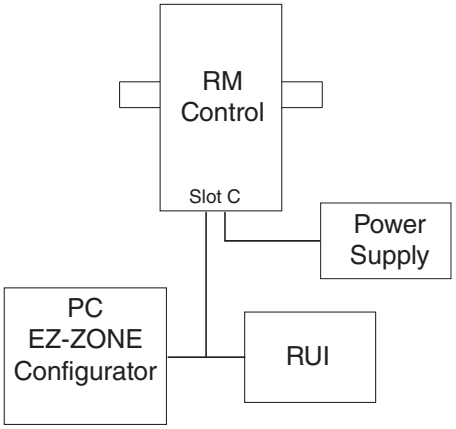
Based on a given input (Digital I/O, Event output, Logic function, etc..) the Action function can cause other functions to occur. To name a few, starting and stopping a profile, silencing alarms, turn control loops off and placing alarms in non-alarm state.

A Conceptual View of RM Hardware Configurations

Due to the scalability and flexibility in the RM system a user has several options available in the way that the hardware can be connected. Listed below are a few examples.

RMC Module Connected to a Remote User Interface (RUI) and a PC

In this configuration the RUI and PC are connected to the RMC module via Watlow's Standard Bus where both will be able to talk directly to the RMC

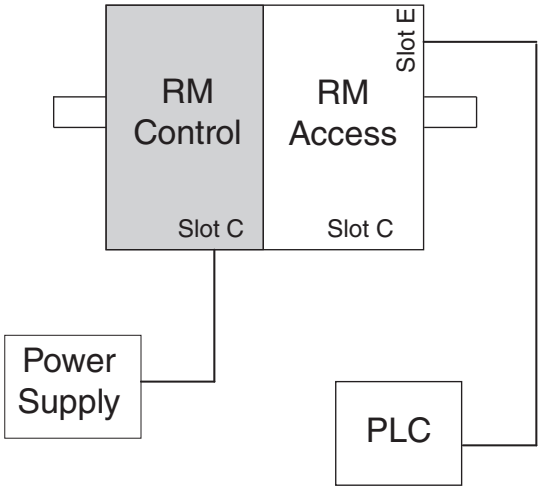


module. The PC running EZ-ZONE Configurator software and the RUI can be used to configure and then monitor the RMC module.

RMC Module Connected to a Programmable Logic Controller (PLC) on a DIN Rail

In this configuration the PLC can be connected to the RMC module via the Access module using one or more available protocols:

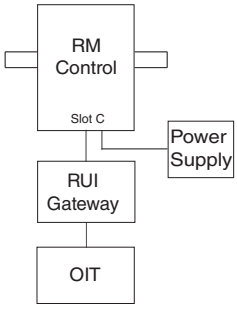
1. EtherNet/IP and or Modbus TCP
2. DeviceNet
3. Modbus RTU



RMC Module Connected to an Operator Interface Terminal (OIT) through an RUI/Gateway

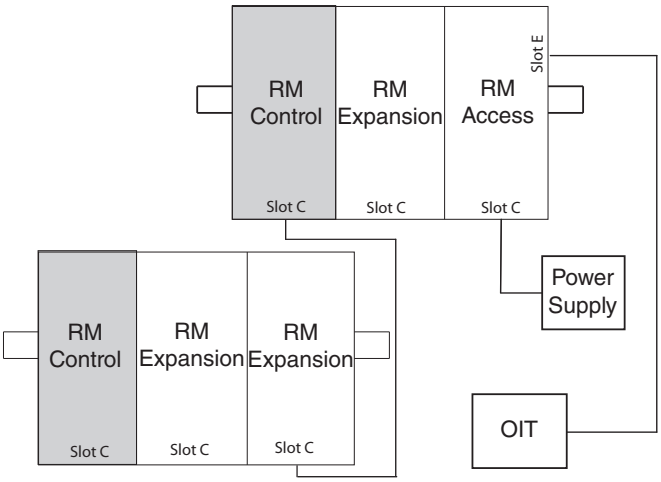
In this configuration the OIT can be running any of a number of protocols communicating to the RM system through Watlow's RUI/Gateway. Available protocols for the RUI/Gateway follow:

1. EtherNet/IP and or Modbus TCP
2. DeviceNet
3. Modbus RTU



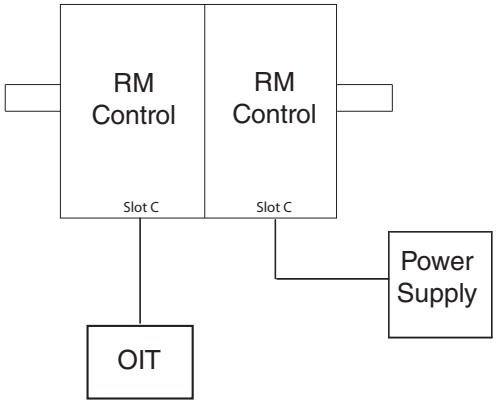
RM System Connected to a Split Rail with OIT

In this configuration both the Inter-module Bus (backplane communications) and Standard Bus are connected between rails to allow for remote capabilities. It is recommended that the split rail connection not exceed 200 feet. In this configuration the OIT can communicate with all modules (maximum 16 modules any combination with one Access module).



RM Control Module Connected to an OIT Running Modbus RTU

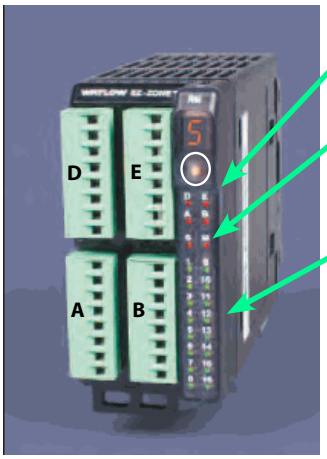
In this configuration the control module connected to the OIT is equipped with the Modbus RTU protocol (RMCxxxxxxxxx1xx). It is important to note that Modbus communications takes place between the OIT and the control it is connected to. The RM backplane is always using the Standard Bus protocol. If it is desired that the OIT communicate to both control modules, both control modules would need Modbus communications and then pins CC, CA, and CB would need to be daisy chained together.



Module Orientation

The picture below represents one of six possible RM modules. All six will have four slots on the face (slot A, B, D, and E) and one on the bottom (slot C) not shown. All of these slots are not always used on all modules. On the face of the module there is a button (white circle) under the Zone address (5) that when pushed and held has the following functions:

1. For any module, push and hold for ~ 2 seconds. The address will intensify indicating that it can now be changed. Release and repeatedly press to change to the desired unique address
2. For the control module, if equipped with the Modbus protocol (RMCxxxxxxxxx1xx) pushing and holding this button for ~ 6 seconds will cause the display to reflect P for protocol. Releasing the button and then pushing it again (within 6 seconds) the display will toggle between N (Modbus) and S (Standard Bus). Valid addresses for Modbus and Standard bus range from 1 -16 (1 - 9, A is 10, B is 11, C is 12, D is 13, E is 14, F is 15, and h is 16). The Access module is shipped at address J or 17

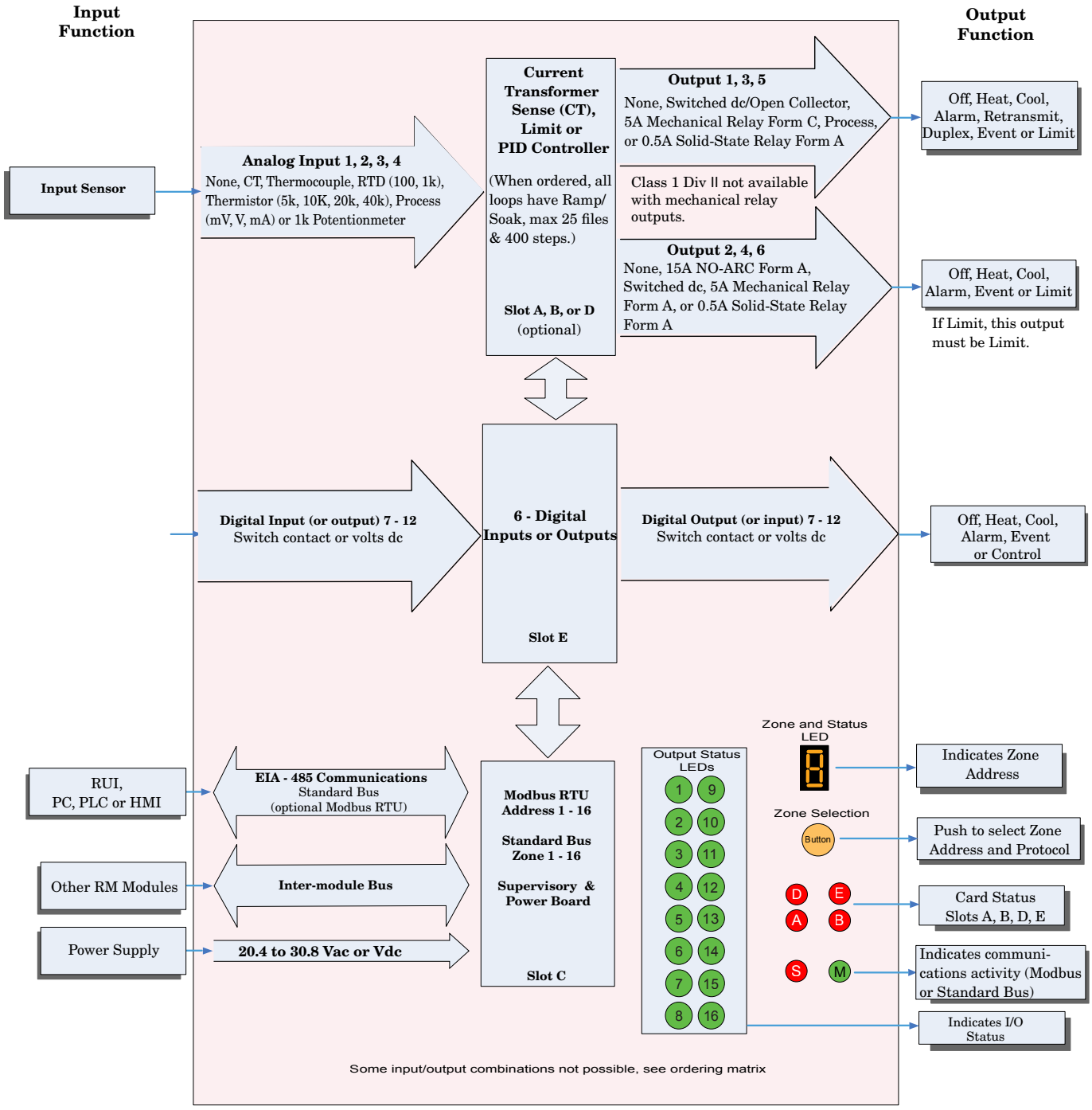


Module Status (Slot A, B, D, or E)

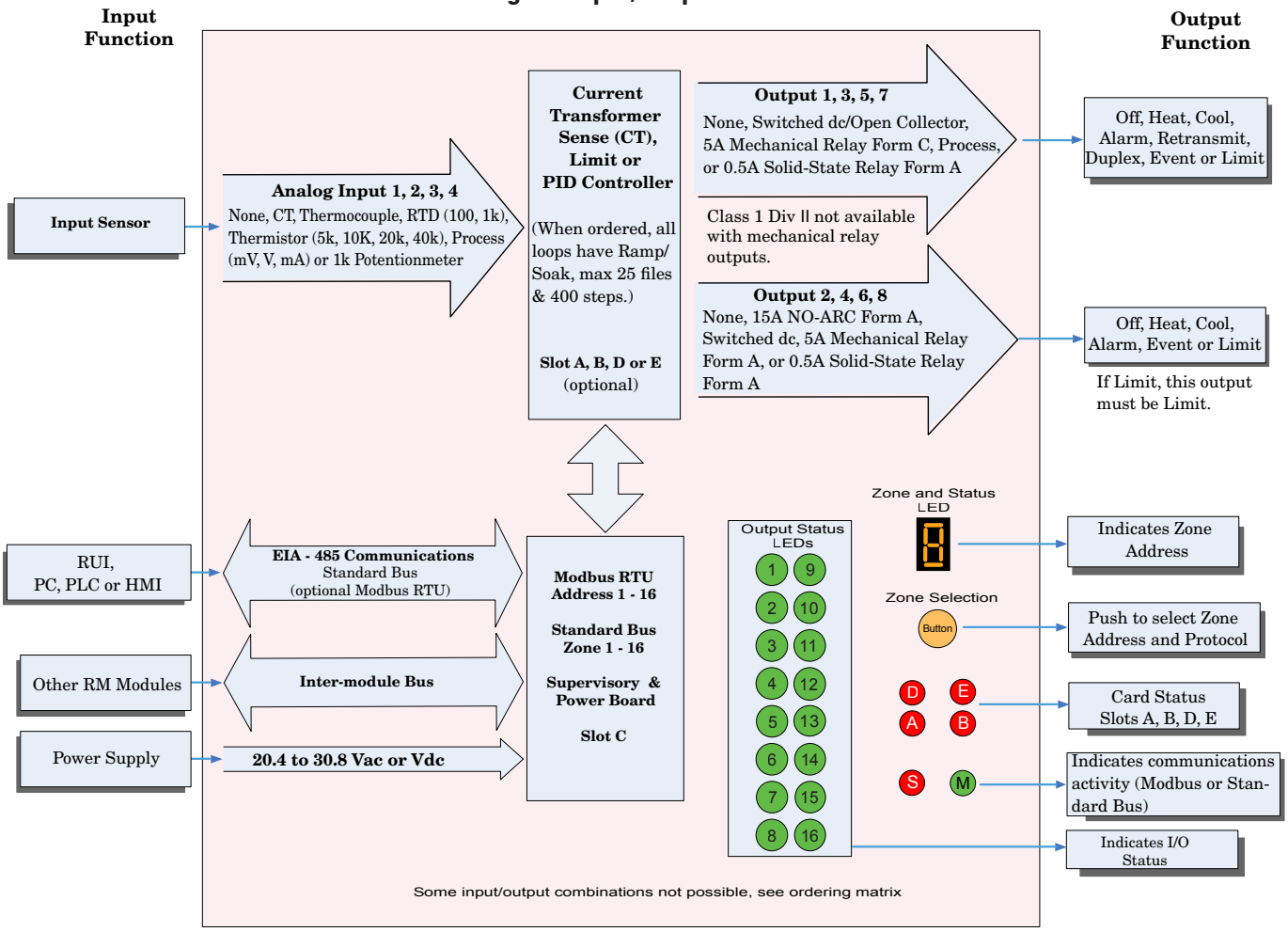
Protocol (Standard Bus - red or Modbus - green)

Module outputs 1 through 16, all may or may not be used depending on module type

EZ-ZONE RM-Control Module - System Diagram with 6-Digital Input/Output card in slot E



EZ-ZONE RM-Control Module - System Diagram without 6-Digital Input/Output card in slot E

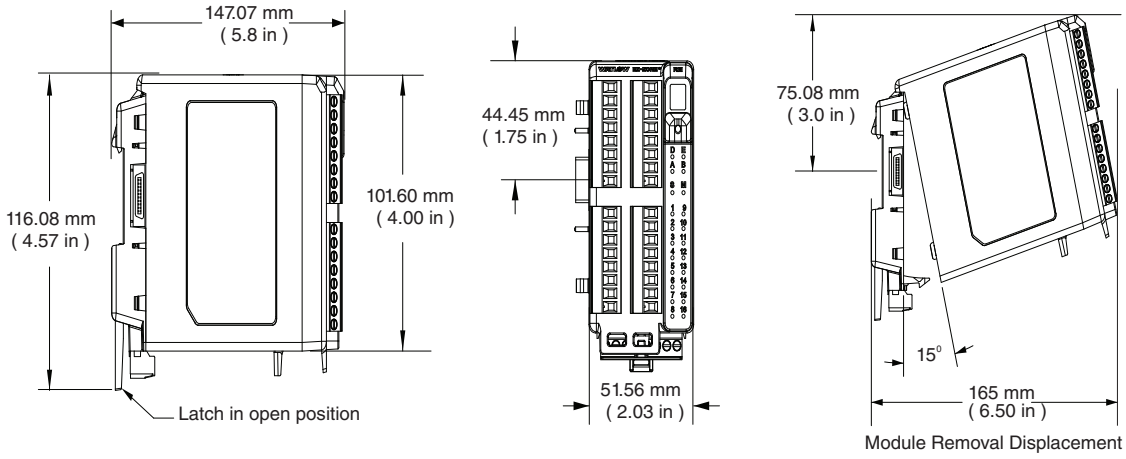


2 Chapter 2: Install and Wire

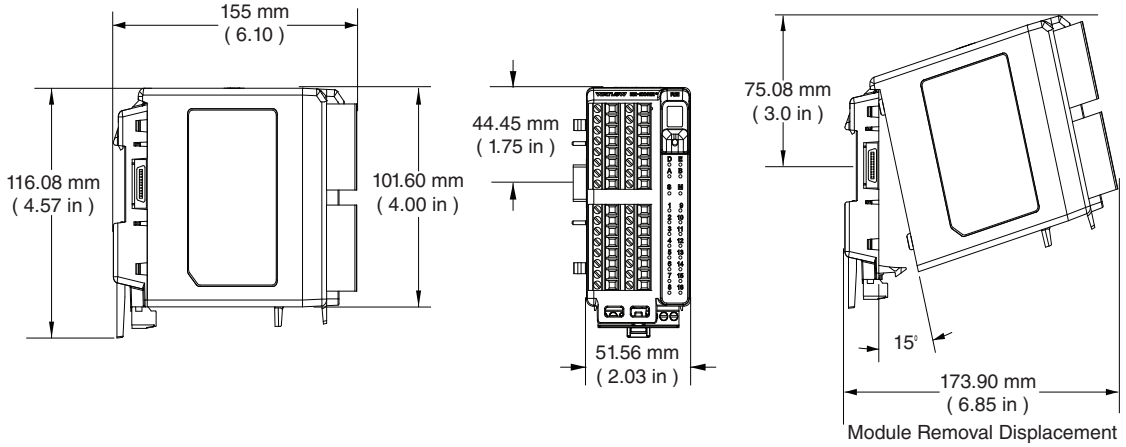
Dimensions

As can be seen below the dimensions of the RMC module will change slightly based on the type of connector used.

Module Removal Clearance **Standard Connectors**

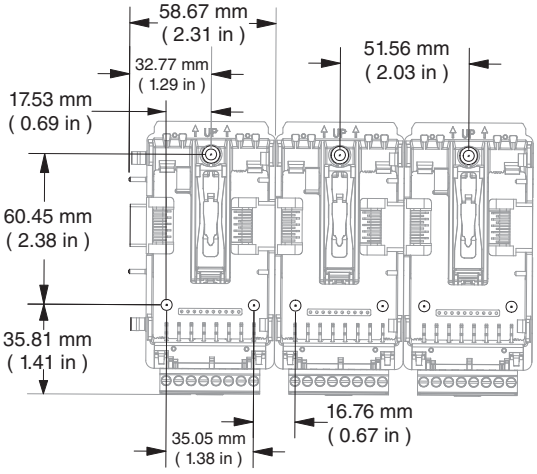


Module Removal Clearance **Straight Connectors**



Dimensions

Chassis Mount Front View (Module Removed) - Screw Connection Pattern



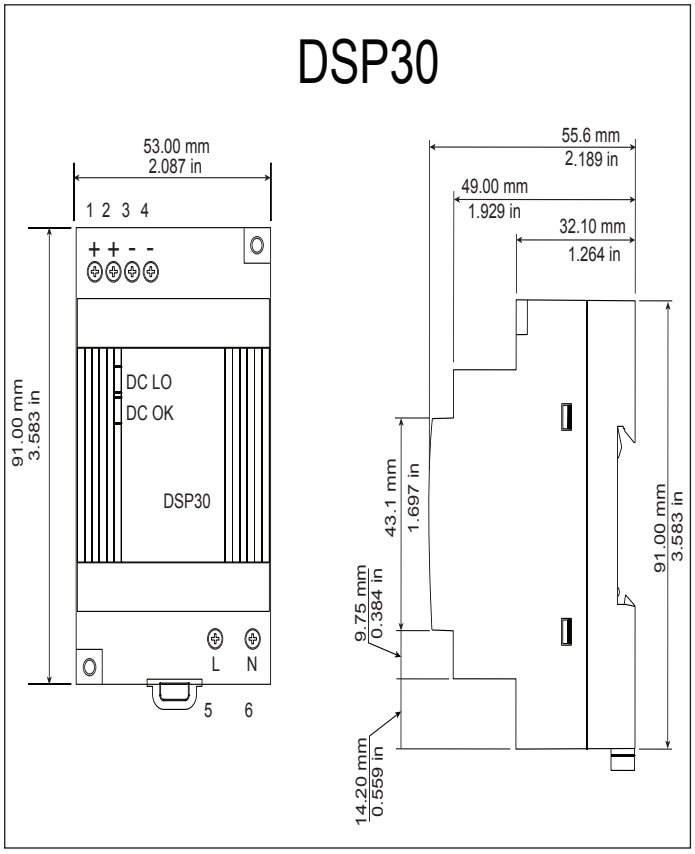
The view above is representative of the modular backplane without the module.

Recommended chassis mount hardware:

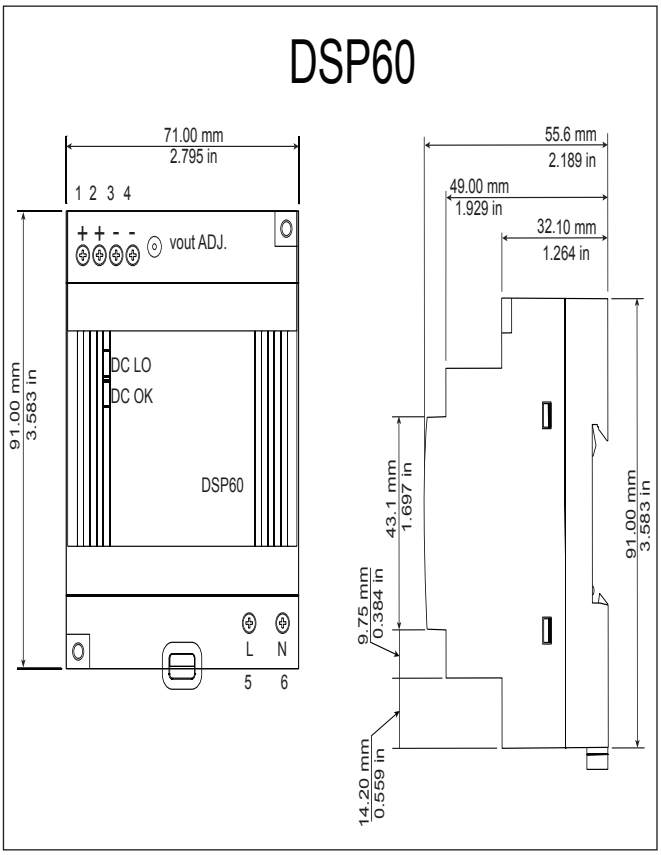
1. #8 screw, 3/4" long
2. Torque to 10 -15 in-lb
3. No washers of any kind

Power Supplies

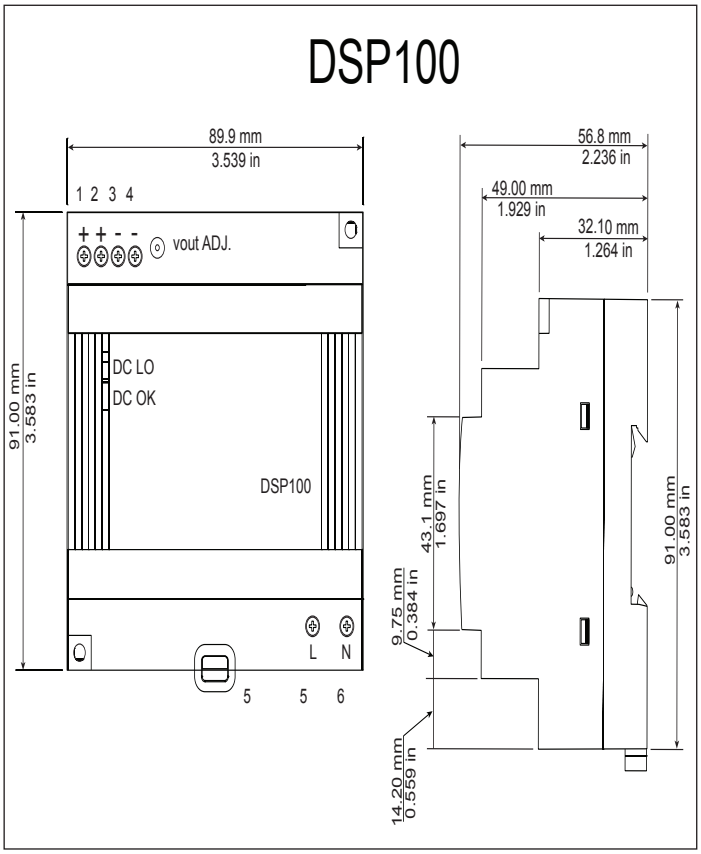
DSP30



DSP60



DSP100



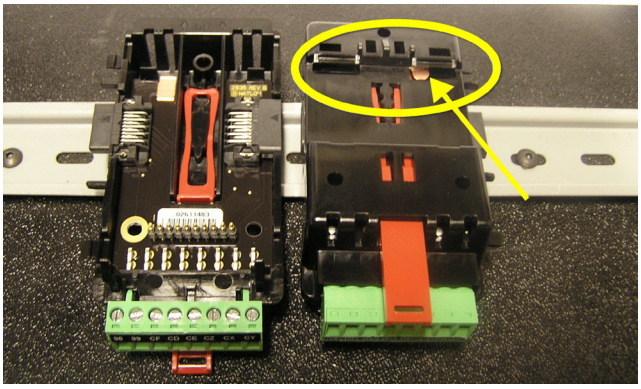
Power Supply Specifications				
		DSP 30	**DSP60**	**DSP100**
AC Input Voltage Range	VAC	90 - 264VAC, Class II double insulated (No ground connection required)		
Input Frequency	Hz	47 - 63Hz		
DC Input Voltage range	VDC	120 - 370VDC		
Inrush Current (115 / 230VAC)	A	25 / 50A	30 / 60A	30 / 60A
Output Voltage Accuracy	%	±1% of Nominal		
Over voltage Protection	V	120 - 145%		
LED Indicators	- - - -	Green LED = On, Red LED = DC Output Low		
Operating Temperature	- - - -	-25 to +71°C (Derate linearly 2.5%/°C from 55 to 71°C)		
Storage Temperature	- - - -	-25 to +85°C		
Operating Humidity	- - - -	20 - 95% RH (non condensing)		
Vibration (Operating)	- - - -	IEC 60068-2-6 (Mounting by rail: Random wave, 10-500 Hz, 2G, ea. along X, Y, Z axes 10 min/cycle, 60 min)		
Safety Agency Approvals		UL1310 Class 2(1), UL508 Listed, UL60950-1, EN60950-1, CE		

For a comprehensive listing of these specifications point your browser to : http://us.tdk-lambda.com/lp/products/dsp-series.htm

RMC Installation and Removal on a DIN Rail

Modular Backplane Connector

The picture on the right shows the Modular Backplane Connector, both front and rear view. The rear view is bringing in to focus a metal clip. If the DIN rail is grounded the Modular Backplane Connector and the module connected to it will be also (recommended).



Installing the Modular Backplane Connector

Step 1

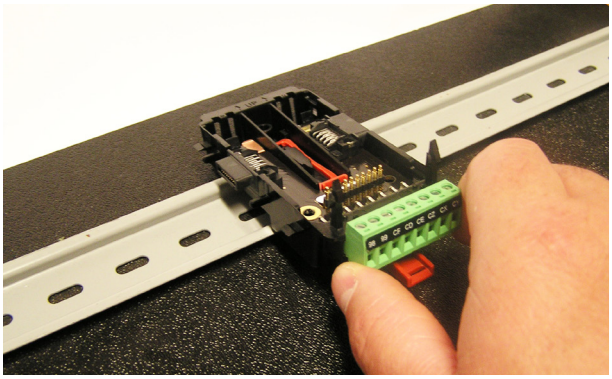
Hook backplane assembly to upper edge of DIN rail, (see rear view above, backplane hook detail that mates with upper rail edge is circled)

Step 2

Next, rotate back plane assembly downward to en gage the lower edge of the rail. (Note: Din Rail clipping distance ranges from 1.366 -1.389 inches. The back plane assembly will not latch onto the rail successfully if the rail is out of dimension).

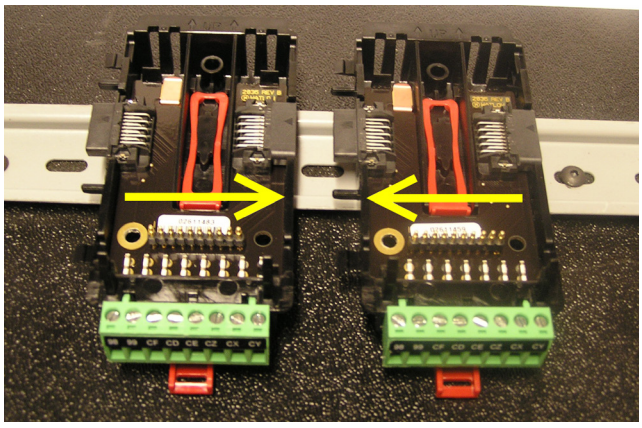
Step 3

For final positioning and locking, the red tab is to be pushed upward to further engage the bottom edge of the rail with an over center snap action latch. (The red locking tab protrudes from the bottom side of the back plane assembly).



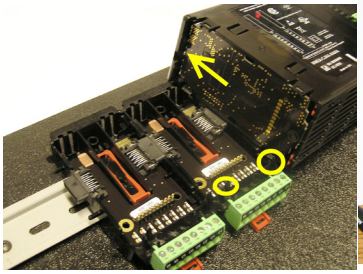
Installing Multiple Modular Backplane Connectors

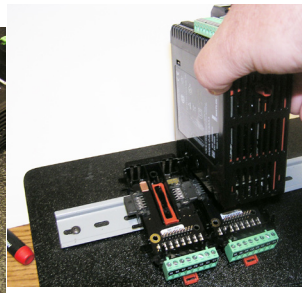
Multiple modules are easily aligned and latched together. Each module includes matched mating geometry that facilitates accurate and consistent interconnections. The recommended method of multi-module attachment is to first attach individual modules to the rail separately and second to laterally slide the modules together until they touch. (Refer to steps 1&2 above). When the multi-module system is attached and laterally positioned to the desired placement the locking tab should be engaged to secure the control system to the rail, (Refer to step 3 above).



Module Installation

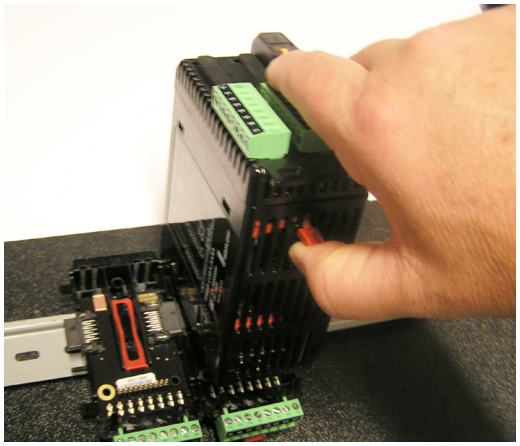
In the picture to the right notice that the arrow is pointing at the top lip of the module (on side). When installing the module simply slide this lip over the top of the Modular Backplane Connector and then push down on the rear of the module where it will seat on the two posts just above the green connector.





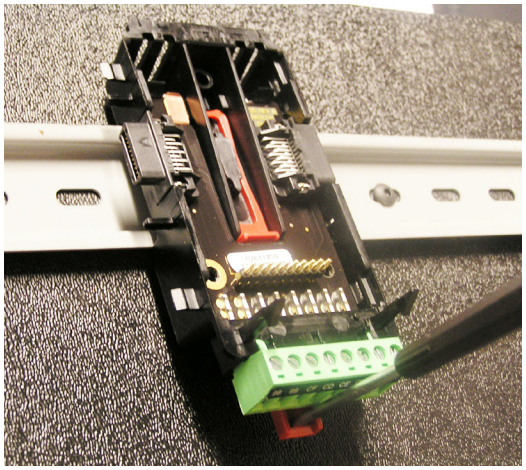
Module Removal

To remove a module from the Modular Backplane Connector find the red tab protruding from the bottom of the module and pull back on it as shown to the right. While pulling back on the red tab the two mounting posts will release the module where the module can then be lifted up and out of the Modular Backplane Connector.



Removal of the Modular Backplane Connector

A module can be removed from the Modular Backplane Connector by inserting a screw driver into the red locking tab just behind the green connector and applying downward pressure on the tab by lifting the screwdriver upwards. When released, the tab will move downward and the connector can then be lifted up off of the DIN rail.



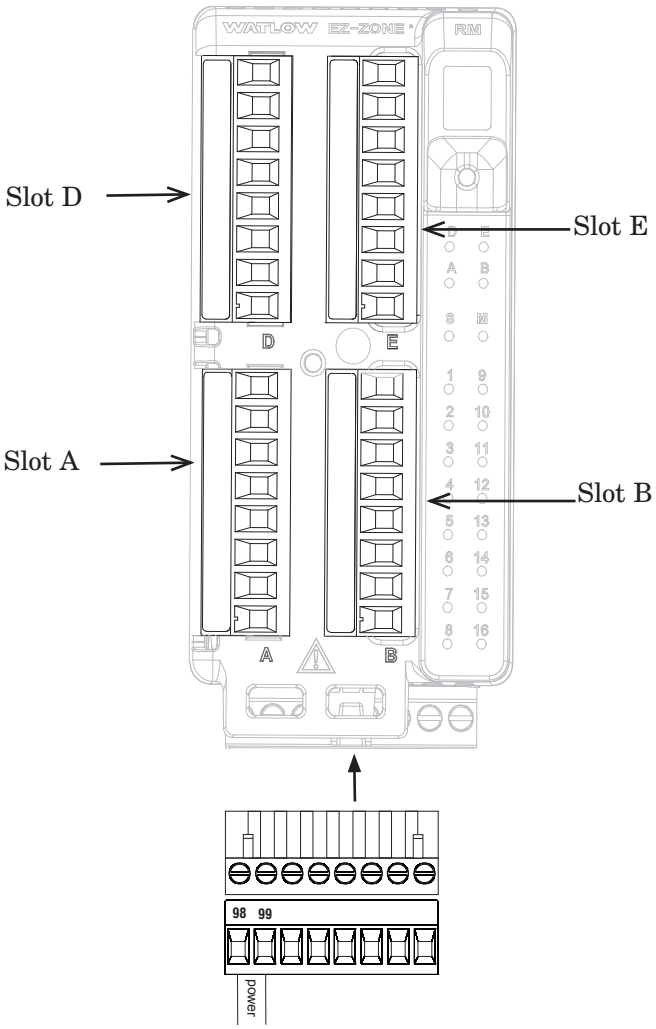
Wiring

Controller Module (RMCxxxxxxxxxxxx)									
Slot A		**Slot B**		**Slot D**		**Slot E**		**Terminal Function**	**Configuration**
Inputs								**Universal, RTD, Potentiometer and Thermistor Inputs 1 - 4**	
1		**2**		**3**		**4**			
T1 S1 R1		T2 S2 R2		T3 S3 R3		T4 S4 R4		T_ (RTD) or current +S_ (RTD), thermocouple -, current -, potentiometer or volts - R_ (RTD), thermocouple + or volts +, potentiometer wiper	Universal/Thermistor Input Part # Digits 4, 6, 8, 10 Input 1: RMC[**1,2,3,4,5,6**]xxxxxxxxxxx Input 2: RMCxx[**1,2,5,6**]xxxxxxxxx Input 3: RMCxxxx[**1,2,5,6**]xxxxxxx Input 4: RMCxxxxxx[**1,2,5,6**]xxxxx
								Current Transformer Inputs 1 - 4	
T1 S1		T2 S2		T3 S3		T4 S4		mA ac mA ac	Current Transformer Part # Digits 4, 6, 8, 10 Input 1: RMC[**7**]xxxxxxxxxxx Input 2: RMCxx[**7**]xxxxxxxxx Input 3: RMCxxxx[**7**]xxxxxxx Input 4: RMCxxxxxx[**7**]xxxxx
								Digital Inputs 7 - 12	
						B7 D7 D8 D9 D10 D11 D12 Z7		Common dc +input dc +input dc +input dc +input dc +input dc +input Internal Supply	Digital Inputs/Outputs Part # Digit 11 Slot A: Option not valid Slot B: Option not valid Slot D: Option not valid Slot E: RMCxxxxxxx[**C**]xxxx
Outputs								**Switched dc / Open Collector Outputs 1, 3, 5 and 7**	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
X1 W1 Y1		X3 W3 Y3		X5 W5 Y5		X7 W7 Y7		common dc- (open collector) dc+	Switched DC/Open Collector Part # Digits 5, 7, 9, 11 Output 1: RMCx[**U,D,E,F,G**]xxxxxxxxxx Output 3: RMCxxx[**U,D,E,F,G**]xxxxxxxx Output 5: RMCxxxxx[**U,D,E,F,G**]xxxxxx Output 7: RMCxxxxxxx[**U,D,E,F,G**]xxxx
								Switched dc Outputs 2, 4, 6 and 8	
	W2 Y2		W4 Y4		W6 Y6		W8 Y8	dc- dc+	Switched DC Part # Digits 5, 7, 9, 11 Output 2: RMCx[**E,K,P**]xxxxxxxxxx Output 4: RMCxxx[**E,K,P**]xxxxxxxx Output 6: RMCxxxxx[**E,K,P**]xxxxxx Output 8: RMCxxxxxxx(**E,K,P**]xxxx
								Universal Process Outputs 1, 3, 5 and 7	
F1 G1 H1		F3 G3 H3		F5 G5 H5		F7 G7 H7		voltage or current - voltage + current +	Universal Process Part # Digits 5, 7, 9, 11 Output 1: RMCx[**N,P,R,S**]xxxxxxxxxx Output 3: RMCxxx[**N,P,R,S**]xxxxxxxx Output 5: RMCxxxxx[**N,P,R,S**]xxxxxx Output 7: RMCxxxxxxx[**N,P,R,S**]xxxx
								Form C - Mechanical Relay Outputs 1, 3, 5 and 7	
L1 K1 J1		L3 K3 J3		L5 K5 J5		L7 K7 J7		normally open common normally closed	Mechanical Relay 5 A, Form C Part # Digits 5, 7, 9, 11 Output 1: RMCx[**H,J,K,L,M**]xxxxxxxxxx Output 3: RMCxxx[**H,J,K,L,M**]xxxxxxxx Output 5: RMCxxxxx[**H,J,K,L,M**]xxxxxx Output 7: RMCxxxxxxx[**H,J,K,L,M**]xxxx

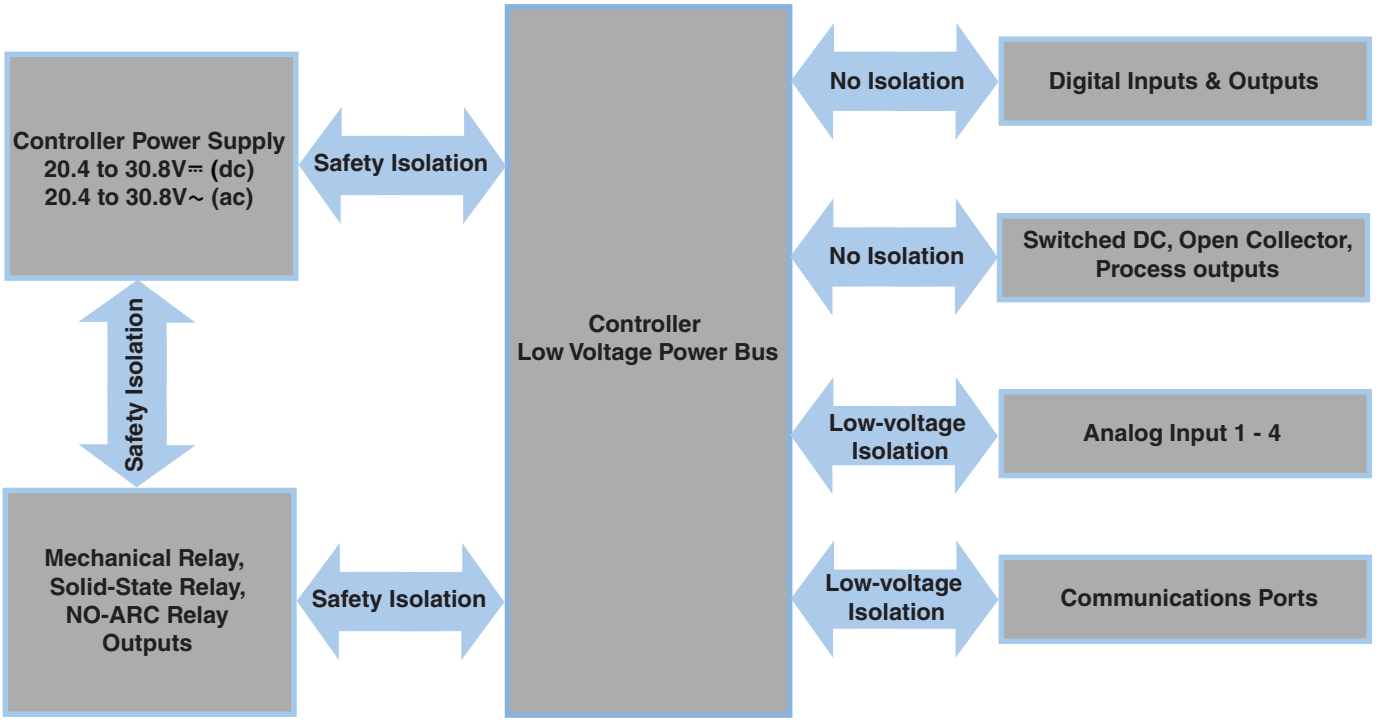
Controller Module (RMCxxxxxxxxxxxx)									
Slot A		Slot B		Slot D		Slot E		Terminal Function	Configuration
Outputs (cont.)								NO-ARC Form A - Mechanical Relay Outputs 2, 4, 6 and 8	
	L2 K2		L4 K4		L6 K6		L8 K8	normally open common	NO-ARC 15 A, Form A Part # Digits 5, 7, 9, 11 Output 2: RMCx[**D,J,Y**]xxxxxxxxxx Output 4: RMCxxx[**D,J,Y**]xxxxxxxx Output 6: RMCxxxxx[**D,J,Y**]xxxxxx Output 8: RMCxxxxxxx[**D,J,Y**]xxxx
								Form A - Mechanical Relay Outputs 2, 4, 6 and 8	
	L2 K2		L4 K4		L6 K6		L8 K8	normally open common	Mechanical Relay 5 A, Form A Part # Digits 5, 7, 9, 11 Output 2: RMCx[**B,F**]xxxxxxxxxx Output 4: RMCxxx[**B,F**]xxxxxxxx Output 6: RMCxxxxx[**B,F**]xxxxxx Output 8: RMCxxxxxxx[**B,F**]xxxx
								Solid State Relay Outputs 1 - 8	
L1 K1	L2 K2	L3 K3	L4 K4	L5 K5	L6 K6	L7 K7	L8 K8	normally open common	Solid-State Relay 0.5 A, Form A Part # Digits 5, 7, 9, 11 Output 1: RMCx[**G,M,S,T,Y,Z**]xxxxxxxxxx Output 2: RMCx[**G,M,S,T,Y,Z**]xxxxxxxxxx Output 3: RMCxxx[**G,M,S,T,Y,Z**]xxxxxxxx Output 4: RMCxxx[**G,M,S,T,Y,Z**]xxxxxxxx Output 5: RMCxxxxx[**G,M,S,T,Y,Z**]xxxxxx Output 6: RMCxxxxx[**G,M,S,T,Y,Z**]xxxxxx Output 7: RMCxxxxxxx[**G,M,S,T,Y,Z**]xxxx Output 8: RMCxxxxxxx[**G,M,S,T,Y,Z**]xxxx
								Digital Outputs 7 - 12	
						B7 D7 D8 D9 D10 D11 D12 Z7		Common open collector/ switched dc open collector/ switched dc open collector/ switched dc open collector/ switched dc open collector/ switched dc open collector/ switched dc Internal Supply	Digital Inputs/Outputs Part # Digit 11 Slot A: Option not valid Slot B: Option not valid Slot D: Option not valid Slot E: RMCxxxxxxx[**C**]xxxx

Power and Communications		
Slot C	Terminal Function	Configuration
98 99	Power input: ac or dc+ Power input: ac or dc-	All
CF CD CE	Standard Bus EIA-485 common Standard Bus EIA-485 T-/R- Standard Bus EIA-485 T+/R+	Standard Bus Part # Digit 13 RMCxxxxxxxxxAxx
CC CA CB	Standard Bus or Modbus RTU EIA-485 common Standard Bus or Modbus RTU EIA-485 T-/R- Standard Bus or Modbus RTU EIA-485 T+/R+	Standard Bus or Modbus Part # Digit 13 RMCxxxxxxxxx1xx
CZ CX CY	Inter-module Bus Inter-module Bus Inter-module Bus	Inter-module Bus

RMC Front View
Standard Connector



RMC Module Isolation Diagram



Low-voltage Isolation: 42V peak
Safety Isolation: 1,528V~ (ac)

Warning:

Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Note:

Maximum wire size termination and torque rating:

- **0.0507 to 3.30 mm^2 (30 to 12 AWG) single-wire termination or two 1.31 mm^2 (16 AWG)**
- **0.8 Nm (7.0 in-lb.) torque**

Note:

Adjacent terminals may be labeled differently, depending on the model number.

Note:

To prevent damage to the controller, do not connect wires to unused terminals.

Note:

Maintain electrical isolation between digital input-outputs, switched dc/open collector outputs and process outputs to prevent ground loops.

Note:

If the last two digits of the part number are "12", this equipment is suitable for use in CLASS I, DIVISION 2, Groups A, B, C and D or Non-Hazardous locations only. Temperature Code T4

Warning:

Explosion Hazard – Substitution of component may impair suitability for CLASS I, DIVISION 2.

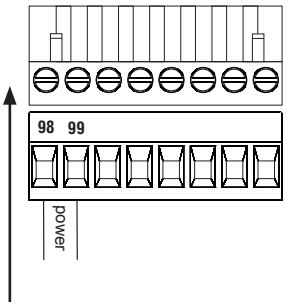
Warning:

Explosion Hazard - Do not disconnect while the circuit is live or unless the area is known to be free of ignitable concentrations of flammable substances.

Controller Module Wiring (RMCxxxxxxxxxxx)

Low Power

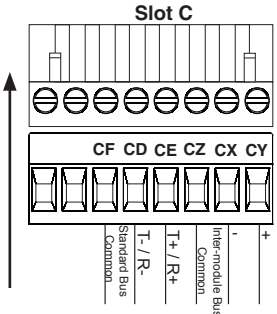
RMC - All Model Numbers



- 20.4 to 30.8 V ~ (ac) / ⎓ (dc) 14VA
- 47 to 63 Hz
- Controller module power consumption, 7 Watts maximum
- 31 Watts maximum power available for P/S part #:0847-0299-0000
- 60 Watts maximum power available for P/S part #:0847-0300-0000
- 91 Watts maximum power available for P/S part #:0847-0301-0000
- Class 2 or Safety Extra Low Voltage (SELV) power source required to meet UL compliance standards

Communications

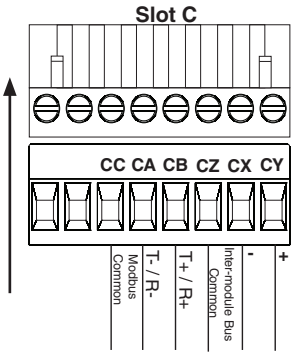
RMC Part # Digit 13 is A



- CF, CD, CE - Standard Bus EIA485 Communications
- CZ, CX, CY - Inter-module Bus EIA485 Communications
- Do not route network wires with power wires. Connect network wires in daisy-chain fashion when connecting multiple devices in a network

Communications

RMC Part # Digit 13 is 1

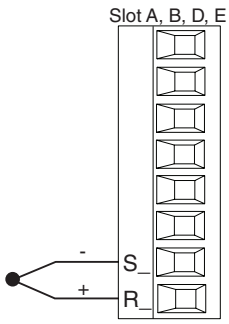


- CC, CA, CB - Modbus and Standard Bus EIA485 Communications (selectable via push button under zone address)
- CZ, CX, CY - Inter-module Bus EIA485 Communications
- Do not route network wires with power wires. Connect network wires in daisy-chain fashion when connecting multiple devices in a network

Modbus-IDA Terminal	EIA/TIA-485 Name	Watlow Terminal Label	Function
DO	A	CA or CD	T-/R-
D1	B	CB or CE	T+/R+
common	common	CC or CF	common

Input 1, 2, 3, 4 Thermocouple

RMC Part # Digits 4, 6, 8, 10



- >20 MΩ input impedance
- 3 microampere open-sensor detection
- Thermocouples are polarity sensitive. The negative lead (usually red) must be connected to S terminal
- To reduce errors, the extension wire for thermocouples must be of the same alloy as the thermocouple.

  Input 1: RMC(**1,3,5**)xxxxxxxxxxx

  Input 2: RMCxx(**1,5**)xxxxxxxxx

  Input 3: RMCxxxx(**1,5**)xxxxxxx

  Input 4: RMCxxxxxx(**1,5**)xxxxx

Warning:

Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Note:

Maximum wire size termination and torque rating:

- **0.0507 to 3.30 mm^2 (30 to 12 AWG) single-wire termination or two 1.31 mm^2 (16 AWG)**
- **0.8 Nm (7.0 in-lb.) torque**

Note:

Adjacent terminals may be labeled differently, depending on the model number.

Note:

To prevent damage to the controller, do not connect wires to unused terminals.

Note:

Maintain electrical isolation between digital input-outputs, switched dc/open collector outputs and process outputs to prevent ground loops.

Note:

If the last two digits of the part number are "12", this equipment is suitable for use in CLASS I, DIVISION 2, Groups A, B, C and D or Non-Hazardous locations only. Temperature Code T4

Warning:

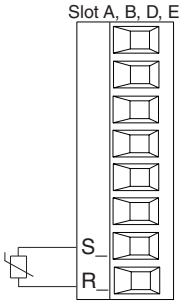
Explosion Hazard – Substitution of component may impair suitability for CLASS I, DIVISION 2.

Warning:

Explosion Hazard - Do not disconnect while the circuit is live or unless the area is known to be free of ignitable concentrations of flammable substances.

Input 1, 2, 3, 4 Thermistor

RMC Part # Digits 4, 6, 8, 10



- >20 MΩ input impedance

  Input 1: RMC(2,4,6)xxxxxxxxxxx

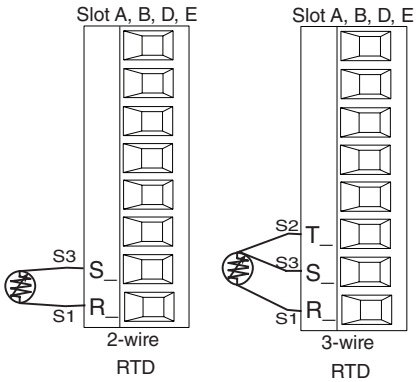
  Input 2: RMCxx(2,6)xxxxxxxxx

  Input 3: RMCxxxx(2,6)xxxxxxx

  Input 4: RMCxxxxxx(2,6)xxxxx

Input 1, 2, 3, 4 RTD

RMC Part # Digits 4, 6, 8, 10



- platinum, 100 and 1,000 Ω @ 0°C
- calibration to DIN curve (0.00385 Ω/Ω/°C)
- 20 Ω total lead resistance
- RTD excitation current of 0.09 mA typical. Each ohm of lead resistance may affect the reading by 0.03°C for 100 Ω.
- For 3-wire RTDs, the S1 lead (usually white) must be connected to R terminal
- For best accuracy use a 3-wire RTD to compensate for lead-length resistance. All three lead wires must have the same resistance.

  Input 1: RMC(**1,3,5**)xxxxxxxxxxx (S1,R1),(T1-S1-R1)

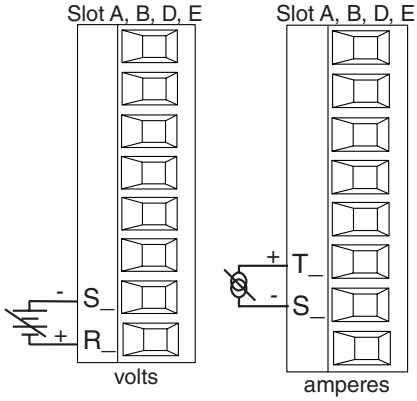
  Input 2: RMCxx(**1,5**)xxxxxxxxx (S2,R2),(T2-S2-R2)

  Input 3: RMCxxxx(**1,5**)xxxxxxx (S3,R3),(T3-S3-R3)

  Input 4: RMCxxxxxx(**1,5**)xxxxx (S4,R4),(T4-S4-R4)

Input 1, 2, 3, 4 Process

RMC Part # Digits 4, 6, 8, 10



- 0 to 20 mA @ 100 Ω input impedance
- 0 to 10V⎓ (dc) @ 20 kΩ input impedance
- 0 to 50 mV⎓ (dc) @ 20 MΩ input impedance
- scalable

  Input 1: RMC(1,3,5)xxxxxxxxxxx (S1-/R1+),(T1+/S1-)

  Input 2: RMCxx(1,5)xxxxxxxxx (S2-/R2+),(T2+/S2-)

  Input 3: RMCxxxx(1,5)xxxxxxx (S3-/R3+),(T3-S3-R3)

  Input 4: RMCxxxxxx(1,5)xxxxx (S4-/R4+),(T4+/S4-)

Warning:

Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Note:

Maximum wire size termination and torque rating:

- **0.0507 to 3.30 mm^2 (30 to 12 AWG) single-wire termination or two 1.31 mm^2 (16 AWG)**
- **0.8 Nm (7.0 in-lb.) torque**

Note:

Adjacent terminals may be labeled differently, depending on the model number.

Note:

To prevent damage to the controller, do not connect wires to unused terminals.

Note:

Maintain electrical isolation between digital input-outputs, switched dc/open collector outputs and process outputs to prevent ground loops.

Note:

If the last two digits of the part number are "12", this equipment is suitable for use in CLASS I, DIVISION 2, Groups A, B, C and D or Non-Hazardous locations only. Temperature Code T4

Warning:

Explosion Hazard – Substitution of component may impair suitability for CLASS I, DIVISION 2.

Warning:

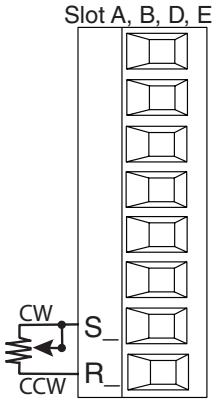
Explosion Hazard - Do not disconnect while the circuit is live or unless the area is known to be free of ignitable concentrations of flammable substances.

Warning:

Explosion Hazard - Dry contact closure Digital Inputs shall not be used in Class I Division 2 Hazardous Locations unless switch used is approved for this application.

Input 1, 2, 3, 4 Potentiometer

RMC Part # Digits 4, 6, 8, 10

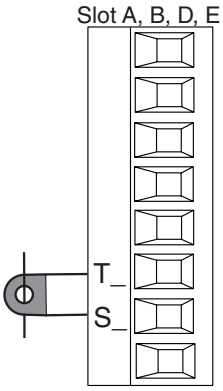


- Use a 1 kΩ potentiometer.

  Input 1: RMC(1,3,5)xxxxxxxxxxx (S1/R1)
  Input 2: RMCxx(1,5)xxxxxxxxx (S2/R2)
  Input 3: RMCxxxx(1,5)xxxxxxx (S3/R3)
  Input 4: RMCxxxxxx(1,5)xxxxx (S4/R4)

Input 1, 2, 3, 4 Current Transformer

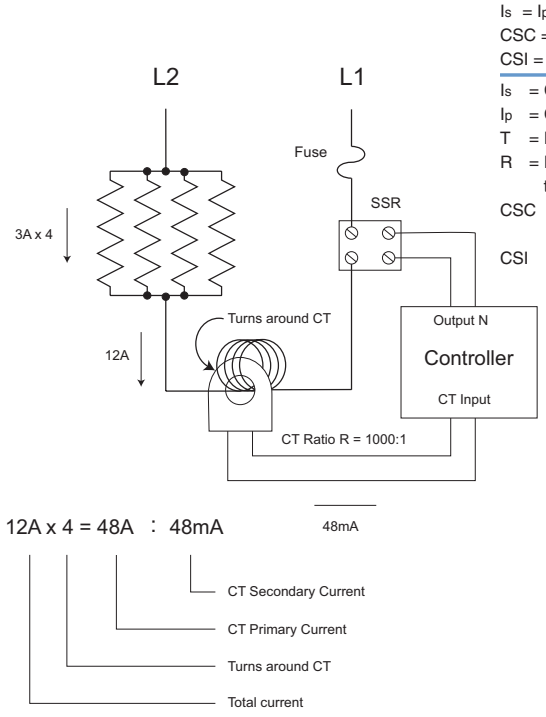
RMC Part # Digits 4, 6, 8, 10



- Input range is 0 to 50 mA (ac).
- Current transformer part number: 16-0246
- 100 Ω input impedance
- Response time: 1 second maximum
- Accuracy +/-1 mA typical

  Input 1: RMC(7)xxxxxxxxxxx (T1/S1)
  Input 2: RMCxx(7)xxxxxxxxx (T2/S2)
  Input 3: RMCxxxx(7)xxxxxxx (T3/S3)
  Input 4: RMCxxxxxx(7)xxxxx (T4/S4)

Example: Using a Current Transformer



$I_S = I_PT/R = 50mA$
$CSC = I_{P(full\ scale)} = 50mA(R)/T$
CSI = Output N

I_S = Current in secondary of current transformer
I_P = Current in primary of current transformer
T = Number of turns through the primary of the transformer
R = Number of turns in the secondary of the current transformer (Turns ratio, assuming one primary turn)
CSC = Current Scaling (parameter found in Current Menu of Setup Page)
CSI = Current Source Instance (parameter found in Current Menu of Setup Page)

Warning:

Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Note:

Maximum wire size termination and torque rating:

- **0.0507 to 3.30 mm^2 (30 to 12 AWG) single-wire termination or two 1.31 mm^2 (16 AWG)**
- **0.8 Nm (7.0 in-lb.) torque**

Note:

Adjacent terminals may be labeled differently, depending on the model number.

Note:

To prevent damage to the controller, do not connect wires to unused terminals.

Note:

Maintain electrical isolation between digital input-outputs, switched dc/open collector outputs and process outputs to prevent ground loops.

Note:

If the last two digits of the part number are "12", this equipment is suitable for use in CLASS I, DIVISION 2, Groups A, B, C and D or Non-Hazardous locations only. Temperature Code T4

Warning:

Explosion Hazard – Substitution of component may impair suitability for CLASS I, DIVISION 2.

Warning:

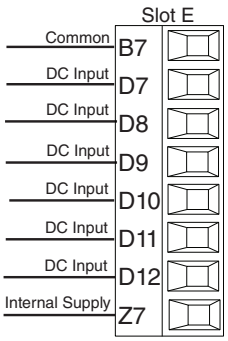
Explosion Hazard - Do not disconnect while the circuit is live or unless the area is known to be free of ignitable concentrations of flammable substances.

Suppressor Note:

Switching pilot duty inductive loads (relay coils, solenoids, etc.) with the mechanical relay, solid state relay or open collector output options requires use of an R.C. suppressor.

Digital Inputs 7 through 12

RMC Part # Digit 11 is C

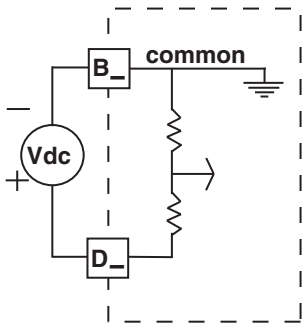


Digital Input Event Conditions

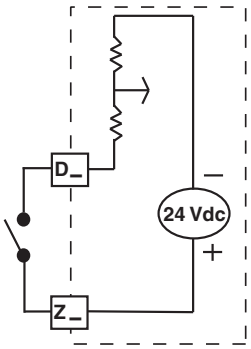
- Dry Contact
  - Input inactive when > 100KΩ
  - Input active when < 50Ω
- Voltage
  - Input inactive when < 2V
  - Input active when > 3V

- Six user configurable Digital Inputs/outputs per slot
  - Slot E DIO 7-12

Voltage Input

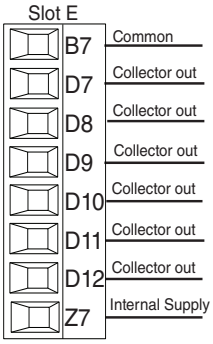


Dry Contact



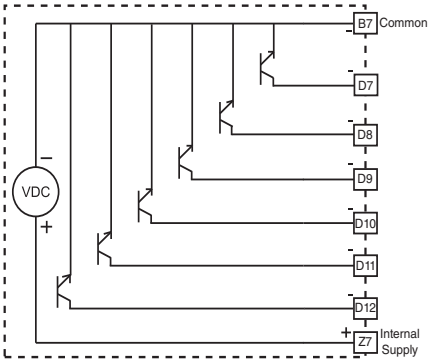
Digital Inputs/Outputs 7 through 12

RMC Part # Digit 11 is C



- Maximum switched voltage is 32V⎓ (dc)
- Internal supply provides a constant power output of 750mW
- Maximum output sink current per output is 1.5A (external class 2 or *SELV supply required)
- Total sink current for all outputs not to exceed 8A
- Do not connect outputs in parallel

*Safety Extra Low Voltage



Warning:

Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Note:

Maximum wire size termination and torque rating:

- **0.0507 to 3.30 mm^2 (30 to 12 AWG) single-wire termination or two 1.31 mm^2 (16 AWG)**
- **0.8 Nm (7.0 in-lb.) torque**

Note:

Adjacent terminals may be labeled differently, depending on the model number.

Note:

To prevent damage to the controller, do not connect wires to unused terminals.

Note:

Maintain electrical isolation between digital input-outputs, switched dc/open collector outputs and process outputs to prevent ground loops.

Note:

If the last two digits of the part number are "12", this equipment is suitable for use in CLASS I, DIVISION 2, Groups A, B, C and D or Non-Hazardous locations only. Temperature Code T4

Warning:

Explosion Hazard – Substitution of component may impair suitability for CLASS I, DIVISION 2.

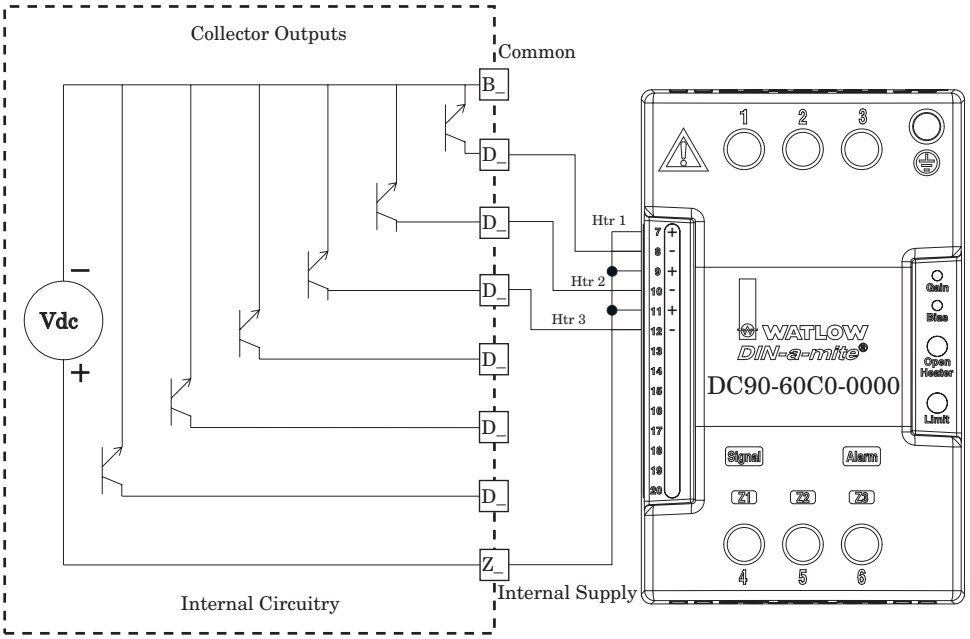
Warning:

Explosion Hazard - Do not disconnect while the circuit is live or unless the area is known to be free of ignitable concentrations of flammable substances.

Quencharc Note:

Switching pilot duty inductive loads (relay coils, solenoids, etc.) with the mechanical relay, solid state relay or open collector output options requires use of an R.C. suppressor.

Switched DC Wiring Example Using DO 7-12

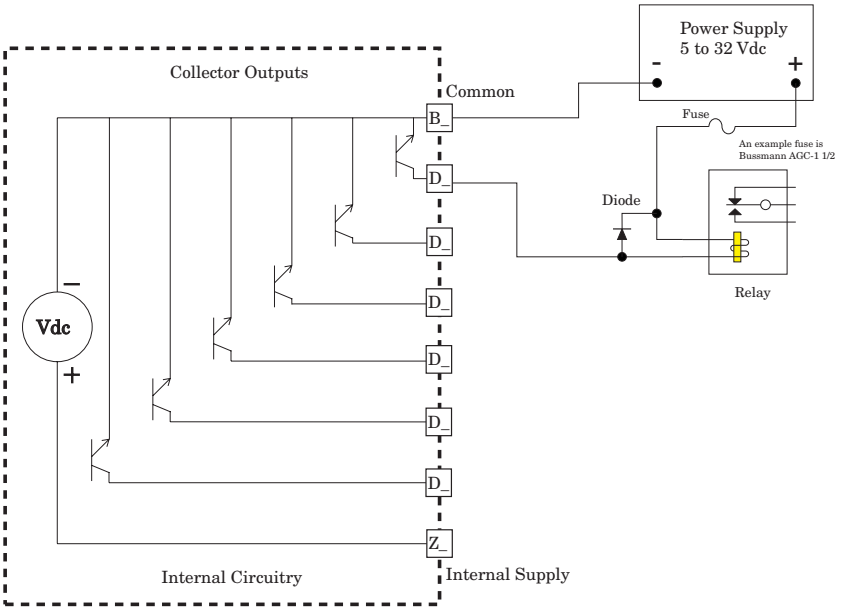


Note:

As a switched DC output; this output is a constant current output delivering 750 mW, current limited to 400 mA. The internal supply does have a maximum open circuit voltage of 22 VDC and minimum open circuit voltage of 19 VDC. Pin Z7 is shared to all digital outputs. This type of output is meant to drive solid state relays, not mechanical relays.

As an open collector output, use an external power supply with the negative wired to B7, the positive to the coil of a pilot mechanical relay and the other side of the coil wired to D_. Each open collector output can sink 1.5 A with the total for all open collector outputs not exceeding 8 amperes. Ensure that a kickback diode is reversed wired across the relay coil to prevent damage to the internal transistor.

Open Collector Wiring Example Using DO 7-12



Warning:

Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Note:

Maximum wire size termination and torque rating:

- **0.0507 to 3.30 mm^2 (30 to 12 AWG) single-wire termination or two 1.31 mm^2 (16 AWG)**
- **0.8 Nm (7.0 in-lb.) torque**

Note:

Adjacent terminals may be labeled differently, depending on the model number.

Note:

To prevent damage to the controller, do not connect wires to unused terminals.

Note:

Maintain electrical isolation between digital input-outputs, switched dc/open collector outputs and process outputs to prevent ground loops.

Note:

If the last two digits of the part number are "12", this equipment is suitable for use in CLASS I, DIVISION 2, Groups A, B, C and D or Non-Hazardous locations only. Temperature Code T4

Warning:

Explosion Hazard – Substitution of component may impair suitability for CLASS I, DIVISION 2.

Warning:

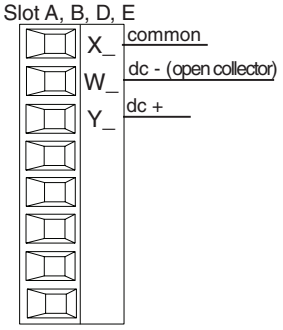
Explosion Hazard - Do not disconnect while the circuit is live or unless the area is known to be free of ignitable concentrations of flammable substances.

Quencharc Note:

Switching pilot duty inductive loads (relay coils, solenoids, etc.) with the mechanical relay, solid state relay or open collector output options requires use of an R.C. suppressor.

Output 1, 3, 5, 7 Switched DC/Open Collector

RMC Part # Digit 5, 7, 9, 11 is U, D, E, F or G



Switched DC

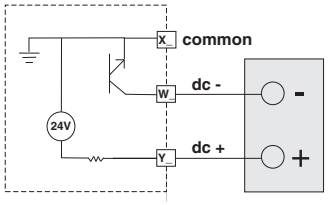
- 30 mA dc maximum supply current
- short circuit limited to <50 mA
- 22 to 32V⎓ (dc) open circuit voltage
- Use dc- and dc+ to drive external solid-state relay.
- DIN-A-MITE compatible

Open Collector

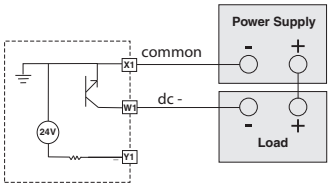
- 100 mA maximum output current sink
- 30V⎓ (dc) maximum supply voltage
- Any switched dc output can use the common terminal.
- Use an external class 2 or *SELV power supply to control a dc load, with the load positive to the positive of the power supply, the load negative to the open collector and common to the power supply negative.

*Safety Extra Low Voltage

Switched DC

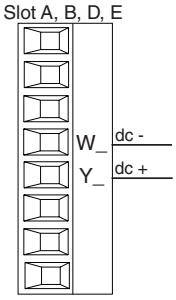


Open Collector



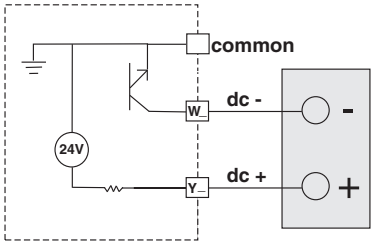
Output 2, 4, 6, 8 Switched DC

RMC Part # Digit 5, 7, 9, 11 is U, D, E, F or G



Switched DC

- 30 mA dc maximum supply current
- short circuit limited to <50 mA
- 22 to 32V⎓ (dc) open circuit voltage
- Use dc- and dc+ to drive external solid-state relay.
- DIN-A-MITE compatible



Warning:

Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Note:

Maximum wire size termination and torque rating:

- **0.0507 to 3.30 mm^2 (30 to 12 AWG) single-wire termination or two 1.31 mm^2 (16 AWG)**
- **0.8 Nm (7.0 in-lb.) torque**

Note:

Adjacent terminals may be labeled differently, depending on the model number.

Note:

To prevent damage to the controller, do not connect wires to unused terminals.

Note:

Maintain electrical isolation between digital input-outputs, switched dc/open collector outputs and process outputs to prevent ground loops.

Note:

If the last two digits of the part number are "12", this equipment is suitable for use in CLASS I, DIVISION 2, Groups A, B, C and D or Non-Hazardous locations only. Temperature Code T4

Warning:

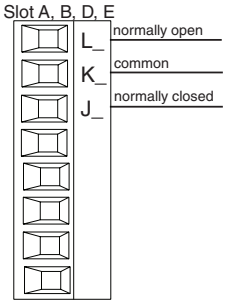
Explosion Hazard – Substitution of component may impair suitability for CLASS I, DIVISION 2.

Warning:

Explosion Hazard - Do not disconnect while the circuit is live or unless the area is known to be free of ignitable concentrations of flammable substances.

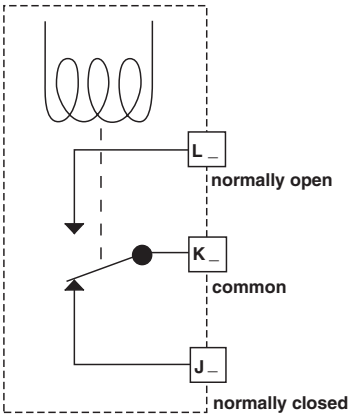
Output 1, 3, 5, 7 Mechanical Relay, Form C

RMC Part # Digit 5, 7, 9, 11 is H, J, K, L or M



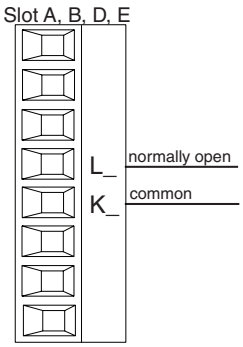
- 5 A at 240V~ (ac) or 30V⎓ (dc) maximum resistive load
- 20 mA at 24V minimum load
- 125 VA pilot duty at 120/240V~ (ac), 25 VA at 24V~ (ac)
- 100,000 cycles at rated load
- Output does not supply power.
- for use with ac or dc

See Quencharc note.

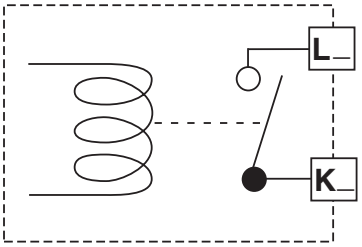


Output 2, 4, 6, 8 Mechanical Relay, Form A

RMC Part # Digit 5, 7, 9, 11 is B, F, L or R



- 5 A at 240V~ (ac) or 30V⎓ (dc) maximum resistive load
- 20 mA at 24V minimum inductive load
- 125 VA pilot duty at 120/240V ~(ac), 25 VA at 24V ~(ac)
- 100,000 cycles at rated load
- Output does not supply power.
- for use with ac or dc
- See Quencharc note.



Warning:

Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Note:

Maximum wire size termination and torque rating:

- **0.0507 to 3.30 mm^2 (30 to 12 AWG) single-wire termination or two 1.31 mm^2 (16 AWG)**
- **0.8 Nm (7.0 in-lb.) torque**

Note:

Adjacent terminals may be labeled differently, depending on the model number.

Note:

To prevent damage to the controller, do not connect wires to unused terminals.

Note:

Maintain electrical isolation between digital input-outputs, switched dc/open collector outputs and process outputs to prevent ground loops.

Note:

If the last two digits of the part number are "12", this equipment is suitable for use in CLASS I, DIVISION 2, Groups A, B, C and D or Non-Hazardous locations only. Temperature Code T4

Warning:

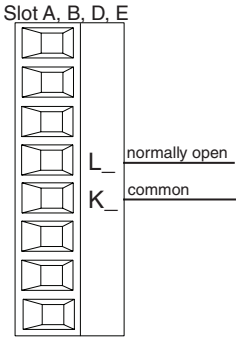
Explosion Hazard – Substitution of component may impair suitability for CLASS I, DIVISION 2.

Warning:

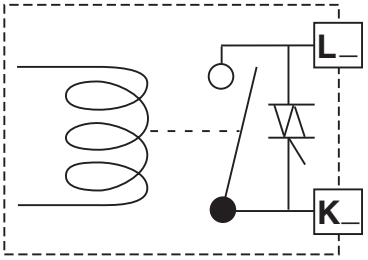
Explosion Hazard - Do not disconnect while the circuit is live or unless the area is known to be free of ignitable concentrations of flammable substances.

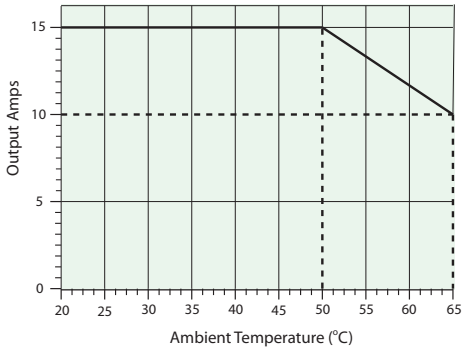
Output 2, 4, 6, 8 NO-ARC Relay, Form A

RMC Part # Digit 5, 7, 9, 11 is D, J or Y



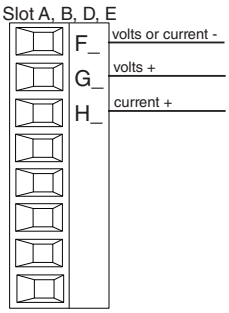
- 15 A at 85 to 264V~ (ac) resistive load only
- 2,000,000 cycle rating for NO-ARC circuit (preliminary)
- 100 mA minimum load
- 2 mA maximum off state leakage
- Do not use on dc loads.
- Output does not supply power.
- Do not drive another relay or solenoid with this output type.



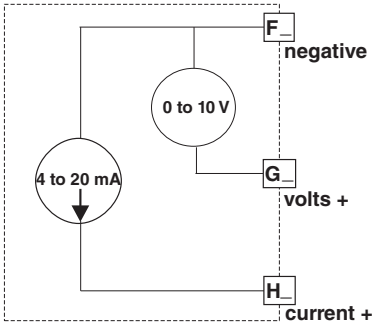


Output 1, 3, 5, 7 Universal Process

RMC Part # Digit 5, 7, 9, 11 is N, P, R, or S



- 0 to 20 mA into 800 Ω maximum load
- 0 to 10V⎓ (dc) into 1 kΩ minimum load
- scalable
- output supplies power
- cannot use voltage and current outputs at same time
- Output may be used as retransmit or control.



Warning:

Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Note:

Maximum wire size termination and torque rating:

- **0.0507 to 3.30 mm^2 (30 to 12 AWG) single-wire termination or two 1.31 mm^2 (16 AWG)**
- **0.8 Nm (7.0 in-lb.) torque**

Note:

Adjacent terminals may be labeled differently, depending on the model number.

Note:

To prevent damage to the controller, do not connect wires to unused terminals.

Note:

Maintain electrical isolation between digital input-outputs, switched dc/open collector outputs and process outputs to prevent ground loops.

Note:

If the last two digits of the part number are "12", this equipment is suitable for use in CLASS I, DIVISION 2, Groups A, B, C and D or Non-Hazardous locations only. Temperature Code T4

Warning:

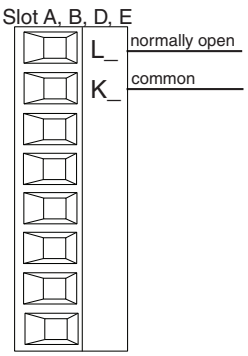
Explosion Hazard – Substitution of component may impair suitability for CLASS I, DIVISION 2.

Warning:

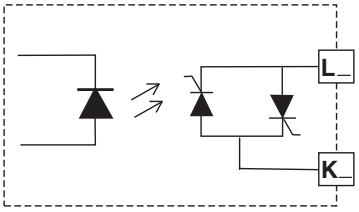
Explosion Hazard - Do not disconnect while the circuit is live or unless the area is known to be free of ignitable concentrations of flammable substances.

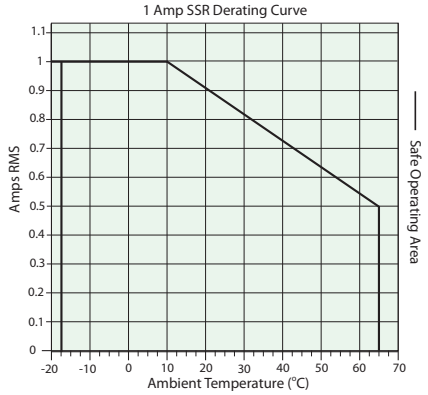
Outputs 1, 3, 5, 7 Solid-State Relay, Form A

RMC Part # Digit 5, 7, 9, 11 is G, M, S, T, Y or Z



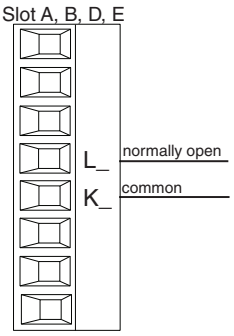
- 1 A at 20 to 264V~ (ac) maximum resistive load
- 20 VA 120/240V~ (ac) pilot duty
- Optical isolation, without contact suppression
- maximum off state leakage of 105 microamperes
- Output does not supply power.
- Do not use on dc loads.
- See Quencharc note.



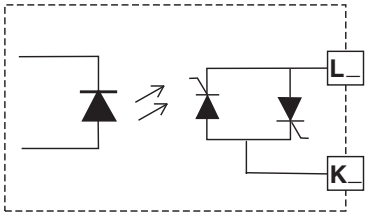


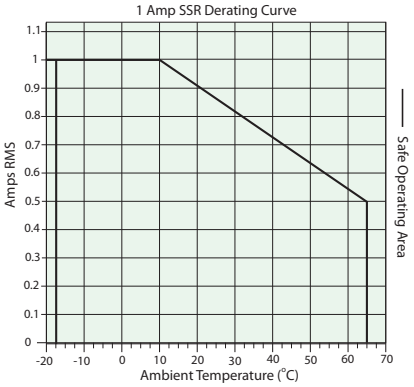
Outputs 2, 4, 6, 8 Solid-State Relay, Form A

RMC Part # Digit 5, 7, 9, 11 is G, M, S, T, Y or Z



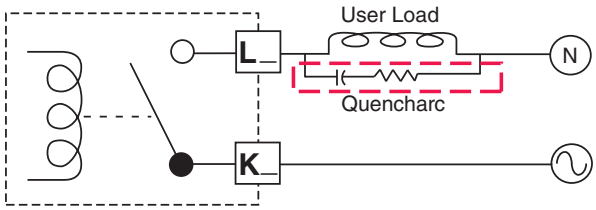
- 1 A at 20 to 264V~ (ac) maximum resistive load
- 20 VA 120/240V~ (ac) pilot duty
- Optical isolation, without contact suppression
- maximum off state leakage of 105 microamperes
- Output does not supply power.
- Do not use on dc loads.
- See Quencharc note.



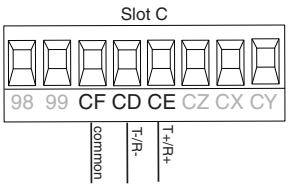


Quencharc Wiring Example

In this example the Quencharc circuit (Watlow part# 0804-0147-0000) is used to protect the RMC internal circuitry from the counter electromagnetic force from the inductive user load when de-engergized. It is recommended that this or an equivalent Quencharc be used when connecting inductive loads to RMC outputs.



Standard Bus EIA-485 Communications



- Wire T-/R- to the A terminal of the EIA-485 port.
- Wire T+/R+ to the B terminal of the EIA-485 port.
- Wire common to the common terminal of the EIA-485 port.
- Do not route network wires with power wires. Connect network wires in daisy-chain fashion when connecting multiple devices in a network.
- A 120 Ω termination resistor may be required across T+/R+ and T-/R-, placed on the last controller on the network.
- Do not connect more than 16 EZ-ZONE RM controllers on a network.
- maximum network length: 1,200 meters (4,000 feet)
- 1/8th unit load on EIA-485 bus

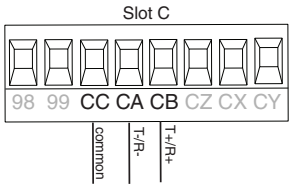
RMCxxxxxxxx(**A**)xx

* All models include Standard Bus communications

Note:

Do not leave a USB to EIA-485 converter connected to Standard Bus without power (i.e., disconnecting the USB end from the computer while leaving the converter connected on Standard Bus). Disturbance on the Standard Bus may occur.

