



Series F4P

Communications Guide



**1/4 DIN Temperature/Process
Controller
with Guided Setup**

€ € 98



ISO 9001



Registered Company
Winona, Minnesota USA



WATLOW

Watlow Controls



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About Watlow Controls

Watlow Controls is a division of Watlow Electric Mfg. Co., St. Louis, Missouri, a manufacturer of industrial electric heating products since 1922. Watlow begins with a full set of specifications and completes an industrial product that is manufactured in-house, in the U.S.A. Watlow products include electric heaters, sensors, controllers and switching devices. The Winona operation has been designing solid-state electronic control devices since

1962, and has earned the reputation as an excellent supplier to original equipment manufacturers. These OEMs and end users depend upon Watlow Controls to provide compatibly engineered controls that they can incorporate into their products with confidence. Watlow Controls resides in a 100,000-square-foot marketing, engineering and manufacturing facility in Winona, Minnesota.

Your Feedback

Your comments or suggestions on this manual are welcome. Please send them to the Technical Literature Team, Watlow Controls, 1241 Bundy Blvd., P.O. Box 5580, Winona, Minnesota, 55987-

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The Series F4P uses Modbus as its communications protocol. Modbus is a standard protocol developed by A.E.G. Schneider. Modbus RTU enables a computer or PLC to read and write directly to registers containing the controller's parameters. With it you can read all of the controller's parameters with a few read commands. For more information, see <http://www.modicon.com>.

If you already have a software application that uses Modbus, the Modbus Registers Table in this chapter will provide the register number and values (sometimes called enumerated types) for each parameter.

Dependencies between parameters do exist. For best results, program the parameters in the order in which they appear in the Software Map (inside back cover).

For basic information about writing an application

using Modbus protocol, you may want to download the electronic *Watlow Controls Data Communications Guide* from the Watlow web site:

<http://www.watlow.com/prodtechinfo>

A Microsoft Excel file at that location, F4PMBE_A.xls, contains parameter and Modbus information that can be sorted, edited or exported as a text file. The spreadsheet or a printout of it can also be used to keep track of controller settings.

For more information about the Series F4P, such as wiring and features, consult the *Series F4P User's Manual*.

The *Series F4P User's Manual* and this manual are available in pdf format at the Watlow web site. Call or write Watlow Controls for a printed copy of this manual or the *Series F4P User's Manual*.

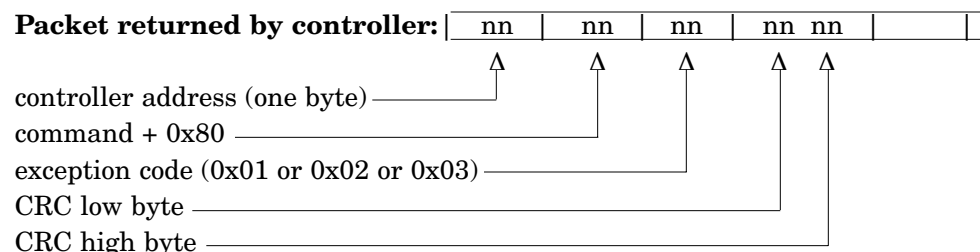
Exception Responses

When a controller cannot process a command it returns an exception response and sets the high bit (0x80) of the command.

0x01 illegal command

0x02 illegal data address

0x03 illegal data value



Steps to Setting Up the Series F4P Controller for Communications

1. Wire the controller using the Series F4P User's Manual wiring chapter.

The Series F4P can be wired to either an EIA-232 or EIA-485 serial port.

The EIA-232 port is found on a typical PC. EIA-232 allows one PC to communicate with one controller.

An EIA-485 port is not typically found in a PC, but can be found on many PLCs (Programmable Logic Controllers). PC ports are available, but the most common way for a PC to communicate using an EIA-485 port is with an EIA-232 to EIA-485 converter. The advantages of EIA-485 are that it is less susceptible to noise and it allows a PC or PLC to communicate with multiple controllers on the same port. It is important when using EIA-485, to install termination resistors along with pull-up and pull-down resistors to ensure reliable communications. See the *Series F4P User's Manual* or wiring diagrams in the last section of this manual for details on termination.

2. Configure the controller's communications parameters in the Setup Menu.

Only two communications parameters in the Setup Menu need to be configured directly on the Series F4P: Baud Rate and Address.

The Baud Rates are 9,600 bps (bits per second) and 19,200 bps. The 19,200 rate allows the fastest communication, and 9,600 baud allows the maximum communications distance. With EIA-485, all devices connected to that port must use the same baud rate.

Address is used to uniquely identify each controller on the port. Since there is only one controller on an EIA-232 port, the address setting is not important except it must be known to configure the software. Every controller on an EIA-485 port must have a unique address.

3. Determine what device will communicate with the controller.

Several types of devices can communicate with a controller, such as a computer, a PLC (Programma-

ble Logic Controller) or an OIT (Operator Interface Terminal). Whichever device is chosen, it needs to be able to use the Modbus RTU Protocol. OITs must be ordered with Modbus RTU support. PLC's either have Modbus RTU as a standard feature or it can be added with an I/O module. On a computer, the software package to be used would need to have Modbus RTU capability.

4. Select a software package for the computer.

Select the software package based on what is required from the controller. If you will just perform some basic communications, such as reading the process value, setting the set point or diagnostics, Watlow can provide Comm6 software free from the Watlow web site, at <http://www.watlow.com>.

For more advanced features, software can be purchased from a number of software companies. When purchasing third-party software, be sure to look for a package that is Modbus RTU compatible or has Modbus RTU drivers. Most third party packages require you to specify the Series F4P Modbus registers to set up the package.

Another option is to create a custom software package. Using the Modbus information in this guide and in the user's manual, a software package can be created and tailored to an application. For examples of software routines to communicate in Modbus, contact an application's engineer at 507/454-5300 or download the *Watlow Controls Data Communications Guide* on the Watlow web site at <http://www.watlow.com/prodtechinfo>

5. Configure the software communication's parameters.

The software package, (be it software for a computer, a PLC or an OIT) will need to be configured just as the controller was configured, setting the baud rate and address to match. The software package may have additional parameters to set, such as number of data bits, parity and stop bits. For the Series F4P these should always be set at 8 data bits, no parity, and 1 stop bit. This is often written as "8N1".

Some software packages may give the option to control the activity of the RTS, CTS and DTR lines, which are sometimes used by EIA-232 to EIA-485 converters. On packages where the Modbus registers for the Series F4P need to be defined, these values can be entered at this time.

6. Test the communications.

Once communications are configured, test the communication link to the controller to verify that everything is wired and configured properly. One misplaced wire or incorrect setting can disrupt communications. Re-verify the wiring and configurations if things are not working.

When using an EIA-232 to EIA-485 converter, be sure to follow the instructions provided with the converter, as some may require special jumper and switch settings, external power supply requirements or special signals from the software. Some software packages have built-in routines to test the communications. Comm6 is also a useful tool for diagnosing problems.

7. Start communications with the controller.

With communications successfully verified, the software is ready to use with the controller. The above guidelines are the general steps to establish communications with the Series F4P. Some applications may require additional steps, but would follow the same general process.

8. Program and configure the Series F4P.

To program and configure the F4P with a software program, a couple of things must be kept in mind. If the software allows changing Setup Page parameters, such as Input 1 Type, other parameters values that are dependant on that setting may be automatically changed (see “Parameter List in Download Order for the Unenhanced Series F4P Controller” in this guide). Some software packages may warn you of this possibility and others may not.

Also, any changes made by the software program to controller parameters that need to be retained in the controller memory must be saved by sending a “0” to register 25. Any settings not saved to the controller’s memory will be lost when power is removed from the controller.



CAUTION:

Sending a “0” to Modbus register 25 will overwrite the previous parameter settings with the new ones.

Parameter List in Modbus Order for the Series F4P

| Modbus Number | Parameter | Menu>Pathway |
|---------------|--------------------------------|--------------------------------------|
| 0 | Model | Diagnostic |
| 1 | Serial Number (first part) | Diagnostic |
| 2 | Serial Number (second part) | Diagnostic |
| 3 | Software Number | Diagnostic |
| 4 | Revision | Diagnostic |
| 5 | Manufacturing Date | Diagnostic |
| 8 | Input 1 | Diagnostic |
| 9 | Input 2 | Diagnostic |
| 10 | Input 3 | Diagnostic |
| 16 | Output 1A | Diagnostic |
| 17 | Output 1B | Diagnostic |
| 20 | Retransmit 1 | Diagnostic |
| 21 | Retransmit 2 | Diagnostic |
| 25 | Save Changes to EE | Save |
| 100 | Input 1 Value | Status |
| 101 | Input 1 Error | Status |
| 102 | Alarm 1 | Status |
| 103 | % Power Output 1A | Status |
| 106 | Alarm 2 | Status |
| 107 | % Power Output 1B | Status |
| 200 | Auto/Manual Mode | Status |
| 201 | Digital Input 1 | Status |
| 209 | System Error | Status |
| 210 | Input 1 Open Loop | Status |
| 213 | Digital Input 2 | Status |
| 225 | Digital Input 3 | Status |
| 237 | Digital Input 4 | Status |
| 300 | Set Point 1 | Main Page |
| 302 | Alarm 1 Low Deviation | Alarm Set Points |
| 302 | Alarm 1 Low Set Point | Alarm Set Points |
| 302 | Alarm 1 Max. Low Rate | Alarm Set Points |
| 303 | Alarm 1 High Deviation | Alarm Set Points |
| 303 | Alarm 1 High Set Point | Alarm Set Points |
| 303 | Alarm 1 Max. High Rate | Alarm Set Points |
| 304 | Autotune Set Point | System |
| 305 | Autotune PID | Autotune PID |
| 305 | Cascade Inner Loop | Autotune PID |
| 307 | Autotune PID Type | Autotune PID |
| 308 | Digital Set Point 1 | Control Set Points |
| 309 | Boost Set Point (1B) | Control Set Points |
| 311 | Clear Error 1 | Key Press Simulation |
| 312 | Clear Alarm 1 | Key Press Simulation |
| 313 | Silence Alarm 1 | Key Press Simulation |
| 314 | Digital Differential Set Pt. 1 | Control Set Points |
| 315 | Digital Ratio Set Point 1 | Control Set Points |
| 316 | Remote/Local Set Point | Local/Remote Set Point |
| 321 | Alarm 2 Low Deviation | Alarm Set Points |
| 321 | Alarm 2 Low Set Point | Alarm Set Points |
| 321 | Alarm 2 Maximum Low Rate | Alarm Set Points |
| 322 | Alarm 2 High Deviation | Alarm Set Points |
| 322 | Alarm 2 High Set Point | Alarm Set Points |
| 322 | Alarm 2 Max. High Rate | Alarm Set Points |
| 327 | Digital Set Point 2 | Control Set Points |
| 330 | Clear Error 2 | Key Press Simulation |
| 331 | Clear Alarm 2 | Key Press Simulation |
| 332 | Silence Alarm 2 | Key Press Simulation |
| 333 | Digital Differential Set Pt. 2 | Control Set Points |
| 334 | Digital Ratio Set Point 2 | Control Set Points |
| 343 | Cascade Outer Loop | Autotune PID |
| 346 | Digital Set Point 3 | Control Set Points |
| 349 | Clear Error 3 | Key Press Simulation |
| 352 | Digital Differential Set Pt. 3 | Control Set Points |
| 353 | Digital Ratio Set Point 3 | Control Set Points |
| 365 | Digital Set Point 4 | Control Set Points |
| 371 | Digital Differential Set Pt. 4 | Control Set Points |
| 372 | Digital Ratio Set Point 4 | Control Set Points |
| 452 | Maximum Transfer Heat | System |
| 453 | Maximum Transfer Cool | System |
| 454 | Manual to Auto Transfer | System |
| 500 | Proportional Band 1A | Edit PID > PID Set Chl 1 > PID Set 1 |
| 501 | Integral 1A | Edit PID > PID Set Chl 1 > PID Set 1 |