Modbus RTU or Standard Bus EIA-485 Communications



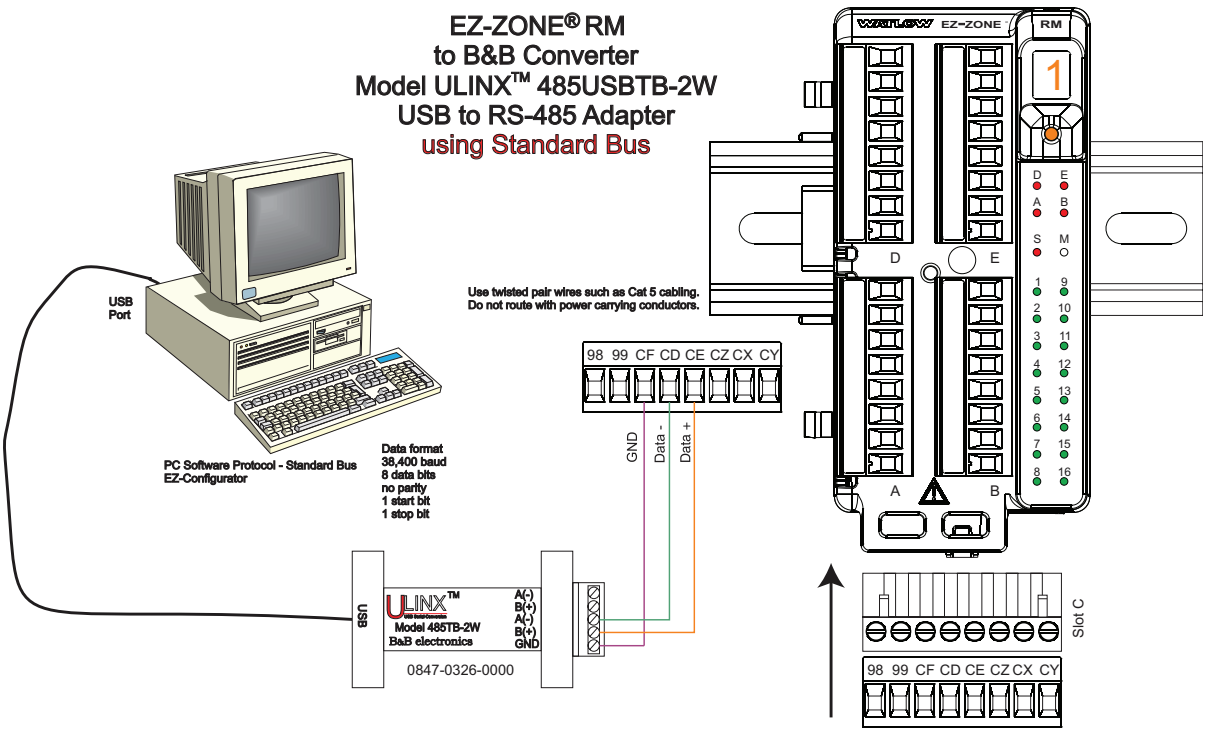
- Wire T-/R- to the A terminal of the EIA-485 port.
- Wire T+/R+ to the B terminal of the EIA-485 port.
- Wire common to the common terminal of the EIA-485 port.
- Do not route network wires with power wires. Connect network wires in daisy-chain fashion when connecting multiple devices in a network.
- A termination resistor may be required. Place a 120 Ω resistor across T+/R+ and T-/R- of last controller on network.
- Only one protocol per port is available at a time: either Modbus RTU or Standard Bus.
- Do not connect more than 16 EZ-ZONE controllers on a Standard Bus network.
- Maximum number of EZ-ZONE controllers on a Modbus network is 247.
- maximum network length: 1,200 meters (4,000 feet)
- 1/8th unit load on EIA-485 bus

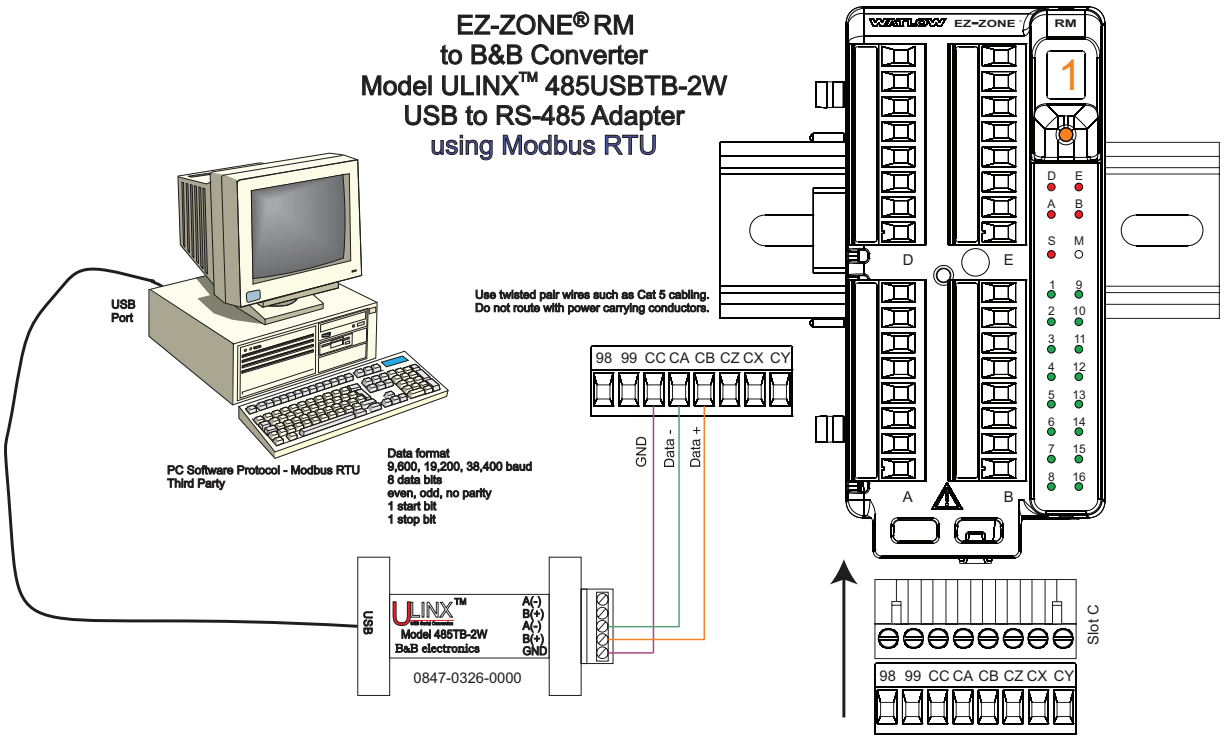
RMCxxxxxxxx(**1**)xx

Note:

Do not leave a USB to EIA-485 converter connected to Standard Bus without power (i.e., disconnecting the USB end from the computer while leaving the converter connected on Standard Bus). Disturbance on the Standard Bus may occur.

Modbus-IDA Terminal	EIA/TIA-485 Name	Watlow Terminal Label	Function
DO	A	CA or CD	T-/R-
D1	B	CB or CE	T+/R+
common	common	CC or CF	common





Note:

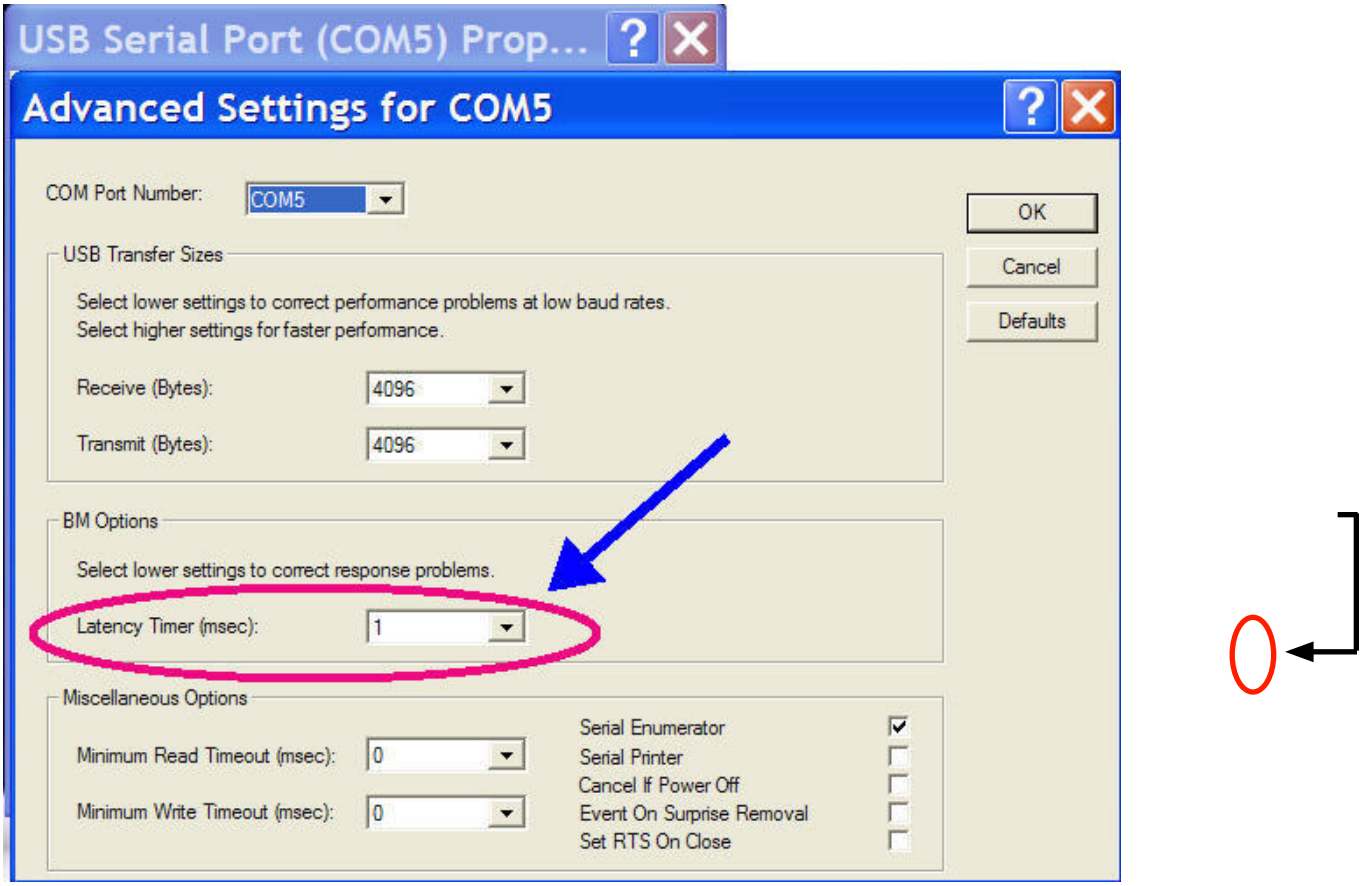
Do not leave a USB to EIA-485 converter connected to Standard Bus without power (i.e., disconnecting the USB end from the computer while leaving the converter connected on Standard Bus). Disturbance on the Standard Bus may occur.

Note:

When connecting the USB converter to the PC it is suggested that the Latency Timer be changed from the default of 16 msec to 1 msec. Failure to make this change may cause communication loss between the PC running ZE-ZONE Configurator software and the control.

To modify Latency Timer settings follow the steps below:

1. Navigate to Device Manager.
2. Double click on Ports.
3. Right click on the USB serial port in use and select Properties.
4. Click the tab labeled Port settings and then click the Advance button.

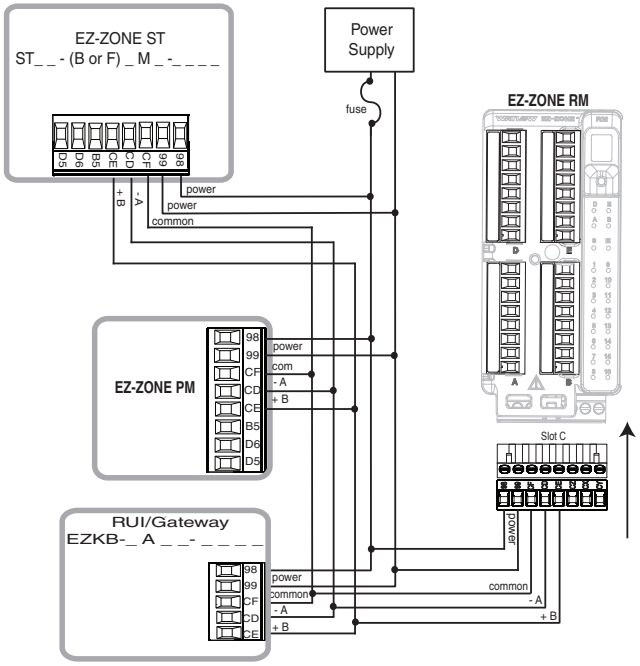


Wiring a Serial EIA-485 Network

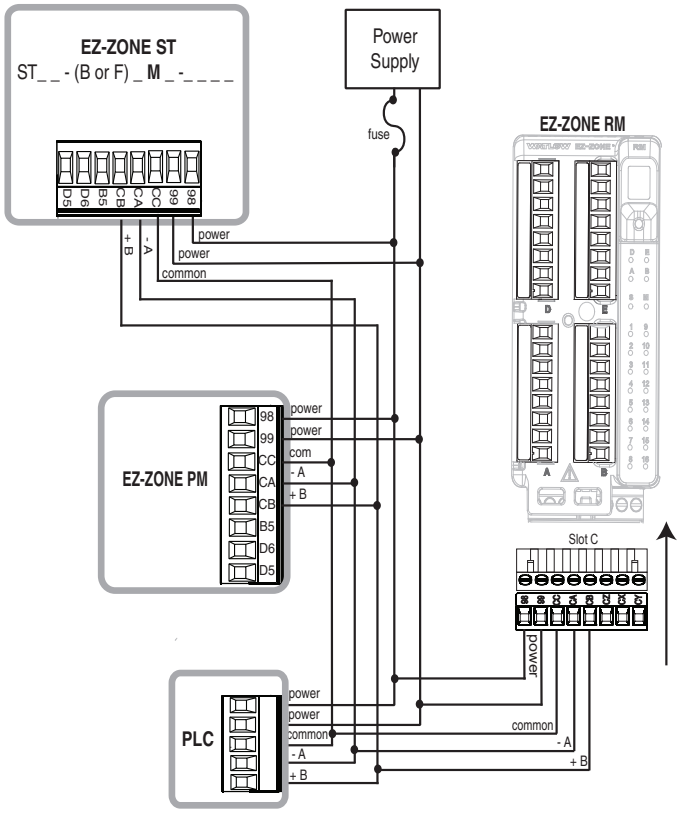
Do not route network wires with power wires. Connect network wires in daisy-chain fashion when connecting multiple devices in a network. A termination resistor may be required. Place a 120 Ω resistor across T+/R+ and T-/R- of the last controller on a network. Only one protocol per port is available at a time: either Modbus RTU or Standard Bus.

Note:
Termination resistors when used, require a termination resistor at both ends of the network.

A Network Using Watlow's Standard Bus and an RUI/Gateway



A Network Using Modbus RTU

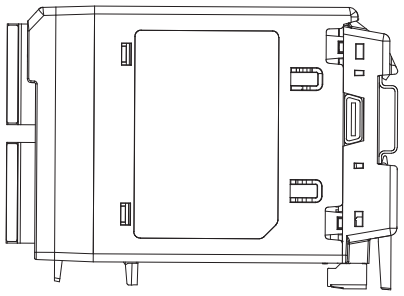


Connecting the Modules

RM System Connections

The RMC module can be installed as stand-alone modules or can be interconnected on the DIN rail as shown below. When modules are connected together as shown, power and communications are shared between modules over the modular backplane interconnection. Therefore, bringing the necessary power and communications wiring to any one connector in slot C is sufficient. The modular backplane interconnect comes standard with every module ordered and is generic in nature, meaning any of the RM modules can use it.

Modular Backplane Interconnect



Notice in the split rail system diagram that a single power supply is being used across both DIN rails. One notable consideration when designing the hardware layout would be the available power supplied and the loading affect of all of the modules used. Watlow provides three options for power supplies listed below:

1. 90-264 Vac to 24Vdc @ 31 watts (Part #: 0847-0299-0000)
2. 90-264 Vac to 24Vdc @ 60 watts (Part #: 0847-0300-0000)
3. 90-264 Vac to 24Vdc @ 91 watts (Part #: 0847-0301-0000)

With regards to the modular loading affect, maximum power for each is listed below:

1. **RMCxxxxxxxxxxx @ 7 watts / 14VA**
2. RMEx-xxxx-xxxx @ 7 watts / 14VA
3. RMAx-xxxx-xxxx @ 4 watts / 9VA
4. RMLx-xxxx-xxxx @ 7 watts / 14VA
5. RMHx-xxxx-xxxx @ 7 watts / 14VA
6. RMSx-xxxx-xxxx @ 7 watts / 14VA

So, in the split rail system diagram, the maximum current draw on the supply would be 38 Watts.

- 1 RMC modules consumes 7W
- 1 RME modules consumes 7W
- 1 RMA module consumes 4W
- 1 RMS modules consumes 7W
- 1 RMH modules consumes 7W
- 1 Remote User Interface consumes 6W

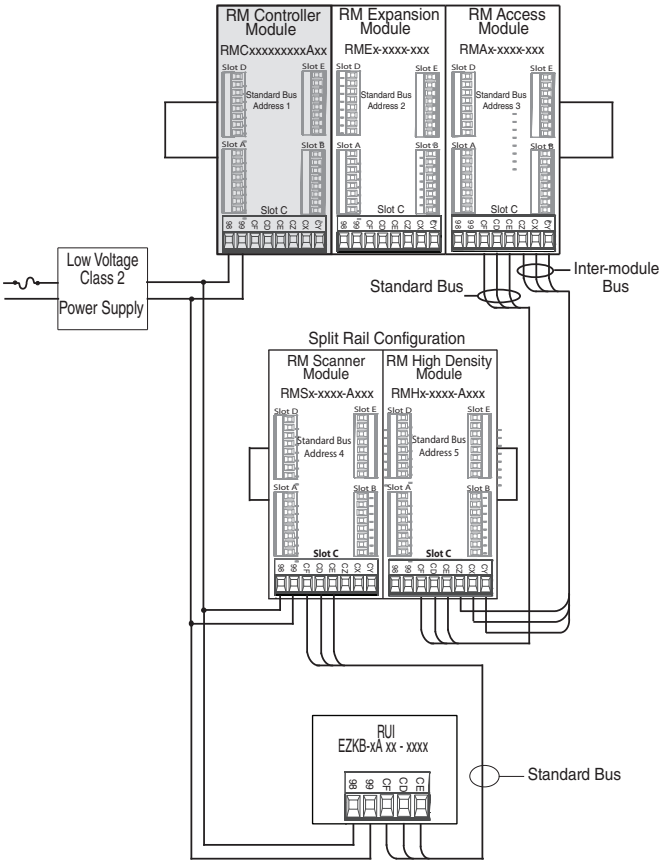
With this power requirement the second or third power supply could be used.

Another hardware configuration scenario that could present itself (graphic not shown) would be a configuration that requires more than one supply. Lets make some assumptions pertaining to the split rail system diagram shown below. The power supply used is the 91W supply. The top DIN rail now has the following modules:

- 2 RMC modules consumes 14W
- 1 RMA consumes 4W
- 11 RME modules consumes 77W

As it can now be understood, the total power requirement exceeds 91W. In this case, another power supply would be required. To incorporate another supply in this system simply disconnect pins 99 and 98 on the remote DIN rail and connect another appropriately sized power supply to those same pins.

When using a split rail configuration ensure that the interconnections for the Inter-module Bus and Standard Bus do not exceed 200 feet. Standard Bus and the Inter-module Buses are different protocols and both are required for split rail configurations. Without having both connected communications between modules would not be possible.



Note:
Unit is not provided with a disconnect, use of an external disconnect is required. It should be located in close proximity to the unit and be labeled as the disconnect for the unit.

Note:
Connecting power supplies in parallel is not allowed. When power consumption is greater than 91 watts use a split rail configuration.

Conventions Used in the Menu Pages

To better understand the menu pages that follow review the naming conventions used. When encountered throughout this document, the word "default" implies as shipped from the factory. Each page (Operations, Setup, Profile and Factory) and their associated menus have identical headers defined below:

Header Name	Definition
Display	Visually displayed information from the control.
Parameter Name	Describes the function of the given parameter.
Range	Defines options available for this prompt, i.e., min/max values (numerical), yes/no, etc... (further explanation below).
Default	Values as delivered from the factory.
Modbus Relative Address	Identifies unique parameters using either the Modbus RTU or Modbus TCP protocols (further explanation below).
CIP (Common Industrial Protocol)	If used in conjunction with an RMA module identifies unique parameters using either the DeviceNet or EtherNet/IP protocol (further explanation below).
Profibus Index	If used in conjunction with an RMA module identifies unique parameters using Profibus DP protocol (further explanation below).
Parameter ID	Identifies unique parameters used with other software such as, LabVIEW.
Data Type R/W	uint = Unsigned 16 bit integer dint = Signed 32-bit, long string = ASCII (8 bits per character) float = IEEE 754 32-bit RWES = **R**eadable **W**ritable **E**EPROM (saved) User **S**et (saved)

Display

When the RMC module is used in conjunction with the RUI (optional equipment) visual information from the control is displayed to the observer using a fairly standard 7 segment display. Due to the use of this technology, several characters displayed need some interpretation, see the list below:

1 = 1	0 = 0	i = i	r = r
2 = 2	A = A	J = J	S = S
3 = 3	b = b	K = K	t = t
4 = 4	c, C = c	L = L	u = u
5 = 5	d = d	M = M	v = v
6 = 6	E = E	n = n	W = W
7 = 7	F = F	o = o	y = y
8 = 8	g = g	P = P	Z = Z
9 = 9	h = h	q = q	

Range

Within this column notice that on occasion there will be numbers found within parenthesis. This number represents the enumerated value for that particular selection. Range selections can be made simply by writing the enumerated value of choice using any of the available communications protocols. As an example, turn to the Control Module Setup Page and look at the Analog Input menu and then the Sensor Type. To turn the sensor off using Modbus simply write the value of 62 (off) to register 400369 and send that value to the control.

Communication Protocols

All modules come with the standard offering of Watlow's Standard Bus protocol used primarily for inter-module communications as well as for configuration using EZ-ZONE Configurator software (free download from Watlow's web site (http://www.watlow.com). Along with Standard Bus, the RMC module can also be ordered with Modbus RTU (only one protocol can be active at any given time). The RMA module has options for several different protocols listed below:

- Modbus RTU 232/485
- EtherNet/IP, Modbus TCP
- DeviceNet
- Profibus DP

To learn more about the RM Access module click on the link below. Once there simply type in RM in the Keyword field.

http://www.watlow.com/literature/manuals.cfm

Modbus RTU Protocol

All Modbus registers are 16-bits and as displayed in this manual are relative addresses (actual). Some legacy software packages limit available Modbus registers to 40001 to 49999 (5 digits). Many applications today require access to all available Modbus registers which range from 400001 to 465535 (6 digits). Watlow controls support 6 digit Modbus registers.

Note:

In this User's Guide all values shown representing Modbus addresses are added to 400,001 or 40,001 to acquire the absolute address. As an example, notice above (under the Range header) the Modbus address identified for Sensor type. Compare this to the value listed for this same parameter found in the Setup Page under the Analog Input Menu.

For parameters listed as float notice that only one (low order) of the two registers is listed, this is true throughout this document. By default, the low order word contains the two low bytes of the 32-bit parameter. As an example, look in the Controller Operations Page for the Analog Input Value. Find the column identified in the header as Modbus and notice that it lists register 360. Because this parameter is a float it is actually represented by registers 360 (low order bytes) and 361 (high order bytes). The Modbus specification does not dictate which register should be high or low order so Watlow provides the user the ability to swap this order (Setup Page, Communications Menu) from the default low/high to high/low.

It should also be noted that some of the cells in the Modbus column contain wording pertaining to an offset. Several parameters in the control contain more than one instance; such as, profiles (4), alarms (8), analog inputs (4), etc... The Modbus register shown Always represents instance one. Take for an example the Alarm Silencing parameter found in the Controller Setup Pages under the Alarm menu. Instance one is shown as address 1750 and the offset to the next instance is identified as +60. If there was a desire to read or write to instance 3 simply add 120 to 1750 to find its address, in this case, the instance 3 address for Alarm Silence is 1870.

RMC _ _ _ _ _ _ _ _ _ **[1]** _ _

or:

RMA _ - A **[2, 3]** _ _ - A A _ or EZKB - x [2,3] _ _ - _ _ _ _

To learn more about the Modbus protocol point your browser to http://www.modbus.org.

3 Chapter 3: Operations Pages

Control Module Operation Page Parameters

To navigate to the Operations Page using the RUI, follow the steps below:

1. From the Home Page, press both the Up ▲ and Down ▼ keys for three seconds. [A1] will appear in the upper display and [oPEr] will appear in the lower display.
2. Press the Up ▲ or Down ▼ key to view available menus.
3. Press the Advance Key ◎ to enter the menu of choice.
4. If a submenu exists (more than one instance), press the Up ▲ or Down ▼ key to select and then press the Advance Key ◎ to enter.
5. Press the Up ▲ or Down ▼ key to move through available menu prompts.
6. Press the Infinity Key ∞ to move backwards through the levels: parameter to submenu; submenu to menu; menu to Home Page.
7. Press and hold the Infinity Key ∞ for two seconds to return to the Home Page.

On the following pages, top level menus are identified with a yellow background color.

Note:
Some of these menus and parameters may not appear, depending on the controller's options. See model number information in the Appendix for more information. If there is only one instance of a menu, no submenus will appear.

Note:
Some of the listed parameters may not be visible. Parameter visibility is dependent upon controller part number.

[A1]
[oPEr] **Analog Input Menu**
[1]
[A1] **Analog Input (1 to 4)**
[A1n] **Value**
[1Er] **Error Status**
[1CA] **Calibration Offset**

[Pu]
[oPEr] **Process Value Menu**
[1]
[Pu] **Process Value (1 to 4)**
[Su.A] **Source Value A**
[Su.b] **Source Value B**
[Su.C] **Source Value C**
[Su.d] **Source Value D**
[Su.E] **Source Value E**
[oFSt] **Offset**
[o.u] **Output Value**

[d1o]
[oPEr] **Digital Input/Output Menu**
[1]
[d1o] **Digital Input/Output (7 to 12)**
[do.S] **Output State**
[d1.S] **Input State**

[ACt]
[oPEr] **Action Menu**
[1]
[ACt] **Action (1 to 8)**
[E1.S] **Event Status**

[L1M]
[oPEr] **Limit Menu**
[1]
[L1M] **Limit (1 to 4)**
[LL.S] **Low Set Point**
[Lh.S] **High Set Point**
[LCr] **Clear Request ****
[L.St] **State ****

[MMon]
[oPEr] **Monitor Menu**
[1]
[MMon] **Monitor (1 to 4)**
[C.MA] **Control Mode Active**
[h.Pr] **Heat Power**
[C.Pr] **Cool Power**
[C.SP] **Closed Loop Working Set Point**
[Pu.A] **Process Value Active**

[LooP]
[oPEr] **Loop Menu**
[1]
[LooP] **Loop (1 to 4)**
[r.En] **Remote Enable**
[C.M] **Control Mode**
[At.SP] **Autotune Set Point**
[AUt] **Autotune Request**
[C.SP] **Closed Loop Set Point**
[1d.S] **Idle Set Point**
[h.Pb] **Heat Proportional Band**
[h.hy] **Heat Hysteresis**
[C.Pb] **Cool Proportional Band**
[C.hy] **Cool Hysteresis**
[t1] **Time Integral**
[td] **Time Derivative**
[db] **Dead Band**
[o.SP] **Open Loop Set Point**

[ALM]
[oPEr] **Alarm Menu**
[1]
[ALM] **Alarm (1 to 8)**
[A.Lo] **Low Set Point**
[A.h1] **High Set Point**
[A.CLr] **Clear Request ****
[A.S1r] **Silence Request ****
[A.St] **State ****

[CUrr]
[oPEr] **Current Menu**
[1]
[CUrr] **Current (1 to 4)**
[C.h1] **High Set Point**
[C.Lo] **Low Set Point**
[CUr] **RMS Read**
[C.Er] **Error**
[h.Er] **Heater Error**

[Lnr]
[oPEr] **Linearization Menu**
[1]
[Lnr] **Linearization (1 to 4)**
[Su.A] **Source Value A**
[oFSt] **Offset**
[o.u] **Output Value**

** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.

CPE
oPEr **Compare Menu**
1
CPE **Compare (1 to 4)**
Su.A **Source Value A**
Su.b **Source Value B**
ou **Output Value**

tMr
oPEr **Timer Menu**
1
tMr **Timer (1 to 4)**
Su.A **Source Value A**
Su.b **Source Value B**
Et **Elapsed Time**
ou **Output Value**

Ctr
oPEr **Counter Menu**
1
Ctr **Counter (1 to 4)**
Cnt **Count**
Su.A **Source Value A**
Su.b **Source Value B**
ou **Output Value**

LGC
oPEr **Logic Menu**
1
LGC **Logic (1 to 4)**
Su.A **Source Value A**
Su.b **Source Value B**
Su.C **Source Value C**
Su.d **Source Value D**
Su.E **Source Value E**
Su.F **Source Value F**
Su.G **Source Value G**
Su.h **Source Value H**
ou **Output Value**

MAtH
oPEr **Math Menu**
1
MAtH **Math (1 to 8)**
Su.A **Source Value A**
Su.b **Source Value B**
Su.C **Source Value C**
Su.d **Source Value D**
Su.E **Source Value E**
oFSt **Offset**
ou **Output Value**

SoF
oPEr **Special Output Function Menu**
1
SoF **Special Output Function (1 to 4)**
Su.A **Source Value A**
Su.b **Source Value B**
ou.1 **Output Value 1**
ou.2 **Output Value 2**
ou.3 **Output Value 3**
ou.4 **Output Value 4**

P.StA
oPEr **Profile Status Menu**
1
P.StA **Profile Status 1**
P.Str **Profile Start**
PACr **Action Request**
StP **Active Step**
Sub.S **Active Subroutine Step**
St.tP **Active Step Type**
t.SP1 **Target Set Point Loop 1**
t.SP2 **Target Set Point Loop 2**
t.SP3 **Target Set Point Loop 3**
t.SP4 **Target Set Point Loop 4**
P.SP1 **Produced Set Point 1**
P.SP2 **Produced Set Point 2**
P.SP3 **Produced Set Point 3**
P.SP4 **Produced Set Point 4**
hour **Hours Remaining**
MN.in **Minutes Remaining**
SEC **Seconds Remaining**
Ent1 **Active Event Output 1**
Ent2 **Active Event Output 2**
Ent3 **Active Event Output 3**
Ent4 **Active Event Output 4**
Ent5 **Active Event Output 5**
Ent2 **Active Event Output 6**
Ent2 **Active Event Output 7**
Ent8 **Active Event Output 8**
JC **Jump Count Remaining**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
A i oPEr **Analog Input Menu**								
A in [Ain]	*Analog Input (1 to 4)* **Value** View the process value. **Note:** Ensure that the Error Status (below) indicates no error (61) when reading this value using a field bus protocol. If an error exists, the last known value prior to the error occurring will be returned.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	360 [offset 90]	0x68 (104) 1 to 4 1	0	4001	float R
i.Er [i.Er]	*Analog Input (1 to 4)* **Error Status** View the cause of the most recent error. If the AEtn message is Er.i1 or Er.i2, this parameter will display the cause of the input error.	nonE None (61) OPEn Open (65) Shrt Shorted (127) E.Pr Measurement Error (140) E.CAL Bad Calibration Data (139) Er.Ab Ambient Error (9) Er.td RTD Error (141) FAiL Fail (32)	- - - -	362 [offset 90]	0x68 (104) 1 to 4 2	1	4002	uint R
i.CA [i.CA]	*Analog Input (1 to 4)* **Calibration Offset** Offset the input reading to compensate for lead wire resistance or other factors that cause the input reading to vary from the actual process value.	-1,999.000 to 9,999.000°F or units -1,110.555 to 5,555.000°C	0.0	382 [offset 90]	0x68 (104) 1 to 4 0xC (12)	2	4012	float RWES
No Display	*Analog Input (1 to 4)* **Clear Latched Input Error** Clear latched input when input error condition no longer exists.	Clear Latch (1221)	- - - -	416 [offset 90]	0x68 (104) 1 to 4 0x1D (29)	- - - -	4029	uint RW
Pu oPEr **Process Value Menu**								
Su.A [Su.A]	*Process Value (1 to 4)* **Source Value A** View the value of Source A.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	3430 [offset 70]	0x7E (126) 1 to 4 0x10 (16)	- - - -	26016	float R
Su.b [Su.b]	*Process Value (1 to 4)* **Source Value B** View the value of Source B.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	3432 [offset 70]	0x7E (126) 1 to 4 0x11 (17)	- - - -	26017	float R
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
Su.C [Su.C]	*Process Value (1 to 4)* **Source Value C** View the value of Source C.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	3434 [offset 70]	0x7E (126) 1 to 4 0x12 (18)	- - - -	26018	float R
Su.d [Su.d]	*Process Value (1 to 4)* **Source Value D** View the value of Source D.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	3436 [offset 70]	0x7E (126) 1 to 4 0x13 (19)	- - - -	26019	float R
Su.E [Su.E]	*Process Value (1 to 4)* **Source Value E** View the value of Source E.	oFF Off (62) on On (63)	- - - -	3438 [offset 70]	0x7E (126) 1 to 4 0x14 (20)	- - - -	26020	float R
oFSt [oFSt]	*Process Value (1 to 4)* **Offset** Set an offset to be applied to this function's output.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0	3444 [offset 70]	0x7E (126) 1 to 4 0x17 (23)	- - - -	26023	float RWES
o.u [o.u]	*Process Value (1 to 4)* **Output Value** View the value of this function block's output.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	3442 [offset 70]	0x7E (126) 1 to 4 0x16 (22)	- - - -	26022	float R
No Display	*Process Value (1 to 4)* **Error** View reported cause for Process output malfunction.	None (61) Open (65) Shorted (127) Measurement error (140) Bad calibration data (139) Ambient error (9) RTD error (14) Fail (32) Math error (1423) Not sourced (246) Stale (1617)	- - - -	3452 [offset 70]	0x7E (126) 1 to 4 0x1B (27)	- - - -	26027	uint R
d.io oPEr **Digital Input/Output Menu**								
do.S [do.S]	*Digital Output (7 to 12)* **Output State** View the state of this output.	oFF Off (62) on On (63)	- - - -	1212 [offset 30]	0x6A (106) 7 to C (12) 7	90	6007	uint R
d.iS [di.S]	*Digital Input (7 to 12)* **Input State** View this event input state.	oFF Off (62) on On (63)	- - - -	1220 [offset 30]	0x6A (106) 7 to C (12) 0xB (11)	- - - -	6011	uint R
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
No Display	*Digital Input (7 to 12)* **Source Error** View reported cause for input malfunction.	None (61) Open (65) Shorted (127) Measurement error (140) Bad calibration data (139) Ambient error (9) RTD error (14) Fail (32) Math error (1423) Not sourced (246) Stale (1617)	- - - -	1228 [offset 30]	0x6A (106) 7 to C (12) 0x0F (15)	- - - -	6015	uint R
Action Menu								
[Ei.S]	*Action (1 to 8)* **Event Input Status** View this input state.	oFF Off (62) on On (63)	- - - -	1588 [offset 20]	0x6E (110) 1 to 8 5	140	10005	uint R
Limit Menu								
[LL.S]	*Limit (1 to 4)* **Low Set Point** Set the low process value that will trigger the limit.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	724 [offset 30]	0x70 (112) 1 to 4 3	38	12003	float RWES
[Lh.S]	*Limit (1 to 4)* **High Set Point** Set the high process value that will trigger the limit.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	726 [offset 30]	0x70 (112) 1 to 4 4	39	12004	float RWES
No Display	*Limit (1-4)* **Limit State** Clear limit once limit condition is cleared.	Off (62) None (61) Limit High (51) Limit Low (52) Error (225)	- - - -	730 [offset 30]	0x70 (112) 1 6	- - - -	12006	uint R
[LCr]	*Limit (1-4)* **Limit Clear Request** ** Clear limit once limit condition is cleared.	Clear (0) No Change (255)	- - - -	720 [offset 30]	0x70 (112) 1 1	- - - -	12001	uint W
[L.St]	*Limit (1 to 4)* **Status** ** Reflects whether or not the limit is in a safe or failed mode..	Fail (32) Safe (1667)	- - - -	744 [offset 30]	0x70 (112) 1 to 4 0x0D (13)	- - - -	12013	uint R
Monitor Menu								
[C.MA]	*Monitor (1 to 4)* **Control Mode Active** View the current control mode.	oFF Off (62) Auto Auto (10) Man Manual (54)	- - - -	2222 [offset 70]	0x97 (151) 1 to 4 2	- - - -	8002	uint R
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
h.Pr [h.Pr]	*Monitor (1 to 4)* **Heat Power** View the current heat output level.	0.0 to 100.0%	- - - -	2244 [offset 70]	0x97 (151) 1 to 4 0xD (13)	- - - -	8011	float R
C.Pr [C.Pr]	*Monitor (1 to 4)* **Cool Power** View the current cool output level.	-100.0 to 0.0%	- - - -	2246 [offset 70]	0x97 (151) 1 to 4 0xE (14)	- - - -	8014	float R
C.SP [C.SP]	*Monitor (1 to 4)* **Closed Loop Active Set Point** View the set point currently in effect.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	2512 [offset 80]	0x6B (107) 1 to 4 7	- - - -	8029	float R
Pv.A [Pv.A]	*Monitor (1 to 4)* **Process Value Active** View the current filtered process value using the control input.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	402 [offset 90]	0x68 (104) 1 to 4 0x16 (22)	- - - -	8031	float R
No Display	*Monitor (1 to 4)* **Autotune Status** Read the present status of Autotune.	oFF Off (62) tS.1P Waiting for cross 1 positive (119) tS.1n Waiting for cross 1 negative (120) tS.2P Waiting for cross 2 positive (121) tS.2n Waiting for cross 2 negative (122) tS.3P Waiting for cross 3 positive (123) tS.3n Waiting for cross 3 negative (150) PPn Measuring maximum peak (151) PPA Measuring minimum peak (152) CALC Calculating (153) CPLt Complete (18) to Timeout (118)	- - - -	2272 [offset 70]	0x97 (151) 1 to 4 27	- - - -	8027	uint R
LooP oPEr **Control Loop Menu**								
r.En [r.En]	*Control Loop (1 to 4)* **Remote Set Point** Enable this loop to switch control to the remote set point.	no No (59) YES Yes (106)	No	2540 [offset 80]	0x6B (107) 1 to 4 0x15 (21)	48	7021	uint RWES
C.Pn [C.M]	*Control Loop (1 to 4)* **Control Mode** Select the method that this loop will use to control.	oFF Off (62) AUto Auto (10) PnAn Manual (54)	Auto	2220 [offset 70]	0x97 (151) 1 to 4 1	63	8001	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
AtSP [A.tSP]	*Control Loop (1 to 4)* **Autotune Set Point** Set the set point that the autotune will use, as a percentage of the current set point.	50.0 to 200.0%	90.0	2258 [offset 70]	0x97 (151) 1 to 4 0x14 (20)	- - - -	8025	float RWES
AUt [AUt]	*Control Loop (1 to 4)* **Autotune Request** Start an autotune. While the autotune is active, the Home Page will display AtUn tUn1. When the autotune is complete, the message will clear automatically.	no No (59) YES Yes (106)	No	2260 [offset 70]	0x97 (151) 1 to 4 0x15 (21)	64	8026	uint RW
C.SP [C.SP]	*Control Loop (1 to 4)* **Closed Loop Set Point** Set the set point that the controller will automatically control to.	Low Set Point to High Set Point (Setup Page)	75.0°F or units 24.0°C	2500 [offset 80]	0x6B (107) 1 to 4 1	49	7001	float RWES
id.S [id.S]	*Control Loop (1 to 4)* **Idle Set Point** Set a closed loop set point that can be triggered by an event state.	Low Set Point to High Set Point (Setup Page)	75.0°F or units 24.0°C	2516 [offset 80]	0x6B (107) 1 to 4 9	50	7009	float RWES
h.Pb [h.Pb]	*Control Loop (1 to 4)* **Heat Proportional Band** Set the PID proportional band for the heat outputs.	0.001 to 9,999.000°F or units 0.001 to 5,555.000°C	25.0°F or units 14.0°C	2230 [offset 70]	0x97 (151) 1 to 4 6	65	8009	float RWES
h.hy [h.hy]	*Control Loop (1 to 4)* **Heat Hysteresis** Set the control switching hysteresis for on-off control. This determines how far into the "on" region the process value needs to move before the output turns on.	0.001 to 9,999.000°F or units 0.001 to 5,555.000°C	3.0°F or units 2.0°C	2240 [offset 70]	0x97 (151) 1 to 4 0xB (11)	66	8010	float RWES
C.Pb [C.Pb]	*Control Loop (1 to 4)* **Cool Proportional Band** Set the PID proportional band for the cool outputs.	0.001 to 9,999.000°F or units 0.001 to 5,555.000°C	25.0°F or units 14.0°C	2232 [offset 70]	0x97 (151) 1 to 4 7	67	8012	float RWES
C.hy [C.hy]	*Control Loop (1 to 4)* **Cool Hysteresis** Set the control switching hysteresis for on-off control. This determines how far into the "on" region the process value needs to move before the output turns on.	0.001 to 9,999.000°F or units 0.001 to 5,555.000°C	3.0°F or units 2.0°C	2242 [offset 70]	0x97 (151) 1 to 4 0xC (12)	68	8013	float RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
t i [ti]	*Control Loop (1 to 4)* **Time Integral** Set the PID integral for the outputs.	0 to 9,999 seconds per repeat	180 seconds per repeat	2234 [offset 70]	0x97 (151) 1 to 4 8	69	8006	float RWES
t d [td]	*Control Loop (1 to 4)* **Time Derivative** Set the PID derivative time for the outputs.	0 to 9,999 seconds	0 seconds	2236 [offset 70]	0x97 (151) 1 to 4 9	70	8007	float RWES
d b [db]	*Control Loop (1 to 4)* **Dead Band** Set the offset to the proportional band. With a negative value, both heating and cooling outputs are active when the process value is near the set point. A positive value keeps heating and cooling outputs from fighting each other.	-1,000.0 to 1,000.0°F or units -556 to 556°C	0.0	2238 [offset 70]	0x97 (151) 1 to 4 0xA (10)	71	8008	float RWES
o.SP [o.SP]	*Control Loop (1 to 4)* **Open Loop Set Point** Set a fixed level of output power when in manual (open-loop) mode.	-100 to 100% (heat and cool) 0 to 100% (heat only) -100 to 0% (cool only)	0.0	2502 [offset 80]	0x6B (107) 1 to 4 2	51	7002	float RWES
No Display	*Control Loop (1 to 4)* **Error State** Read to see if loop is in an error state.	None (61) Open Loop (1274) Reversed Loop (1275)	- - - -	2268 [offset 70]	0x97 (151) 1 to 4 0x19(25)	- - - -	8048	uint R
No Display	*Control Loop (1 to 4)* **Error Clear** Write to this register to clear loop error.	Clear (129) Ignore (204)	Ignore	2270 [offset 70]	0x97 (151) 1 to 4 0x1A(26)	- - - -	8049	uint W
No Display	*Control Loop (1 to 4)* **Loop Output Power** View the loop output power.	-100.0 to 100.0	- - - -	2248 [offset 70]	0x97 (151) 1 to 4 0x0F (15)	- - - -	8033	float R
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
ALM1 oPEr **Alarm Menu**								
A.Lo [A.Lo]	*Alarm (1 to 8)* **Low Set Point** If Alarm Type (Setup Page, Alarm Menu) is set to: **process** - set the process value that will trigger a low alarm. **deviation** - set the span of units from the closed loop set point that will trigger a low alarm. A negative set point represents a value below closed loop set point. A positive set point represents a value above closed loop set point.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	32.0°F or units 0.0°C	1742 [offset 60]	0x6D (109) 1 to 8 2	18	9002	float RWES
A.hi [A.hi]	*Alarm (1 to 8)* **High Set Point** If Alarm Type (Setup Page, Alarm Menu) is set to: **process** - set the process value that will trigger a high alarm. **deviation** - set the span of units from the closed loop set point that will trigger a low alarm. A negative set point represents a value below closed loop set point. A positive set point represents a value above closed loop set point.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	300.0°F or units 150.0°C	1740 [offset 60]	0x6D (109) 1 to 8 1	19	9001	float RWES
A.CLr [A.CLr]	*Alarm (1 to 8)* **Alarm Clear Request** Write to this register to clear an alarm	0	- - - -	1764 [offset 60]	0x6D (109) 1 to 8 0xD (13)	32	9013	uint W
A.Sir [A.Sir]	*Alarm (1 to 8)* **Alarm Silence Request** Write to this register to silence an alarm	0	- - - -	1766 [offset 60]	0x6D (109) 1 to 8 0xE (14)	33	9014	uint W
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
A.St [A.St]	*Alarm (1 to 8)* **Alarm State** Current state of alarm	Startup (88) None (61) Blocked (12) Alarm low (8) Alarm high (7) Error (28)	- - - -	1756 [offset 60]	0x6D (109) 1 to 8 9	- - - -	9009	uint R
No Display	*Alarm (1 to 8)* **Alarm Clearable** Read to see if alarm can be cleared.	no No (59) YES Yes (106)	- - - -	1762 [offset 60]	0x6D (109) 1 to 8 0xC (12)	- - - -	9012	uint R
No Display	*Alarm (1 to 8)* **Silenced** Read to see if alarm is active but has been silenced by Alarm Silence Request.	Yes (106) No (59)	- - - -	1760 [offset 60]	0x6D (109) 1 to 4 0x0B (11)	- - - -	9011	uint R
No Display	*Alarm (1 to 8)* **Latched** Read to see if alarm is currently latched.	Yes (106) No (59)	- - - -	1758 [offset 60]	0x6D (109) 1 to 4 0x0A (10)	- - - -	9010	uint R
CUrr oPEr **Current Menu**				**Note: To use the current sensing feature, Time Base (Setup Page, Output Menu) must be set to 0.7 seconds or more.**				
C.hi [C.hi]	*Current (1 to 4)* **High Set Point** Set the current value that will trigger a high heater error state.	-1,999.000 to 9,999.000	50.0	1394 [offset 50]	0x73 (115) 1 to 4 8	- - - -	15008	float RWES
C.Lo [C.Lo]	*Current (1 to 4)* **Low Set Point** Set the current value that will trigger a low heater error state.	-1,999.000 to 9,999.000	0.0	1396 [offset 50]	0x73 (115) 1 to 4 9	- - - -	15009	float RWES
CU.r [CU.r]	*Sensed Current (1 to 4)* **Read** View the most recent current value monitored by the current transformer.	-1,999.000 to 9,999.000	- - - -	1380 [offset 50]	0x73 (115) 1 to 4 1	- - - -	15001	float R
No Display	*Ammeter Current (1 to 4)* **Read** RMS current value monitored by the current transformer.	0 to 9,999.00	- - - -	1392 [offset 50]	0x73 (115) 1 to 4 7	- - - -	15007	float R
C.Er [C.Er]	*Current (1 to 4)* **Error** View the cause of the most recent load fault.	nonE None (61) Shrt Shorted (127) oPEn Open (65)	- - - -	1382 [offset 50]	0x73 (115) 1 to 4 2	- - - -	15002	uint R
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
h.Er [h.Er]	*Current (1 to 4)* **Heater Error** View the cause of the most recent load fault monitored by the current transformer.	none None (61) h iGh High (37) LoUJ Low (53)	- - - -	1384 [offset 50]	0x73 (115) 1 to 4 3	- - - -	15003	uint R
No Display	*Current (1 to 4)* **Actual Power** Power delivered to output monitored by CT.	0.0 to 100.0%	- - - -	1418 [offset 50]	0x73 (115) 1 to 4 0x14 (20)	- - - -	15020	float R
No Display	*Current (1 to 4)* **Error Status** View the cause of the most recent load fault	None (61) Fail (32)	- - - -	1420 [offset 50]	0x73 (115) 1 to 4 21	- - - -	15021	uint R
LnrE oPEr **Linearization Menu**								
Su.A [Su.A]	*Linearization (1 to 4)* **Source Value A** View the value of Source A.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	4526 [offset 70]	0x86 (134) 1 to 4 4	- - - -	34004	float R
oFSt [oFSt]	*Linearization (1 to 4)* **Offset** Set an offset to be applied to this function's output.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0	4530 [offset 70]	0x86 (134) 1 to 4 6	- - - -	34006	float RWES
o.u [o.v]	*Linearization (1 to 4)* **Output Value** View the value of this function's output.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	4532 [offset 70]	0x86 (134) 1 to 4 7	- - - -	34007	float R
No Display	*Linearization (1 to 4)* **Error** View reported cause for Linearization output malfunction.	None (61) Open (65) Shorted (127) Measurement error (140) Bad calibration data (139) Ambient error (9) RTD error (14) Fail (32) Math error (1423) Not sourced (246) Stale (1617) Can't process (1659)	- - - -	4574 [offset 70]	0x86 (134) 1 to 4 0x1C (28)	- - - -	34028	uint R
CPE oPEr **Compare Menu**								
Su.A [Su.A]	*Compare (1 to 4)* **Source Value A** View the value of Source A.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	4012 [offset 40]	0x80 (128) 1 to 4 7	- - - -	28007	float R
Su.b [Su.b]	*Compare (1 to 4)* **Source Value B** View the value of Source B.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	4014 [offset 40]	0x80 (128) 1 to 4 8	- - - -	28008	float R
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RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
o.v [o.v]	*Compare (1 to 4)* **Output Value** View the value of this function's output.	oFF Off (62) on On (63)	- - - -	4018 [offset 40]	0x80 (128) 1 to 4 0xA (10)	- - - -	28010	uint R
No Display	*Compare (1 to 4)* **Error** Read reported cause for compare error	None (61) Open (65) Shorted (127) Measurement Error (140) Bad Cal Data (139) Ambient Error (9) RTD Error (141) Fail (32) Math Error (1423) Not Sourced (246) Stale (1617)	- - - -	4024 [offset 40]	0x80 (128) 1 to 4 0x0D (13)	- - - -	28013	uint R
tMr oPEr **Timer Menu**								
Su.A [Su.A]	*Timer (1 to 4)* **Value Source A** View the value of Source A.	oFF Off (62) on On (63)	- - - -	4332 [offset 50]	0x83 (131) 1 to 4 7	- - - -	31007	uint R
Su.b [Su.b]	*Timer (1 to 4)* **Value Source B** View the value of Source B.	oFF Off (62) on On (63)	- - - -	4334 [offset 50]	0x83 (131) 1 to 4 8	- - - -	31008	uint R
E.t [E.t]	*Timer (1 to 4)* **Elapsed Time** View the value of this function's elapsed time.	0 to 9,999.000 seconds	- - - -	4350 [offset 50]	0x83 (131) 1 to 4 0x10 (16)	- - - -	31016	float R
o.v [o.v]	*Timer (1 to 4)* **Output Value** View the value of this function's output.	oFF Off (62) on On (63)	- - - -	4338 [offset 50]	0x83 (131) 1 to 4 0xA (10)	- - - -	31010	uint R
No Display	*Timer (1 to 4)* **Error** Read reported cause for timer error	None (61) Open (65) Shorted (127) Measurement Error (140) Bad Cal Data (139) Ambient Error (9) RTD Error (141) Fail (32) Math Error (1423) Not Sourced (246) Stale (1617)	- - - -	4354 [offset 50]	0x83 (131) 1 to 4 0x12 (18)	- - - -	31018	uint R
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
CtrL oPEr **Counter Menu**								
CnT [Cnt]	*Counter (1 to 4)* **Count** View the function's total count.	0 to 9,999	- - - -	4188 [offset 40]	0x82 (130) 1 to 4 0xF (15)	217	30015	uint R
Su.A [Su.A]	*Counter (1 to 4)* **Source Value A** View the value of Source A.	oFF Off (62) on On (63)	- - - -	4172 [offset 40]	0x82 (130) 1 to 4 7	- - - -	30007	uint R
Su.b [Su.b]	*Counter (1 to 4)* **Source Value B** View the value of Source B.	oFF Off (62) on On (63)	- - - -	4174 [offset 40]	0x82 (130) 1 to 4 8	- - - -	30008	uint R
o.u [o.v]	*Counter (1 to 4)* **Output Value** View the value of this function's output.	oFF Off (62) on On (63)	- - - -	4178 [offset 40]	0x82 (130) 1 to 4 0xA (10)	- - - -	30010	uint R
No Display	*Counter (1 to 4)* **Error** Read reported cause for counter error	None (61) Open (65) Shorted (127) Measurement Error (140) Bad Cal Data (139) Ambient Error (9) RTD Error (141) Fail (32) Math Error (1423) Not Sourced (246) Stale (1617)	- - - -	4190 [offset 40]	0x82 (130) 1 to 4 0x10 (16)	- - - -	30016	uint R
LoG oPEr **Logic Menu**								
Su.A [Su.A]	*Logic (1 to 4)* **Source Value A** View the value of Source A.	oFF Off (62) on On (63)	- - - -	3728 [offset 80]	0x7F (127) 1 to 4 0x19 (25)	- - - -	27025	uint R
Su.b [Su.b]	*Logic (1 to 4)* **Source Value B** View the value of Source B.	oFF Off (62) on On (63)	- - - -	3730 [offset 80]	0x7F (127) 1 to 4 0x1A (26)	- - - -	27026	uint R
Su.C [Su.C]	*Logic (1 to 4)* **Source Value C** View the value of Source C.	oFF Off (62) on On (63)	- - - -	3732 [offset 80]	0x7F (127) 1 to 4 0x1B (27)	- - - -	27027	uint R
Su.d [Su.d]	*Logic (1 to 4)* **Source Value D** View the value of Source D.	oFF Off (62) on On (63)	- - - -	3734 [offset 80]	0x7F (127) 1 to 4 0x1C (28)	- - - -	27028	uint R
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RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
Su.E [Su.E]	*Logic (1 to 4)* **Source Value E** View the value of Source E.	oFF Off (62) on On (63)	- - - -	3736 [offset 80]	0x7F (127) 1 to 4 0x1D (29)	- - - -	27029	uint R
Su.F [Su.F]	*Logic (1 to 4)* **Source Value F** View the value of Source F.	oFF Off (62) on On (63)	- - - -	3738 [offset 80]	0x7F (127) 1 to 4 0x1E (30)	- - - -	27030	uint R
Su.9 [Su.g]	*Logic (1 to 4)* **Value Source G** View the value of Source G.	oFF Off (62) on On (63)	- - - -	3740 [offset 80]	0x7F (127) 1 to 4 0x1F (31)	- - - -	27031	uint R
Su.h [Su.h]	*Logic (1 to 4)* **Source Value H** View the value of Source H.	oFF Off (62) on On (63)	- - - -	3742 [offset 80]	0x7F (127) 1 to 4 0x20 (32)	- - - -	27032	uint R
o.u [o.v]	*Logic (1 to 4)* **Output Value** View the value of this function's output.	oFF Off (62) on On (63)	- - - -	3746 [offset 80]	7F (127) 1 to 4 0x22 (34)	- - - -	27034	uint R
No Display	*Logic (1 to 4)* **Error** Read reported cause for logic error	None (61) Open (65) Shorted (127) Measurement Error (140) Bad Cal Data (139) Ambient Error (9) RTD Error (141) Fail (32) Math Error (1423) Not Sourced (246) Stale (1617)	- - - -	3750 [offset 80]	0x7F (127) 1 to 4 0x24 (36)	- - - -	27036	uint R
MAtH oPEr **Math Menu**								
Su.A [Su.A]	*Math (1 to 8)* **Source Value A** View the value of Source A.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	2870 [offset 70]	0x7D (125) 1 to 8 0x10 (16)	- - - -	25016	float R
Su.b [Su.b]	*Math (1 to 8)* **Source Value B** View the value of Source B.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	2872 [offset 70]	0x7D (125) 1 to 8 0x11 (17)	- - - -	25017	float R
Su.C [Su.C]	*Math (1 to 8)* **Source Value C** View the value of Source C.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	2874 [offset 70]	0x7D (125) 1 to 8 0x12 (18)	- - - -	25018	float R
Su.d [Su.d]	*Math (1 to 8)* **Source Value D** View the value of Source D.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	2876 [offset 70]	0x7D (125) 1 to 8 0x13 (19)	- - - -	25019	float R
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
Su.E [Su.E]	*Math (1 to 8)* **Source Value E** View the value of Source E.	oFF Off (62) on On (63)	- - - -	2878 [offset 70]	0x7D (125) 1 to 8 0x14 (20)	- - - -	25020	uint R
oFSt [oFSt]	*Math (1 to 8)* **Offset** Set an offset to be applied to this function's output.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0	2884 [offset 70]	0x7D (125) 1 to 8 0x17 (23)	- - - -	25023	float RWES
o.v [o.v]	*Math (1 to 8)* **Output Value** View the value of this function's output.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	2882 [offset 70]	0x7D (125) 1 to 8 0x16 (22)	- - - -	25022	float R
No Display	*Math (1 to 8)* **Error** Read reported cause for logic error	None (61) Open (65) Shorted (127) Measurement Error (140) Bad Cal Data (139) Ambient Error (9) RTD Error (141) Fail (32) Math Error (1423) Not Sourced (246) Stale (1617)	- - - -	2896 [offset 70]	0x7D (125) 1 to 8 0x1D (29)	- - - -	25029	uint R
SoF oPEr **Special Output Function Menu**								
Su.A [uS.A]	*Special Output Function (1 to 4)* **Source Value A** View the value of Source A.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	4972 [offset 80]	0x87 (135) 1 to 4 7	- - - -	35007	float R
Su.b [Su.b]	*Special Output Function (1 to 4)* **Source Value B** View the value of Source B.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	4974 [offset 80]	0x87 (135) 1 to 4 8	- - - -	35008	float R
o.u 1 [o.v1]	*Special Output Function (1 to 4)* **Output Value 1** View the value of this function's Output 1.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	4978 [offset 80]	0x87 (135) 1 to 4 0xA (10)	- - - -	35010	float R
No Display	*Special Output Function (1 to 4)* **Error 1** View reported cause for output malfunction.	None (61) Open (65) Shorted (127) Measurement error (140) Bad calibration data (139) Ambient error (9) RTD error (14) Fail (32) Math error (1423) Not sourced (246) Stale (1617) Can't process (1659)	- - - -	4980 [offset 80]	0x87 (135) 1 to 4 0x0B (11)	- - - -	35011	uint R
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
o.u2 [o.v2]	*Special Output Function (1 to 4)* **Output Value 2** View the value of this function's Output 2.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	4982 [offset 80]	0x87 (135) 1 to 4 0xC (12)	- - - -	35012	float R
No Display	*Special Output Function (1 to 4)* **Error 2** View reported cause for output malfunction.	None (61) Open (65) Shorted (127) Measurement error (140) Bad calibration data (139) Ambient error (9) RTD error (14) Fail (32) Math error (1423) Not sourced (246) Stale (1617) Can't process (1659)	- - - -	4984 [offset 80]	0x87 (135) 1 to 4 0x0D (13)	- - - -	35013	uint R
o.u3 [o.v3]	*Special Output Function (1 to 4)* **Output Value 3** View the value of this function's Output 3.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	4986 [offset 80]	0x87 (135) 1 to 4 0xE (14)	- - - -	35014	float R
No Display	*Special Output Function (1 to 4)* **Error 3** View reported cause for output malfunction.	None (61) Open (65) Shorted (127) Measurement error (140) Bad calibration data (139) Ambient error (9) RTD error (14) Fail (32) Math error (1423) Not sourced (246) Stale (1617) Can't process (1659)	- - - -	4988 [offset 80]	0x87 (135) 1 to 4 0x0F (15)	- - - -	35015	uint R
o.u4 [o.v4]	*Special Output Function (1 to 4)* **Output Value 4** View the value of this function's Output 4.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	4990 [offset 80]	0x87 (135) 1 to 4 0x10 (16)	- - - -	35016	float R
No Display	*Special Output Function (1 to 4)* **Error 4** View reported cause for output malfunction.	None (61) Open (65) Shorted (127) Measurement error (140) Bad calibration data (139) Ambient error (9) RTD error (14) Fail (32) Math error (1423) Not sourced (246) Stale (1617) Can't process (1659)	- - - -	4992 [offset 80]	0x87 (135) 1 to 4 0x11 (17)	- - - -	35017	uint R
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
P.StA oPEr **Profile Status Menu**		* Some parameters in the Profile Status Menu can be changed for the currently running profile, but should only be changed by knowledgeable personnel and with caution. Changing parameters via the Profile Status Menu will not change the stored profile but will have an immediate impact on the profile that is running. Changes made to profile parameters in the Profiling Pages will be saved and will also have an immediate impact on the running profile.						
P.Str [P.Str]	*Profile Status* **Profile Start**	1 to 25	1	5280	0x7A (122) 1 1	204	22001	uint W
P.ACr [PACr]	*Profile Status* **Action Request**	none None (61) PAUS Pause (146) rESU Resume (147) End Terminate (148) Prof Profile (77)	None	5300	0x7A (122) 1 0xB (11)	205	22011	uint W
StP [StP]	*Profile Status* **Active Step** View the currently running step.	0 to 250 0 (none)	- - - -	5286	0x7A (122) 1 4	- - - -	22004	uint R
SUb.S [SUb.S]	*Profile Status* **Active Subroutine Step** View the currently running subroutine.	0 to 150 0 (none)	- - - -		0x7A (122) 1 0x37 (55)	- - - -	22055	uint R
S.tyP [S.typ]	*Profile Status* **Active Step Type** View the currently running step type.	USTP Unused Step (50) t i Time (143) rAtE Rate (81) SoAH Soak (87) tLoC Wait For Time (1543) LoPE Wait For Process or Event (1542) StAt State (1515) Subr Subroutine Step (1516) JL Jump Loop (116) End End (27)	- - - -	5304	0x7A (122) 1 0xD (13)	- - - -	22013	uint R
t.SP1 [tg.SP]	*Profile Status* ***Target Set Point Loop 1** View or change the target set point of the current step.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	5302	0x7A (122) 1 0xC (12)	- - - -	22012	float RW
t.SP2 [tg.SP]	*Profile Status* ***Target Set Point Loop 2** View or change the target set point of the current step.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	5374	0x7A (122) 1 0x30 (48)	- - - -	22048	float RW
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
t.SP3 [t.SP3]	*Profile Status* ***Target Set Point Loop 3** View or change the target set point of the current step.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	5376	0x7A (122) 1 0x31 (49)	- - - -	22049	float RW
t.SP4 [t.SP4]	*Profile Status* ***Target Set Point Loop 4** View or change the target set point of the current step.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	5378	0x7A (122) 1 0x32 (50)	- - - -	22050	float RW
P.SP1 [P.SP1]	*Profile Status* **Produced Set Point 1** Display the current set point, even if the profile is ramping.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	5288	- - - -	- - - -	22005	float R
P.SP2 [P.SP2]	*Profile Status* **Produced Set Point 2** Display the current set point, even if the profile is ramping.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	5380	- - - -	- - - -	22051	float R
P.SP3 [P.SP3]	*Profile Status* **Produced Set Point 3** Display the current set point, even if the profile is ramping.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	5382	- - - -	- - - -	22052	float R
P.SP4 [P.SP4]	*Profile Status* **Produced Set Point 4** Display the current set point, even if the profile is ramping.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	5384	- - - -	- - - -	22053	float R
No Display	*Profile Status* **Produced Control Mode 1** Display the current control mode.	Off (62) Auto (10) Manual (54)	- - - -	5366	0x7A (122) 1 0x2C (44)	- - - -	22044	uint R
No Display	*Profile Status* **Produced Control Mode 2** Display the current control mode.	Off (62) Auto (10) Manual (54)	- - - -	5368	0x7A (122) 1 0x2D (45)	- - - -	22045	uint R
No Display	*Profile Status* **Produced Control Mode 3** Display the current control mode.	Off (62) Auto (10) Manual (54)	- - - -	5370	0x7A (122) 1 0x2E (46)	- - - -	22046	uint R
No Display	*Profile Status* **Produced Control Mode 4** Display the current control mode.	Off (62) Auto (10) Manual (54)	- - - -	5372	0x7A (122) 1 0x2F (47)	- - - -	22047	uint R

Note:
Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces.

Note:
If there is only one instance of a menu, no submenus will appear.

** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.

R: Read
W: Write
E: EEPROM
S: User Set

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
hoUr [hoUr]	*Profile Status* **Hours** Step time remaing in hours.	0 to 99	0	5434	0x7A (122) 1 0x4E (78)	- - - -	22078	uint RW
[Min]	*Profile Status* **Minutes** Step time remaing in minutes.	0 to 59	0	5432	0x7A (122) 1 0x4D (77)	- - - -	22077	uint RW
SEC [SEC]	*Profile Status* **Seconds** Step time remaing in seconds.	0 to 59	0	5430	0x7A (122) 1 0x4C (76)	- - - -	22076	uint RW
No Display	*Profile Status* **Wait for Event Source Value 1** Read the present state of event input 1.	oFF Off (62) on On (63)	- - - -	5346	0x7A (122) 1 0x22 (34)	- - - -	22034	uint R
No Display	*Profile Status* **Wait for Event Source Value 2** Read the present state of event input 1.	oFF Off (62) on On (63)	- - - -	5348	0x7A (122) 1 0x23 (35)	- - - -	22035	uint R
No Display	*Profile Status* **Wait for Event Source Value 3** Read the present state of event input 1.	oFF Off (62) on On (63)	- - - -	5350	0x7A (122) 1 0x24 (36)	- - - -	22036	uint R
No Display	*Profile Status* **Wait for Event Source Value 4** Read the present state of event input 1.	oFF Off (62) on On (63)	- - - -	5352	0x7A (122) 1 0x25 (37)	- - - -	22037	uint R
No Display	*Profile Status* **Wait for Analog Source Value 1** Read the present value of analog source 1.	-1999.000 to 9999.000	- - - -	5414	0x7A (122) 1 0x44 (68)	- - - -	22068	float R
No Display	*Profile Status* **Wait for Analog Source Value 2** Read the present value of analog source 2.	-1999.000 to 9999.000	- - - -	5416	0x7A (122) 1 0x45 (69)	- - - -	22069	float R
No Display	*Profile Status* **Wait for Analog Source Value 3** Read the present value of analog source 3.	-1999.000 to 9999.000	- - - -	5418	0x7A (122) 1 0x46 (70)	- - - -	22070	float R
No Display	*Profile Status* **Wait for Analog Source Value 4** Read the present value of analog source 4.	-1999.000 to 9999.000	- - - -	5420	0x7A (122) 1 0x47 (71)	- - - -	22071	float R
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
Ent1 [Ent1]	*Profile Status* ***Active Event Output 1** View or change the event output states.	oFF Off (62) on On (63)	Off	5306	0x7A (122) 1 0xE (14)	- - - -	22014	uint RW
Ent2 [Ent2]	*Profile Status* ***Active Event Output 2** View or change the event output states.	oFF Off (62) on On (63)	Off	5308	0x7A (122) 1 0xF (15)	- - - -	22015	uint RW
Ent3 [Ent3]	*Profile Status* ***Active Event Output 3** View or change the event output states.	oFF Off (62) on On (63)	Off	5310	0x7A (122) 1 0x10 (16)	- - - -	22016	uint RW
Ent4 [Ent4]	*Profile Status* ***Active Event Output 4** View or change the event output states.	oFF Off (62) on On (63)	Off	5312	0x7A (122) 1 0x11 (17)	- - - -	22017	uint RW
Ent5 [Ent5]	*Profile Status* ***Active Event Output 5** View or change the event output states.	oFF Off (62) on On (63)	Off	5314	0x7A (122) 1 0x12 (18)	- - - -	22018	uint RW
Ent6 [Ent6]	*Profile Status* ***Active Event Output 6** View or change the event output states.	oFF Off (62) on On (63)	Off	5316	0x7A (122) 1 0x13 (19)	- - - -	22019	uint RW
Ent7 [Ent7]	*Profile Status* ***Active Event Output 7** View or change the event output states.	oFF Off (62) on On (63)	Off	5318	0x7A (122) 1 0x14 (20)	- - - -	22020	uint RW
Ent8 [Ent8]	*Profile Status* ***Active Event Output 8** View or change the event output states.	oFF Off (62) on On (63)	Off	5320	0x7A (122) 1 0x15 (21)	- - - -	22021	uint RW
JC [JC]	*Profile Status* **Jump Count Remaining** View the jump counts remaining for the current loop. In a profile with nested loops, this may not indicate the actual jump counts remaining.	0 to 9,999	- - - -	5298	0x7A (122) 1 0xA (10)	- - - -	22010	uint R
No Display	*Profile Status* **Current File** Indicates current file being executed.	1 to 25 0 (none)	- - - -	5284	0x7A (122) 1 3	- - - -	22003	uint R
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Operations Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
No Display	*Profile Status* **Profile State** Read currentProfile state.	Off (62) Running (149) Pause (146)	- - - -	5282	0x7A (122) 1 2	- - - -	22002	uint R
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

4 Chapter 4: Setup Pages

Control Module Setup Page Parameters

To navigate to the Setup Page using the RUI, follow the steps below:

1. From the Home Page, press and hold both the Up ▲ and Down ▼ keys for six seconds. [A1] will appear in the upper display and [SEt] will appear in the lower display.

Note:
If keys are released when [OPEr] is displayed, press the Infinity Key ∞ or reset key to exit and repeat until [SEt] is displayed.

2. Press the Up ▲ or Down ▼ key to view available menus.
3. Press the Advance Key ◎ to enter the menu of choice.
4. If a submenu exists (more than one instance), press the Up ▲ or Down ▼ key to select and then press the Advance Key ◎ to enter.
5. Press the Up ▲ or Down ▼ key to move through available menu prompts.
6. Press the Infinity Key ∞ to move backwards through the levels: parameter to submenu; submenu to menu; menu to Home Page.
7. Press and hold the Infinity Key ∞ for two seconds to return to the Home Page.

On the following pages, top level menus are identified with a yellow background color.

Note:
Some of these menus and parameters may not appear, depending on the controller's options. See model number information in the Appendix for more information. If there is only one instance of a menu, no submenus will appear.

Note:
Some of the listed parameters may not be visible. Parameter visibility is dependent upon controller part number.

[A1]
[SEt] **Analog Input Menu**
[1]
[A1] **Analog Input 1 to 4**
[SEn] **Sensor Type**
[L in] **TC Linearization**
[rtL] **RTD Leads**
[Unit] **Units**
[SLo] **Scale Low**
[Sh1] **Scale High**
[rLo] **Range Low**
[rh1] **Range High**
[PEE] **Process Error Enable**
[PEL] **Process Error Low Value**
[tC] **Thermistor Curve**
[rr] **Resistance Range**
[Fil] **Filter**
[1Er] **Error Latching**
[dEC] **Display Precision**
[1CA] **Calibration Offset ****
[A in] **Value ****
[1Er] **Error Status ****

[Pu]
[SEt] **Process Value**
[1]
[Pu] **Process Value 1 to 4**
[Fn] **Function**
[SFnA] **Source Function A**
[S1A] **Source Instance A**
[SFnb] **Source Function B**
[S1b] **Source Instance B**
[S2b] **Source Zone B**
[SFnC] **Source Function C**
[S1C] **Source Instance C**
[S2C] **Source Zone C**
[SFnd] **Source Function D**
[S1d] **Source Instance D**
[S2d] **Source Zone D**
[SFnE] **Source Function E**
[S1E] **Source Instance E**
[S2E] **Source Zone E**
[CP] **Cross Over Point**
[Cb] **Cross Over Band**
[Punt] **Pressure Units**
[Aunt] **Altitude Units**
[bPr] **Barometric Pressure**
[Fil] **Filter**

[d10]
[SEt] **Digital Input/Output Menu**
[1]
[d10] **Digital Input/Output 7 to 12**
[dir] **Direction**
[Fn] **Function**
[F1] **Function Instance**
[S2A] **Source Zone A**
[oCt] **Control**
[otb] **Time Base**
[oLo] **Low Power Scale**
[oh1] **High Power Scale**

[ACt]
[SEt] **Action Menu**
[1]
[ACt] **Action 1 to 8**
[Fn] **Function**
[F1] **Function Instance**
[SFnA] **Source Function A**
[S1A] **Source Instance A**
[S2A] **Source Zone A**
[LEu] **Active Level**

[LiM1]
[SEt] **Limit Menu**
[1]
[LiM1] **Limit 1 to 4**
[LSd] **Sides**
[LhY] **Hysteresis**
[SPLh] **Set Point High Limit**
[SPLL] **Set Point Low Limit**
[LhS] **High Set Point ****
[LLS] **Low Set Point ****
[SFnA] **Source Function A ****
[S1A] **Source Instance A ****
[S2A] **Source Zone A ****
[LCr] **Clear Request ****
[LSt] **Status ****

[LooP]
[SEt] **Control Loop Menu**
[1]
[LooP] **Control Loop 1 to 4**
[SFnA] **Source Function A**
[1SA] **Source Instance A**
[hAG] **Heat Algorithm**
[CAG] **Cool Algorithm**
[CCr] **Cool Output Curve**
[hPb] **Heat Proportional Band ****

****** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.

- hHY Heat Hysteresis **
- CPb Cool Proportional Band **
- ChY Cool Hysteresis **
- t I Time Integral **
- td Time Derivative **
- db Dead Band **
- tEUn TRU-TUNE+® Enable
- tbnd TRU-TUNE+ Band
- tGn TRU-TUNE+ Gain
- AtSP Autotune Set Point **
- tAGr Autotune Aggressiveness
- PdL Peltier Delay
- rEn Remote Set Point Enable
- SFnb Source Function B
- S Ib Source Instance B
- Szb Source Zone B
- rtY Remote Set Point Type
- UFA User Failure Action
- FAIL Input Error Failure
- MAn Fixed Power
- LdE Open Loop Detect Enable
- Ldt Open Loop Detect Time
- Ldd Open Loop Detect Deviation
- rP Ramp Action
- rSC Ramp Scale
- rrt Ramp Rate
- ProE Profiling Enable
- LSP Low Set Point
- hSP High Set Point
- CSP Closed Loop Set Point **
- IdS Idle Set Point **
- SPLo Set Point Open Limit Low
- SPhI Set Point Open Limit High
- oSP Open Loop Set Point **
- CMd Control Mode **

oEPt
- SEt Output Menu
  - I
  - oEPt Output 1 to 8
    - Fn Function
    - FI Function Instance
    - SzA Source Zone
    - oCt Control
    - otb Time Base
    - oLo Low Power Scale
    - oHI High Power Scale
  - oEPt Output 1, 3, 5 or 7 process
    - otY Type
    - Fn Function
    - FI Function Instance
    - SzA Source Zone A
    - SLo Scale Low
    - SHI Scale High
    - rLo Range Low
    - rHI Range High
    - oCA Calibration Offset

ALM
- SEt Alarm Menu
  - I
  - ALM Alarm 1 to 8
    - AtY Type
    - SrA Source
    - ISA Source Instance
    - SzA Source Zone
    - LooP Control Loop
    - AhY Hysteresis
    - AL9 Logic
    - ASd Sides
    - ALo Low Set Point **
    - AHI High Set Point **
    - ALA Latching
    - AbL Blocking
    - AS I Silencing
    - AdSP Display
    - AdL Delay Time
    - ACLr Clear Request **
    - AS Ir Silence Request **
    - ASt State **

Curr
- SEt Current Menu
  - I
  - Curr Current 1 to 4
    - CSd Sides
    - CUr Read Enable
    - Cdt Detection Threshold
    - CSC Input Current Scaling
    - CoFS Heater Current Offset
    - CS I Output Source Instance

Lnr
- SEt Linearization Menu
  - I
  - Lnr Linearization 1 to 4
    - Fn Function
    - SFnA Source Function A
    - S IA Source Instance A
    - SzA Source Zone A
    - Unit Units
    - IP.1 Input Point 1
    - oP.1 Output Point 1
    - IP.2 Input Point 2
    - oP.2 Output Point 2
    - IP.3 Input Point 3
    - oP.3 Output Point 3
    - IP.4 Input Point 4
    - oP.4 Output Point 4
    - IP.5 Input Point 5
    - oP.5 Output Point 5
    - IP.6 Input Point 6
    - oP.6 Output Point 6
    - IP.7 Input Point 7
    - oP.7 Output Point 7
    - IP.8 Input Point 8
    - oP.8 Output Point 8
    - IP.9 Input Point 9
    - oP.1 Output Point 9
    - IP.10 Input Point 10
    - oP.10 Output Point 10

CPE
- SEt Compare Menu
  - I
  - CPE Compare 1 to 4
    - Fn Function
    - tol Tolerance
    - SFnA Source Function A
    - S IA Source Instance A
    - SzA Source Zone A
    - SFnb Source Function B
    - S Ib Source Instance B
    - Szb Source Zone B
    - Erh Error Handling

tMr
- SEt Timer Menu
  - I
  - tMr Timer 1 to 4
    - Fn Function
    - SFnA Source Function A
    - S IA Source Instance A
    - SzA Source Zone A
    - SASA Source Active State A
    - SFnb Source Function B
    - S Ib Source Instance B
    - Szb Source Zone B
    - SASb Source Active State B
    - t I Time
    - LEu Active Level

Ctr
- SEt Counter Menu
  - I
  - Ctr Counter 1 to 4
    - Fn Function
    - SFnA Source Function A
    - S IA Source Instance A
    - SzA Source Zone A
    - SASA Source Active State A
    - SFnb Source Function B
    - S Ib Source Instance B
    - Szb Source Zone B
    - SASb Source Active State B
    - LoAd Load Value
    - trgt Target Value
    - LAt Latching

LgC
- SEt Logic Menu
  - I
  - LgC Logic 1 to 4
    - Fn Function
    - SFnA Source Function A
    - S IA Source Instance A
    - SzA Source Zone A
    - SFnb Source Function B
    - S Ib Source Instance B
    - Szb Source Zone B
    - SFnC Source Function C
    - S IC Source Instance C
    - SzC Source Zone C
    - SFnd Source Function D
    - S Id Source Instance D
    - Szd Source Zone D
    - SFnE Source Function E
    - S IE Source Instance E
    - SzE Source Zone E
    - SFnF Source Function F
    - S IF Source Instance F
    - SzF Source Zone F
    - SFnG Source Function G
    - S IG Source Instance G
    - SzG Source Zone G
    - SFnH Source Function H
    - S IH Source Instance H
    - SzH Source Zone H
    - Erh Error Handling

MAt
- SEt Math Menu
  - I
  - MAt Math 1 to 8
    - Fn Function
    - SFnA Source Function A
    - S IA Source Instance A
    - SzA Source Zone A
    - SFnb Source Function B
    - S Ib Source Instance B
    - Szb Source Zone B
    - SFnC Source Function C
    - S IC Source Instance C
    - SzC Source Zone C
    - SFnd Source Function D
    - S Id Source Instance D
    - Szd Source Zone D

** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.

- SFnE Source Function E
- S iE Source Instance E
- S2E Source Zone E
- SLo Scale Low
- Sh i Scale High
- Unit Units
- rLo Range Low
- rh i Range High
- P.unt Pressure Units
- A.unt Altitude Units
- F iL Filter

SoF
SEt Special Output Function Menu
1
SoF Special Output Function 1 to 4
- Fn Function
- SFnA Source Function A
- S iA Source Instance A
- S2A Source Zone A
- SFnb Source Function B
- S ib Source Instance B
- S2b Source Zone B
- PonA Power On Level 1
- PoFA Power Off Level 1
- Ponb Power On Level 2
- PoFb Power Off Level 2
- ont On Time
- oFt Off Time
- tt Valve Travel Time
- db Dead Band
- oS1 Output 1 Size
- oS2 Output 2 Size
- oS3 Output 3 Size
- oS4 Output 4 Size
- tdL Time Delay
- ot.o Output Order

uAr
SEt Variable Menu
1
uAr Variable 1 to 8
- tYPE Data Type
- Unit Units
- di9 Digital
- AnL9 Analog

9Lbl
SEt Global Menu
9Lbl Global
- C_F Display Units
- AC.LF AC Line Frequency
- Sutb Synchronized Variable Time Base
- d.PrS Display Pairs
- USr.S User Settings Save
- USr.r User Settings Restore

Pro
SEt Profile Menu
Pro Profile
- r.tYP Ramping Type
- P.tYP Profile Type
- 9SE Guaranteed Soak Enable
- 9Sd1 Guaranteed Soak Deviation 1
- 9Sd2 Guaranteed Soak Deviation 2
- 9Sd3 Guaranteed Soak Deviation 3
- 9Sd4 Guaranteed Soak Deviation 4
- CMnE Control Mode Enable
- uiMn Wait for Mode
- SFnA Source Function A
- S iA Source Instance A
- S2A Source Zone A
- SFnb Source Function B
- S ib Source Instance B
- S2b Source Zone B
- SFnC Source Function C
- S iC Source Instance C
- S2C Source Zone C
- SFnd Source Function D
- S id Source Instance D
- S2d Source Zone D
- SFnE Source Function E
- S iE Source Instance E
- S2E Source Zone E
- SFnF Source Function F
- S iF Source Instance F
- S2F Source Zone F
- SFn9 Source Function G
- S i9 Source Instance G
- S29 Source Zone G
- SFnH Source Function H
- S iH Source Instance H
- S2H Source Zone H

COMM
SEt Communications Menu
COMM Communications
- bAUd Baud Rate
- PAr Parity
- MnhL Modbus Word Order
- C_F Display Units
- nvS Non-volatile Save

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
A1 SEt **Analog Input Menu**								
SEn [SEn]	*Analog Input (1 to 4)* **Sensor Type** Set the analog sensor type to match the device wired to this input. **Note:** There is no open sensor protection for process inputs.	oFF Off (62) tC Thermocouple (95) mV Millivolts (56) volt Volts dc (104) mA Milliamps dc (112) rtd.2 RTD 100 Ω (113) rtd.1 RTD 1,000 Ω (114) Pot Potentiometer 1 kΩ (155) thEr Thermistor (229)	Thermo-couple or Thermis-tor	368 [offset 90]	0x68 (104) 1 to 4 5	3	4005	uint RWES
Lin [Lin]	*Analog Input (1 to 4)* **TC Linearization** Set the linearization to match the thermocouple wired to this input.	b B (11) C C (15) d D (23) E E (26) F F (30) J J (46) K K (48) n N (58) r R (80) S S (84) t T (93)	J	370 [offset 90]	0x68 (104) 1 to 4 6	4	4006	uint RWES
rtL [rt.L]	*Analog Input (1 to 4)* **RTD Leads** Set to match the number of leads on the RTD wired to this input.	2 2 (1) 3 3 (2)	2	372 [offset 90]	0x68 (104) 1 to 4 7	- - - -	4007	uint RWES
Unit [Unit]	*Analog Input (1 to 4)* **Units** Set the type of units the sensor will measure.	AtP Absolute Temperature (1540) rh Relative Humidity (1538) Pro Process (75) PWJr Power (73)	Process	442 [offset 90]	0x68 (104) 1 to 4 0x2A (42)	5	4042	uint RWES
S.Lo [S.Lo]	*Analog Input (1 to 4)* **Scale Low** Set the low scale for process inputs. This value, in millivolts, volts or milliamps, will correspond to the Range Low output of this function block.	-100.0 to 1,000.0	0.0	388 [offset 90]	0x68 (104) 1 to 4 0xF (15)	6	4015	float RWES
S.hi [S.hi]	*Analog Input (1 to 4)* **Scale High** Set the high scale for process inputs. This value, in millivolts, volts or milliamperes, will correspond to the Range High output of this function block.	-100.0 to 1,000.0	20.0	390 [offset 90]	0x68 (104) 1 to 4 0x10 (16)	7	4016	float RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
r.Lo [r.Lo]	*Analog Input (1 to 4)* **Range Low** Set the low range for this function block's output.	-1,999.000 to 9,999.000	0.0	392 [offset 90]	0x68 (104) 1 to 4 0x11 (17)	8	4017	float RWES
r.hi [r.hi]	*Analog Input (1 to 4)* **Range High** Set the high range for this function block's output.	-1,999.000 to 9,999.000	9,999	394 [offset 90]	0x68 (104) 1 to 4 0x12 (18)	9	4018	float RWES
P.EE [P.EE]	*Analog Input (1 to 4)* **Process Error Enable** Turn the Process Error Low feature on or off.	oFF Off (62) Lou Low (53)	Off	418 [offset 90]	0x68 (104) 1 to 4 0x1E (30)	10	4030	uint RWES
P.EL [P.EL]	*Analog Input (1 to 4)* **Process Error Low Value** If the process value drops below this value, it will trigger an input error.	-100.0 to 1,000.0	0.0	420 [offset 90]	0x68 (104) 1 to 4 0x1F (31)	11	4031	float RWES
t.C [t.C]	*Analog Input (1 to 4)* **Thermistor Curve** Select a curve to apply to the thermistor input.	A Curve A (1451) b Curve B (1452) C Curve C (1453) CUSt Custom (180)	Curve A	434 [offset 90]	0x68 (104) 1 to 4 0x26 (38)	- - - -	4038	uint RWES
r.r [r.r]	*Analog Input (1 to 4)* **Resistance Range** Set the maximum resistance of the thermistor input.	5 5K (1448) 10 10K (1360) 20 20K (1361) 40 40K (1449)	40K	432 [offset 90]	0x68 (104) 1 to 4 0x25 (37)	- - - -	4037	uint RWES
F.iL [FiL]	*Analog Input (1 to 4)* **Filter** Filtering smooths out the process signal to both the display and the input. Increase the time to increase filtering.	0.0 to 60.0 seconds	0.5	386 [offset 90]	0x68 (104) 1 to 4 0xE (14)	12	4014	float RWES
i.Er [i.Er]	*Analog Input (1 to 4)* **Error Latching** Turn input error latching on or off. If latching is on, errors must be manually cleared.	oFF Off (62) on On (63)	Off	414 [offset 90]	0x68 (104) 1 to 4 0x1C (28)	- - - -	4028	uint RWES
dEC [dEC]	*Analog Input (1 to 4)* **Display Precision** Set the precision of the displayed value.	0 Whole (105) 0.0 Tenths (94) 0.00 Hundredths (40) 0.000 Thousandths (96)	Whole	398 [offset 90]	0x68 (104) 1 to 4 0x14 (20)	- - - -	4020	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
i.CA [i.CA]	*Analog Input (1 to 4)* **Calibration Offset** ** Offset the input reading to compensate for lead wire resistance or other factors that cause the input reading to vary from the actual process value.	-1,999.000 to 9,999.000°F or units -1,110.555 to 5,555.000°C	0.0	382 [offset 90]	0x68 (104) 1 to 4 0xC (12)	2	4012	float RWES
A in [Ain]	*Analog Input (1 to 4)* **Value** ** View the process value. **Note:** Ensure that the Error Status (below) indicates no error (61) when reading this value using a field bus protocol. If an error exists, the last known value prior to the error occurring will be returned.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	- - - -	360 [offset 90]	0x68 (104) 1 to 4 1	0	4001	float R
i.Er [i.Er]	*Analog Input (1 to 4)* **Input Error** ** View the cause of the most recent error.	nonE None (61) OPEn Open (65) Shrt Shorted (127) E.rr Measurement Error (140) E.CAL Bad Calibration Data (139) Er.Ab Ambient Error (9) E.rtd RTD Error (141) FAIL Fail (32)	- - - -	362 [offset 90]	0x68 (104) 1 to 4 2	1	4002	uint R
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
Pu SEt **Process Value Menu**								
Fn [Fn]	*Process Value (1 to 4)* **Function** Set the function that will be applied to the source or sources.	oFF Off (62) S.bA Sensor Backup (1201) Au9 Average (1367) C.o Crossover (1368) Ud.b Wet Bulb Dry Bulb (1369) S.o Switch Over (1370) d.FF Differential (1373) rAt.o Ratio (1374) Add Add (1375) MMUL Multiply (1376) Ad.F Absolute Difference (1377) MM.in Minimum (1378) MMAX Maximum (1379) root Square Root (1380) uSLA Vaisala (1648) ALt Pressure to Altitude (1649)	Off	3440 [offset 70]	0x7E (126) 1 to 4 0x15 (21)	123	26021	uint RWES
SFn.A [SFn.A]	*Process Value (1 to 4)* **Source Function A** Set the type of function that will be used for this source.	A.i Analog Input (142) Pu Process Value (241)	Analog Input	3400 [offset 70]	0x7E (126) 1 to 4 1	- - - -	26001	uint RWES
S.iA [Si.A]	*Process Value (1 to 4)* **Source Instance A** Set the instance of the function selected above.	1 to 250		3410 [offset 70]	0x7E (126) 1 to 4 6	- - - -	26006	uint RWES
SFn.b [SFn.b]	*Process Value (1 to 4)* **Source Function B** Set the type of function that will be used for this source.	nonE None (61) A.i Analog Input, (142) Lnr Linearization (238) MAt Math (240) Pu Process Value (241) uAr Variable (245)	None	3402 [offset 70]	0x7E (126) 1 to 4 2	- - - -	26002	uint RWES
S.ib [Si.b]	*Process Value (1 to 4)* **Source Instance B** Set the instance of the function selected above.	1 to 250	1	3412 [offset 70]	0x7E (126) 1 to 4 7	- - - -	26007	uint RWES
SZ.b [SZ.b]	*Process Value (1 to 4)* **Source Zone B** Set the zone of the function selected above.	0 to 16	0	3422 [offset 70]	0x7E (126) 1 to 4 0xC(12)	- - - -	26012	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.C [SFn.C]	*Process Value (1 to 4)* **Source Function C** Set the type of function that will be used for this source.	nonE None (61) AI Analog Input (142) Lnr Linearization (238) MATH Math (240) PV Process Value (241) uAr Variable (245)	None	3404 [offset 70]	0x7E (126) 1 to 4 3	- - - -	26003	uint RWES
Si.C [Si.C]	*Process Value (1 to 4)* **Source Instance C** Set the instance of the function selected above.	1 to 250	1	3414 [offset 70]	0x7E (126) 1 to 4 8	- - - -	26008	uint RWES
SZ.C [SZ.C]	*Process Value (1 to 4)* **Source Zone C** Set the zone of the function selected above.	0 to 16	0	3424 [offset 70]	0x7E (126) 1 to 4 0x0D (13)	- - - -	26013	uint RWES
SFn.d [SFn.d]	*Process Value (1 to 4)* **Source Function D** Set the type of function that will be used for this source.	nonE None (61) AI Analog Input, (142) Lnr Linearization (238) MATH Math (240) PV Process Value (241) uAr Variable (245)	None	3406 [offset 70]	0x7E (126) 1 to 4 4	- - - -	26004	uint RWES
Si.d [Si.d]	*Process Value (1 to 4)* **Source Instance D** Set the instance of the function selected above.	1 to 250	1	3416 [offset 70]	0x7E (126) 1 to 4 9	- - - -	26009	uint RWES
SZ.d [SZ.E]	*Process Value (1 to 4)* **Source Zone D** Set the zone of the function selected above.	0 to 16	0	3426 [offset 60]	0x7E (126) 1 to 4 0x0E (14)	- - - -	26014	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.E [SFn.E]	*Process Value (1 to 4)* **Source Function E** Set the type of function that will be used by this source to trigger a switch between Source A and Source B.	nonE None (61) ALM Alarm (6) CPE Compare (230) Ctr Counter (231) d io Digital I/O (1142) EntA Profile Event Out A (233) EntB Profile Event Out B (234) EntC Profile Event Out C (235) EntD Profile Event Out D (236) EntE Profile Event Out E (247) EntF Profile Event Out F (248) EntG Profile Event Out G (249) EntH Profile Event Out H (250) FUn Function Key (1001) LGC Logic (239) tMr Timer (244) uAr Variable (245)	None	3408 [offset 70]	0x7E (126) 1 to 4 5	- - - -	26005	uint RWES
S i.E [Si.E]	*Process Value (1 to 4)* **Source Instance E** Set the instance of the function selected above.	1 to 250	1	3418 [offset 70]	0x7E (126) 1 to 4 0xA (10)	- - - -	26010	uint RWES
SZ.E [SZ.E]	*Process Value (1 to 4)* **Source Zone E** Set the zone of the function selected above.	0 to 16	0	3428 [offset 70]	0x7E (126) 1 to 4 0xF (15)	- - - -	26015	uint RWES
C.P [C.P]	*Process Value (1 to 4)* **Cross Over Point** When the value of source A is <= cross over point - crossover band divided by 2 then the output value will use source A.	-1999.000 to 9999.000	100.0	3446 [offset 70]	0x7E (126) 1 to 4 0x18 (24)		26024	float RWES
C.b [C.b]	*Process Value (1 to 4)* **Cross Over Band** The source will transition between Source A and Source B when within this band at a progressive rate	-1999.000 to 9999.000	10.0	3448 [offset 70]	0x7E (126) 1 to 4 0x19 (25)		26025	float RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
P.unt [P.unt]	*Process Value (1 - 4)* **Pressure Units** If Process Value function is set for Pressure to Altitude units, define units of measure for conversion.	PSI Pounds per Square Inch (1671) PASc Pascal (1674) AtM Atmosphere (1675) mbr Millibar (1672) torr Torr (1673)	PSI	3454 [offset 70]	0x7E (126) 1 to 2 0x1C (28)	- - - -	26028	uint RWES
A.unt [A.unt]	*Process Value (1 - 4)* **Altitude Units** If Process Value function is set for Pressure to Altitude units, define units of measure for conversion.	HFt Kilofeet (1677) Ft Feet (1676)	HFt	3456 [offset 70]	0x7E (126) 1 to 2 0x1D (29)	- - - -	26029	uint RWES
b.Pr [b.Pr]	*Process Value (1 - 4)* **Barometric Pressure** If Process Value function is set for Wet Bulb / Dry Bulb, define pressure value used for humidity calculation.	10.0 to 16.0	14.7	3458 [offset 70]	0x7E (126) 1 to 2 0x1E (30)	- - - -	26030	float RWES
FiL [FiL]	*Process Value (1 to 4)* **Filter** Filtering smooths out the output signal of this function block. Increase the time to increase filtering.	0.0 to 60.0 seconds	0.0	3450 [offset 70]	0x7E (126) 1 to 4 0x1A (26)	- - - -	26026	float RWES
dio SEt **Digital Input/Output Menu**								
dir [dir]	*Digital Input/Output (7 to 12)* **Direction** Set this function to operate as an input or output.	OtPt Output (68) in Input Voltage (193) iCon Input Dry Contact (44)	Output	1200 [offset 30]	0x6A (106) 7 to 12 1	82	6001	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
Fn [Fn]	*Digital Output (7 to 12)* **Function** Select what function will drive this output.	oFF Off (62) Ai Analog Input (142) ALrM Alarm (6) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) CPE Compare (230) Ctr Counter (231) d io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.g Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) LgC Logic (239) Lnr Linearization (238) MAtH Math (240) Pu Process Value (241) SoF.1 Special Function Output 1 (1532) SoF.2 Special Function Output 2 (1533) SoF.3 Special Function Output 3 (1534) SoF.4 Special Function Output 4 (1535) tMr Timer (244) uAr Variable (245)	Off	1208 [offset 30]	0x 6A (106) 7 to 12 5	83	6005	uint RWES
Fi [Fi]	*Digital Output (7 to 12)* **Function Instance** Set the instance of the function selected above.	1 to 250	1	1210 [offset 30]	0x6A (106) 7 to 12 6	84	6006	uint RWES
SZ.A [SZ.A]	*Digital Output (7 to 12)* **Source Zone A** Set the zone of the function selected above.	0 to 16	0	1222 [offset 30]	0x6A (106) 7 to 12 0xC (12)	- - - -	6012	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
o.Ct [o.Ct]	*Digital Output (7 to 12)* **Control** Set the output control type. This parameter is only used with PID control, but can be set anytime.	FtB Fixed Time Base (34) utB Variable Time Base (103)	Fixed Time Base	1204 [offset 30]	0x6A (106) 7 to 12 2	85	6002	uint RWES
o.tb [o.tb]	*Digital Output (7 to 12)* **Time Base** Set the time base for fixed-time-base control.	0.1 to 60.0 seconds	1.0	1202 [offset 30]	0x6A (106) 7 to 12 3	86	6003	float RWES
o.Lo [o.Lo]	*Digital Output (7 to 12)* **Low Power Scale** The power output will never be less than the value specified and will represent the value at which output scaling begins.	0.0 to 100.0	0.0	1216 [offset 30]	0x6A (106) 7 to 12 9	87	6009	float RWES
o.hi [o.hi]	*Digital Output (7 to 12)* **High Power Scale** The power output will never be greater than the value specified and will represent the value at which output scaling stops.	0.0 to 100.0	100.0	1218 [offset 30]	0x6A (106) 7 to 12 A (10)	88	6010	float RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Dis-play	Parameter Name Description	Range	Default	Modbus Relative Address	CIP Class Instance Attribute hex (dec)	Profibus Index	Parameter ID	Data Type & Read/ Write
ACt SEt **Action Menu**								
Fn [Fn]	*Action (1 to 8)* **Function** Set the action that will be triggered by this function. **Note:** The Limit Reset function is not available in this menu for firmware revision 6.0 and above. To reset a tripped limit see the section entitled "Resetting a Tripped Limit".	nonE None (61) USr.r User Settings Restore (227) L.rSt Limit Reset (82) ALrM Alarm (6) S.iL Silence Alarms (108) AoF Control Loops Off and Alarms to Non-alarm State (220) F.AL Force Alarm to Occur (218) .dLE Idle Set Point (107) tUnE Tune (98) rMAn Manual (54) oFF Switch Control Loop Off (90) r.En Remote Set Point Enable (216) t.dA TRU-TUNE+® Disable (219) P.d.S Profile Disable (206) P.hoL Profile Hold/Resume (207) ProF Start Profile (196) P.StS Profile Start/Stop (208)	None	1584 [offset 20]	0x6E (110) 1 to 8 3	138	10003	uint RWES
F. [Fi]	*Action (1 to 8)* **Function Instance** Set the instance of the function selected above.	0 to 25	0	1586 [offset 20]	0x6E (110) 1 to 8 4	139	10004	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.A [SFn.A]	*Action (1 to 8)* **Source Function A** Set the event or function that will trigger the action.	none None (61) ALRM Alarm (6) CPE Compare (230) Ctr Counter (231) d.io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.G Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) L.IM Limit (126) LGC Logic (239) tMRr Timer (244) uAr Variable (245)	None	1590 [offset 20]	0x6E (110) 1 to 8 6	- - - -	10006	uint RWES
S.iA [Si.A]	*Action (1 to 8)* **Source Instance A** Set the instance of the function selected above.	1 to 250	1	1582 [offset 20]	0x6E (110) 1 to 8 2	- - - -	10002	uint RWES
S2A [SZ.A]	*Action (1 to 8)* **Source Zone A** Set the zone of the function selected above.	0 to 16	0	1592 [offset 20]	0x6E (110) 1 to 8 7	- - - -	10007	uint RWES
LEv [LEv]	*Action (1 to 8)* **Active Level** Set the action that will be considered a true state.	Lolo Low (53) hi.gh High (37)	High	1580 [offset 20]	0x6E (110) 1 to 8 1	137	10001	uint RWES
L.IM SEt **Limit Menu**								
L.Sd [L.Sd]	*Limit (1 to 4)* **Sides** Select which side or sides of the process value will be monitored.	both Both (13) hi.gh High (37) Lolo Low (53)	Both	728 [offset 30]	0x70 (112) 1 to 4 5	40	12005	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Dis-play	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
L.hy [L.hy]	*Limit (1 to 4)* **Hysteresis** Set the hysteresis for the limit function. This determines how far into the safe range the process value must move before the limit can be cleared.	0.001 to 9,999.000°F or units 0.001 to 5,555.000°C	3.0°F or units 2.0°C	722 [offset 30]	0x70 (112) 1 to 4 2	41	12002	float RWES
SP.Lh [SP.Lh]	*Limit (1 to 4)* **Set Point High Limit** Set the high end of the limit set point range.	-1,999.000 to 9,999.000	9,999.000	736 [offset 30]	0x70 (112) 1 to 4 9	42	12009	float RWES
SP.LL [SP.LL]	*Limit (1 to 4)* **Set Point Low Limit** Set the low end of the limit set point range.	-1,999.000 to 9,999.000	-1,999.000	738 [offset 30]	0x70 (112) 1 to 4 0xA (10)	43	12010	float RWES
Lh.S [Lh.S]	*Limit (1 to 4)* **High Set Point** ** Set the high process value that will trigger the limit.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	726 [offset 30]	0x70 (112) 1 to 4 4	39	12004	float RWES
LL.S [LL.S]	*Limit (1 to 4)* **Low Set Point** ** Set the low process value that will trigger the limit.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	724 [offset 30]	0x70 (112) 1 to 4 3	38	12003	float RWES
SFnA [SFn.A]	*Limit (1 to 4)* **Source Function A** ** Set the source for the limit reset function.	none None (61) d io Digital I/O (1142) FUn Function Key (1001) uAr Variable (245)	None	748 [offset 30]	0x70 (112) 1 to 4 0x0F (15)	- - - -	12015	uint RWES
Si.A [Si.A]	*Limit (1 to 4)* **Source Instance A** ** Set the instance of the function selected above.	1 to 250	1	- - - -	0x70 (112) 1 to 4 0x10 (16)	- - - -	12016	uint RWES
SZ.A [SZ.A]	*Control Loop (1 to 4)* **Source Zone A** ** Set the zone of the function selected above.	0 to 16	0	- - - -	0x6B (107) 1 to 4 0x11 (17)	- - - -	12017	uint RWES
LCr [LCr]	*Limit (1 to 4)* **Limit Clear Request** ** Clear limit once limit condition is safe.	Clear (0) No Change (255)	- - - -	720 [offset 30]	0x70 (112) 1 to 4 1	- - - -	12001	uint W
L.St [L.St]	*Limit (1 to 4)* **Status** ** Reflects whether or not the limit is in a safe or failed mode.	Fail (32) Safe (1667)	- - - -	744 [offset 30]	0x70 (112) 1 to 4 0x0D (13)	- - - -	12013	uint R
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RMC Module • Setup Page								
Dis-play	Parameter Name Description	Range	Default	Modbus Relative Address	CIP Class Instance Attribute hex (dec)	Profibus Index	Parameter ID	Data Type & Read/ Write
LooP SEt **Control Loop Menu**								
SFn.A [SFn.A]	*Control Loop (1 to 4)* **Source Function A** Set the type of function that will be used for this source.	AI Analog Input (142) Pu Process Value (241)	Analog Input	2276 [offset 70]	0x97 (151) 1 to 4 0x1D (29)	- - - -	8050	RWE
iS.A [iS.A]	*Control Loop (1 to 4)* **Source Instance A** Source Instance A follows the Control Loop and is not changeable	1 to 250	- - - -	- - - -	- - - -	- - - -	8021	R
h.Ag [h.Ag]	*Control Loop (1 to 4)* **Heat Algorithm** Set the heat control method.	oFF Off (62) PID PID (71) onoF On-Off (64)	PID	2224 [offset 70]	0x97 (151) 1 to 4 3	72	8003	uint RWES
C.Ag [C.Ag]	*Control Loop (1 to 4)* **Cool Algorithm** Set the cool control method.	oFF Off (62) PID PID (71) onoF On-Off (64)	Off	2226 [offset 70]	0x97 (151) 1 to 4 4	73	8004	uint RWES
C.Cr [C.Cr]	*Control Loop (1 to 4)* **Cool Output Curve** Select a cool output curve to change the responsiveness of the system.	oFF Off (62) Cr.A Non-linear Curve 1 (214) Cr.b Non-linear Curve 2 (215)	Off	2228 [offset 70]	0x97 (151) 1 to 4 5	- - - -	8038	uint RWES
h.Pb [h.Pb]	*Control Loop (1 to 4)* **Heat Proportional Band** ** Set the PID proportional band for the heat outputs.	0.001 to 9,999.000°F or units 0.001 to 5,555.000°C	25.0°F or units 14.0°C	2230 [offset 70]	0x97 (151) 1 to 4 6	65	8009	float RWES
h.hy [h.hy]	*Control Loop (1 to 4)* **Heat Hysteresis** ** Set the control switching hysteresis for on-off control. This determines how far into the "on" region the process value needs to move before the output turns on.	0.001 to 9,999.000°F or units 0.001 to 5,555.000°C	3.0°F or units 2.0°C	2240 [offset 70]	0x97 (151) 1 to 4 0xB (11)	66	8010	float RWES
C.Pb [C.Pb]	*Control Loop (1 to 4)* **Cool Proportional Band** ** Set the PID proportional band for the cool outputs.	0.001 to 9,999.000°F or units 0.001 to 5,555.000°C	25.0°F or units 14.0°C	2232 [offset 70]	0x97 (151) 1 to 4 7	67	8012	float RWES
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RMC Module • Setup Page								
Dis-play	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
C.hy [C.hy]	*Control Loop (1 to 4)* **Cool Hysteresis** ** Set the control switching hysteresis for on-off control. This determines how far into the "on" region the process value needs to move before the output turns on.	0.001 to 9,999.000°F or units 0.001 to 5,555.000°C	3.0°F or units 2.0°C	2242 [offset 70]	0x97 (151) 1 to 4 0xC (12)	68	8013	float RWES
t i [ti]	*Control Loop (1 to 4)* **Time Integral** ** Set the PID integral for the outputs.	0 to 9,999 seconds per repeat	180 seconds per repeat	2234 [offset 70]	0x97 (151) 1 to 4 8	69	8006	float RWES
td [td]	*Control Loop (1 to 4)* **Time Derivative** ** Set the PID derivative time for the outputs.	0 to 9,999 seconds	0 seconds	2236 [offset 70]	0x97 (151) 1 to 4 9	70	8007	float RWES
db [db]	*Control Loop (1 to 4)* **Dead Band** ** Set the offset to the proportional band. With a negative value, both heating and cooling outputs are active when the process value is near the set point. A positive value keeps heating and cooling outputs from fighting each other.	-1,000.0 to 1,000.0°F or units -556 to 556°C	0.0	2238 [offset 70]	0x97 (151) 1 to 4 0xA (10)	71	8008	float RWES
t.tUn [t.tUn]	*Control Loop (1 to 4)* **TRU-TUNE+® Enable** Enable or disable the TRU-TUNE+® adaptive tuning feature.	no No (59) yES Yes (106)	No	2250 [offset 70]	0x97 (151) 1 to 4 10 (16)	- - - -	8022	uint RWES
t.bnd [t.bnd]	*Control Loop (1 to 4)* **TRU-TUNE+® Band** Set the range, centered on the set point, within which TRU-TUNE+® will be in effect. Use this function only if the controller is unable to adaptive tune automatically.	0 to 100	0	2252 [offset 70]	0x97 (151) 1 to 4 0x11 (17)	- - - -	8034	uint RWES
t.gn [t.gn]	*Control Loop (1 to 4)* **TRU-TUNE+® Gain** Select the responsiveness of the TRU-TUNE+® adaptive tuning calculations. More responsiveness may increase overshoot.	1 to 6	3	2254 [offset 70]	0x97 (151) 1 to 4 0x12 (18)	- - - -	8035	uint RWES
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RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
A.tSP [A.tSP]	*Control Loop (1 to 4)* **Autotune Set Point** ** Set the set point that the autotune will use, as a percentage of the current set point.	50.0 to 200.0%	90.0	2258 [offset 70]	0x97 (151) 1 to 4 0x14 (20)	- - - -	8025	float RWES
t.Agr [t.Agr]	*Control Loop (1 to 4)* **Autotune Aggressiveness** Select the aggressiveness of the autotuning calculations.	Undr Under damped (99) Cr.t Critical damped (21) OuEr Over damped (69)	Critical	2256 [offset 70]	0x97 (151) 1 to 4 0x13 (19)	- - - -	8024	uint RWES
P.dL [P.dL]	*Control Loop (1 to 4)* **Peltier Delay** Set a value that will cause a delay when switching from heat PID mode to cool PID mode.	0.0 to 5.0 seconds	0.0	2274 [offset 70]	0x97 (151) 1 to 4 0x1C (28)	- - - -	8051	float RWES
r.En [r.En]	*Control Loop (1 to 4)* **Remote Set Point Enable** Set whether this loop will use a remote set point.	no No (59) YES Yes (106)	No	2540 [offset 80]	0x6B (107) 1 to 4 0x15 (21)	48	7021	uint RWES
SFn.b [SFn.b]	*Control Loop (1 to 4)* **Source Function B** Set the function that will provide the remote set point.	nonE None (61) A.In Analog Input (142) Curr Current (22) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PLdr Power, Control Loop (73) Lnr Linearization (238) MAtH Math (240) Pv Process Value (241) SP.C Set Point Closed, Control Loop (242) SP.o Set Point Open, Control Loop (243) vAr Variable (245)	None	2544 [offset 80]	0x6B (107) 1 to 4 0x17 (23)	- - - -	7023	uint RWES
Si.b [Si.b]	*Control Loop (1 to 4)* **Source Instance B** Set the instance of the function selected above.	1 to 250	1	2546 [offset 80]	0x6B (107) 1 to 4 0x18 (24)	- - - -	7024	uint RWES
SZ.b [SZ.b]	*Control Loop (1 to 4)* **Source Zone B** Set the zone of the function selected above.	0 to 16	0	2550 [offset 80]	0x6B (107) 1 to 4 0x1A (26)	- - - -	7026	uint RWES

Note:
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Note:
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R: Read
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RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
r.tY [r.ty]	*Control Loop (1 to 4)* **Remote Set Point Type** Set what type of set point will be used.	AUto Auto (10) MAn Manual (54)	Auto	2542 [offset 80]	0x6B (107) 1 to 4 0x16 (22)	- - - -	7022	uint RWES
UFA [UFA]	*Control Loop (1 to 4)* **User Failure Action** Select what the controller outputs will do when the user switches control to manual mode.	oFF Off, sets output power to 0% (62) bPLS Bumpless transfer, maintains same output power, if it was less than 75% and stable, otherwise 0% (14) MAn Manual Power, sets output power to Fixed Power setting (54) USEr User, sets output power to last open-loop set point the user entered (100)	User	2522 [offset 80]	0x6B (107) 1 to 4 0xC (12)	- - - -	7012	uint RWES
FAiL [FAiL]	*Control Loop (1 to 4)* **Input Error Failure** Select what the controller outputs will do when an input error switches control to manual mode.	oFF Off, sets output power to 0% (62) bPLS Bumpless transfer, maintains same output power, if it was less than 75% and stable, otherwise 0% (14) MAn Manual Power, sets output power to Fixed Power setting (54) USEr User, sets output power to last open-loop set point the user entered (100)	User	2524 [offset 80]	0x6B (107) 1 to 4 0xD (13)	- - - -	7013	uint RWES
MAn [MAn]	*Control Loop (1 to 4)* **Fixed Power** Set the manual output power level that will take effect if an input error failure occurs while User Failure Action is set to Manual Power.	Set Point Open Loop Limit Low to Set Point Open Loop Limit High (Setup Page)	0.0	2520 [offset 80]	0x6B (107) 1 to 4 0xB (11)	- - - -	7011	float RWES
L.dE [L.dE]	*Control Loop (1 to 4)* **Open Loop Detect Enable** Turn on the open-loop detect feature to monitor a closed-loop operation for the appropriate response.	no No (59) YES Yes (106)	No	2262 [offset 70]	0x97 (151) 1 to 4 0x16 (22)	74	8039	uint RWES
L.dt [L.dt]	*Control Loop (1 to 4)* **Open Loop Detect Time** The Open Loop Detect Deviation value must occur for this time period to trigger an open-loop error.	0 to 3,600 seconds	240	2264 [offset 70]	0x97 (151) 1 to 4 0x17 (23)	75	8040	uint RWES
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RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
L.dd [L.dd]	*Control Loop (1 to 4)* **Open Loop Detect Deviation** Set the value that the process must deviate from the set point to trigger an open-loop error.	-1,999.000 to 9,999.000°F or units -1,110.555 to 5,555.000°C	10.0°F or units 6.0°C	2266 [offset 70]	0x97 (151) 1 to 4 0x18 (24)	76	8041	float RWES
rP [rP]	*Control Loop (1 to 4)* **Ramp Action** Select when the controller's set point will ramp to the defined end set point.	oFF Off (62) Str Startup (88) StPt Set Point Change (85) both Both (13)	Off	2526 [offset 80]	0x6B (107) 1 to 4 0xE (14)	56	7014	uint RWES
r.SC [r.SC]	*Control Loop (1 to 4)* **Ramp Scale** Select the scale of the ramp rate.	hour Hours (39) Min Minutes (57)	Minutes	2528 [offset 80]	0x6B (107) 1 to 4 0xF (15)	57	7015	uint RWES
r.rt [r.rt]	*Control Loop (1 to 4)* **Ramp Rate** Set the rate for the set point ramp. Set the time units for the rate with the Ramp Scale parameter.	0.0 to 9,999.000°F or units 0.0 to 5,555.000°C	1.0°F or units 1.0°C	2532 [offset 80]	0x6B (107) 1 to 4 0x11 (17)	58	7017	float RWES
Pro.E [Pro.E]	*Control Loop (1 to 4)* **Profiling Enable** Enable this loop to run profiles.	no No (59) YES Yes (106)	No	2552 [offset 80]	0x6B (107) 1 to 4 0x1B (27)	- - - -	7027	uint RWES
L.SP [L.SP]	*Control Loop (1 to 4)* **Low Set Point** Set the minimum value of the closed loop set point range.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	-1,999°F or units -1,128°C	2504 [offset 80]	0x6B (107) 1 to 4 3	- - - -	7003	float RWES
h.SP [h.SP]	*Control Loop (1 to 4)* **High Set Point** Set the maximum value of the closed loop set point range.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	9,999°F or units 5,537°C	2506 [offset 80]	0x6B (107) 1 to 4 4	- - - -	7004	float RWES
C.SP [C.SP]	*Control Loop (1 to 4)* **Closed Loop Set Point** ** Set the set point that the controller will automatically control to.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	75.0°F or units 24.0°C	2500 [offset 80]	0x6B (107) 1 to 4 1	49	7001	float RWES
id.S [id.S]	*Control Loop (1 to 4)* **Idle Set Point** ** Set a closed loop set point that can be triggered by an event state.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	75.0°F or units 24.0°C	2516 [offset 80]	0x6B (107) 1 to 4 9	50	7009	float RWES
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RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SP.Lo [SP.Lo]	*Control Loop (1 to 4)* **Set Point Open Limit Low** Set the minimum value of the open-loop set point range.	-100.0 to 100.0%	-100	2508 [offset 80]	0x6B (107) 1 to 4 5	54	7005	float RWES
SP.hi [SP.hi]	*Control Loop (1 to 4)* **Set Point Open Limit High** Set the maximum value of the open-loop set point range.	-100.0 to 100.0%	100	2510 [offset 80]	0x6B (107) 1 to 4 6	55	7006	float RWES
o.SP [o.SP]	*Control Loop (1 to 4)* **Open Loop Set Point** ** Set a fixed level of output power when in manual (open-loop) mode.	-100.0 to 100.0% (heat and cool) 0 to 100.0% (heat only) -100.0 to 0% (cool only)	0.0	2502 [offset 80]	0x6B (107) 1 to 4 2	51	7002	float RWES
C.M [C.M]	*Control Loop (1 to 4)* **Control Mode** ** Select the method that this loop will use to control.	oFF Off (62) AUto Auto (10) MAn Manual (54)	Auto	2220 [offset 70]	0x97 (151) 1 to 4 1	63	8001	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
oUtP SEt **Output Menu**								
Fn [Fn]	*Output Digital (1 to 8)* **Function** Select what function will drive this output. **Note:** Limit function is available only for the slot in which the Limit resides.	oFF Off (62) A1 Analog Input (142) ALM Alarm (6) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) CPE Compare (230) Ctr Counter (231) d.io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.g Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) LgC Logic (239) Lnr Linearization (238) MAtH Math (240) Pu Process Value (241) SoF.1 Special Function Output 1 (1532) SoF.2 Special Function Output 2 (1533) SoF.3 Special Function Output 3 (1534) SoF.4 Special Function Output 4 (1535) tMr Timer (244) uAr Variable (245) L.Pr Limit (126)	off	1028 [offset 30]	0x6A (106) 1 to 8 5	96	6005	uint RWES
Fi [Fi]	*Output Digital (1 to 8)* **Function Instance** Set the instance of the function selected above.	1 to 250	1	1030 [offset 30]	0x6A (106) 1 to 4 6	- - - -	6006	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SZ.A [SZ.A]	*Output Digital (1 to 8)* **Source Zone A** Set the instance of the function selected above.	0 to 16	0	1042 [offset 30]	0x6A (106) 1 to 8 0xC (12)	- - - -	6012	uint RWES
o.Ct [o.Ct]	*Output Digital (1 to 8)* **Control** Set the output control type. This parameter is only used with PID control, but can be set anytime.	FtB Fixed Time Base (34) vtB Variable Time Base (103)	Fixed Time Base	1022 [offset 30]	0x6A (106) 1 to 8 2	- - - -	6002	uint RWES
o.tb [o.tb]	*Output Digital (1 to 8)* **Time Base** Set the time base for fixed-time-base control.	0.1 to 60.0 seconds (solid-state relay or switched dc) 5.0 to 60.0 seconds (mechanical relay or NO-ARC power control)	1.0 sec. [SSR & sw dc] 20.0 sec. [mech, relay, NO-ARC]	1024 [offset 30]	0x6A (106) 1 to 8 3	- - - -	6003	float RWES
o.Lo [o.Lo]	*Output Digital (1 to 8)* **Low Power Scale** The power output will never be less than the value specified and will represent the value at which output scaling begins.	0.0 to 100.0%	0.0%	1036 [offset 30]	0x6A (106) 1 to 8 9	- - - -	6009	float RWES
o.hi [o.hi]	*Output Digital (1 to 8)* **High Power Scale** The power output will never be greater than the value specified and will represent the value at which output scaling stops.	0.0 to 100.0%	100.0%	1038 [offset 30]	0x6A (106) 1 to 8 0xA (10)	- - - -	6010	float RWES
o.ty [o.ty]	*Output Process (1, 3, 5 or 7)* **Type** Select whether the process output will operate in volts or milliamps.	volt Volts (104) mA Milliamps (112)	Volts	840 (1) 888 (3) 936 (5) 984 (7)	0x76 (118) 1 to 4 1	95	18001	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
Fn [Fn]	*Output Process (1, 3, 5 or 7)* **Function** Set the type of function that will drive this output.	oFF Off (62) AI Analog Input (142) CUrr Current (22) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PUJr Power, Control Loop (73) Lnr Linearization (238) MATH Math (240) Pu Process Value (241) SP.C Set Point Closed, Control Loop (242) SP.o Set Point Open, Control Loop (243) SoF.1 Special Function Output 1 (1532) SoF.2 Special Function Output 2 (1533) SoF.3 Special Function Output 3 (1534) SoF.4 Special Function Output 4 (1535) uAr Variable (245)	Off	842 (1) 890 (3) 938 (5) 986 (7)	0x76 (118) 1 to 4 2	96	18002	uint RWES
Fi [Fi]	*Output Process (1, 3, 5 or 7)* **Function Instance** Set the instance of the function selected above.	1 to 250	1	846 (1) 894 (3) 942 (5) 990 (7)	0x76 (118) 1 to 4 4	98	18004	uint RWES
S2A [ZS.A]	*Output Process (1, 3, 5 or 7)* **Source Zone A** Set the zone of the function selected above.	0 to 16	0	- - - -	0x76 (118) 1 to 4 0x13 (19)	- - - -	18019	uint RWES
S.Lo [S.Lo]	*Output Process (1, 3, 5 or 7)* **Scale Low** Set the scale low for process output in electrical units. This value, in volts or milliamps, will correspond to 0% PID power output or the range low value.	-100.0 to 100.0	0.00	856 (1) 904 (3) 952 (5) 1000 (7)	0x76 (118) 1 to 4 9	99	18009	float RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Dis-play	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
S.hi [S.hi]	*Output Process (1, 3, 5 or 7)* **Scale High** Set the scale high for process output in electrical units. This value, in volts or milliamps, will correspond to 0% PID power output or the range high value.	-100.0 to 100.0	10.00	858 (1) 906 (3) 954 (5) 1002 (7)	0x76 (118) 1 to 4 0xA (10)	100	18010	float RWES
r.Lo [r.Lo]	*Output Process (1, 3, 5 or 7)* **Range Low** Use to set the minimum value in process units. This will correspond with the Scale Low value.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18°C	860 (1) 908 (3) 956 (5) 1004 (7)	0x76 (118) 1 to 4 0xB (11)	101	18011	float RWES
r.hi [r.hi]	*Output Process (1, 3, 5 or 7)* **Range High** Use to set the maximum value in process units. This will correspond with the Scale High value.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	100 F or units 38 C	862 (1) 910 (3) 958 (5) 1006 (7)	0x76 (118) 1 to 4 0xC (12)	102	18012	float RWES
o.CA [o.CA]	*Output Process (1, 3, 5 or 7)* **Calibration Offset** Set an offset value for a process output.	-1,999.000 to 9,999.000°F or units -1,110.555 to 5,555.000°C	0.0°F or units 0.0°C	852 (1) 900 (3) 948 (5) 996 (7)	0x76 (118) 1 to 4 7	105	18007	float RWES
ALM1 SEt **Alarm Menu**								
A.ty [A.ty]	*Alarm (1 to 8)* **Type** Select whether the alarm trigger is a fixed value or will track the set point.	oFF Off (62) Pr.AL Process Alarm (76) dE.AL Deviation Alarm (24)	Off	1768 [offset 60]	0x6D (109) 1 to 8 0xF (15)	20	9015	uint RWES
Sr.A [Sr.A]	*Alarm (1 to 8)* **Source** Select what will trigger this alarm.	nonE None (61) A 1 Analog Input (142) CUrr Current (22) PUJr Power (73) Lnr Linearization (238) MMAt Math (240) Pu Process Value (241) uAr Variable (245) Cu.r Current Read (179)	Analog Input	1772 [offset 60]	0x6D (109) 1 to 8 0x11 (17)	21	9017	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
iS.A [iS.A]	*Alarm (1 to 8)* **Source Instance** Set the instance of the function selected above.	1 or 250	1	1774 [offset 60]	0x6D (109) 1 to 8 0x12 (18)	22	9018	uint RWES
SZ.A [SZ.A]	*Alarm (1 to 8)* **Source Zone** Set the zone of the function selected above.	0 or 16	0	1788 [offset 60]	0x6D (109) 1 to 8 0x19 (25)	- - - -	9025	uint RWES
LooP [LooP]	*Alarm (1 to 4)* **Control Loop** Set the instance of the Set Point Closed, Control Loop, that will be referenced by the deviation alarm.	1 to 250	1	1784 [offset 60]	0x6D (109) 1 to 8 0x17 (23)	23	9023	uint RWES
A.hy [A.hy]	*Alarm (1 to 8)* **Hysteresis** Set the hysteresis for an alarm. This determines how far into the safe region the process value needs to move before the alarm can be cleared.	0.001 to 9,999.000°F or units 0.001 to 5,555.000°C	1.0°F or units 1.0°C	1744 [offset 60]	0x6D (109) 1 to 8 3	24	9003	float RWES
A.Lg [A.Lg]	*Alarm (1 to 8)* **Logic** Select what the output condition will be during the alarm state.	AL.C Close On Alarm (17) AL.o Open On Alarm (66)	Close On Alarm	1748 [offset 60]	0x6D (109) 1 to 8 5	25	9005	uint RWES
A.Sd [A.Sd]	*Alarm (1 to 8)* **Sides** Select which side or sides will trigger this alarm.	both Both (13) h.gh High (37) Lolo Low (53)	Both	1746 [offset 60]	0x6D (109) 1 to 8 4	26	9004	uint RWES
A.Lo [A.Lo]	*Alarm (1 to 8)* **Low Set Point** ** If Alarm Type (Setup Page, Alarm Menu) is set to: **process** - set the process value that will trigger a low alarm. **deviation** - set the span of units from the closed loop set point that will trigger a low alarm. A negative set point represents a value below closed loop set point. A positive set point represents a value above closed loop set point.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	32.0°F or units 0.0°C	1742 [offset 60]	0x6D (109) 1 to 8 2	18	9002	float RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
A.hi [A.hi]	*Alarm (1 to 8)* **High Set Point** ** If Alarm Type (Setup Page, Alarm Menu) is set to: **process** - set the process value that will trigger a high alarm. **deviation** - set the span of units from the closed loop set point that will trigger a low alarm. A negative set point represents a value below closed loop set point. A positive set point represents a value above closed loop set point.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	300.0°F or units 150.0°C	1740 [offset 60]	0x6D (109) 1 to 8 1	19	9001	float RWES
A.LA [A.LA]	*Alarm (1 to 8)* **Latching** Turn alarm latching on or off. A latched alarm has to be turned off by the user.	nLAt Non-Latching (60) LAt Latching (49)	Non-Latching	1752 [offset 60]	0x6D (109) 1 to 8 7	27	9007	uint RWES
A.bL [A.bL]	*Alarm (1 to 8)* **Blocking** Select when an alarm will be blocked. After startup and/or after the set point changes, the alarm will be blocked until the process value enters the normal range.	oFF Off (62) Str Startup (88) StPt Set Point (85) both Both (13)	Off	1754 [offset 60]	0x6D (109) 1 to 8 8	28	9008	uint RWES
A.Si [A.Si]	*Alarm (1 to 8)* **Silencing** Turn alarm silencing on to allow the user to disable this alarm.	oFF Off (62) on On (63)	Off	1750 [offset 60]	0x6D (109) 1 to 8 6	29	9006	uint RWES
A.dSP [A.dSP]	*Alarm (1 to 8)* **Display** Display an alarm message when an alarm is active.	oFF Off (62) on On (63)	On	1770 [offset 60]	0x6D (109) 1 to 8 0x10 (16)	30	9016	uint RWES
A.dL [A.dL]	*Alarm (1 to 8)* **Delay Time** Set the span of time that the alarm will be delayed after the process value exceeds the alarm set point.	0 to 9,999 seconds	0	1780 [offset 60]	0x6D (109) 1 to 8 0x15 (21)	31	9021	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
A.CLr [A.CLr]	*Alarm (1 to 8)* **Alarm Clear Request** ** Write to this register to clear an alarm	0	- - - -	1764 [offset 60]	0x6D (109) 1 to 8 0xD (13)	32	9013	uint W
A.Sir [A.Sir]	*Alarm (1 to 8)* **Alarm Silence Request** ** Write to this register to silence an alarm	0	- - - -	1766 [offset 60]	0x6D (109) 1 to 8 0xE (14)	33	9014	uint W
A.St [A.St]	*Alarm (1 to 8)* **Alarm State** ** Current state of alarm	Startup (88) None (61) Blocked (12) Alarm low (8) Alarm high (7) Error (28)	- - - -	1756 [offset 60]	0x6D (109) 1 to 8 9	- - - -	9009	uint R
CUrr SEt **Current Menu**								
C.Sd [C.Sd]	*Current (1 to 4)* **Sides** Use Current Sides to select which side of the current to monitor.	oFF Off (62) h.Gh High (37) Lou Low (53) both Both (13)	off	1388 [offset 50]	0x73 (115) 1 to 4 5	145	15005	uint RWES
C.Ur [C.Ur]	*Current (1 to 4)* **Read Enable** Use Current Read Enable to display solid-state relay (SSR) failure and heater failure messages on the RUI (remote user interface).	no No (59) YES Yes (106)	no	1386 [offset 50]	0x73 (115) 1 to 4 4	146	15004	uint RWES
C.dt [C.dt]	*Current (1 to 4)* **Detection Threshold** Current Detection Threshold is for factory use only.	3 to 59	9	1402 [offset 50]	0x73 (115) 1 to 4 0xC (12)	147	15012	uint RWES
C.SC [C.SC]	*Current (1 to 4)* **Scaling** Use Input Current Scaling to adjust scaling to match the transformer's high range, in amperes.	0 to 9,999.000	50.0	1422 [offset 50]	0x73 (115) 1 to 4 0x16 (22)	148	15022	float RWES
C.oFS [C.oFS]	*Current (1 to 4)* **Heater Offset** Heater Current Offset is used to calibrate the current reading with an offset value.	-9,999.000 to 9,999.000	0.0	1400 [offset 50]	0x73 (115) 1 to 4 0xB (11)	149	15011	float RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
C.Si [C.Si]	*Current (1 to 4)* **Output Source Instance** With Current Output Source Instance, set the output on which the current will be monitored.	1 to 250	1	1416 [offset 50]	0x73 (115) 1 to 4 0x13 (19)	150	15019	uint RWES
LnrSEt **Linearization Menu**								
Fn [Fn]	*Linearization (1 to 4)* **Function** Set how this function will linearize Source A.	oFF Off (62) Intr Interpolated (1482) StPd Stepped (1483)	Off	4528 [offset 70]	0x86 (134) 1 to 4 5	- - - -	34005	uint RWES
SFn.A [SFn.A]	*Linearization (1 to 4)* **Source Function A** Set the type of function that will be used for this source.	nonE None (61) AI Analog Input (142) CUrr Current (22) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PUJr Power, Control Loop (73) Lnr Linearization (238) MAtH Math (240) Pu Process Value (241) SP.C Set Point Closed, Control Loop (242) SP.o Set Point Open, Control Loop (243) uAr Variable (245)	None	4520 [offset 70]	0x86 (134) 1 to 4 1	155	34001	uint RWES
Si.A [Si.A]	*Linearization (1 to 4)* **Source Instance A** Set the instance of the function selected above.	1 or 250	1	4522 [offset 70]	0x86 (134) 1 to 4 2	- - - -	34002	uint RWES
SZ.A [SZ.A]	*Linearization (1 to 4)* **Source Zone A** Set the zone of the function selected above.	0 or 16	0	4524 [offset 70]	0x86 (134) 1 to 4 3	- - - -	34003	uint RWES
Unit [Unit]	*Linearization (1 to 4)* **Units** Set the units of the output value.	Src Source (1539) nonE None (61) AtP Absolute Temperature (1540) rtP Relative Temperature (1541) PUJr Power (73) Pro Process (75) rh Relative Humidty (1538)	Source	4576 [offset 70]	0x86 (134) 1 to 4 0x1D (29)	156	34029	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Setup Page								
Dis-play	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
iP.1 [ip.1]	*Linearization (1 to 4)* **Input Point 1** Set the value that will be mapped to output 1.	-1,999.000 to 9,999.000	0.0	4534 [offset 70]	0x86 (134) 1 to 4 8	157	34008	float RWES
oP.1 [op.1]	*Linearization (1 to 4)* **Output Point 1** Set the value that will be mapped to input 1.	-1,999.000 to 9,999.000	0.0	4554 [offset 70]	0x86 (134) 1 to 4 0x12 (18)	158	34018	float RWES
iP.2 [ip.2]	*Linearization (1 to 4)* **Input Point 2** Set the value that will be mapped to output 2.	-1,999.000 to 9,999.000	1.0	4536 [offset 70]	0x86 (134) 1 to 4 9	159	34009	float RWES
oP.2 [op.2]	*Linearization (1 to 4)* **Output Point 2** Set the value that will be mapped to input 2.	-1,999.000 to 9,999.000	1.0	4556 [offset 70]	0x86 (134) 1 to 4 0x13 (19)	160	34019	float RWES
iP.3 [ip.3]	*Linearization (1 to 4)* **Input Point 3** Set the value that will be mapped to output 3.	-1,999.000 to 9,999.000	2.0	4538 [offset 70]	0x86 (134) 1 to 4 0xA (10)	161	34010	float RWES
oP.3 [op.3]	*Linearization (1 to 4)* **Output Point 3** Set the value that will be mapped to input 3.	-1,999.000 to 9,999.000	2.0	4558 [offset 70]	0x86 (134) 1 to 4 0x14 (20)	162	34020	float RWES
iP.4 [ip.4]	*Linearization (1 to 4)* **Input Point 4** Set the value that will be mapped to output 4.	-1,999.000 to 9,999.000	3.0	4540 [offset 70]	0x86 (134) 1 to 4 0xB (11)	163	34011	float RWES
oP.4 [op.4]	*Linearization (1 to 4)* **Output Point 4** Set the value that will be mapped to input 4.	-1,999.000 to 9,999.000	3.0	4560 [offset 70]	0x86 (134) 1 to 4 0x15 (21)	164	34021	float RWES
iP.5 [ip.5]	*Linearization (1 to 4)* **Input Point 5** Set the value that will be mapped to output 5.	-1,999.000 to 9,999.000	4.0	4542 [offset 70]	0x86 (134) 1 to 4 0xC (12)	165	34012	float RWES
oP.5 [op.5]	*Linearization (1 to 4)* **Output Point 5** Set the value that will be mapped to input 5.	-1,999.000 to 9,999.000	4.0	4562 [offset 70]	0x86 (134) 1 to 4 0x16 (22)	166	34022	float RWES
iP.6 [ip.6]	*Linearization (1 to 4)* **Input Point 6** Set the value that will be mapped to output 6.	-1,999.000 to 9,999.000	5.0	4544 [offset 70]	0x86 (134) 1 to 4 0xD (13)	167	34013	float RWES
oP.6 [op.6]	*Linearization (1 to 4)* **Output Point 6** Set the value that will be mapped to input 6.	-1,999.000 to 9,999.000	5.0	4564 [offset 70]	0x86 (134) 1 to 4 0x17 (23)	168	34023	float RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
ip.7 [ip.7]	*Linearization (1 to 4)* **Input Point 7** Set the value that will be mapped to output 7.	-1,999.000 to 9,999.000	6.0	4546 [offset 70]	0x86 (134) 1 to 4 E (14)	169	34014	float RWES
op.7 [op.7]	*Linearization (1 to 4)* **Output Point 7** Set the value that will be mapped to input 7.	-1,999.000 to 9,999.000	6.0	4566 [offset 70]	0x86 (134) 1 to 4 0x18 (24)	170	34024	float RWES
ip.8 [ip.8]	*Linearization (1 to 4)* **Input Point 8** Set the value that will be mapped to output 8.	-1,999.000 to 9,999.000	7.0	4548 [offset 70]	0x86 (134) 1 to 4 0xF (15)	171	34015	float RWES
op.8 [op.8]	*Linearization (1 to 4)* **Output Point 8** Set the value that will be mapped to input 8.	-1,999.000 to 9,999.000	7.0	4568 [offset 70]	0x86 (134) 1 to 4 0x19 (25)	172	34025	float RWES
ip.9 [ip.9]	*Linearization (1 to 4)* **Input Point 9** Set the value that will be mapped to output 9.	-1,999.000 to 9,999.000	8.0	4550 [offset 70]	0x86 (134) 1 to 4 0x10 (16)	173	34016	float RWES
op.9 [op.9]	*Linearization (1 to 4)* **Output Point 9** Set the value that will be mapped to input 9.	-1,999.000 to 9,999.000	8.0	4570 [offset 70]	0x86 (134) 1 to 4 0x1A (26)	174	34026	float RWES
ip.10 [ip.10]	*Linearization (1 to 4)* **Input Point 10** Set the value that will be mapped to output 10.	-1,999.000 to 9,999.000	9.0	4552 [offset 70]	0x86 (134) 1 to 4 0x11 (17)	175	34017	float RWES
op.10 [op.10]	*Linearization (1 to 4)* **Output Point 10** Set the value that will be mapped to input 10.	-1,999.000 to 9,999.000	9.0	4572 [offset 70]	0x86 (134) 1 to 4 0x1B (27)	176	34027	float RWES
CPE SEt **Compare Menu**								
Fn [Fn]	*Compare (1 to 4)* **Function** Set operator that will be used to compare Source A to Source B.	oFF Off (62) gt Greater Than (1435) Lt Less Than (1436) E Equal To (1437) nE Not Equal To (1438) goE Greater or Equal (1439) LoE Less or Equal (1440)	Off	4016 [offset 40]	0x80 (128) 1 to 4 9	223	28009	uint RWES
toL [toL]	*Compare (1 to 4)* **Tolerance** If the difference between Source A and Source B is less than this value the two will appear to be equal.	0 to 9,999.000	0.1	4020 [offset 40]	0x80 (128) 1 to 4 0xB (11)	230	28011	float RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.A [SFn.A]	*Compare (1 to 4)* **Source Function A** Set the type of function that will be used for this source.	nonE None (61) AI Analog Input (142) CUrr Current (22) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PUJr Power, Control Loop (73) Lnr Linearization (238) MATH Math (240) Pu Process Value (241) SP.C Set Point Closed, Control Loop (242) SP.o Set Point Open, Control Loop (243) uAr Variable (245)	None	4000 [offset 40]	0x80 (128) 1 to 4 1	- - - -	28001	uint RWES
Si.A [Si.A]	*Compare (1 to 4)* **Source Instance A** Set the instance of the function selected above.	1 to 250	1	4004 [offset 40]	0x80 (128) 1 to 4 3	- - - -	28003	uint RWES
SZ.A [SZ.A]	*Compare (1 to 4)* **Source Zone A** Set the zone of the function selected above.	0 to 16	0	4008 [offset 40]	0x80 (128) 1 to 4 5	- - - -	28005	uint RWES
SFn.b [SFn.b]	*Compare (1 to 4)* **Source Function B** Set the type of function that will be used for this source. This represents the timer reset signal.	nonE None (61) AI Analog Input (142) CUrr Current (22) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PUJr Power, Control Loop (73) Lnr Linearization (238) MATH Math (240) Pu Process Value (241) SP.C Set Point Closed, Control Loop (242) SP.o Set Point Open, Control Loop (243) uAr Variable (245)	None	4002 [offset 40]	0x80 (128) 1 to 4 2	- - - -	28002	uint RWES
Si.b [Si.b]	*Compare (1 to 4)* **Source Instance B** Set the instance of the function selected above.	1 to 250	1	4006 [offset 40]	0x80 (128) 1 to 4 4	- - - -	28004	uint RWES
SZ.b [SZ.b]	*Compare (1 to 4)* **Source Zone B** Set the zone of the function selected above.	0 to 16	0	4010 [offset 40]	0x80 (128) 1 to 4 6	- - - -	28006	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
Er.h [Er.h]	*Compare (1 to 4)* **Error Handling** Use Error Handling to select the output value and error output state of this function if it receives an error signal from one or more sources and it cannot determine the output value.	t.9 True Good (1476) t.b True Bad (1477) F.9 False Good (1478) F.b False Bad (1479)	False Bad	4022 [offset 40]	0x80 (128) 1 to 4 0xC (12)	- - - -	28012	uint RWES
tMr SEt **Timer Menu**								
Fn [Fn]	*Timer (1 to 4)* **Function** Set how the timer will function.	oFF Off (62) on.P On Pulse (1471) dEL Delay (1472) o.S One Shot (1473) rEt Retentive (1474)	Off	4336 [offset 50]	0x83 (131) 1 to 4 9	223	31009	uint RWES
SFn.A [SFn.A]	*Timer (1 to 4)* **Source Function A** Set the type of function that will be used for this source. This represents the timer run signal.	nonE None (61) ALM Alarm (6) CPE Compare (230) Ctr Counter (231) d io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.9 Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) L9C Logic (239) SoF.1 Special Function Output 1 (1532) SoF.2 Special Function Output 2 (1533) SoF.3 Special Function Output 3 (1534) SoF.4 Special Function Output 4 (1535) tMr Timer (244) uAr Variable (245)	None	4320 [offset 50]	0x83 (131) 1 to 4 1	- - - -	31001	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
Si.A [Si.A]	*Timer (1 to 4)* **Source Instance A** Set the instance of the function selected above.	1 to 250	1	4324 [offset 50]	0x83 (131) 1 to 4 3	- - - -	31003	uint RWES
SZ.A [SZ.A]	*Timer (1 to 4)* **Source Zone A** Set the zone of the function selected above.	0 to 16	0	4328 [offset 50]	0x83 (131) 1 to 4 5	- - - -	31005	uint RWES
SASA [SAS.A]	*Timer (1 to 4)* **Source Active State A** Set what state will be read as on.	High (37) Low (53)	High	4340 [offset 50]	0x83 (131) 1 to 4 0xB (11)	- - - -	31011	uint RWES
SFn.b [SFn.b]	*Timer (1 to 4)* **Source Function B** Set the type of function that will be used to reset a retentive timer.	None (61) Alarm (6) Cool Power, Control Loop (161) Compare (230) Counter (231) Digital I/O (1142) Profile Event Out A (233) Profile Event Out B (234) Profile Event Out C (235) Profile Event Out D (236) Profile Event Out E (247) Profile Event Out F (248) Profile Event Out G (249) Profile Event Out H (250) Function Key (1001) Logic (239) Special Function Output 1 (1532) Special Function Output 2 (1533) Special Function Output 3 (1534) Special Function Output 4 (1535) Timer (244) Variable (245)	None	4322 [offset 50]	0x83 (131) 1 to 4 2	- - - -	31002	uint RWES
Si.b [Si.b]	*Timer (1 to 4)* **Source Instance B** Set the instance of the function selected above.	1 to 250	1	4326 [offset 50]	0x83 (131) 1 to 4 4	- - - -	31004	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SZ.b [SZ.b]	*Timer (1 to 4)* **Source Zone B** Set the zone of the function selected above.	0 to 16	0	4330 [offset 50]	0x83 (131) 1 to 4 6	- - - -	31006	uint RWES
SAS.b [SAS.b]	*Timer (1 to 4)* **Source Active State B** Set what state will be read as on.	hIGh High (37) LoUU Low (53)	High	4342 [offset 50]	0x83 (131) 1 to 4 0xC (12)	- - - -	31012	uint RWES
ti [ti]	*Timer (1 to 4)* **Time** Set the time span that will be measured in tenths of a second.	0 to 9,999.000	0.1	4344 [offset 50]	0x83 (131) 1 to 4 0xD (13)	224	31013	float RWES
LEv [LEv]	*Timer (1 to 4)* **Active Level** Set which output state will indicate on.	hIGh High (37) LoUU Low (53)	High	4346 [offset 50]	0x83 (131) 1 to 4 0xE (14)	- - - -	31014	uint RWES
CtR SEt **Counter Menu**								
Fn [Fn]	*Counter (1 to 4)* **Function** Set whether the counter increments or decrements the count value. Decrementing 0 returns 9,999. Incrementing 9,999 returns 0.	UP Up (1456) dn Down (1457)	Up	4176 [offset 40]	0x82 (130) 1 to 4 9	- - - -	30009	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.A [SFn.A]	*Counter (1 to 4)* **Source Function A** Set the type of function that will be used for the counter clock signal.	nonE None (61) ALrM Alarm (6) CPE Compare (230) Ctr Counter (231) d.io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.g Profile Event Out G (249) Ent.h Profile Event Out H (250) Fun Function Key (1001) LgC Logic (239) SoF.1 Special Function Output 1 (1532) SoF.2 Special Function Output 2 (1533) SoF.3 Special Function Output 3 (1534) SoF.4 Special Function Output 4 (1535) tMr Timer (244) uAr Variable (245)	None	4160 [offset 40]	0x82 (130) 1 to 4 1	- - - -	30001	uint RWES
S.iA [Si.A]	*Counter (1 to 4)* **Source Instance A** Set the instance of the function selected above.	1 to 250	1	4164 [offset 40]	0x82 (130) 1 to 4 3	- - - -	30003	uint RWES
SZ.A [SZ.A]	*Counter (1 to 4)* **Source Zone A** Set the zone of the function selected above.	0 to 16	0	4168 [offset 40]	0x82 (130) 1 to 4 5	- - - -	30005	uint RWES
SASA [SAS.A]	*Counter (1 to 4)* **Source Active State A** Set what output state will indicate on.	both Both (130 high High (37) Lolo Low (53)	High	4180 [offset 40]	0x82 (130) 1 to 4 0xB (11)	- - - -	30011	uint RWES

Note:
Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces.

Note:
If there is only one instance of a menu, no submenus will appear.

** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.

R: Read
W: Write
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RMC Module • Setup Page								
Dis-play	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.b [SFn.b]	*Counter (1 to 4)* **Source Function B** Set the type of function that will be used for the counter load signal.	nonE None (61) ALrM Alarm (6) CPtE Compare (230) Ctr Counter (231) d io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.G Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) LGC Logic (239) SoF.1 Special Function Output 1 (1532) SoF.2 Special Function Output 2 (1533) SoF.3 Special Function Output 3 (1534) SoF.4 Special Function Output 4 (1535) tMr Timer (244) uAr Variable (245)	None	4162 [offset 40]	0x82 (130) 1 to 4 2	- - - -	30002	uint RWES
Si.b [Si.b]	*Counter (1 to 4)* **Source Instance B** Set the instance of the function selected above.	1 to 250	1	4166 [offset 40]	0x82 (130) 1 to 4 4	- - - -	30004	uint RWES
SZ.b [SZ.b]	*Counter (1 to 4)* **Source Zone B** Set the zone of the function selected above.	0 to 16	0	4170 [offset 40]	0x82 (130) 1 to 4 6	- - - -	30006	uint RWES
SASb [SAS.b]	*Counter (1 to 4)* **Source Active State B** Set what output state will indicate on.	High (37) Low (53)	High	4182 [offset 40]	0x82 (130) 1 to 4 0x0C (12)	- - - -	30012	uint RWES
LoAd [LoAd]	*Counter (1 to 4)* **Load Value** Set the counter's initial value.	0 to 9,999	0	4184 [offset 40]	0x82 (130) 1 to 4 (13)	215	30013	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Dis-play	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
trgt [trgt]	*Counter (1 to 4)* **Target Value** Set the value that will turn the output value on.	0 to 9,999	9,999	4186 [offset 40]	0x82 (130) 1 to 4 0xE (14)	216	30014	uint RWES
LAt [LAt]	*Counter (1 to 4)* **Latching** Output latched.	No (59) Yes (106)	No	4192 [offset 40]	0x82 (130) 1 to 4 0x11 (17)	218	30017	uint RWES
LGC SEt **Logic Menu**								
Fn [Fn]	*Logic (1 to 4)* **Function** Set the operator that will be used to compare the sources.	oFF Off (62) And And (1426) nAnd Nand (1427) or Or (1442) nor Nor (1443) E Equal To (1437) nE Not Equal To (1438) LAt Latch (1444) rSFF RS Flip-Flop (1693) or Or (1442)	Off	3744 [offset 80]	0x7F (127) 1 to 4 0x21 (33)	235	27033	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.A [SFn.A]	*Logic (1 to 4)* **Source Function A** Set the type of function that will be used for this source.	nonE None (61) ALrM Alarm (6) CPE Compare (230) Ctr Counter (231) d io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.g Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) Limt Limit (126) LgC Logic (239) SoF.1 Special Function Output 1 (1532) SoF.2 Special Function Output 2 (1533) SoF.3 Special Function Output 3 (1534) SoF.4 Special Function Output 4 (1535) tMr Timer (244) uAr Variable (245)	None	3680 [offset 80]	0x7F (127) 1 to 4 1	- - - -	27001	uint RWES
Si.A [Si.A]	*Logic (1 to 4)* **Source Instance A** Set the instance of the function selected above.	1 to 250	1	3696 [offset 80]	0x7F (127) 1 to 4 9	- - - -	27009	uint RWES
SZ.A [SZ.A]	*Logic (1 to 4)* **Source Zone A** Set the zone of the function selected above.	0 to 16	0	3712 [offset 80]	0x7F (127) 1 to 4 0x11 (17)	- - - -	27017	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Dis-play	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.b [SFn.b]	*Logic (1 to 4)* **Source Function B** Set the type of function that will be used for this source.	nonE None (61) ALrM Alarm (6) C.Pr Cool Power, Control Loop (161) CPE Compare (230) Ctr Counter (231) d.io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.G Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) Lim Limit (126) LGC Logic (239) SoF.1 Special Function Output 1 (1532) SoF.2 Special Function Output 2 (1533) SoF.3 Special Function Output 3 (1534) SoF.4 Special Function Output 4 (1535) tMr Timer (244) uAr Variable (245)	None	3682 [offset 80]	0x7F (127) 1 to 4 2	- - - -	27002	uint RWES
Si.b [Si.b]	*Logic (1 to 4)* **Source Instance B** Set the instance of the function selected above.	1 to 250	1	3698 [offset 80]	0x7F (127) 1 to 4 0xA (10)	- - - -	27010	uint RWES
SZ.b [SZ.b]	*Logic (1 to 4)* **Source Zone B** Set the zone of the function selected above	0 to 16	0	3714 [offset 80]	0x7F (127) 1 to 4 0x12 (18)	- - - -	27018	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.C [SFn.C]	*Logic (1 to 4)* **Source Function C** Set the type of function that will be used for this source.	nonE None (61) ALrM Alarm (6) CLPr Cool Power, Control Loop (161) CPtE Compare (230) Ctr Counter (231) d io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.9 Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) LimM Limit (126) LGC Logic (239) SoF.1 Special Function Output 1 (1532) SoF.2 Special Function Output 2 (1533) SoF.3 Special Function Output 3 (1534) SoF.4 Special Function Output 4 (1535) tMrM Timer (244) uAr Variable (245)	None	3684 [offset 80]	0x7F (127) 1 to 4 3	- - - -	27003	uint RWES
Si.C [Si.C]	*Logic (1 to 4)* **Source Instance C** Set the instance of the function selected above.	1 to 250	1	3700 [offset 80]	0x7F (127) 1 to 4 0xB (11)	- - - -	27011	uint RWES
SZ.C [SZ.C]	*Logic (1 to 4)* **Source Zone C** Set the zone of the function selected above.	0 to 16	0	3716 [offset 80]	0x7F (127) 1 to 4 0x13 (19)	- - - -	27019	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Dis-play	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.d [SFn.d]	*Logic (1 to 4)* **Source Function D** Set the type of function that will be used for this source.	nonE None (61) ALrM Alarm (6) CLPr Cool Power, Control Loop (161) CPtE Compare (230) Ctr Counter (231) d.io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.9 Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) L.iM Limit (126) LgC Logic (239) SoF.1 Special Function Output 1 (1532) SoF.2 Special Function Output 2 (1533) SoF.3 Special Function Output 3 (1534) SoF.4 Special Function Output 4 (1535) tiMr Timer (244) uAr Variable (245)	None	3686 [offset 80]	0x7F (127) 1 to 4 4	- - - -	27004	uint RWES
Si.d [Si.d]	*Logic (1 to 4)* **Source Instance D** Set the instance of the function selected above.	1 to 250	1	3702 [offset 80]	0x7F (127) 1 to 4 0xC (12)	- - - -	27012	uint RWES
SZ.d [SZ.d]	*Logic (1 to 4)* **Source Zone D** Set the zone of the function selected above.	0 to 16	0	3718 [offset 80]	0x7F (127) 1 to 4 0x14 (20)	- - - -	27020	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.E [SFn.E]	*Logic (1 to 4)* **Source Function E** Set the type of function that will be used for this source.	nonE None (61) ALrM Alarm (6) CLPr Cool Power, Control Loop (161) CPE Compare (230) Ctr Counter (231) d io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.9 Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) L iM Limit (126) LgC Logic (239) SoF.1 Special Function Output 1 (1532) SoF.2 Special Function Output 2 (1533) SoF.3 Special Function Output 3 (1534) SoF.4 Special Function Output 4 (1535) tMr Timer (244) uAr Variable (245)	None	3688 [offset 80]	0x7F (127) 1 to 4 5	- - - -	27005	uint RWES
S iE [Si.E]	*Logic (1 to 4)* **Source Instance E** Set the instance of the function selected above.	1 to 250	1	3704 [offset 80]	0x7F (127) 1 to 4 D (13)	- - - -	27013	uint RWES
SZ.E [SZ.E]	*Logic (1 to 4)* **Source Zone E** Set the zone of the function selected above.	0 to 16	0	3720 [offset 80]	0x7F (127) 1 to 4 0x15 (21)	- - - -	27021	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.F [SFn.F]	*Logic (1 to 4)* **Source Function F** Set the type of function that will be used for this source.	nonE None (61) ALrM Alarm (6) CPr Cool Power, Control Loop (161) CPE Compare (230) Ctr Counter (231) d io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.9 Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) Limt Limit (126) LoGC Logic (239) SoF.1 Special Function Output 1 (1532) SoF.2 Special Function Output 2 (1533) SoF.3 Special Function Output 3 (1534) SoF.4 Special Function Output 4 (1535) tMr Timer (244) uAr Variable (245)	None	3690 [offset 80]	0x7F (127) 1 to 4 6	- - - -	27006	uint RWES
Si.F [Si.F]	*Logic (1 to 4)* **Source Instance F** Set the instance of the function selected above.	1 to 250	1	3706 [offset 80]	0x7F (127) 1 to 4 0xE (14)	- - - -	27014	uint RWES
SZ.F [SF.F]	*Logic (1 to 4)* **Source Zone F** Set the zone of the function selected above.	0 to 16	0	3722 [offset 80]	0x7F (127) 1 to 4 0x16 (22)	- - - -	27022	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.g [SFn.g]	*Logic (1 to 4)* **Source Function G** Set the type of function that will be used for this source.	nonE None (61) ALrM Alarm (6) CLPr Cool Power, Control Loop (161) CPtE Compare (230) Ctr Counter (231) d io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.g Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) Limt Limit (126) LgC Logic (239) SoF.1 Special Function Output 1 (1532) SoF.2 Special Function Output 2 (1533) SoF.3 Special Function Output 3 (1534) SoF.4 Special Function Output 4 (1535) tMr Timer (244) uAr Variable (245)	None	3692 [offset 80]	0x7F (127) 1 to 4 7	- - - -	27007	uint RWES
S i.g [Si.g]	*Logic (1 to 4)* **Source Instance G** Set the instance of the function selected above.	1 to 250	1	3708 [offset 80]	0x7F (127) 1 to 4 0xF (15)	- - - -	27015	uint RWES
SZ.g [SZ.g]	*Logic (1 to 4)* **Source Zone G** Set the zone of the function selected above.	0 to 16	0	3724 [offset 80]	0x7F (127) 1 to 4 0x17 (23)	- - - -	27023	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Dis-play	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.h [SFn.h]	*Logic (1 to 4)* **Source Function H** Set the type of function that will be used for this source.	nonE None (61) ALM Alarm (6) C.Pr Cool Power, Control Loop (161) CPE Compare (230) Ctr Counter (231) d.io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.G Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) Lim Limit (126) LGC Logic (239) SoF.1 Special Function Output 1 (1532) SoF.2 Special Function Output 2 (1533) SoF.3 Special Function Output 3 (1534) SoF.4 Special Function Output 4 (1535) tMr Timer (244) uAr Variable (245)	None	3694 [offset 80]	0x7F (127) 1 to 4 8	- - - -	27008	uint RWES
Si.h [Si.h]	*Logic (1 to 4)* **Source Instance H** Set the instance of the function selected above.	1 to 250	1	3710 [offset 80]	0x7F (127) 1 to 4 0x10 (16)	- - - -	27016	uint RWES
SZ.h [SZ.h]	*Logic (1 to 4)* **Source Zone H** Set the zone of the function selected above.	0 to 16	0	3726 [offset 80]	0x7F (127) 1 to 4 0x18 (24)	- - - -	27024	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
Er.h [Er.h]	*Logic (1 to 4)* **Error Handling** Use to select the output value and error output state of this function if it receives an error signal from one or more sources and it cannot determine the output value.	t.9 True Good (1476) t.b True Bad (1477) F.9 False Good (1478) F.b False Bad (1479)	False Bad	3748 [offset 80]	0x7F (127) 1 to 4 0x23 (35)	- - - -	27035	uint RWES
MAtH SEt **Math Menu**								
Fn [Fn]	*Math (1 to 8)* **Function** Set the operator that will be applied to the sources.	oFF Off (62) Av9 Average (1367) P.SC Process Scale (1371) d.SC Deviation Scale (1372) So Switch Over (1370) d.iFF Differential (1373) rAt.i Ratio (1374) Add Add (1375) MUL Multiply (1376) A.d.iF Absolute Difference (1377) MI.in Minimum (1378) MAH Maximum (1379) root Square Root (1380) hold Sample and Hold (1381) ALt Pressure to Altitude (1649) dEvJ Dewpoint (1650)	Off	2880 [offset 70]	0x7D (125) 1 to 8 0x15 (21)	128	25021	uint RWES
SFn.A [SFn.A]	*Math (1 to 8)* **Source Function A** Set the type of function that will be used for this source.	nonE None (61) Ai.i Analog Input (142) CUrr Current (22) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PUJr Power, Control Loop (73) Lnr Linearization (238) MAtH Math (240) Pu Process Value (241) SP.C Set Point Closed, Control Loop (242) SP.o Set Point Open, Control Loop (243) uAr Variable (245)	None	2840 [offset 70]	0x7D (125) 1 to 8 1	- - - -	25001	uint RWES
S.iA [Si.A]	*Math (1 to 8)* **Source Instance A** Set the instance of the function selected above.	1 to 250	1	2850 [offset 70]	0x7D (125) 1 to 8 6	- - - -	25006	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SZ.A [SZ.A]	*Math (1 to 8)* **Source Zone A** Set the zone of the function selected above.	0 to 16	0	2860 [offset 70]	0x7D (125) 1 to 8 0xB (11)	- - - -	25011	uint RWES
SFn.b [SFn.b]	*Math (1 to 8)* **Source Function B** Set the type of function that will be used for this source.	nonE None (61) AI Analog Input (142) CUrr Current (22) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PUJr Power, Control Loop (73) Lnr Linearization (238) MAtH Math (240) PU Process Value (241) SP.C Set Point Closed, Control Loop (242) SP.o Set Point Open, Control Loop (243) uAr Variable (245)	None	2842 [offset 70]	0x7D (125) 1 to 8 2	- - - -	25002	uint RWES
Si.b [Si.b]	*Math (1 to 8)* **Source Instance B** Set the instance of the function selected above.	1 to 250	1	2852 [offset 70]	0x7D (125) 1 to 8 7	- - - -	25007	uint RWES
SZ.b [SZ.b]	*Math (1 to 8)* **Source Zone B** Set the zone of the function selected above.	0 to 16	0	2862 [offset 70]	0x7D (125) 1 to 8 0xC (12)	- - - -	25012	uint RWES
SFn.C [SFn.C]	*Math (1 to 8)* **Source Function C** Set the type of function that will be used for this source.	nonE None (61) AI Analog Input (142) CUrr Current (22) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PUJr Power, Control Loop (73) Lnr Linearization (238) MAtH Math (240) PU Process Value (241) SP.C Set Point Closed, Control Loop (242) SP.o Set Point Open, Control Loop (243) uAr Variable (245)	None	2844 [offset 70]	0x7D (125) 1 to 8 3	- - - -	25003	uint RWES
Si.C [Si.C]	*Math (1 to 8)* **Source Instance C** Set the instance of the function selected above.	1 to 250	1	2854 [offset 70]	0x7D (125) 1 to 8 8	- - - -	25008	uint RWES

Note:
Some values will be rounded off to fit in the four-character display.
Full values can be read with other interfaces.

Note:
If there is only one instance of a menu, no submenus will appear.

** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.

R: Read
W: Write
E: EEPROM
S: User Set

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SZ.C [SZ.C]	*Math (1 to 8)* **Source Zone C** Set the zone of the function selected above.	0 to 16	0	2864 [offset 70]	0x7D (125) 1 to 8 0xD (13)	- - - -	25013	uint RWES
SFn.d [SFn.d]	*Math (1 to 8)* **Source Function D** Set the type of function that will be used for this source.	none None (61) Ai Analog Input (142) CUrr Current (22) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PUJr Power, Control Loop (73) Lnr Linearization (238) MATH Math (240) Pu Process Value (241) SP.C Set Point Closed, Control Loop (242) SP.o Set Point Open, Control Loop (243) uAr Variable (245)	None	2846 [offset 70]	0x7D (125) 1 to 8 4	- - - -	25004	uint RWES
Si.d [Si.d]	*Math (1 to 8)* **Source Instance D** Set the instance of the function selected above.	1 to 250	1	2856 [offset 70]	0x7D (125) 1 to 8 9	- - - -	25009	uint RWES
SZ.d [SZ.d]	*Math (1 to 8)* **Source Zone D** Set the zone of the function selected above.	0 to 16	0	2866 [offset 70]	0x7D (125) 1 to 8 0xE (14)	- - - -	25014	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.E [SFn.E]	*Math (1 to 8)* **Source Function E** Set the type of function that will be used for this source.	nonE None (61) ALM Alarm (6) CPE Compare (230) Ctr Counter (231) d io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.g Profile Event Out G (249) Ent.h Profile Event Out H (250) Fun Function Key (1001) LgC Logic (239) tMr Timer (244) uAr Variable (245))	None	2848 [offset 70]	0x7D (125) 1 to 8 5	- - - -	25005	uint RWES
S iE [Si.E]	*Math (1 to 8)* **Source Instance E** Set the instance of the function selected above.	1 to 250	1	2858 [offset 70]	0x7D (125) 1 to 8 0xA (10)	- - - -	25010	uint RWES
SZE [SZ.E]	*Math (1 to 8)* **Source Zone E** Set the zone of the function selected above.	0 to 16	0	2868 [offset 70]	0x7D (125) 1 to 8 0xF (15)	- - - -	25015	uint RWES
S.Lo [S.Lo]	*Math (1 to 8)* **Scale Low** If Math function is set to Process Scale, this will scale Source A low value to Range Low setting.	-1,999.000 to 9,999.000	0.0	2886 [offset 70]	0x7D (125) 1 to 8 0x18 (24)	129	25024	float RWES
S.hi [S.hi]	*Math (1 to 8)* **Scale High** If Math function is set to Process Scale, this will scale Source A high value to Range High setting.	-1,999.000 to 9,999.000	1.0	2888 [offset 70]	0x7D (125) 1 to 8 0x19 (25)	130	25025	float RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
Un it [Unit]	*Math (1 to 8)* **Units** Set units for Source.	Src Source (1539) nonE None (61) AtP Absolute Temperature (1540) rtP Relative Temperature (1541) PwJr Power (73) Pro Process (75) rh Relative Humidty (1538)	Source	2902 [offset 70]	0x7D (125) 1 to 8 0x20 (32)	- - - -	25032	uint RWES
r.Lo [r.Lo]	*Math (1 to 8)* **Range Low** If Math function is set to Process Scale, this will output Source A Scale Low value to Range Low setting.	-1,999.000 to 9,999.000	0.0	2890 [offset 70]	0x7D (125) 1 to 8 0x1A (26)	131	25026	float RWES
r.hi [r.hi]	*Math (1 to 8)* **Range High** If Math function is set to Process Scale, this will output Source A Scale High value to Range High setting.	-1,999.000 to 9,999.000	1.0	2892 [offset 70]	0x7D (125) 1 to 8 0x1B (27)	132	25027	float RWES
P.unt [P.unt]	*Math (1 to 8)* **Pressure Units** If Math function is set for Pressure to Altitude units, set units of measure for conversion.	PSi Pressure Units (1671) PASc Pascal (1674) AtM Atmosphere (1675) mbr mbar (1672) torr Torr (1673)	Pressure Units	2898 [offset 70]	0x7D (125) 1 to 8 0x1E (30)	- - - -	25030	uint RWES
A.unt [A.unt]	*Math (1 to 8)* **Altitude Units** If Math function is set for Pressure to Altitude units, set units of measure for conversion.	HFt Kilofeet (1671) Ft Feet (1674)	Kilofeet	2900 [offset 70]	0x7D (125) 1 to 8 0x1F (31)	- - - -	25031	uint RWES
F iL [FiL]	*Math (1 to 8)* **Filter** Filtering smooths out the output signal of this function block. Increase the time to increase filtering.	0.0 to 60.0 seconds	0.0	2894 [offset 70]	0x7D (125) 1 to 8 0x1C (28)	- - - -	25028	float RWES
SoF SEt Special Output Function Menu								
Fn [Fn]	*Special Output (1 to 4)* **Function** Set the function to match the device it will operate.	oFF Off (62) CoC Compressor Control (1506) uAC Motorized Valve (1508) SEC Sequencer (1507)	Off	4976 [offset 80]	0x87 (135) 1 to 4 9	181	35009	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Dis-play	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.A [SFn.A]	*Special Output (1 to 4)* **Source Function A** Set the type of function that will be used for this source.	nonE None (61) AI Analog Input (142) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PLdr Power, Control Loop (73) Lnr Linearization (238) MATH Math (240) Pu Process Value (241) SoF.1 Special Function Output 1 (1532) uAr Variable (245)	None	4960 [offset 80]	0x87 (135) 1 to 4 1	182	35001	uint RWES
Si.A [Si.A]	*Special Output (1 to 4)* **Source Instance A** Set the instance of the function selected above.	1 to 250	1	4964 [offset 80]	0x87 (135) 1 to 4 3	183	35003	uint RWES
SZ.A [SZ.A]	*Special Output (1 to 4)* **Source Zone A** Set the zone of the function selected above.	0 to 16	0	4968 [offset 80]	0x87 (135) 1 to 4 5	- - - -	35005	uint RWES
SFn.b [SFn.b]	*Special Output (1 to 4)* **Source Function B** Set the type of function that will be used for this source.	nonE None (61) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PLdr Power, Control Loop (73) Lnr Linearization (238) MATH Math (240) uAr Variable (245)	None	4962 [offset 80]	0x87 (135) 1 to 4 2	184	35002	uint RWES
Si.b [Si.b]	*Special Output (1 to 4)* **Source Instance B** Set the instance of the function selected above.	1 to 250	1	4966 [offset 80]	0x87 (135) 1 to 4 4	185	35004	uint RWES
SZ.b [SZ.b]	*Special Output (1 to 4)* **Source Zone B** Set the zone of the function selected above.	0 to 16	0	4970 [offset 80]	0x87 (135) 1 to 4 6	- - - -	35006	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Dis-play	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
Pon.A [Pon.A]	*Special Output (1 to 4)* **Power On Level 1** If Function is set to Compressor Control: Use Source A for a first loop to inform the function whether the compressor will soon be required. • Set Power On Level 1 and Power Off Level 1 to the Source A values that will switch the compressor on and off.	-100.0 to 100.0%	0	4994 [offset 80]	0x87 (135) 1 to 4 0x12 (18)	186	35018	float RWES
PoF.A [PoF.A]	*Special Output (1 to 4)* **Power Off Level 1**	-100.0 to 100.0%	5	4996 [offset 80]	0x87 (135) 1 to 4 0x13 (19)	187	35019	float RWES
Pon.b [Pon.b]	*Special Output (1 to 4)* **Power On Level 2** If Function is set to Compressor Control: Use Source B for a second loop to inform the function whether the compressor will soon be required. • Set Power On Level 2 and Power Off Level 2 to the Source B values that will switch the compressor on and off.	-100.0 to 100.0%	0	4998 [offset 80]	0x87 (135) 1 to 4 0x14 (20)	188	35020	float RWES
PoF.b [PoF.b]	*Special Output (1 to 4)* **Power Off Level 2**	-100.0 to 100.0%	5	5000 [offset 80]	0x87 (135) 1 to 4 0x15 (21)	189	35021	float RWES
on.t [on.t]	*Special Output (1 to 4)* **On Time** If Function is set to Compressor Control: • Set Minimum On Time and Minimum Off Time to the minimum span of time, in seconds, that the compressor will be on or off.	0 to 9,999 seconds	20	5002 [offset 80]	0x87 (135) 1 to 4 0x16 (22)	190	35022	uint RWES
oF.t [oF.t]	*Special Output (1 to 4)* **Off Time**	0 to 9,999 seconds	20	5004 [offset 80]	0x87 (135) 1 to 4 0x17 (23)	191	35023	uint RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
t.t [t.t]	*Special Output (1 to 4)* **Valve Travel Time** If Function is set to Motorized Valve: Source A will determine the valve position. • Set this time in seconds representing the time that it will take the valve to travel between fully closed and fully open.	10 to 9,999 seconds	120	5006 [offset 80]	0x87 (135) 1 to 4 0x18 (24)	192	35024	uint RWES
db [db]	*Special Output (1 to 4)* **Dead Band** If Function is set to Motorized Valve: • Set to the minimum valve adjustment as a percentage, representing the movement of the valve in a single action. A small value improves accuracy and depletes valve life where a large value reduces the number of adjustments (less accurate) and the wear on the mechanism.	1.0 to 100.0%	2	5008 [offset 80]	0x87 (135) 1 to 4 0x19 (25)	193	35025	float RWES
o.S1 [o.S1]	*Special Output (1 to 4)* **Output 1 Size** If Function is set to Sequencer: • Set Output 1 Size, as a percentage of the total capacity of all output devices, or vernier output. This value must be larger than the values set for outputs 2 through 4.	0 to 9,999	10	5014 [offset 80]	0x87 (135) 1 to 4 0x1C (28)	- - - -	35028	float RWES
o.S2 [o.S2]	*Special Output (1 to 4)* **Output 2 Size** If Function is set to Sequencer: • Set the size of outputs 2 through 4 to represent a percentage of the total output capacity. Outputs 2 through 4 will control using the ON-OFF algorithm.	0 to 9,999	0	5016 [offset 80]	0x87 (135) 1 to 4 0x1D (29)	- - - -	35029	float RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
o.S3 [o.S3]	*Special Output (1 to 4)* **Output 3 Size**	0 to 9,999	0	5018 [offset 80]	0x87 (135) 1 to 4 0x1E (30)	- - - -	35030	float RWES
o.S4 [o.S4]	*Special Output (1 to 4)* **Output 4 Size**	0 to 9,999	0	5020 [offset 80]	0x87 (135) 1 to 4 0x1F (31)	- - - -	35031	float RWES
t.dL [t.dL]	*Special Output (1 to 4)* **Time Delay** If Function is set to Sequencer: • Set in seconds to represent the minimum span of time that must elapse between the turn on of one (on-off) output to the next.	0 to 9,999 seconds	0	5010 [offset 80]	0x87 (135) 1 to 4 0x1A (26)	- - - -	35026	uint RWES
ot.o [ot.o]	*Special Output (1 to 4)* **Output Order** If Function is set to Sequencer: • Set to Linear to turn the on-off outputs on in the same order every time. Select Progressive to rotate the order to balance usage and wear on contactors and heaters.	L in Linear (1509) Pro Progressive (1510)	Linear	5012 [offset 80]	0x87 (135) 1 to 4 0x1B (27)	- - - -	35027	uint RWES
uAr SEt **Variable Menu**								
tYPE [tyPE]	*Variable 1 to 8* **Data Type** Set the variable's data type.	AnLg Analog (1215) dig Digital (1220)	Analog	4800 [offset 20]	0x66 (102) 1 to 8 1	210	2001	uint RWES
Unit [Unit]	*Variable 1 to 8* **Units** Set the variable's units. **Note:** Units are always in degrees F when used for temperature	AbS Absolute Temperature (1540) rEL Relative Temperature (1541) PWr Power (73) Pro Process (75) rh Relative Humidity (1538) nonE None (61)	Absolute Temperature	4812 [offset 20]	0x66 (102) 1 to 8 7	- - - -	2007	uint RWES
dig [dig]	*Variable 1 to 8* **Digital** Set the variable's value.	oFF Off (62) on On (63)	Off	4802 [offset 20]	0x66 (102) 1 to 8 2	211	2002	uint RWES
AnLg [AnLg]	*Variable 1 to 8* **Analog** Set the variable's value.	-1,999.000 to 9,999.000	0.0	4804 [offset 20]	0x66 (102) 1 to 8 3	212	2003	float RWES

Note:
Some values will be rounded off to fit in the four-character display.
Full values can be read with other interfaces.