| | | | | | |
|-----|--------------------------|--------------------------------------|------|--------------------------|---------------------|
| 502 | Reset 1A | Edit PID > PID Set Chl 1 > PID Set 1 | 606 | Decimal | Analog Input 1 |
| 503 | Derivative 1A | Edit PID > PID Set Chl 1 > PID Set 1 | 607 | Error Latch | Analog Input 1 |
| 504 | Rate 1A | Edit PID > PID Set Chl 1 > PID Set 1 | 608 | Units | Analog Input 1 |
| 505 | Dead Band 1A | Edit PID > PID Set Chl 1 > PID Set 1 | 610 | Sensor | Analog Input 2 |
| 506 | Cycle Time Type | Control Output 1A | 610 | Type | Analog Input 2 |
| 507 | Hysteresis 1A | Edit PID > PID Set Chl 1 > PID Set 1 | 613 | Set Point High Limit | Analog Input 2 |
| 509 | Cycle Time Value | Control Output 1A | 614 | Filter Time | Analog Input 2 |
| 510 | Proportional Band 1A | Edit PID > PID Set Chl 1 > PID Set 2 | 615 | Calibration Offset Value | Analog Input 2 |
| 511 | Integral 1A | Edit PID > PID Set Chl 1 > PID Set 2 | 616 | Decimal | Analog Input 2 |
| 512 | Reset 1A | Edit PID > PID Set Chl 1 > PID Set 2 | 617 | Error Latch | Analog Input 2 |
| 513 | Derivative 1A | Edit PID > PID Set Chl 1 > PID Set 2 | 618 | Units | Analog Input 2 |
| 514 | Rate 1A | Edit PID > PID Set Chl 1 > PID Set 2 | 620 | Sensor | Analog Input 3 |
| 515 | Dead Band 1A | Edit PID > PID Set Chl 1 > PID Set 2 | 621 | Type | Analog Input 3 |
| 517 | Hysteresis 1A | Edit PID > PID Set Chl 1 > PID Set 2 | 623 | Set Point High Limit | Analog Input 3 |
| 520 | Proportional Band 1A | Edit PID > PID Set Chl 1 > PID Set 3 | 624 | Filter Time | Analog Input 3 |
| 521 | Integral 1A | Edit PID > PID Set Chl 1 > PID Set 3 | 625 | Calibration Offset Value | Analog Input 3 |
| 522 | Reset 1A | Edit PID > PID Set Chl 1 > PID Set 3 | 626 | Decimal | Analog Input 3 |
| 523 | Derivative 1A | Edit PID > PID Set Chl 1 > PID Set 3 | 627 | Error Latch | Analog Input 3 |
| 524 | Rate 1A | Edit PID > PID Set Chl 1 > PID Set 3 | 628 | Units | Analog Input 3 |
| 525 | Dead Band 1A | Edit PID > PID Set Chl 1 > PID Set 3 | 680 | Scale Low | Analog Input 1 |
| 527 | Hysteresis 1A | Edit PID > PID Set Chl 1 > PID Set 3 | 681 | Scale High | Analog Input 1 |
| 530 | Proportional Band 1A | Edit PID > PID Set Chl 1 > PID Set 4 | 681 | Set Point Low Limit | Analog Input 1 |
| 531 | Integral 1A | Edit PID > PID Set Chl 1 > PID Set 4 | 682 | Scale Low | Analog Input 2 |
| 532 | Reset 1A | Edit PID > PID Set Chl 1 > PID Set 4 | 683 | Scale High | Analog Input 2 |
| 533 | Derivative 1A | Edit PID > PID Set Chl 1 > PID Set 4 | 683 | Set Point Low Limit | Analog Input 2 |
| 534 | Rate 1A | Edit PID > PID Set Chl 1 > PID Set 4 | 684 | Scale Low | Analog Input 3 |
| 535 | Dead Band 1A | Edit PID > PID Set Chl 1 > PID Set 4 | 685 | Scale High | Analog Input 3 |
| 537 | Hysteresis 1A | Edit PID > PID Set Chl 1 > PID Set 4 | 685 | Set Point Low Limit | Analog Input 3 |
| 540 | Proportional Band 1A | Edit PID > PID Set Chl 1 > PID Set 5 | 700 | Function | Control Output 1A |
| 541 | Integral 1A | Edit PID > PID Set Chl 1 > PID Set 5 | 701 | Process | Control Output 1A |
| 542 | Reset 1A | Edit PID > PID Set Chl 1 > PID Set 5 | 702 | Alarm Type | Alarm Output 1 |
| 543 | Derivative 1A | Edit PID > PID Set Chl 1 > PID Set 5 | 703 | Alarm Hysteresis | Alarm Output 1 |
| 544 | Rate 1A | Edit PID > PID Set Chl 1 > PID Set 5 | 704 | Latching | Alarm Output 1 |
| 545 | Dead Band 1A | Edit PID > PID Set Chl 1 > PID Set 5 | 705 | Silencing | Alarm Output 1 |
| 547 | Hysteresis 1A | Edit PID > PID Set Chl 1 > PID Set 5 | 706 | Alarm Sides | Alarm Output 1 |
| 550 | Proportional Band 1B | Edit PID > PID Set Chl 1 > PID Set 1 | 707 | Alarm Logic | Alarm Output 1 |
| 551 | Integral 1B | Edit PID > PID Set Chl 1 > PID Set 1 | 708 | Alarm Messages | Alarm Output 1 |
| 552 | Reset 1B | Edit PID > PID Set Chl 1 > PID Set 1 | 709 | Retransmit Source | Retransmit Output 1 |
| 553 | Derivative 1B | Edit PID > PID Set Chl 1 > PID Set 1 | 710 | Low Scale | Retransmit Output 1 |
| 554 | Rate 1B | Edit PID > PID Set Chl 1 > PID Set 1 | 711 | High Scale | Retransmit Output 1 |
| 555 | Dead Band 1B | Edit PID > PID Set Chl 1 > PID Set 1 | 712 | Scale Offset | Retransmit Output 1 |
| 556 | Cycle Time Type | Control Output 1B | 714 | High Power Limit | Control Output 1A |
| 557 | Hysteresis 1B | Edit PID > PID Set Chl 1 > PID Set 1 | 715 | Low Power Limit | Control Output 1A |
| 559 | Cycle Time Value | Control Output 1B | 716 | Alarm Source | Alarm Output 1 |
| 560 | Proportional Band 1B | Edit PID > PID Set Chl 1 > PID Set 2 | 717 | Function | Control Output 1B |
| 561 | Integral 1B | Edit PID > PID Set Chl 1 > PID Set 2 | 718 | Process | Control Output 1B |
| 562 | Reset 1B | Edit PID > PID Set Chl 1 > PID Set 2 | 719 | Alarm Type | Alarm Output 2 |
| 563 | Derivative 1B | Edit PID > PID Set Chl 1 > PID Set 2 | 720 | Alarm Hysteresis | Alarm Output 2 |
| 564 | Rate 1B | Edit PID > PID Set Chl 1 > PID Set 2 | 721 | Latching | Alarm Output 2 |
| 565 | Dead Band 1B | Edit PID > PID Set Chl 1 > PID Set 2 | 722 | Silencing | Alarm Output 2 |
| 567 | Hysteresis 1B | Edit PID > PID Set Chl 1 > PID Set 2 | 723 | Alarm Sides | Alarm Output 2 |
| 570 | Proportional Band 1B | Edit PID > PID Set Chl 1 > PID Set 3 | 724 | Alarm Logic | Alarm Output 2 |
| 571 | Integral 1B | Edit PID > PID Set Chl 1 > PID Set 3 | 725 | Alarm Messages | Alarm Output 2 |
| 572 | Reset 1B | Edit PID > PID Set Chl 1 > PID Set 3 | 726 | Retransmit Source | Retransmit Output 2 |
| 573 | Derivative 1B | Edit PID > PID Set Chl 1 > PID Set 3 | 727 | Low Scale | Retransmit Output 2 |
| 574 | Rate 1B | Edit PID > PID Set Chl 1 > PID Set 3 | 728 | High Scale | Retransmit Output 2 |
| 575 | Dead Band 1B | Edit PID > PID Set Chl 1 > PID Set 3 | 729 | Scale Offset | Retransmit Output 2 |
| 577 | Hysteresis 1B | Edit PID > PID Set Chl 1 > PID Set 3 | 731 | High Power Limit | Control Output 1B |
| 580 | Proportional Band 1B | Edit PID > PID Set Chl 1 > PID Set 4 | 732 | Low Power Limit | Control Output 1B |
| 581 | Integral 1B | Edit PID > PID Set Chl 1 > PID Set 4 | 733 | Alarm Source | Alarm Output 2 |
| 582 | Reset 1B | Edit PID > PID Set Chl 1 > PID Set 4 | 836 | Analog Range | Retransmit Output 1 |
| 583 | Derivative 1B | Edit PID > PID Set Chl 1 > PID Set 4 | 837 | Analog Range | Retransmit Output 2 |
| 584 | Rate 1B | Edit PID > PID Set Chl 1 > PID Set 4 | 844 | Duplex | Control Output 1A |
| 585 | Dead Band 1B | Edit PID > PID Set Chl 1 > PID Set 4 | 880 | Failure Mode | System |
| 587 | Hysteresis 1B | Edit PID > PID Set Chl 1 > PID Set 4 | 881 | Boost Power Mode | Control Output 1B |
| 590 | Proportional Band 1B | Edit PID > PID Set Chl 1 > PID Set 5 | 882 | Boost Set Point Type | Control Output 1B |
| 591 | Integral 1B | Edit PID > PID Set Chl 1 > PID Set 5 | 883 | Boost Power (1B) | Control Set Points |
| 592 | Reset 1B | Edit PID > PID Set Chl 1 > PID Set 5 | 884 | Boost Delay Time (1B) | Control Set Points |
| 593 | Derivative 1B | Edit PID > PID Set Chl 1 > PID Set 5 | 885 | Boost Type | Control Output 1B |
| 594 | Rate 1B | Edit PID > PID Set Chl 1 > PID Set 5 | 900 | PID Units | System |
| 595 | Dead Band 1B | Edit PID > PID Set Chl 1 > PID Set 5 | 901 | °F or °C | System |
| 597 | Hysteresis 1B | Edit PID > PID Set Chl 1 > PID Set 5 | 903 | Input 1 Fail | System |
| 600 | Sensor | Analog Input 1 | 904 | Open Loop Detect | System |
| 601 | Type | Analog Input 1 | 1060 | Function | Digital Input 1 |
| 603 | Set Point High Limit | Analog Input 1 | 1061 | Condition | Digital Input 1 |
| 604 | Filter Time | Analog Input 1 | 1062 | Function | Digital Input 2 |
| 605 | Calibration Offset Value | Analog Input 1 | 1063 | Condition | Digital Input 2 |