Note:
If there is only one instance of a menu, no submenus will appear.

** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.

R: Read
W: Write
E: EEPROM
S: User Set

RMC Module • Setup Page								
Dis-play	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
GLbL SEt **Global Menu**								
C_F [C_F]	*Global* **Display Units** Select which scale to use for temperature.	F °F (30) C °C (15)	°F	43348	0x67 (103) 1 5	- - - -	3005	- - - -
AC.LF [AC.LF]	*Global* **AC Line Frequency** Set the frequency to the applied ac line power source.	50 50 Hz (3) 60 60 Hz (4)	60 Hz	1026	0x6A (106) 1 4	- - - -	6004	uint RWES
Sutb [Sutb]	*Global* **Synchronized Variable Time Base** Used to acquire tighter accuracy when running a profile. A setting of +0.01 would equate to approximately +9 seconds/day (faster) where a setting of -0.01 would equate to approximately -9 seconds/day (slower).	-2.00 to 2.00 Percent	0.00	- - - -	- - - -	- - - -	- - - -	float RWE
dPrS [dPrS]	*Global* **Display Pairs** Defines the number of Display Pairs.	1 to 10	1	- - - -	0x67 (103) 1 0x1C (28)	- - - -	3028	uint RWES
USr.S [USr.S]	*Global* **User Settings Save** Save all of this controller's settings to the selected set that have a Data Type of RWES	SEt1 User Set 1 (101) SEt2 User Set 2 (102)* none None (61) * Starting with firmware release 6, there is only one user set.	None	26	0x65 (101) 1 0x0E (14)	118	1014	uint RWE
USr.r [USr.r]	*Global* **User Settings Restore** Replace all of this controller's settings with another set.	FCty Factory (31) none None (61) SEt1 User Set 1 (101) SEt2 User Set 2 (102)* * Starting with firmware release 6, there is only one user set.	None	24	0x65 (101) 1 0xD (13)	117	1013	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	Parameter Name Description	Range	Default	Modbus Relative Address	CIP Class Instance Attribute hex (dec)	Profibus Index	Parameter ID	Data Type & Read/ Write
Pro SEt **Profile Menu**								
r.tyP [R.tyP]	*Profile* **Ramping Type** Use to have the ramping set point change at a set Rate or over a set interval of Time as profile steps.	rAtE Rate (81) t i Time (143)	Time	5354	0x7A (122) 1 0x26 (38)	- - - -	22038	uint RWE
P.tyP [P.tyP]	*Profile* **Profile Type** Set the profile startup to be based on a set point or a process value.	SEPt Set Point (85) Pro Process (75)	Set Point	5294	0x7A (122) 1 8	- - - -	22008	uint RWE
gSE [gSE]	*Profile* **Guaranteed Soak Enable** Enables the guaranteed soak deviation function in profiles.	oFF Off (62) on On (63)	Off	5290	0x7A (122) 1 6	- - - -	22006	uint RWE
gSd1 [gSd1]	*Profile* **Guaranteed Soak Deviation 1** Set the value of the deviation band that will be used in all profile step types. The process value for control loop 1 must enter the deviation band before the step can proceed. .	0.0 to 9,999.000°F or units 0.0 to 5,555.000°C	10.0°F or units 6.0°C	5292	0x7A (122) 1 7	- - - -	22007	float RWE
gSd2 [gSd2]	*Profile* **Guaranteed Soak Deviation 2** Set the value of the deviation band that will be used in all profile step types. The process value for control loop 2 must enter the deviation band before the step can proceed.	0.0 to 9,999.000°F or units 0.0 to 5,555.000°C	10.0°F or units 6.0°C	5360	0x7A (122) 1 0x29 (41)	- - - -	22041	float RWE
gSd3 [gSd3]	*Profile* **Guaranteed Soak Deviation 3** Set the value of the deviation band that will be used in all profile step types. The process value for control loop 3 must enter the deviation band before the step can proceed..	0.0 to 9,999.000°F or units 0.0 to 5,555.000°C	10.0°F or units 6.0°C	5362	0x7A (122) 1 0x2A (42)	- - - -	22042	float RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
gSd4 [gSd4]	*Profile* **Guaranteed Soak Deviation 4** Set the value of the deviation band that will be used in all profile step types. The process value for control loop 4 must enter the deviation band before the step can proceed. .	0.0 to 9,999.000°F or units 0.0 to 5,555.000°C	10.0°F or units 6.0°C	5364	0x7A (122) 1 0x2B (43)	- - - -	22043	float RWE
CM.E [CM.E]	*Profile* **Control Mode Enable** Use to allow the loops control mode to be programmed in profile steps.	oFF Off (62) on On (63)	Off	5356	0x7A (122) 1 0x27 (39)	- - - -	22039	uint RWE
W.M [W.M]	*Profile* **Wait for Mode** Use to determine how the wait-for conditions must be satisfied: • *Complete* requires that all of the conditions must be true at the same time. • *Once* requires that all of the conditions were true at some time during the wait period.	OnCE Once (1583) CPLt Complete (18)	Complete	5358	0x7A (122) 1 0x28 (40)	- - - -	22040	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.A [SFn.A]	*Profile* **Source Function A** Set the type of function that will be used for this source. Source will be used in profile step type "Wait for Process or Event" as "Event 1".	nonE None (61) ALM Alarm (6) CPE Compare (230) Ctr Counter (231) d io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.9 Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) LGC Logic (239) tMr Timer (244) uAr Variable (245))	None	5322	0x7A (122) 1 0x16 (22)	- - - -	22022	uint RWE
S iA [Si.A]	*Profile* **Source Instance A** Set the instance of the function selected above.	1 to 250	1	5330	0x7A (122) 1 0x1A (26)	- - - -	22026	uint RWE
S2A [SZ.A]	*Profile* **Source Zone A** Set the zone of the function selected above.	0 to 16	0	5338	0x7A (122) 1 0x1E (30)	- - - -	22030	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Dis-play	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.b [SFn.b]	*Profile* **Source Function B** Set the type of function that will be used for this source. Source will be used in profile step type "Wait for Process or Event" as "Event 1"	nonE None (61) ALrM Alarm (6) CPE Compare (230) Ctr Counter (231) d.io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.9 Profile Event Out G (249) Ent.h Profile Event Out H (250) Fun Function Key (1001) LoGC Logic (239) tMr Timer (244) uAr Variable (245))	None	5324	0x7A (122) 1 0x17 (23)	- - - -	22023	uint RWE
S.ib [Si.b]	*Profile* **Source Instance B** Set the instance of the function selected above.	1 to 250	1	5332	0x7A (122) 1 0x1B (27)	- - - -	22027	uint RWE
SZ.b [SZ.b]	*Profile* **Source Zone B** Set the zone of the function selected above.	0 to 16	0	5340	0x7A (122) 1 0x1F (31)	- - - -	22031	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.C [SFn.C]	*Profile* **Source Function C** Set the type of function that will be used for this source. Source will be used in profile step type "Wait for Process or Event" as "Event 1"	none None (61) ALrM Alarm (6) CPE Compare (230) Ctr Counter (231) d io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.9 Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) LGC Logic (239) tMr Timer (244) uAr Variable (245))	None	5326	0x7A (122) 1 0x18 (24)	- - - -	22024	uint RWE
Si.C [Si.C]	*Profile* **Source Instance C** Set the instance of the function selected above.	1 to 250	1	5334	0x7A (122) 1 0x1C (28)	- - - -	22028	uint RWE
SZ.C [SZ.C]	*Profile* **Source Zone C** Set the zone of the function selected above.	0 to 16	0	5342	0x7A (122) 1 0x20 (32)	- - - -	22032	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SFn.d [SFn.D]	*Profile* **Source Function D** Set the type of function that will be used for this source. Source will be used in profile step type "Wait for Process or Event" as "Event 1"	nonE None (61) ALrM Alarm (6) CPE Compare (230) Ctr Counter (231) d.io Digital I/O (1142) Ent.A Profile Event Out A (233) Ent.b Profile Event Out B (234) Ent.C Profile Event Out C (235) Ent.d Profile Event Out D (236) Ent.E Profile Event Out E (247) Ent.F Profile Event Out F (248) Ent.9 Profile Event Out G (249) Ent.h Profile Event Out H (250) FUn Function Key (1001) L9C Logic (239) tMr Timer (244) uAr Variable (245))	None	5328	0x7A (122) 1 0x19 (25)	- - - -	22025	uint RWE
S.id [Si.d]	*Profile* **Source Instance D** Set the instance of the function selected above.	1 to 250	1	5336	0x7A (122) 1 0x1D (29)	- - - -	22029	uint RWE
S2.d [SZ.D]	*Profile* **Source Zone D** Set the zone of the function selected above.	0 to 16	0	5344	0x7A (122) 1 0x21 (33)	- - - -	22033	uint RWE
SFn.E [SFn.E]	*Profile* **Source Function E** Set the type of function that will be used for this source. Source will be used in profile step type "Wait for Process or Event" as "Event 1"	nonE None (61) A.in Analog Input (142) CUrr Current (22) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PLdr Power, Control Loop (73) Lnr Linearization (238) MAtH Math (240) Pu Process Value (241) SP.C Set Point Closed, Control Loop (242) SP.o Set Point Open, Control Loop (243) uAr Variable (245)	None	5390	0x7A (122) 1 0x38 (56)	- - - -	22056	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
S i.E [Si.E]	*Profile* **Source Instance E** Set the instance of the function selected above.	1 to 250	1	5398	0x7A (122) 1 0x3C (60)	- - - -	22060	uint RWE
SZ.E [SZ.E]	*Profile* **Source Zone E** Set the zone of the function selected above.	0 to 16	0	5406	0x7A (122) 1 0x40 (64)	- - - -	22064	uint RWE
SFn.F [SFn.F]	*Profile* **Source Function F** Set the type of function that will be used for this source. Source will be used in profile step type "Wait for Process or Event" as "Wait For Process 2"	nonE None (61) Ai Analog Input (142) CUrr Current (22) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PwJr Power, Control Loop (73) Lnr Linearization (238) MATh Math (240) Pv Process Value (241) SP.C Set Point Closed, Control Loop (242) SP.o Set Point Open, Control Loop (243) vAr Variable (245)	None	5392	0x7A (122) 1 0x39 (57)	- - - -	22057	uint RWE
S i.F [Si.F]	*Profile* **Source Instance F** Set the instance of the function selected above.	1 to 250	1	5400	0x7A (122) 1 0x3D (61)	- - - -	22061	uint RWE
SZ.F [SZ.F]	*Profile* **Source Zone F** Set the zone of the function selected above.	0 to 16	0	5408	0x7A (122) 1 0x41 (65)	- - - -	22065	uint RWE
SFn.g [SFn.g]	*Profile* **Source Function G** Set the type of function that will be used for this source. Source will be used in profile step type "Wait for Process or Event" as "Wait For Process 3"	nonE None (61) Ai Analog Input (142) CUrr Current (22) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PwJr Power, Control Loop (73) Lnr Linearization (238) MATh Math (240) Pv Process Value (241) SP.C Set Point Closed, Control Loop (242) SP.o Set Point Open, Control Loop (243) vAr Variable (245)	None	5394	0x7A (122) 1 0x3A (58)	- - - -	22058	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SI.G [Si.g]	*Profile* **Source Instance G** Set the instance of the function selected above.	1 to 250	1	5402	0x7A (122) 1 0x3E (62)	- - - -	22062	uint RWE
SZ.G [SZ.g]	*Profile* **Zone Source G** Set the zone of the function selected above.	0 to 16	0	5410	0x7A (122) 1 0x42 (66)	- - - -	22066	uint RWE
SFn.h [SFn.h]	*Profile* **Source Function H** Set the type of function that will be used for this source. Source will be used in profile step type "Wait for Process or Event" as "Wait For Process 4"	nonE None (61) AI Analog Input (142) CUrr Current (22) C.Pr Cool Power, Control Loop (161) h.Pr Heat Power, Control Loop (160) PUJr Power, Control Loop (73) Lnr Linearization (238) MATH Math (240) Pu Process Value (241) SP.C Set Point Closed, Control Loop (242) SP.o Set Point Open, Control Loop (243) uAr Variable (245)	None	5396	0x7A (122) 1 0x3B (59)	- - - -	22059	uint RWE
SI.H [Si.h]	*Profile* **Source Instance H** Set the instance of the function selected above.	1 to 250	1	5404	0x7A (122) 1 0x3F (63)	- - - -	22063	uint RWE
SZ.H [SZ.h]	*Profile* **Source Zone H** Set the zone of the function selected above.	0 to 16	0	5412	0x7A (122) 1 0x43 (67)	- - - -	22067	uint RWE
COMM SEt **Communications Menu**								
bAUd [bAUd]	*Communications* **Baud Rate** Set the speed of this controller's communications to match the speed of the serial network. **Note:** This applies if 13th digit in part number is equal to one.	9,600 (188) 19,200 (189) 38,400 (190)	9,600	2824	0x96 (150) 1 3	- - - -	17002	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
PAr [PAr]	*Communications* **Parity** Set the parity of this controller to match the parity of the serial network. **Note:** This applies if 13th digit in part number is equal to one.	nonE None (61) EuEn Even (191) odd Odd (192)	None	2826	0x96 (150) 1 4	- - - -	17003	uint RWE
nuS [nV.S]	*Communications* **Non-volatile Save** If set to Yes all values written to the control will be saved in EEPROM. **Note:** This applies if 13th digit in part number is equal to one.	YES Yes (106) no No (59)	Yes	2834	0x96 (150) 1 to 2 8	198	17051	uint RWE
M.hL [M.hL]	*Communications* **Modbus Word Order** Select the word order of the two 16-bit words in the floating-point values. **Note:** This applies if 13th digit in part number is equal to one.	h,Lo Word High Low (1330) Loh, Word Low High (1331)	Low High	2828	0x96 (150) 1 5	- - - -	17043	uint RWE
C_F [C_F]	*Communications* **Display Units** Select which scale to use for temperature passed when using Modbus **Note:** This applies if 13th digit in part number is equal to one.	F °F (30) C °C (15)	°F	2830	0x96 (150) 1 6	199	17050	uint RWE
No Display	*Communications* **Protocol** Select the communications protocol.	Standard Bus (1286) Modbus RTU Word (1057)	1	2832	- - - -	- - - -	17009	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Setup Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
No Display	*Communications* **Modbus Address** Select the Modbus address. **Note:** This applies if 13th digit in part number is equal to one.	1 to 247	1	2822	- - - -	- - - -	17007	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **Note:** If there is only one instance of a menu, no submenus will appear. ** These parameters/prompts are available in these menus with firmware revisions 6.0 and above.								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

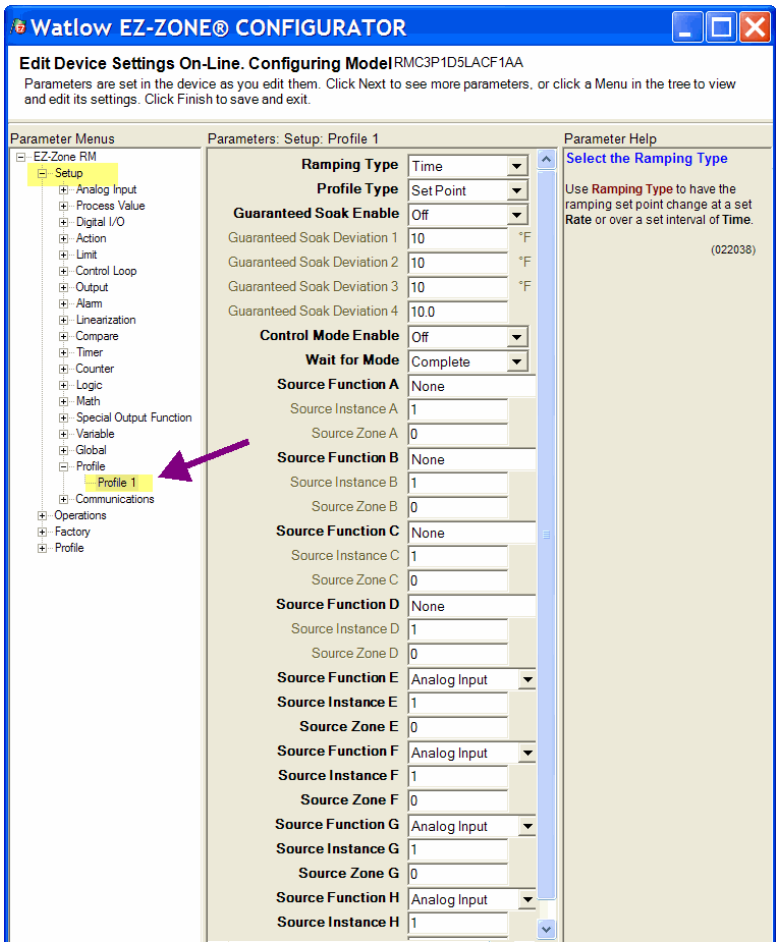
5 Chapter 5: Profiling Page

How to Setup and Start a Profile

First, consider some foundational profile setup features that once configured, will then be available for all profiles.

Note:
It should also be noted that to execute a profile for any given loop of control, profiles must be enabled for each loop; this can be found in the Loop Menu of the Setup Page.

The screen shot below (EZ-ZONE Configurator software) graphically shows the settings that will apply to all profiles; e.g., if Guaranteed Soak is not enabled here this feature will not be available in any individual profile configuration.



Some of those features that apply to all profiles are listed below with a brief description of their function.

- **Ramping Type** (Time or Rate) which changes the profile set point based on a set interval of time or set rate.
- **Profile Type** (Set Point or Process) determines whether a step (any step changing the set point) of a profile will begin by using the process value (Process) or the last closed-loop set point (Set Point).
- **Guaranteed Soak Enable**, when set to On makes this feature available in all profiles. If Guaranteed Soak Enable is on, use Guaranteed Soak Deviation 1 to 4 to set the value for the corresponding loop. Set the deviation or band above or below the working set point where this condition must be met before the profile can proceed.
- **Control Mode Enable** if changed to on, will allow the loops control mode to be changed through the profile.
- **Wait for Mode** determines how the wait-for conditions must be satisfied:
  - *Complete* requires that all of the conditions must be true at the same time.
  - *Once* requires that all of the conditions were true at some time during the wait period.

Note:
Changes made to profile parameters in the Profiling Pages will be saved and will also have an immediate impact on the running profile. Some parameters in the Profile Status Menu can be changed for the currently running profile, but should only be changed by knowledgeable personnel and with caution. Changing parameters via the Profile Status Menu will not change the stored profile but will have an immediate impact on the profile that is running.

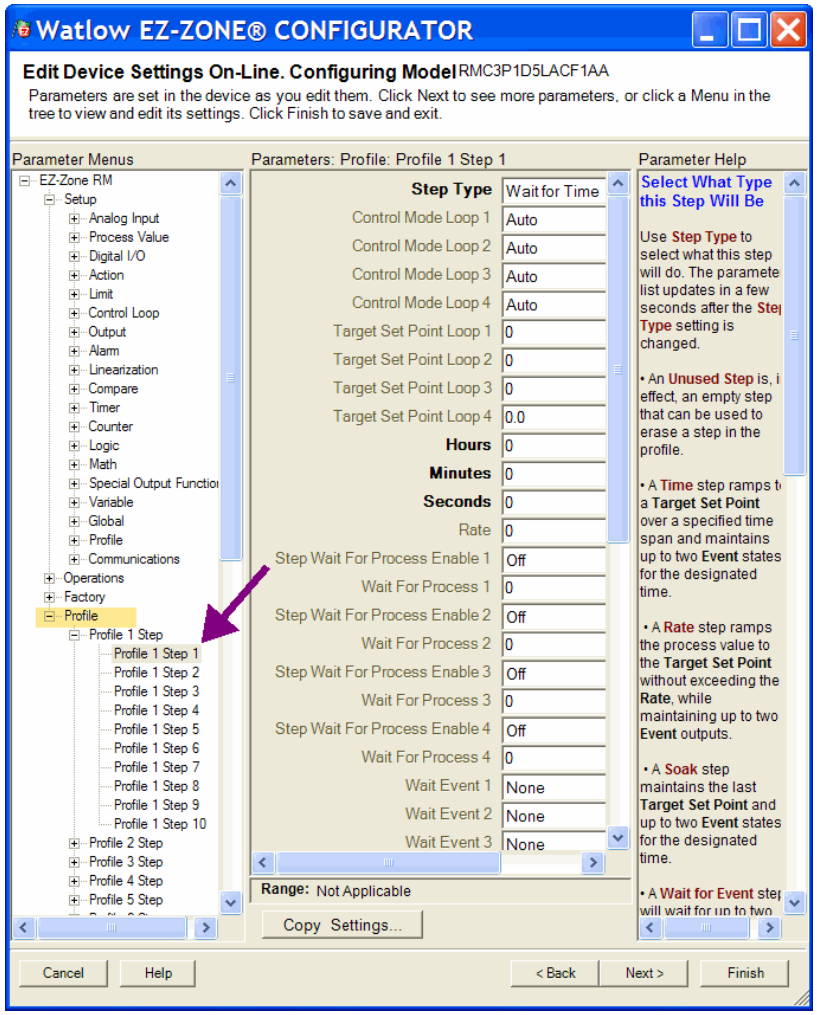
Once these global profile features are configured, the next step will require navigation to the Profiling Page. Here, each desired ramp and soak profile will be configured.

To navigate to the Profile Page using the RUI, follow the steps below:

1. From the Home Page, press and hold the Advance Key for four seconds. The profile prompt ProF will appear in the lower display and the profile number (e.g. P 1) appears in the upper display.
2. Press the Up or Down key to change to another profile.
3. Press the Advance Key to move to the selected profiles first step.
4. Press the Up or Down keys to move through the steps.
5. Press the Advance Key to move through the se-

lected step settings.

6. Press the Up ▲ or Down ▼ keys to change the steps settings.
7. Press the Infinity Key ∞ at any time to return to the step number prompt.
8. Press the Infinity Key ∞ again to return to the profile number prompt.
9. From any point press and hold the Infinity Key ∞ for two seconds to return to the Home Page.



If using EZ-ZONE Configurator software, simply click on the plus sign next to Profiles in the left hand column, as shown in the screen shot below.

Prior to moving on, it would be beneficial to point out (see graphic on previous page) that if it is desired to configure a wait-for (process or event) step within any given profile that Source Functions A through D would be used for digital wait-for events where Source Functions E through H would be used for wait-for process. The source functions must be defined in the Profile Menu of the Setup Page to be available when configuring each individual profile on the Profiling Page. Notice in the screen shot to the right some fields or parameters are not selectable (grayed out) due to the selections made for the profile features in the Profile Page of the Setup menu.

Profiling Parameters

P 1 to P25 **Profile 1 to 25**
S 1 to S 15 **Subroutine 1 to 15**
ProF
1 to 250
StYP **Step Type**
C.Pn1 **Control Mode Loop 1**
C.Pn2 **Control Mode Loop 2**
C.Pn3 **Control Mode Loop 3**
C.Pn4 **Control Mode Loop 4**
t.SP1 **Target Set Point Loop 1**
t.SP2 **Target Set Point Loop 2**
t.SP3 **Target Set Point Loop 3**
t.SP4 **Target Set Point Loop 4**
hoUr **Hours**
Pn.in **Minutes**
SEC **Seconds**
rAtE **Rate**
PE 1 **Step Wait For Process Enable 1**
WJP 1 **Wait For Process 1**
PE2 **Step Wait For Process Enable 2**
WJP2 **Wait For Process 2**
PE3 **Step Wait For Process Enable 3**
WJP3 **Wait For Process 3**
PE4 **Step Wait For Process Enable 4**
WJP4 **Wait For Process 4**
WJE.1 **Wait Event 1**
WJE.2 **Wait Event 2**
WJE.3 **Wait Event 3**
WJE.4 **Wait Event 4**
doWJ **Day of Week**
gSE 1 **Guaranteed Soak Enable 1**
gSE2 **Guaranteed Soak Enable 2**
gSE3 **Guaranteed Soak Enable 3**
gSE4 **Guaranteed Soak Enable 4**
SS **Subroutine Step**
SC **Subroutine Count**
JS **Jump Step**
JC **Jump Count**
End **End Type**
Ent 1 **Event 1**
Ent2 **Event 2**
Ent3 **Event 3**
Ent4 **Event 4**
Ent5 **Event 5**
Ent6 **Event 6**
Ent7 **Event 7**
Ent8 **Event 8**

Subroutine Step 1 (to 150)
StYP **Step Type**
C.Pn1 **Control Mode Loop 1**
C.Pn2 **Control Mode Loop 2**
C.Pn3 **Control Mode Loop 3**
C.Pn4 **Control Mode Loop 4**
t.SP1 **Target Set Point Loop 1**
t.SP2 **Target Set Point Loop 2**
t.SP3 **Target Set Point Loop 3**
t.SP4 **Target Set Point Loop 4**
hoUr **Hours**
Pn.in **Minutes**
SEC **Seconds**
rAtE **Rate**
PE 1 **Step Wait For Process Enable 1**
WJP 1 **Wait For Process 1**
PE2 **Step Wait For Process Enable 2**
WJP2 **Wait For Process 2**
PE3 **Step Wait For Process Enable 3**
WJP3 **Wait For Process 3**
PE4 **Step Wait For Process Enable 4**
WJP4 **Wait For Process 4**
WJE.1 **Wait Event 1**
WJE.2 **Wait Event 2**
WJE.3 **Wait Event 3**
WJE.4 **Wait Event 4**
doWJ **Day of Week**
gSE 1 **Guaranteed Soak Enable 1**
gSE2 **Guaranteed Soak Enable 2**
gSE3 **Guaranteed Soak Enable 3**
gSE4 **Guaranteed Soak Enable 4**
Ent 1 **Event 1**
Ent2 **Event 2**
Ent3 **Event 3**
Ent4 **Event 4**
Ent5 **Event 5**
Ent6 **Event 6**
Ent7 **Event 7**
Ent8 **Event 8**

RMC Module • Profile Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
StYP [S.typ]	*Step (1 to 250)* **Step Type** Select a step type.	uSEP Unused Step (50) SoAH Soak (87) uJPE Wait For Process or Event (1542) CLoc Wait For Time (1543) StAt State (1515) Subr Subroutine Step (1516) JL Jump Loop (116) End End (27) t i Time (143) rAtE Rate (81)	Unused	5440 [offset 100]	0x79 (121) 1 to (250) 1	- - - -	21001	uint RWE
C.M1 [C.M1]	*Step (1 to 250)* **Control Mode Loop 1** Set the control mode for this loop.	AUto Auto (10) oFF Off (62) MAn Manual (54)	Auto	5486 [offset 100]	0x79 (121) 1 to (250) 0x18 (24)	- - - -	21024	uint RWE
C.M2 [C.M2]	*Step (1 to 250)* **Control Mode Loop 2** Set the control mode for this loop.	AUto Auto (10) oFF Off (62) MAn Manual (54)	Auto	5488 [offset 100]	0x79 (121) 1 to (250) 0x19 (25)	- - - -	21025	uint RWE
C.M3 [C.M3]	*Step (1 to 250)* **Control Mode Loop 3** Set the control mode for this loop.	AUto Auto (10) oFF Off (62) MAn Manual (54)	Auto	5490 [offset 100]	0x79 (121) 1 to (250) 0x1A (26)	- - - -	21026	uint RWE
C.M4 [C.M4]	*Step (1 to 250)* **Control Mode Loop 4** Set the control mode for this loop.	AUto Auto (10) oFF Off (62) MAn Manual (54)	Auto	5492 [offset 100]	0x79 (121) 1 to (250) 0x1B (27)	- - - -	21027	uint RWE
t.SP1 [t.SP1]	*Step (1 to 250)* **Target Set Point Loop 1** If step type is Time or State - enter set point for this loop. If Rate step, enter set point for loops 1, 2, 3 and 4.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0	5442 [offset 100]	0x79 (121) 1 to (250) 2	- - - -	21002	float RWE
t.SP2 [t.SP2]	*Step (1 to 250)* **Target Set Point Loop 2** If step type is Time or State - enter set point for this loop.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0	5494 [offset 100]	0x79 121 1 to (250) 0x1C (28)	- - - -	21028	float RWE
t.SP3 [t.SP3]	*Step (1 to 250)* **Target Set Point Loop 3** If step type is Time or State - enter set point for this loop.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0	5496 [offset 100]	0x79 (121) 1 to (250) 0x1D (29)	- - - -	21029	float RWE
t.SP4 [t.SP4]	*Step (1 to 250)* **Target Set Point Loop 4** If step type is Time or State - enter set point for this loop.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0	5498 [offset 100]	0x79 (121) 1 to (250) 0x1E (30)	- - - -	21030	float RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **If there is only one instance of a menu, no submenus will appear.**								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Profile Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
hoUr [hoUr]	*Step (1 to 250)* **Hours** If step type is Time, enter time over which set point changes. If Soak or State Step, enter time to maintain this step.	0 to 99	0	5444 [offset 100]	0x79 (121) 1 to (250) 3	- - - -	21003	uint RWE
mn.in [Min]	*Step (1 to 250)* *Step Type Parameters* **Minutes** If step type is Time, enter time over which set point changes. If Soak or State Step, enter time to maintain this step.	0 to 59	0	5446 [offset 100]	0x79 (121) 1 to (250) 4	- - - -	21004	uint RWE
SEC [SEC]	*Step (1 to 250)* **Seconds** If step type is Time, enter time over which set point changes. If Soak or State Step, enter time to maintain this step.	0 to 59	0	5448 [offset 100]	0x79 (121) 1 to (250) 5	- - - -	21005	uint RWE
rAtE [rAtE]	*Step (1 to 250)* **Rate** If step type is Rate, select the rate for ramping in degrees or units per minute.	0 to 9,999.000°F or units per minute 0 to 5,555.000°C per minute	0.0	5450 [offset 100]	0x79 (121) 1 to (250) 6	- - - -	21006	float RWE
P.E1 [P.E1]	*Step (1 to 250)* **Step Wait For Process Enable 1** If step type is Wait for Process or Event, select whether process value must be Less Than or Greater Than the value of Wait for Process to satisfy the wait-for condition.	oFF Off (62) Lt Less Than (1436) gt Greater Than (1435)	Off	5510 [offset 100]	0x79 (121) 1 to (250) 0x24 (36)	- - - -	21036	uint RWE
W.P1 [W.P1]	*Step (1 to 250)* **Wait For Process 1** Enter a value that must be satisfied which is specified by Source E in Profile Setup.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	5460 [offset 100]	0x79 (121) 1 to (250) 0xB (11)	- - - -	21011	float RWE
P.E2 [P.E2]	*Step (1 to 250)* **Step Wait For Process Enable 2** If step type is Wait for Process or Event, select whether process value must be Less Than or Greater Than the value of Wait for Process to satisfy the wait-for condition.	oFF Off (62) Lt Less Than (1436) gt Greater Than (1435)	Off	5512 [offset 100]	0x79 (121) 1 to (250) 0x25 (37)	- - - -	21037	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **If there is only one instance of a menu, no submenus will appear.**								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Profile Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
uJP1 [W.P1]	*Step (1 to 250)* **Wait For Process 2** Enter a value that must be satisfied which is specified by Source F in Profile Setup.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	5500 [offset 100]	0x79 (121) 1 to (250) 0x1F (31)	- - - -	21031	float RWE
PE3 [P.E3]	*Step (1 to 250)* **Step Wait For Process Enable 3** If step type is Wait for Process or Event, select whether process value must be Less Than or Greater Than the value of Wait for Process to satisfy the wait-for condition.	oFF Off (62) Lt Less Than (1436) gt Greater Than (1435)	Off	5514 [offset 100]	0x79 (121) 1 to (250) 0x26 (38)	- - - -	21038	uint RWE
uJP3 [W.P3]	*Step (1 to 250)* **Wait For Process 3** Enter a value that must be satisfied which is specified by Source G in Profile Setup.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	5502 [offset 100]	0x79 (121) 1 to (250) 0x20 (32)	- - - -	21032	float RWE
PE4 [P.E4]	*Step (1 to 250)* **Step Wait For Process Enable 4** If step type is Wait for Process or Event, select whether process value must be Less Than or Greater Than the value of Wait for Process to satisfy the wait-for condition.	oFF Off (62) Lt Less Than (1436) gt Greater Than (1435)	Off	5516 [offset 100]	0x79 (121) 1 to (250) 0x27 (39)	- - - -	21039	uint RWE
uJP4 [W.P4]	*Step (1 to 250)* **Wait For Process 4** Enter a value that must be satisfied which is specified by Source H in Profile Setup.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	5504 [offset 100]	0x79 (121) 1 to (250) 0x21 (33)	- - - -	21033	float RWE
uJE.1 [WE.1]	*Step (1 to 250)* **Wait Event 1** Select a state that must be satisfied which is specified by Source A in Profile Setup.	nonE None (61) on On (63) oFF Off (62)	None	5456 [offset 100]	0x79 (121) 1 to (250) 9	- - - -	21009	uint RWE
uJE.2 [WE.2]	*Step (1 to 250)* **Wait Event 2** Select a state that must be satisfied which is specified by Source B in Profile Setup.	nonE None (61) on On (63) oFF Off (62)	None	5458 [offset 100]	0x79 (121) 1 to (250) 0xA (10)	- - - -	21010	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **If there is only one instance of a menu, no submenus will appear.**								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Profile Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
wJE.3 [WE.3]	*Step (1 to 250)* **Wait Event 3** Select a state that must be satisfied which is specified by Source C in Profile Setup.	nonE None (61) on On (63) oFF Off (62)	None	5482 [offset 100]	0x79 (121) 1 to (250) 0x16 (22)	- - - -	21022	uint RWE
wJE.4 [WE.4]	*Step (1 to 250)* **Wait Event 4** Select a state that must be satisfied which is specified by Source D in Profile Setup.	nonE None (61) on On (63) oFF Off (62)	None	5484 [offset 100]	0x79 (121) 1 to (250) 0x18 (24)	- - - -	21024	uint RWE
doW [doW]	*Step (1 to 250)* **Day of Week** If step type is Wait for Time, select day of week for profile to proceed.	Ed Every Day (1567) wJd Week Days (1566) Mon Monday (1559) tuE Tuesday (1560) wJEd Wednesday (1561) thUr Thursday (1562) Fri Friday (1563) SAt Saturday (1564) Sun Sunday (1565)	Every Day	5520 [offset 100]	0x79 (121) 1 to (250) 0x29 (41)	- - - -	21041	uint RWE
gSE1 [gSE1]	*Step (1 to 250)* **Guaranteed Soak Enable 1** Select if profile should pause while process 1 deviates from deviation band.	oFF Off (62) on On (63)	Off	5522 [offset 100]	0x79 (121) 1 to (250) 0x2A (42)	- - - -	21042	uint RWE
gSE2 [gSE2]	*Step (1 to 250)* **Guaranteed Soak Enable 2** Select if profile should pause while process 2 deviates from deviation band.	oFF Off (62) on On (63)	Off	5524 [offset 100]	0x79 (121) 1 to (250) 0x2B(43)	- - - -	21043	uint RWE
gSE3 [gSE3]	*Step (1 to 250)* **Guaranteed Soak Enable 3** Select if profile should pause while process 3 deviates from deviation band.	oFF Off (62) on On (63)	Off	5526 [offset 100]	0x79 (121) 1 to (250) 0x2C (44)	- - - -	21044	uint RWE
gSE4 [gSE4]	*Step (1 to 250)* **Guaranteed Soak Enable 4** Select if profile should pause while process 4 deviates from deviation band.	oFF Off (62) on On (63)	Off	5528 [offset 100]	0x79 (121) 1 to (250) 0x2D (45)	- - - -	21045	uint RWE
SS [SS]	*Step (1 to 250)* **Subroutine Step** If step type is Subroutine, specify subroutine step to jump to next.	1 to 15	1	5506 [offset 100]	0x79 (121) 1 to (250) 0x22 (34)	- - - -	21034	uint RWE
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RMC Module • Profile Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SC [SC]	*Step (1 to 250)* **Subroutine Count** If step type is Subroutine, specify number of times to execute subroutine steps.	1 to 9,999	1	5508 [offset 100]	0x79 (121) 1 to (250) 0x23 (35)	- - - -	21035	uint RWE
JS [JS]	*Step (1 to 250)* **Jump Step** If step type is Jump Loop, select a step to jump next.	Step-1 (Minimum of 1)	1	5462 [offset 100]	0x79 (121) 1 to (250) 0xC (12)	- - - -	21012	uint RWE
JC [JC]	*Step (1 to 250)* **Jump Count** If step type is Jump Loop, set the number of jumps. A value of 0 creates an infinite loop. Loops can be nested four deep.	0 to 9,999	1	5464 [offset 100]	0x79 (121) 1 to (250) 0xD (13)	- - - -	21013	uint RWE
End [End]	*Step (1 to 250)* **End Type** If step type is End, select what the controller will do when this profile ends.	oFF Control Mode set to Off (62) Hold Hold last closed-loop set point in the profile (47)* USEr User, reverts to previous set point (100) * End Hold does not affect the control mode, only the closed loop set point. The profile will return to the control mode prior to starting the profile.	User	5466 [offset 100]	0x79 (121) 1 to (250) 0xE (14)	- - - -	21014	uint RWE
Ent1 [Ent1]	*Step (1 to 250)* **Event 1** Select whether output programmed as Profile Event Out A is on, unchanged or off during this step.	oFF Off (62) Ucgd Unchanged (1557) on On (63)	Unchanged	5452 [offset 100]	0x79 (121) 1 to (250) 7	- - - -	21007	uint RWE
Ent2 [Ent2]	*Step (1 to 250)* **Event 2** Select whether output programmed as Profile Event Out B is on, unchanged or off during this step.	oFF Off (62) Ucgd Unchanged (1557) on On (63)	Unchanged	5454 [offset 100]	0x79 (121) 1 to (250) 8	- - - -	21008	uint RWE
Ent3 [Ent3]	*Step (1 to 250)* **Event 3** Select whether output programmed as Profile Event Out C is on, unchanged or off during this step.	oFF Off (62) Ucgd Unchanged (1557) on On (63)	Unchanged	5470 [offset 100]	0x79 (121) 1 to (250) 0x10 (16)	- - - -	21016	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **If there is only one instance of a menu, no submenus will appear.**								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Profile Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
EnE4 [Ent4]	*Step (1 to 250)* **Event 4** Select whether output programmed as Profile Event Out D is on, unchanged or off during this step.	oFF Off (62) Uc9d Unchanged (1557) on On (63)	Unchanged	5472 [offset 100]	0x79 (121) 1 to (250) 0x11 (17)	- - - -	21017	uint RWE
EnE5 [Ent5]	*Step (1 to 250)* **Event 5** Select whether output programmed as Profile Event Out E is on, unchanged or off during this step.	oFF Off (62) Uc9d Unchanged (1557) on On (63)	Unchanged	5474 [offset 100]	0x79 (121) 1 to (250) 0x12 (18)	- - - -	21018	uint RWE
EnE6 [Ent6]	*Step (1 to 250)* **Event 6** Select whether output programmed as Profile Event Out F is on, unchanged or off during this step.	oFF Off (62) Uc9d Unchanged (1557) on On (63)	Unchanged	5476 [offset 100]	0x79 (121) 1 to (250) 0x13 (19)	- - - -	21019	uint RWE
EnE7 [Ent7]	*Step (1 to 250)* **Event 7** Select whether output programmed as Profile Event Out G is on, unchanged or off during this step.	oFF Off (62) Uc9d Unchanged (1557) on On (63)	Unchanged	5478 [offset 100]	0x79 (121) 1 to (250) 0x14 (20)	- - - -	21020	uint RWE
EnE8 [Ent8]	*Step (1 to 250)* **Event 8** Select whether output programmed as Profile Event Out H is on, unchanged or off during this step.	oFF Off (62) Uc9d Unchanged (1557) on On (63)	Unchanged	5480 [offset 100]	0x79 (121) 1 to (250) 0x15 (21)	- - - -	21021	uint RWE
S.tYP [S.typ]	*Subroutine Step (1 to 150)* **Step Type** Select a step type.	USTP Unused Step (50) SoAH Soak (87) WJPE Wait For Process or Event (1542) tLoc Wait For Time (1543) StAt State (1515) End End (27) t i Time (143) rAtE Rate (81)	Unused	30440 [offset 86]	0x69 (105) 1 to (150) 1	- - - -	5001	uint RWE
C.M1 [C.M1]	*Subroutine Step (1 to 150)* **Control Mode Loop 1** Set the control mode for this loop.	Auto Auto (10) oFF Off (62) Man Manual (54)	Auto	30442 [offset 86]	0x69 (105) 1 to (150) 2	- - - -	5002	uint RWE
C.M2 [C.M2]	*Subroutine Step (1 to 150)* **Control Mode Loop 2** Set the control mode for this loop.	Auto Auto (10) oFF Off (62) Man Manual (54)	Auto	30444 [offset 86]	0x69 (105) 1 to (150) 3	- - - -	5003	uint RWE
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RMC Module • Profile Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
C.M3 [C.M3]	*Subroutine Step (1 to 150)* **Control Mode Loop 3** Set the control mode for this loop.	Auto Auto (10) oFF Off (62) Manu Manual (54)	Auto	30446 [offset 86]	0x69 (105) 1 to (150) 4	- - - -	5004	uint RWE
C.M4 [C.M4]	*Subroutine Step (1 to 150)* **Control Mode Loop 4** Set the control mode for this loop.	Auto Auto (10) oFF Off (62) Manu Manual (54)	Auto	30448 [offset 86]	0x69 (105) 1 to (150) 5	- - - -	5005	uint RWE
t.SP1 [t.SP1]	*Subroutine Step (1 to 150)* **Target Set Point Loop 1** If step type is Time or State - enter set point for this loop. If Rate step, enter set point for loops 1, 2, 3 and 4.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0	30450 [offset 86]	0x69 (105) 1 to (150) 6	- - - -	5006	float RWE
t.SP2 [t.SP2]	*Subroutine Step (1 to 150)* **Target Set Point Loop 2** If step type is Time or State - enter set point for this loop.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0	30452 [offset 86]	0x69 (105) 1 to (150) 7	- - - -	5007	float RWE
t.SP3 [t.SP3]	*Subroutine Step (1 to 150)* **Target Set Point Loop 3** If step type is Time or State - enter set point for this loop.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0	30454 [offset 86]	0x69 (105) 1 to (150) 8	- - - -	5008	float
t.SP4 [t.SP4]	*Subroutine Step (1 to 150)* **Target Set Point Loop 4** If step type is Time or State - enter set point for this loop.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0	30456 [offset 86]	0x69 (105) 1 to (150) 9	- - - -	5009	float RWE
hoUr [hoUr]	*Subroutine Step (1 to 150)* **Hours** If step type is Time, enter time over which set point changes. If Soak or State Step, enter time to maintain this step. If step type is Wait for Time, enter time to wait on.	0 to 23	0	30458 [offset 86]	0x69 (105) 1 to (150) 0xA (10)	- - - -	5010	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **If there is only one instance of a menu, no submenus will appear.**								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Profile Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
mn.in [Min]	*Subroutine Step (1 to 150)* **Minutes** If step type is Time, enter time over which set point changes. If Soak or State Step, enter time to maintain this step. If step type is Wait for Time, enter time to wait on.	0 to 59	0	30460 [offset 86]	0x69 (105) 1 to (150) 0xB (11)	- - - -	5011	uint RWE
SEC [SEC]	*Subroutine Step (1 to 150)* **Seconds** If step type is Time, enter time over which set point changes. If Soak or State Step, enter time to maintain this step. If step type is Wait for Time, enter time to wait on.	0 to 59	0	30462 [offset 86]	0x69 (105) 1 to (150) 0xC (12)	- - - -	5012	uint RWE
rAtE [rAtE]	*Subroutine Step (1 to 150)* **Rate** If step type is Rate, select the rate for ramping in degrees or units per minute.	0 to 9,999.000°F or units per minute 0 to 5,555.000°C per minute	0.0	30464 [offset 86]	0x69 (105) 1 to (150) 0xD (13)	- - - -	5013	float RWE
P.E1 [P.E1]	*Subroutine Step (1 to 150)* **Step Wait For Process Enable 1** If step type is Wait for Process or Event, select whether process value must be Less Than or Greater Than the value of Wait for Process to satisfy the wait-for condition.	oFF Off (62) Lt Less Than (1436) gt Greater Than (1435)	Off	30490 [offset 86]	0x69 (105) 1 to (150) 0x1A (26)	- - - -	5026	uint RWE
W.P1 [W.P1]	*Subroutine Step (1 to 150)* **Wait For Process 1** Enter a value that must be satisfied which is specified by Source E in Profile Setup.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	30498 [offset 86]	0x69 (105) 1 to (150) 0x1E (30)	- - - -	5030	float RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **If there is only one instance of a menu, no submenus will appear.**								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Profile Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
PE2 [P.E2]	*Subroutine Step (1 to 150)* **Step Wait For Process Enable 2** If step type is Wait for Process or Event, select whether process value must be Less Than or Greater Than the value of Wait for Process to satisfy the wait-for condition.	oFF Off (62) Lt Less Than (1436) gt Greater Than (1435)	Off	30492 [offset 86]	0x69 (105) 1 to (150) 0x1B (27)	- - - -	5027	uint RWE
WP1 [W.P1]	*Subroutine Step (1 to 150)* **Wait For Process 2** Enter a value that must be satisfied which is specified by Source F in Profile Setup.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	30500 [offset 86]	0x69 (105) 1 to (150) 0x1F (31)	- - - -	5031	float RWE
PE3 [P.E3]	*Subroutine Step (1 to 150)* **Step Wait For Process Enable 3** If step type is Wait for Process or Event, select whether process value must be Less Than or Greater Than the value of Wait for Process to satisfy the wait-for condition.	oFF Off (62) Lt Less Than (1436) gt Greater Than (1435)	Off	30494 [offset 86]	0x69 (105) 1 to (150) 0x1C (28)	- - - -	5028	uint RWE
WP3 [W.P3]	*Subroutine Step (1 to 150)* **Wait For Process 3** Enter a value that must be satisfied which is specified by Source G in Profile Setup.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	30502 [offset 86]	0x69 (105) 1 to (250) 0x20 (32)	- - - -	5032	float RWE
PE4 [P.E4]	*Subroutine Step (1 to 150)* **Step Wait For Process Enable 4** If step type is Wait for Process or Event, select whether process value must be Less Than or Greater Than the value of Wait for Process to satisfy the wait-for condition.	oFF Off (62) Lt Less Than (1436) gt Greater Than (1435)	Off	30496 [offset 86]	0x69 (105) 1 to (250) 0x1D (29)	- - - -	5029	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **If there is only one instance of a menu, no submenus will appear.**								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Profile Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
uJP4 [W.P4]	*Subroutine Step (1 to 150)* **Wait For Process 4** Enter a value that must be satisfied which is specified by Source H in Profile Setup.	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C	0.0°F or units -18.0°C	30504 [offset 86]	0x69 (105) 1 to (250) 0x21 (33)	- - - -	5033	float RWE
uJE.1 [WE.1]	*Subroutine Step (1 to 150)* **Wait Event 1** Enter a state that must be satisfied which is specified by Source A in Profile Setup.	nonE None (61) on On (63) oFF Off (62)	None	30482 [offset 86]	0x69 (105) 1 to (150) 0x16 (22)	- - - -	5022	uint RWE
uJE.2 [WE.2]	*Subroutine Step (1 to 150)* **Wait Event 2** Enter a state that must be satisfied which is specified by Source B in Profile Setup.	nonE None (61) on On (63) oFF Off (62)	None	30484 [offset 86]	0x69 (105) 1 to (150) 0x17 (23)	- - - -	5023	uint RWE
uJE.3 [WE.3]	*Subroutine Step (1 to 150)* **Wait Event 3** Enter a state that must be satisfied which is specified by Source C in Profile Setup.	nonE None (61) on On (63) oFF Off (62)	None	30486 [offset 86]	0x69 (105) 1 to (150) 0x18 (24)	- - - -	5024	uint RWE
uJE.4 [WE.4]	*Subroutine Step (1 to 150)* **Wait Event 4** Enter a state that must be satisfied which is specified by Source D in Profile Setup.	nonE None (61) on On (63) oFF Off (62)	None	30488 [offset 86]	0x69 (105) 1 to (150) 0x19 (25)	- - - -	5025	uint RWE
doUJ [doW]	*Subroutine Step (1 to 150)* **Day of Week** If step type is Wait for Time, select day of week for profile to proceed.	Ed Every Day (1567) UJd Week Days (1566) Mon Monday (1559) tuE Tuesday (1560) UJEd Wednesday (1561) thUr Thursday (1562) Fri Friday (1563) SAt Saturday (1564) Sun Sunday (1565)	Every Day	30508 [offset 86]	0x69 (105) 1 to (150) 0x23 (35)	- - - -	5035	uint RWE
gSE1 [gSE1]	*Subroutine Step (1 to 150)* **Guaranteed Soak Enable 1** Select if profile should pause while process 1 deviates from deviation band.	oFF Off (62) on On (63)	Off	30510 [offset 86]	0x69 (105) 1 to (150) 0x24 (36)	- - - -	5036	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **If there is only one instance of a menu, no submenus will appear.**								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Profile Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
gSE2 [gSE2]	*Subroutine Step (1 to 150)* **Guaranteed Soak Enable 2** Select if profile should pause while process 2 deviates from deviation band.	oFF Off (62) on On (63)	Off	30512 [offset 86]	0x69 (105) 1 to (150) 0x25 (37)	- - - -	5037	uint RWE
gSE3 [gSE3]	*Subroutine Step (1 to 150)* **Guaranteed Soak Enable 3** Select if profile should pause while process 3 deviates from deviation band.	oFF Off (62) on On (63)	Off	30514 [offset 86]	0x69 (105) 1 to (150) 0x26 (38)	- - - -	5038	uint RWE
gSE4 [gSE4]	*Subroutine Step (1 to 150)* **Guaranteed Soak Enable 4** Select if profile should pause while process 4 deviates from deviation band.	oFF Off (62) on On (63)	Off	30516 [offset 86]	0x69 (105) 1 to (150) 0x27 (39)	- - - -	5039	uint RWE
Ent1 [Ent1]	*Subroutine Step (1 to 150)* **Event 1** Select whether output programmed as Profile Event Out A is on, unchanged or off during this step.	Ucgd Unchanged (1557) oFF Off (62) on On (63)	Unchanged	30466 [offset 86]	0x69 (105) 1 to (150) 0xE (14)	- - - -	5014	uint RWE
Ent2 [Ent2]	*Subroutine Step (1 to 150)* **Event 2** Select whether output programmed as Profile Event Out B is on, unchanged or off during this step.	Ucgd Unchanged (1557) oFF Off (62) on On (63)	Unchanged	30468 [offset 86]	0x69 (105) 1 to (150) 0xF (15)	- - - -	5015	uint RWE
Ent3 [Ent3]	*Subroutine Step (1 to 150)* **Event 3** Select whether output programmed as Profile Event Out C is on, unchanged or off during this step.	Ucgd Unchanged (1557) oFF Off (62) on On (63)	Unchanged	30470 [offset 86]	0x69 (105) 1 to (150) 0x10 (16)	- - - -	5016	uint RWE
Ent4 [Ent4]	*Subroutine Step (1 to 150)* **Event 4** Select whether output programmed as Profile Event Out D is on, unchanged or off during this step.	Ucgd Unchanged (1557) oFF Off (62) on On (63)	Unchanged	30472 [offset 86]	0x69 (105) 1 to (150) 0x11 (17)	- - - -	5017	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **If there is only one instance of a menu, no submenus will appear.**								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

RMC Module • Profile Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
EnE5 [Ent5]	*Subroutine Step (1 to 150)* **Event 5** Select whether output programmed as Profile Event Out E is on, unchanged or off during this step.	Ucgd Unchanged (1557) oFF Off (62) on On (63)	Unchanged	30474 [offset 86]	0x69 (105) 1 to (150) 0x12 (18)	- - - -	5018	uint RWE
EnE6 [Ent6]	*Subroutine Step (1 to 150)* **Event 6** Select whether output programmed as Profile Event Out F is on, unchanged or off during this step.	Ucgd Unchanged (1557) oFF Off (62) on On (63)	Unchanged	30476 [offset 86]	0x69 (105) 1 to (150) 0x13 (19)	- - - -	5019	uint RWE
EnE7 [Ent7]	*Subroutine Step (1 to 150)* **Event 7** Select whether output programmed as Profile Event Out G is on, unchanged or off during this step.	Ucgd Unchanged (1557) oFF Off (62) on On (63)	Unchanged	30478 [offset 86]	0x69 (105) 1 to (150) 0x14 (20)	- - - -	5020	uint RWE
EnE8 [Ent8]	*Subroutine Step (1 to 150)* **Event 8** Select whether output programmed as Profile Event Out H is on, unchanged or off during this step.	Ucgd Unchanged (1557) oFF Off (62) on On (63)	Unchanged	30480 [offset 86]	0x69 (105) 1 to (150) 0x15 (21)	- - - -	5021	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with other interfaces. **If there is only one instance of a menu, no submenus will appear.**								**R: Read** **W: Write** **E: EEPROM** **S: User Set**

Display	Step Type Description	Parameters in Step Type
USTP [UStP]	*Step Types* **Unused Step** This is an empty step that can be used to plan for future steps to be inserted or temporarily deactivate a step in a profile. Change step type back when the step should be active again.	- - - -
t i [ti]	*Step Types* **Time** If Ramping Type in Setup Profile is set for Time, control loop 1 to 4 may be part of the profile and all enabled control loops follow independent set points over the specified time. The state of up to 8 event outputs may be set or maintained.	CM1.1 Control Mode Loop 1 CM1.2 Control Mode Loop 2 CM1.3 Control Mode Loop 3 CM1.4 Control Mode Loop 4 tSP1.1 Target Set Point Loop 1 tSP1.2 Target Set Point Loop 2 tSP1.3 Target Set Point Loop 3 tSP1.4 Target Set Point Loop 4 hour Hours Min Minutes SEC Seconds SSE1 Guaranteed Soak Enable 1 SSE2 Guaranteed Soak Enable 2 SSE3 Guaranteed Soak Enable 3 SSE4 Guaranteed Soak Enable 4 Ent1 Event 1 Ent2 Event 2 Ent3 Event 3 Ent4 Event 4 Ent5 Event 5 Ent6 Event 6 Ent7 Event 7 Ent8 Event 8
rAtE [rAtE]	*Step Types* **Rate** If Ramping Type in Setup Profile is set for Rate, control loop 1 must be part of the profile and all other enabled control loops follow the same set point and rate in degrees or units per minute. Ensure all control loops have the same units of measure. The state of up to 8 event outputs may be set or maintained.	CM1.1 Control Mode Loop 1 CM1.2 Control Mode Loop 2 CM1.3 Control Mode Loop 3 CM1.4 Control Mode Loop 4 tSP1.1 Target Set Point Loop 1 SSE1 Guaranteed Soak Enable 1 SSE2 Guaranteed Soak Enable 2 SSE3 Guaranteed Soak Enable 3 SSE4 Guaranteed Soak Enable 4 rAtE Rate Ent1 Event 1 Ent2 Event 2 Ent3 Event 3 Ent4 Event 4 Ent5 Event 5 Ent6 Event 6 Ent7 Event 7 Ent8 Event 8

Display	Step Type Description	Parameters in Step Type
SoAH [SoAk]	*Step Types* **Soak** A Soak Step maintains the last Target Set Points for the designated time. The state of up to 8 event outputs may be set or maintained.	CM.1 Control Mode Loop 1 CM.2 Control Mode Loop 2 CM.3 Control Mode Loop 3 CM.4 Control Mode Loop 4 hour Hours MN.in Minutes SEC Seconds GSE.1 Guaranteed Soak Enable 1 GSE.2 Guaranteed Soak Enable 2 GSE.3 Guaranteed Soak Enable 3 GSE.4 Guaranteed Soak Enable 4 Ent.1 Event 1 Ent.2 Event 2 Ent.3 Event 3 Ent.4 Event 4 Ent.5 Event 5 Ent.6 Event 6 Ent.7 Event 7 Ent.8 Event 8
CLoc [CLoc]	*Step Types* **Wait For Time** A Wait for Time Step is available with an Access module having the real-time calendar clock feature. This allows the program to wait for a specified day and time before proceeding to the next step. Used to have the profile execute steps everyday or only weekdays. The state of up to 8 event outputs may be set or maintained.	hour Hours MN.in Minutes SEC Seconds doW Day of Week Ent.1 Event 1 Ent.2 Event 2 Ent.3 Event 3 Ent.4 Event 4 Ent.5 Event 5 Ent.6 Event 6 Ent.7 Event 7 Ent.8 Event 8
W.PE [W.PE]	*Step Types* **Wait For Process or Event** A Wait For Process or Event Step will wait for four process values to match the Wait for Process Values (1 to 4), and/or for the four Wait For Event states (1 to 4) to match the specified state. The state of up to 8 event outputs may be set or maintained.	PE.1 Step Wait For Process Enable 1 WJP.1 Wait For Process 1 PE.2 Step Wait For Process Enable 2 WJP.2 Wait For Process 2 PE.3 Step Wait For Process Enable 3 WJP.3 Wait For Process 3 PE.4 Step Wait For Process Enable 4 WJP.4 Wait For Process 4 WJE.1 Wait Event 1 WJE.2 Wait Event 2 WJE.3 Wait Event 3 WJE.4 Wait Event 4 Ent.1 Event 1 Ent.2 Event 2 Ent.3 Event 3 Ent.4 Event 4 Ent.5 Event 5 Ent.6 Event 6 Ent.7 Event 7 Ent.8 Event 8

Display	Step Type Description	Parameters in Step Type
StAt [StAt]	*Step Types* **State** A State Step changes set points instantly to the specified values then maintains the Target Set Points for the designated time. The state of up to 8 event outputs may be set or maintained.	CM 1 Control Mode Loop 1 CM 2 Control Mode Loop 2 CM 3 Control Mode Loop 3 CM 4 Control Mode Loop 4 tSP1 Target Set Point Loop 1 tSP2 Target Set Point Loop 2 tSP3 Target Set Point Loop 3 tSP4 Target Set Point Loop 4 SE 1 Guaranteed Soak Enable 1 SE2 Guaranteed Soak Enable 2 SE3 Guaranteed Soak Enable 3 SE4 Guaranteed Soak Enable 4 hour Hours Min Minutes SEC Seconds Ent 1 Event 1 Ent2 Event 2 Ent3 Event 3 Ent4 Event 4 Ent5 Event 5 Ent6 Event 6 Ent7 Event 7 Ent8 Event 8
Subr [Subr]	*Step Types* **Subroutine** A Subroutine Step jumps to a set of subroutine steps that are common to many profiles. This allows efficiency by utilizing several steps to be accessed and called upon. Once the subroutine is complete, control is passed back to the main profile at the next step. The state of up to 8 event outputs may be set or maintained. This step type not available in subroutine.	SS Subroutine Step SC Subroutine Count Ent 1 Event 1 Ent2 Event 2 Ent3 Event 3 Ent4 Event 4 Ent5 Event 5 Ent6 Event 6 Ent7 Event 7 Ent8 Event 8
JL [JL]	*Step Types* **Jump Loop** A Jump Loop step will repeat previous steps a number of times designated in Jump Count. Jump Loops can be nested up to four deep. The state of up to 8 event outputs may be set or maintained. This step type not available in subroutine. Note: Use the Subroutine step type to jump forward to a set of common steps.	JS Jump Step JC Jump Count Ent 1 Event 1 Ent2 Event 2 Ent3 Event 3 Ent4 Event 4 Ent5 Event 5 Ent6 Event 6 Ent7 Event 7 Ent8 Event 8
End [End]	*Step Types* **End** An End Step will end the profile and set the control modes and set points to match the End Type. The state of up to 8 event outputs may be set or maintained. The event outputs will not be set off unless specifically stated in this step. If a profile does not have an End Step, the profile continues until step 250, then stops and maintains the last set points and control modes. In Subroutines, the End Step returns control back to the next profile step following the call.	End End Type Ent 1 Event 1 Ent2 Event 2 Ent3 Event 3 Ent4 Event 4 Ent5 Event 5 Ent6 Event 6 Ent7 Event 7 Ent8 Event 8

6 Chapter 6: Factory Pages

Control Module Factory Page Parameters

To navigate to the Factory Page using the RUI, follow the steps below:

1. From the Home Page, press and hold both the Advance and Infinity keys for six seconds.
2. Press the Up or Down key to view available menus.
3. Press the Advance Key to enter the menu of choice.
4. If a submenu exists (more than one instance), press the Up or Down key to select and then press the Advance Key to enter.
5. Press the Up or Down key to move through available menu prompts.
6. Press the Infinity Key to move backwards through the levels: parameter to submenu; submenu to menu; menu to Home Page.
7. Press and hold the Infinity Key for two seconds to return to the Home Page.

On the following pages, top level menus are identified with a yellow background color.

Note:
Some of these menus and parameters may not appear, depending on the controller's options. See model number information in the Appendix for more information. If there is only one instance of a menu, no submenus will appear.

Note:
Some of the listed parameters may not be visible. Parameter visibility is dependent upon controller part number.

CUSt
FCty **Custom Setup Menu**
1 to 20
CUSt **Custom Setup**
PAr **Parameter**
, id **Instance ID**

LoC
FCty **Security Setting Menu**
LoC **Security Setting**
LoC.o **Operations Page**
LoC.P **Profiling Page**
PAS.E **Password**
rLoC **Read Lock**
SLoC **Write Security**
LoC.L **Locked Access Level**
roLL **Rolling Password**
PAS.u **User Password**
PAS.A **Administrator Password**

ULoC
FCty **Security Setting Menu**
LoC **Security Setting**
CodE **Public Key**
PASS **Password**

diAG
FCty **Diagnostics Menu**
diAG **Diagnostics**
Pn **Part Number**
rEu **Software Revision**
S.bLd **Software Build Number**
Sn **Serial Number**
dAtE **Date of Manufacture**

CAL
FCty **Calibration Menu**
1
ACt **Calibration 1 (to 4)**
mEu **Electrical Measurement**
EL.o **Electrical Input Offset**
EL.S **Electrical Input Slope**
ELo.o **Electrical Output Offset**
ELo.S **Electrical Output Slope**

RMC Module • Factory Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
CUSt FCty **Custom Setup Menu**								
PAr [Par]	*Custom Menu* **Parameter 1 to 20** Select the parameters that will appear in the Home Page. The Parameter 1 value will appear in the upper display of the Home Page. It cannot be changed with the Up and Down Keys in the Home Page. The Parameter 2 value will appear in the lower display in the Home Page. It can be changed with the Up and Down Keys, if the parameter is a writable one. Scroll through the other Home Page parameters with the Advance Key .	nonE None LSt Limit Status LhY Limit Hysteresis LhS Limit High Set Point LLS Limit Low Set Point 9Sd1 Guaranteed Soak Deviation 1 PACr Profile Action Request PStr Profile Start idLE Idle Set Point tUn TRU-TUNE+® Enable rrt Ramp Rate ChY Cool Hysteresis CPb Cool Proportional Band hhY Heat Hysteresis hPb Heat Proportional Band db Dead Band td Time Derivative t i Time Integral CPr Cool Power hPr Heat Power CM Mode AUt Autotune oP Open Loop Set Point ACSP Active Set Point ACPu Active Process Value StPt Set Point CUSt Custom Menu AhY Alarm Hysteresis Ah i Alarm High Set Point ALo Alarm Low Set Point USrr User Restore Set C F Display Units iCA Input Calibration Offset Pro Process	- - - -	- - - -	- - - -	- - - -	14005	uint RWES
i id iid]	*Custom Setup (1 to 20)* **Instance ID** Select the instance of the parameter selected above to be displayed.	1 to 24	- - - -	- - - -	- - - -	- - - -	14003	uint RWES
LoC FCty **Security Setting Menu**								
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with another interface. If there is only one instance of a menu, no submenus will appear.								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Factory Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
LoC.o [LoC.o]	*Security Setting* **Operations Page** Use to change the required security level clearance required to gain access to the Operations Page.	1 to 3	2	43342	0x67 (103) 1 2	- - - -	3002	unit RWE
LoCP [LoC.P]	*Security Setting* **Profiling Page** Use to change the required security level clearance required to gain access to the Profiling Page.	1 to 3	3	43354	0x67 (103) 1 8	- - - -	3008	uint RWE
PASE [LoC.P]	*Security Setting* **Password Enable** Turn Password Enable ON if a Password access feature is desired. This is in addition to Read Lock or Write Security..	oFF Off on On	Off	- - - -	- - - -	- - - -	- - - -	- - - -
rLoC [rLoC]	*Security Setting* **Read Lock** Set the read security clearance level. The user can access the selected level and all lower levels. Applies regardless of Password Enable setting. Set the Read Lock clearance level. The user can have read access to the selected level and all lower levels. If the Write Security level is higher than the Read Lock, the Read Lock level takes priority.	1 to 5	5	- - - -	0x67 (103) 1 0x0A (10)	- - - -	3010	uint RWE
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with another interface. If there is only one instance of a menu, no submenus will appear.								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Factory Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
SLoC [SLoC]	*Security Setting* **Write Security** Set the write security clearance level. The user can access the selected level and all lower levels. Applies regardless of Password Enable setting. Set the Write Security clearance level. The user can have write access to the selected level and all lower levels. If the Write Security level is higher than the Read Lock, the Read Lock level takes priority.	0 to 5	5	- - - -	0x67 (103) 1 0x0B (11)	- - - -	3011	uint RWE
LoC.L [LoC.L]	*Security Setting* **Locked Access Level** Determines user level menu visibility when Password is enabled. See Features section under Password Security. This setting is in addition to Read Lock and Write Security. Consider using only Locked Access Level and Set Read Lock and Write Security to 5.	1 to 5	5	- - - -	- - - -	- - - -	- - - -	- - - -
roLL [roLL]	*Security Setting* **Rolling Password** Applies if Password Enable is ON. When power is cycled a new Public Key will be displayed.	oFF Off on On	Off	- - - -	- - - -	- - - -	- - - -	- - - -
PAS.u [PAS.u]	*Security Setting* **User Password** Applies if Password Enable is ON. Used to acquire access to menus made available through the Locked Access Level setting. Do not forget the password as it is required to change Locked Access Level, Read Lock or Write Security.	10 to 999	63	- - - -	- - - -	- - - -	- - - -	- - - -
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with another interface. If there is only one instance of a menu, no submenus will appear.								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Factory Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
PASA [PAS.A]	*Security Setting* **Administrator Password** Applies if Password Enable is ON. Used to acquire access to menus made available through the Locked Access Level setting. Do not forget the password as it is required to change Locked Access Level, Read Lock, Write Security and the ability to change the Passwords.	10 to 999	156	- - - -	- - - -	- - - -	- - - -	- - - -
ULoC FCty **Security Setting Menu**								
CodE [CodE]	*Security Setting* **Public Key** If Rolling Password is turned ON, generates a random number when power is cycled. If Rolling Password is OFF, a fixed number will be displayed. The Public Key is only required if the assigned Password is unknown. Provide the key to the OEM or technical support to gain access.	Customer Specific	0	- - - -	- - - -	- - - -	- - - -	- - - -
PASS [PASS]	*Security Setting* **Password** Applies if Password Enable is set to ON. Enter the 4-digit assigned password. If unknown, contact your supervisor, the OEM or technical support to gain access.	-1999 to 9999	0	- - - -	- - - -	- - - -	- - - -	- - - -
diAG FCty **Diagnostics Menu**								
Pn [Pn]	*Diagnostics Menu* **Part Number** Display this controller's part number.	24	- - - -	- - - -	0x65 (101) 1 9	115	1009	int RWE
rEu [rEu]	*Diagnostics Menu* **Software Revision** Display this controller's firmware revision number.	5	- - - -	4	0x65 (101) 1 to 5 0x11 (17)	116	1003	int R
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with another interface. If there is only one instance of a menu, no submenus will appear.								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Factory Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
S.bLd [S.bLd]	*Diagnostics Menu* **Software Build Number** Display the firmware build number.	0 to 2,147,483,647	- - - -	8	0x65 (101) 1 to 5 5	- - - -	1005	float R
Sn [Sn]	*Diagnostics Menu* **Serial Number** Display the serial number.	0 to 2,147,483,647	- - - -	12	0x65 (101) 1 7	- - - -	1007	float RWE
dAtE [dAtE]	*Diagnostics Menu* **Date of Manufacture** Display the date code.	0 to 2,147,483,647	- - - -	14	0x65 (101) 1 8	- - - -	1008	float RWE
No Display	*Diagnostics Menu* **Hardware ID** Read the hardware ID.	23 or 116	23	0	0x65 (101) 1 1	- - - -	1001	signed 32-bit R
CAL FCty **Calibration Menu**								
Mv [Mv]	*Calibration Menu (1 to 4)* **Electrical Measurement** Read the raw electrical value for this input in the units corresponding to the Sensor Type (Setup Page, Analog Input Menu) setting.	-3.4e38 to 3.4e38		400 [offset 90]	0x68 (104) 1 to 4 0x15 (21)	- - - -	4021	float R
ELio [ELi.o]	*Calibration Menu (1 to 4)* **Electrical Input Offset** Change this value to calibrate the low end of the input range.	-1,999.000 to 9,999.000	0.0	378 [offset 90]	0x68 (104) 1 to 4 0xA (10)	- - - -	4010	float RWES
ELiS [ELi.S]	*Calibration Menu (1 to 4)* **Electrical Input Slope** Adjust this value to calibrate the slope of the input value.	-1,999.000 to 9,999.000	1.0	380 [offset 90]	0x68 (104) 1 to 4 0xB (11)	- - - -	4011	float RWES
ELo.o [ELo.o]	*Calibration Menu (1, 3, 5, 7)* **Electrical Output Offset** Change this value to calibrate the low end of the output range.	-1,999.000 to 9,999.000	0.0	848 (1) 938 (5)	0x76 (118) 1 to 4 5	- - - -	18005	float RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with another interface. If there is only one instance of a menu, no submenus will appear.								**R: Read W: Write E: EEPROM S: User Set**

RMC Module • Factory Page								
Display	**Parameter Name Description**	**Range**	**Default**	**Modbus Relative Address**	**CIP Class Instance Attribute hex (dec)**	**Profibus Index**	**Parameter ID**	**Data Type & Read/ Write**
ELo.S [ELo.S]	*Calibration Menu (1, 3, 5, 7)* **Electrical Output Slope** Adjust this value to calibrate the slope of the output value.	-1,999.000 to 9,999.000	1.0	850 (1) 896 (3) 940 (5) 986 (7)	0x76 (118) 1 to 4 6	- - - -	18006	float RWES
Note: Some values will be rounded off to fit in the four-character display. Full values can be read with another interface. If there is only one instance of a menu, no submenus will appear.								**R: Read W: Write E: EE-PROM S: User Set**

7 Chapter 7: Features

7

Chapter 7: Features (cont.)

Saving and Restoring User Settings

Recording setup and operations parameter settings for future reference is very important. If you unintentionally change these, you will need to program the correct settings back into the controller to return the equipment to operational condition.

After you program the controller and verify proper operation, use User Settings Save [USr.S] (Setup Page, Global Menu) to save the settings into either of two files in a special section of memory.

Note:
Starting with firmware release 6, there is only one user set.

If the settings in the controller are altered and you want to return the controller to the saved values, use User Settings Restore [USr.r] (Setup Page, Global Menu) to recall the previously saved settings.

A digital input or the Function Key can also be configured to restore parameters.

CAUTION: ⚠

If a Digital Input or Function Key is programmed for User Setting Restore, the operator may select Factory Restore and the Digital Input or Function Key may no longer be programmed for User Setting Restore.

Note:
Only perform the above procedure when you are sure that all the correct settings are programmed into the controller. Saving the settings overwrites any previously saved collection of settings. Be sure to document all the controller settings.

Tuning the PID Parameters

Autotune

When an autotune is performed on the RMC module, the Closed Loop Set Point is used to calculate the tuning set point.

For example, if the active set point is 200° and autotune Set Point [AtSP] (Operations Page, Loop Menu) is set to 90 percent, the auto-tune function utilizes 180° for tuning. Changing the set point after an autotune has been started has no affect on the current tuning process. Set point changes can occur while the control is auto tuning. When the autotune is initially started it will use the current set point and will disregard all set point changes until the tuning process is complete. Once complete, the controller will then use the new set point. This is why it is a good idea to enter the active set point before initiating an autotune.

Auto tuning calculates the optimum heating and/or cooling PID parameter settings based on the systems response. Autotuning can be enabled whether or not TRU-TUNE+® is enabled. The PID settings generated by the autotune will be used until the autotune feature is rerun, the PID values are manually adjusted or TRU-TUNE+® is enabled.

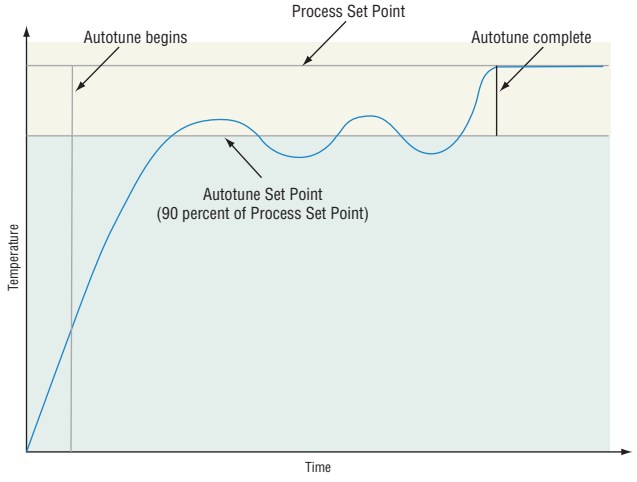
Note:
Do not perform an autotune while a profile is running.

To initiate an autotune follow the steps below:

1. Using an RUI, from the Home Page, push the up or down keys to enter the desired Closed Loop Set Point or one that is in the middle of the expected range of set points that you want to tune for.
2. Navigate to the Operations Page, Loop Menu (push and hold the up and down arrow for approximately 3 seconds) and select the Autotune Set Point [AtSP]. The Autotune Set Point is expressed as a percent of the Closed Loop Set Point.
3. Set Autotune Request [AUt] to [YES]. If the autotune cannot be completed in 60 minutes, the autotune will time-out and the original settings will take effect.

Once started, the lower RUI display will flash between [tUnE] and the set point while the autotuning is underway. The temperature must cross the Autotune Set Point five times to complete the autotuning process. Once complete, the controller controls at the normal set point, using the new parameters.

If you need to adjust the tuning procedures aggressiveness, use Autotune Aggressiveness [tAGr] (Setup Page, Loop Menu). Select Under Damped [Undr] to bring the process value to the set point quickly. Select over damped [ouEr] to bring the process value to the set point with minimal overshoot. Select critical damped [Cr.tL] to balance a rapid response with minimal overshoot.



Manual Tuning

In some applications, the autotune process may not provide PID parameters for the process characteristics you desire. If that is the case, you may want to tune the controller manually.

1. Apply power to the controller and establish a set point typically used in your process.
2. Go to the Operations Page, Loop Menu, and set

Heat Proportional Band [h.Pb] and/or Cool Proportional Band [C.Pb] to 5. Set Time Integral [t i] to 0. Set Time Derivative [t d] to 0.

3. When the system stabilizes, watch the process value. If it fluctuates, increase the Heat Proportional Band or Cool Proportional Band value in 3 to 5° increments until it stabilizes, allowing time for the system to settle between adjustments.
4. When the process has stabilized, watch Heat Power [h.Pr] or Cool Power [C.Pr] (Operations Page, Monitor Menu). It should be stable ±2%. At this point, the process temperature should also be stable, but it will have stabilized before reaching the set point. The difference between the set point and actual process value can be eliminated with Integral.
5. Start with an Integral value of 6,000 and allow 10 minutes for the process temperature to reach the set point. If it has not, reduce the setting by half and wait another 10 minutes. Continue reducing the setting by half every 10 minutes until the process value equals the set point. If the process becomes unstable, the Integral value is too small. Increase the value until the process stabilizes.
6. Increase Derivative to 0.1. Then increase the set point by 11° to 17°C. Monitor the system's approach to the set point. If the process value overshoots the set point, increase Derivative to 0.2. Increase the set point by 11° to 17°C and watch the approach to the new set point. If you increase Derivative too much, the approach to the set point will be very sluggish. Repeat as necessary until the system rises to the new set point without overshoot or sluggishness.

For additional information about autotune and PID control, see related features in this chapter.

Autotuning with TRU-TUNE+®

The TRU-TUNE+ adaptive algorithm will optimize the controller's PID values to improve control of dynamic processes. TRU-TUNE+ monitors the Process Value and adjusts the control parameters automatically to keep your process at set point during set point and load changes. When the controller is in the adaptive control mode, it determines the appropriate output signal and, over time, adjusts control parameters to optimize responsiveness and stability. The TRU-TUNE+ feature does not function for on-off control.

The preferred and quickest method for tuning a loop is to establish initial control settings and continue with the adaptive mode to fine tune the settings.

Setting a controller's control mode to tune starts this two-step tuning process. (See Autotuning in this chapter.) This predictive tune determines initial, rough settings for the PID parameters. Then the loop automatically switches to the adaptive mode which fine tunes the PID parameters.