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|------|-------------------------------|---------------------------------|------|-----------------------------|------------------------------------|
| 1064 | Function | Digital Input 3 | 1608 | 20.000mA | Calibration > Calibrate Input 2 |
| 1065 | Condition | Digital Input 3 | 1608 | 32°F Type J | Calibration > Calibrate Input 2 |
| 1066 | Function | Digital Input 4 | 1608 | 380.0 Ohms | Calibration > Calibrate Input 2 |
| 1067 | Condition | Digital Input 4 | 1608 | 4.000mA | Calibration > Calibrate Input 2 |
| 1100 | Ramp to Set Point Mode | Ramp to Set Point | 1608 | 50.00mV Thermocouple | Calibration > Calibrate Input 2 |
| 1101 | Ramp to Set Point Rate | Ramp to Set Point | 1608 | Ground | Calibration > Calibrate Input 2 |
| 1102 | Ramp to Set Point Scale | Ramp to Set Point | 1608 | Lead | Calibration > Calibrate Input 2 |
| 1140 | Control Type | Analog Input 2 | 1609 | 4.000mA | Calibration > Process Output 1B |
| 1141 | Control Type | Analog Input 3 | 1610 | 20.000mA | Calibration > Process Output 1B |
| 1300 | Set Point | Set Lockout | 1611 | 1.000V | Calibration > Process Output 1B |
| 1302 | Setup Page | Set Lockout | 1612 | 10.000V | Calibration > Process Output 1B |
| 1303 | Factory Page | Set Lockout | 1613 | 0.000V | Calibration > Calibrate Input 3 |
| 1306 | Operations, Autotune PID | Set Lockout | 1613 | 0.00mV Thermocouple | Calibration > Calibrate Input 3 |
| 1307 | Operations, Edit PID | Set Lockout | 1613 | 10.000V | Calibration > Calibrate Input 3 |
| 1308 | Operations, Alarm Set Point | Set Lockout | 1613 | 1000 Ohms | Calibration > Calibrate Input 3 |
| 1315 | Clear Locks | Set Lockout | 1613 | 15.0 Ohms | Calibration > Calibrate Input 3 |
| 1316 | Operations, PID Crossover | Set Lockout | 1613 | 20.000mA | Calibration > Calibrate Input 3 |
| 1317 | Operations, Ramp Set Point | Set Lockout | 1613 | 32°F Type J | Calibration > Calibrate Input 3 |
| 1318 | Operations, Control Set Point | Set Lockout | 1613 | 380.0 Ohms | Calibration > Calibrate Input 3 |
| 1319 | Local/Remote Set Pt. Operatn | Set Lockout | 1613 | 4.000mA | Calibration > Calibrate Input 3 |
| 1330 | Set/Change Password (Ch 1) | Set Lockout | 1613 | 50.00mV Thermocouple | Calibration > Calibrate Input 3 |
| 1331 | Set/Change Password (Ch 2) | Set Lockout | 1613 | Ground | Calibration > Calibrate Input 3 |
| 1332 | Set/Change Password (Ch 3) | Set Lockout | 1613 | Lead | Calibration > Calibrate Input 3 |
| 1333 | Set/Change Password (Ch 4) | Set Lockout | 1624 | 4.000mA | Calibration > Retransmit Output 1 |
| 1400 | Parameter 01 | Custom Main Page | 1625 | 20.000mA | Calibration > Retransmit Output 1 |
| 1401 | Parameter 02 | Custom Main Page | 1626 | 1.000V | Calibration > Retransmit Output 1 |
| 1402 | Parameter 03 | Custom Main Page | 1627 | 10.000V | Calibration > Retransmit Output 1 |
| 1403 | Parameter 04 | Custom Main Page | 1629 | 4.000mA | Calibration > Retransmit Output 2 |
| 1404 | Parameter 05 | Custom Main Page | 1630 | 20.000mA | Calibration > Retransmit Output 2 |
| 1405 | Parameter 06 | Custom Main Page | 1631 | 1.000V | Calibration > Retransmit Output 2 |
| 1406 | Parameter 07 | Custom Main Page | 1632 | 10.000V | Calibration > Retransmit Output 2 |
| 1407 | Parameter 08 | Custom Main Page | 1910 | Process Display | Process Display |
| 1408 | Parameter 09 | Custom Main Page | 1911 | Display Time | Process Display>Input 1 |
| 1409 | Parameter 10 | Custom Main Page | 1912 | Display Time | Process Display>Input 2 |
| 1410 | Parameter 11 | Custom Main Page | 1913 | Display Time | Process Display>Input 3 |
| 1411 | Parameter 12 | Custom Main Page | 1914 | LED Intensity | Process Display |
| 1412 | Parameter 13 | Custom Main Page | 1915 | Auto/Manual Slidewire Cali. | Analog Input 3 |
| 1413 | Parameter 14 | Custom Main Page | 1916 | Slidewire Deadband | Analog Input 3 |
| 1414 | Parameter 15 | Custom Main Page | 1917 | Slidewire Hysteresis | Analog Input 3 |
| 1415 | Parameter 16 | Custom Main Page | 1918 | Slidewire Learn Closed | Analog Input 3 |
| 1500 | CJC1 Temp | Diagnostic | 1919 | Slidewire Learn Open | Analog Input 3 |
| 1501 | CJC1 AtoD | Diagnostic | 1923 | Show °F or °C | System |
| 1504 | Input 1 A to D | Diagnostic | 1925 | Cascade | Analog Input 3 |
| 1505 | Input 2 A to D | Diagnostic | 1926 | Cascade Low Deviation | Analog Input 3 |
| 1506 | Input 3 A to D | Diagnostic | 1926 | Cascade Low Range | Analog Input 3 |
| 1513 | Display Test | Test | 1927 | Cascade High Deviation | Analog Input 3 |
| 1514 | Test Outputs | Test | 1927 | Cascade High Range | Analog Input 3 |
| 1515 | Line Frequency | Diagnostic | 1951 | PID Crossover | Operations Page |
| 1531 | CJC2 Temp | Diagnostic | 1961 | PID Cross 1 to 2 | Operations Page |
| 1531 | CJC3 Temp | Diagnostic | 1962 | PID Cross 2 to 3 | Operations Page |
| 1532 | CJC2 AtoD | Diagnostic | 1963 | PID Cross 3 to 4 | Operations Page |
| 1532 | CJC3 AtoD | Diagnostic | 1964 | PID Cross 4 to 5 | Operations Page |
| 1601 | Restore Input 1 Calibration | Calibration | 2600 | Proportional Band 1A | Edit PID > Cascade PID > PID Set 1 |
| 1601 | Restore Input 2 Calibration | Calibration | 2601 | Integral 1A | Edit PID > Cascade PID > PID Set 1 |
| 1601 | Restore Input 3 Calibration | Calibration | 2602 | Reset 1A | Edit PID > Cascade PID > PID Set 1 |
| 1602 | Full Defaults | Test | 2603 | Derivative 1A | Edit PID > Cascade PID > PID Set 1 |
| 1603 | 0.000V | Calibration > Calibrate Input 1 | 2604 | Rate 1A | Edit PID > Cascade PID > PID Set 1 |
| 1603 | 0.00mV Thermocouple | Calibration > Calibrate Input 1 | 2605 | Dead Band 1A | Edit PID > Cascade PID > PID Set 1 |
| 1603 | 10.000V | Calibration > Calibrate Input 1 | 2607 | Hysteresis 1A | Edit PID > Cascade PID > PID Set 1 |
| 1603 | 1000 Ohms | Calibration > Calibrate Input 1 | 2610 | Proportional Band 1B | Edit PID > Cascade PID > PID Set 1 |
| 1603 | 15.0 Ohms | Calibration > Calibrate Input 1 | 2611 | Integral 1B | Edit PID > Cascade PID > PID Set 1 |
| 1603 | 20.000mA | Calibration > Calibrate Input 1 | 2612 | Reset 1B | Edit PID > Cascade PID > PID Set 1 |
| 1603 | 32°F Type J | Calibration > Calibrate Input 1 | 2613 | Derivative 1B | Edit PID > Cascade PID > PID Set 1 |
| 1603 | 380.0 Ohms | Calibration > Calibrate Input 1 | 2614 | Rate 1B | Edit PID > Cascade PID > PID Set 1 |
| 1603 | 4.000mA | Calibration > Calibrate Input 1 | 2615 | Dead Band 1B | Edit PID > Cascade PID > PID Set 1 |
| 1603 | 50.00mV Thermocouple | Calibration > Calibrate Input 1 | 2617 | Hysteresis 1B | Edit PID > Cascade PID > PID Set 1 |
| 1603 | Ground | Calibration > Calibrate Input 1 | 2620 | Proportional Band 1A | Edit PID > Cascade PID > PID Set 2 |
| 1603 | Lead | Calibration > Calibrate Input 1 | 2621 | Integral 1A | Edit PID > Cascade PID > PID Set 2 |
| 1604 | 4.000mA | Calibration > Process Output 1A | 2622 | Reset 1A | Edit PID > Cascade PID > PID Set 2 |
| 1605 | 20.000mA | Calibration > Process Output 1A | 2623 | Derivative 1A | Edit PID > Cascade PID > PID Set 2 |
| 1606 | 1.000V | Calibration > Process Output 1A | 2624 | Rate 1A | Edit PID > Cascade PID > PID Set 2 |
| 1607 | 10.000V | Calibration > Process Output 1A | 2625 | Dead Band 1A | Edit PID > Cascade PID > PID Set 2 |
| 1608 | 0.000V | Calibration > Calibrate Input 2 | 2627 | Hysteresis 1A | Edit PID > Cascade PID > PID Set 2 |
| 1608 | 0.00mV Thermocouple | Calibration > Calibrate Input 2 | 2630 | Proportional Band 1B | Edit PID > Cascade PID > PID Set 2 |
| 1608 | 10.000V | Calibration > Calibrate Input 2 | 2631 | Integral 1B | Edit PID > Cascade PID > PID Set 2 |
| 1608 | 1000 Ohms | Calibration > Calibrate Input 2 | 2632 | Reset 1B | Edit PID > Cascade PID > PID Set 2 |
| 1608 | 15.0 Ohms | Calibration > Calibrate Input 2 | 2633 | Derivative 1B | Edit PID > Cascade PID > PID Set 2 |

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|------|----------------------|------------------------------------|------|------------------------------|-----------------|
| 2634 | Rate 1B | Edit PID > Cascade PID > PID Set 2 | 3032 | Name (Char 03) | Digital Input 4 |
| 2635 | Dead Band 1B | Edit PID > Cascade PID > PID Set 2 | 3033 | Name (Char 04) | Digital Input 4 |
| 2637 | Hysteresis 1B | Edit PID > Cascade PID > PID Set 2 | 3034 | Name (Char 05) | Digital Input 4 |
| 2640 | Proportional Band 1A | Edit PID > Cascade PID > PID Set 3 | 3035 | Name (Char 06) | Digital Input 4 |
| 2641 | Integral 1A | Edit PID > Cascade PID > PID Set 3 | 3036 | Name (Char 07) | Digital Input 4 |
| 2642 | Reset 1A | Edit PID > Cascade PID > PID Set 3 | 3037 | Name (Char 08) | Digital Input 4 |
| 2643 | Derivative 1A | Edit PID > Cascade PID > PID Set 3 | 3038 | Name (Char 09) | Digital Input 4 |
| 2644 | Rate 1A | Edit PID > Cascade PID > PID Set 3 | 3039 | Name (Char 10) | Digital Input 4 |
| 2645 | Dead Band 1A | Edit PID > Cascade PID > PID Set 3 | 3050 | Activate Message | Digital Input 1 |
| 2647 | Hysteresis 1A | Edit PID > Cascade PID > PID Set 3 | 3051 | Activate Message | Digital Input 2 |
| 2650 | Proportional Band 1B | Edit PID > Cascade PID > PID Set 3 | 3052 | Activate Message | Digital Input 3 |
| 2651 | Integral 1B | Edit PID > Cascade PID > PID Set 3 | 3053 | Activate Message | Digital Input 4 |
| 2652 | Reset 1B | Edit PID > Cascade PID > PID Set 3 | 3060 | Message Display Time | Digital Input 1 |
| 2653 | Derivative 1B | Edit PID > Cascade PID > PID Set 3 | 3061 | Message Display Time | Digital Input 2 |
| 2654 | Rate 1B | Edit PID > Cascade PID > PID Set 3 | 3062 | Message Display Time | Digital Input 3 |
| 2655 | Dead Band 1B | Edit PID > Cascade PID > PID Set 3 | 3063 | Message Display Time | Digital Input 4 |
| 2657 | Hysteresis 1B | Edit PID > Cascade PID > PID Set 3 | 3070 | Units (char 1) | Analog Input 1 |
| 2660 | Proportional Band 1A | Edit PID > Cascade PID > PID Set 4 | 3071 | Units (char 2) | Analog Input 1 |
| 2661 | Integral 1A | Edit PID > Cascade PID > PID Set 4 | 3072 | Units (char 3) | Analog Input 1 |
| 2662 | Reset 1A | Edit PID > Cascade PID > PID Set 4 | 3073 | Units (char 1) | Analog Input 2 |
| 2663 | Derivative 1A | Edit PID > Cascade PID > PID Set 4 | 3074 | Units (char 2) | Analog Input 2 |
| 2664 | Rate 1A | Edit PID > Cascade PID > PID Set 4 | 3075 | Units (char 3) | Analog Input 2 |
| 2665 | Dead Band 1A | Edit PID > Cascade PID > PID Set 4 | 3076 | Units (char 1) | Analog Input 3 |
| 2667 | Hysteresis 1A | Edit PID > Cascade PID > PID Set 4 | 3077 | Units (char 2) | Analog Input 3 |
| 2670 | Proportional Band 1B | Edit PID > Cascade PID > PID Set 4 | 3078 | Units (char 3) | Analog Input 3 |
| 2671 | Integral 1B | Edit PID > Cascade PID > PID Set 4 | 3200 | Name (Char 01) | Alarm Output 1 |
| 2672 | Reset 1B | Edit PID > Cascade PID > PID Set 4 | 3201 | Name (Char 02) | Alarm Output 1 |
| 2673 | Derivative 1B | Edit PID > Cascade PID > PID Set 4 | 3202 | Name (Char 03) | Alarm Output 1 |
| 2674 | Rate 1B | Edit PID > Cascade PID > PID Set 4 | 3203 | Name (Char 04) | Alarm Output 1 |
| 2675 | Dead Band 1B | Edit PID > Cascade PID > PID Set 4 | 3204 | Name (Char 05) | Alarm Output 1 |
| 2677 | Hysteresis 1B | Edit PID > Cascade PID > PID Set 4 | 3205 | Name (Char 06) | Alarm Output 1 |
| 2680 | Proportional Band 1A | Edit PID > Cascade PID > PID Set 5 | 3206 | Name (Char 07) | Alarm Output 1 |
| 2681 | Integral 1A | Edit PID > Cascade PID > PID Set 5 | 3207 | Name (Char 08) | Alarm Output 1 |
| 2682 | Reset 1A | Edit PID > Cascade PID > PID Set 5 | 3208 | Name (Char 09) | Alarm Output 1 |
| 2683 | Derivative 1A | Edit PID > Cascade PID > PID Set 5 | 3209 | Name (Char 10) | Alarm Output 1 |
| 2684 | Rate 1A | Edit PID > Cascade PID > PID Set 5 | 3210 | Name (Char 01) | Alarm Output 2 |
| 2685 | Dead Band 1A | Edit PID > Cascade PID > PID Set 5 | 3211 | Name (Char 02) | Alarm Output 2 |
| 2687 | Hysteresis 1A | Edit PID > Cascade PID > PID Set 5 | 3212 | Name (Char 03) | Alarm Output 2 |
| 2687 | Hysteresis 1B | Edit PID > Cascade PID > PID Set 5 | 3213 | Name (Char 04) | Alarm Output 2 |
| 2690 | Proportional Band 1B | Edit PID > Cascade PID > PID Set 5 | 3214 | Name (Char 05) | Alarm Output 2 |
| 2691 | Integral 1B | Edit PID > Cascade PID > PID Set 5 | 3215 | Name (Char 06) | Alarm Output 2 |
| 2692 | Reset 1B | Edit PID > Cascade PID > PID Set 5 | 3216 | Name (Char 07) | Alarm Output 2 |
| 2693 | Derivative 1B | Edit PID > Cascade PID > PID Set 5 | 3217 | Name (Char 08) | Alarm Output 2 |
| 2694 | Rate 1B | Edit PID > Cascade PID > PID Set 5 | 3218 | Name (Char 09) | Alarm Output 2 |
| 2695 | Dead Band 1B | Edit PID > Cascade PID > PID Set 5 | 3219 | Name (Char 10) | Alarm Output 2 |
| 3000 | Name (Char 01) | Digital Input 1 | 4501 | Message 1 (Line 01, Char 01) | Static Message |
| 3001 | Name (Char 02) | Digital Input 1 | 4502 | Message 1 (Line 01, Char 02) | Static Message |
| 3002 | Name (Char 03) | Digital Input 1 | 4503 | Message 1 (Line 01, Char 03) | Static Message |
| 3003 | Name (Char 04) | Digital Input 1 | 4504 | Message 1 (Line 01, Char 04) | Static Message |
| 3004 | Name (Char 05) | Digital Input 1 | 4505 | Message 1 (Line 01, Char 05) | Static Message |
| 3005 | Name (Char 06) | Digital Input 1 | 4506 | Message 1 (Line 01, Char 06) | Static Message |
| 3006 | Name (Char 07) | Digital Input 1 | 4507 | Message 1 (Line 01, Char 07) | Static Message |
| 3007 | Name (Char 08) | Digital Input 1 | 4508 | Message 1 (Line 01, Char 08) | Static Message |
| 3008 | Name (Char 09) | Digital Input 1 | 4509 | Message 1 (Line 01, Char 09) | Static Message |
| 3009 | Name (Char 10) | Digital Input 1 | 4510 | Message 1 (Line 01, Char 10) | Static Message |
| 3010 | Name (Char 01) | Digital Input 2 | 4511 | Message 1 (Line 01, Char 11) | Static Message |
| 3011 | Name (Char 02) | Digital Input 2 | 4512 | Message 1 (Line 01, Char 12) | Static Message |
| 3012 | Name (Char 03) | Digital Input 2 | 4513 | Message 1 (Line 01, Char 13) | Static Message |
| 3013 | Name (Char 04) | Digital Input 2 | 4514 | Message 1 (Line 01, Char 14) | Static Message |
| 3014 | Name (Char 05) | Digital Input 2 | 4515 | Message 1 (Line 01, Char 15) | Static Message |
| 3015 | Name (Char 06) | Digital Input 2 | 4516 | Message 1 (Line 01, Char 16) | Static Message |
| 3016 | Name (Char 07) | Digital Input 2 | 4517 | Message 1 (Line 01, Char 17) | Static Message |
| 3017 | Name (Char 08) | Digital Input 2 | 4521 | Message 1 (Line 02, Char 01) | Static Message |
| 3018 | Name (Char 09) | Digital Input 2 | 4522 | Message 1 (Line 02, Char 02) | Static Message |
| 3019 | Name (Char 10) | Digital Input 2 | 4523 | Message 1 (Line 02, Char 03) | Static Message |
| 3020 | Name (Char 01) | Digital Input 3 | 4524 | Message 1 (Line 02, Char 04) | Static Message |
| 3021 | Name (Char 02) | Digital Input 3 | 4525 | Message 1 (Line 02, Char 05) | Static Message |
| 3022 | Name (Char 03) | Digital Input 3 | 4526 | Message 1 (Line 02, Char 06) | Static Message |
| 3023 | Name (Char 04) | Digital Input 3 | 4527 | Message 1 (Line 02, Char 07) | Static Message |
| 3024 | Name (Char 05) | Digital Input 3 | 4528 | Message 1 (Line 02, Char 08) | Static Message |
| 3025 | Name (Char 06) | Digital Input 3 | 4529 | Message 1 (Line 02, Char 09) | Static Message |
| 3026 | Name (Char 07) | Digital Input 3 | 4530 | Message 1 (Line 02, Char 10) | Static Message |
| 3027 | Name (Char 08) | Digital Input 3 | 4531 | Message 1 (Line 02, Char 11) | Static Message |
| 3028 | Name (Char 09) | Digital Input 3 | 4532 | Message 1 (Line 02, Char 12) | Static Message |
| 3029 | Name (Char 10) | Digital Input 3 | 4533 | Message 1 (Line 02, Char 13) | Static Message |
| 3030 | Name (Char 01) | Digital Input 4 | 4534 | Message 1 (Line 02, Char 14) | Static Message |
| 3031 | Name (Char 02) | Digital Input 4 | 4535 | Message 1 (Line 02, Char 15) | Static Message |

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Watlow Series F4P

Parameter List in Download Order for the Unenhanced Series F4P (F4P _ _ _ A _ _ _ _)

| Modbus Number | Parameter | Menu>Pathway |
|---------------|--------------------------|-----------------|
| 900 | PID Units | System |
| 901 | °F or °C | System |
| 600 | Sensor | Analog Input 1 |
| 601 | Type | Analog Input 1 |
| 608 | Units | Analog Input 1 |
| 3070 | Units (char 1) | Analog Input 1 |
| 3071 | Units (char 2) | Analog Input 1 |
| 3072 | Units (char 3) | Analog Input 1 |
| 606 | Decimal | Analog Input 1 |
| 680 | Scale Low | Analog Input 1 |
| 681 | Scale High | Analog Input 1 |
| 681 | Set Point Low Limit | Analog Input 1 |
| 603 | Set Point High Limit | Analog Input 1 |
| 5572 | Offset Type | Analog Input 1 |
| 605 | Calibration Offset Value | Analog Input 1 |
| 5566 | Clear Input 1 Offsets | Analog Input 1 |
| 5506 | Offset Point 01 | Analog Input 1 |
| 5536 | Offset Value 01 | Analog Input 1 |
| 5507 | Offset Point 02 | Analog Input 1 |
| 5537 | Offset Value 02 | Analog Input 1 |
| 5508 | Offset Point 03 | Analog Input 1 |
| 5538 | Offset Value 03 | Analog Input 1 |
| 5509 | Offset Point 04 | Analog Input 1 |
| 5539 | Offset Value 04 | Analog Input 1 |
| 5510 | Offset Point 05 | Analog Input 1 |
| 5540 | Offset Value 05 | Analog Input 1 |
| 5511 | Offset Point 06 | Analog Input 1 |
| 5541 | Offset Value 06 | Analog Input 1 |
| 5512 | Offset Point 07 | Analog Input 1 |
| 5542 | Offset Value 07 | Analog Input 1 |
| 5513 | Offset Point 08 | Analog Input 1 |
| 5543 | Offset Value 08 | Analog Input 1 |
| 5514 | Offset Point 09 | Analog Input 1 |
| 5544 | Offset Value 09 | Analog Input 1 |
| 5515 | Offset Point 10 | Analog Input 1 |
| 5545 | Offset Value 10 | Analog Input 1 |
| 604 | Filter Time | Analog Input 1 |
| 607 | Error Latch | Analog Input 1 |
| 5569 | Square Root | Analog Input 1 |
| 1923 | Show °F or °C | System |
| 1060 | Function | Digital Input 1 |
| 3050 | Activate Message | Digital Input 1 |
| 3060 | Message Display Time | Digital Input 1 |
| 3000 | Name (Char 01) | Digital Input 1 |
| 3001 | Name (Char 02) | Digital Input 1 |
| 3002 | Name (Char 03) | Digital Input 1 |
| 3003 | Name (Char 04) | Digital Input 1 |
| 3004 | Name (Char 05) | Digital Input 1 |
| 3005 | Name (Char 06) | Digital Input 1 |
| 3006 | Name (Char 07) | Digital Input 1 |
| 3007 | Name (Char 08) | Digital Input 1 |
| 3008 | Name (Char 09) | Digital Input 1 |
| 3009 | Name (Char 10) | Digital Input 1 |
| 1061 | Condition | Digital Input 1 |
| 1062 | Function | Digital Input 2 |
| 3051 | Activate Message | Digital Input 2 |
| 3061 | Message Display Time | Digital Input 2 |
| 3010 | Name (Char 01) | Digital Input 2 |
| 3011 | Name (Char 02) | Digital Input 2 |
| 3012 | Name (Char 03) | Digital Input 2 |
| 3013 | Name (Char 04) | Digital Input 2 |
| 3014 | Name (Char 05) | Digital Input 2 |
| 3015 | Name (Char 06) | Digital Input 2 |
| 3016 | Name (Char 07) | Digital Input 2 |
| 3017 | Name (Char 08) | Digital Input 2 |

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|------|----------------------|-------------------|
| 3018 | Name (Char 09) | Digital Input 2 |
| 3019 | Name (Char 10) | Digital Input 2 |
| 1063 | Condition | Digital Input 2 |
| 1064 | Function | Digital Input 3 |
| 3052 | Activate Message | Digital Input 3 |
| 3062 | Message Display Time | Digital Input 3 |
| 3020 | Name (Char 01) | Digital Input 3 |
| 3021 | Name (Char 02) | Digital Input 3 |
| 3022 | Name (Char 03) | Digital Input 3 |
| 3023 | Name (Char 04) | Digital Input 3 |
| 3024 | Name (Char 05) | Digital Input 3 |
| 3025 | Name (Char 06) | Digital Input 3 |
| 3026 | Name (Char 07) | Digital Input 3 |
| 3027 | Name (Char 08) | Digital Input 3 |
| 3028 | Name (Char 09) | Digital Input 3 |
| 3029 | Name (Char 10) | Digital Input 3 |
| 1065 | Condition | Digital Input 3 |
| 1066 | Function | Digital Input 4 |
| 3053 | Activate Message | Digital Input 4 |
| 3063 | Message Display Time | Digital Input 4 |
| 3030 | Name (Char 01) | Digital Input 4 |
| 3031 | Name (Char 02) | Digital Input 4 |
| 3032 | Name (Char 03) | Digital Input 4 |
| 3033 | Name (Char 04) | Digital Input 4 |
| 3034 | Name (Char 05) | Digital Input 4 |
| 3035 | Name (Char 06) | Digital Input 4 |
| 3036 | Name (Char 07) | Digital Input 4 |
| 3037 | Name (Char 08) | Digital Input 4 |
| 3038 | Name (Char 09) | Digital Input 4 |
| 3039 | Name (Char 10) | Digital Input 4 |
| 1067 | Condition | Digital Input 4 |
| 700 | Function | Control Output 1A |
| 506 | Cycle Time Type | Control Output 1A |
| 509 | Cycle Time Value | Control Output 1A |
| 701 | Process | Control Output 1A |
| 844 | Duplex | Control Output 1A |
| 714 | High Power Limit | Control Output 1A |
| 715 | Low Power Limit | Control Output 1A |
| 717 | Function | Control Output 1B |
| 556 | Cycle Time Type | Control Output 1B |
| 559 | Cycle Time Value | Control Output 1B |
| 885 | Boost Type | Control Output 1B |
| 881 | Boost Power Mode | Control Output 1B |
| 882 | Boost Set Point Type | Control Output 1B |
| 718 | Process | Control Output 1B |
| 731 | High Power Limit | Control Output 1B |
| 732 | Low Power Limit | Control Output 1B |
| 3200 | Name (Char 01) | Alarm Output 1 |
| 3201 | Name (Char 02) | Alarm Output 1 |
| 3202 | Name (Char 03) | Alarm Output 1 |
| 3203 | Name (Char 04) | Alarm Output 1 |
| 3204 | Name (Char 05) | Alarm Output 1 |
| 3205 | Name (Char 06) | Alarm Output 1 |
| 3206 | Name (Char 07) | Alarm Output 1 |
| 3207 | Name (Char 08) | Alarm Output 1 |
| 3208 | Name (Char 09) | Alarm Output 1 |
| 3209 | Name (Char 10) | Alarm Output 1 |
| 702 | Alarm Type | Alarm Output 1 |
| 716 | Alarm Source | Alarm Output 1 |
| 704 | Latching | Alarm Output 1 |
| 705 | Silencing | Alarm Output 1 |
| 703 | Alarm Hysteresis | Alarm Output 1 |
| 706 | Alarm Sides | Alarm Output 1 |
| 707 | Alarm Logic | Alarm Output 1 |
| 708 | Alarm Messages | Alarm Output 1 |
| 3210 | Name (Char 01) | Alarm Output 2 |
| 3211 | Name (Char 02) | Alarm Output 2 |
| 3212 | Name (Char 03) | Alarm Output 2 |
| 3213 | Name (Char 04) | Alarm Output 2 |
| 3214 | Name (Char 05) | Alarm Output 2 |
| 3215 | Name (Char 06) | Alarm Output 2 |
| 3216 | Name (Char 07) | Alarm Output 2 |