Once the Process Value has been at set point for a suitable period (about 30 minutes for a fast process to roughly two hours for a slower process) and if no further tuning of the PID parameters is desired or needed, TRU-TUNE+ may be turned off. However, keeping the controller in the adaptive mode allows it to automatically adjust to load changes and compensate for differing control characteristics at various set points for processes that are not entirely linear.

Once the PID parameters have been set by the TRU-TUNE+ adaptive algorithm, the process, if shut down for any reason, can be restarted in the adaptive control mode.

Turn TRU-TUNE+ on or off with TRU-TUNE+ Enable [tEUn] (Setup Page, Loop Menu).

Use TRU-TUNE+ Band [tbnd] (Setup Page, Loop Menu) to set the range above and below the set point in which adaptive tuning will be active. Adjust this parameter only in the unlikely event that the controller is unable to stabilize at the set point with TRU-TUNE+ Band set to auto (0). This may occur with very fast processes. In that case, set TRU-TUNE+ Band to a large value, such as 100.

Use TRU-TUNE+ Gain [tgn] (Setup Page, Loop Menu) to adjust the responsiveness of the adaptive tuning calculations. Six settings range from 1, with the most aggressive response and most potential overshoot (highest gain), to 6, with the least aggressive response and least potential for overshoot (lowest gain). The default setting, 3, is recommended for loops with thermocouple feedback and moderate response and overshoot potential.

Before Tuning

Before autotuning, the controller hardware must be installed correctly, and these basic configuration parameters must be set:

- Sensor Type [SEn] (Setup Page, Analog Input Menu), and scaling, if required;
- Function [Fn] (Setup Page, Output Menu) and scaling, if required.

How to Autotune a Loop

1. Enter the desired set point or one that is in the middle of the expected range of set points that you want to tune for.
2. Enable TRU-TUNE+.
3. Initiate an autotune. (See Autotuning in this chapter.)

When autotuning is complete, the PID parameters should provide good control. As long as the loop is in the adaptive control mode, TRU-TUNE+ continuously tunes to provide the best possible PID control for the process.

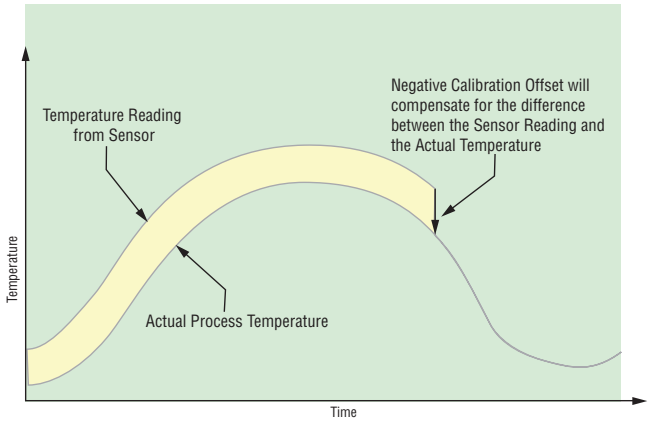
WARNING! During autotuning, the controller sets the output to 100 percent and attempts to drive the Process Value toward the set point. Enter a set point and heat and cool power limits that are within the safe operating limits of your system.

Inputs

Calibration Offset

Calibration offset allows a user to compensate for an inaccurate sensor, lead resistance or other factors that affect the input value. A positive offset increases the input value, and a negative offset decreases the input value.

The input offset value can be viewed or changed with Calibration Offset [,CA] (Operations Page, Analog Input Menu).



Calibration

Before performing any calibration procedure, verify that the displayed readings are not within published specifications by inputting a known value from a precision source to the analog input. Next, subtract the displayed value with the known value and compare this difference to the published accuracy range specification for that type of input.

Use of the Calibration Offset [,CA] parameter found in the Operations Page [oPEr], Analog Input Menu [A ,] shifts the readings across the entire displayed range by the offset value. Use this parameter to compensate for sensor error or sensor placement error. Typically this value is set to zero.

Equipment required while performing calibration: Obtain a precision source for millivolts, volts, milliamperes or resistance depending on the sensor type to be calibrated. Use copper wire only to connect the precision source to the controller's input. Keep leads between the precision source and controller as short as possible to minimize error. In addition, a precision volt/ohm meter capable of reading values to 4 decimal places or better is recommended. Prior to calibration, connect this volt/ohm meter to the precision source to verify accuracy.

Actual input values do NOT have to be exactly the recommended values, but it IS critical that the actual value of the signal connected to the controller be accurately known to at least four digits.

Calibration of Analog Inputs:

To calibrate an analog input, you will need to provide a source of two electrical signals or resistance values near the extremes of the range that the application is likely to utilize. See recommended values below:

Sensor Type	Precision Source Low	Precision Source High
thermocouple	0.000 mV	50.000 mV
millivolts	0.000 mV	50.000 mV
volts	0.000V	10.000V
milliamps	0.000 mA	20.000 mA
100 Ω RTD	50.00 Ω	350.0 Ω
1,000 Ω RTD	500.0 Ω	3,500 Ω
thermistor 5 kΩ	50.00	5,000
thermistor 10 kΩ	150.0	10,000
thermistor 20 kΩ	1,800	20,000
thermistor 40 kΩ	1,700	40,000
potentiometer	0.000	1,200

Note:

The user may only calibrate one sensor type. If the calibrator interferences with open thermocouple detection, set Sensor Type [SEn] in Setup Page [SEt], Analog Input Menu [A ,] to millivolt [mV] instead of Thermocouple [tC] to avoid interference between the calibrator and open thermocouple detect circuit for the duration of the calibration process. Be sure to set sensor type back to the thermocouple type utilized.

1. Disconnect the sensor from the controller.
2. Record the Calibration Offset [,CA] parameter value in the Operations Page [oPEr], Analog Input Menu [A ,] then set value to zero.
3. Wire the precision source to the appropriate controller input terminals to be calibrated. Do not have any other wires connected to the input terminals. Please refer to the Install and Wiring section of this manual for the appropriate connections.
4. Ensure the controller sensor type is programmed to the appropriate Sensor Type [SEn] to be utilized in the Setup Page [SEt], Analog Input Menu [A ,].
5. Enter Factory Page [FCty], Calibration Menu [CAL] via RUI or EZ-ZONE Configurator Software.
6. Select the Calibration [CAL] input instance to be calibrated. This corresponds to the analog input to be calibrated.
7. Set Electrical Input Slope [EL ,S] to 1.000 and Electrical Input Offset [EL ,o] to 0.000 (this will cancel any prior user calibration values)

8. Input a Precision Source Low value. Read Electrical Measurement value [CAL L] of controller via EZ-Configurator or RUI. This will be referred to as Electrical Measured Low.

Record low value _____

9. Input a Precision Source High value.

10. Read Electrical Measurement value [CAL H] of controller via EZ-Configurator or RUI. This will be referred to as Electrical Measured High.

Record high value _____

11. Calculated Electrical Input Slope = (Precision High – Precision Low) / (Electrical Measured High – Electrical Measured Low)

Calculated Slope value _____

12. Calculated Electrical Input Offset = Precision Low – (Electrical Input Slope * Measured Low)

Calculated Offset value _____

13. Enter the calculated Electrical Input Slope [EL 1.S] and Electrical Input Offset [EL 1.O] into the controller.

14. Exit calibration menu.

15. Validate calibration process by utilizing a calibrator to the analog input.

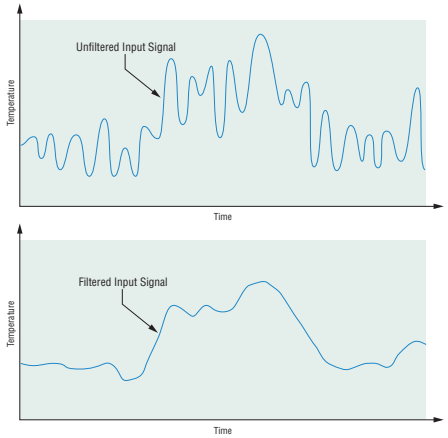
16. Enter calibration offset as recorded in step 2 if required to compensate for sensor error.

Setting Electrical Input Slope [EL 1.S] to 1.000 and Electrical Input Offset [EL 1.O] to 0.000, restores factory calibration as shipped from factory.

Filter Time Constant

Filtering smooths an input signal by applying a first-order filter time constant to the signal. Filtering the displayed value makes it easier to monitor. Filtering the signal may improve the performance of PID control in a noisy or very dynamic system.

Adjust the filter time interval with Filter Time [FIL] (Setup Page, Analog Input Menu). Example: With a filter value of 0.5 seconds, if the process input value instantly changes from 0 to 100 and remained at 100, the display will indicate 100 after five time constants of the filter value or 2.5 seconds.



Filter Time Constant

Sensor Selection

You need to configure the controller to match the input device, which is normally a thermocouple, RTD or process transmitter.

Select the sensor type with Sensor Type [SEn] (Setup Page, Analog Input Menu).

Sensor Backup

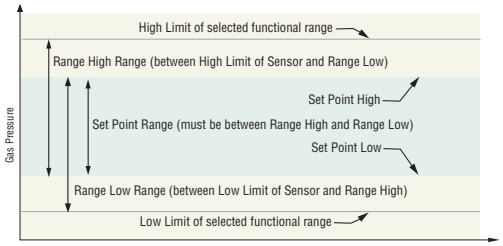
The Process Value function can be set for sensor backup which would maintain closed-loop control after an input failure by switching the control input to another input sensor of choice. Turn sensor backup on or off via the Setup Page, Process Value Menu. Source Function A must select a backup sensor from the same module (zone) where Source Function B through D can select a sensor as the backup from another zone (module).

Set Point Low Limit and High Limit

The controller constrains the set point to a value between a set point low limit and a set point high limit.

Set the set point limits with Low Set Point [LSP] and High Set Point [HSP] (Setup Page, Loop Menu).

There are two sets of set point low and high limits: one for a closed-loop set point, another for an open-loop set point.



Range Low and Range High

Scale High and Scale Low

When an analog input is selected as process voltage or process current input, you must choose the value of voltage or current to be the low and high ends. For example, when using a 4 to 20 mA input, the scale low value would be 4.00 mA and the scale high value would be 20.00 mA. Commonly used scale ranges are: 0 to 20 mA, 4 to 20 mA, 0 to 5V, 1 to 5V and 0 to 10V.

You can create a scale range representing other units for special applications. You can reverse scales from high values to low values for analog input signals that have a reversed action. For example, if 50 psi causes a 4 mA signal and 10 psi causes a 20 mA signal.

Scale low and high low values do not have to match the bounds of the measurement range. These along with range low and high provide for process scaling and can include values not measurable by the controller. Regardless of scaling values, the measured value will be constrained by the electrical measurements of the hardware.

Select the low and high values with Scale Low [S.Lo] and Scale High [S.hi]. Select the displayed range with Range Low [r.Lo] and Range High [r.hi] (Setup Page, Analog Input Menu).

Range High and Range Low

With a process input, you must choose a value to represent the low and high ends of the current or voltage range. Choosing these values allows the controller's display to be scaled into the actual working units of measurement. For example, the analog input from a humidity transmitter could represent 0 to 100 percent relative humidity as a process signal of 4 to 20 mA. Low scale would be set to 0 to represent 4 mA and high scale set to 100 to represent 20 mA. The indication on the display would then represent percent humidity and range from 0 to 100 percent with an input of 4 to 20 mA.

Select the low and high values with Range Low [r.Lo] and Range High [r.hi] (Setup Page, Analog Input Menu).

Receiving a Remote Set Point

The remote set point feature allows the controller to use a thermocouple, RTD, 1k potentiometer or process signal (from any RM module) as the second input to establish the set point, which allows its set point to be manipulated by an external source. A common application would use one ramping controller with a set-point retransmit output to ramp multiple controllers using the remote set point. Or you could use an analog output from a PLC to send set point values to an EZ-ZONE RMC. The controller must have at least two process inputs to use the remote set point feature.

You may select between local and remote set points at the front panel, with an event input, from a remote computer using the communications feature or from an external switch using an event input. Make sure all input and output impedances are compatible.

Switch to the remote set point with Remote Enable [r.En] (Operations Page, Loop Menu). Select whether the remote set point controls an open- or closed-loop set point with Remote Set Point Type [r.tY].

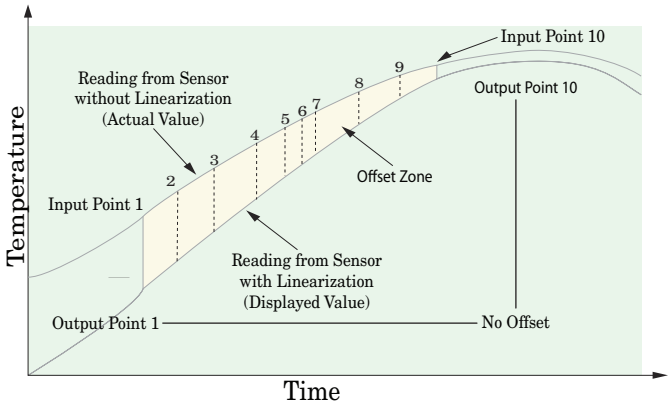
Assign the function of switching to a remote set point to an Action Function [Fn] (Setup Page, Action Menu).

Assign the function of switching to a remote set point to the EZ Key with Digital Input Function [Fn] (Setup Page, Function Key Menu).

Ten Point Linearization

The linearization function allows a user to re-linearize a value read from an analog source. The function selections are Off, Interpolated and Stepped. When set to Off the output will match the Source A value plus offset. There are 10 data points used to compensate for differences between the source value read (input point) and the desired value (output point). Multiple data points enable compensation for non-linear differences between the sensor readings and target process values over the thermal or process system operating range. Sensor reading differences can be caused by sensor placement, tolerances, an inaccurate sensor or lead resistance.

The user specifies the unit of measurement and then each data point by entering an input point value and a corresponding output point value. Each data point must be incrementally higher than the previous point. The linearization function will interpolate data points linearly in between specified data points.



Outputs

NO-ARC Relay

A NO-ARC relay provides a significant improvement in the life of the output relay over conventional relays.

Conventional mechanical relays have an expected life of 100,000 cycles at the rated full-load current. The shorter life for conventional relays is due to the fact that when contacts open while current is flowing metal degradation occurs. This action produces unavoidable electrical arcing causing metal to transfer from one contact to the other. The arcing conditions continue on each subsequent contact opening until over time the resistance through the contacts increases causing the contacts to increase in temperature. Eventually, the contacts will weld together and the relay remains in the on state.

The Watlow NO-ARC relay is a hybrid relay. It uses a mechanical relay for the current load and a triac (solid-state switch) to carry the turn-on and turn-off currents. NO-ARC relays extend the life of the relay more than two million cycles at the rated full-load current.

Although a NO-ARC relay has significant life advantages, a few precautions must be followed for acceptable usage:

Do not use:

- Hybrid relays for limit contactors. A limit or safety device must provide a positive mechanical break on all hot legs simultaneously;

- DC loads with hybrid relays. The triacs used for arc suppression will turn off only with ac line voltage;
- Hybrid switches to drive any inductive loads, such as relay coils, transformers or solenoids;
- Cycle times less than five seconds on hybrid switches;
- On loads that exceed 264V ac through relay;
- On loads that exceed 15 amperes load;
- On loads less than 100 mA;
- NO-ARC relays in series with other BO-ARC relays.

Retransmitting a Process Value or Set Point

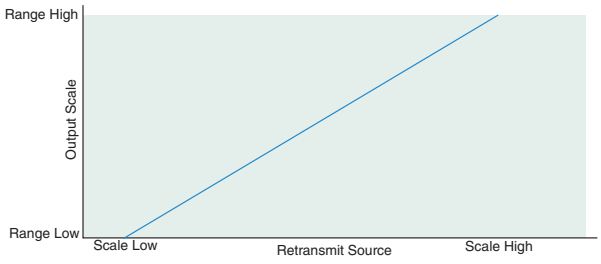
The retransmit feature allows a process output to provide an analog signal that represents the set point or process value. The signal may serve as a remote set point for another controller or as an input for a chart recorder documenting system performance over time.

In choosing the type of retransmit signal the operator must take into account the input impedance of the device to be retransmitted to and the required signal type, either voltage or milliamperes.

Typically, applications might use the retransmit option to record one of the variables with a chart recorder or to generate a set point for other controls in a multi-zone application.

Outputs 1, 3, 5 and 7 can be ordered as process outputs. Assign an analog source to Output Function to accomplish retransmit of a process or set point value.

Note:
The active set point is not retransmitted, only the user requested closed loop set point which may not be the closed loop set point in control. Retransmitting a profiling closed loop set point is not allowed.



Retransmit

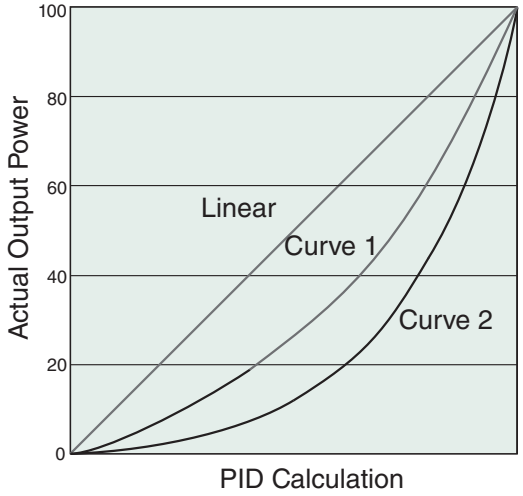
Set the range of the process output with Scale Low [5.Lo] and Scale High [5.hi]. Scale the retransmit source to the process output with Range Low [r.Lo] and Range High [r.hi].

When the retransmit source is at the Range Low value, the retransmit output will be at its Scale Low value. When the retransmit source is at the Range High value, the retransmit output will be at its Scale High value.

Cool Output Curve

A nonlinear output curve may improve performance when the response of the output device is nonlinear. If a cool output uses one of the nonlinear curves a PID calculation yields a lower actual output level than a linear output would provide.

These output curves are used in plastics extruder applications: curve 1 for oil-cooled extruders and curve 2 for water-cooled extruders.



Select a nonlinear cool output curve with Cool Output Curve [C.Cr] (Setup Menu, Loop Menu).

Control Methods

Output Configuration

Controller outputs can be configured as a heat output, a cool output, an alarm output or deactivated and driven by any available control loop. No dependency limitations have been placed on the available combinations. The outputs can be configured in any combination. For instance, all three could be set to cool.

Heat and cool outputs use the set point and Operations parameters to determine the output value. All heat and cool outputs use the same set point value. Heat and cool each have their own set of control parameters. All heat outputs use the same set of heat control parameters and all cool outputs use the same set of cool output parameters. Each alarm output has its own set of configuration parameters and set points, allowing independent operation.

Auto (closed loop) and Manual (open loop) Control

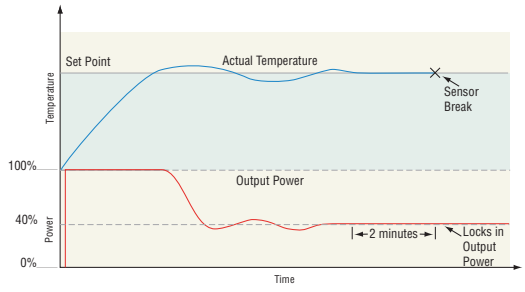
The controller has two basic modes of operation, auto mode and manual mode. Auto mode allows the controller to decide whether to perform closed-loop control or to follow the settings of Input Error Failure [FAIL] (Setup Page, Loop Menu). The manual mode only allows open-loop control. The RMC module is normally used in the auto mode. The manual mode is usually only used for specialty applications or for troubleshooting. Manual mode is open-loop control

that allows the user to directly set the power level to the controller's output load. No adjustments of the output power level occur based on temperature or closed loop set point in this mode.

In auto mode, the controller monitors the input to determine if closed-loop control is possible. The controller checks to make certain a functioning sensor is providing a valid input signal. If a valid input signal is present, the controller will perform closed-loop control. Closed-loop control uses a process sensor to determine the difference between the process value and the closed loop set point. Then the controller applies power to a control output load to reduce that difference. If a valid input signal is not present, the controller will indicate an input error message in the upper display and AtEn in the lower display and respond to the failure according to the setting of Input Error Failure FAiL. You can configure the controller to perform a "bumpless" transfer bPLS, switch power to output a preset fixed level MANn, or turn the output power off.

Bumpless transfer will allow the controller to transfer to the manual mode using the last power value calculated in the auto mode if the process had stabilized at a ±5 percent output power level for the time interval of Time Integral or 10 seconds, which ever is larger (Operations Page, Loop), prior to sensor failure, and that power level is less than 75 percent.

Reverse Bumpless functionality will take effect when the control is changed from Manual to Auto mode. The control will preload the Open Loop Set Point value into the Integral Term, which will allow for a bumpless transition. The normal PID action will then take over to control the output to the Closed Loop Set Point value.



Bumpless Transfer

Input Error Latching iEr (Setup Page, Analog Input Menu) determines the controller's response once a valid input signal returns to the controller. If latching is on, then the controller will continue to indicate an input error until the error is cleared. To clear a latched alarm, press the Advance Key then the Up Key.

If latching is off, the controller will automatically clear the input error and return to reading the temperature. If the controller was in the auto mode when the input error occurred, it will resume closed-loop control. If the controller was in manual mode when the error occurred, the controller will remain in open-loop control.

The Manual Control Indicator Light % is on when the controller is operating in manual mode.

If using an RUI switching between modes is easy if the Control Mode Cnt parameter is selected to appear in the Home Page.

To transfer to manual mode from auto mode, press the Advance Key until Cnt appears in the lower display. The upper display will display AUto for auto mode. Use the Up or Down keys to select MANn. The manual set point value will be recalled from the last manual operation.

To transfer to auto mode from manual mode, press the Advance Key until Cnt appears in the lower display. The upper display will display MANn for manual mode. Use the Up or Down keys to select AUto. The automatic set point value will be recalled from the last automatic operation.

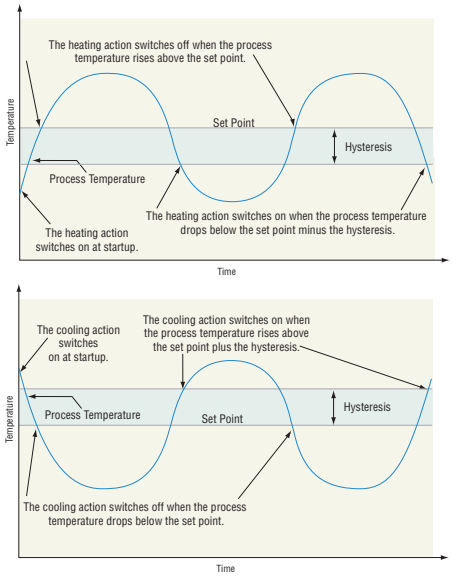
Changes take effect after three seconds or immediately upon pressing either the Advance Key or the Infinity Key.

On-Off Control

On-off control switches the output either full on or full off, depending on the input, set point and hysteresis values. The hysteresis value indicates the amount the process value must deviate from the set point to turn on the output. Increasing the value decreases the number of times the output will cycle. Decreasing hysteresis improves controllability. With hysteresis set to 0, the process value would stay closer to the set point, but the output would switch on and off more frequently, and may result in the output "chattering." On-off control can be selected with Heat Algorithm hAG or Cool Algorithm CAG (Setup Page, Loop Menu). On-off hysteresis can be set with Heat Hysteresis hHy or Cool Hysteresis CHy (Operations Page, Loop Menu).

Note:

Input Error Failure Mode FAIL does not function in on-off control mode. The output goes off.



On/Off System Cycles

Proportional (P) Control

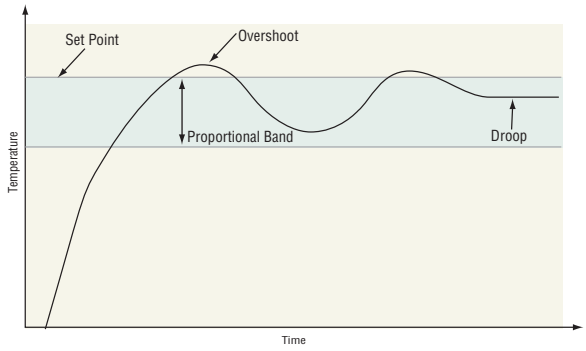
Some processes need to maintain a temperature or process value closer to the set point than on-off control can provide. Proportional control provides closer control by adjusting the output when the temperature or process value is within a proportional band. When the value is in the band, the controller adjusts the output based on how close the process value is to the set point.

The closer the process value is to the set point, the lower the output power. This is similar to backing off on the gas pedal of a car as you approach a stop sign. It keeps the temperature or process value from swinging as widely as it would with simple on-off control. However, when the system settles down, the temperature or process value tends to "droop" short of the set point.

With proportional control the output power level equals (set point minus process value) divided by the proportional band value.

In an application with one output assigned to heating and another assigned to cooling, each will have a separate proportional parameter. The heating parameter takes effect when the process temperature is lower than the set point, and the cooling parameter takes effect when the process temperature is higher than the set point.

Adjust the proportional band with Heat Proportional Band [h.Pb] or Cool Proportional Band [C.Pb] (Operations Page, Loop Menu).



Proportional Control

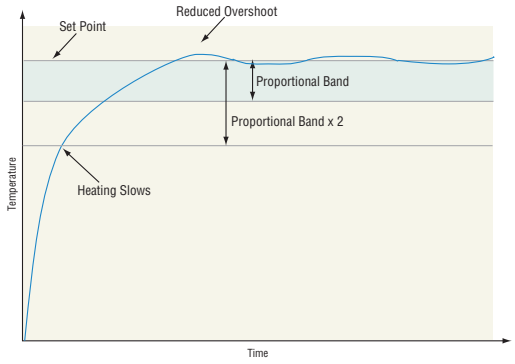
Proportional plus Integral (PI) Control

The droop caused by proportional control can be corrected by adding integral (reset) control. When the system settles down, the integral value is tuned to bring the temperature or process value closer to the set point. Integral determines the speed of the correction, but this may increase the overshoot at startup or when the set point is changed. Too much integral action will make the system unstable. Adjust the integral with Time Integral [t.i] (Operations Page, Loop Menu).

Proportional, Integral and Derivative (PID) Control

Use derivative (rate) control to minimize the overshoot in a PI-controlled system. Derivative (rate) adjusts the output based on the rate of change in the temperature or process value. Too much derivative (rate) will make the system sluggish.

Adjust the derivative with Time Derivative [t.d] (Operations Page, Loop Menu).

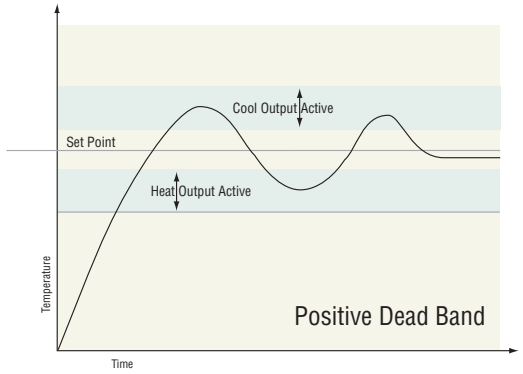


PID Control

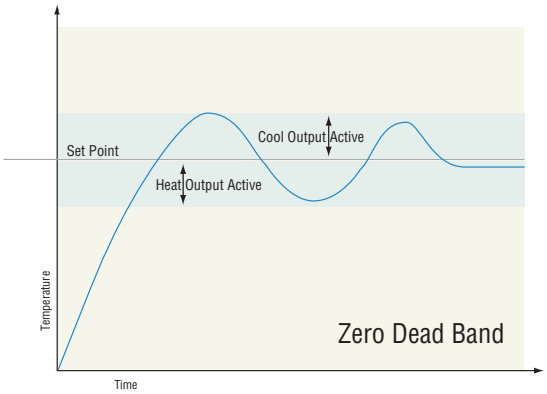
Dead Band

In a PID application the dead bands above and below the set point can save an application's energy and wear by maintaining process temperature within acceptable ranges. Use Dead Band to set an offset for the proportional band. With a negative value both the heating and cooling outputs are active when the process value is near the set point. A positive value prevents heating and cooling outputs from being on at the same time.

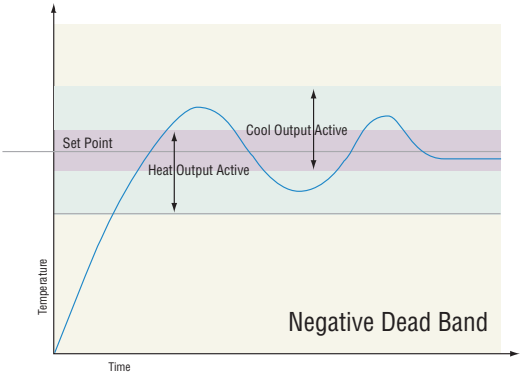
Proportional action ceases when the process value is within the dead band. Integral action continues to bring the process temperature to the set point.



When the **dead band value is zero**, the heating output activates when the temperature drops below the set point, and the cooling output switches on when the temperature exceeds the set point.



When the **dead band value is a negative value,** both heating and cooling outputs are active when the temperature is near the set point.



Adjust the dead band with Dead Band [db] (Operations Page, Loop Menu).

Variable Time Base

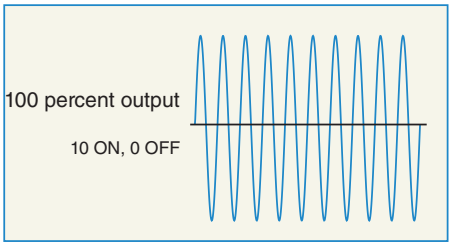
Variable time base is the preferred method for controlling a resistive load, providing a very short time base for longer heater life. Unlike phase-angle firing, variable-time-base switching does not limit the current and voltage applied to the heater.

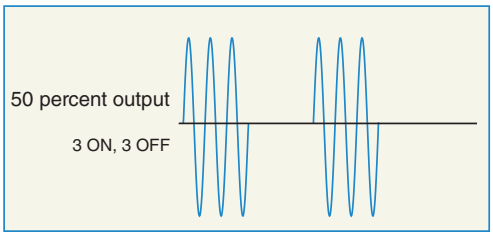
With variable time base outputs, the PID algorithm calculates an output between 0 and 100%, but the output is distributed in groupings of three ac line cycles. For each group of three ac line cycles, the controller decides whether the power should be on or off. There is no fixed cycle time since the decision is made for each group of cycles. When used in conjunction with a zero cross (burst fire) device, such as a solid-state power controller, switching is done only at the zero cross of the ac line, which helps reduce electrical noise (RFI).

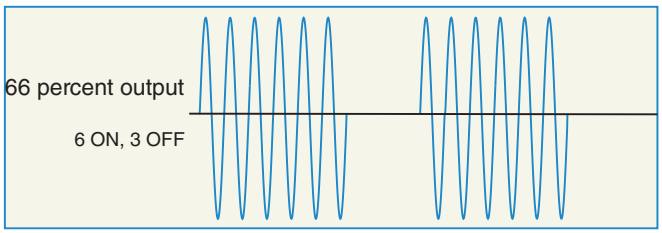
Variable time base should be used with solid-state power controllers, such as a solid-state relay (SSR) or silicon controlled rectifier (SCR) power controller. Do not use a variable time base output for controlling electromechanical relays, mercury displacement relays, inductive loads or heaters with unusual resistance characteristics.

The combination of variable time base output and a solid-state relay can inexpensively approach the effect of analog, phase-angle fired control.

Select the AC Line Frequency [AC.LF] (Setup Page, Global Menu), 50 or 60 Hz.







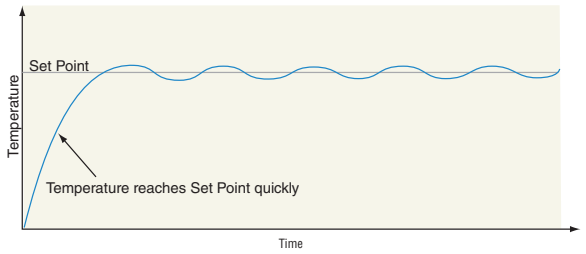
Single Set Point Ramping

Ramping protects materials and systems that cannot tolerate rapid temperature changes. The value of the ramp rate is the maximum degrees per minute or hour that the system temperature can change. Ramping to set point starts from the process value and increments or decrements to the closed loop set point at the defined rate.

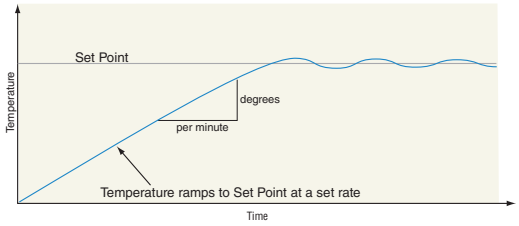
Select Ramp Action [rP] (Setup Page, Loop Menu):

- [oFF] ramping not active.
- [Str] ramp at startup.
- [StPt] ramp at a set point change.
- [both] ramp at startup or when the set point changes.

Select whether the rate is in degrees per minute or degrees per hour with Ramp Scale [r.SC]. Set the ramping rate with Ramp Rate [r.rt] (Setup Page, Loop Menu).



Heating System without Ramping

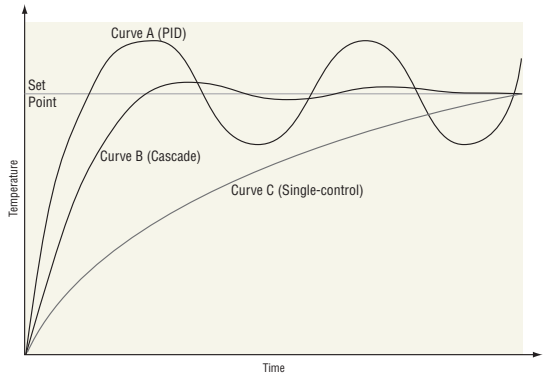


Heating System with Ramping

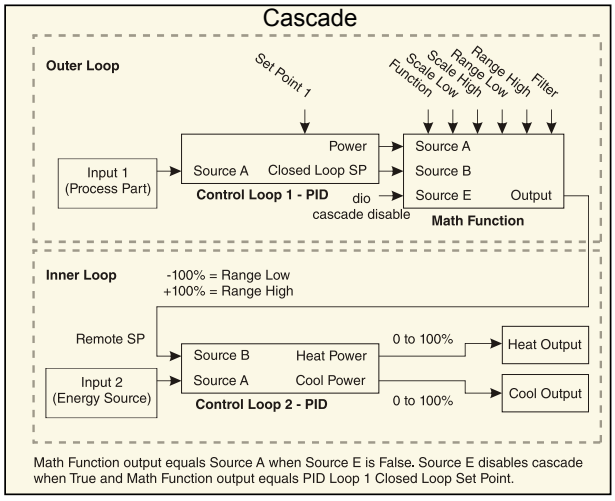
Cascade Control

Cascade control is a control strategy in which one control loop provides the set point for another loop. It allows the process or part temperature to be reached quickly while minimizing overshoot. Cascade is used to optimize the performance of thermal systems with long lag times. The graph on the next page illustrates a thermal system with a long lag time.

Curve A represents a single loop control system with PID parameters that allow a maximum heat up rate. Too much energy is introduced and the set point is overshot. In most systems with long lag time, the process value may never settle out to an acceptable error. Curve C represents a single control system tuned to minimize overshoot. This results in unacceptable heat up rates, taking hours to reach the final value. Curve B shows a cascade system that limits the energy introduced into the system, allowing an optimal heat up rate with minimal overshoot. Cascade control uses two control loops (outer and inner) to control the process. The outer loop (analog input 2) monitors the process or part temperature, which is then compared to the closed loop set point. The result of the comparison, the error signal, is acted on by the PID settings in the cascade outer loop, which then generates a power level for the outer loop. The set point for the inner loop is determined by the outer loop power level. The inner loop input (any input) monitors the energy source (heating and cooling), which is compared to the inner loop set point generated by the outer loop. The result of the comparison, the error signal, is acted on by the PID settings in the cascade inner loop, which generates an output power level between -100% to +100%. If the power level is positive the heat will be on; if the power level is negative the cool will come on. Power from the energy sources are supplied by the outputs of choice.

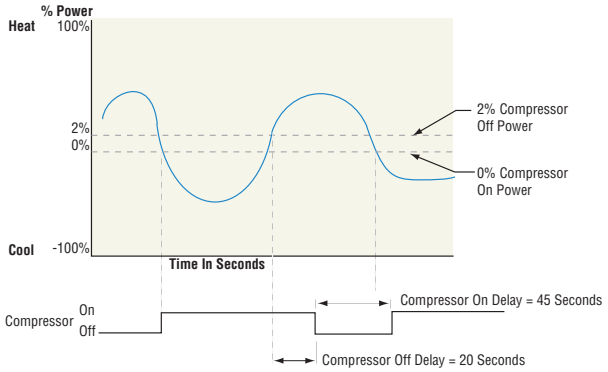


Cascade



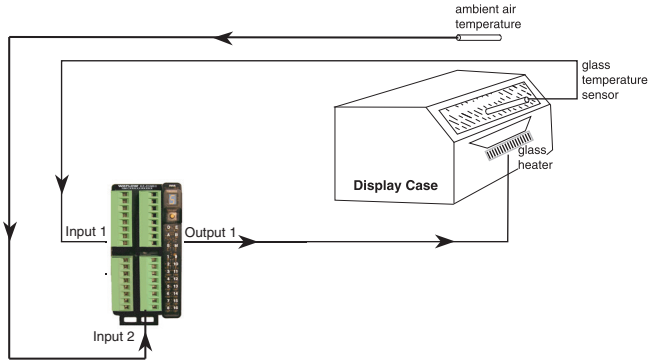
Compressor Control

The compressor control can save wear on a compressor and prevent it from locking up from short cycling. A bypass valve operated by a control output regulates how the process is cooled, while another output switches the compressor on and off. The compressor will not turn on until the output power exceeds the Compressor On % Power for a time longer than the Compressor On Delay. The compressor will not turn off until the output power exceeds the Compressor Off % Power for a time longer than the Compressor Off Delay.



Differential Control

After configuring the appropriate inputs and their associated internal functions Differential Control allows the RMC to drive an output based on the difference between those analog inputs.

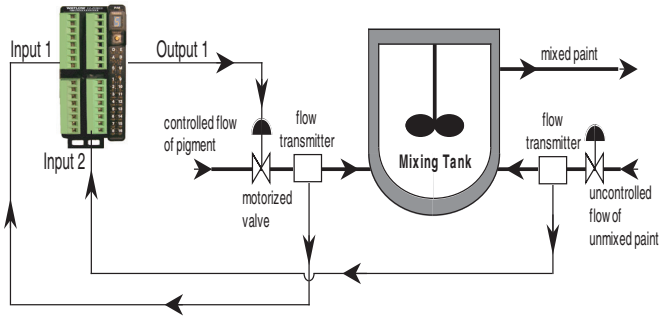


Ratio Control

Ratio control is commonly used to ensure that two or more flows are kept at the same ratio even if the flows are changing; especially useful in applications that mix materials.

Applications of ratio control:

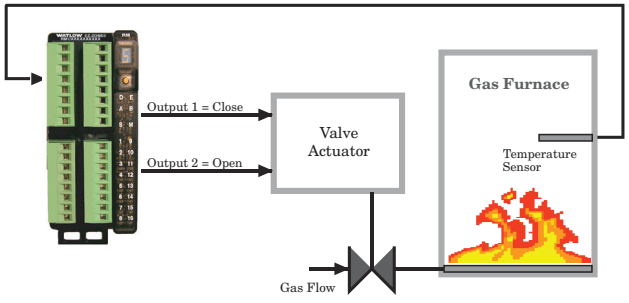
- Blending two or more flows to produce a mixture with specified composition.
- Blending two or more flows to produce a mixture with specified physical properties.
- Maintaining correct air and fuel mixture to combustion.



Motorized Valve Control

A motorized valve is used is to regulate the flow of fluid which in turn impacts the loop process value. A valve is opened or closed by closing contacts to drive the value in the intended direction. This feature is configured by selecting Motorized Valve as the function in the Setup Page, Special Output Function menu. Source Function A is selected for either Heat or Cool Power then entering the Valve Travel Time and Deadband.

Lastly, program the outputs which will open and close the valve. The algorithm will calculate Dead Time which is the minimum on time that the valve will travel once it is turned on in either the closed or open direction. Dead Time = Valve Dead Band / 100 * Valve Travel Time.



Alarms

Alarms are activated when the output level, process value or temperature leaves a defined range. A user can configure how and when an alarm is triggered, what action it takes and whether it turns off automatically when the alarm condition is over.

Configure alarm outputs in the Setup Page before setting alarm set points.

Alarms do not have to be assigned to an output. Alarms can be monitored and controlled through the front panel or by using software.

Process and Deviation Alarms

A process alarm uses one or two absolute set points to define an alarm condition.

A deviation alarm uses one or two set points that are defined relative to the control set point. High and low alarm set points are calculated by adding or subtracting offset values from the control set point. If the set point changes, the window defined by the alarm set points automatically moves with it.

Select the alarm type [A.tY] via the Setup Page, Alarm Menu.

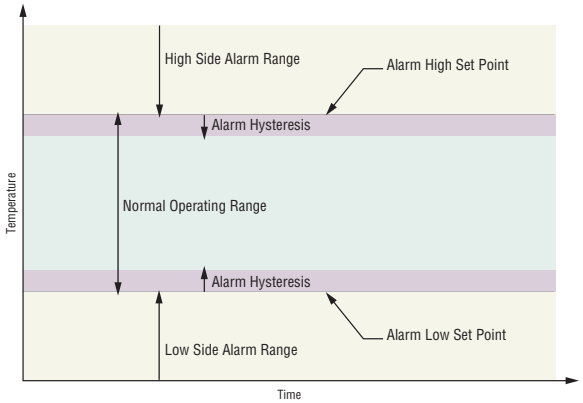
Alarm Set Points

The alarm high set point defines the process value or temperature that will trigger a high side alarm. The alarm low set point defines the temperature that will trigger a low side alarm. For deviation alarms, a negative set point represents a value below closed loop set point. A positive set point represents a value above closed loop set point. View or change alarm set points with Alarm Low [A.Lo] and Alarm High Set Points [A.h i] (Operations Page, Alarm Menu).

Alarm Hysteresis

An alarm state is triggered when the process value reaches the alarm high or alarm low set point. Alarm Hysteresis defines how far the process must return into the normal operating range before the alarm can be cleared.

Alarm Hysteresis is a zone inside each alarm set point. This zone is defined by adding the hysteresis value to the alarm low set point or subtracting the hysteresis value from the alarm high set point. View or change Alarm Hysteresis [A.hY] via the Setup Page, Alarm Menu.



Alarm Set Points and Hysteresis

Alarm Latching

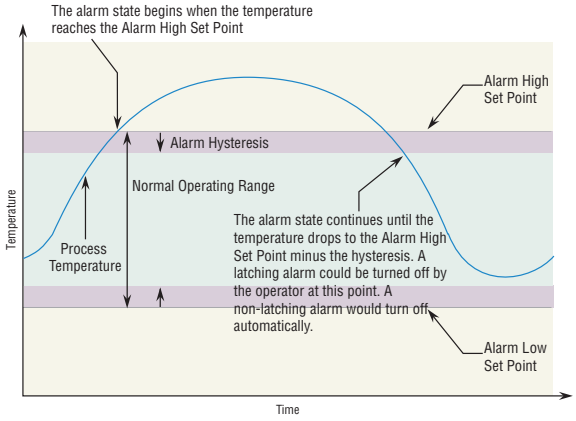
A latched alarm will remain active after the alarm condition has passed. It can only be deactivated by the user and only when the alarm condition no longer exists.

If using an RUI an active message, such as an alarm message, will cause the display to toggle between the normal settings and the active message in the upper display and AtAn in the lower display. To clear a latched alarm:

1. Push the Advance Key to display iSrc in the upper display and the message source in the lower display.
2. Use the Up or Down keys to scroll through possible responses, such as Clear CLr or Silence SiL.
3. Push the Advance or Infinity key to execute the action.

Without an RUI, a latched alarm can be reset by cycling power to the module or configuring an Action function within the control to perform a reset. Do this by setting the Action Function to alarm and trigger the Action to occur through Source Function A.

An alarm that is not latched (self-clearing) will deactivate automatically when the alarm condition has passed. Turn Alarm Latching A1LA on or off via the Setup Page, Alarm Menu.



Alarm Response with Hysteresis

Alarm Silencing

If alarm silencing is on the operator can disable the alarm output while the controller is in an alarm state. The process value or temperature has to enter the normal operating range beyond the hysteresis zone to activate the alarm output function again.

If using an RUI an active message, such as an alarm message, will cause the display to toggle between the normal settings and the active message in the upper display and AtAn in the lower display. To silence an alarm:

1. Push the Advance Key to display iSrc in the upper display and the message source in the lower display.
2. Use the Up and Down keys to scroll through possible responses, such as Clear CLr or Silence SiL.
3. Push the Advance or Infinity key to execute the action.

Without an RUI, silencing aa alarm can be accomplished by configuring an Action function within the control to silence the alarm. Do this by setting the Action Function to Silence and trigger the Action to occur through Source Function A.

Turn Alarm Silencing A1SI on or off via the Setup Page, Alarm Menu.

Alarm Blocking

Alarm blocking allows a system to warm up after it has been started up. With alarm blocking on, an alarm is not triggered when the process temperature is initially lower than the alarm low set point or higher than the alarm high set point. The process temperature has to enter the normal operating range beyond the hysteresis zone to activate the alarm function.

If the RMC module has an output that is functioning as a deviation alarm, the alarm is blocked when the set point is changed, until the process value re-enters the normal operating range.

Turn Alarm Blocking A1bL on or off via the Setup Page, Alarm Menu.

Resetting a Tripped Limit

When a limit controller is ordered (RMC[**5,6**] _ [**5,6**] _ [**5,6**] _ [**5,6**] _ _ _ _ _) output 2 (digit 4), output 4 (digit 6), output 6 (digit 8) or output 8 (digit 10) will always be a Form A (normally open) Mechanical Relay and it will always be internally tied to the limit function. When the limit is in a safe state the internal coil for this relay will be energized, therefore the relay will be closed. When a condition occurs that causes the limit to trip, the internal coil will deengerize causing the relay to latch open. When the condition that caused the limit to trip has been resolved, the relay will remain latched open until reset. The process to reset a latched limit can be different from control to control and is dependent upon the controller firmware version.

To check the firmware revision of your control do one of the following:

If Used in Conjunction with an Remote User Interface

1. Navigate to the RMC Factory Page by simultaneously pushing and holding the Advance Key and the Infinity for approximately 8 seconds and then use the up or down arrow key to navigate to the Diagnostic Menu. Once there, push the Advance Key twice where the revision rEv will be shown in the lower display and the upper display will indicate the current firmware revision.

Execute One of the Following Steps to Reset a Tripped Limit Prior to Firmware Release 6.0:

1. Push the Advance Key and then push the Up or Down keys and select Clear [CLr].
2. Configure an Action Function to Limit Reset assigning the Source Function to a digital input (navigate to the Setup Page under the Action Menu).
3. Use a field bus protocol, i.e., Modbus, EtherNet/IP, etc...where a value of zero would be written to the associated address (to find the appropriate address, navigate to the Operations Page and then the Limit Menu. Under the Limit Menu look for Limit Clear Request).
4. Cycle the power to the controller.

Execute One of the Following Steps to Reset a Tripped Limit with Firmware Release 6.0 and above:

1. Push the Advance Key and then push the Up or Down keys and select Clear [CLr].
2. Follow the steps below:

   2a. Navigate to the Setup Page and then the Limit Menu

   2b. Set Source Function A to the desired device that will reset the limit (Digital I/O, Variable or Function Key)

   2c. Define the Source Instance and Zone
3. Use a field bus protocol, i.e., Modbus, EtherNet/IP, etc...where a value of zero would be written to the associated address (navigate to the Operations Page and look for Limit Clear Request under the Limit Menu to find appropriate address).
4. Cycle the power to the controller.

Current Sensing

Open heater circuit detection

Current Error [C.Er] (Operations Page, Current Menu) detects an open load circuit if no current is flowing through the current transformer when the output associated with the current sense input is active and the load is supposed to be on.

Shorted heater circuit detection

Current Error detects a shorted load circuit if current is flowing through the current transformer when the output is inactive and the load is supposed to be off.

Set the current detect set points with High Set Point [C.h 1] and Low Set Point [C.Lo] (Operations Page, Current Menu).

View the current level and most recent faults with Read, Current Error [C.Er] (Operations Page, Current Menu) and Heater Error [h.Er] (Operations Page, Current Menu).

Open Loop Detection

When Open Loop Detection is enabled [L.dE], the controller will look for the power output to be at 100%. Once there, the control will then begin to monitor the Open Loop Detect Deviation [L.dd] as it relates to the value entered for the Open Loop Detect Time [L.dt]. If the specified time period expires and the deviation does not occur, an Open Loop Error will be triggered. Once the Open Loop Error condition exists the control mode will go off.

Note:

All prompts identified in this section can be found in the Loop Menu of the Setup Page.

Programming the EZ Key/s

If using an RUI, the EZ Key can be configured either in the Setup Menu or with EZ-ZONE configurator software, using a personal computer.

The following examples show how to program the EZ Key to start and stop a profile.

1. To go to the Setup Page from the Home Page, press both the Up and Down keys for six seconds. [A 1] will appear in the upper display and [SEt] will appear in the lower display.
2. Press the Up Key until [Fun] appears in the upper display and [SEt] will appear in the lower display.
3. Press the Advance Key until Digital Input Level [LEu] appears in the lower display. Use an arrow key to specify the state of the key (high or low) when the controller is powered up. Functions will toggle with each press of the EZ Key, such as Profile Start/Stop.
4. Press the Advance Key. The lower display will show Digital Function [Fn]. Press the Up or Down key to scroll through the functions that can be assigned to the EZ Key

   When Profile Start/Stop [P.St.S] appears in the upper display and [Fn] appears in the lower display, press the Advance Key once to select that function and move to the Function Instance [F 1] parameter.
5. Press the Up or Down key to scroll to the profile that you want the EZ Key to control.
6. The instance tells the controller which of the numbered functions should be acted upon. For profiles, there are 25 instances. Press the Infinity Key once to return to the submenu, twice to return to the main menu or three times to return to the Home Page.

Using Lockout to Hide Pages and Menus

If unintentional changes to parameter settings might raise safety concerns or lead to downtime, your can use the lockout feature to make them more secure. These settings will affect any access using Standard

Bus, including the RUI. This does not affect field protocol access.

Each of the menus in the Factory Page and each of the pages, except the Factory Page, has a security level assigned to it. You can change the read and write access to these menus and pages by using the parameters in the Lockout Menu (Factory Page).

Lockout Menu

There are five parameters in the Lockout Menu (Factory Page):

- Lock Operations Page [LoC.o] sets the security level for the Operations Page. (default: 2)

Note:
The Home and Setup Page lockout levels are fixed and cannot be changed.

- Lock Profiling Page [LoC.P] sets the security level for the Profiling Page. (default: 3)
- Password Security Enable [PAS.E] will turn on or off the Password security feature. (default: off)
- Read Lockout Security [rLoC] determines which pages can be accessed. The user can access the selected level and all lower levels. (default: 5)
- Set Lockout Security [SLoC] determines which parameters within accessible pages can be written to. The user can write to the selected level and all lower levels. (default: 5)

The table that follows represents the various levels of lockout for the Set Lockout Security prompt and the Read Lockout Security prompt. The Set Lockout has 6 levels (0-5) of security where the Read Lockout has 5 (1-5). Therefore, level "0" applies to Set Lockout only. "Y" equates to yes (can write/read) where "N" equates to no (cannot write/read). The colored cells simply differentiate one level from the next.

Lockout Security [SLoC] & [rLoC]						
Lockout Level	0	1	2	3	4	5
Home Page	Y	Y	Y	Y	Y	Y
Operations Page	N	N	Y	Y	Y	Y
Setup Page	N	N	N	N	Y	Y
Profile Page	N	N	N	Y	Y	Y
Factory Page						
Custom Menu	N	N	N	N	N	Y
Diagnostic Menu	N	Y	Y	Y	Y	Y
Calibration Menu	N	N	N	N	N	Y
Lockout Menu						
[LoC.0]	N	Y	Y	Y	Y	Y
[LoC.P]	N	Y	Y	Y	Y	Y
[PAS.E]	N	Y	Y	Y	Y	Y
[rLoC]	Y	Y	Y	Y	Y	Y
[SLoC]	Y	Y	Y	Y	Y	Y

The following examples show how the Lockout Menu parameters may be used in applications:

1. You can lock out access to the Operations Page but allow an operator access to the Profile Menu, by changing the default Profile Page and Operations Page security levels. Change Lock Operations Page [LoC.o] to 3 and Lock Profiling Page [LoC.P] to 2. If Set Lockout Security [SLoC] is set to 2 or higher and the Read Lockout Security [rLoC] is set to 2, the Profiling Page and Home Pages can be accessed, and all writable parameters can be written to. Pages with security levels greater than 2 will be locked out (inaccessible).
2. If Set Lockout Security [SLoC] is set to 0 and Read Lockout Security [rLoC] is set to 5, all pages will be accessible, however, changes will not be allowed on any pages or menus, with one exception: Set Lockout Security [SLoC] can be changed to a higher level.
3. The operator wants to read all the menus and not allow any parameters to be changed.

   In the Factory Page, Lockout Menu, set Read Lockout Security [rLoC] to 5 and Set Lockout Security [SLoC] to 0.
4. The operator wants to read and write to the Home Page and Profiling Page, and lock all other pages and menus.

   In the Factory Page, Lockout Menu, set Read Lockout Security [rLoC] to 2 and Set Lockout Security [SLoC] to 2.

   In the Factory Page, Lockout Menu, set Lock Operations Page [LoC.0] to 3 and Lock Profiling Page [LoC.P] to 2.
5. The operator wants to read the Operations Page, Setup Page, Profiling Page, Diagnostics Menu, Lock Menu, Calibration Menu and Custom Menus. The operator also wants to read and write to the Home Page.

   In the Factory Page, Lockout Menu, set Read Lockout Security [rLoC] to 1 and Set Lockout Security [SLoC] to 5.

   In the Factory Page, Lockout Menu, set Lock Operations Page [LoC.0] to 2 and Lock Profiling Page [LoC.P] to 3.

Using Password Security

It is sometimes desirable to apply a higher level of security to the control where a limited number of menus are visible and not providing access to others without a security password. Without the appropriate password those menus will remain inaccessible. If Password Enabled [PAS.E] in the Factory Page under the [LoC] Menu is set to on, an overriding Password Security will be in effect. When in effect, the only Pages that a User without a password has visibility to are defined in the Locked Access Level [LoC.L] prompt. On the other hand, a User with a password would have visibility restricted by the Read Lockout Security [rLoC]. As an example, with Password Enabled and the Locked Access Level [LoC.L]

set to 1 and [rLoC] is set to 3, the available Pages for a User without a password would be limited to the Home and Factory Pages (locked level 1). If the User password is entered all pages would be accessible with the exception of the Setup Page as defined by level 3 access.

How to Enable Password Security

Go to the Factory Page by holding down the Infinity key and the Advance key for approximately six seconds. Once there, push the Down key one time to get to the [LoC] menu. Again push the Advance key until the Password Enabled [PAS.E] prompt is visible. Lastly, push either the up or down key to turn it on. Once on, 4 new prompts will appear:

1. [LoC.L], Locked Access Level (1 to 5) correspond ing to the lockout table above.
2. [roLL], Rolling Password will change the Customer Code every time power is cycled.
3. [PAS.u], User Password which is needed for a User to acquire access to the control.
4. [PAS.A], Administrator Password which is needed to acquire administrative access to the control.

The Administrator can either change the User and or the Administrator password or leave them in the default state. Once Password Security is enabled they will no longer be visible to anyone other than the Administrator. As can be seen in the formula that follows either the User or Administrator will need to know what those passwords are to acquire a higher level of access to the control. Back out of this menu by pushing the Infinity key. Once out of the menu, the Password Security will be enabled.

How to Acquire Access to the Control

To acquire access to any inaccessible Pages or Menus, go to the Factory Page and enter the [ULoC] menu. Once there follow the steps below:

Note:

If Password Security (Password Enabled [PAS.E] is On) is enabled the two prompts mentioned below in the first step will not be visible. If unknown, call the individual or company that originally setup the control.

1. Acquire either the User Password [PAS.u] or the Administrator Password [PAS.A].
2. Push the Advance key one time where the Code [CodE] prompt will be visible.

Note:

a. If the the Rolling Password is off push the Advance key one more time where the Password [PASS] prompt will be displayed. Proceed to either step 7a or 8a. Pushing the Up or Down arrow keys enter either the User or Administrator Password. Once entered, push and hold the Infinity key for two seconds to return to the Home Page.

b. If the Rolling Password [roLL] was turned on proceed on through steps 3 - 9.

3. Assuming the Code [CodE] prompt (Public Key) is still visible on the face of the control simply push the Advance key to proceed to the Password [PASS] prompt. If not find your way back to the Factory Page as described above.
4. Execute the calculation defined below (7b or 8b) for either the User or Administrator.
5. Enter the result of the calculation in the upper display play by using the Up and Down arrow keys or use EZ-ZONE Confgurator Software.
6. Exit the Factory Page by pushing and holding the Infinity key for two seconds.

Formulas used by the User and the Administrator to calculate the Password follows:

Passwords equal:

7. **User**
   a. If Rolling Password [roLL] is Off, Password [PASS] equals User Password [PAS.u].
   b. If Rolling Password [roLL] is On, Password [PASS] equals:
   ([PAS.u] x code) Mod 929 + 70
8. **Administrator**
   a. If Rolling Password [roLL] is Off, Password [PASS] equals Administrator Password [PAS.A].
   b. If Rolling Password [roLL] is On, Password [PASS] equals:
   ([PAS.A] x code) Mod 997 + 1000

Differences Between a User Without Password, User With Password and Administrator

- User **without** a password is restricted by the Locked Access Level [LoC.L].
- A User **with** a password is restricted by the Read Lockout Security [rLoC] never having access to the Lock Menu [LoC].
- An Administrator is restricted according to the Read Lockout Security [rLoC] however, the Administrator has access to the Lock Menu where the Read Lockout can be changed.

Modbus - Using Programmable Memory Blocks

When using the Modbus protocol, the RMC module features a block of addresses that can be configured by the user to provide direct access to a list of 40 user configured parameters. This allows the user easy access to this customized list by reading from or writing to a contiguous block of registers.

To acquire a better understanding of the tables found in the back of this manual (See Appendix: (Modbus Programmable Memory Blocks) please read

through the text below which defines the column headers used.

Assembly Definition Addresses

- Fixed addresses used to define the parameter that will be stored in the "Working Addresses", which may also be referred to as a pointer. The value stored in these addresses will reflect (point to) the Modbus address of a parameter within the RM control.

Assembly Working Addresses

- Fixed addresses directly related to their associated "Assembly Definition Addresses" (i.e., Assembly Working Addresses 200 & 201 will assume the parameter pointed to by Assembly Definition Addresses 40 & 41).

When the Modbus address of a target parameter is stored in an "Assembly Definition Address" its corresponding working address will return that parameter's actual value. If it's a writable parameter, writing to its working register will change the parameter's actual value.

As an example, Modbus registers 726 and 727 contain the Limit 1 High Set Point (See Operations Page, Limit Menu). If the value 726 and 727 is loaded into Assembly Definition Address 110 and 111 respectively (by default these registers are configured as Alarm 8 State), the Limit 1 High Set Point will now be stored in Modbus registers 270 and 271.

The table (See Appendix: Modbus Programmable Memory Blocks) identified as "Assembly Definition Addresses and Assembly Working Addresses" reflects the assemblies and their associated addresses.

Software Configuration

Using EZ-ZONE® Configurator Software

To enable a user to configure the RMC module using a personal computer (PC), Watlow has provided free software for your use. If you have not yet obtained a copy of this software insert the CD (Controller Support Tools) into your CD drive and install the software. Alternatively, if you are viewing this document electronically and have a connection to the internet simply click on the link below and download the software from the Watlow web site free of charge.

http://www.watlow.com/products/software/zone_config.cfm

Once the software is installed double click on the EZ-ZONE Configurator icon placed on your desktop during the installation process. If you cannot find the icon follow the steps below to run the software:

1. Move your mouse to the "Start" button
2. Place the mouse over "All Programs"
3. Navigate to the "Watlow" folder and then the subfolder "EZ-ZONE Configurator"
4. Click on EZ-ZONE Configurator to run.

The first screen that will appear is shown below.

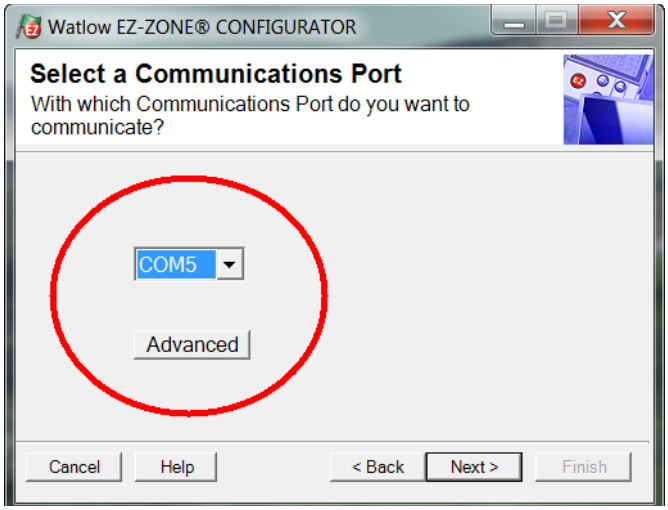
If the PC is already physically connected to the RMC module click the next button to go on-line.

Note:

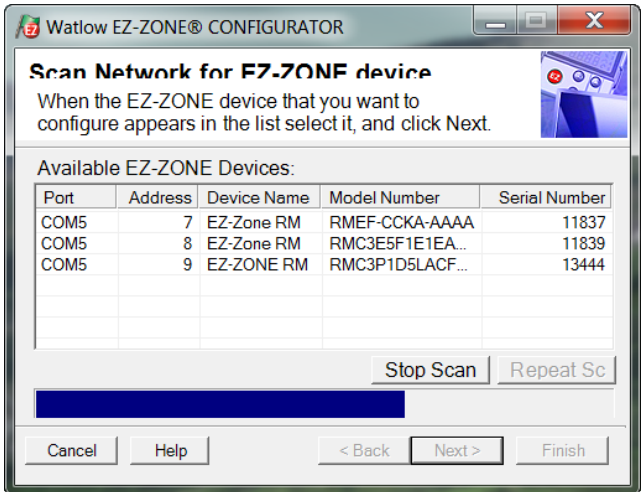
When establishing communications from PC to the RMC module an interface converter will be required. The Standard Bus network uses EIA-485 as the interface. Most PCs today would require a USB to EIA-485 converter. However, some PCs may still be equipped with EIA-232 ports, therefore an EIA-232 to EIA-485 converter would be required.

As can be seen in the above screen shot the software provides the user with the option of downloading a previously saved configuration as well as the ability to create a configuration off-line to download later. The screen shots that follow will take the user on-line.

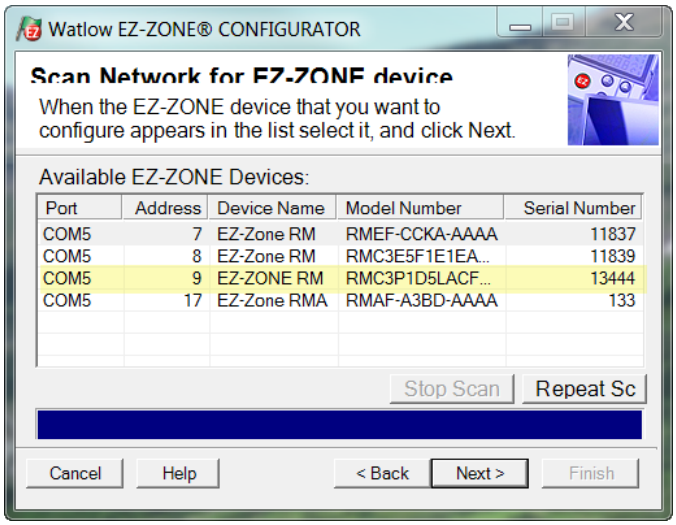
After clicking the next button above, it is necessary to define the communications port on the PC to use.



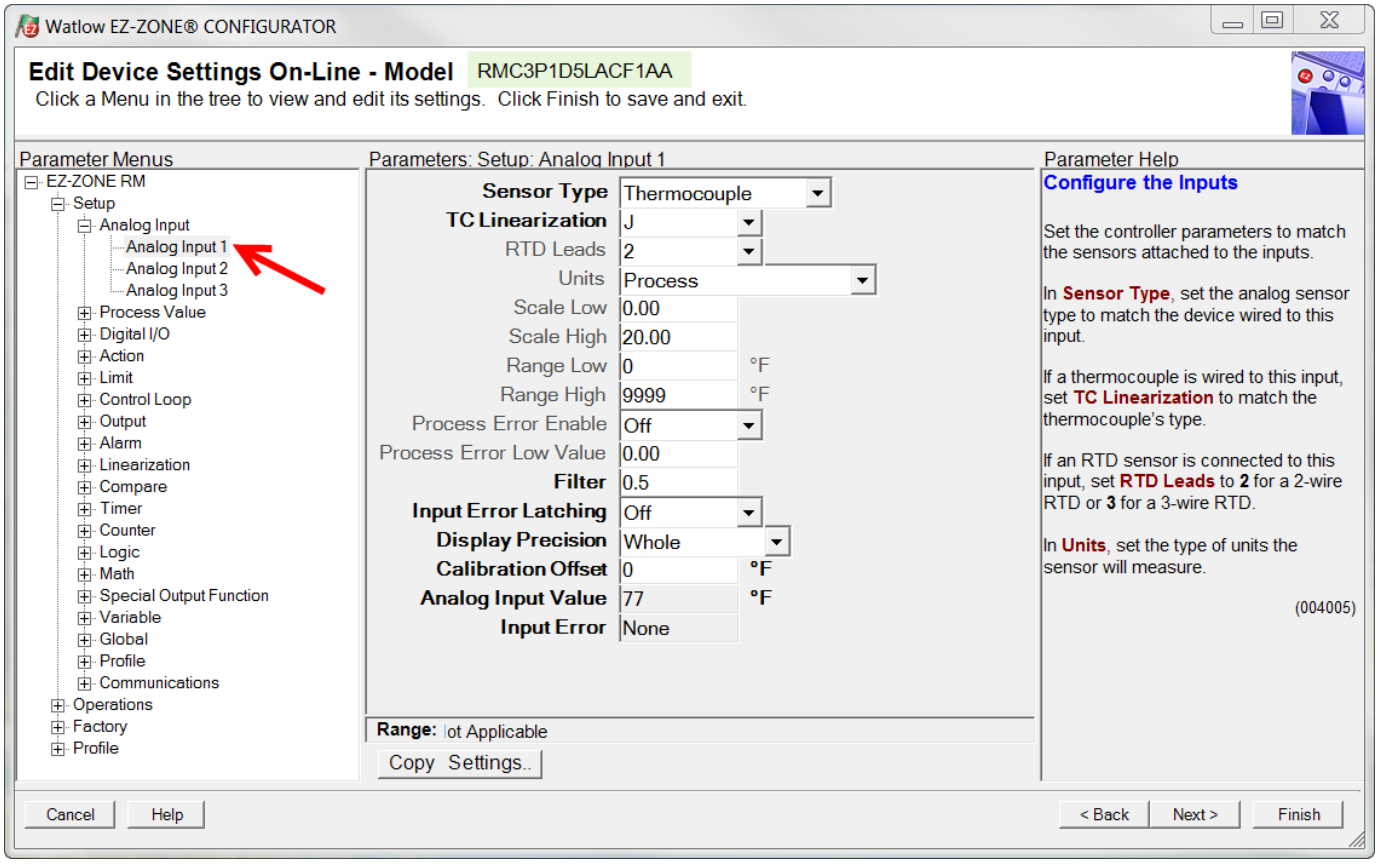
The available options allows the user to click on a drop down box to select a specific known communications port. Clicking on the Advanced button allows the user to define the number of EZ-ZONE devices to look for on the network. The screen that follows shows that the software is scanning for devices on the network and that progress is being made.



When complete the software will display all of the available devices found on the network as shown below.



In the previous screen shot the RMC is shown highlighted to bring greater clarity to the control in focus. Any EZ-ZONE device on the network will appear in this window and would be available for the purpose of configuration or monitoring. After clicking on the control of choice simply click the next button once again. The next screen appears below.



In the screen shot above notice that the device part number is clearly displayed at the top of the page (green highlight added for emphasis). When multiple EZ-ZONE devices are on the network it is important that the part number be noted prior to configuring so as to avoid making unwanted configuration changes to another control.

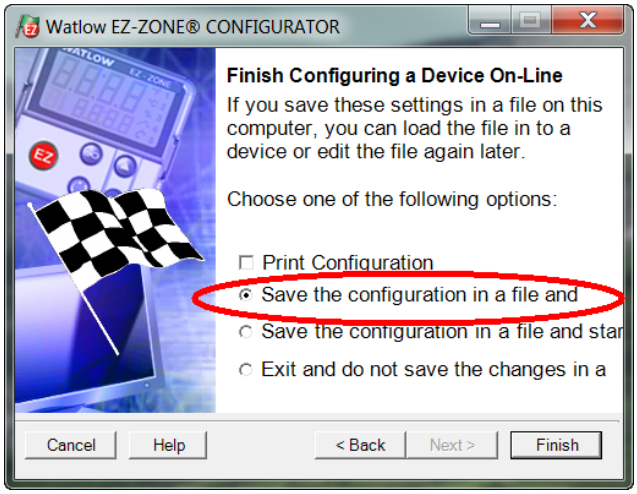
Looking closely at the left hand column (Parameter Menus) notice that it displays all of the available menus and associated parameters within the control. The menu structure as laid out within this software follows:

- Setup
- Operations
- Factory
- Profile

Navigating from one menu to the next is easy and clearly visible. Simply slide the scroll bar up or down to display the menu and parameter of choice. As an alternative, clicking on the negative symbol next to Setup will collapse the Setup Menu where the Operations Menu will appear next and perhaps deliver more clarity for the area of focus by not displaying unwanted menus and parameters. Once the focus is brought to an individual parameter (single click of mouse) as is the case for Analog Input 1 in the left column, all that can be setup related to that parameter will appear in the center column. The grayed out fields in the center column simply mean that this does not apply for the type of sensor selected. As an example, notice that when TC Linearization is select-ed, RTD Leads does not apply and is therefore grayed out. To speed up the process of configuration notice that at the bottom of the center column there is an option to copy settings. If Analog Input 1, 2 and 3 are the same type of sensor click on "Copy Settings" where a copy from/to dialog box will appear allowing for quick duplication of all settings.

Notice too, that by clicking on any of those items in the center column that context sensitive help will appear for that particular item in the right hand column.

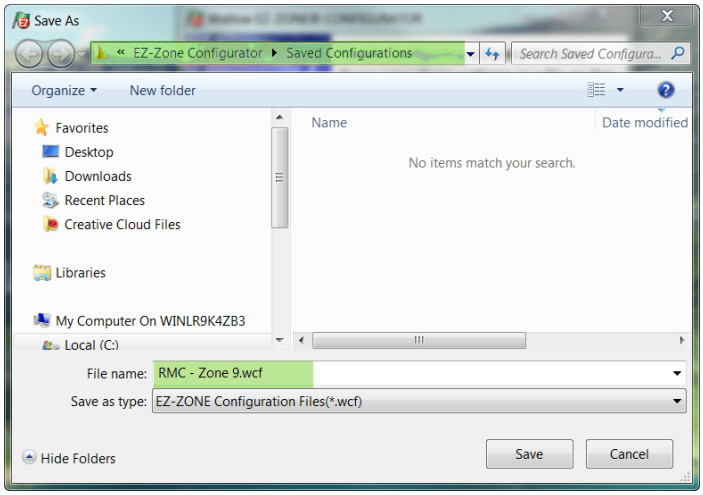
Lastly, when the configuration is complete click the "Finish" button at the bottom right of the previous screen shot. The screen that follows this action can be seen below.



Although the RMC module now contains the configuration (because the previous discussion focused on doing the configuration on-line) it is suggested that after the configuration process is completed that the user save this file on the PC for future use. If for some reason someone inadvertently changed a setting without understanding the impact it would be easy and perhaps faster to download a saved configuration back to the control versus trying to figure out what was changed.

Of course, there is an option to exit without saving a copy to the local hard drive.

After selecting Save above, click the "Finish" button once again. The screen below will than appear.



When saving the configuration note the location where the file will be placed (Saved in) and enter the file name (File name) as well. The default path for saved files follows:

\My Documents\Watlow\EZ-ZONE CONFIGURATOR\Saved Configurations

The user can save the file to any folder of choice.

Function Block Descriptions

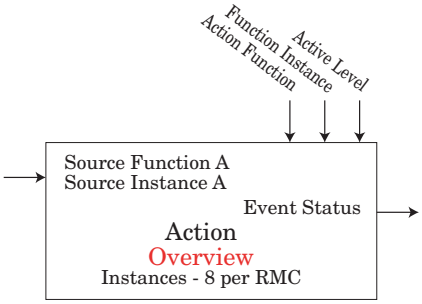
Each of the next several pages graphically shows each of the RMC function blocks. Note that as you view each you will find text that is black and text that appears gray. The gray text represents inputs that are not currently available based on the functions defined use (red text). For instance, when the defined use of the Analog Input function is set for RTD, TC Linearization will appear gray. Ranges specified are in units or degrees F, if expressed in degrees C, the range will be smaller.

Action Function

The Action Function will cause the action selected to occur when Source Function A = ON and Active Level = High. The active level specifies when the action occurs. A digital value that is high causes the action function when Active Level = High. A digital value that is low causes the action function when Active Level = Low. Based on a given input (Digital I/O, Event output, Logic function, etc), the Action function can cause other functions to occur. To name a few, starting and stopping a profile, silencing alarms, turn control loops off and placing alarms in non-alarm state.

Note:

Note: Action Function selection is module type and part number dependant.



ACt Action Menu
SEt Setup Page

- Fn Action Function : None, User Set Restore, Limit Reset*, Alarm, Silence Alarms, Control Loops Off and Alarms to Non-alarm State, Force Alarm to Occur, Idle Set Point, Tune, Manual, Switch Control Loop Off, Remote Set Point, TRU-TUNE+ Disable, Profile Disable, Profile Hold/Resume, Start Profile,
- F I Function Instance : 0 to 25
- SFn.A Source Function A : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Limit, Logic, Timer, Variable
- S I.A Source Instance A : 1 to 250
- S2.A Source Zone A : 0 to 16
- LEv Active Level : High, Low

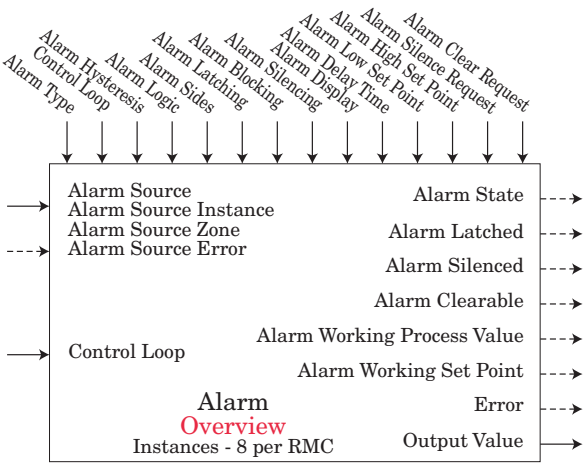
* Not available in firmware release 6.0 and above

ACt Action Menu
oPEr Operation Page

- E.IS Event Status : On, Off

Alarm Function

The Alarm function will cause the output to change states when Alarm Source exceeds Alarm Set Points.



ALrM Alarm Menu
SEt Setup Page

- AtY Alarm Type : Off, Deviation, Process
- Sr.A Alarm Source : Analog Input, Current, Power, Linearization, Math, Process Value, Variable, Current Read
- I.SA Alarm Source Instance : 1 to 250
- S2.A Alarm Source Zone : 0 to 16
- LooP Control Loop : 1 to 4
- A.hY Alarm Hysteresis : 0.001 to 9,999.000
- A.Lg Alarm Logic : Close on Alarm, Open on Alarm
- A.Sd Alarm Sides : Both, High, Low
- A.Lo Alarm Low Set Point : -1,999.000 to 9,999.000°F
- A.h I Alarm High Set Point: -1,999.000 to 9,999.000°F
- A.LA Alarm Latching : Non-Latching, Latching
- A.bL Alarm Blocking : Off, Startup, Set Point, Both
- A.S I Alarm Silencing : Off, On
- A.dSP Alarm Display : Off, On
- A.dL Alarm Delay Time : 0 to 9,999 seconds
- A.CLr Alarm Clear Request : 0
- A.S Ir Alarm Silence Request : 0
- A.St Alarm State: Startup, None, Blocked, Alarm Low, Alarm High, Error

ALrM Alarm Menu
oPEr Operation Page

- A.Lo Alarm Low Set Point : -1,999.000 to 9,999.000
- A.h I Alarm High Set Point : -1,999.000 to 9,999.000

Alarm Clear Request : Ignore, Clear

Alarm Silence Request : Ignore, Silence

Alarm State : Startup, None, Blocked, Alarm Low, Alarm High, Error

Alarm Latched : No, Yes

Alarm Silenced : No, Yes

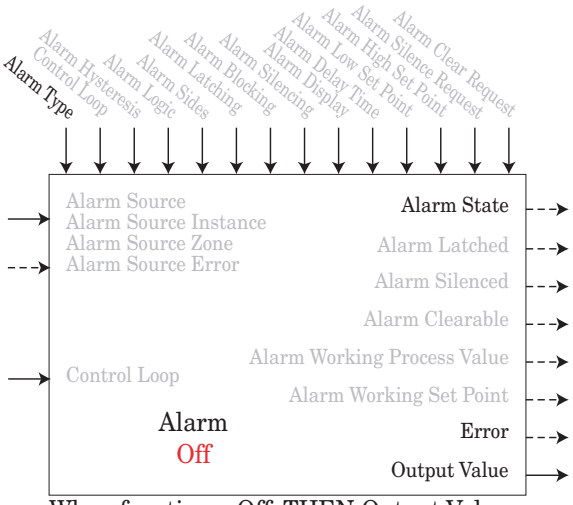
Alarm Clearable : No, Yes

Alarm Working Process Value : -1,999.000 to 9,999.000

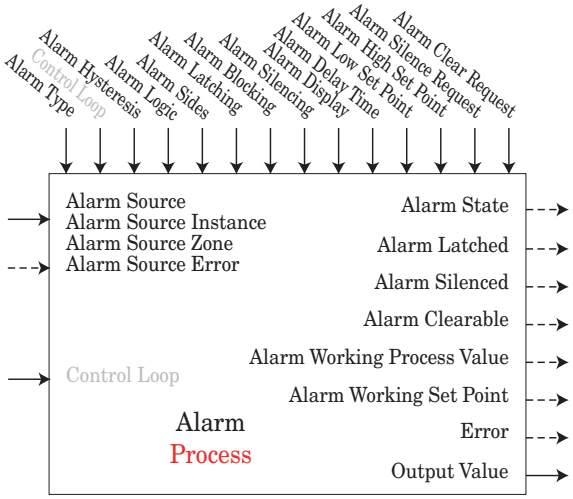
Alarm Working Set Point : -1,999.000 to 9,999.000

Error : None, Open, Shorted, Measurement Error, Bad Cal Data, Ambient Error, Fail, Not Sourced

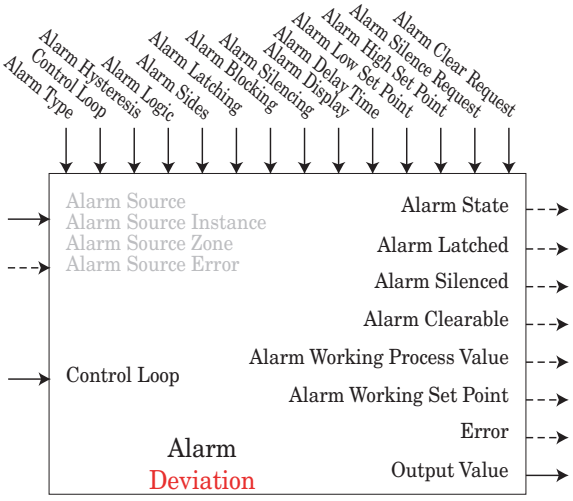
Output Value : On, Off



When function = Off THEN Output Value = OFF Alarm State = None Alarm Indication = None



When function= Process THEN Alarm Variable = Process Value

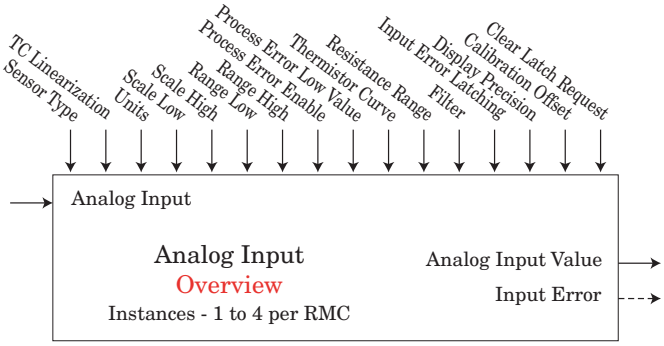


When function = Deviation THEN Alarm Variable = Process Value - Closed Loop Set Point + Alarm Set Point

Analog Input Function

Note:

This Function configures and connects physical inputs to internal functions. Control Loop primary source instance must match Process Value or Analog Input instance.