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|------|------------------------------|---------------------|------|------------------------------|----------------|
| 3217 | Name (Char 08) | Alarm Output 2 | 4542 | Message 1 (Line 03, Char 02) | Static Message |
| 3218 | Name (Char 09) | Alarm Output 2 | 4543 | Message 1 (Line 03, Char 03) | Static Message |
| 3219 | Name (Char 10) | Alarm Output 2 | 4544 | Message 1 (Line 03, Char 04) | Static Message |
| 719 | Alarm Type | Alarm Output 2 | 4545 | Message 1 (Line 03, Char 05) | Static Message |
| 733 | Alarm Source | Alarm Output 2 | 4546 | Message 1 (Line 03, Char 06) | Static Message |
| 721 | Latching | Alarm Output 2 | 4547 | Message 1 (Line 03, Char 07) | Static Message |
| 722 | Silencing | Alarm Output 2 | 4548 | Message 1 (Line 03, Char 08) | Static Message |
| 720 | Alarm Hysteresis | Alarm Output 2 | 4549 | Message 1 (Line 03, Char 09) | Static Message |
| 723 | Alarm Sides | Alarm Output 2 | 4550 | Message 1 (Line 03, Char 10) | Static Message |
| 724 | Alarm Logic | Alarm Output 2 | 4551 | Message 1 (Line 03, Char 11) | Static Message |
| 725 | Alarm Messages | Alarm Output 2 | 4552 | Message 1 (Line 03, Char 12) | Static Message |
| 709 | Retransmit Source | Retransmit Output 1 | 4553 | Message 1 (Line 03, Char 13) | Static Message |
| 836 | Analog Range | Retransmit Output 1 | 4554 | Message 1 (Line 03, Char 14) | Static Message |
| 710 | Low Scale | Retransmit Output 1 | 4555 | Message 1 (Line 03, Char 15) | Static Message |
| 711 | High Scale | Retransmit Output 1 | 4556 | Message 1 (Line 03, Char 16) | Static Message |
| 712 | Scale Offset | Retransmit Output 1 | 4557 | Message 1 (Line 03, Char 17) | Static Message |
| 726 | Retransmit Source | Retransmit Output 2 | 4561 | Message 1 (Line 04, Char 01) | Static Message |
| 837 | Analog Range | Retransmit Output 2 | 4562 | Message 1 (Line 04, Char 02) | Static Message |
| 727 | Low Scale | Retransmit Output 2 | 4563 | Message 1 (Line 04, Char 03) | Static Message |
| 728 | High Scale | Retransmit Output 2 | 4564 | Message 1 (Line 04, Char 04) | Static Message |
| 729 | Scale Offset | Retransmit Output 2 | 4565 | Message 1 (Line 04, Char 05) | Static Message |
| 1400 | Parameter 01 | Custom Main Page | 4566 | Message 1 (Line 04, Char 06) | Static Message |
| 1401 | Parameter 02 | Custom Main Page | 4567 | Message 1 (Line 04, Char 07) | Static Message |
| 1402 | Parameter 03 | Custom Main Page | 4568 | Message 1 (Line 04, Char 08) | Static Message |
| 1403 | Parameter 04 | Custom Main Page | 4569 | Message 1 (Line 04, Char 09) | Static Message |
| 1404 | Parameter 05 | Custom Main Page | 4570 | Message 1 (Line 04, Char 10) | Static Message |
| 1405 | Parameter 06 | Custom Main Page | 4571 | Message 1 (Line 04, Char 11) | Static Message |
| 1406 | Parameter 07 | Custom Main Page | 4572 | Message 1 (Line 04, Char 12) | Static Message |
| 1407 | Parameter 08 | Custom Main Page | 4573 | Message 1 (Line 04, Char 13) | Static Message |
| 1408 | Parameter 09 | Custom Main Page | 4574 | Message 1 (Line 04, Char 14) | Static Message |
| 1409 | Parameter 10 | Custom Main Page | 4575 | Message 1 (Line 04, Char 15) | Static Message |
| 1410 | Parameter 11 | Custom Main Page | 4576 | Message 1 (Line 04, Char 16) | Static Message |
| 1411 | Parameter 12 | Custom Main Page | 4577 | Message 1 (Line 04, Char 17) | Static Message |
| 1412 | Parameter 13 | Custom Main Page | 4581 | Message 2 (Line 01, Char 01) | Static Message |
| 1413 | Parameter 14 | Custom Main Page | 4582 | Message 2 (Line 01, Char 02) | Static Message |
| 1414 | Parameter 15 | Custom Main Page | 4583 | Message 2 (Line 01, Char 03) | Static Message |
| 1415 | Parameter 16 | Custom Main Page | 4584 | Message 2 (Line 01, Char 04) | Static Message |
| 4501 | Message 1 (Line 01, Char 01) | Static Message | 4585 | Message 2 (Line 01, Char 05) | Static Message |
| 4502 | Message 1 (Line 01, Char 02) | Static Message | 4586 | Message 2 (Line 01, Char 06) | Static Message |
| 4503 | Message 1 (Line 01, Char 03) | Static Message | 4587 | Message 2 (Line 01, Char 07) | Static Message |
| 4504 | Message 1 (Line 01, Char 04) | Static Message | 4588 | Message 2 (Line 01, Char 08) | Static Message |
| 4505 | Message 1 (Line 01, Char 05) | Static Message | 4589 | Message 2 (Line 01, Char 09) | Static Message |
| 4506 | Message 1 (Line 01, Char 06) | Static Message | 4590 | Message 2 (Line 01, Char 10) | Static Message |
| 4507 | Message 1 (Line 01, Char 07) | Static Message | 4591 | Message 2 (Line 01, Char 11) | Static Message |
| 4508 | Message 1 (Line 01, Char 08) | Static Message | 4592 | Message 2 (Line 01, Char 12) | Static Message |
| 4509 | Message 1 (Line 01, Char 09) | Static Message | 4594 | Message 2 (Line 01, Char 14) | Static Message |
| 4510 | Message 1 (Line 01, Char 10) | Static Message | 4595 | Message 2 (Line 01, Char 15) | Static Message |
| 4511 | Message 1 (Line 01, Char 11) | Static Message | 4593 | Message 2 (Line 01, Char 13) | Static Message |
| 4512 | Message 1 (Line 01, Char 12) | Static Message | 4596 | Message 2 (Line 01, Char 16) | Static Message |
| 4513 | Message 1 (Line 01, Char 13) | Static Message | 4597 | Message 2 (Line 01, Char 17) | Static Message |
| 4514 | Message 1 (Line 01, Char 14) | Static Message | 4601 | Message 2 (Line 02, Char 01) | Static Message |
| 4515 | Message 1 (Line 01, Char 15) | Static Message | 4602 | Message 2 (Line 02, Char 02) | Static Message |
| 4516 | Message 1 (Line 01, Char 16) | Static Message | 4603 | Message 2 (Line 02, Char 03) | Static Message |
| 4517 | Message 1 (Line 01, Char 17) | Static Message | 4604 | Message 2 (Line 02, Char 04) | Static Message |
| 4521 | Message 1 (Line 02, Char 01) | Static Message | 4605 | Message 2 (Line 02, Char 05) | Static Message |
| 4522 | Message 1 (Line 02, Char 02) | Static Message | 4606 | Message 2 (Line 02, Char 06) | Static Message |
| 4523 | Message 1 (Line 02, Char 03) | Static Message | 4607 | Message 2 (Line 02, Char 07) | Static Message |
| 4524 | Message 1 (Line 02, Char 04) | Static Message | 4608 | Message 2 (Line 02, Char 08) | Static Message |
| 4525 | Message 1 (Line 02, Char 05) | Static Message | 4609 | Message 2 (Line 02, Char 09) | Static Message |
| 4526 | Message 1 (Line 02, Char 06) | Static Message | 4610 | Message 2 (Line 02, Char 10) | Static Message |
| 4527 | Message 1 (Line 02, Char 07) | Static Message | 4611 | Message 2 (Line 02, Char 11) | Static Message |

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|------|------------------------------|--------------------------------------|------|-------------------------------|--------------------------------------|
| 4794 | Message 4 (Line 03, Char 14) | Static Message | 524 | Rate 1A | Edit PID > PID Set Chl 1 > PID Set 3 |
| 4795 | Message 4 (Line 03, Char 15) | Static Message | 525 | Dead Band 1A | Edit PID > PID Set Chl 1 > PID Set 3 |
| 4796 | Message 4 (Line 03, Char 16) | Static Message | 527 | Hysteresis 1A | Edit PID > PID Set Chl 1 > PID Set 3 |
| 4797 | Message 4 (Line 03, Char 17) | Static Message | 570 | Proportional Band 1B | Edit PID > PID Set Chl 1 > PID Set 3 |
| 4801 | Message 4 (Line 04, Char 01) | Static Message | 571 | Integral 1B | Edit PID > PID Set Chl 1 > PID Set 3 |
| 4802 | Message 4 (Line 04, Char 02) | Static Message | 572 | Reset 1B | Edit PID > PID Set Chl 1 > PID Set 3 |
| 4803 | Message 4 (Line 04, Char 03) | Static Message | 573 | Derivative 1B | Edit PID > PID Set Chl 1 > PID Set 3 |
| 4804 | Message 4 (Line 04, Char 04) | Static Message | 574 | Rate 1B | Edit PID > PID Set Chl 1 > PID Set 3 |
| 4805 | Message 4 (Line 04, Char 05) | Static Message | 575 | Dead Band 1B | Edit PID > PID Set Chl 1 > PID Set 3 |
| 4806 | Message 4 (Line 04, Char 06) | Static Message | 577 | Hysteresis 1B | Edit PID > PID Set Chl 1 > PID Set 3 |
| 4807 | Message 4 (Line 04, Char 07) | Static Message | 530 | Proportional Band 1A | Edit PID > PID Set Chl 1 > PID Set 4 |
| 4808 | Message 4 (Line 04, Char 08) | Static Message | 531 | Integral 1A | Edit PID > PID Set Chl 1 > PID Set 4 |
| 4809 | Message 4 (Line 04, Char 09) | Static Message | 532 | Reset 1A | Edit PID > PID Set Chl 1 > PID Set 4 |
| 4810 | Message 4 (Line 04, Char 10) | Static Message | 533 | Derivative 1A | Edit PID > PID Set Chl 1 > PID Set 4 |
| 4811 | Message 4 (Line 04, Char 11) | Static Message | 534 | Rate 1A | Edit PID > PID Set Chl 1 > PID Set 4 |
| 4812 | Message 4 (Line 04, Char 12) | Static Message | 535 | Dead Band 1A | Edit PID > PID Set Chl 1 > PID Set 4 |
| 4813 | Message 4 (Line 04, Char 13) | Static Message | 537 | Hysteresis 1A | Edit PID > PID Set Chl 1 > PID Set 4 |
| 4814 | Message 4 (Line 04, Char 14) | Static Message | 580 | Proportional Band 1B | Edit PID > PID Set Chl 1 > PID Set 4 |
| 4815 | Message 4 (Line 04, Char 15) | Static Message | 581 | Integral 1B | Edit PID > PID Set Chl 1 > PID Set 4 |
| 4816 | Message 4 (Line 04, Char 16) | Static Message | 582 | Reset 1B | Edit PID > PID Set Chl 1 > PID Set 4 |
| 4817 | Message 4 (Line 04, Char 17) | Static Message | 583 | Derivative 1B | Edit PID > PID Set Chl 1 > PID Set 4 |
| 452 | Maximum Transfer Heat | System | 584 | Rate 1B | Edit PID > PID Set Chl 1 > PID Set 4 |
| 453 | Maximum Transfer Cool | System | 585 | Dead Band 1B | Edit PID > PID Set Chl 1 > PID Set 4 |
| 454 | Manual to Auto Transfer | System | 587 | Hysteresis 1B | Edit PID > PID Set Chl 1 > PID Set 4 |
| 304 | Autotune Set Point | System | 540 | Proportional Band 1A | Edit PID > PID Set Chl 1 > PID Set 5 |
| 880 | Failure Mode | System | 541 | Integral 1A | Edit PID > PID Set Chl 1 > PID Set 5 |
| 903 | Input 1 Fail | System | 542 | Reset 1A | Edit PID > PID Set Chl 1 > PID Set 5 |
| 904 | Open Loop Detect | System | 543 | Derivative 1A | Edit PID > PID Set Chl 1 > PID Set 5 |
| 302 | Alarm 1 Low Deviation | Alarm Set Points | 544 | Rate 1A | Edit PID > PID Set Chl 1 > PID Set 5 |
| 302 | Alarm 1 Low Set Point | Alarm Set Points | 545 | Dead Band 1A | Edit PID > PID Set Chl 1 > PID Set 5 |
| 302 | Alarm 1 Maximum Low Rate | Alarm Set Points | 547 | Hysteresis 1A | Edit PID > PID Set Chl 1 > PID Set 5 |
| 303 | Alarm 1 High Deviation | Alarm Set Points | 590 | Proportional Band 1B | Edit PID > PID Set Chl 1 > PID Set 5 |
| 303 | Alarm 1 High Set Point | Alarm Set Points | 591 | Integral 1B | Edit PID > PID Set Chl 1 > PID Set 5 |
| 303 | Alarm 1 Maximum High Rate | Alarm Set Points | 592 | Reset 1B | Edit PID > PID Set Chl 1 > PID Set 5 |
| 321 | Alarm 2 Low Deviation | Alarm Set Points | 593 | Derivative 1B | Edit PID > PID Set Chl 1 > PID Set 5 |
| 321 | Alarm 2 Low Set Point | Alarm Set Points | 594 | Rate 1B | Edit PID > PID Set Chl 1 > PID Set 5 |
| 321 | Alarm 2 Maximum Low Rate | Alarm Set Points | 595 | Dead Band 1B | Edit PID > PID Set Chl 1 > PID Set 5 |
| 322 | Alarm 2 High Deviation | Alarm Set Points | 597 | Hysteresis 1B | Edit PID > PID Set Chl 1 > PID Set 5 |
| 322 | Alarm 2 High Set Point | Alarm Set Points | 1951 | PID Crossover | Operations Page |
| 322 | Alarm 2 Maximum High Rate | Alarm Set Points | 1961 | PID Cross 1 to 2 | Operations Page |
| 500 | Proportional Band 1A | Edit PID > PID Set Chl 1 > PID Set 1 | 1962 | PID Cross 2 to 3 | Operations Page |
| 501 | Integral 1A | Edit PID > PID Set Chl 1 > PID Set 1 | 1963 | PID Cross 3 to 4 | Operations Page |
| 502 | Reset 1A | Edit PID > PID Set Chl 1 > PID Set 1 | 1964 | PID Cross 4 to 5 | Operations Page |
| 503 | Derivative 1A | Edit PID > PID Set Chl 1 > PID Set 1 | 1100 | Ramp to Set Point Mode | Ramp to Set Point |
| 504 | Rate 1A | Edit PID > PID Set Chl 1 > PID Set 1 | 1102 | Ramp to Set Point Scale | Ramp to Set Point |
| 505 | Dead Band 1A | Edit PID > PID Set Chl 1 > PID Set 1 | 1101 | Ramp to Set Point Rate | Ramp to Set Point |
| 507 | Hysteresis 1A | Edit PID > PID Set Chl 1 > PID Set 1 | 883 | Boost Power (1B) | Control Set Points |
| 550 | Proportional Band 1B | Edit PID > PID Set Chl 1 > PID Set 1 | 884 | Boost Delay Time (1B) | Control Set Points |
| 551 | Integral 1B | Edit PID > PID Set Chl 1 > PID Set 1 | 309 | Boost Set Point (1B) | Control Set Points |
| 552 | Reset 1B | Edit PID > PID Set Chl 1 > PID Set 1 | 308 | Digital Set Point 1 | Control Set Points |
| 553 | Derivative 1B | Edit PID > PID Set Chl 1 > PID Set 1 | 327 | Digital Set Point 2 | Control Set Points |
| 554 | Rate 1B | Edit PID > PID Set Chl 1 > PID Set 1 | 346 | Digital Set Point 3 | Control Set Points |
| 555 | Dead Band 1B | Edit PID > PID Set Chl 1 > PID Set 1 | 365 | Digital Set Point 4 | Control Set Points |
| 557 | Hysteresis 1B | Edit PID > PID Set Chl 1 > PID Set 1 | 300 | Set Point 1 | Main Page |
| 510 | Proportional Band 1A | Edit PID > PID Set Chl 1 > PID Set 2 | 307 | Autotune PID Type | Autotune PID |
| 511 | Integral 1A | Edit PID > PID Set Chl 1 > PID Set 2 | 1330 | Set/Change Password (Char 1) | Set Lockout |
| 512 | Reset 1A | Edit PID > PID Set Chl 1 > PID Set 2 | 1331 | Set/Change Password (Char 2) | Set Lockout |
| 513 | Derivative 1A | Edit PID > PID Set Chl 1 > PID Set 2 | 1332 | Set/Change Password (Char 3) | Set Lockout |
| 514 | Rate 1A | Edit PID > PID Set Chl 1 > PID Set 2 | 1333 | Set/Change Password (Char 4) | Set Lockout |
| 515 | Dead Band 1A | Edit PID > PID Set Chl 1 > PID Set 2 | 1300 | Set Point | Set Lockout |
| 517 | Hysteresis 1A | Edit PID > PID Set Chl 1 > PID Set 2 | 1306 | Operations, Autotune PID | Set Lockout |
| 560 | Proportional Band 1B | Edit PID > PID Set Chl 1 > PID Set 2 | 1307 | Operations, Edit PID | Set Lockout |
| 561 | Integral 1B | Edit PID > PID Set Chl 1 > PID Set 2 | 1308 | Operations, Alarm Set Point | Set Lockout |
| 562 | Reset 1B | Edit PID > PID Set Chl 1 > PID Set 2 | 1302 | Setup Page | Set Lockout |
| 563 | Derivative 1B | Edit PID > PID Set Chl 1 > PID Set 2 | 1303 | Factory Page | Set Lockout |
| 564 | Rate 1B | Edit PID > PID Set Chl 1 > PID Set 2 | 1316 | Operations, PID Crossover | Set Lockout |
| 565 | Dead Band 1B | Edit PID > PID Set Chl 1 > PID Set 2 | 1317 | Operations, Ramp Set Point | Set Lockout |
| 567 | Hysteresis 1B | Edit PID > PID Set Chl 1 > PID Set 2 | 1318 | Operations, Control Set Point | Set Lockout |
| 520 | Proportional Band 1A | Edit PID > PID Set Chl 1 > PID Set 3 | 25 | Save Changes to EE | Save |
| 521 | Integral 1A | Edit PID > PID Set Chl 1 > PID Set 3 | | | |
| 522 | Reset 1A | Edit PID > PID Set Chl 1 > PID Set 3 | | | |
| 523 | Derivative 1A | Edit PID > PID Set Chl 1 > PID Set 3 | | | |

Operations Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|--|--|---|--------------|---|---|
| Autotune PID | | | | | |
| Main > Operations > Autotune PID | | | | | |
| Autotune PID | Select which PID parameters will be automatically tuned. | Tune Off (0) PID Set 1 (1) PID Set 2 (2) PID Set 3 (3) PID Set 4 (4) PID Set 5 (5) | Off | 305 r/w | Active if controller is in auto (closed-loop) mode. |
| Cascade Inner Loop | Select which PID parameters will be automatically tuned. | Tune Off (0) PID Set 1 (1) PID Set 2 (2) PID Set 3 (3) PID Set 4 (4) PID Set 5 (5) | Off | 305 r/w | Active if Analog Input 3 Control Type is set to Cascade. |
| Cascade Outer Loop | Select which PID parameters will be automatically tuned. | Tune Off (0) PID Set 1 (1) PID Set 2 (2) PID Set 3 (3) PID Set 4 (4) PID Set 5 (5) | Off | 343 r/w | Active if Analog Input 3 Control Type is set to Cascade. |
| Autotune PID Type | Select which output to autotune. | Heat Only (0) Cool Only (1) Heat and Cool (3) | Off | 307 r/w | Active if controller is in auto (closed-loop) mode. |
| PID Set x (1 to 5) | | | | | |
| Main > Operations > Edit PID > PID Set Channel 1 > PID Set x (1 to 5)* | | | | | |
| Proportional Band x (A or B) | Define the proportional band for PID control. | 0° to 30,000° | 25°F 14°C | 1A 1B Set 500 550 [1] 510 560 [2] 520 570 [3] 530 580 [4] 540 590 [5] r/w | Active: Always.* |
| Integral x (A or B) | Set the integral time in minutes. [or] | 0.00 to 99.99 minutes | 0 minutes | 1A 1B Set 501 551 [1] 511 561 [2] 521 571 [3] 531 581 [4] 541 591 [5] r/w | Active if PID Units (Setup Page) is set to SI and Proportional Band is not set to 0.* |
| Reset x (A or B) | Set the reset time in repeats per minute. | 0.00 per minute to 99.99 per minute | 0 per minute | 1A 1B Set 502 552 [1] 512 562 [2] 522 572 [3] 532 582 [4] 542 592 [5] r/w | Active if PID Units (Setup Page) is set to U.S. and Proportional Band is not set to 0.* |
| Derivative x (A or B) | Set the derivative time. [or] | 0.00 to 9.99 minutes | 0.00 minutes | 1A 1B Set 503 553 [1] 513 563 [2] 523 573 [3] 533 583 [4] 543 593 [5] r/w | Active if PID Units (Setup Page) is set to SI and Proportional Band is not set to 0.* |
| Rate x (A or B) | Set the rate time. | 0.00 to 9.99 minutes | 0.00 minutes | 1A 1B Set 504 554 [1] 514 564 [2] 524 574 [3] 534 584 [4] 544 594 [5] r/w | Active if PID Units (Setup Page) is set to U.S. and Proportional Band is not set to 0.* |

Operations Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|--|--|-------------------------------------|--------------|---|---|
| Dead Band x (A or B) | Define the effective shift in the heating and cooling set points to prevent conflict. | 0 to 30,000 | 0 | 1A 1B Set 505 555 [1] 515 565 [2] 525 575 [3] 535 585 [4] 545 595 [5] r/w | Active if Proportional Band is not set to 0 and one output is set to heat and the other to cool (Setup Page).* |
| Hysteresis x (A or B) | Define the process variable change from the set point required to re-energize the output (in on-off mode). | 1 to 30,000 | 3 | 1A 1B Set 507 557 [1] 517 567 [2] 527 577 [3] 537 587 [4] 547 597 [5] r/w | Active if Proportional Band is set to 0 and one output is set to heat and the other to cool (Setup Page).* |
| * None of the B parameters are active if both outputs are set to cool or heat. | | | | | |
| PID Set x (1 to 5) | | | | | |
| Main > Operations > Edit PID > Cascade PID > PID Set x (1 to 5)* | | | | | |
| Proportional Band x (A or B) | Define the proportional band for PID control. | 0° to 30,000° | 25°F 14°C | 1A 1B Set 2600 2610 [1] 2620 2630 [2] 2640 2650 [3] 2660 2670 [4] 2680 2690 [5] r/w | Active if Control Type (Analog Input 3) is set to Cascade.* |
| Integral x (A or B) | Set the integral time in minutes. [or] | 0.00 to 99.99 minutes | 0 minutes | 1A 1B Set 2601 2611 [1] 2621 2631 [2] 2641 2651 [3] 2661 2671 [4] 2681 2691 [5] r/w | Active if Control Type (Analog Input 3) is set to Cascade, PID Units (Setup Page) is set to SI and Proportional Band is not set to 0.* |
| Reset x (A or B) | Set the reset time in repeats per minute. | 0.00 per minute to 99.99 per minute | 0 per minute | 1A 1B Set 2602 2612 [1] 2622 2632 [2] 2642 2652 [3] 2662 2672 [4] 2682 2692 [5] r/w | Active if Control Type (Analog Input 3) is set to Cascade, PID Units (Setup Page) is set to U.S. and Proportional Band is not set to 0.* |
| Derivative x (A or B) | Set the derivative time. [or] | 0.00 to 9.99 minutes | 0.00 minutes | 1A 1B Set 2603 2613 [1] 2623 2633 [2] 2643 2653 [3] 2663 2673 [4] 2683 2693 [5] r/w | Active if Control Type (Analog Input 3) is set to Cascade, PID Units (Setup Page) is set to SI and Proportional Band is not set to 0.* |
| Rate x (A or B) | Set the rate time. | 0.00 to 9.99 minutes | 0.00 minutes | 1A 1B Set 2604 2614 [1] 2624 2634 [2] 2644 2654 [3] 2664 2674 [4] 2684 2694 [5] r/w | Active if Control Type (Analog Input 3) is set to Cascade, PID Units (Setup Page) is set to U.S. and Proportional Band is not set to 0.* |
| Dead Band x (A or B) | Define the effective shift in the heating and cooling set points to prevent conflict. | 0 to 9,999 | 0 | 1A 1B Set 2605 2615 [1] 2625 2635 [2] 2645 2655 [3] 2665 2675 [4] 2685 2695 [5] r/w | Active if Control Type (Analog Input 3) is set to Cascade, Proportional Band is not set to 0 and one output is set to heat and the other to cool (Setup Page).* |