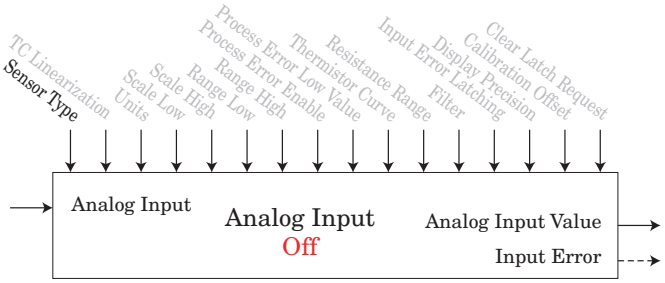
AI Analog Input Menu
SEt Setup Page

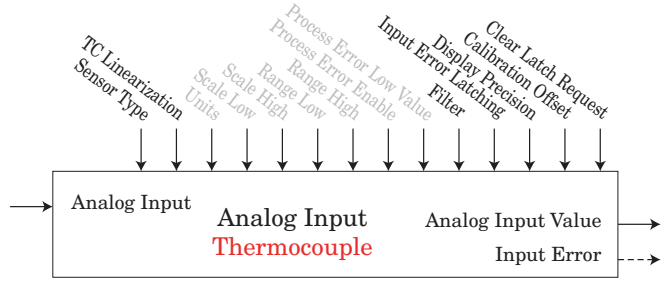
- SEn Sensor Type : Off, Thermocouple, Millivolts, Volts, Milliamps, RTD 100 Ohm, RTD 1000 Ohm, 1K Potentiometer, Thermistor (optional)
- rtL Number of RTD Leads: 2 or 3
- L in TC Linearization : B, C, D, E, F, J, K, N, R, S, T
- Unit Units : Absolute Temperature, Power, Process, Relative Humidity
- SLo Scale Low : -100.00 to 1000.00
- Shi Scale High : -100.00 to 1000.00
- rLo Range Low : -1,999.000 to 9,999.000
- rhi Range High : -1,999.000 to 9,999.000
- PEE Process Error Enable : Off, Low
- PEL Process Error Low Value : -100.00 to 1,000.00
- tC Thermistor Curve : Curve A, Curve B, Curve C, Custom
- rr Resistance Range : 5k, 10k, 20k, 40k
- FiL Filter : 0.0 to 60.0 seconds
- iEr Input Error Latching : Off, On
- dEC Display Precision : Whole, Tenths, Hundredths, Thousandths
- iCA Calibration Offset : -1,999.000 to 9,999.000
- AIn Analog Input Value : -1,999.000 to 9,999.000

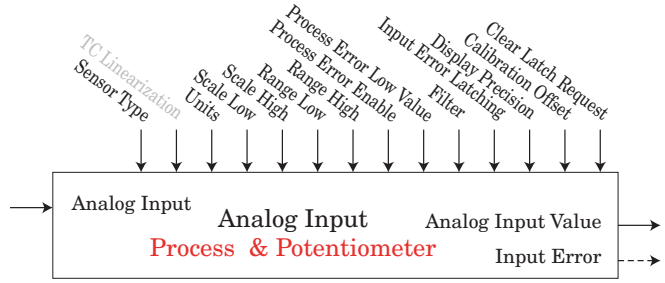
AI Analog Input Menu
oPEr Operation Page

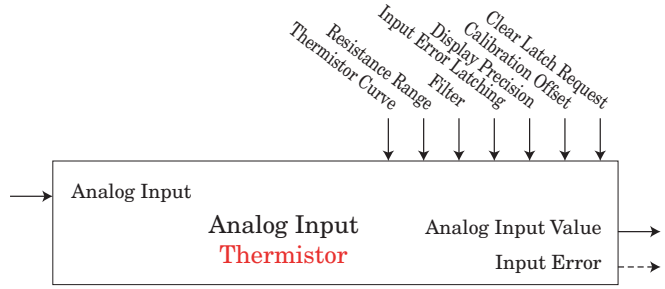
- AIn Analog Input Value : -1,999.000 to 9,999.000
- iEr Input Error : None, Open, Shorted, Measurement Error, Bad Cal Data, Ambient Error, RTD Error, Fail, Not Sourced
- iCA Calibration Offset : -1,999.000 to 9,999.000

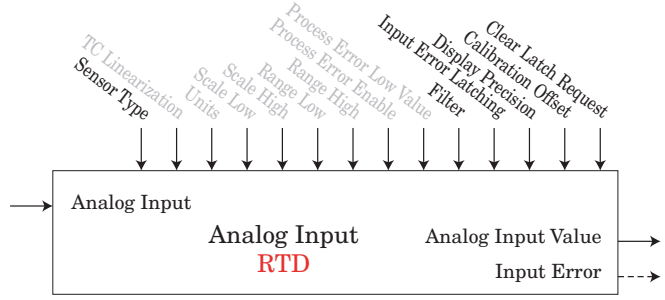
Clear Latch Request : Clear, Ignore







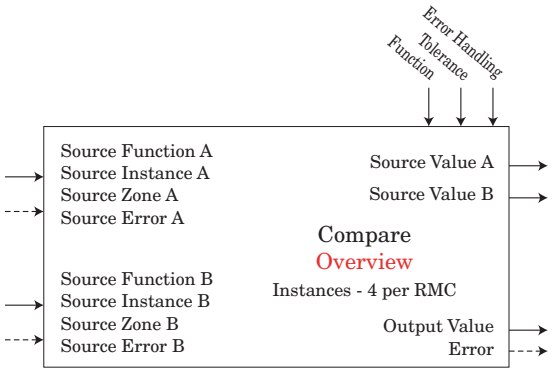




Compare Function

An error, when read, can indicate any of the following: None, Open, Shorted, Measurement Error, Bad Cal Data, Ambient Error, RTD Error, Fail, Math Error, Not Sourced, Stale

Tolerance is expressed in the same units as Source A. For the function to work properly Source A and Source B must be without errors.

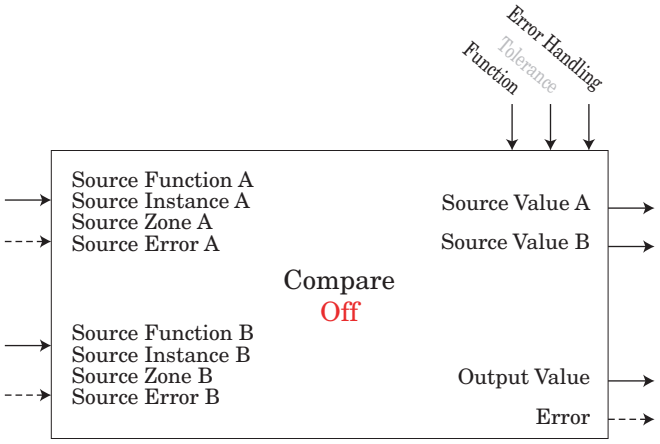


CPE Compare Menu
SEt Setup Page

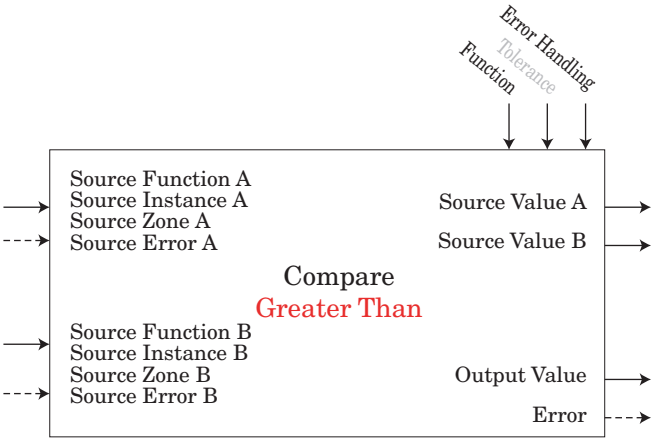
- Fn Function : Off, Greater Than, Less Than, Equal To, Not Equal To,
- tol Tolerance : 0.0 to 9,999.000 units or F
- SFn.A Source Function A : None, Analog Input, Current, Cool Power, Heat Power, Power, Linearization, Math, Process Value, Set Point Closed, Set Point Open, Variable
- S .A Source Instance A : 1 to 250
- S2.A Source Zone A : 0 to 16
- SFn.b Source Function B : None, Analog Input, Current, Cool Power, Heat Power, Power, Linearization, Math, Process Value, Set Point Closed, Set Point Open, Variable
- S .b Source Instance B : 1 to 250
- S2.b Source Zone B : 0 to 16
- Er.h Error Handling : False Bad, False Good, True Bad, True Good

CPE Compare Menu
oPEr Operation Page

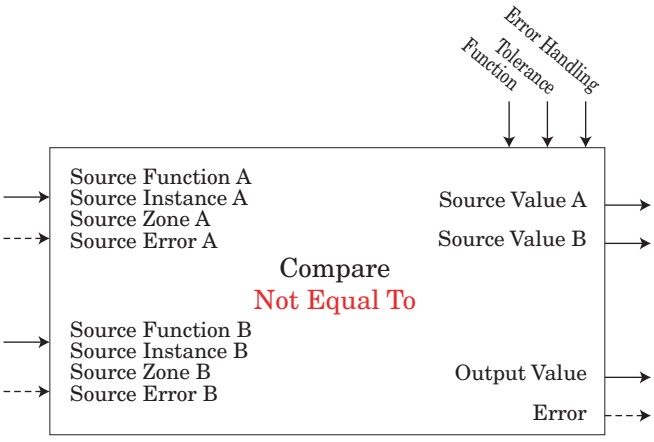
- Su.A Source Value A : -1,999.000 to 9,999.000 units or F
- Su.b Source Value B : -1,999.000 to 9,999.000 units or F
- ou Output Value : Off, On



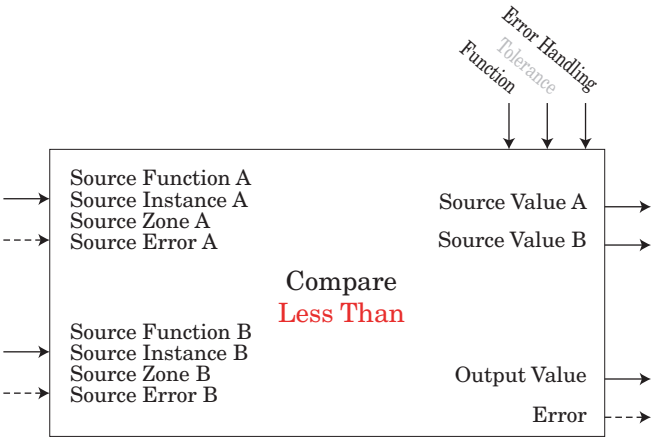
No Compare, Output Value = OFF



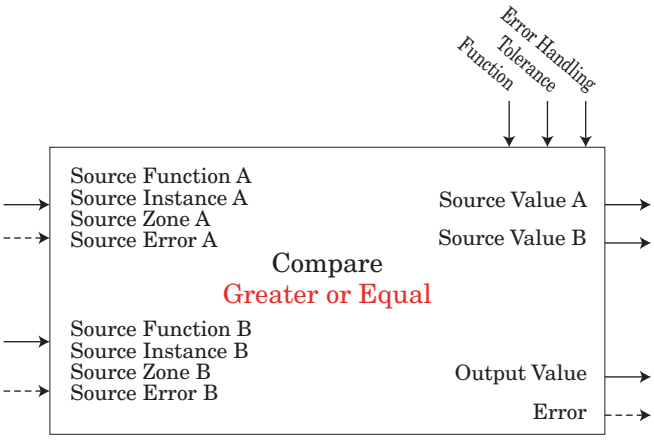
A>B, Output Value = ON



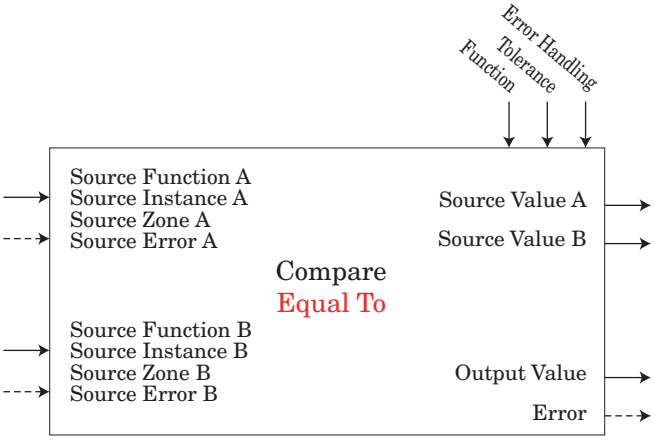
A not equal B, Output Value = ON



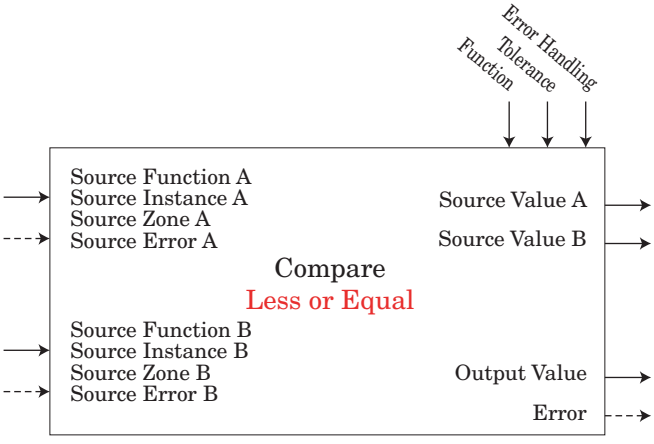
A<B, Output Value = ON



A>=B, Output Value = ON

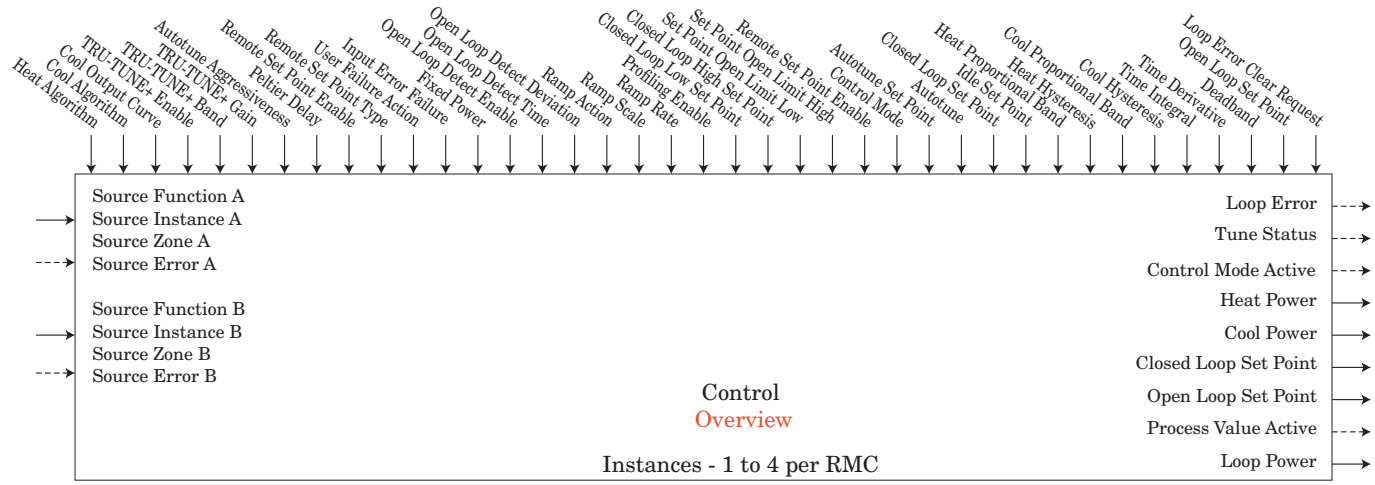


A=B, Output Value = ON



A<=B, Output Value = ON

Control Function



LooP Loop Menu
SEt Setup Page

- SFnA Source Function A : Analog Input, Process Value
- ,SA Source Instance A : (not changeable)*
- hAG Heat Algorithm : Off, PID, On/Off
- CAG Cool Algorithm : Off, PID, On/Off
- CCr Cool Output Curve : Off, Non-linear curve 1, Non-linear curve 2
- tEUn TRU-TUNE+ Enable : No, Yes
- tEbnd TRU-TUNE+ Band : 0 to 100
- tEGn TRU-TUNE+ Gain : 1 to 6
- tAGr Autotune Aggressiveness : Under, Critical, Over
- PdL Peltier Delay : 0.0 to 5.0
- rEn Remote Set Point Enable : No, Yes
- SFnb Source Function B : (Remote Set Point Source) : None, Analog Input, Current, Cool Power, Heat Power, Power, Linearization, Math, Process Value, Set Point Closed, Set Point Open, Variable
- S ,b Source Instance B (Remote Set Point Source Instance) : 1 to 250
- S2b Source Zone B : 0 to 16
- rtY Remote Set Point Type : Auto, Manual
- UFA User Failure Action : Off, Bumpless Transfer, Manual Power, User
- FA ,L Input Error Failure : Off, Bumpless Transfer, Manual Power, User
- PnAn Fixed Power : -100.0 to 100.0 %
- LdE Open Loop Detect Enable : No, Yes
- Ldt Open Loop Detect Time : 0 to 3,600 seconds
- Ldd Open Loop Detect Deviation : -1,999.000 to 9,999.000
- rP Ramp Action : Off, Startup, Set Point, Both
- rSC Ramp Scale : Hours, Minutes
- rrt Ramp Rate : 0.000 to 9,999.000
- ProE Profiling Enable: No, Yes
- LSP Low Set Point : -1,999.000 to 9,999.000
- hSP High Set Point : -1,999.000 to 9,999.000
- SPLo Set Point Open Limit Low : -100.0 to 100.0 %
- SPH, Set Point Open Limit High : -100.0 to 100.0 %

Note: Control Loop primary source instance must match Process Value or Analog Input instance.

MnOn Monitor Menu
oPEr Operation Page

- CPnA Control Mode Active : Off, Auto, Manual
- hPr Heat Power : 0.0 to 100.0 %
- CPr Cool Power : 0.0 to 100.0 %
- CSP Closed Loop Set Point : -1,999.000 to 9,999.000
- PvA Process Value Active : -1,999.000 to 9,999.000

LooP Loop Menu
oPEr Operation Page

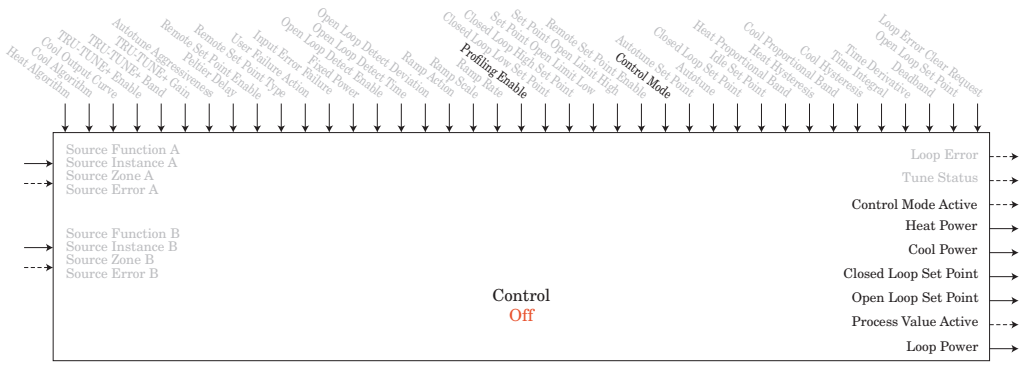
- rEn Remote Set Point Enable : No, Yes
- CPn Control Mode : Off, Auto, Manual
- AtSP Autotune Set Point : 50 to 200 %
- AUt Autotune : No, Yes
- CSP Closed Loop Set Point : -1,999.000 to 9,999.000
- ,dS Idle Set Point : -1,999.000 to 9,999.000
- hPb Heat Proportional Band : 0.001 to 9,999.000
- hhY Heat Hysteresis : 0.001 to 9,999.000
- CPb Cool Proportional Band : 0.001 to 9,999.000
- ChY Cool Hysteresis : 0.001 to 9,999.000
- t , Time Integral : 0 to 9,999 seconds
- td Time Derivative : 0 to 9,999 seconds
- db Deadband : -1,000.000 to 1,000.000
- oSP Open Loop Set Point : -100.0 to 100.0 %

Loop Power : -100.0 to 100.0 %

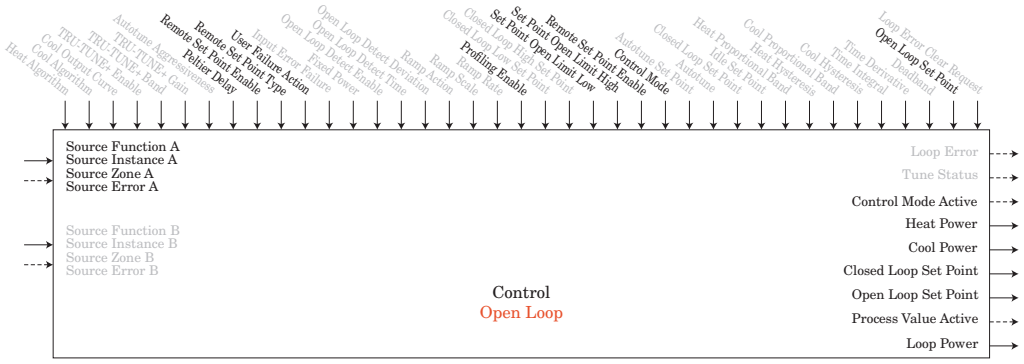
Loop Error: None, Open Loop, Reversed Sensor

Loop Error Clear Request : Ignore, Clear

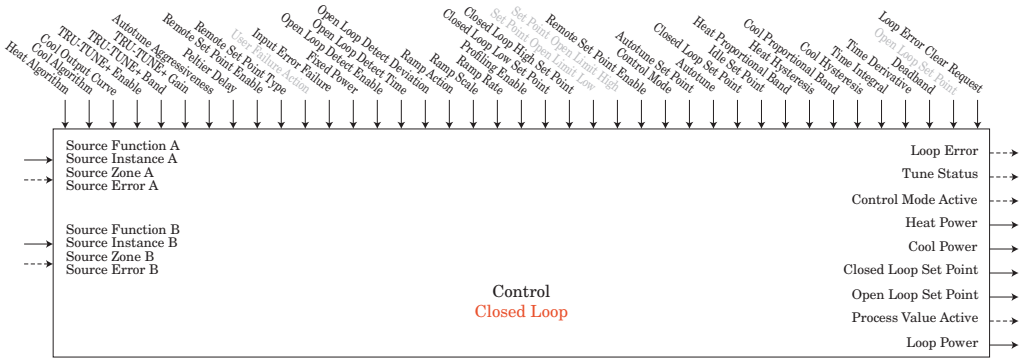
Tune Status : Off, Cross 1 Positive, Cross 1 Negative, Cross 2 Positive, Cross 2 Negative, Cross 3 Positive, Cross 3 Negative, Measuring Max, Measuring Min, Calculating, Complete, Timeout



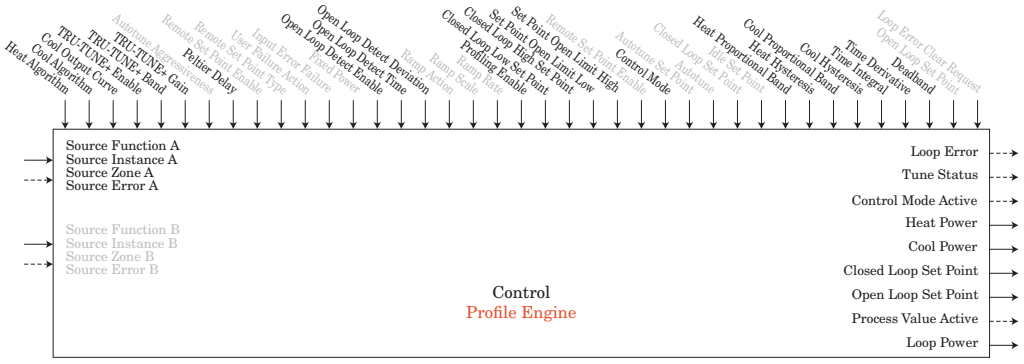
If Control Mode = Off : Heat Power, Cool Power and Loop Power = 0%



If Control Mode = Open Loop :
Open Loop Set Point = user entered value
Heat Power, Cool Power and Loop Power = Open Loop Set Point



If Control Mode = Closed Loop :
Closed Loop Set Point = user entered value
Heat Power, Cool Power and Loop Power = PID calculated power



If Control Mode = Profiling :
Closed Loop Set Point = Profile Step
Heat Power, Cool Power and Loop Power = PID calculated power

Counter Function

Function counts up or down from Load Value and produces Output Value = On when Count = Target Value.

Note:

Count value clears on power loss.

Load Value restored on power up.

Counter Operation:

Whenever a prescribed clock transition occurs without an error on source B the count will be equal to the Load Value.

If Function is an Up Counter:

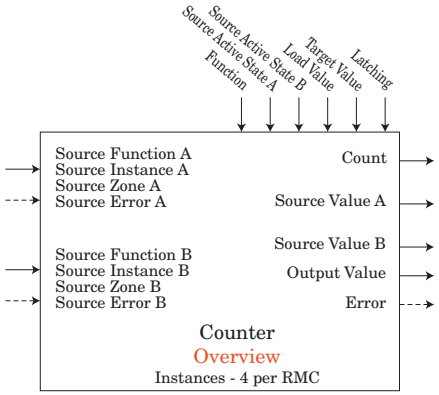
Whenever a prescribed clock transition occurs without an error on Source A the count will increment by +1. If the count is equal to 9,999 when the transition occurs count will be 1 after transition.

If Function is a Down Counter:

Whenever a prescribed clock transition occurs without an error on Source A the count will decrement by -1. If the count is equal to 0 when the transition occurs the count will be 9,999 after transition.

An error, when read, can indicate any of the following:

None, Open, Shorted, Measurement Error, Bad Cal Data, Ambient Error, RTD Error, Fail, Math Error, Not Sourced, Stale



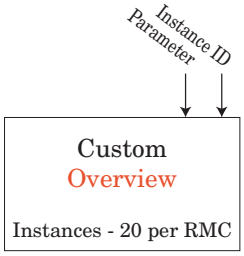
CtR Counter Menu
SEt Setup Page

- Fn Function : Up, Down
- SFnA Source Function A : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Logic, Timer, Variable
- S.iA Source Instance A : 1 to 250
- S2A Source Zone A : 0 to 16
- SASA Source Active State A (Active State Clock) : High (rising), Low (falling), Both (rising & falling)
- SFnA Source Function A : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Logic, Timer, Variable
- S.ib Source Instance B : 1 to 250
- S2b Source Zone B : 0 to 16
- SASb Source Active State B (Active State Load) : High, Low
- LoAd Load Value : 0 to 9,999
- trgt Target Value : 0 to 9,999
- LAt Latching : No, Yes

CtR Counter Menu
SEt Operation Page

- Cnt Count : 0 to 9,999
- SuA Source Value A : Off, On
- Sub Source Value B : Off, On
- ou Output Value : Off, On

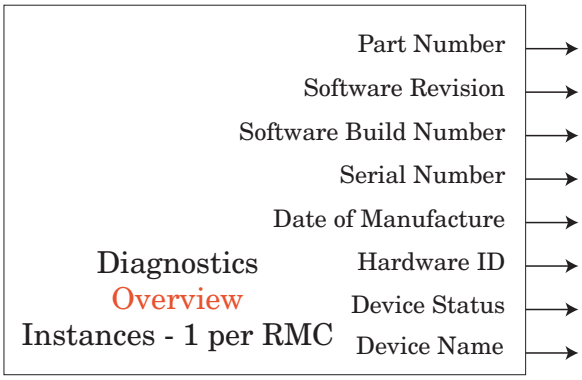
Custom Function



CUSt Custom Menu
FACt Factory Page

- PAr Parameter : None, Process, Calibration Offset, Display Units, User Settings Restore, Alarm Low Set Point, Alarm High Set Point, Alarm Hysteresis, Set Point, Active Process Value, Active Set Point, Open-Loop Set Point, Autotune, Control Mode, Heat Power, Cool Power, Time Integral, Time Derivative, Dead band, Heat Proportional Band, Heat Hysteresis, Cool Proportional Band, Cool Hysteresis, Ramp Rate, TRU-TUNE+ Enable, Idle Set Point, Custom, Profile Start, Profile Action Request, Guaranteed Soak Deviation Value, Current, Limit Low Set Point, Limit High Set Point, Limit Hysteresis, Limit Status
- id Instance ID : 1 to 24

Diagnostic Function



diAG Diagnostics Menu
FACt Factory Page

- Pn Part Number: scrolls on display
- rEv Software Revision: 1.00, ...
- SbLd Software Build Number : 0, 1, 2, ...
- Sn Serial Number : xxxxxx
- dAtE Date of Manufacture : YWW format

Hardware ID : 23 (RMC)

Device Status : OK, Fail

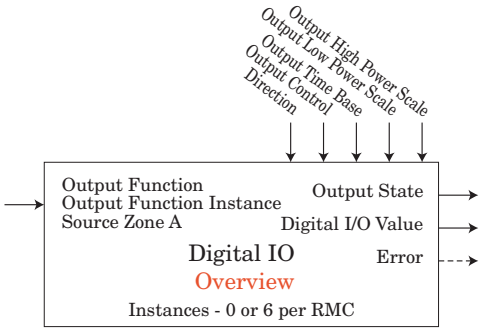
Device Name : EZ-ZONE RM

Digital Input/Output Function

Note:

Input Value is passed to either profile event inputs or action function blocks.

Output Value determined by Source A and Digital Output Function.



d io Digital I/O Menu
SEt Setup Page

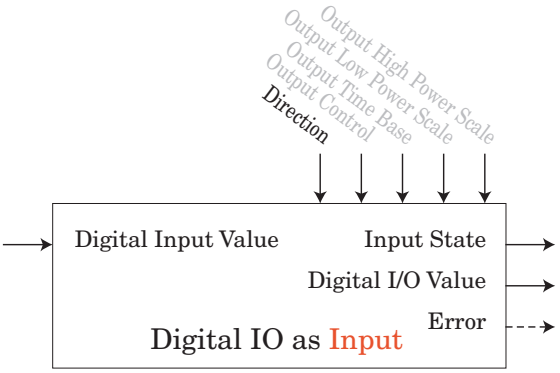
- dir Direction : Output, Input Voltage, Input Dry
- Fn Output Function : Off, Analog Input, Alarm, Cool Power, Heat Power, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Logic, Linearization, Math, Process Value, Special Function Output 1 to 4, Timer, Variable
- F i Output Function Instance : 1 to 250
- SrcA Source Zone A : 0 to 16
- oCtl Output Control : Fixed Time Base, Variable Time Base
- otb Output Time Base : 0.1 to 60.0 seconds
- olo Output Low Power Scale : 0.0 to 100.0 %
- oh i Output High Power Scale : 0.0 to 100.0 %

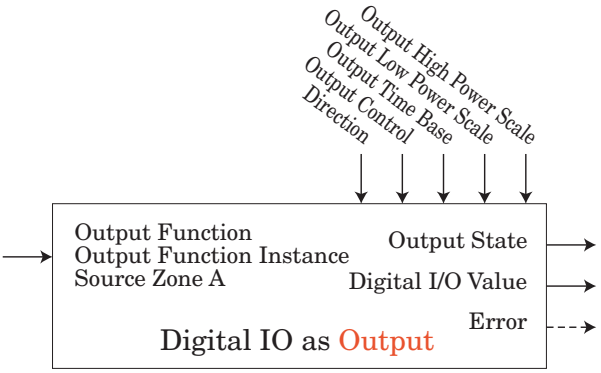
d io Digital I/O Menu
SEt Operation Page

- di.S Input State : On, Off
- do.S Output State : On, Off

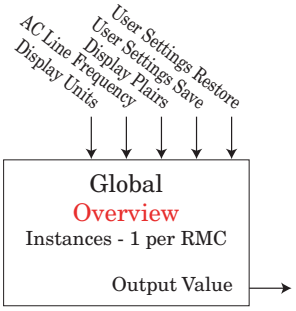
Digital Input Value : On, Off

An error, when read, can indicate any of the following: None, Open, Shorted, Measurement Error, Bad Cal Data, Ambient Error, RTD Error, Fail, Math Error, Not Sourced, Stale





Global Function



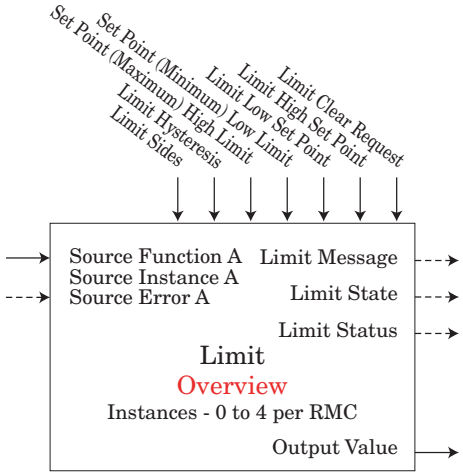
glbl Global Menu
SEt Setup Page

- C_F Display Units : F, C
- ACLF AC Line Frequency : 50 Hz, 60 Hz
- dPrS Display Pairs : 1 to 10
- USr.S User Settings Save : None, User Set 1, User Set 2*
- USr.r User Settings Restore : None, User Set 1, User Set 2, Factory

* Starting with firmware release 6, there is only one User Set.

Limit Function

This function uses a dedicated input and the output will change state when Source A exceeds limit set points. The limit, when tripped, must be manually cleared to reset the output and clear the message. The Analog Input and mechanical relay output are dedicated to each limit loop and are located in same module.



Source Function A : Analog Input
Source Instance A : fixed to 1, 2, 3, or 4

LIM Limit Menu
SET Setup Page

- LSd Limit Sides : Both, High, Low
- LHy Limit Hysteresis : 0.001 to 9,999.000
- SPLH Set Point (Maximum) High Limit : -1,999.000 to 9,999.000
- SPLL Set Point (Minimum) Low Limit : -1,999.000 to 9,999.000
- LHS Limit High Set Point : -1,999.000 to 9,999.000
- LLS Limit Low Set Point: -1,999.000 to 9,999.000
- SFnA Source Function: Digital I/O, Function Key, Variable
- SInA Source Instance: 1 to 250
- S2nA Source Zone: 0 to 16
- LCr Limit Clear Request: Ignore or Clear
- LSt Limit State: Off, None, Limit High, Limit Low, Error

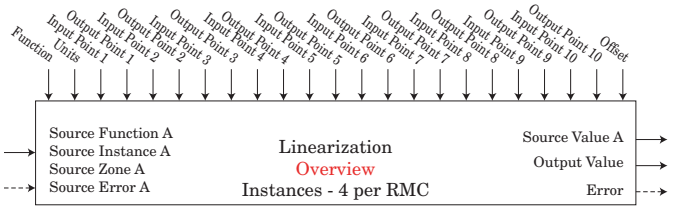
LIM Limit Menu
OPER Operation Page

- LLS Limit Low Set Point : -1,999.000 to 9,999.000
- LHS Limit High Set Point : -1,999.000 to 9,999.000

Linearization Function

This function will take an analog Source A and re-linearize using a 10-point offset, then add Offset and produce an Output Value.

An error, when read, can indicate any of the following: None, Open, Shorted, Measurement Error, Bad Cal Data, Ambient Error, RTD Error, Fail, Math Error, Not Sourced, Stale

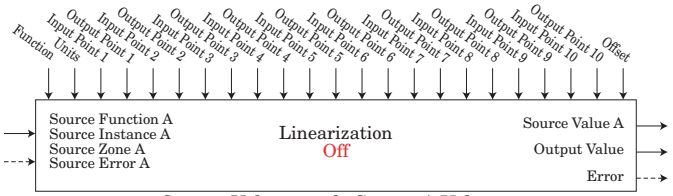


LIN Linearization
SET Setup Page

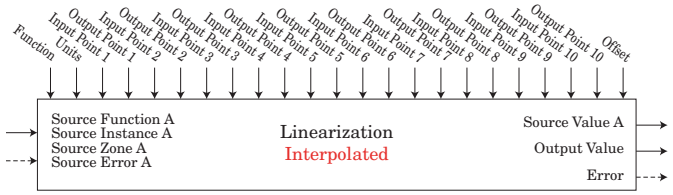
- FnA Function : Off, Interpolated, Stepped
- SFnA Source Function A : None, Analog Input, Current, Cool Power, Heat Power, Power, Linearization, Math, Process Value, Set Point Closed, Set Point Open, Variable
- SInA Source Instance A : 1 to 250
- S2nA Source Zone A : 0 to 16
- Unit Units : Source, None, Absolute Temperature, Relative Temperature, Power, Process, Relative Humidity
- InP1 Input Point 1 : -1,999.000 to 9,999.000
- oP1 Output Point 1 : -1,999.000 to 9,999.000
- InP2 Input Point 2 : -1,999.000 to 9,999.000
- oP2 Output Point 2 : -1,999.000 to 9,999.000
- InP3 Input Point 3 : -1,999.000 to 9,999.000
- oP3 Output Point 3 : -1,999.000 to 9,999.000
- InP4 Input Point 4 : -1,999.000 to 9,999.000
- oP4 Output Point 4 : -1,999.000 to 9,999.000
- InP5 Input Point 5 : -1,999.000 to 9,999.000
- oP5 Output Point 5 : -1,999.000 to 9,999.000
- InP6 Input Point 6 : -1,999.000 to 9,999.000
- oP6 Output Point 6 : -1,999.000 to 9,999.000
- InP7 Input Point 7 : -1,999.000 to 9,999.000
- oP7 Output Point 7 : -1,999.000 to 9,999.000
- InP8 Input Point 8 : -1,999.000 to 9,999.000
- oP8 Output Point 8 : -1,999.000 to 9,999.000
- InP9 Input Point 9 : -1,999.000 to 9,999.000
- oP9 Output Point 9 : -1,999.000 to 9,999.000
- InP10 Input Point 10 : -1,999.000 to 9,999.000
- oP10 Output Point 10 : -1,999.000 to 9,999.000

LIN Linearization Menu
OPER Operation Page

- SwA Source Value A : -1,999.000 to 9,999.000
- OFSt Offset : -1,999.000 to 9,999.000
- ou Output Value : -1,999.000 to 9,999.000

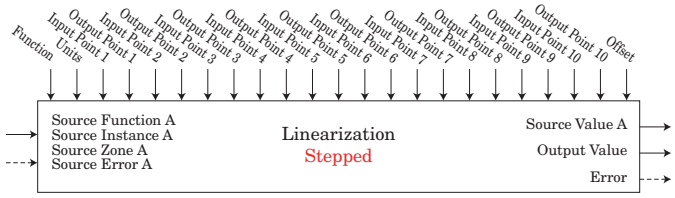


Output Value equals Source A Value



IF Source A < Input Point 1 THEN Output Value = Output Point 1 + Offset

ELSE WHILE ((Source A > Input Point n) AND (Input Point n < Input Point n+1)) n = n+1 UNTIL n is largest valid value. IF ((Source A >= Input Point n-1) AND (Input Value < Input Point n)) THEN Output Value = (Source A - Input Point n-1) * (Output Point n - Output Point n-1) / (Input Point n - Input Point n-1) + Output Point n-1 + Offset ELSE Output Value = Output Point n + Offset WHERE n = 1 to 10



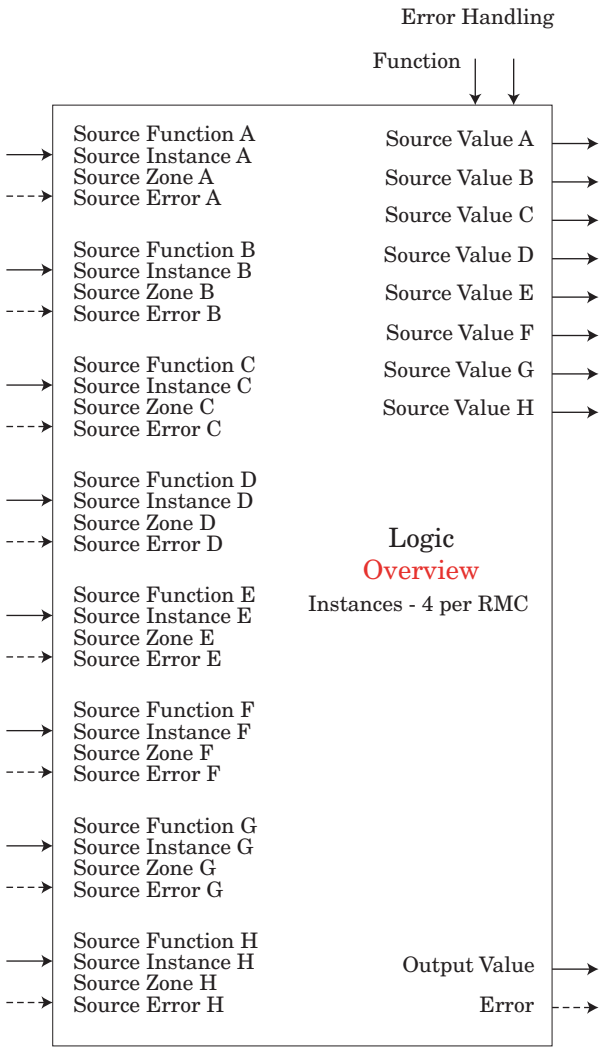
WHILE (Source A < Input Point n) n = n+1 FROM n = 2 UNTIL n is largest valid value

Output Value = Output Point n-1 + Offset

Note: if Source A < Input Point 2 then Output Value = Output Point 1; if Source A < Input Point 3 then out = Output Point 2; etc If Source A > last Input Point the Output Value = last Output Point.

The list of Input Point values are assumed to be in increasing order. If Input Point n < Input Point n-1 THEN Output Value = Output Point n-1

Logic Function



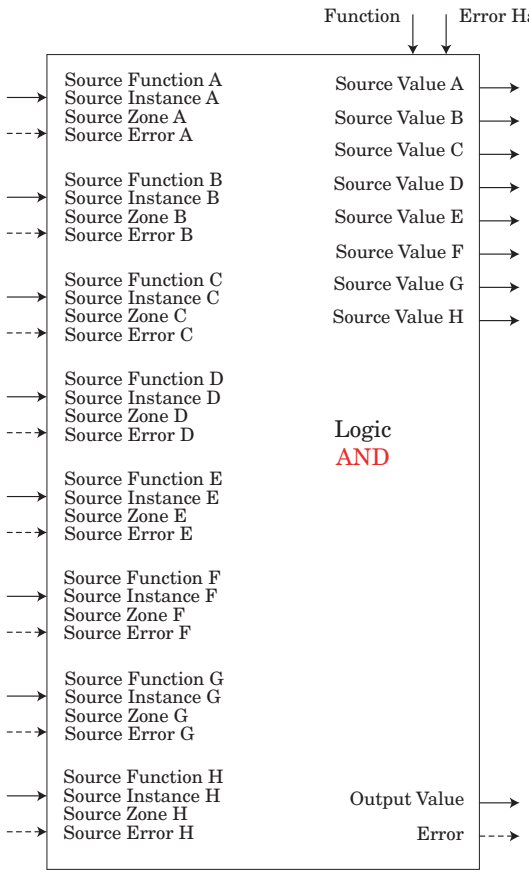
An error, when read, can indicate any of the following: None, Open, Shorted, Measurement Error, Bad Cal Data, Ambient Error, RTD Error, Fail, Math Error, Not Sourced, Stale

LGC Logic Menu
SEE Setup Page

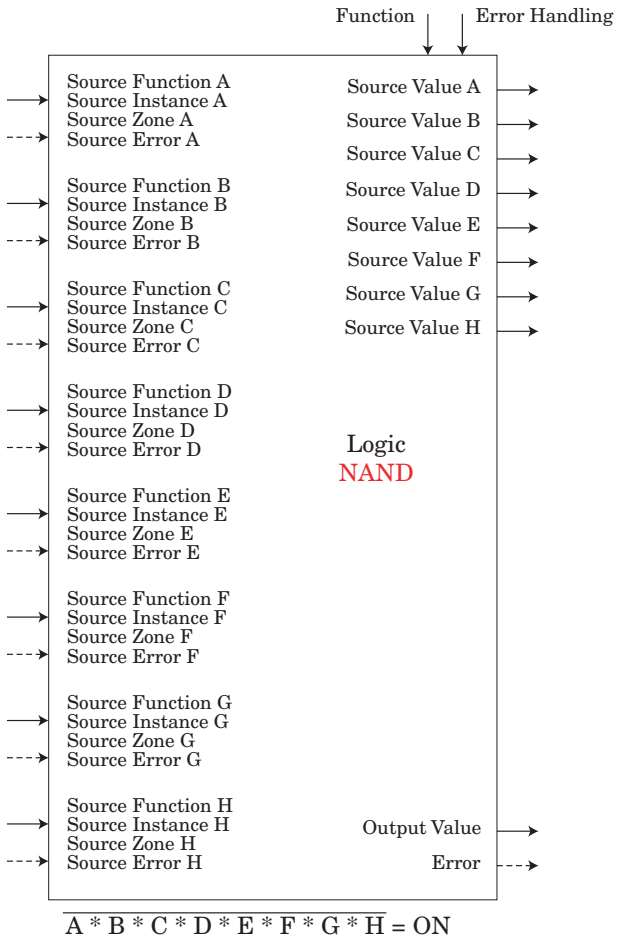
- Fn Function : Off, AND, OR, Equal To, NAND, NOR, Not Equal To, Latch, RS Flip Flop
- SFnA Source Function A : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Limit, Logic, Special Function Output 1 to 4, Timer, Variable
- S iA Source Instance A : 1 to 250
- S2A Source Zone A : 0 to 16
- SFnb Source Function B : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Limit, Logic, Special Function Output 1 to 4, Timer, Variable
- S ib Source Instance B : 1 to 250
- S2b Source Zone B : 0 to 16
- SFnC Source Function C : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Limit, Logic, Special Function Output 1 to 4, Timer, Variable
- S iC Source Instance C : 1 to 250
- S2C Source Zone C : 0 to 16
- SFnd Source Function D : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Limit, Logic, Special Function Output 1 to 4, Timer, Variable
- S id Source Instance D : 1 to 250
- S2d Source Zone D : 0 to 16
- SFnE Source Function E : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Limit, Logic, Special Function Output 1 to 4, Timer, Variable
- S iE Source Instance E : 1 to 250
- S2E Source Zone E : 0 to 16
- SFnF Source Function F : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Limit, Logic, Special Function Output 1 to 4, Timer, Variable
- S iF Source Instance F : 1 to 250
- S2F Source Zone F : 0 to 16
- SFnG Source Function G : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Limit, Logic, Special Function Output 1 to 4, Timer, Variable
- S iG Source Instance G : 1 to 250
- S2G Source Zone G : 0 to 16
- SFnh Source Function H : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Limit, Logic, Special Function Output 1 to 4, Timer, Variable
- S ih Source Instance H : 1 to 250
- S2h Source Zone H : 0 to 16
- Erh Error Handling : True Good, True Bad, False Good, False Bad

LGC Logic Menu
oPEr Operation Page

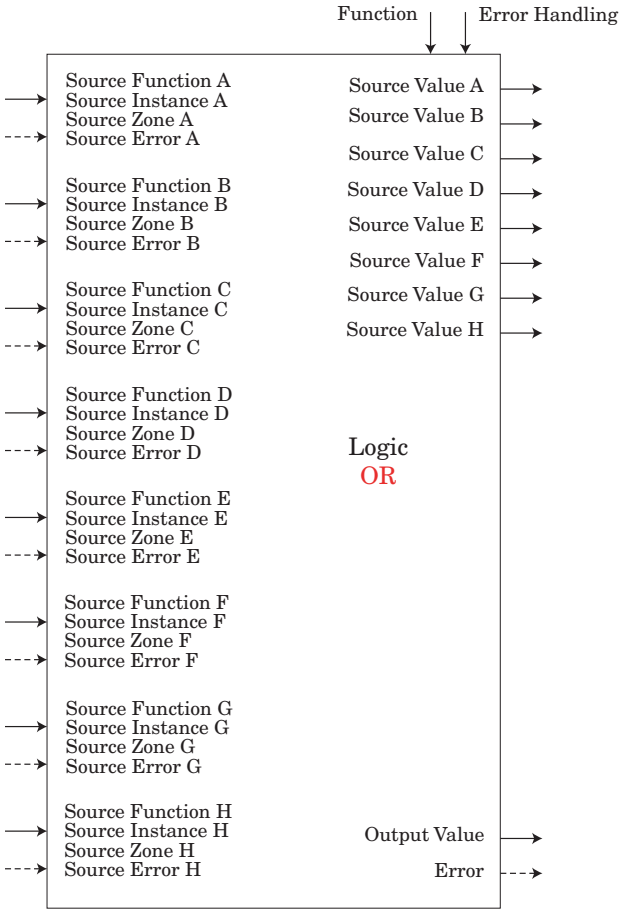
- SuA Source Value A : Off, On
- Sub Source Value B : Off, On
- SuC Source Value C : Off, On
- Sud Source Value D : Off, On
- SuE Source Value E : Off, On
- SuF Source Value F : Off, On
- SuG Source Value G : Off, On
- Suh Source Value H : Off, On
- ou Output Value : Off, On



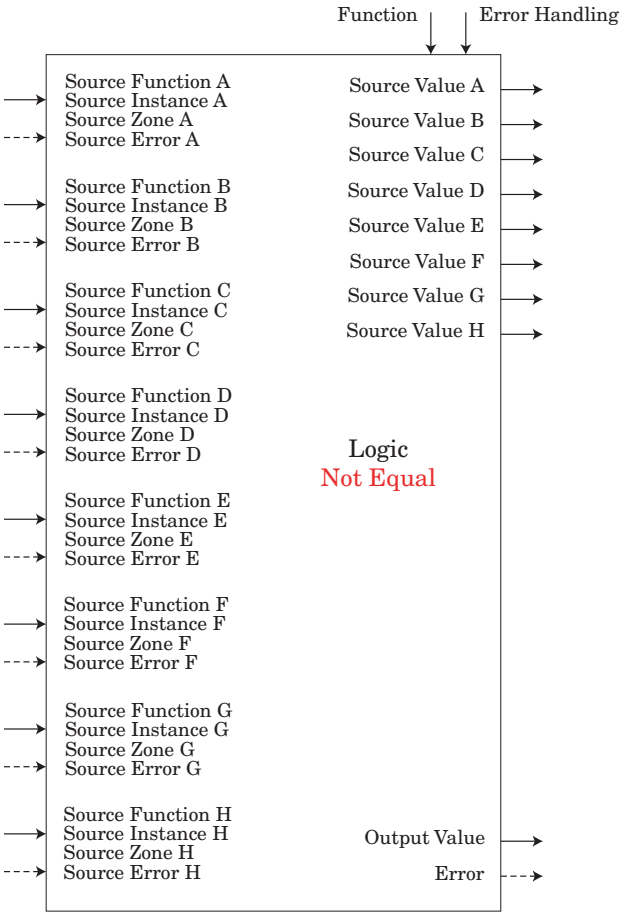
A * B * C * D * E * F * G * H = ON



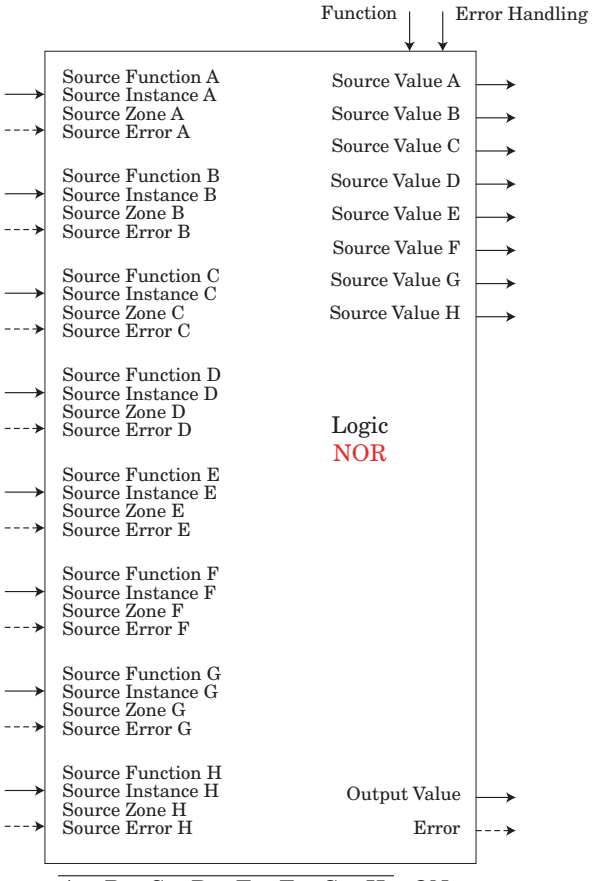
$\overline{A * B * C * D * E * F * G * H} = ON$



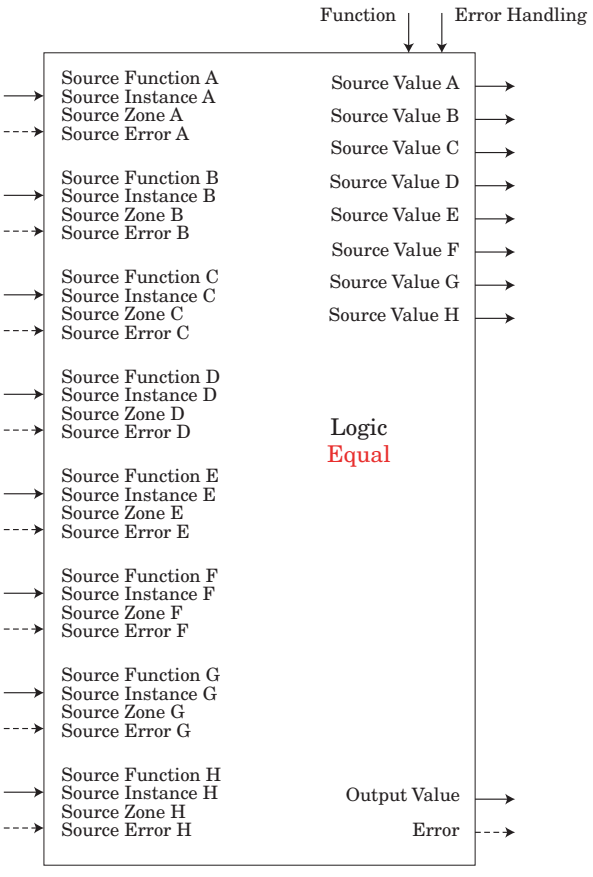
A + B + C + D + E + F + G + H = ON



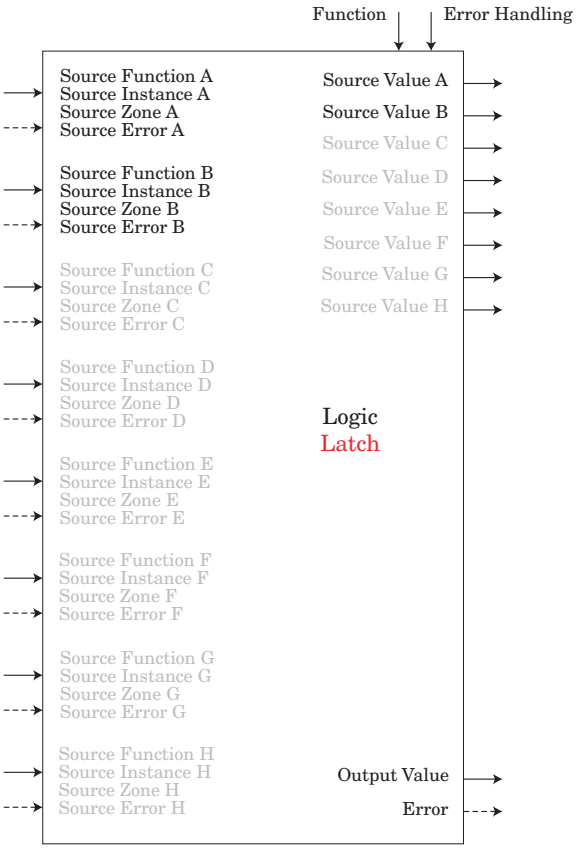
If A ≠ B ≠ C ≠ D ≠ E ≠ F ≠ G ≠ H then ON



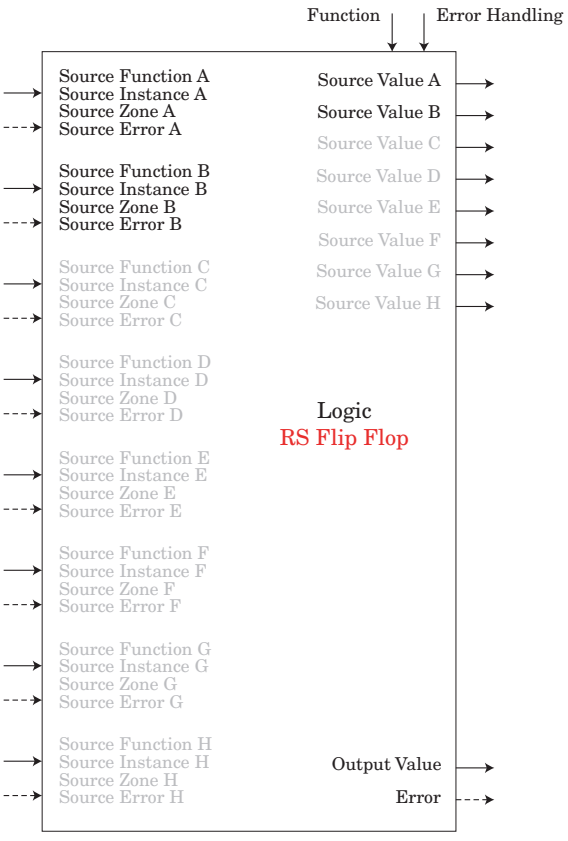
$\overline{A + B + C + D + E + F + G + H} = ON$



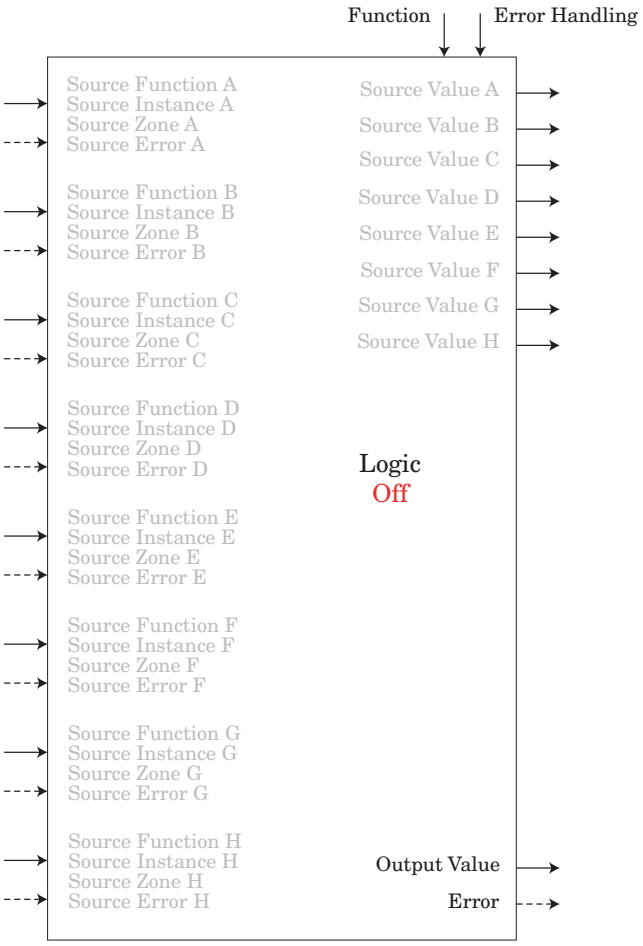
If A = B = C = D = E = F = G = H then ON



Output Value follows A, unless B = ON
Latch Output while B = ON



A Sets Output Value ON
B Resets Output Value OFF



Output Value = Off

Math Function

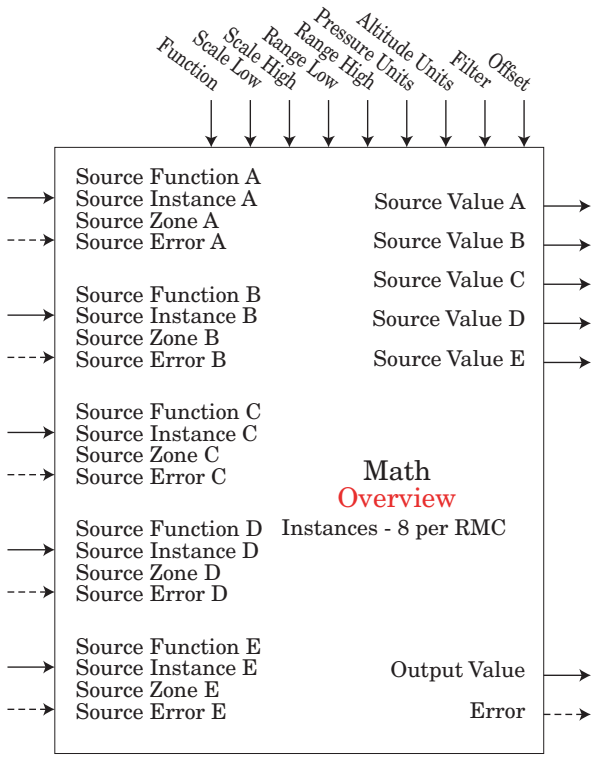
The Math function block accepts up to 4 Analog Inputs and performs a programmed math function to derive an output value with Filter and Offset values applied. One digital input is used for enabling or disabling Process and Deviation Scale and some math operations must be performed in the user's units.

Functions may combine multiple inputs. Those inputs may have incompatible units from a logical point of view. As a result, unless otherwise indicated, the presentation of the output value is the same as Source A. This accommodates temperatures being multiplied, divided and offset by constants and process inputs.

Only inputs pointed to a source are used in the calculations.

An error, when read, can indicate any of the following:

None, Open, Shorted, Measurement Error, Bad Cal Data, Ambient Error, RTD Error, Fail, Math Error, Not Sourced, Stale



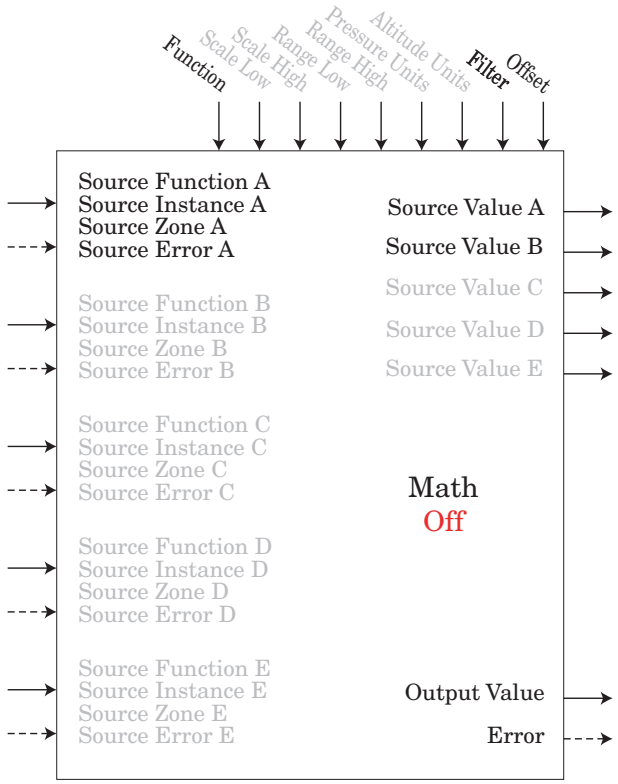
Math Menu
Setup Page

- Function : Off, Average, Process Scale, Deviation Scale, Switch Over, Differential, Ratio, Add, Multiply, Absolute Difference, Minimum, Maximum, Square Root, Sample and Hold, Pressure to Altitude, Dewpoint
- Source Function A : None, Analog Input, Current, Cool Power, Heat Power, Power, Linearization, Math, Process Value, Set Point Closed, Set Point Open, Variable
- Source Instance A : 1 to 250
- Source Zone A : 0 to 16
- Source Function B : None, Analog Input, Current, Cool Power, Heat Power, Power, Linearization, Math, Process Value, Set Point Closed, Set Point Open, Variable
- Source Instance B : 1 to 250
- Source Zone B : 0 to 16
- Source Function C : None, Analog Input, Current, Cool Power, Heat Power, Power, Linearization, Math, Process Value, Set Point Closed, Set Point Open, Variable
- Source Instance C : 1 to 250
- Source Zone C : 0 to 16
- Source Function D : None, Analog Input, Current, Cool Power, Heat Power, Power, Linearization, Math, Process Value, Set Point Closed, Set Point Open, Variable
- Source Instance D : 1 to 250
- Source Zone D : 0 to 16
- Source Function E : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Logic, Timer, Variable
- Source Instance E : 1 to 250
- Source Zone E : 0 to 16
- Scale Low : -1,999.0 to 9,999.0
- Scale High : -1,999.0 to 9,999.0
- Units : Source, None, Absolute Temperature, Relative Temperature, Power, Process, Relative Humidty
- Range Low : -1,999.0 to 9,999.0
- Range High : -1,999.0 to 9,999.0
- Pressure Units : PSI, Torr, mBar, Atmosphere, Pascal
- Altitude Units : Feet, Kilofeet
- Filter : 0.0 to 60.0 seconds

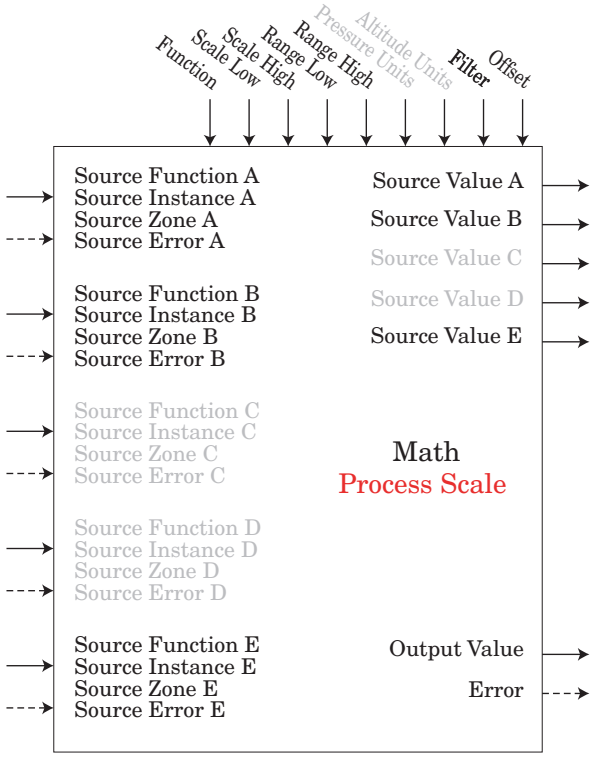
Math Menu
Operation Page

- Source Value A : -1,999.000 to 9,999.000
- Source Value B : -1,999.000 to 9,999.000
- Source Value C : -1,999.000 to 9,999.000
- Source Value D : -1,999.000 to 9,999.000
- Source Value E : Off, On
- Output Value : -1,999.000 to 9,999.000
- Offset : -1,999.000 to 9,999.000

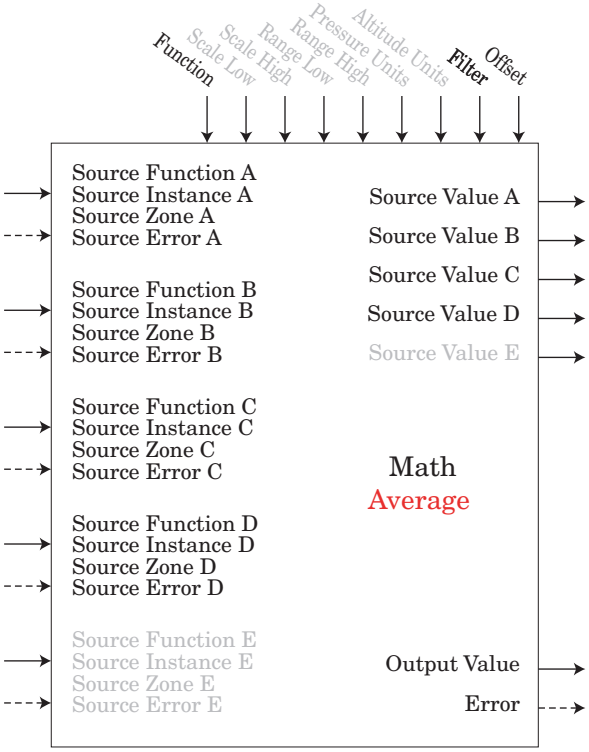
Error : None, Open, Shorted, Measurement Error, Bad Cal Data,



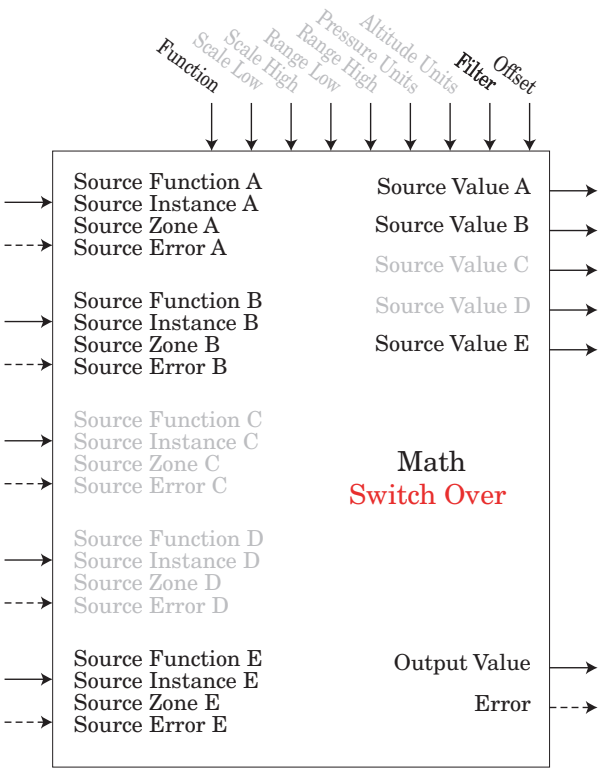
Output Value = Filter [A + Offset]
Display units follows Source A



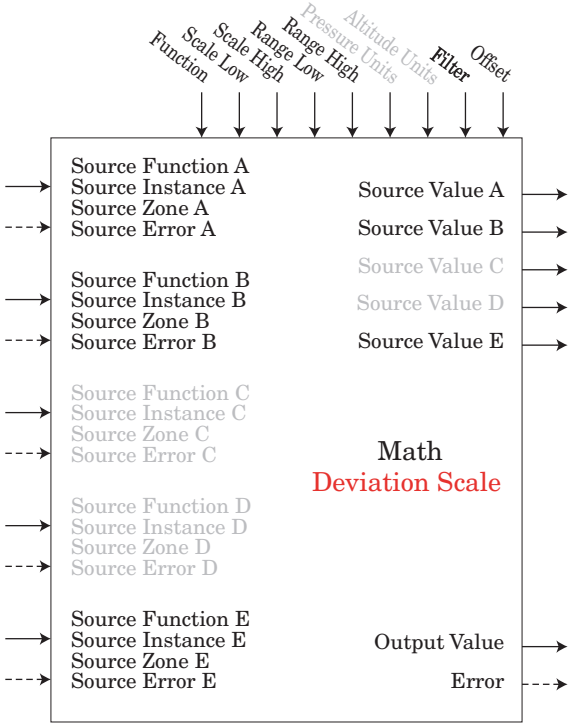
If E = OFF, Output Value = Filter [(Range High - Range Low) / (Scale High - Scale Low) * (A - Scale Low) + Range Low + Offset] If E = ON, Output Value = Filter [B + Offset] Scale Low/High and Range Low/High follows Source A display units.



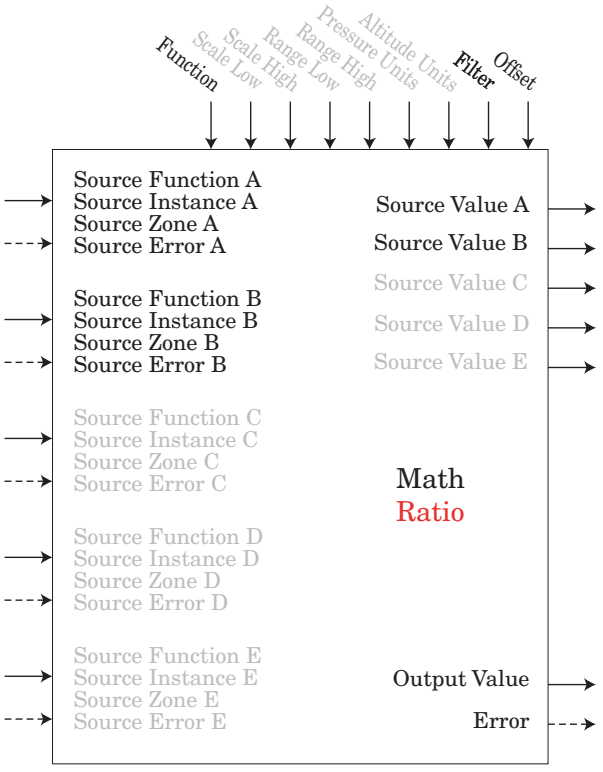
Output Value = Filter [(Average (A + B + C + D)) + Offset] Display units follows the last source that is temperature else follow Source A



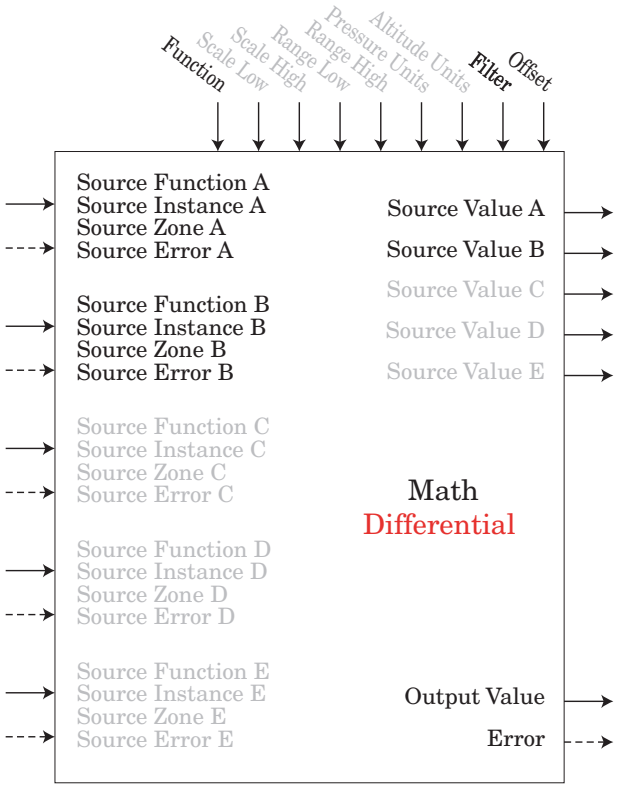
If E = OFF, Output Value = Filter [A + Offset] If E = ON, Output Value = Filter [B + Offset] Display units follows active source.



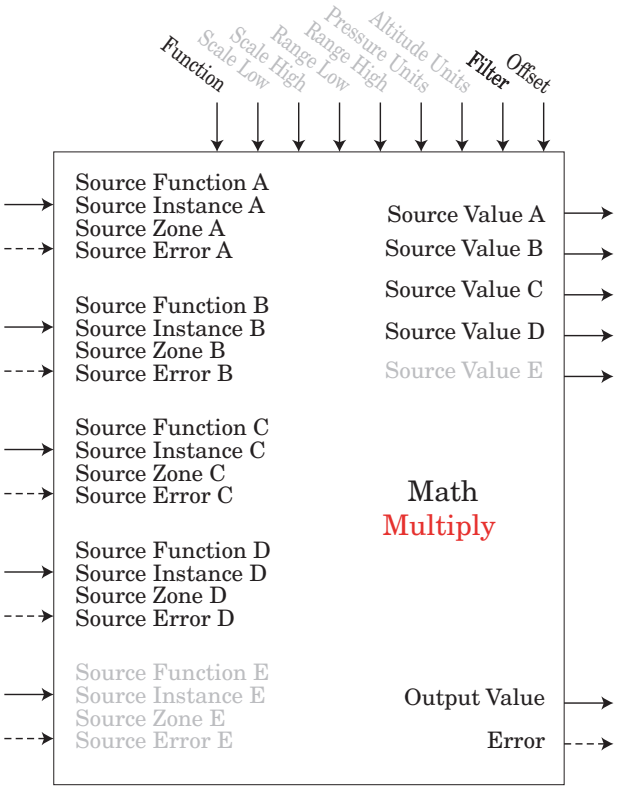
If E = OFF, Output Value = Filter [((Range High - Range Low) / (Scale High - Scale Low)) * (A - Scale Low) + Range Low + B + Offset] If E = ON, Output Value = Filter [B + Offset] Scale Low/High and Range Low/High follows Source A display units.



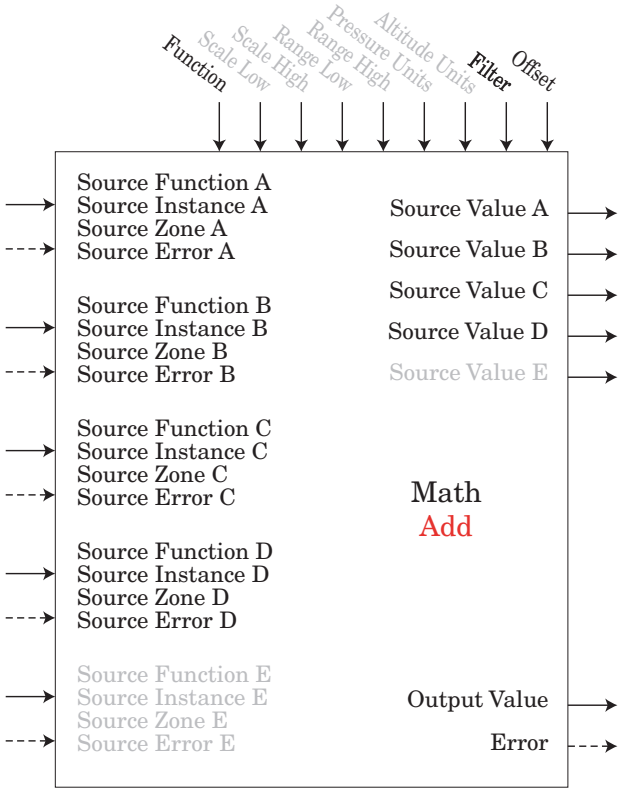
Output Value = Filter [(A / B) + Offset] If display units of Source A = Source B, no display units on output value, else follow Source A



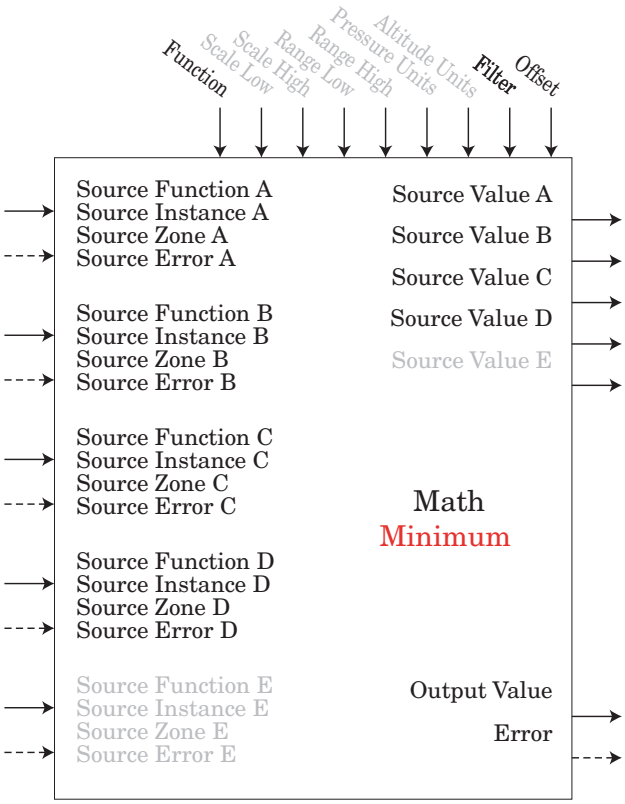
Output Value = Filter [(A - B) + Offset] Display units follows Source A plus relative Source B



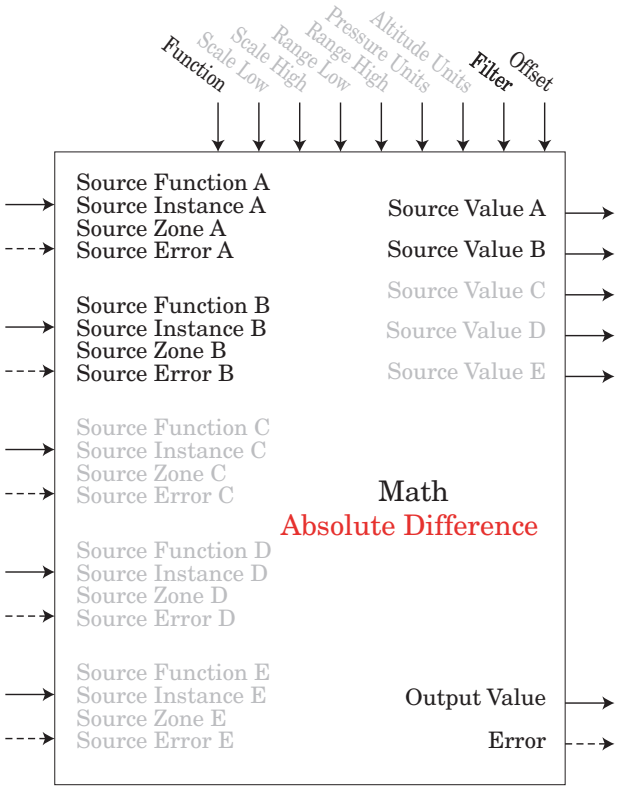
Output Value = Filter [(A * B * C * D) + Offset] Display units follows last temperature source else follow Source A



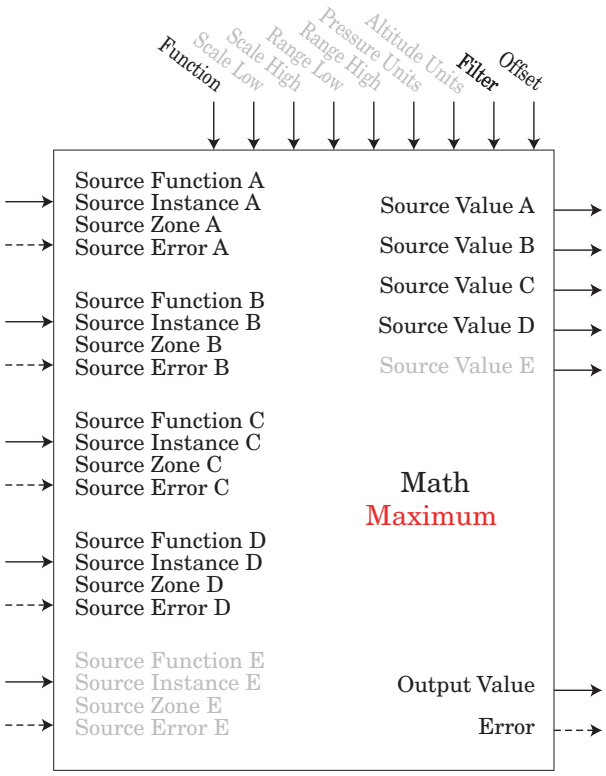
Output Value = Filter [(A + B + C + D) + Offset] Display units follows last temperature source else follow Source A



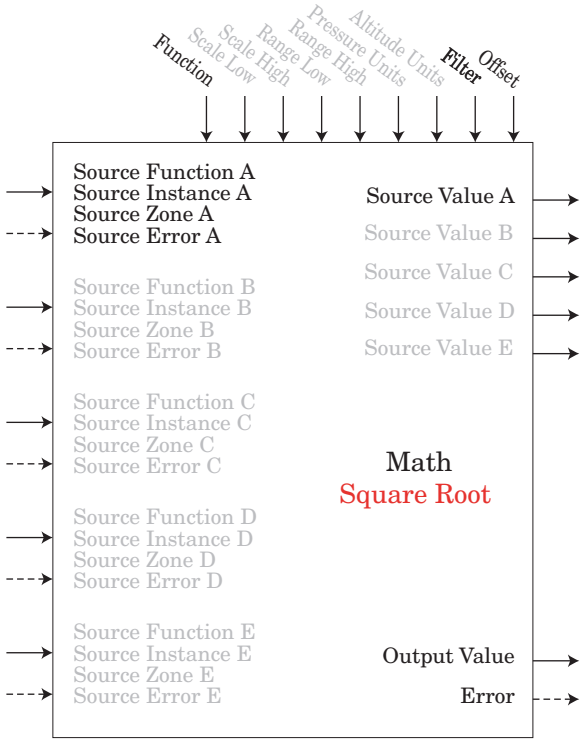
Output Value = Filter [Minimum Value (A : B : C : D) + Offset] Display units follows Source with minimum value.



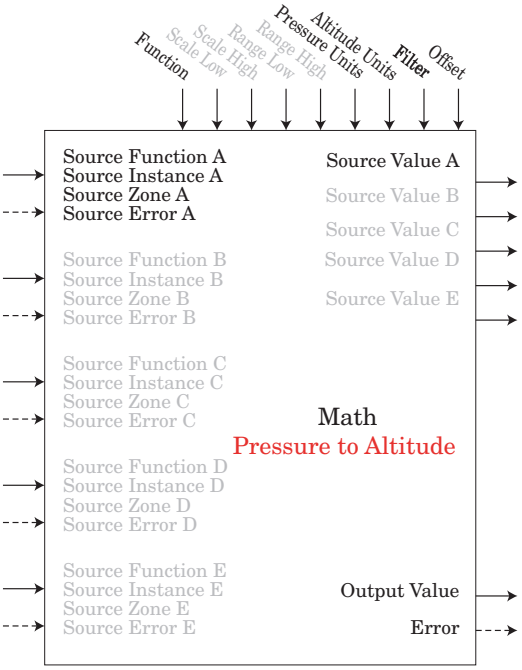
Output Value = Filter [| A - B | + Offset] Display units follow Source A plus relative Source B



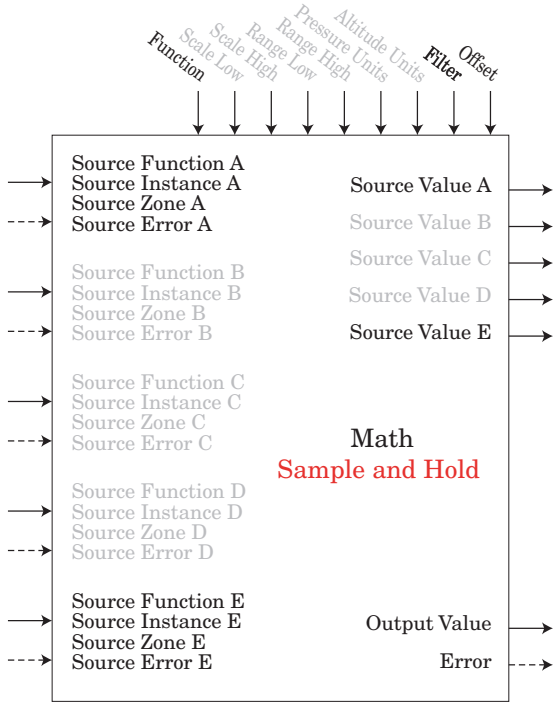
Output Value = Filter [Maximum Value (A : B : C : D) + Offset] Display units follows Source with maximum value.



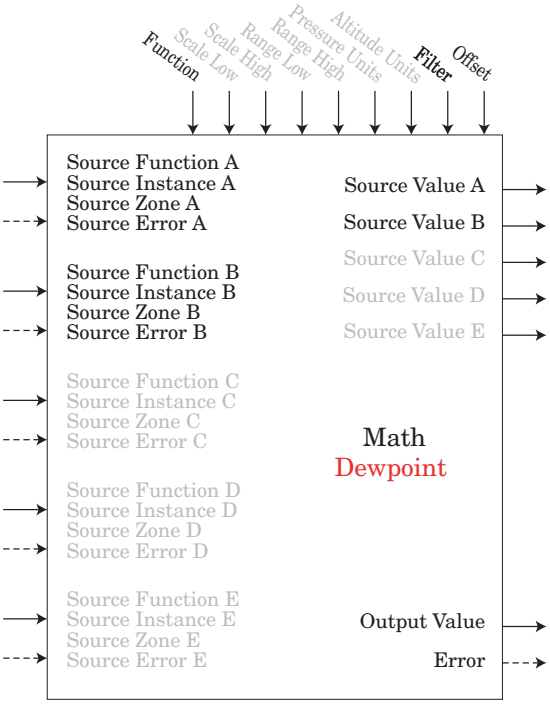
Output Value = Filter [Sqr Root A + Offset]
Display units follows Source A



Output Value = Filter [Convert Source A in Pressure to Altitude + Offset]
Note: Pressure Altitude calculation is based on the International Standard Atmosphere 1976. Source A is a pressure signal and needs to be in PSI units for the calculation. The calculation is accurate from sea level to 90,000 feet. It can be used beyond this range in both directions, but with loss of accuracy. The standard is based on an altitude of 0 feet (sea level) pressure of 14.6967 PSI and a temperature of 59 degrees F. Result of calculation is in feet.



If E = OFF, Output Value = Filter [A + Offset]
If E = ON, Output Value = Filter [last value of A + Offset]
Display units follows Source A



Output Value = Filter [427.26 * (CP * B / 8.8618)
/ (17.27- (CP * B / 8.8618)) + 32 + Offset]
Source A is used for Calculated Pressure or CP ;
Note: For dewpoint, Source A is temperature (F) and Source B is RH (%). Saturation pressure calculation is identical to that used in wet/dry bulb. Result is in degrees F.

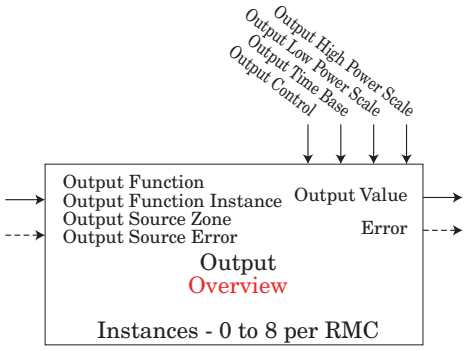
Output Function

This function configures and connects physical outputs to internal functions.

Note:

Digital Outputs not included on these sheets

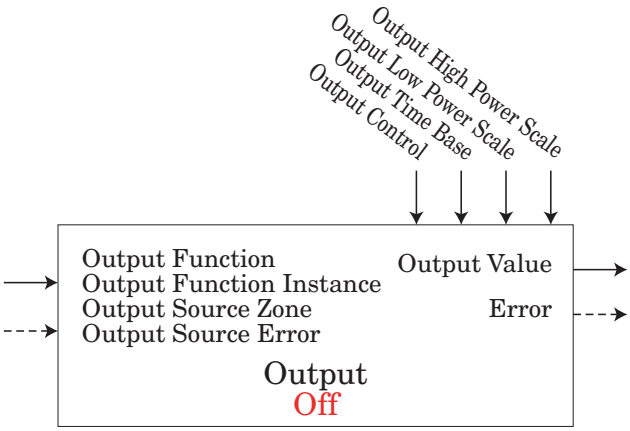
An error, when read, can indicate any of the following: None, Open, Shorted, Measurement Error, Bad Cal Data, Ambient Error, RTD Error, Fail, Math Error, Not Sourced, Stale

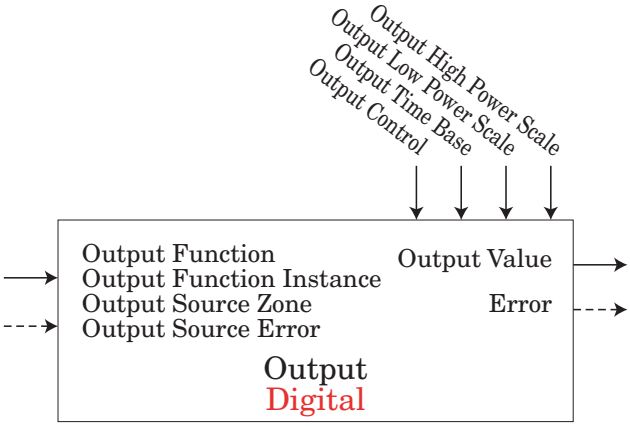


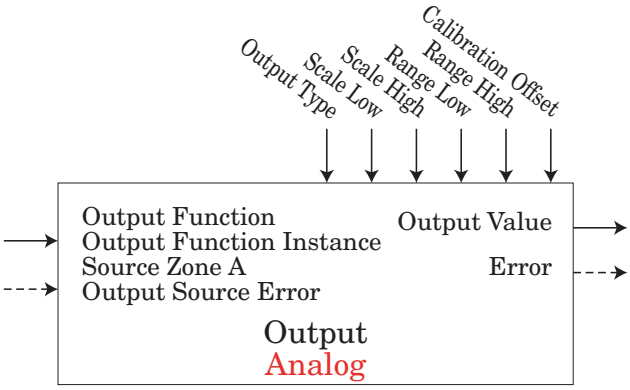
oPt Output Menu
SEt Setup Page

- Fn Output Function : Off, Analog Input, Alarm, Cool Power, Heat Power, Compare, Counter, Digital I/O. Profile Event Out A to H, Function Key, Logic, Linearization, Math, Process Value, Special Function Output 1 to 4, Timer, Variable, Limit
- F1 Output Function Instance : 1 to 250
- S2 Output Source Zone : 0 to 16
- oCt Output Control : Fixed Time Base, Variable Time Base
- otb Output Time Base : 0.1 to 60.0 seconds
- oLo Output Low Power Scale : 0 to 100 %
- oh1 Output High Power Scale : 0 to 100 %
- oty Output Type : Volts, Milliamps
- Fn Output Function : Off, Analog Input, Alarm, Cool Power, Heat Power, Compare, Counter, Digital I/O. Profile Event Out A to H, Function Key, Logic, Linearization, Math, Process Value, Special Function Output 1 to 4, Timer, Variable
- F1 Output Function Instance : 1 to 250
- S2A Source Zone A : 0 to 16
- SLo Scale Low : 0.0 to 20.00
- Sh1 Scale High : 0.0 to 20.00
- rLo Range Low : -1,999.000 to 9,999.000
- rh1 Range High : -1,999.000 to 9,999.000
- oCA Calibration Offset : -1,999.000 to 9,999.000

- ou Output Value : On, Off
- ou Output Value : 0 to 10.0 volts or 0 to 20.00 milliamperes

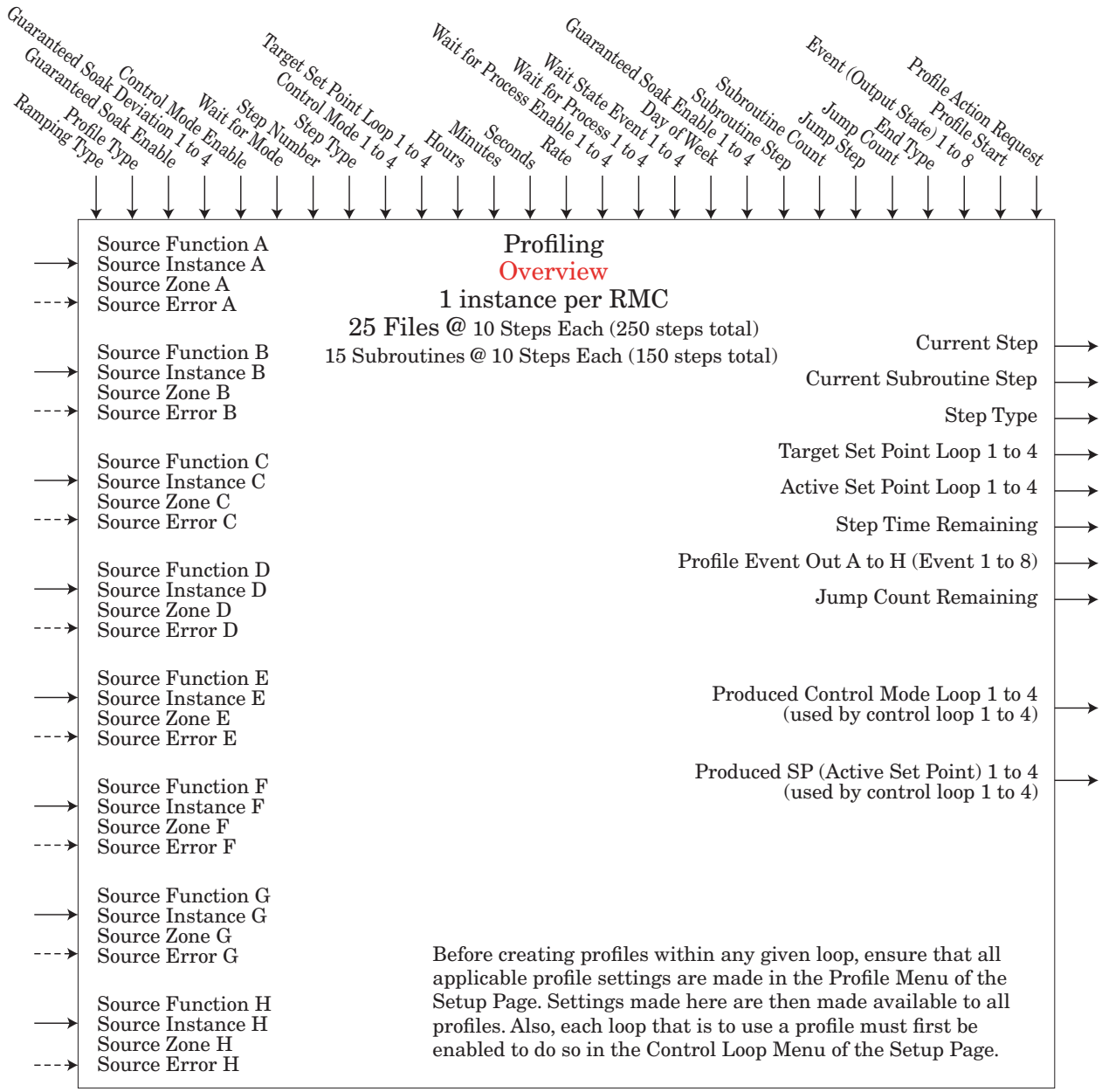

Output High Power Scale
Output Low Power Scale
Output Time Base
Output Control
Output Function
Output Function Instance
Output Source Zone
Output Source Error
Output Value
Error
Output
Off


Output High Power Scale
Output Low Power Scale
Output Time Base
Output Control
Output Function
Output Function Instance
Output Source Zone
Output Source Error
Output Value
Error
Output
Digital


Calibration Offset
Range High
Range Low
Scale High
Scale Low
Output Type
Output Function
Output Function Instance
Source Zone A
Output Source Error
Output Value
Error
Output
Analog

Profile Function

The the RMC module supports up to 25 profiles with each having up to 10 steps each. In some applications there is a need to execute a profile multiple times with varying frequency within multiple Profiles. When and if this need arises, rather than creating the same steps over and over again it would be wise to think of using a Subroutine. There can be a maximum of 15 Subroutines having up to 10 steps each. Subroutines can be called from within any Profile. The logic is, create it just once and execute it as needed from any given profile.



rtyP Ramping Type : Rate, Time

PtyP Profile Type : Set Point, Process

gSE Guaranteed Soak Enable : Off, On

gSd1 gSd2 gSd3 gSd4 Guaranteed Soak Deviation 1 to 4 : 0 to 9,999.000

CrnE Control Mode Enable : Off, On

uJnn Wait for Mode : Once, Complete

SFn.A Source Function A (Wait Event Input 1) : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Logic, Timer, Variable

S i.A Source Instance A : 1 to 250

S2.A Source Zone A : 0 to 16

SFn.b Source Function B (Wait Event Input 2) : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Logic, Timer, Variable

S i.b Source Instance B : 1 to 250

S2.b Source Zone B : 0 to 16

SFn.C Source Function C (Wait Event Input 3) : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Logic, Timer, Variable

S i.C Source Instance C : 1 to 250

S2.C Source Zone C : 0 to 16

SFn.d Source Function D (Wait Event Input 4) : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Logic, Timer, Variable

S i.d Source Instance D : 1 to 250

S2.d Source Zone D : 0 to 16

SFn.E Source Function E (Wait Analog 1) : None, Analog Input, Current, Cool Power, Heat Power, Power, Linearization, Math, Process Value, Set Point Closed, Set Point Open, Variable

S i.E Source Instance E : 1 to 250

S2.E Source Zone E : 0 to 16

SFn.F Source Function F (Wait Analog 2) : None, Analog Input, Current, Cool Power, Heat Power, Power, Linearization, Math, Process Value, Set Point Closed, Set Point Open, Variable

S i.F Source Instance F : 1 to 250

S2.F Source Zone F : 0 to 16

SFn.g Source Function G (Wait Analog 3) : None, Analog Input, Current, Cool Power, Heat Power, Power, Linearization, Math, Process Value, Set Point Closed, Set Point Open, Variable

S i.g Source Instance G : 1 to 250

S2.g Source Zone G : 0 to 16

SFn.h Source Function H (Wait Analog 4) : None, Analog Input, Current, Cool Power, Heat Power, Power, Linearization, Math, Process Value, Set Point Closed, Set Point Open, Variable

S i.h Source Instance H : 1 to 250

S2.h Source Zone H : 0 to 16

PSTA Profile Status Menu
oPEr Operation Page

PStr Profile Start : 1 to 25

PACr Profile Action Request : None, Profile, Pause, Resume, Terminate

StP Current Step : 0 to 250

SUbS Current Subroutine Step : 0 to 150

StyP Current Step Type : Unused Step, Time or Rate, Soak, Wait For Process or Event, Wait for Time, State, Subroutine Step, Jump Loop, End

tSP1 tSP2 tSP3 tSP4 Target Set Point Loop 1 to 4

PSP1 PSP2 PSP3 PSP4 Produced SP (Active Set Point) 1 to 4 : -1,999.000 to 9,999.000

St Step Time Remaining : 0 to 9,999 seconds

Ent1 Ent2 Ent3 Ent4 Ent5 Ent6 Ent7 Ent8 Event (State Output) 1 to 8 : Off, On

JC Jump Count Remaining : 0 to 9,999

P_ Profile Menu
ProF Profiling Page

StPt Step Number : 1 to 250

StyP Step Type : Unused Step, Time or Rate, State, Soak, Wait For Process & Event, Wait for Time, Subroutine Step, Jump Loop, End

CM1 CM2 CM3 CM4 Control Mode Loop 1 to 4 : Off, Auto, Manual

tSP1 tSP2 tSP3 tSP4 Target Set Point Loop 1 to 4 : -1,999.000 to 9,999.000

hour Hours : 0 to 99

MIn Minutes : 0 to 59

SEC Seconds : 0 to 59

rAtE Rate : 0 to 9,999.000

PE1 PE2 PE3 PE4 Step Wait For Process Enable 1 to 4 : Off, Greater Than, Less Than

WP1 WP2 WP3 WP4 Wait For Process 1 to 4 : -1,999.000 to 9,999.000

WE1 WE2 WE3 WE4 Wait Event 1 to 4 : None, Off, On

dowk Day of Week : Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Week Days, Every Day

GSE1 GSd2 GSd3 GSd4 Guaranteed Soak Enable 1 to 4 : Off, On

SS Subroutine Step : 1 to 15

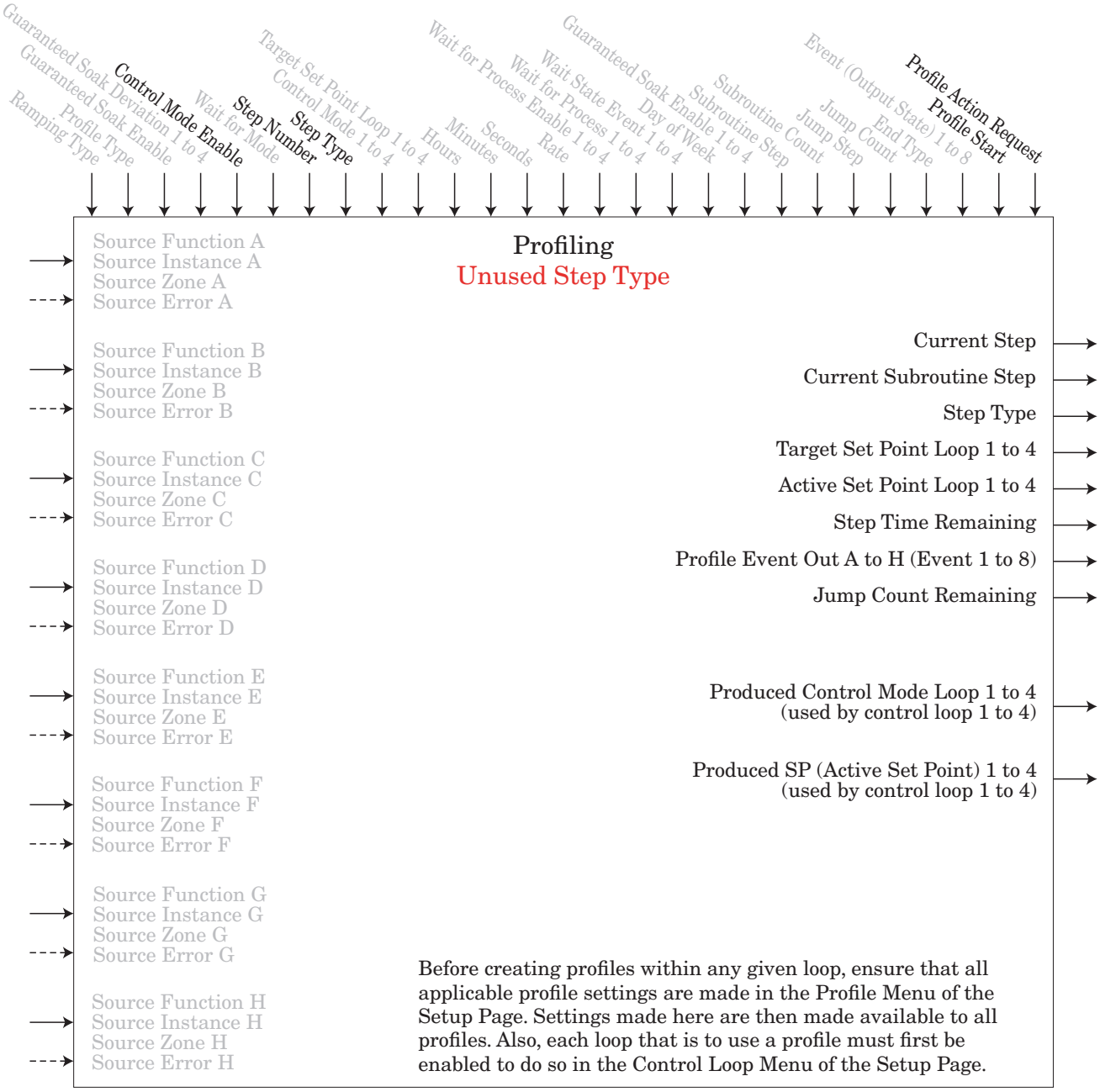
SC Subroutine Count : 1 to 9,999

JS Jump Step : 1 to 250

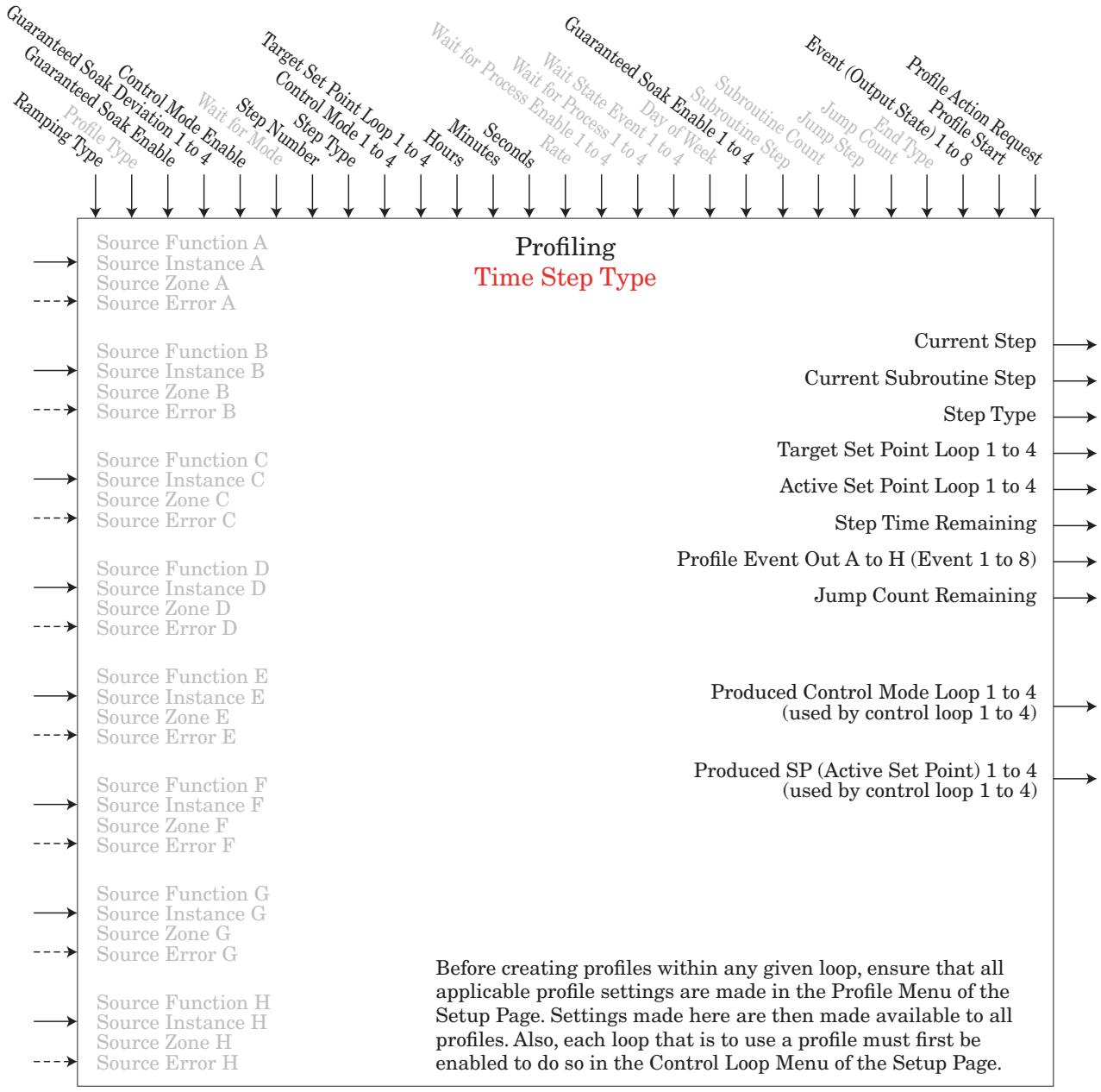
JC Jump Count : 0 to 9,999

End End Type : Off, Hold, User

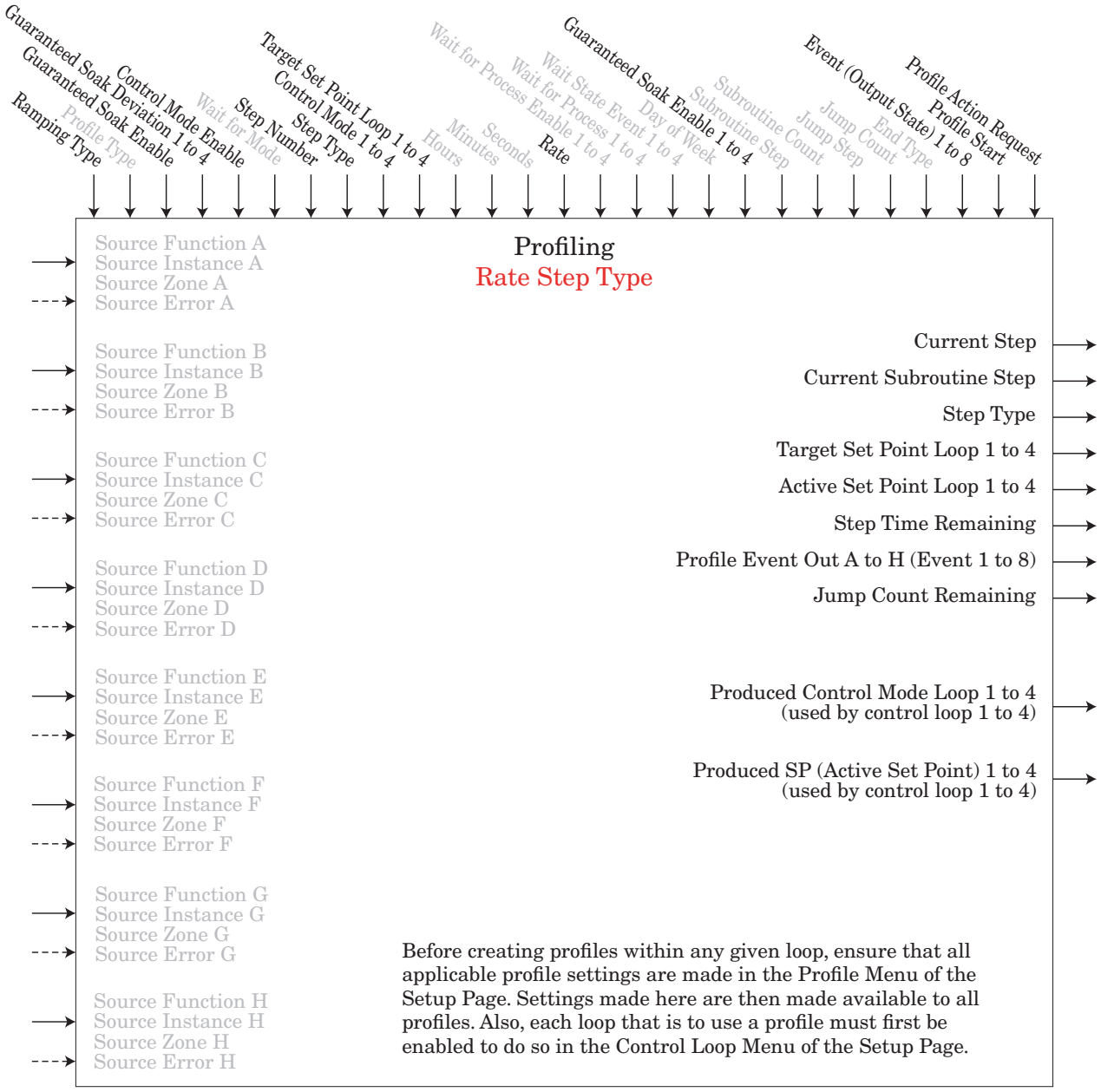
Ent1 Ent2 Ent3 Ent4 Ent5 Ent6 Ent7 Ent8 Event 1 to 8 : Off, On, Unchanged



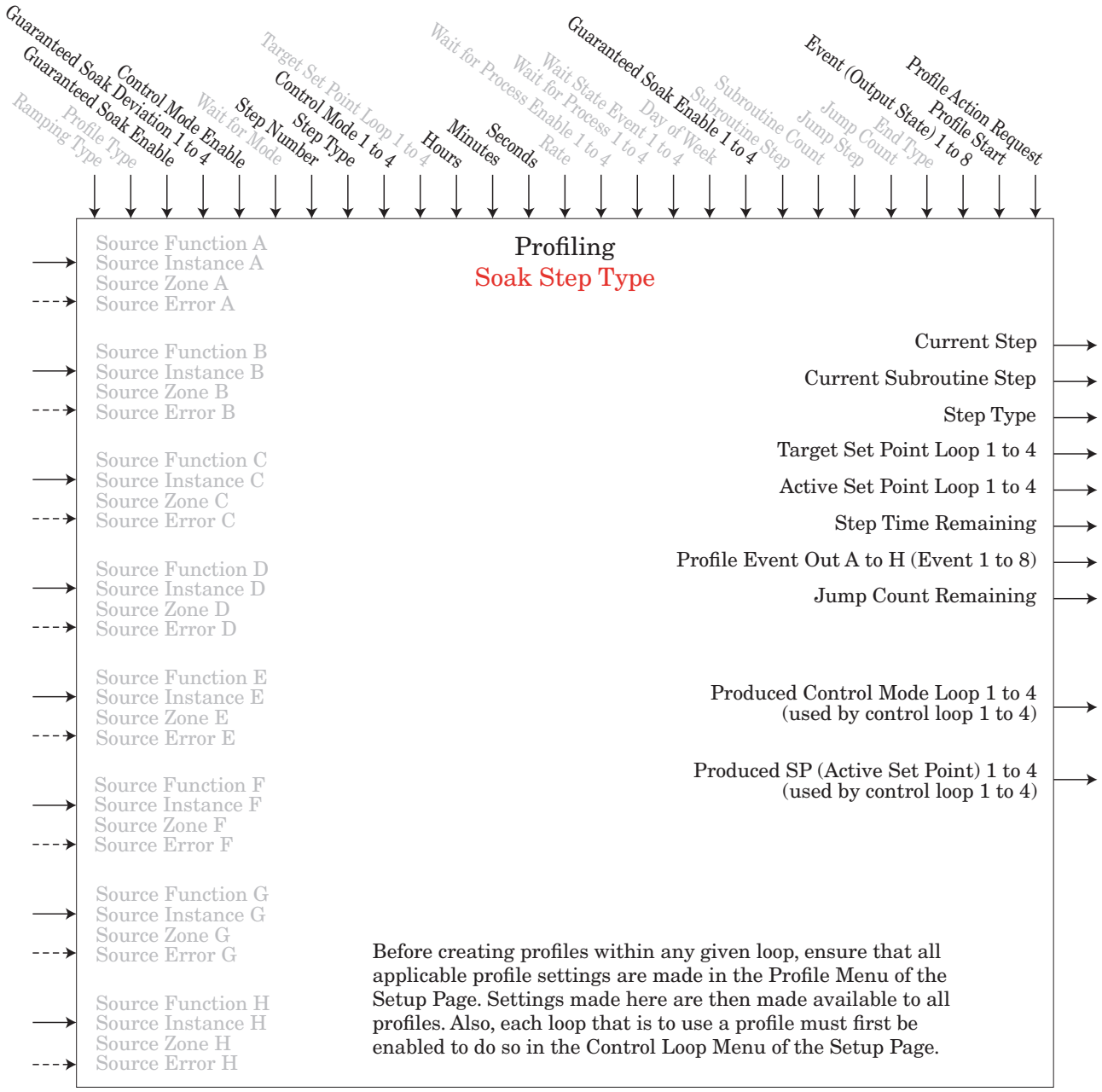
This is an empty step that can be used to plan for future steps to be inserted or temporarily deactivate a step in a profile. Change step type back when the step should be active again.



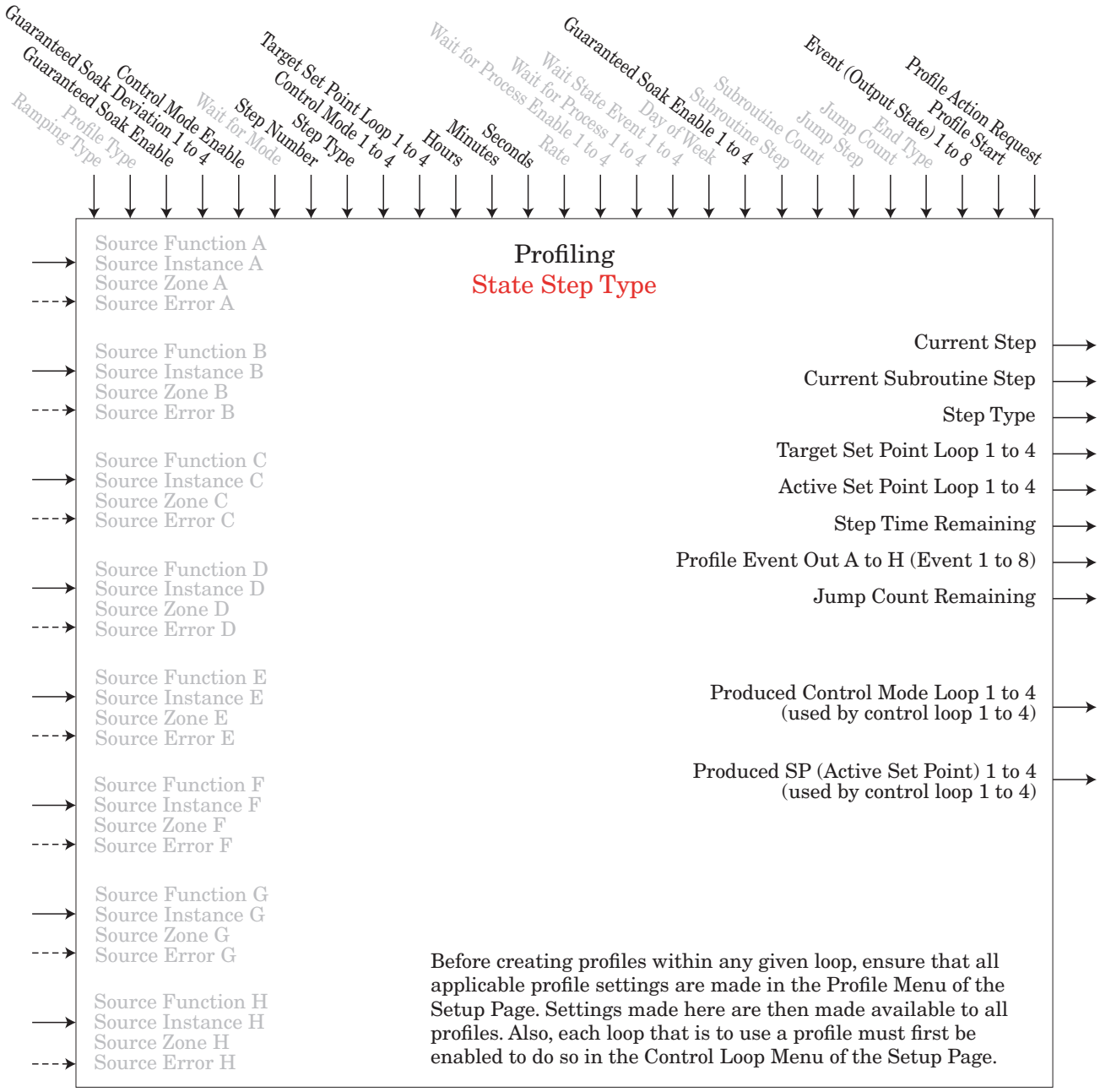
If Ramping Type in Setup Profile is set for Time, control loop 1 to 4 may be part of the profile and all enabled control loops follow independent set points over the specified time. The state of up to 8 event outputs may be set or maintained.



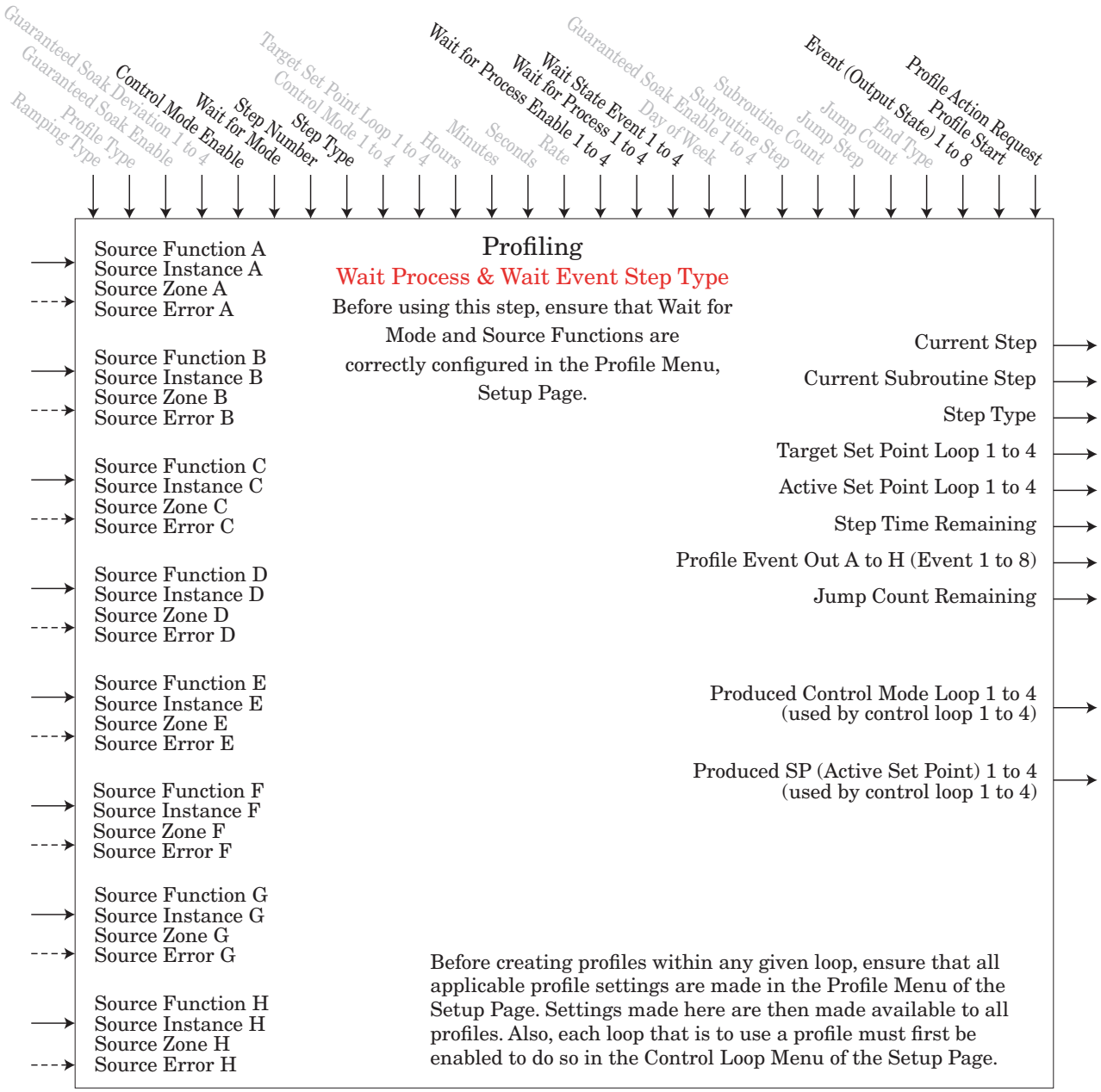
If Ramping Type in Setup Profile is set for Rate, control loop 1 must be part of the profile and all other enabled control loops follow the same set point and rate in degrees or units per minute. Ensure all control loops have the same units of measure. The state of up to 8 event outputs may be set or maintained.



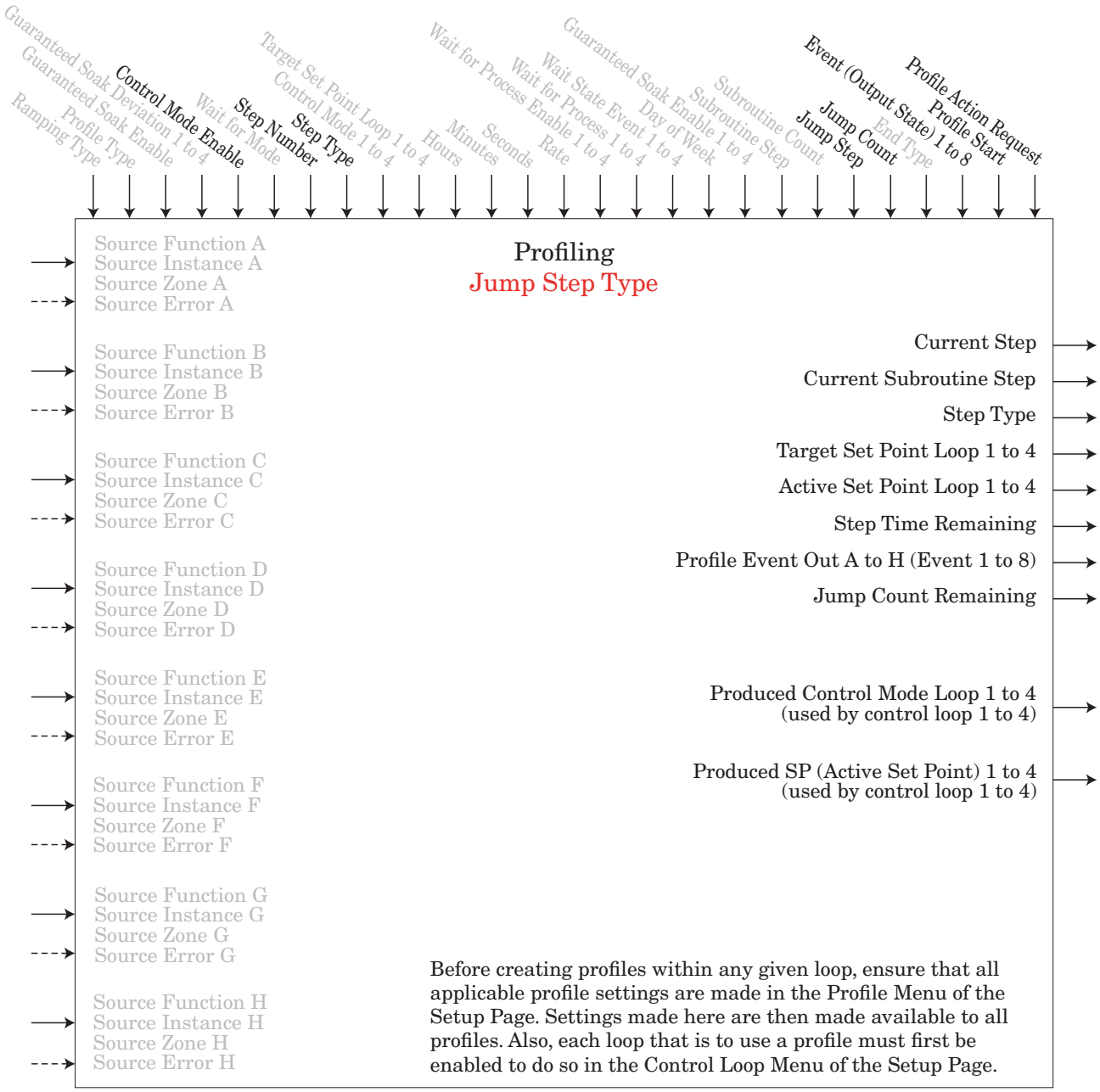
A Soak Step maintains the last Target Set Points for the designated time. The state of up to 8 event outputs may be set or maintained.



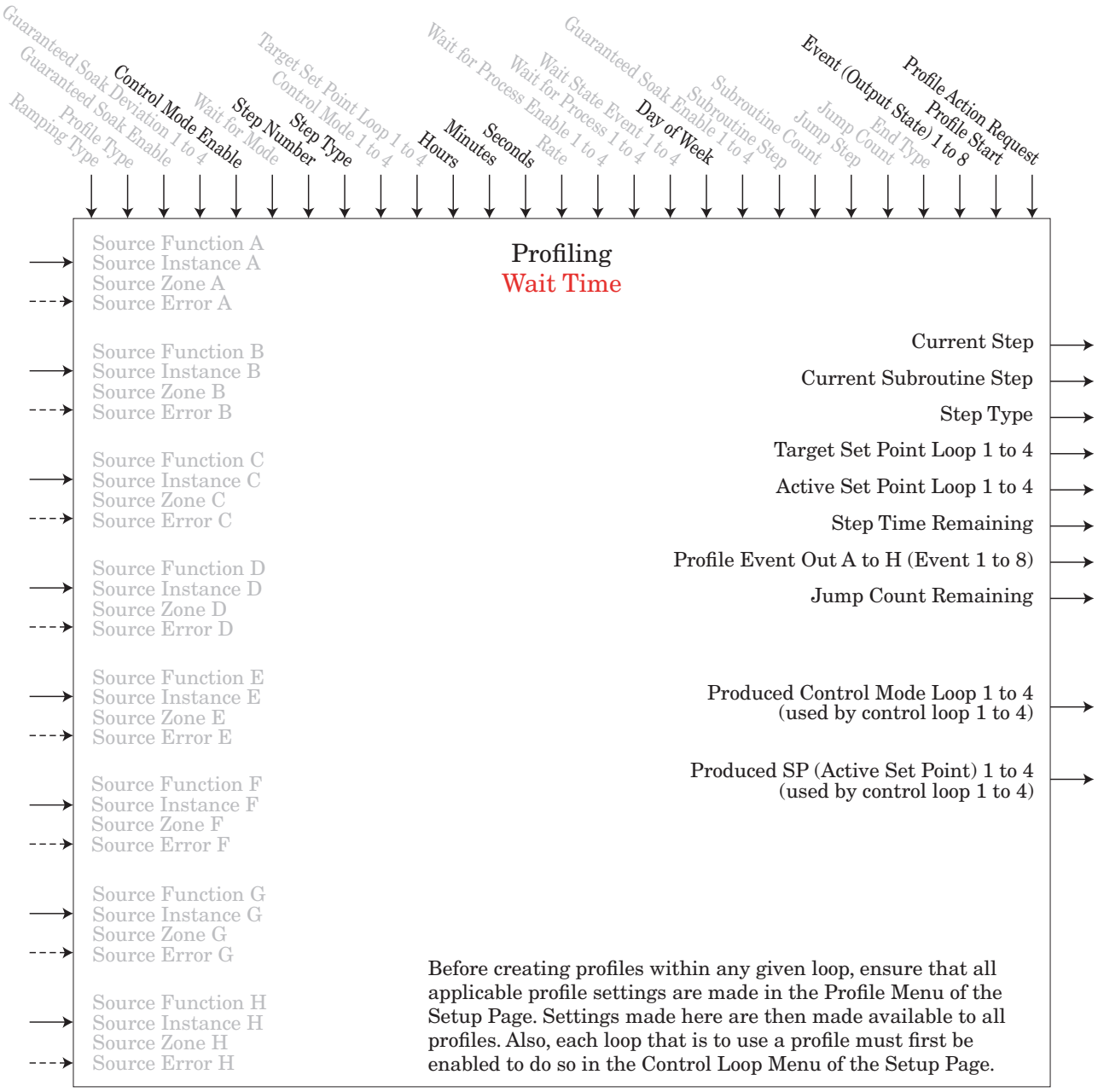
A State Step changes set points instantly to the specified values then maintains the Target Set Points for the designated time. The state of up to 8 event outputs may be set or maintained.



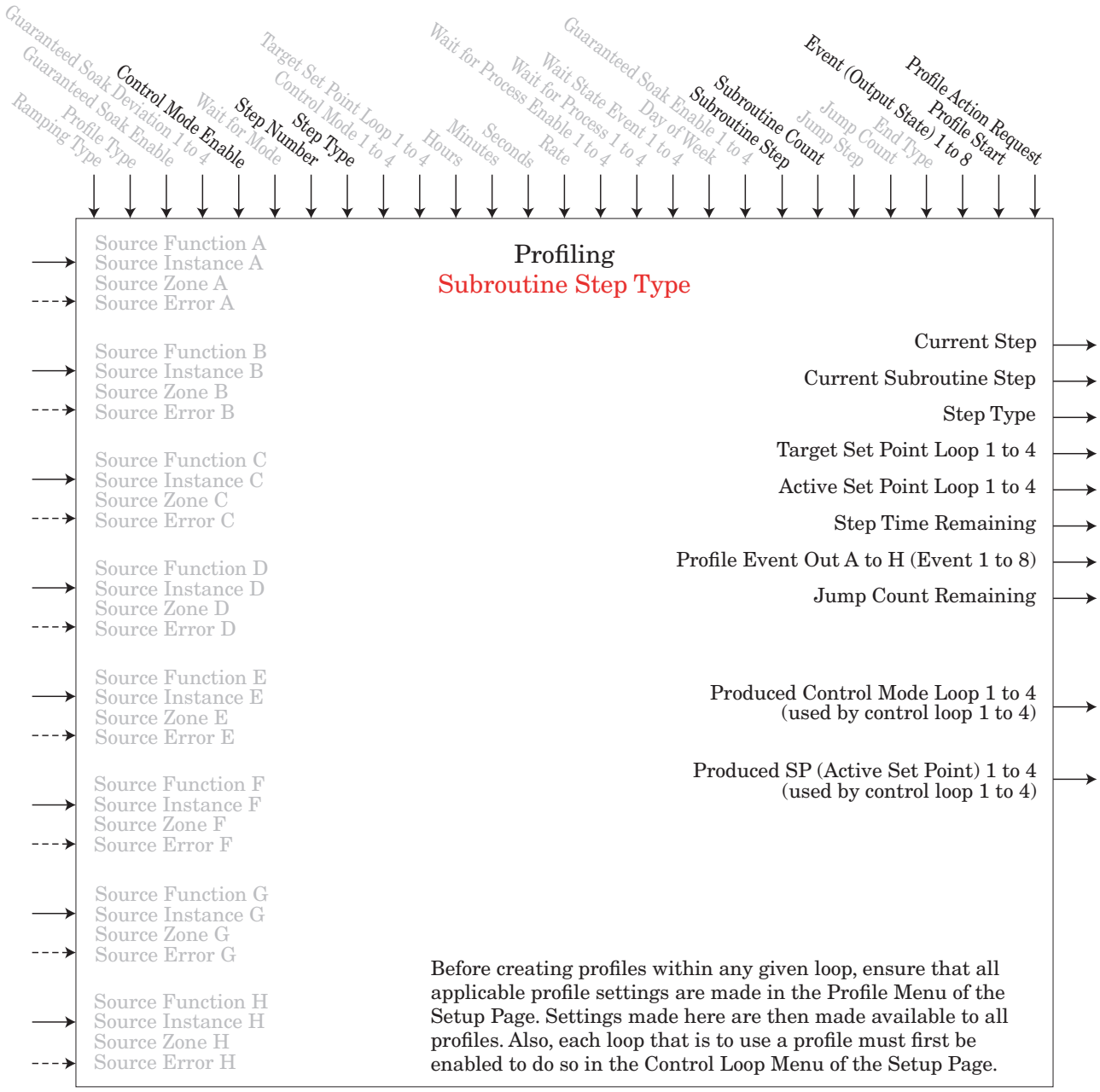
A Wait For Process or Event Step will wait for four process values to match the Wait for Process Values (1 to 4), and/or for the four Wait For Event states (1 to 4) to match the specified state. The state of up to 8 event outputs may be set or maintained.



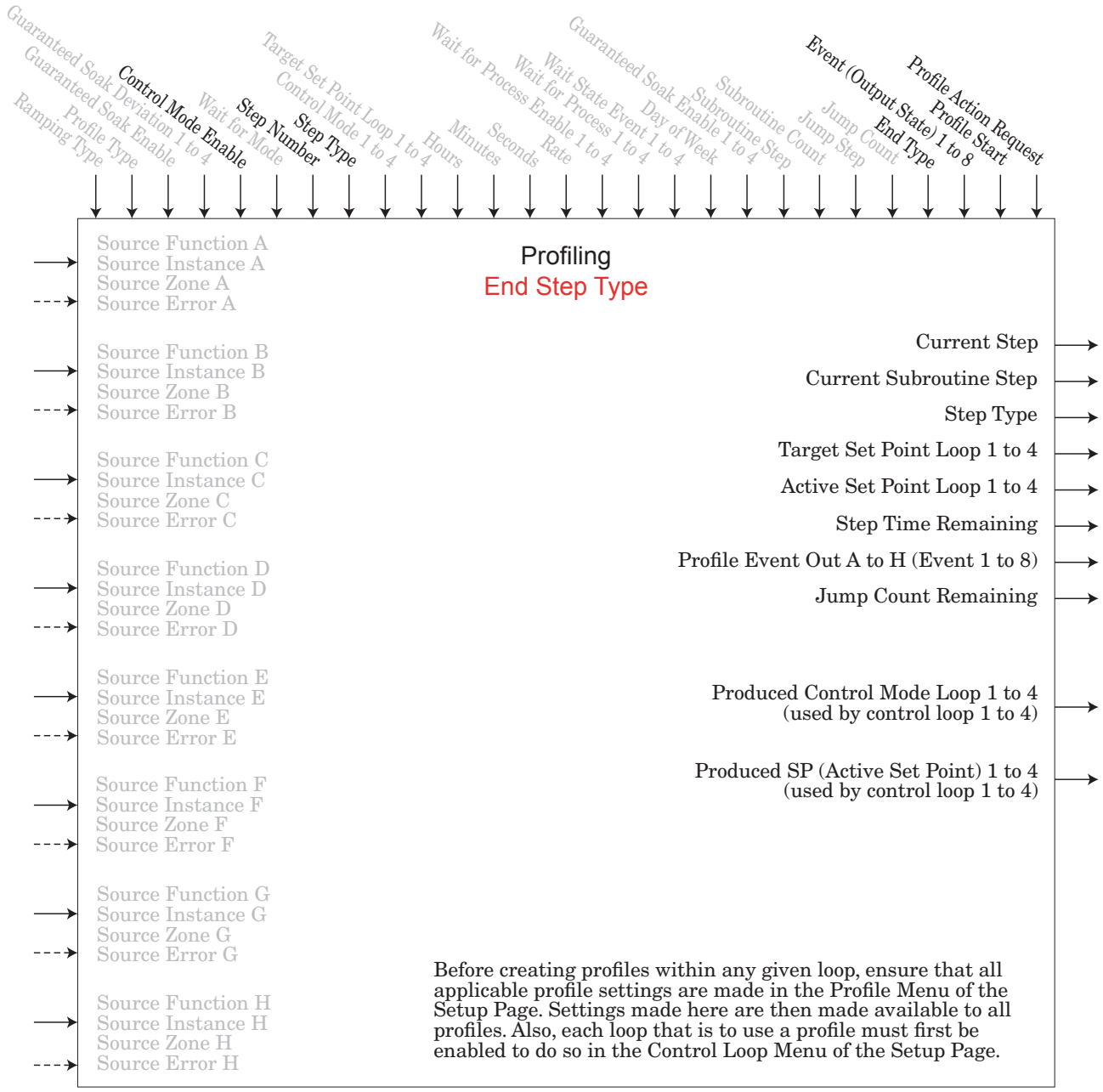
A Jump Loop step will repeat previous steps a number of times designated in Jump Count. Jump Loops can be nested up to four deep. The state of up to 8 event outputs may be set or maintained. This step type not available in subroutine. Note: Use the Subroutine step type to jump forward to a set of common steps.



A Wait for Time Step is available with an Access module having the real-time calendar clock feature. This allows the program to wait for a specified day and time before proceeding to the next step. Used to have the profile execute steps everyday or only weekdays. The state of up to 8 event outputs may be set or maintained.



A Subroutine Step jumps to a set of subroutine steps that are common to many profiles. This allows efficiency by utilizing several steps to be accessed and called upon. Once the subroutine is complete, control is passed back to the main profile at the next step. The state of up to 8 event outputs may be set or maintained. This step type is not available within a subroutine.

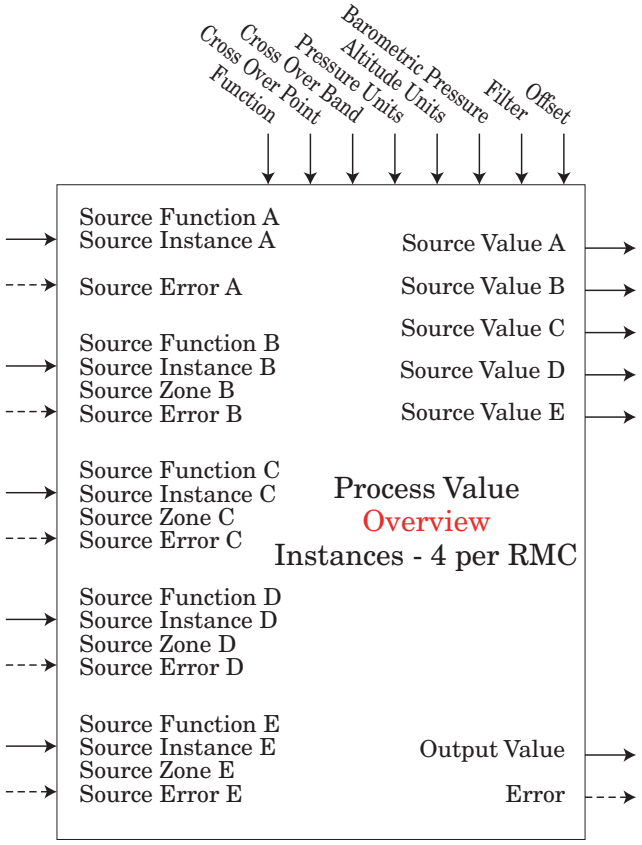


An End Step will end the profile and set the control modes and set points to match the End Type. The state of up to 8 event outputs may be set or maintained. The event outputs will not be set off unless specifically stated in this step. If a profile does not have an End Step, the profile continues until step 250, then stops and maintains the last set points and control modes. In Subroutines, the End Step returns control back to the next profile step following the call.

Process Value Function

The Process Value (PV) function block accepts up to 4 analog inputs and one digital input to perform a programmed math function to derive an output value with Filter and Offset values applied. It is assumed that no input error conditions apply. Some PV operations must be performed in the user's units. Functions may combine multiple inputs. Those inputs may have incompatible units from a logical point of view. As a result, unless otherwise indicated, the presentation of the output value is the same as Source A. This accommodates temperatures being multiplied, divided and offset by constants and process inputs. Only inputs that have a source associated to them are used in the calculations.

An error, when read, can indicate any of the following: None, Open, Shorted, Measurement Error, Bad Cal Data, Ambient Error, RTD Error, Fail, Math Error, Not Sourced, Stale

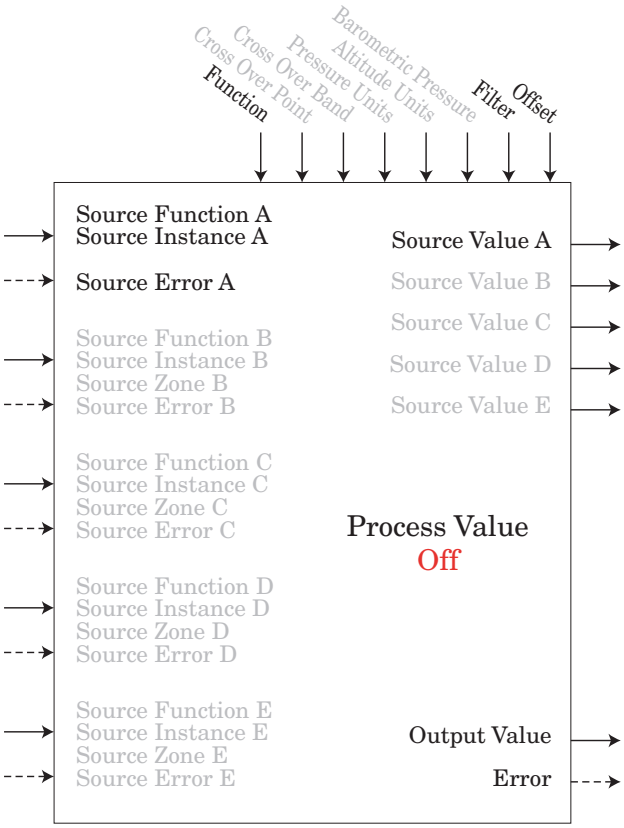


PU Process Value Menu
SEE Setup Page

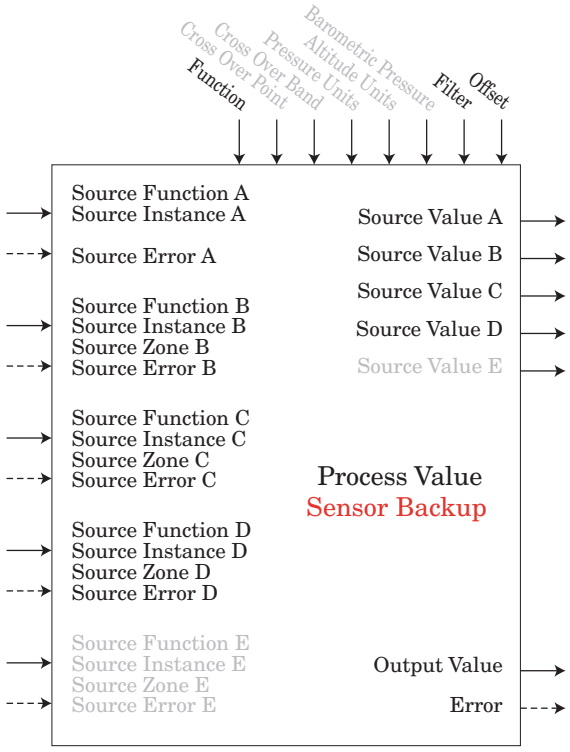
- FN Function : Off, AIN Backup Enable, Average, Crossover, Wet Bulb/Dry Bulb, Switch Over, Differential, Ratio, Add, Multiply, Absolute Difference, Minimum, Maximum, Square Root, Vaisala, Altitude
- SFn.A Source Function A : None, Analog Input, Linearization, Math, Process Value, Variable
- S .A Source Instance A : 1 to 250
- S2.A Source Zone A : 0 to 16
- SFn.b Source Function B : None, Analog Input, Linearization, Math, Process Value, Variable
- S .b Source Instance B : 1 to 250
- S2.b Source Zone B : 0 to 16
- SFn.C Source Function C : None, Analog Input, Linearization, Math, Process Value, Variable
- S .C Source Instance C : 1 to 250
- S2.C Source Zone C : 0 to 16
- SFnd Source Function D : None, Analog Input, Linearization, Math, Process Value, Variable
- S .d Source Instance D : 1 to 250
- S2.d Source Zone D : 0 to 16
- SFn.E Source Function E : None, Analog Input, Linearization, Math, Process Value, Variable
- S .E Source Instance E : 1 to 250
- S2.E Source Zone E : 0 to 16
- CP Cross Over Point : -1,999.000 to 9,999.000
- C.b Cross Over Band : -1,999.000 to 9,999.000
- PUnt Pressure Units : PSI, Torr, mBar, Atmosphere, Pascal
- AUnt Altitude Units : Feet, Kilofeet
- b.Pr Barometric Pressure : 10.0 to 16.0
- F .L Filter : 0.0 to 60.0 seconds

PU Process Value Menu
oPEr Operation Page

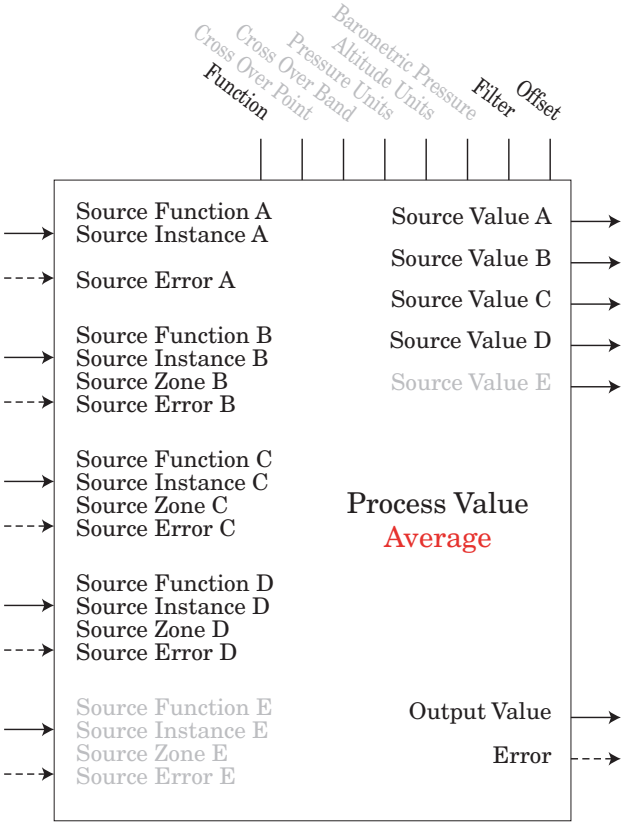
- SU.A Source Value A : -1,999.000 to 9,999.000
- SU.b Source Value B : -1,999.000 to 9,999.000
- SU.C Source Value C : -1,999.000 to 9,999.000
- SU.d Source Value D : -1,999.000 to 9,999.000
- SU.E Source Value E : Off, On
- oU Output Value : -1,999.000 to 9,999.000
- oFSE Offset : -1,999.000 to 9,999.000



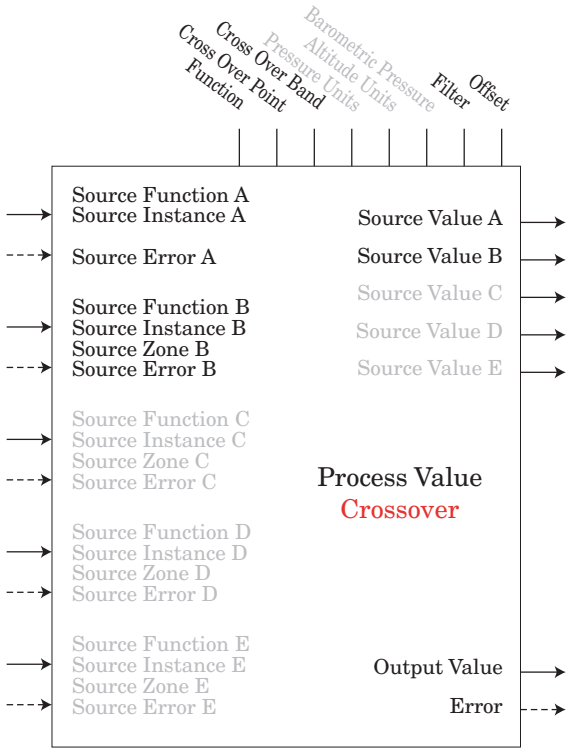
Output Value = Filter [A + Offset]
Display units follows Source A



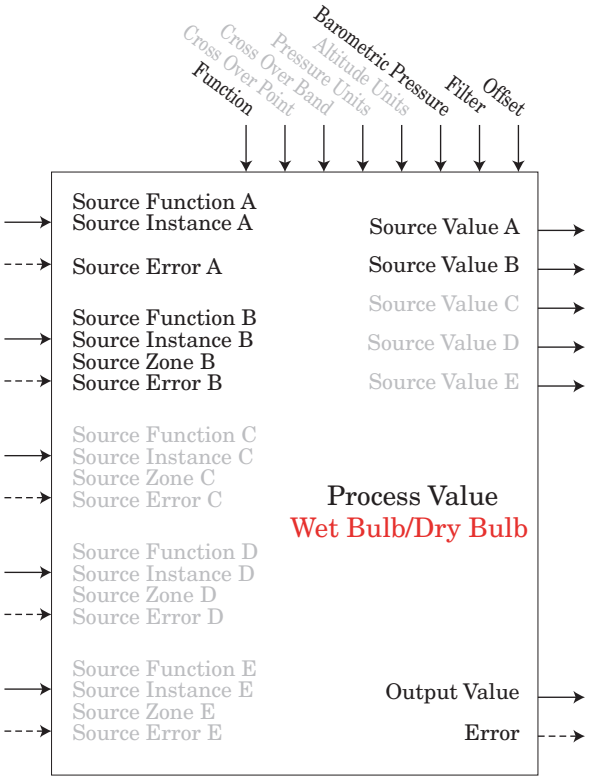
Output Value = Filter [first assigned Source without an error + Offset]



Output Value = Filter [(Average (A + B + C + D)) + Offset]
Display units follows the last source that is temperature else follow Source A

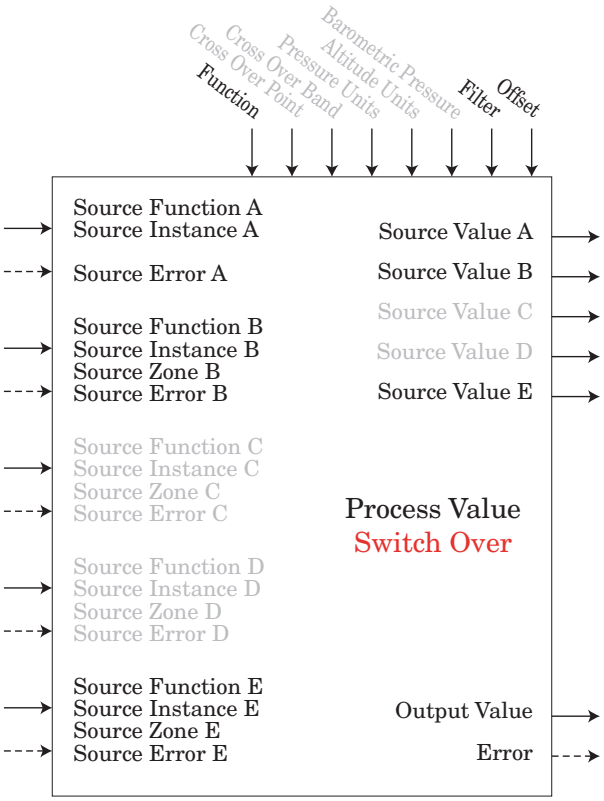


If A <= Cross Over Point - (Cross Over Band / 2) THEN Output Value = Filter [(A + Offset)] If A >= Cross Over Point + (Cross Over Band / 2) THEN Output Value = Filter[(B + Offset)] Output Value = Filter [((A * X) + (B * (1-X))) + Offset] Where variable X = (Cross Over Point + (Cross Over Band / 2) - A) / Cross Over Band

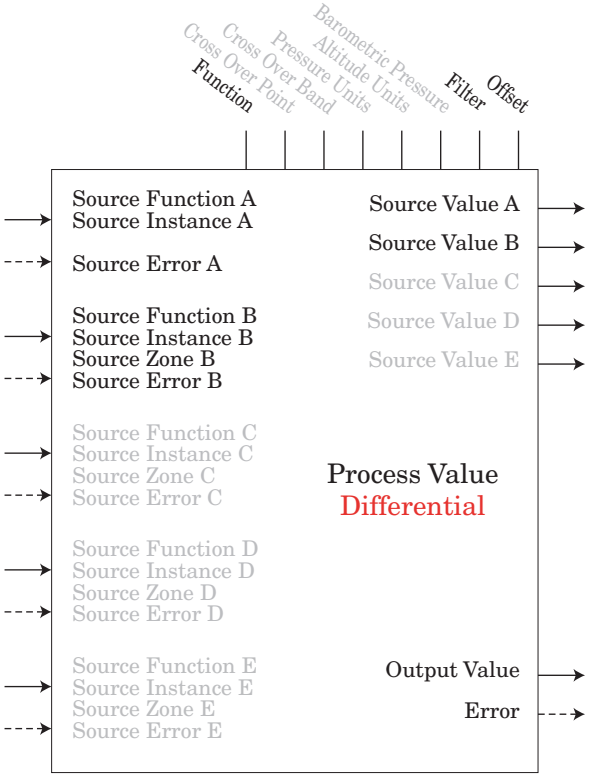


Output Value = Filter [Calculated Humidity + Offset] where Source A is the Dry Bulb and Source B is the Wet Bulb

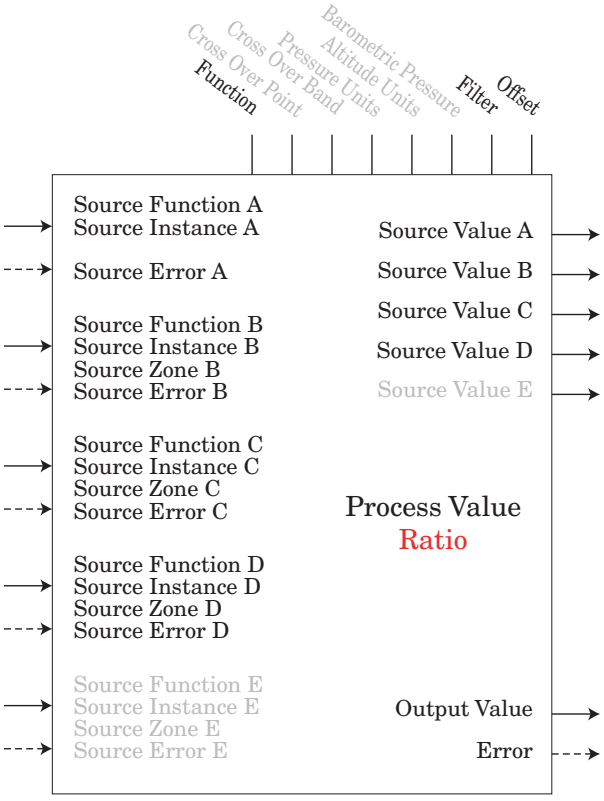
Note: Wet/Dry bulb temperatures are in degrees F and pressures are in PSI. Output Value is % relative humidity. Useful temperature range is 10 to 350F



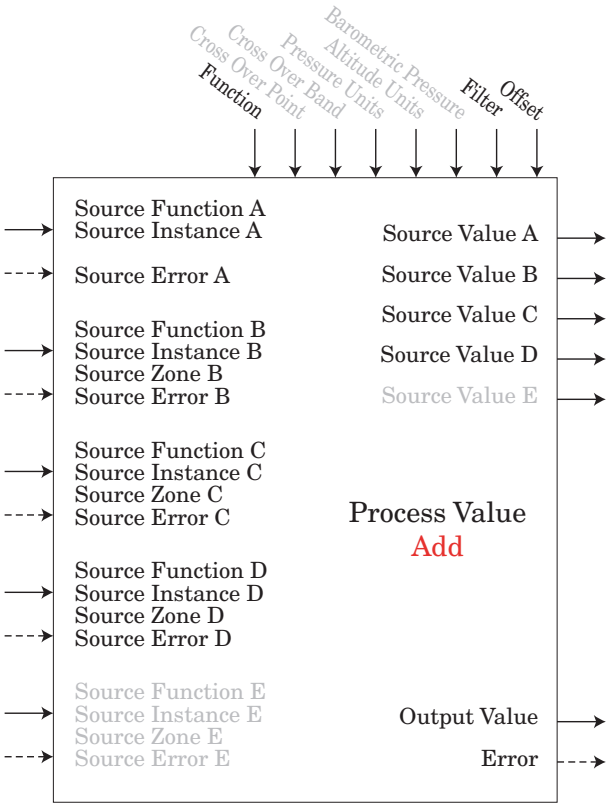
If E = OFF, Output Value = Filter [A + Offset]
If E = ON, Output Value = Filter [B + Offset]
Display units follows active source.