Operations Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|--|--|---|--------------|---|---|
| Hysteresis x (A or B) | Define the process variable change from the set point required to re-energize the output (in on-off mode). | 1 to 9,999 | 3 | 1A 1B Set 2607 2617 [1] 2627 2637 [2] 2647 2657 [3] 2667 2677 [4] 2687 2697 [5] r/w | Active if Control Type (Analog Input 3) is set to Cascade, Proportional Band is set to 0 and one output is set to heat and the other to cool (Setup Page).* |
| * None of the B parameters are active if both outputs are set to cool or heat. | | | | | |
| Alarm Set Points | | | | | |
| Main > Operations > Alarm Set Points | | | | | |
| Alarm x (1 or 2) Low Set Point | Set low value at which alarm is triggered. | <per sensor> to Alarm x High Set Point | <per sensor> | 302 [1] 321 [2] r/w | Active if Alarm x Type (Setup Page) is set to Process. |
| Alarm x (1 or 2) High Set Point | Set high value at which alarm is triggered. | <per sensor> to Alarm x Low Set Point | <per sensor> | 303 [1] 322 [2] r/w | Active if Alarm x Type (Setup Page) is set to Process. |
| Alarm x (1 or 2) Low Deviation | Set the deviation below set point 1 that will trigger an alarm. | -19,999 to -1 | -999 | 302 [1] 321 [2] r/w | Active if Alarm x Type (Setup Page) is set to Deviation. |
| Alarm x (1 or 2) High Deviation | Set the deviation above set point 1 that will trigger an alarm. | 1 to 20,000 | 999 | 303 [1] 322 [2] r/w | Active if Alarm x Type (Setup Page) is set to Deviation. |
| Alarm x (1 or 2) Maximum Low Rate | Set the maximum rate process value per second at which alarm is triggered. | -19,999 to Maximum Rate High -1 | -100 | 302 [1] 321 [2] r/w | Active if Alarm x Type (Setup Page) is set to Maximum Rate. |
| Alarm x (1 or 2) Maximum High Rate | Set the maximum rate process value per second at which alarm is triggered. | Maximum Rate Low +1 to 30,000 | 100 | 303 [1] 322 [2] r/w | Active if Alarm x Type (Setup Page) is set to Maximum Rate. |
| Operations | | | | | |
| Main > Operations | | | | | |
| PID Crossover | Select what will trigger the crossover to another PID set. | Off (0) Process (1) Set Point (2) | Off | 1951 r/w | Active: Always. |

Operations Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|---|--|--|--|---|---|
| PID Cross | Select the value that will trigger a change in PID sets. | 1 to 2 2 to 3 3 to 4 4 to 5 (-19,999 to 30,000) | 1 to 2 | 1961 [1-2] 1962 [2-3] 1963 [3-4] 1964 [4-5] r/w | Appears if PID Crossover is not set to Off. |
| Ramp to Set Point | | | | | |
| Main > Operations > Ramp to Set Point | | | | | |
| Ramp to Set Point Mode | Select whether the maximum rate of temperature or process value change will be limited. | Off (0) Startup (1) Startup or Change (2) | Off | 1100 r/w | Active: Always. |
| Ramp to Set Point Scale | Select the units of measure for ramping. | Degrees/Minute (0) Degrees/Hour (1) | Degrees/ Minute | 1102 r/w | Active if Ramp to Set Point Mode is not set to Off. |
| Ramp to Set Point Rate | Select the maximum rate of temperature or process value change. | 1 to 999 degrees or units per minute or hour | 100.0 | 1101 r/w | Active if Ramp to Set Point Mode is not set to Off. |
| Control Set Points | | | | | |
| Main > Operations > Control Set Points | | | | | |
| Boost Power (1B) | Select the minimum output 1A power that will activate output 1B (with 1.0% hysteresis). | 0.0% to 100.0% | 75% | 883 r/w | Active if Boost Type (Setup Page > Control Output 1B) is set to Boost On Power. |
| Boost Delay Time (1B) | Set the time that the power level has to be exceeded before activating output 1B. | 0 to 999 seconds | 0 | 884 r/w | Active if Boost Type (Setup Page > Control Output 1B) is set to Boost On Power. |
| Boost Set Point (1B) | Set the set point that will control output 1B. | -19,999 to 30,000 [deviation] Set Point Low Limit to Set Point High Limit [process] | cool/cool Set Point High Limit (process) 999 (dev.) heat/heat Set Point Low Limit (process) -999 (dev.) | 309 r/w | Active if Boost Type (Setup Page > Control Output 1B) is set to Boost On Set Point. |
| Digital Set Point x (1 to 4) | Select the set point value that will be activated by digital input x. The set point name can be changed in the Setup Page. | Set Point Low Limit to Set Point High Limit | | 308 [1] 327 [2] 346 [3] 365 [4] r/w | Active if any digital input is set to Digital Set Point. |

Operations Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|--|---|---|-----------------|---|---|
| Digital Differential Set Point x (1 to 4) | Select the differential value that will be activated by digital input x. The value will be added to the input 3 process value while digital input X is active. The set point name can be changed in the Setup Page. | -19,999 to 30,000 | 0 | 314 [1] 333 [2] 352 [3] 371 [4] r/w | Active if any digital input is set to Digital Differential Value. |
| Digital Ratio Set Point x (1 to 4) | Select the ratio value that will be activated by digital input x. The input 3 process value will be multiplied by this value while digital input x is active. The set point name can be changed in the Setup Page. | 0% to 30,000% | 100% | 315 [1] 334 [2] 353 [3] 372 [4] r/w | Active if any digital input is set to Digital Ratio Value. |
| Remote/Local Set Point | | | | | |
| Main > Operations > Remote/Local Set Point | | | | | |
| Remote/Local Set Point | Switch between the remote and local set points. | Local Set Point (0) Remote 2 (1) Remote 3 (2) | Local Set Point | 316 r/w | Available if Control Type (Setup Page > Analog Input 2) is set to Remote. |

Setup Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|--------------------------------|--|--|--------------------|--|---|
| System | | | | | |
| Main > Setup > System | | | | | |
| PID Units | Choose units for PID control. | US (Reset/Rate) (0) SI (Integral/Derivative) (1) | US, Reset/Rate | 900 r/w | Active: Always. |
| °F or °C | Choose temperature scale. | °F (0) °C (1) | °F | 901 r/w | Active: Always. |
| Show °F or °C | Choose whether to display or hide °C or °F in top display. | No, Upper Display (0) Yes, Upper Display (1) | Yes, Upper Display | 1923 r/w | Active: Always. |
| Maximum Transfer Heat | The maximum heat output power when control is switched from auto to manual mode. | 0% to 100% | 100% | 452 r/w | Active if one or both control outputs is set to heat [reverse]. |
| Maximum Transfer Cool | The maximum cool output power when control is switched from auto to manual mode. | -100% to 0% | -100% | 453 r/w | Active if one or both control outputs is set to cool [direct]. |
| Manual to Auto Transfer | Select how the set point will be determined when control switches from manual to auto mode. | Restore Set Point (0) Reverse Bumpless (1) | Restore Set Point | 454 r/w | Active: Always. |
| Autotune Set Point | Set percent of set point to auto-tune to. | 50 to 150% | 90% | 304 r/w | Active: Always. |
| Failure Mode | Select how the outputs will behave if an input error switches the controller to manual mode. | Bumpless Transfer (0) Fixed (1) | Bumpless | 880 r/w | Active: Always. |
| Input 1 Fail | Select the output power to be maintained if an input error switches control to manual mode. | 0% to High Power Limit (heat only or cool only) Cool High Power Limit to Heat High Power Limit (heat/cool or cool/heat) | 0% | 903 r/w | Active if Failure Mode is set to Fixed. |
| Open Loop Detect | Select whether to turn off outputs and display an error message. | Off (0) On (1) | Off | 904 r/w | Active: Always. |

Setup Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|--|--|--|--|--|--|
| Analog Input x (1 to 3) | | | | | |
| Main > Setup > Analog Input x (1 to 3) Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). | | | | | |
| Sensor | Select the sensor. | Thermocouple (0) RTD (1) Process (2) Slidewire (3) [Analog Input 3 only] Off (4) [Analog Inputs 2 and 3 only] | Thermocouple | Input 600 [1] 610 [2] 620 [3] r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). Active: Always. |
| Type | Select the linearization table to apply to the sensor. | If Sensor is set to thermocouple: J (0) K (1) T (2) E (3) N (4) C (5) D (6) PT2 (7) R (8) S (9) B (10) If Sensor is set to RTD: JIS (11) DIN (12) If Sensor is set to Process: 4 to 20mA (13) 0 to 20mA (14) 0 to 5V (15) 1 to 5V (16) 0 to 10V (17) 0 to 50mV (18) | J DIN 4-20mA | Input 601 [1] 610 [2] 621 [3] r/w | Active if Sensor is not set to Off. Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). The selection that appears will depend on which sensor was selected for the previous parameter. |
| Analog Input 2 | | | | | |
| Main > Setup > Analog Input 2 Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). | | | | | |
| Control Type | Select the control type. | Normal (0) Remote (3) Alternate (4) | Normal | 1140 r/w | Appears if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _), Analog Input 2 is selected and Analog Input 3 is set to Normal Control. |
| Analog Input x (1 to 3) continued | | | | | |
| Main > Setup > Analog Input x (1 to 3) Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). | | | | | |
| Units | Name the units of measure for the input. | Temperature (0) Units (1) [3 characters] | Temperature | Input 608 [1] 3070 char 1 3071 char 2 3072 char 3 618 [2] 3073 char 1 3074 char 2 3075 char 3 628 [3] 3076 char 1 3077 char 2 3078 char 3 r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). Active if Sensor is set to Process. |

Setup Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|---------------------------------------|--|--|--|---|--|
| Decimal | Set the decimal point for input. | 0 (0) 0.0 (1) 0.00 (process) (2) 0.000 (process) (3) | 0 | Input 606 [1] 616 [2] 626 [3] r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). Active: Always. |
| Scale Low | Set unit value for low end of current or voltage range. | Depends on sensor and decimal point selection. | — | Input 680 [1] 682 [2] 684 [3] r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). Active if Sensor is set to Process. |
| Scale High | Set unit value for high end of current or voltage range. | Depends on sensor and decimal point selection. | — | Input 681 [1] 683 [2] 685 [3] r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). Active if Sensor is set to Process. |
| Set Point Low Limit | Set limit for minimum set point. | Depends on sensor. | — | Input 681 [1] 683 [2] 685 [3] r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). Active: Always. |
| Set Point High Limit | Set limit for maximum set point. | Depends on sensor. | — | Input 603 [1] 613 [2] 623 [3] r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). Active: Always. |
| Offset Type | Select whether to use one or 10 input offset points. | Single Linear (0) Multiple Point (1) | Single Linear | Input 5572 [1] 5573 [2] 5574 [3] r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). Active if Offset Type is set to Single Linear. |
| Calibration Offset Value | Select the input offset value. | Set Point Low Limit to Set Point High Limit | — | Input 605 [1] 615 [2] 625 [3] r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). Active if Offset Type is set to Single Linear. |
| Clear Input x (1 to 3) Offsets | Reset offset values to 0. | No (0) Yes (1) | No | Input 5566 [1] 5567 [2] 5568 [3] r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). Active if Offset Type is set to Multiple Point. |
| Offset Point x (1 to 10) | Set the temperature or value that will trigger the offset. | -19,999 or Input Offset (x-1) Value + 1 to Input Offset (x+1) Value - 1 or 30,000. | SP Low + ((SP High- SP Low) * (x-1) /9) | Input 1 2 3 [1] 5506 5516 5526 [2] 5507 5517 5527 [3] 5508 5518 5528 [4] 5509 5519 5529 [5] 5510 5520 5530 [6] 5511 5521 5531 [7] 5512 5522 5532 [8] 5513 5523 5533 [9] 5514 5524 5534 [10] 5515 5525 5535 r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). Active: Always. |
| Offset Value x (1 to 10) | Set the size of the offset. | -1,000 to 1,000 | 0 | Input 1 2 3 [1] 5536 5546 5556 [2] 5537 5547 5557 [3] 5538 5548 5558 [4] 5539 5549 5559 [5] 5540 5550 5560 [6] 5541 5551 5561 [7] 5542 5552 5562 [8] 5543 5553 5563 [9] 5544 5554 5564 [10] 5545 5555 5565 r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). Active: Always. |