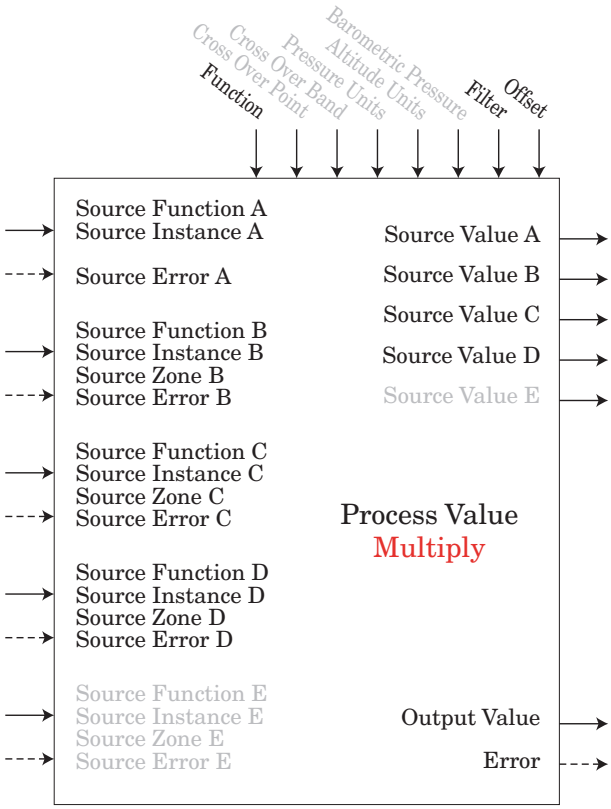
Output Value = Filter [(A - B) + Offset]
Display units follows Source A plus relative Source B



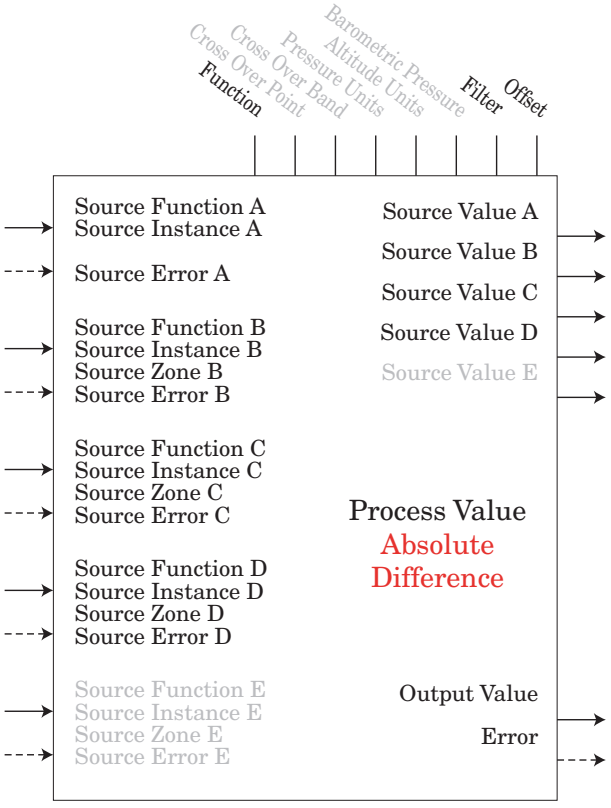
Output Value = Filter [(A / B) + Offset]
If display units of Source A = Source B, no display units on output value, else follow Source A



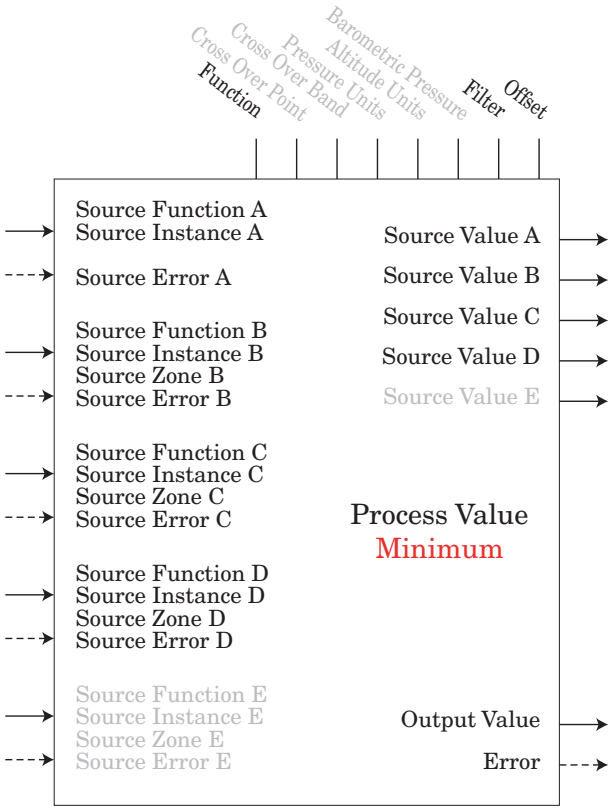
Output Value = Filter [(A + B + C + D) + Offset]
Display units follows last temperature source else follow Source A



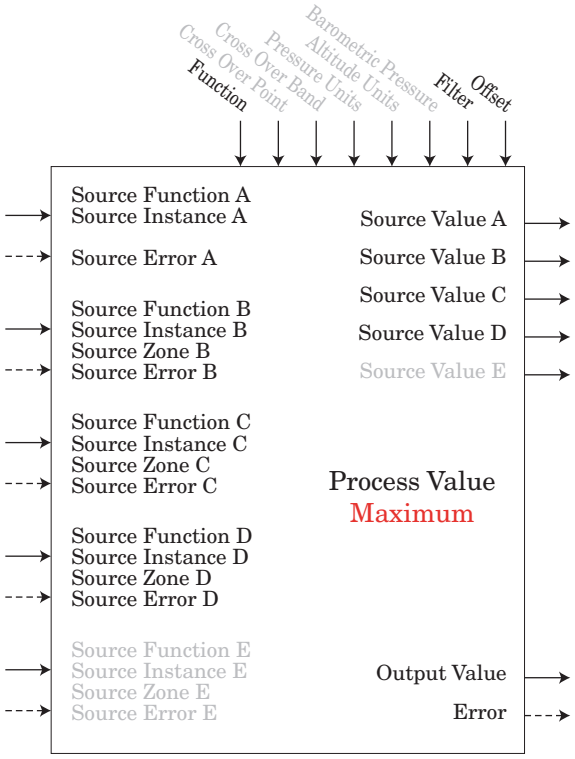
Output Value = Filter [(A * B * C * D) + Offset]
Display units follows last temperature source else follow Source A



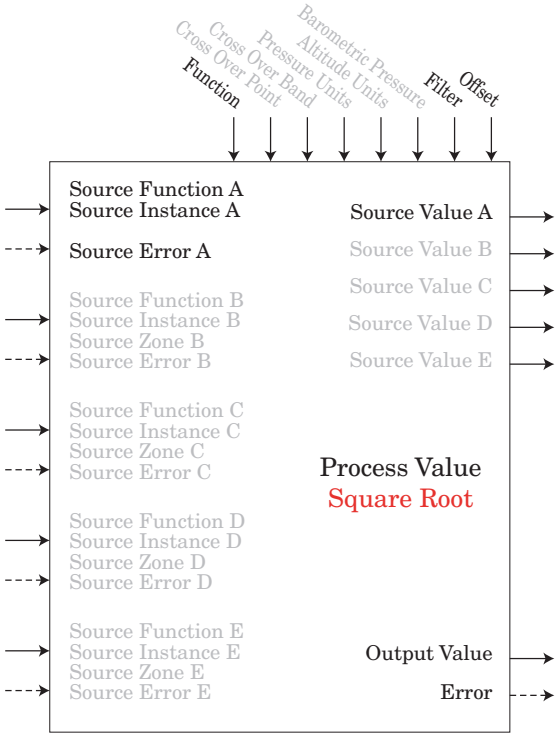
Output Value = Filter [| A - B | + Offset]
Display units follow Source A plus relative Source B



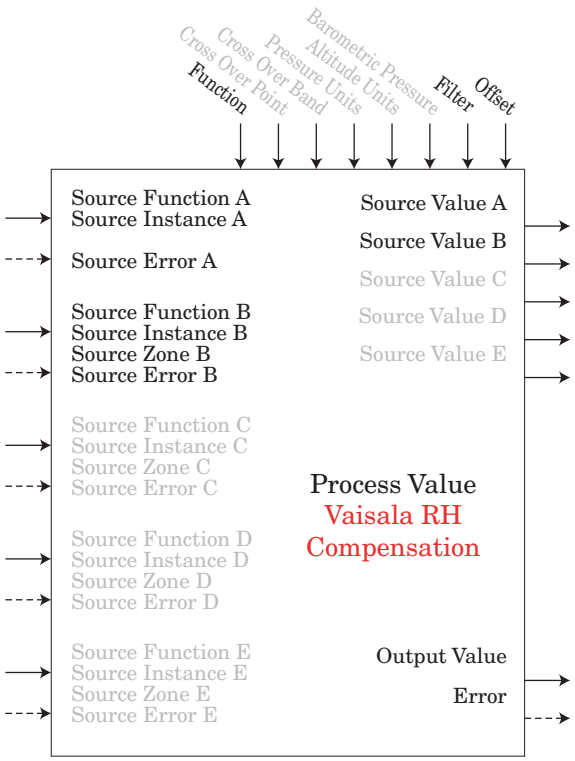
Output Value = Filter [Minimum Value (A : B : C : D) + Offset]
Display units follows Source with minimum value.



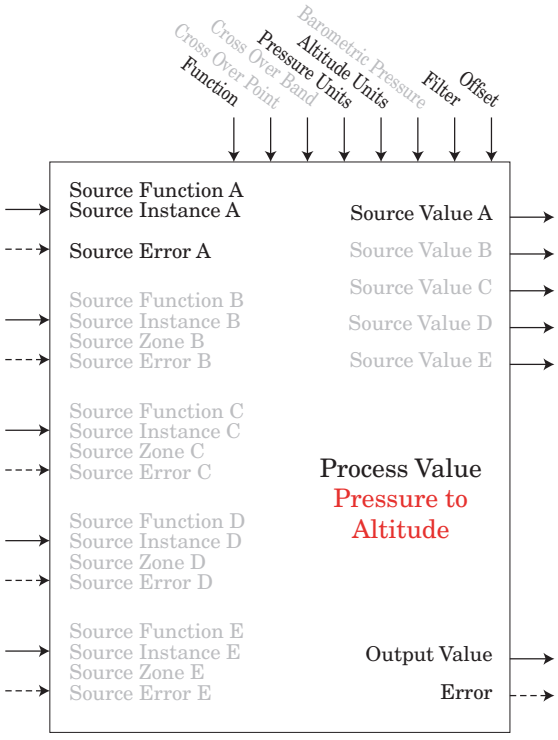
Output Value = Filter [Maximum Value (A : B : C : D) + Offset]
Display units follows Source with maximum value.



Output Value = Filter [Sqr Root A + Offset]
Display units follows Source A



Output Value = Filter [Calculated RH compensated for temperature + Offset].
Note: Source A is RH measured value from an uncompensated Vaisala RH sensor. Source B is temperature of the RH sensor in degrees F. The result is a "corrected" RH measured value. This calculation is effective over the temperature range of -75F to 350F.



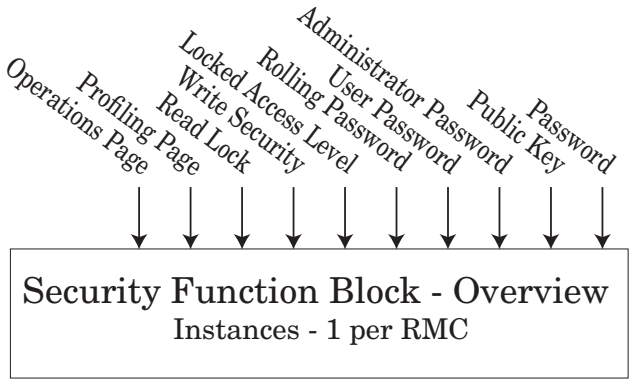
Output Value = Filter [Convert Source A in Pressure to Altitude + Offset]

Note: Pressure Altitude calculation is based on the International Standard Atmosphere 1976. Source A is a pressure signal and needs to be in PSI units for the calculation. The calculation is accurate from sea level to 90,000 feet. The standard is based on an altitude of 0 feet (sea level) pressure of 14.6967 PSI and a temperature of 59 degrees F. Result of calculation is in feet.

Security Function

Note:
Set on a Zone by Zone basis affecting any access using Standard Bus communications. Does not affect field protocols.. This is independent of the RUI Security Setting.

If the Password is enabled, the user must enter the Password to get to menus that have been blocked due to lock level settings. Rolling passwords require a new password each time the power has been cycled to the controller. It will be different for every controller. The administrator password is required to change the security settings even if the user enters their password to override the security settings.



LoC Lock Menu
FAct Factory Page

- LoC.o Operations Page : 1 to 3
- LoC.P Profiling Page : 1 to 3
- PAS.E Password Enable : Off, On
- r.LoC Read Lock : 1 to 5
- S.LoC Write Security: 1 to 5
- LoC.L Locked Access Level : 1 to 5
- roL.L Rolling Password : Off, On
- PAS.u User Password : 10 to 999
- PAS.A Administrator Password : 10 to 999

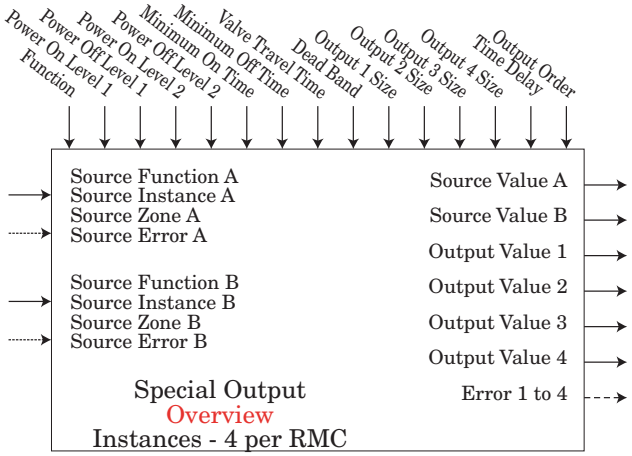
ULoC Unlock Menu
FAct Factory Page

- CodE Public Key : xxx
- PASS Password : xxx

Special Output Function

This function is used to configure outputs when used with compressors, motorized valves or sequencers

An error (1 - 4), when read, can indicate any of the following: None, Open, Shorted, Measurement Error, Bad Cal Data, Ambient Error, RTD Error, Fail, Math Error, Not Sourced, Stale

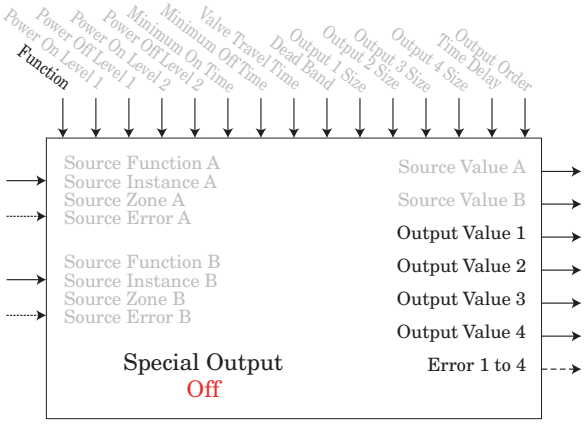


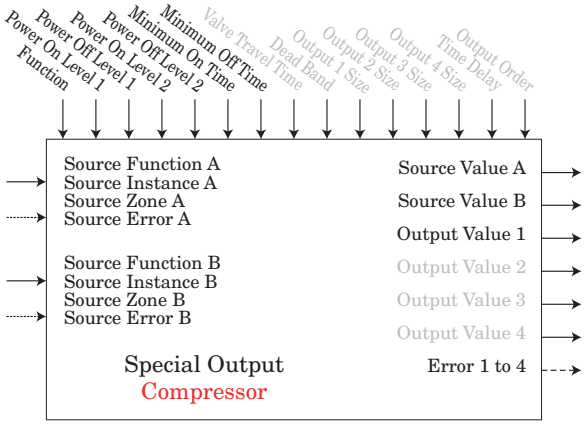
SoF Special Output Function Menu
SEt Setup Page

- Fn Function : Off, Compressor, Motorized Valve, Sequencer
- SFn.A Source Function A : None, Analog Input, Cool Power, Heat Power, Power, Linearization, Math, Process Value, Special Function Output 1, Variable
- S .A Source Instance A : 1 to 250
- S2.A Source Zone A : 0 to 16
- SFn.b Source Function B : None, Cool Power, Heat Power, Power, Linearization, Math, Variable
- S .b Source Instance B : 1 to 250
- S2.b Source Zone B : 0 to 16
- Pon.A Power On Level 1 : -100.0 to 100.0 %
- PoF.A Power Off Level 1 : -100.0 to 100.0 %
- Pon.b Power On Level 2 : -100.0 to 100.0 %
- PoF.b Power Off Level 2 : -100.0 to 100.0 %
- on.t On Time : 0 to 9,999 seconds
- oF.t Off Time : 0 to 9,999 seconds
- t.t Valve Travel Time : 10 to 9,999 seconds
- db Dead Band : 1.0 to 100.0 %
- o.S 1 Output 1 Size : 0 to 9,999
- o.S2 Output 2 Size : 0 to 9,999
- o.S3 Output 3 Size : 0 to 9,999
- o.S4 Output 4 Size : 0 to 9,999
- t.dl Time Delay : 0 to 9,999 seconds
- ot.o Output Order : Linear, Progressive

SoF Special Output Function Menu
oPEr Operation Page

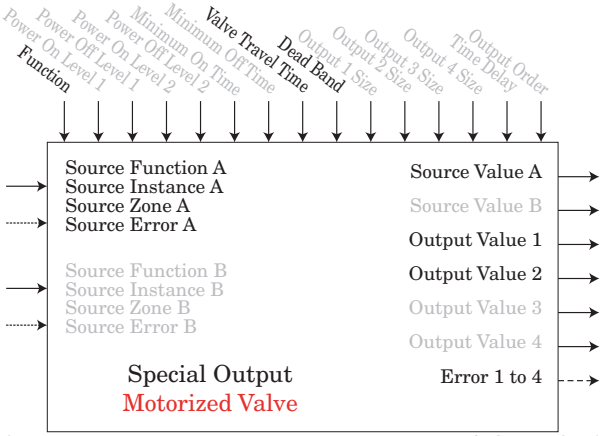
- S.u.A Source Value A : -1,999.000 to 9,999.000
- S.u.b Source Value B : -1,999.000 to 9,999.000
- o.u 1 Output Value 1 : -1,999.000 to 9,999.000 %
- o.u2 Output Value 2 : -1,999.000 to 9,999.000 %
- o.u3 Output Value 3 : -1,999.000 to 9,999.000 %
- o.u4 Output Value 4 : -1,999.000 to 9,999.000 %



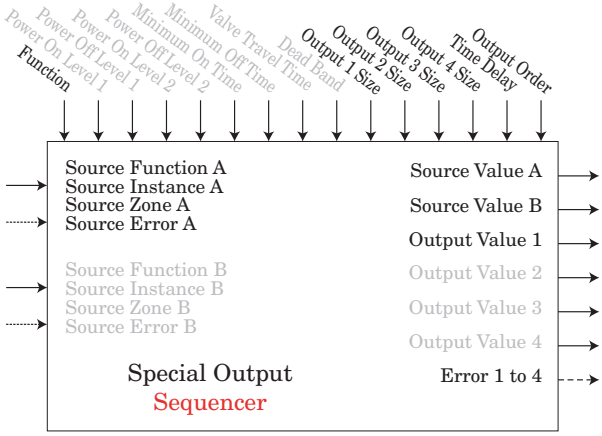


Note:

Typical use scenario for compressor control is for cooling and/or dehumidification. The application may have one or two loops of control which utilize the compressor to accomplish the cooling and/or dehumidificaition (negative power levels). Because the compressor is a mechanical device, it is desirable to minimize starts and stops. Either loop can attempt to start or stop the compressor, but this algorithm will make the determination when it should or should not run. Because you may not turn the compressor off until the loop is in the heat or humidify region, the input values to the compressor algorithm must be loop power (+/- 100%).



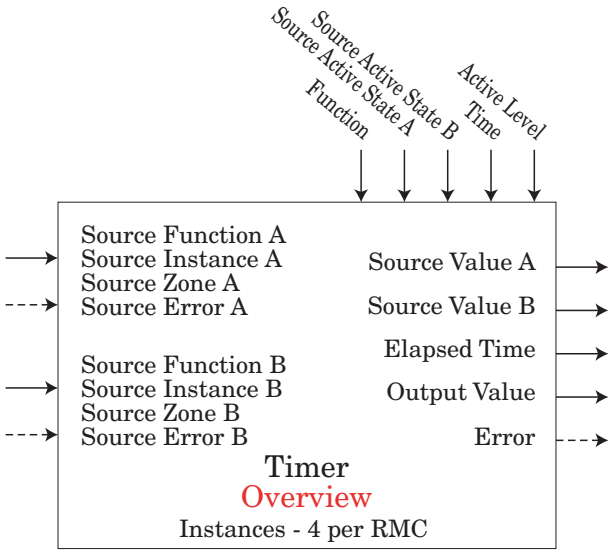
Current Position is an approximation of the valve's position as it relates to a power level (0 - 100%) where 0% is fully closed and 100% is fully open. Dead Time is the minimum on time that the valve will travel once it is turned on in either the closed or open direction. Dead Time = Valve Dead Band / 100 * Valve Travel Time. On Time is the amount of time the valve needs to be turned on (either open or close) to eliminate the error between the estimated valve position and the desired power level. A positive On Time value indicates the need to open the valve while a negative value indicates the need to close the valve. On Time = (Source A Value - Current Position) / 100 * Valve Travel Time. When power is applied to the controller, the valve is closed and time is set to 0. Output Value 1 is the close signal to the valve. Output Value 2 is the open signal to the valve.



A sequencer takes a single input power signal and splits it up into multiple output signals. Each output represents a portion of the total output capacity. The primary output which is often referred to as the vernier output represents a larger portion of the total output capacity than any of the other outputs. The vernier output is always a proportional signal while the other outputs are ON/OFF.

Timer Function

An error, when read, can indicate any of the following: None, Open, Shorted, Measurement Error, Bad Cal Data, Ambient Error, RTD Error, Fail, Math Error, Not Sourced, Stale

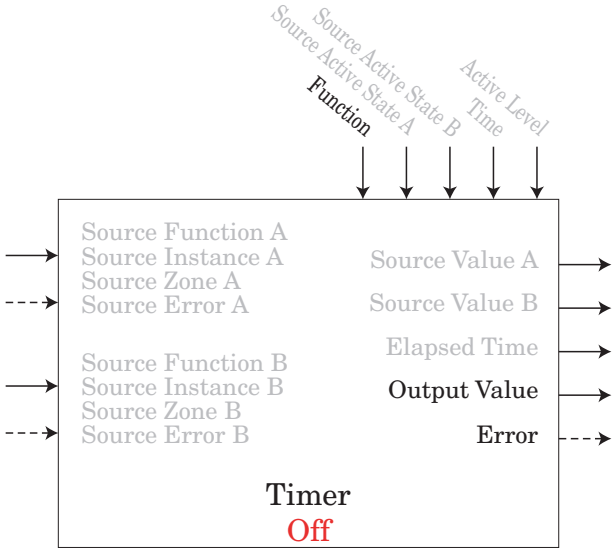


tMr Timer Menu
SEt Setup Page

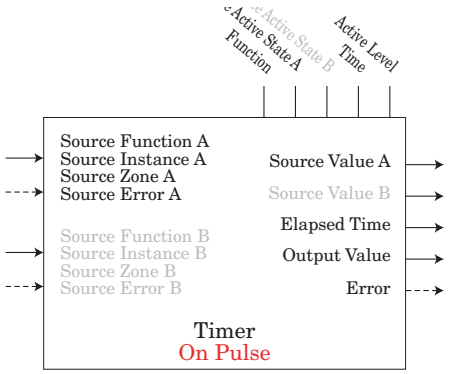
- Fn Function : Off, On Pulse, Delay, One Shot, Retentive
- SFn.A Source Function A (Timer Run) : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Logic, Special Function Output 1 to 4, Variable
- S1.A Source Instance A : 1 to 250
- S2.A Source Zone A : 0 to 16
- SASt.A Source Active State A (Timer Run) : High (rising), Low (falling)
- SFn.b Source Function B (Timer Reset) : None, Alarm, Compare, Counter, Digital I/O, Profile Event Out A to H, Function Key, Logic, Special Function Output 1 to 4, Timer, Variable
- S1.b Source Instance B : 1 to 250
- S2.b Source Zone B : 0 to 16
- SASt.b Source Active State B (Timer Reset) : High (rising), Low (falling)
- t1 Time : 0 to 9,999 seconds
- LEv Active Level : High, Low

tMr Timer Menu
oPEr Operation Page

- Sv.A Source Value A : Off, On
- Sv.b Source Value B : Off, On
- Et Elapsed Time : 0.0 to 9,999.000 seconds
- ov Output Value : Off, On

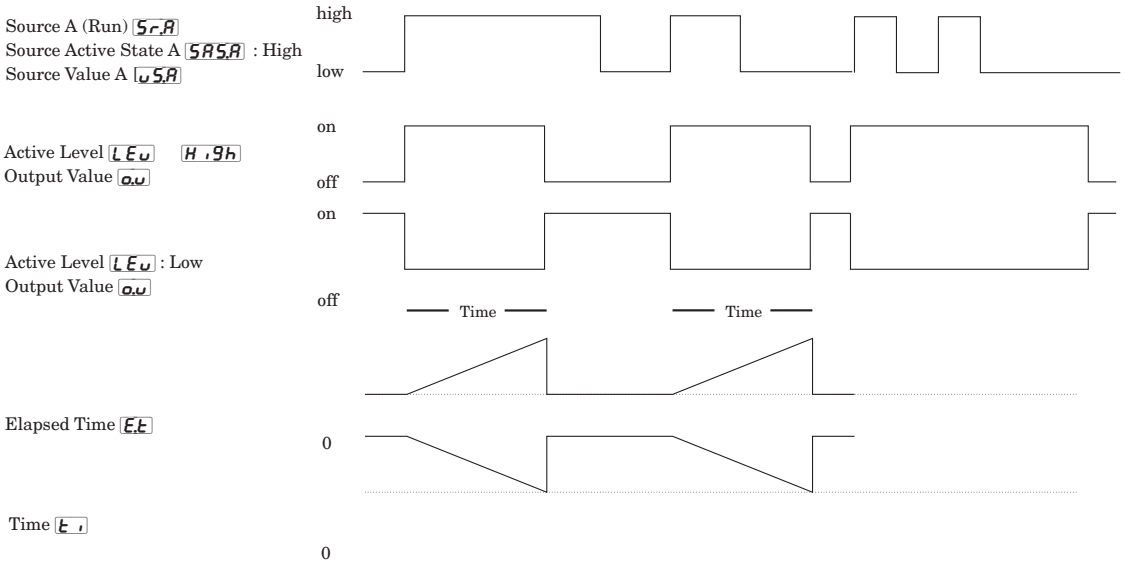


Output Value = OFF

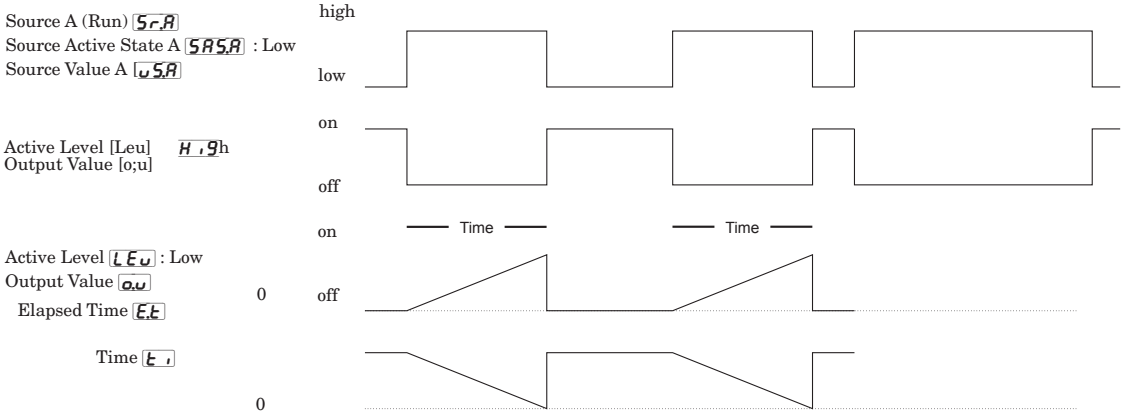


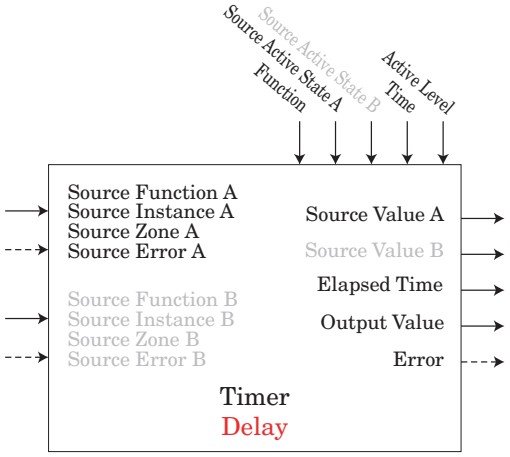
An On Pulse Timer is used to produce an output pulse of a constant duration. It can be used as a minimum on time for compressor control or other devices that do not want excessive cycling.

Timing Diagram of On Pulse with active state rising edge



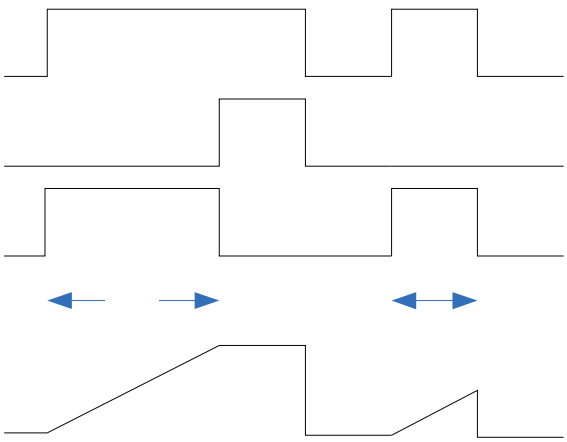
Timing Diagram of On Pulse with active state falling edge



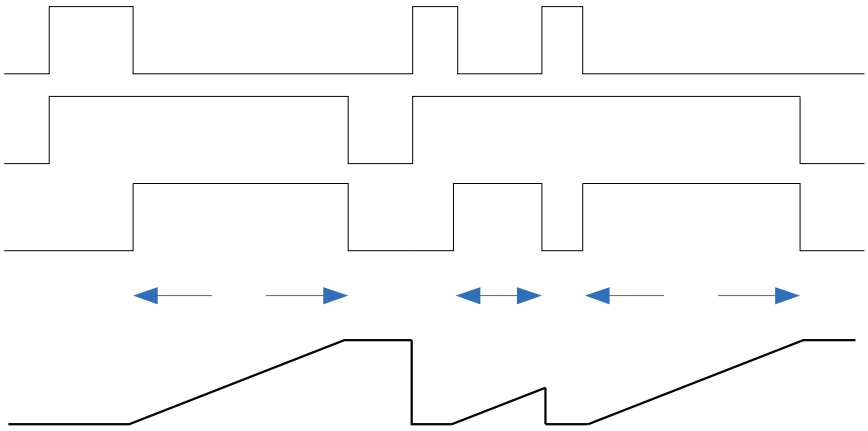


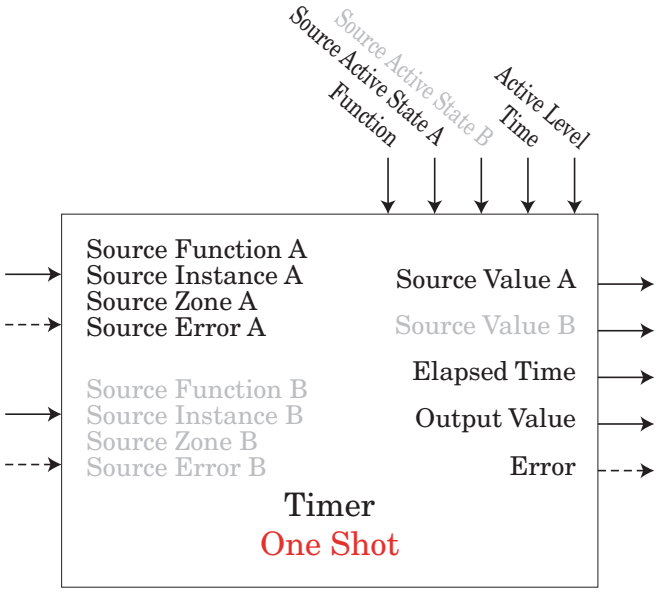
A delay timer is used to cause a delaying action. The delay can be made to happen on either the leading or trailing edge. This can be used to keep short input pulses from propagating or to have a secondary action occur at a known amount of time after the primary action; such as, turning on successive output devices.

Source A

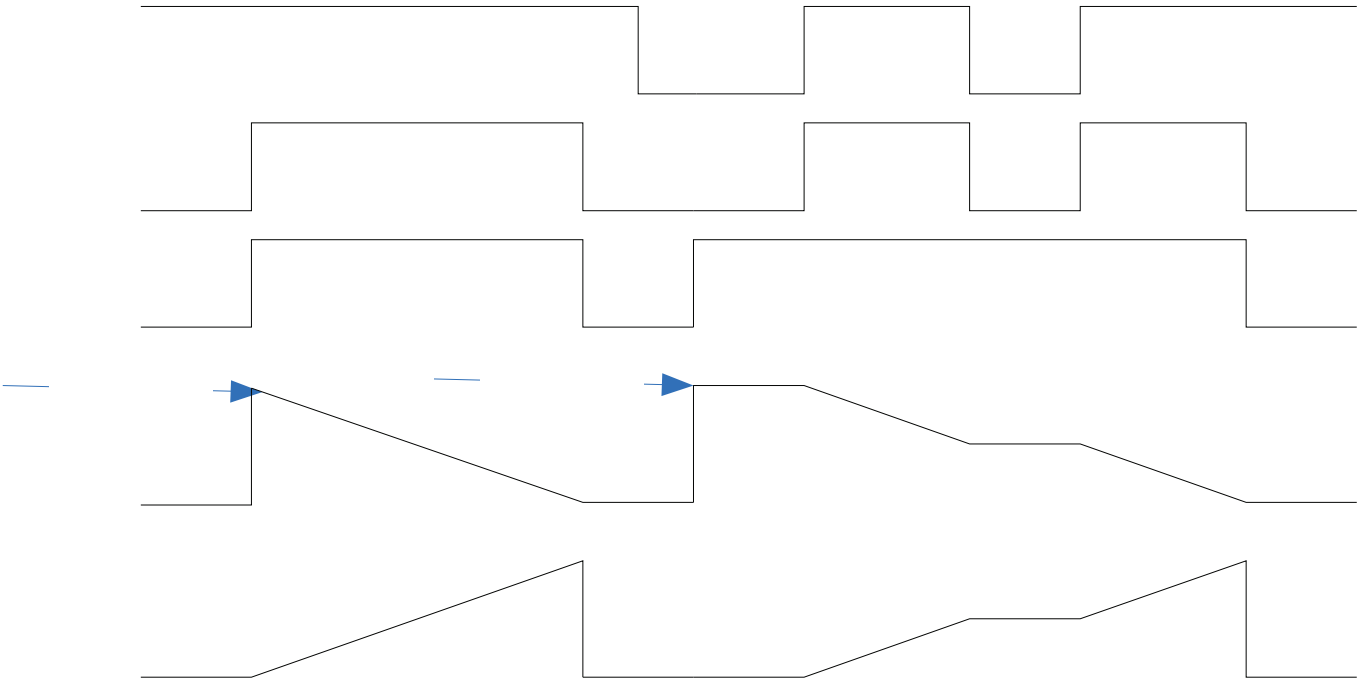


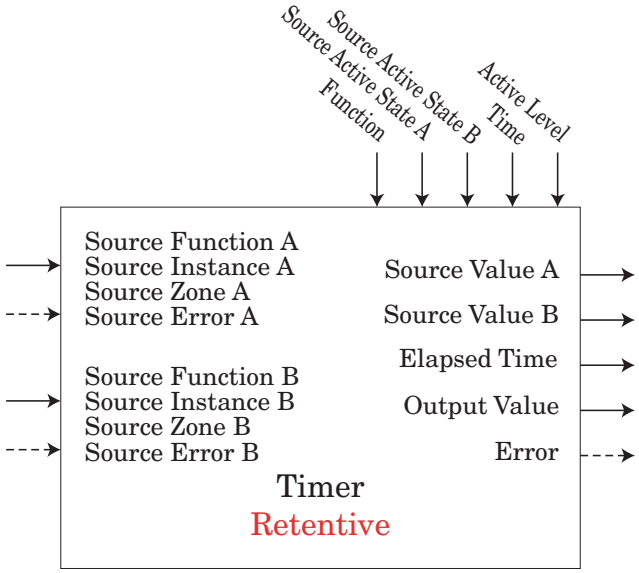
Source A



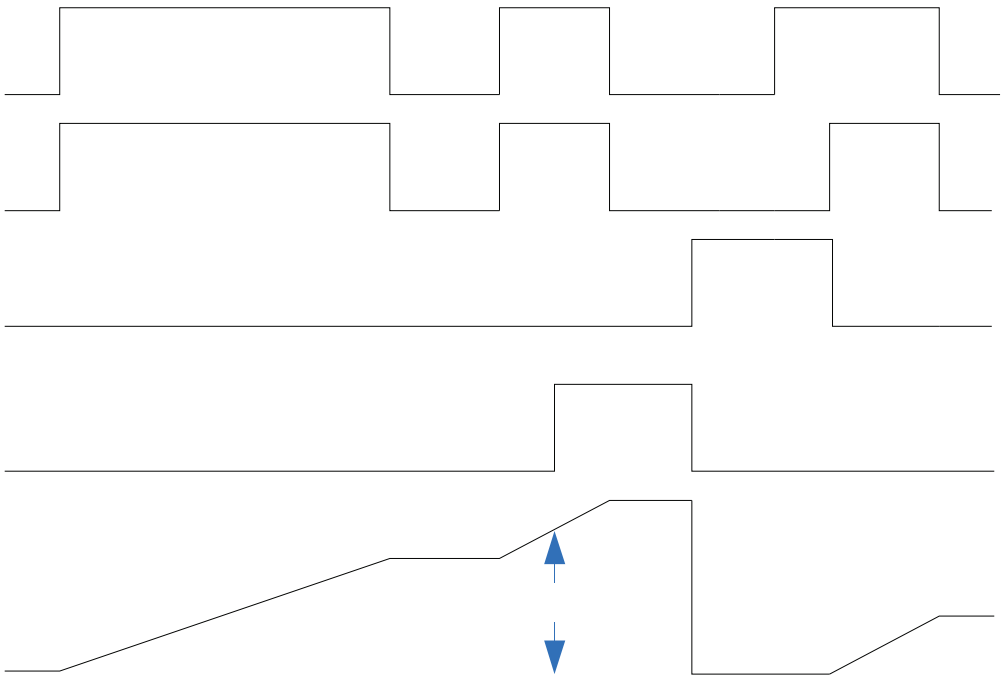


The One Shot timer functions like a simple oven timer. The time value gets set by the user and it counts down to zero without retaining the original time (hence the name one-shot). This is intended to be used in applications where the user will manually set different times for each process.





A retentive timer is used to keep track of how much time something has been in a particular state. This can be used to time how long something has been in an alarm state for example or how long it has been since a profile or step ran. The output can be used to trigger an event if the elapsed time has grown excessive.

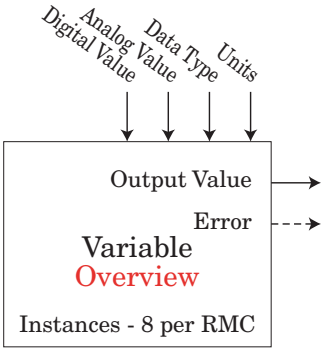


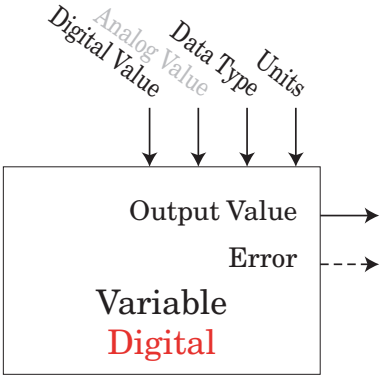
Variable Function

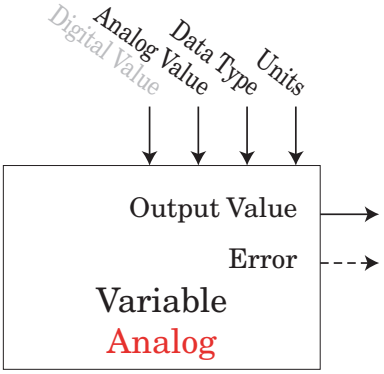
This function simply passes the stored value to its output.

An error, when read, can indicate any of the following: None, Open, Shorted, Measurement Error, Bad Cal Data, Ambient Error, RTD Error, Fail, Math Error, Not Sourced, Stale

A variable function block is used to store a user supplied value and provide a source input to another function block with that value. As an example, you could use a variable function value as one input to a compare function. The other input to the compare function would determine the output value based on the user's supplied value.







uAr Variable Menu
SEt Setup Page

tYPE Data Type : Analog, Digital

d iG Digital Value : On, Off

AnLG Analog Value : -1,999.000 to 9,999.000

Un it Units : None, Absolute Temperature, Relative Temperature, Power, Process Relative Humidity

ou Output Value : -1,999.000 to 9,999.000 or On or Off

Chapter 8: Appendix

Troubleshooting Alarms, Errors and Control Issues

Indication	Description	Possible Cause(s)	Corrective Action
Alarm won't clear or reset	Alarm will not clear or reset with keypad or digital input	• Alarm latching is active • Alarm set to incorrect output • Alarm is set to incorrect source • Sensor input is out of alarm set point range • Alarm set point is incorrect • Alarm is set to incorrect type • Digital input function is incorrect	• Reset alarm when process is within range or disable latching • Set output to correct alarm source instance • Set alarm source to correct input instance • Correct cause of sensor input out of alarm range • Set alarm set point to correct trip point • Set alarm to correct type: process, deviation or power • Set digital input function and source instance
Alarm won't occur	Alarm will not activate output	• Alarm silencing is active • Alarm blocking is active • Alarm is set to incorrect output • Alarm is set to incorrect source • Alarm set point is incorrect • Alarm is set to incorrect type	• Disable alarm silencing, if required • Disable alarm blocking, if required • Set output to correct alarm source instance • Set alarm source to correct input instance • Set alarm set point to correct trip point • Set alarm to correct type: process, deviation or power
Alarm Error AL.E1 AL.E2 AL.E3 AL.E4	Alarm state cannot be determined due to lack of sensor input	• Sensor improperly wired or open • Incorrect setting of sensor type • Calibration corrupt	• Correct wiring or replace sensor • Match setting to sensor used • Check calibration of controller
Alarm Low AL.L1 AL.L2 AL.L3 AL.L4	Sensor input below low alarm set point	• Temperature is less than alarm set point • Alarm is set to latching and an alarm occurred in the past • Incorrect alarm set point • Incorrect alarm source	• Check cause of under temperature • Clear latched alarm • Establish correct alarm set point • Set alarm source to proper setting
Alarm High AL.h1 AL.h2 AL.h3 AL.h4	Sensor input above high alarm set point	• Temperature is greater than alarm set point • Alarm is set to latching and an alarm occurred in the past • Incorrect alarm set point • Incorrect alarm source	• Check cause of over temperature • Clear latched alarm • Establish correct alarm set point • Set alarm source to proper setting
Error Input Er.i1 Er.i2 Er.i3 Er.i4	Sensor does not provide a valid signal to controller	• Sensor improperly wired or open • Incorrect setting of sensor type • Calibration corrupt	• Correct wiring or replace sensor • Match setting to sensor used • Check calibration of controller
Limit won't clear or reset	Limit will not clear or reset with keypad or digital input	• Sensor input is out of limit set point range • Limit set point is incorrect • Digital input function is incorrect	• Correct cause of sensor input out of limit range • Set limit set point to correct trip point • Set digital input function and source instance
Limit Error L.E1 L.E2 L.E3 L.E4	Limit state cannot be determined due to lack of sensor input, limit will trip	• Sensor improperly wired or open • Incorrect setting of sensor type • Calibration corrupt	• Correct wiring or replace sensor • Match setting to sensor used • Check calibration of controller

Indication	Description	Possible Cause(s)	Corrective Action
Limit Low L.L 1 L.L 2 L.L 3 L.L 4	Sensor input below low limit set point	• Temperature is less than limit set point • Limit outputs latch and require reset • Incorrect alarm set point	• Check cause of under temperature • Clear limit • Establish correct limit set point
Limit High L.h 1	Sensor input above high limit set point	• Temperature is greater than limit set point • Limit outputs latch and require reset • Incorrect alarm set point	• Check cause of over temperature • Clear limit • Establish correct limit set point
Loop Open Error LP.o 1 LP.o2 LP.o3 LP.o4	Open Loop Detect is active and the process value did not deviate by a user-selected value in a user specified period with PID power at 100%.	• Setting of Open Loop Detect Time incorrect • Setting of Open Loop Detect Deviation incorrect • Thermal loop is open • Open Loop Detect function not required but activated	• Set correct Open Loop Detect Time for application • Set correct Open Loop Deviation value for application • Determine cause of open thermal loop: misplaced sensors, load failure, loss of power to load, etc. • Deactivate Open Loop Detect feature
Loop Reversed Error LP.r 1 LP.r 2 LP.r 3 LP.r 4	Open Loop Detect is active and the process value is headed in the wrong direction when the output is activated based on deviation value and user-selected value.	• Setting of Open Loop Detect Time incorrect • Setting of Open Loop Detect Deviation incorrect • Output programmed for incorrect function • Thermocouple sensor wired in reverse polarity	• Set correct Open Loop Detect Time for application • Set correct Open Loop Deviation value for application • Set output function correctly • Wire thermocouple correctly, (red wire is negative)
Ramping rP 1 rP2 rP3 rP4	Controller is ramping to new set point	• Ramping feature is activated	• Disable ramping feature if not required
Autotuning tUn 1 tUn2 tUn3 tUn4	Controller is autotuning the control loop	• User started the autotune function • Digital input is set to start autotune	• Wait until autotune completes or disable autotune feature • Set digital input to function other than autotune, if desired
No heat/cool action	Output does not activate load	• Output function is incorrectly set • Control mode is incorrectly set • Output is incorrectly wired • Load, power or fuse is open • Control set point is incorrect • Incorrect controller model for application	• Set output function correctly • Set control mode appropriately (Open vs Closed Loop) • Correct output wiring • Correct fault in system • Set control set point in appropriate control mode and check source of set point: remote, idle, profile, closed loop, open loop • Obtain correct controller model for application
No Display	No display indication or LED illumination	• Power to controller is off • Fuse open • Breaker tripped • Safety interlock switch open • Separate system limit control activated • Wiring error • Incorrect voltage to controller	• Turn on power • Replace fuse • Reset breaker • Close interlock switch • Reset limit • Correct wiring issue • Apply correct voltage, check part number

Indication	Description	Possible Cause(s)	Corrective Action
No Serial Communication	Cannot establish serial communications with the controller	• Address parameter incorrect • Incorrect protocol selected • Baud rate incorrect • Parity incorrect • Wiring error • EIA-485 converter issue • Incorrect computer or PLC communications port • Incorrect software setup • Wires routed with power cables • Termination resistor may be required	• Set unique addresses on network • Match protocol between devices • Match baud rate between devices • Match parity between devices • Correct wiring issue • Check settings or replace converter • Set correct communication port • Correct software setup to match controller • Route communications wires away from power wires • Place 120 Ω resistor across EIA-485 on last controller
Process doesn't control to set point	Process is unstable or never reaches set point	• Controller not tuned correctly	• Perform autotune or manually tune system
		• Control mode is incorrectly set	• Set control mode appropriately (Open vs Closed Loop)
		• Control set point is incorrect	• Set control set point in appropriate control mode and check source of set point: remote, idle, profile, closed loop, open loop
Temperature runway	Process value continues to increase or decrease past set point.	• Controller output incorrectly programmed	• Verify output function is correct (heat or cool)
		• Thermocouple reverse wired	• Correct sensor wiring (red wire negative)
		• Controller output wired incorrectly	• Verify and correct wiring
		• Short in heater	• Replace heater
		• Power controller connection to controller defective	• Replace or repair power controller
		• Controller output defective	• Replace or repair controller
Device Error 100 rEtn	Controller displays internal malfunction message at power up.	• Controller defective • Sensor input over driven	• Replace or repair controller • Check sensors for ground loops, reverse wiring or out of range values.
Heater Error h.Er	Heater Error	• Current through load is above current trip set point	• Check that the load current is proper. Correct cause of overcurrent and/or ensure current trip set point is correct.
		• Current through load is below current trip set point	• Check that the load current is proper. Correct cause of undercurrent and/or ensure current trip set point is correct.
Current Error C.Er	Load current incorrect.	• Shorted solid-state or mechanical relay	• Replace relay
		• Open solid-state or mechanical relay	• Replace relay
		• Current transformer load wire associated to wrong output	• Route load wire through current transformer from correct output, and go to the CS1 Source Output Instance parameter (Setup Page, Current Menu) to select the output that is driving the load.
		• Defective current transformer or controller	• Replace or repair sensor or controller
		• Noisy electrical lines	• Route wires appropriately, check for loose connections, add line filters

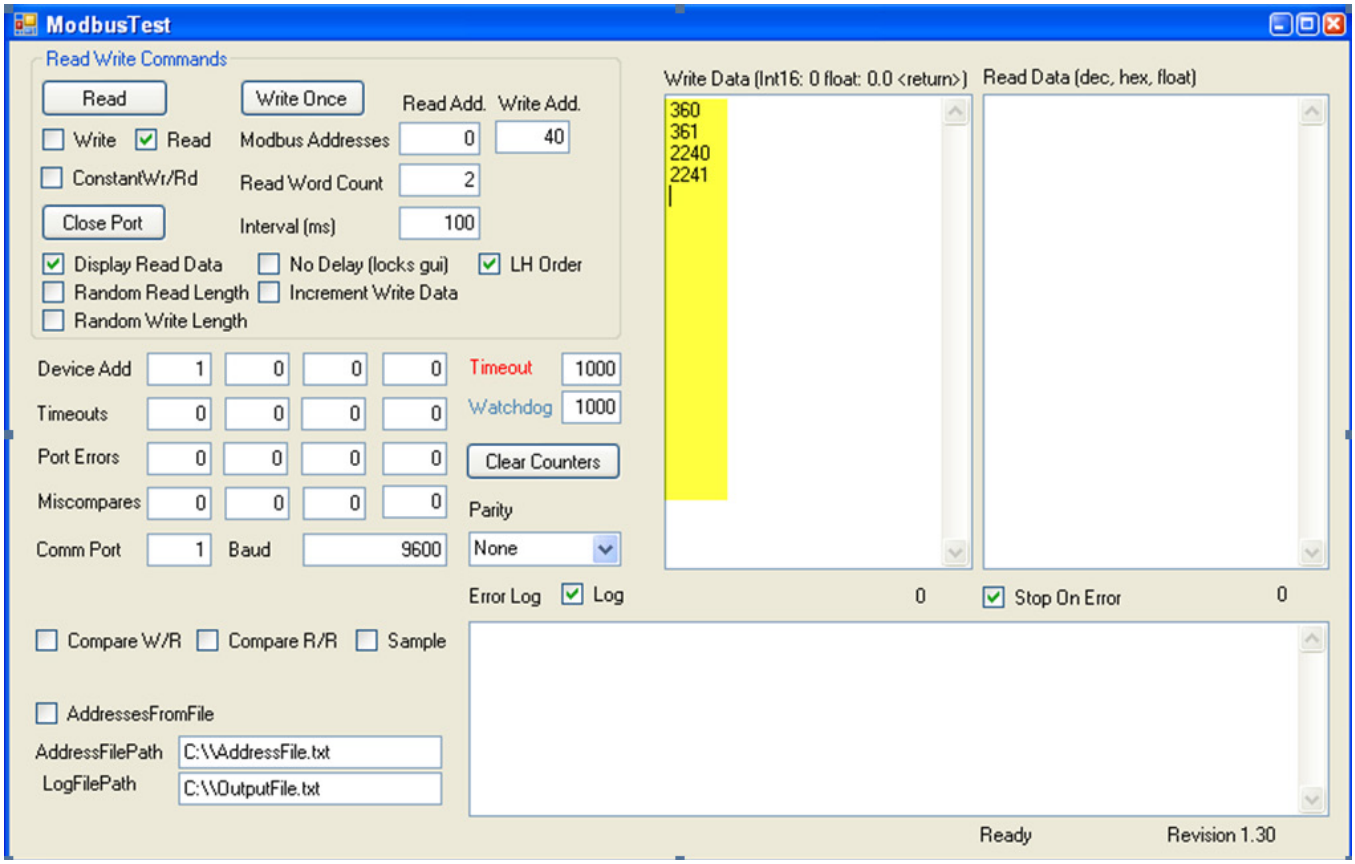
Indication	Description	Possible Cause(s)	Corrective Action
Remote User Interface (RUI) menus inaccessible	Unable to access SEt, OPEr, FCty or ProF menus or particular prompts in Home Page	• Security set to incorrect level	• Check LoC settings in Factory Page • Enter appropriate password in ULoC setting in Factory Page
		• Digital input set to lockout keypad	• Change state of digital input
		• Custom parameters incorrect	• Change custom parameters in Factory Page
RUI value to low uRL.L	Value to low to be displayed in 4 digit LED display <-1999	• Incorrect setup	• Check scaling of source data
RUI value to high uRL.h	Value to high to be displayed in 4 digit LED display >9999	• Incorrect setup	• Check scaling of source data

Detection of and Rules Around Abnormal Sensor Conditions	
Inputs	**Detection of Abnormal Conditions**
Thermocouple	
Shorted	No direct detection, Open loop firmware detection.
Open	Yes, Parasitic pull-up
Reversed	Yes, firmware detection
Current Source	
Shorted	Range limiting only
Open	Range limiting only
Reversed	Range limiting only
Voltage Source	
Open	Range limiting only
Shorted	Range limiting only
Reversed	Range limiting only
RTD	
S1 open	Yes, pulled up.
S2 open	Not implemented.
S3 open	Yes, pulled up.
S1 short to S2	Yes, pulled up
S1 short to S3	Yes, pulled down to under range.
S2 shorted to S3	Not implemented, Possible, monitor S2 voltage.
S1 and S2 open	Yes, pulled down to under range.
S1 and S3 open	Yes, S1 pulled up.
S2 and S3 open	Yes pulled up.
Thermistor	
S1 open	Yes, pulled up to sensor over range.
S3 open	Yes, pulled up to sensor over range.
S1 short to S3	Yes, pulled down to sensor under range.
S1 and S3 open	Yes, S1 pulled up to sensor over range.

Modbus - Programmable Memory Blocks

The Modbus assembly contains 40 pointers to the parameters of your choosing starting at Modbus register 40 (shown on the following page). The pointers are 32-bits long so are stored in two sequential registers. As an example, if we want to move an alias to the analog input of the RMC (register 360) into register 40, we perform a multiple write command (0x10 function) of 360 into register 40 and 361 into register 41 as a single multi-write command.

Once the parameters of choice have been defined and written to the pointer registers, the working registers 200 to 279 then represent those parameters. Therefore, as in the example above, if 360 is in register 40, 361 in register 41, register 200 & 201 contains the 32-bit floating point result for analog input 1.



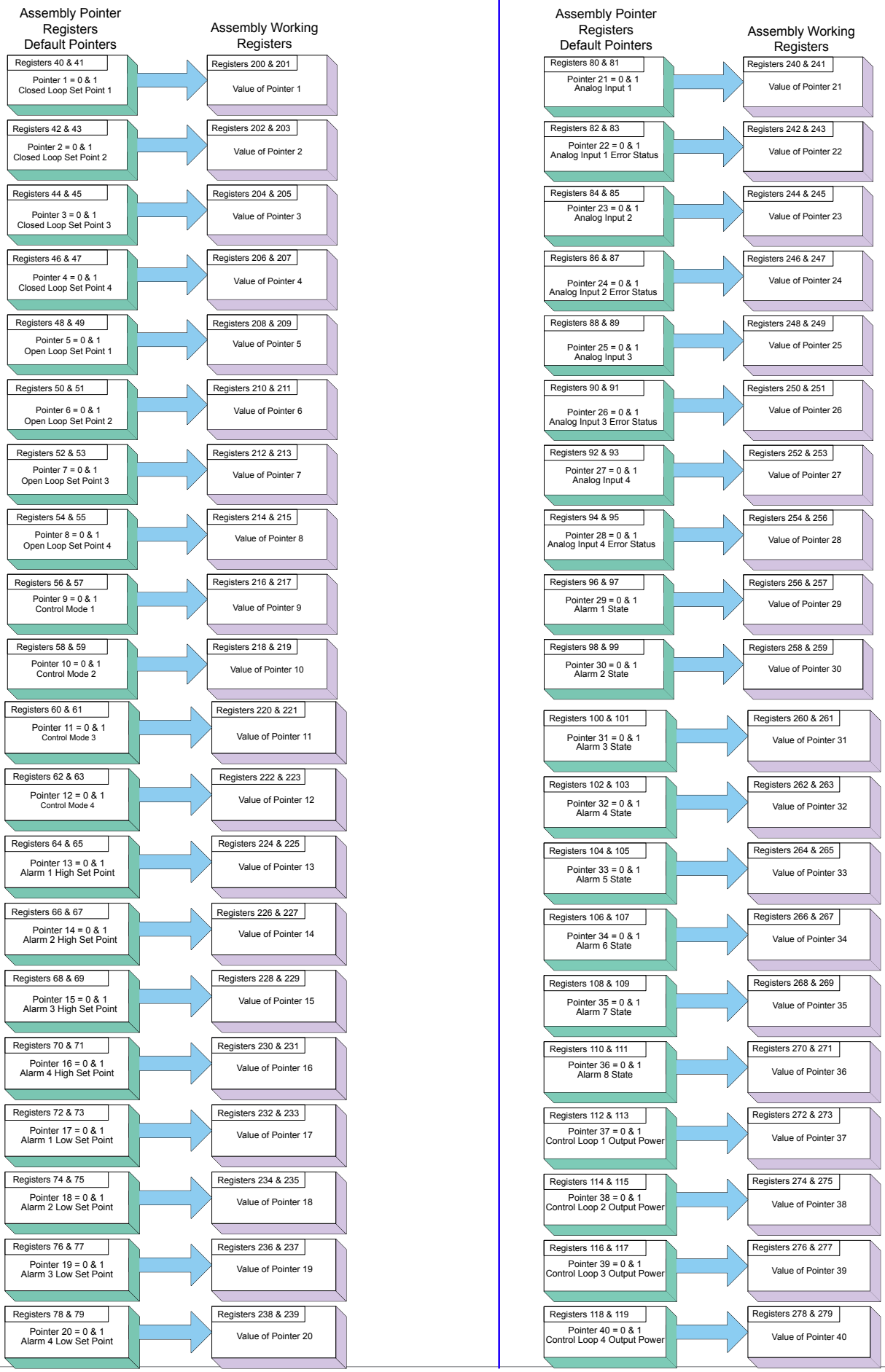
The screen shot above was taken from a program that can be found on the Watlow Support Tools DVD (shipped with the product) as well as on the Watlow website. On the DVD, it can be found under "Utility Tools" and is identified as "Modbus RTU Diagnostic Program for EZ-ZONE PM, RM and ST". A similar program can be found here as well for a connection utilizing Ethernet TCP.

If it is easier to go to the web to acquire this software click on the link below and type "modbus" in the search field where both versions can be found with the same name. http://www.watlow.com/literature/software.cfm

Assembly Pointer Registers and Assembly Working Registers

Pointer Registers	Working Registers
40 & 41	200 & 201
42 & 43	202 & 203
44 & 45	204 & 205
46 & 47	206 & 207
48 & 49	208 & 209
50 & 51	210 & 211
52 & 53	212 & 213
54 & 55	214 & 215
56 & 57	216 & 217
58 & 59	218 & 219
60 & 61	220 & 221
62 & 63	222 & 223
64 & 65	224 & 225
66 & 67	226 & 227
68 & 69	228 & 229
70 & 71	230 & 231
72 & 73	232 & 233
74 & 75	234 & 235
76 & 77	236 & 237
78 & 79	238 & 239
80 & 81	240 & 241
82 & 83	242 & 243
84 & 85	244 & 245
86 & 87	246 & 247
88 & 89	248 & 249
90 & 91	250 & 251
92 & 93	252 & 253
94 & 95	254 & 255
96 & 97	256 & 257
98 & 99	256 & 259
100 & 101	260 & 261
102 & 103	262 & 263
104 & 105	264 & 265
106 & 107	266 & 267
108 & 109	268 & 269
110 & 111	270 & 271
112 & 113	272 & 273
114 & 115	274 & 275
116 & 117	276 & 277
118 & 119	278 & 279

Modbus Default Assembly Structure 40-119



Control Module Specifications

Line Voltage/Power

- 20.4 to 30.8V≂ (ac/dc), 50/60Hz, ±5 percent
- Power consumption: 7 W, 14VA
- Any external power supply used should comply with a class 2 or SELV rating. (Safety Extra Low Voltage)
- Data retention upon power failure via nonvolatile memory
- Compliant with Semi F47-0200, Figure R1-1 voltage sag requirements

Available Power Supplies

- AC/DC Power supply converter 90-264V~ (ac) to 24V⎓ (dc) volts.
- P/N 0847-0299-0000: 31 W
- P/N 0847-0300-0000: 60 W
- P/N 0847-0301-0000: 91 W

Environment

- 0 to 149°F (-18 to 65°C) operating temperature
- -40 to 185°F (-40 to 85°C) storage temperature
- 0 to 90 percent RH, non-condensing
- RMC modules are considered to be open type equipment needing to be installed in a fire and shock protection enclosure, such as a NEMA Type 1 enclosure; unless all circuit connections are Class 2 or SELV

Agency Approvals

- UL®/EN 61010 listed; c-UL C22.2 #61010 File E185611 QUYX, QUYX7
- ANSI/ISA 12.12.01-2007 Hazardous Locations Class 1, Div. 2-Group A, B, C, D Temperature code T4 (optional) File E184390 QUZW, QUZW7
- EN 60529 IP20; RM modules
- UL® 50, Type 4X Indoor use, EN 60529 IP66; 1⁄16 DIN RUI, NEMA 4X
- RoHS by design, W.E.E.E.
- FM Class 3545 on limit control versions
- CE

Serial Communications

- The RMC module ships with isolated standard bus protocol for configuration and communication connection to all other EZ-ZONE products, Modbus RTU is optional.

User Interface

- Seven-segment address LED, programmed via push-button switch
- Communication activity, 2 LEDs
- Error condition of each loop, 4 LEDs
- Output status indication, 16 LEDs

Maximum RM System Configuration

- Sixteen (16) modules, 152 loops. Maximum system capacity (all RM modules) is 16 with one RM Access (RMA) module.

Mounting

- DIN-rail specification EN50022, 35 x 7.5 mm (1.38 x 0.30 in.)
- Can be DIN-rail mounted or chassis mounted with customer-supplied fasteners

Dimensions		Weight
155.0 mm (6.10 in)	116.08 mm (4.57 in)	Controller: 453.59 g (16 oz.)

Wiring Termination—Touch-Safe Terminals

- Right angle and front screw type terminal blocks (slots A, B, D, E)
  - Input, power and controller output terminals, touch-safe removable 12 to 30 AWG
- Wire strip length 7.6 mm (0.30 in.)
- Torque 0.8 Nm (7.0 lb.-in.) right angle, 0.5 Nm (4.51 lb-in) front terminal block
- Dimensional Drawing
- Use solid or stranded copper conductors only

Connector	Dimension “A” (mm/in.)
Standard	148 (5.80)
Straight	155 (6.10)
Ring Terminal	166 (6.50)

Optional Accessories

Remote User Interface (RUI)

Basic RUI

- 1⁄16 DIN
- Dual 4 digit, 7-segment LED displays
- Keys: Advance, infinity, up, down keys, plus an EZ-KEY programmable function key
- Typical display update rate 1Hz

EZ-ZONE RMC Product Documentation

- User Manual, printed hard copy, P/N 0600-0070-0000
- Watlow Support Tools CD, P/N 0601-0001-0000

Process PID or over-temperature limit mode options

- User selectable heat/cool, on-off, P, PI, PD, PID or alarm action, not valid for limit controllers
- Auto-tune with TRU-TUNE+ adaptive control
- Control sampling rates: Input 10Hz, Output 10Hz

Profile Ramp and Soak

- 25 profiles, 15 sub-routines and 400 total steps
- Option for battery back-up and real-time clock via the access module.

Accuracy

- Calibration accuracy and sensor conformity: ±0.1% of span, ±1°C at the calibrated ambient temperature and rated line voltage
- Types R, S, B; 0.2%
- Type T below -50°C; 0.2%
- Calibration ambient temperature at 25°C ±3°C (77°F ±5°F)
- Accuracy span: 540°C (1000°F) min.
- Temperature stability: ±0.1°C/°C (±0.1°F/°F) rise in ambient max.

Universal Input

- Thermocouple, grounded or ungrounded sensors
  - >20MΩ input impedance
- Max. 2KΩ source resistance
- RTD 2- or 3-wire, platinum, 100Ω and 1000Ω @ 0°C (32°F) calibration to DIN curve (0.00385 Ω/Ω/°C)
- Process, 0-20mA @100Ω, or 0-10V⎓ (dc) @ 20kΩ input impedance; scalable, 0-50mV

Voltage Input Ranges

- Accuracy ±10mV ±1 LSD at standard conditions
- Temperature stability ±100 PPM/°C maximum

Milliamp Input Ranges

- Accuracy ±20µA ±1 LSD at standard conditions
- Temperature stability ±100 PPM/°C maximum

Resolution Input Ranges

- 0 to 10V: 200 µV nominal
- 0 to 20 mA: 0.5 mA nominal

- Potentiometer: 0 to 1,200Ω
- Inverse scaling
- Current: input range is 0 to 50mA, 100Ω input impedance Response time: 1 second max., accuracy ±1mA typical

Input Type	Max Error @ 25 Deg C	Accuracy Range Low	Accuracy Range High	Units
J	±1.75	0	750	Deg C
K	±2.45	-200	1250	Deg C
T	±1.55	-200	350	Deg C
N	±2.25	0	1250	Deg C
E	±2.10	-200	900	Deg C
R	±3.9	0	1450	Deg C
S	±3.9	0	1450	Deg C
B	±2.66	870	1700	Deg C
C	±3.32	0	2315	Deg C
D	±3.32	0	2315	Deg C
F (PTII)	±2.34	0	1343	Deg C
RTD, 100 ohm	±2.00	-200	800	Deg C
RTD, 1000 ohm	±2.00	-200	800	DegC
mV	±0.05	-50	50	mV
Volts	±0.01	0	10	Volts
mAdc	±0.02	0	20	mAmps DC
mAac	±5	0	50	mAmps AC
Potentiometer, 1K range	±1	0	1000	Ohms
Resistance, 5K range	±5	0	5000	Ohms
Resistance, 10K range	±10	0	10000	Ohms
Resistance, 20K range	±20	0	20000	Ohms
Resistance, 40K range	±40	0	40000	Ohms

Operating Range			
Input Type	**Range Low**	**Range High**	**Units**
J	-210	1200	Deg C
K	-270	1371	Deg C
T	-270	400	Deg C
N	-270	1300	Deg C
E	-270	1000	Deg C
R	-50	1767	Deg C
S	-50	1767	Deg C
B	0	1816	Deg C
C	0	2315	Deg C
D	0	2315	Deg C
F (PTII)	0	1343	Deg C
RTD (100 ohm)	-200	800	Deg C
RTD (1000 ohm)	-200	800	Deg C
mV	0	50	mV
Volts	0	10	Volts
mAdc	0	20	mAmps DC

Operating Range (cont.)			
Input Type	**Range Low**	**Range High**	**Units**
mAac	0	50	mAmps AC
Potentiometer, 1K range	0	1200	Ohms
Resistance, 5K range	0	5000	Ohms
Resistance, 10K range	0	10000	Ohms
Resistance, 20K range	0	20000	Ohms
Resistance, 40K range	0	40000	Ohms

Thermistor Input				
Input Type	**Max Error @ 25 Deg C**	**Accuracy Range Low**	**Accuracy Range High**	**Units**
Thermistor, 5K range	±5	0	5000	Ohms
Thermistor, 10K range	±10	0	10000	Ohms
Thermistor, 20K range	±20	0	20000	Ohms
Thermistor, 40K range	±40	0	40000	Ohms

- 0 to 40KΩ, 0 to 20KΩ, 0 to 10KΩ, 0 to 5KΩ
- 2.252KΩ and 10KΩ base at 25°C
- Linearization curves built in
- Third party Thermistor compatibility requirements

Base R @ 25C	Alpha Techniques	Beta THERM	YSI	Thermistor Curve
2.252K	Curve A	2.2K3A	004	A
10K	Curve A	10K3A	016	B
10K	Curve C	10K4A	006	C

Digital Input

- Update rate 10Hz
- DC voltage
  - Max. input 36V at 3mA
  - Min. high state 3V at 0.25mA
  - Max. low state 2V

Dry Contact

- Update rate 10Hz
- Min. open resistance 10KΩ
- Max. closed resistance 50Ω
- Max. short circuit 13mA

Single Input Current Measurement Input

- Accepts 0-50mA (ac) signal (user programmable range)
- Displayed operating range and resolution can be scaled and are user programmable

Output Hardware

- Switched dc:
  - Max. 32V⎓ (dc) open circuit
  - Max. current 30mA per single output
  - Max. current 40mA per paired outputs (1 & 2, 3 & 4, 5 & 6, 7 & 8)

Output Hardware (cont.)

- Open Collector
  - Max. 30V⎓ (dc) @ 100mA max. current sink
- Solid state relay (SSR), Form A, 1A at 10°C, derated to 0.5A at 65°C @ 24V~ (ac) min., 264V~ (ac) max., opto-isolated, without contact suppression
- Electromechanical relay, Form C, 5A, 24 to 240V~ (ac) or 30V⎓ (dc) max., resistive load, 100,000 cycles at rated load. Requires a min. load of 20mA at 24V. 125VA pilot duty
- Electromechanical relay, Form A, 5A, 24 to 240V~ (ac) or 30V⎓ (dc) max., resistive load, 100,000 cycles at rated load. Requires a min. load of 20mA at 24V, 125VA pilot duty
- NO-ARC relay, Form A, 15A @ 50°C derated to 10A @ 65°C; 85 to 264V~ (ac), no V⎓ (dc), resistive load, 2 million cycles at rated load
- Universal process/retransmit, output range selectable:
- Digital outputs
  - Update rate 10Hz
  - Switched DC
    - Output voltage 20V⎓ (dc) or 12V⎓ (dc), user selectable
    - Max. supply current source 40mA at 20V⎓ (dc) and 80mA at 12V⎓ (dc)
  - Open Collector
    - Switched voltage max.: 32V⎓ (dc)
    - Max. switched current per output: 1.5A
    - Max. switched current for all 6 outputs combined: 8A
- Universal process/retransmit, Output range selectable:
  - 0 to 10V ⎓(dc) into a min. 1,000Ω load
  - 0 to 20mA into max. 800Ω load

  Resolution
  - dc ranges: 2.5mV nominal
  - mA ranges: 5 µA nominal

  Calibration Accuracy
  - dc ranges: ±15 mV
  - mA ranges: ±30 µA

  Temperature Stability
  - 100 ppm/°C

Programmable Application Blocks

Actions (events) 8 total

Alarms 8 total

Control Loop 4 total

Compare 4 total

Off, greater than, less than, equal, not equal, greater than or equal, less than or equal

Counters 4 total

Counts up or down loads, predetermined value on load signal. Output is active when count value equals predetermined target value

Logic 4 total

Off, and, nand, or, nor, equal, not equal, Latch

Linearization 4 total

Interpolated or stepped relationship

Math 8 total

Off, average, process scale, deviation scale, differential (subtraction), ratio (divide), add, multiply, absolute difference, min., max., square root, sample and hold

Process Value 4 total

Off, sensor backup, average, crossover, wet/dry bulb, switch over, differential (subtraction), ratio (divide), add, multiply, absolute difference, min., max., square root

Special Output Function 4 total

Compressor turns on-off compressor for one or two loops (cool and dehumidify with single compressor)

Motorized Valve turns on-off motor open/closed outputs to cause valve to represent desired power level

Sequencer turns on-off up to four outputs to distribute a single power across all outputs with linear and progressive load wearing

Timers 4 total

On Pulse produces output of fixed time on active edge of timer run signal

Delay output is a delayed start of timer run, off at same time

One Shot oven timer

Retentive measures timer run signal, output on when accumulated time exceeds target

Variable 8 total

User value for digital or analog variable

EZ-ZONE Rail-Mount Control Module Ordering Information

Control module requires a Class 2 or SELV power supply 20.4 to 30.8 V ~(ac) /⎓ (dc), communication port for configuration with EZ-ZONE Configurator software.

Code Number

①② EZ-ZONE Rail Mount	③ Control Module	④ Input 1 Primary Function	⑤ Outputs 1 & 2 Hardware Options	⑥ Input 2	⑦ Outputs 3 & 4 Hardware Options	⑧ Input 3	⑨ Outputs 5 & 6 Hardware Options	⑩ Input 4	⑪ Outputs 7 & 8 Hardware Options	⑫ Connector Style	⑬ Enhanced Options	⑭⑮ Additional Options
RM	C											

④ Input 1

1	=	Control with universal input
2	=	Control with thermistor input
3	=	Ramp/Soak control with universal input (R/S applies to all loops in module)
4	=	Ramp/Soak control with thermistor input (R/S applies to all loops in module)
5	=	Limit with universal input (Only valid Output 1 and 2, options will be B, F, L)
6	=	Limit with thermistor input (Only valid Output 1 and 2, options will be B, F, L)
7	=	Current transformer input (NOT valid Output 1 and 2, options are N, P, R, S)
9	=	Custom

⑤ Output 1 and 2 Hardware Options

		Output 1	Output 2
A	=	None	None
B	=	None	Mechanical relay 5A, Form A
U	=	Switched dc/open collector	None
D	=	Switched dc/open collector	NO-ARC 15A power control
E	=	Switched dc/open collector	Switched dc
F	=	Switched dc/open collector	Mechanical relay 5A, Form A
G	=	Switched dc/open collector	SSR Form A, 0.5A
H	=	Mechanical relay 5A, Form	None
J	=	Mechanical relay 5A, Form C	NO-ARC 15A power control
K	=	Mechanical relay 5A, Form C	Switched dc
L	=	Mechanical relay 5A, Form C	Mechanical relay 5A, Form A
M	=	Mechanical relay 5A, Form C	SSR Form A, 0.5A
N	=	Universal process	None
P	=	Universal process	Switched dc
R	=	Universal process	Mechanical relay 5A, Form A
S	=	Universal process	SSR Form A, 0.5A
T	=	None	SSR Form A, 0.5A
Y	=	SSR Form A, 0.5A	NO-ARC 15A power control
Z	=	SSR Form A, 0.5A	SSR Form A, 0.5A

⑥ Input 2

A	=	None
1	=	Control with universal input
2	=	Control with thermistor input
5	=	Limit with universal input (Only valid Output 3 and 4, options will be B, F ,L)
6	=	Limit with thermistor input (Only valid Output 3 and 4, options will be B, F, L)
7	=	Current transformer input (Not valid Output 3 and 4, options are N, P, R, S)
R	=	Auxillary 2nd Input (Universal Input)
P	=	Auxillary 2nd Input (Thermistor Input)

⑦ Output 3 and 4 Hardware Options

		Output 3	Output 4
A	=	None	None
B	=	None	Mechanical relay 5A, Form A
U	=	Switched dc/open collector	None
D	=	Switched dc/open collector	NO-ARC 15A power control
E	=	Switched dc/open collector	Switched dc
F	=	Switched dc/open collector	Mechanical relay 5A, Form A
G	=	Switched dc/open collector	SSR Form A, 0.5A
H	=	Mechanical relay 5A, Form C	None
J	=	Mechanical relay 5A, Form C	NO-ARC 15A power control
K	=	Mechanical relay 5A, Form C	Switched dc
L	=	Mechanical relay 5A, Form C	Mechanical relay 5A, Form A
M	=	Mechanical relay 5A, Form C	SSR Form A, 0.5A
N	=	Universal process	None
P	=	Universal process	Switched dc
R	=	Universal process	Mechanical relay 5A, Form A
S	=	Universal process	SSR Form A, 0.5A
T	=	None	SSR Form A, 0.5A
Y	=	SSR Form A, 0.5A	NO-ARC 15A power control
Z	=	SSR Form A, 0.5A	SSR Form A, 0.5A

⑧ Input 3

A	=	None
1	=	Control with universal input
2	=	Control with thermistor input
5	=	Limit with universal input (Only valid Output 5 and 6, options will be B, F, L)
6	=	Limit with thermistor input (Only valid Output 5 and 6, options will be B, F, L)
7	=	Current transformer input (Not valid Output 5 and 6, options are N, P, R, S)
R	=	Auxillary 2nd Input (Universal Input)
P	=	Auxillary 2nd Input (Thermistor Input)

⑨ Output 5 and 6 Hardware Options

		Output 5	Output 6
A	=	None	None
B	=	None	Mechanical relay 5A, Form A
U	=	Switched dc/open collector	None
D	=	Switched dc/open collector	NO-ARC 15A power control
E	=	Switched dc/open collector	Switched dc
F	=	Switched dc/open collector	Mechanical relay 5A, Form A
G	=	Switched dc/open collector	SSR Form A, 0.5A
H	=	Mechanical relay 5A, Form C	None
J	=	Mechanical relay 5A, Form C	NO-ARC 15A power control
K	=	Mechanical relay 5A, Form C	Switched dc
L	=	Mechanical relay 5A, Form C	Mechanical relay 5A, Form A
M	=	Mechanical relay 5A, Form C	SSR Form A, 0.5A
N	=	Universal process	None
P	=	Universal process	Switched dc
R	=	Universal process	Mechanical relay 5A, Form A
S	=	Universal process	SSR Form A, 0.5A
T	=	None	SSR Form A, 0.5A
Y	=	SSR Form A, 0.5A	NO-ARC 15A power control
Z	=	SSR Form A, 0.5A	SSR Form A, 0.5A

⑩ Input 4

A	=	None
1	=	Control with universal input
2	=	Control with thermistor input
5	=	Limit with universal input (Only valid Output 7 and 8, options will be B, F, L)
6	=	Limit with thermistor input (Only valid Output 7 and 8, options will be B, F, L)
7	=	Current transformer input (Not valid Output 7 and 8, options are N, P, R, S)
R	=	Auxillary 2nd Input (Universal Input)
P	=	Auxillary 2nd Input (Thermistor Input)

⑪ Output 7 and 8 Hardware Options

		Output 7	Output 8
A	=	None	None
B	=	None	Mechanical relay 5A, Form A
U	=	Switched dc/open collector	None
D	=	Switched dc/open collector	NO-ARC 15A power control
E	=	Switched dc/open collector	Switched dc
F	=	Switched dc/open collector	Mechanical relay 5A, Form A
G	=	Switched dc/open collector	SSR Form A, 0.5A
H	=	Mechanical relay 5A, Form C	None
J	=	Mechanical relay 5A, Form C	NO-ARC 15A power control
K	=	Mechanical relay 5A, Form C	Switched dc
L	=	Mechanical relay 5A, Form C	Mechanical relay 5A, Form A
M	=	Mechanical relay 5A, Form C	SSR Form A, 0.5A
N	=	Universal process	None
P	=	Universal process	Switched dc
R	=	Universal process	Mechanical relay 5A, Form A
S	=	Universal process	SSR Form A, 0.5A
T	=	None	SSR Form A, 0.5A
Y	=	SSR Form A, 0.5A	NO-ARC 15A power control
Z	=	SSR Form A, 0.5A	SSR Form A, 0.5A
C	=	6 digital inputs/outputs (Valid option only if Input 4 selection = A)	

⑫ Connector Style

A	=	Right angle screw connector (standard)
F	=	Front screw connector

⑬ Enhanced Options

A	=	Standard bus
1	=	Standard bus and Modbus® RTU 485

⑭⑮ Additional Options

Firmware, Overlays, Parameter Settings

AA	=	Standard
AB	=	Replacement connectors hardware only for the entered model number
12	=	Class 1, Div. 2 (not available with integrated limit controller or mechanical relay options)
XX	=	Custom, Locked Firmware

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Declaration of Conformity

EZ Zone Series RM

CE

WATLOW
1241 Bundy Blvd.
Winona, MN 55987 USA

an ISO 9001 approved facility since 1996.

Declares that the following Series RM (Rail Mount) products:

Model Numbers:	**RM** followed by additional letters or numbers describing use of up to four module options of various inputs and outputs or communications.
Classification:	Temperature control, Installation Category II, Pollution degree 2
Voltage and Frequency:	SELV 24 to 28 V≂ ac 50/60 Hz or dc
Power Consumption:	RMA models 4 Watts, any other RM model 7 Watts
Environmental Rating:	IP20

Meet the essential requirements of the following European Union Directives by using the relevant standards show below to indicate compliance.

2004/108/EC Electromagnetic Compatibility Directive

EN 61326-1	**2006**	**Electrical equipment for measurement, control and laboratory use – EMC requirements, Industrial Immunity, Class A Emissions (*Not for use in a Class B environment without additional filtering).***
EN 61000-4-2	2008	Electrostatic Discharge Immunity
EN 61000-4-3	2010	Radiated Field Immunity
EN 61000-4-4	2011	Electrical Fast-Transient / Burst Immunity
EN 61000-4-5	2006	Surge Immunity
EN 61000-4-6	2008	Conducted Immunity
EN 61000-4-11	2004	Voltage Dips, Short Interruptions and Voltage Variations Immunity
EN 61000-3-2	2005	Harmonic Current Emissions
EN 61000-3-3[1]	2005	Voltage Fluctuations and Flicker
SEMI F47	2000	Specification for Semiconductor Sag Immunity Figure R1-1

[1]NOTE: To comply with flicker requirements cycle time may need to be up to 160 seconds if load current is at 15A, or the maximum source impedance needs to be < 0.13Ω. Control power input of RM models comply with 61000-3-3 requirements.

2006/95/EC Low-Voltage Directive

EN 61010-1	**2010**	**Safety Requirements of electrical equipment for measurement, control and laboratory use. Part 1: General requirements**

Compliant with 2002/95/EC RoHS Directive

Per 2002/96/EC W.E.E.E Directive *Please Recycle Properly*

Joe Millanes	Winona, Minnesota, USA
Name of Authorized Representative	Place of Issue
Director of Operations	September 2013
Title of Authorized Representative	Date of Issue

Signature of Authorized Representative

How to Reach Us

Corporate Headquarters

Watlow Electric Manufacturing Company
12001 Lackland Road
St. Louis, MO 63146
Sales: 1-800-WATLOW2
Manufacturing Support: 1-800-4WATLOW
Email: info@watlow.com
Website: www.watlow.com
From outside the USA and Canada:
Tel: +1 (314) 878-4600
Fax: +1 (314) 878-6814

Latin America

Watlow de México S.A. de C.V.
Av. Fundición No. 5
Col. Parques Industriales
Querétaro, Qro. CP-76130
Mexico
Tel: +52 442 217-6235
Fax: +52 442 217-6403

Europe

Watlow France
Tour d'Asnières.
4 Avenue Laurent Cély
92600 Asnières sur Seine
France
Tél: + 33 (0)1 41 32 79 70
Télécopie: + 33(0)1 47 33 36 57
Email: info@watlow.fr
Website: www.watlow.fr

Watlow GmbH
Postfach 11 65, Lauchwasenstr. 1
D-76709 Kronau
Germany
Tel: +49 (0) 7253 9400-0
Fax: +49 (0) 7253 9400-900
Email: info@watlow.de
Website: www.watlow.de

Watlow Italy S.r.l.
Viale Italia 52/54
20094 Corsico MI
Italy
Tel: +39 024588841
Fax: +39 0245869954
Email: italyinfo@watlow.com
Website: www.watlow.it

Watlow Ibérica, S.L.U.
C/Marte 12, Posterior, Local 9
E-28850 Torrejón de Ardoz
Madrid - Spain
T. +34 91 675 12 92
F. +34 91 648 73 80
Email: info@watlow.es
Website: www.watlow.es

Watlow UK Ltd.
Linby Industrial Estate
Linby, Nottingham, NG15 8AA
United Kingdom
Telephone: (0) 115 964 0777
Fax: (0) 115 964 0071
Email: info@watlow.co.uk
Website: www.watlow.co.uk
From outside The United Kingdom:
Tel: +44 115 964 0777
Fax: +44 115 964 0071

Asia and Pacific

Watlow Singapore Pte Ltd.
16 Ayer Rajah Crescent,
#06-03/04,
Singapore 139965
Tel: +65 6773 9488 Fax: +65 6778 0323
Email: info@watlow.com.sg Website: www.watlow.com.sg

Watlow Australia Pty., Ltd.
4/57 Sharps Road
Tullamarine, VIC 3043
Australia
Tel: +61 3 9335 6449
Fax: +61 3 9330 3566
Website: www.watlow.com

Watlow Electric Manufacturing Company (Shanghai) Co. Ltd.
Room 501, Building 10, KIC Plaza
290 Songhu Road, Yangpu District
Shanghai, China 200433
China
Phone:
Local: 4006 Watlow (4006 928569)
International: +86 21 3381 0188
Fax: +86 21 6106 1423
Email: vlee@watlow.cn
Website: www.watlow.cn

ワトロー・ジャパン株式会社
〒101-0047 東京都千代田区内神田1-14-4
四国ビル別館9階
Tel: 03-3518-6630 Fax: 03-3518-6632
Email: infoj@watlow.com Website: www.watlow.co.jp

Watlow Japan Ltd.
1-14-4 Uchikanda, Chiyoda-Ku
Tokyo 101-0047
Japan
Tel: +81-3-3518-6630 Fax: +81-3-3518-6632
Email: infoj@watlow.com Website: www.watlow.co.jp

Watlow Korea Co., Ltd.
#1406, E&C Dream Tower, 46, Yangpyeongdong-3ga
Yeongdeungpo-gu, Seoul 150-103
Republic of Korea
Tel: +82 (2) 2628-5770 Fax: +82 (2) 2628-5771
Website: www.watlow.co.kr

Watlow Malaysia Sdn Bhd
1F-17, IOI Business Park
No.1, Persiaran Puchong Jaya Selatan
Bandar Puchong Jaya
47100 Puchong, Selangor D.E.
Malaysia
Tel: +60 3 8076 8745 Fax: +60 3 8076 7186
Email: vlee@watlow.com
Website: www.watlow.com

瓦特龍電機股份有限公司
80143 高雄市前金區七賢二路189號 10樓之一
電話: 07-2885168 傳真: 07-2885568

Watlow Electric Taiwan Corporation
10F-1 No.189 Chi-Shen 2nd Road Kaohsiung 80143
Taiwan
Tel: +886-7-2885168 Fax: +886-7-2885568

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