Setup Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|--|--|--|--|--|--|
| Filter Time | Set the filter time for input in seconds. | -60.0 to 60.0 | 0 1.0 if Decimal set to 0.0 and Sensor Type set to Thermocouple or RTD. | Input 604 [1] 614 [2] 624 [3] r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P_ - _ _ AB - _ _ _). Active: Always. |
| Error Latch | Select whether error clear is automatic or manual. | Self Clear (0) Latch (1) | Self Clear | Input 607 [1] 617 [2] 627 [3] r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P_ - _ _ AB - _ _ _). Active: Always. |
| Square Root | Apply square-root extraction to input. | Off (0) On (1) | No | Input 5569 [1] 5570 [2] 5571 [3] r/w | Inputs 2 and 3 appear only if the controller is the enhanced version (F4P_ - _ _ AB - _ _ _). Active if Sensor is set to Process. |
| Analog Input 3 | | | | | |
| Main > Setup > Analog Input 3 | | | | | |
| Auto/Manual Slidewire Calibration | Select the slidewire calibration method. | Skip Calibration (0) Automatic (1) Manual (2) | Skip Calibration | 1915 r/w | Appears if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _), Analog Input 3 is selected and Sensor is set to Slidewire. |
| Slidewire Learn Closed | Calibrate the slidewire to the closed valve. | (Close the valve manually.) | — | 1918 r/w | Appears if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _), Analog Input 3 is selected, Sensor is set to Slidewire and Auto/Manual Calibration is set to Manual. |
| Slidewire Learn Open | Calibrate the slidewire to the open valve. | (Open the valve manually.) | — | 1919 r/w | Appears if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _), Analog Input 3 is selected, Sensor is set to Slidewire and Auto/Manual Calibration is set to Manual. |
| Slidewire Deadband | Select the slidewire deadband. | 0.3% to 100.0% | 1% | 1916 r/w | Appears if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _), Analog Input 3 is selected and Sensor is set to Slidewire. |
| Slidewire Hysteresis | Select the slidewire hysteresis. | 0.0% to 100.0% | 0.0% | 1917 r/w | Appears if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _), Analog Input 3 is selected and Sensor is set to Slidewire. |
| Control Type | Select the control type. | Normal (0) Ratio (1) Differential (2) Remote (3) Cascade (5) | Normal | Input 1140 [2] 1141 [3] r/w | Appears if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _) and Analog Input 2 or 3 is selected. |

Setup Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|-------------------------------|------------------------------------|--|---------------------|--|---|
| Cascade | Select the cascade control method. | Process Cascade (0) Deviation Cascade (1) | Process Cascade | 1925 r/w | Appears if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _ _), Analog Input 3 is selected and Cascade is selected as the control type. |
| Cascade Low Range | Select the cascade low range. | <sensor range> | <sensor range low> | 1926 r/w | Appears if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _ _) and Cascade is set to Process Cascade. |
| Cascade High Range | Select the cascade high range. | <sensor range> | <sensor range high> | 1927 r/w | Appears if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _ _) and Cascade is set to Process Cascade. |
| Cascade Low Deviation | Select the cascade low deviation. | -19,999 to -1 | -19,999 | 1926 r/w | Appears if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _ _) and Cascade is set to Deviation Cascade. |
| Cascade High Deviation | Select the cascade high deviation. | 1 to 9,999 | 9,999 | 1927 r/w | Appears if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _ _) and Cascade is set to Deviation Cascade. |

Digital Input x (1 to 4)

Main > Setup > Digital Input x (1 to 4)

| | | | | |
|------------------------------------|--|-----|----------|---|
| Function | Off (0) | Off | Input | Active: Always. |
| Select the digital input function. | Panel Lock (1) [level] | | 1060 [1] | Only the currently active features will appear in the list. |
| | Reset Alarm 1 (2) [edge] | | 1062 [2] | |
| | Reset Alarm 2 (3) [edge] | | 1064 [3] | |
| | Reset Both Alarms (4) [edge] | | 1066 [4] | |
| | Control Outputs Off (5) [level] | | r/w | |
| | Digital Set Point (6) [level] | | | |
| | Digital Differential Value (7) [level] | | | |
| | Digital Ratio Value (8) [level] | | | |
| | Remote [set point analog input] 2 (9) [level] | | | |
| | Remote [set point analog input] 3 (10) [level] | | | |
| | Alternate Control (11) [level] | | | |
| | Manual Control (12) [level] | | | |
| | Reverse Outputs (13) [level] | | | |
| | Activate Message (14) [edge] | | | |

Setup Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|--|---|---|-----------------------|--|---|
| Name | Name the digital set point, digital ratio value or digital differential value for easy reference. | <selected by user> | DGT SPX | 3000-3009 3010-3019 3020-3029 3030-3039 r/w | Active: Always. |
| Activate Message | Select which message to display. | Message 1 (0) Message 2 (1) Message 3 (2) Message 4 (3) | Message 1 | Input 3050 [1] 3051 [2] 3052 [3] 3053 [4] r/w | Active if Function is set to Activate Message. |
| Message Display Time | Set the length of time that the message will display. | 0 to 999 | 10 seconds | Input 3060 [1] 3061 [2] 3062 [3] 3063 [4] r/w | Active if Function is set to Activate Message. |
| Condition | Select the condition to trigger digital input. | Low (0) High (1) | Low | Input 1061 [1] 1063 [2] 1065 [3] 1067 [4] r/w | Active: Always. |
| Control Output x (1A and 1B) | | | | | |
| Main > Setup > Control Output x (1A and 1B) | | | | | |
| Function | Select type of function for output. | Off (0) [1B only] Heat (1) [reverse] Cool (2) [direct] | Heat (1A) Off (1B) | Output 700 [1A] 717 [1B] r/w | Active: Always. |
| Cycle Time Type | Select the time base. | Variable Burst (0) Fixed Time (1) | Fixed Time | Output 506 [1A] 556 [1B] r/w | Active if output x is not a mechanical relay or process output. |
| Cycle Time Value | Select the cycle time period. | 0.1 to 60 seconds | 1 second | Output 509 [1A] 559 [1B] | Active if Cycle Time Type is set to Fixed Time. |
| Process | Set process output type. | 4 to 20mA (0) 0 to 20mA (1) 0 to 5V (2) 1 to 5V (3) 0 to 10V (4) 20 to 4mA (5) [reverse value] | 4 to 20mA | Output 701 [1A] 718 [1B] r/w | Active if the controller is equipped with a process output. |
| Duplex (1A) | Control both heat and cool from one output. | Off (0) On (1) | Off | 844 r/w | Active if output 1A is a process output. |
| High Power Limit | Set high limit control (PID mode only) output power level. | Low Limit +1 to 100% | 100% | Output 714 [1A] 731 [1B] r/w | Active: Always. |
| Low Power Limit | Set low limit control (PID mode only) output power level. | 0% to High Limit -1 | 0% | Output 715 [1A] 732 [1B] r/w | Active: Always. |

Setup Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|----------------------------------|--|--|------------|--|--|
| Boost Type (1B) | Select what will activate control output 1B. | Boost on Power (0) Boost on Set Point (1) | Power | 885 r/w | Active if the control output functions are both set to heat or cool. |
| Boost Power Mode (1B) | Select whether boost power operates in Manual Mode. | Auto Only (0) Auto/Manual (1) | Boost Auto | 881 r/w | Active if Boost Type is set to Power. |
| Boost Set Point Type (1B) | Select which type of set point will control output 1B. | Process (0) Deviation (1) | Process | 882 r/w | Active if Boost Type is set to Set Point. |
| Alarm Output x (1 and 2) | | | | | |

Main > Setup > Alarm Output x (1 and 2)

| | | | | | |
|-------------------------|--|---|-------------------|---------------------------------------|------------------------------------|
| Name | Name the alarm for easy reference. | <selected by user> | ALARMX | 3200-3209 [1] 3210-3219 [2] r/w | Active: Always. |
| Alarm Type | Select the alarm type. | Off (0) Process (1) Deviation (2) Maximum Rate (3) | Off | Output 702 [1] 719 [2] r/w | Active: Always. |
| Alarm Source | Select the alarm source. | Input 1 (0) Input 2 (1) Input 3 (2) | Input 1 | Output 716 [1] 733 [2] r/w | Active if the source is enabled. |
| Latching | Choose automatic or manual clearing of alarms. | Alarm Self-Clears (0) Alarm Latches (1) | Alarm Self-Clears | Output 704 [1] 721 [2] r/w | Active if Alarm Output is enabled. |
| Silencing | Choose whether to mask alarms on power-up. | No (0) Yes (1) | No | Output 705 [1] 722 [2] r/w | Active if Alarm Output is enabled. |
| Alarm Hysteresis | Set the alarm hysteresis. | 1 to 9999 | 3 | Output 703 [1] 720 [2] r/w | Active if Alarm Output is enabled. |
| Alarm Sides | Choose to enable Low, High or both alarm set points. | Both (0) Low (1) High (2) | Both | Output 706 [1] 723 [2] r/w | Active if Alarm Output is enabled. |
| Alarm Logic | Select the alarm logic option. | Open on Alarm (0) Close on Alarm (1) | Open on Alarm | Output 707 [1] 724 [2] r/w | Active if Alarm Output is enabled. |
| Alarm Messages | Select the alarm message option. | Yes on Main Page (0) No (1) | Yes on Main Page | Output 708 [1] 725 [2] r/w | Active if Alarm Output is enabled. |

Retransmit Output x (1 and 2)

Main > Setup > Retransmit Output x (1 and 2)

| | | | | | |
|--------------------------|--|--|---------|-------------------------------------|--|
| Retransmit Source | Choose a source for retransmit signal. | Off (0) Input 1 (1) Set Point 1 (4) Channel 1 Power (5) | Input 1 | Output 709 [1] 726 [2] r/w | Active: Always. (Values appear only if the source is enabled.) |
|--------------------------|--|--|---------|-------------------------------------|--|

Setup Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|-----------------------|---|--|--------------------------|--|--|
| Analog Range | Select voltage or current range to retransmit. | 4 to 20mA (0) 0 to 20mA (1) 0 to 5V (2) 1 to 5V (3) 0 to 10V (4) | 4 to 20mA | Output 836 [1] 837 [2] r/w | Active if Retransmit source is not set to Off. |
| Low Scale | Set low end of current or voltage range to retransmit. | -9999 to 9999 (minimum sensor range) | Low end of sensor range | Output 710 [1] 727 [2] r/w | Active if Retransmit source is not set to Off. |
| High Scale | Set high end of current or voltage range to retransmit. | -9999 to 9999 (maximum sensor range) | High end of sensor range | Output 711 [1] 728 [2] r/w | Active if Retransmit source is not set to Off. |
| Scale Offset | Shift the scale up (+) or down (-) to agree with source signal. | -9999 to 9999 Range Low to Range High | 0 | Output 712 [1] 729 [2] r/w | Active if Retransmit source is not set to Off. |
| Communications | | | | | |

Main > Setup > Communications

| | | | | |
|--------------------------------|-----------------------|-------|---------------|-----------------|
| Baud Rate | 19200 (0) 9600 (1) | 19200 | Not available | Active: Always. |
| Address | 1 to 247 | 1 | Not available | Active: Always. |
| Select transmission speed. | | | | |
| Select address for controller. | | | | |

Setup Page Parameter Table

| Setup Page Parameter Table | | | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|--|--|---|---------------------------------------|--|
| Parameter | Description | Range (Modbus Value) | Default | |
| Custom Main Page | | | | |
| Main > Setup > Custom Main Page | | | | |
| Parameter x (1 to 16) | None (0) | | Par. | Appears: Always. |
| Choose parameters to appear on the Main Page. | Input 1 [value] (1) | [Defaults depend on the control type selected.] | 1400 [1] | Analog Inputs 2 and 3 appear only if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _ _). The range of selections for the Custom Main Page will depend on other parameter settings. * Appears if Input 3 is set to Differential. ** Appears if Input 3 is set to Ratio. *** When a digital input is active, its number will appear in the Main Page display; when it is inactive, its position will be underlined. |
| | Input 1 Value bar [graph] (2) | | 1401 [2] | |
| | Input 2 [value] (3) | | 1402 [3] | |
| | Input 2 Value bar [graph] (4) | | 1403 [4] | |
| | Input 3 [value] (5) | | 1404 [5] | |
| | Input 3 Value bar [graph] (6) | | 1405 [6] | |
| | Digital Set Point (7) | | 1406 [7] | |
| | *Dgt. [digital] Diff. [differential] Value (8) | | 1407 [8] | |
| | *Diff. [differential] Set Point (9) | | 1408 [9] | |
| | *Set Differential (10) | | 1409 [10] | |
| | **Dgt. [digital] Ratio Value (11) | | 1410 [11] | |
| | **Ratio Set Point (12) | | 1411 [12] | |
| | **Set Ratio (13) | | 1412 [13] | |
| | Remote Set Point 2 (14) | | 1413 [14] | |
| | Remote Set Point 3 (15) | | 1414 [15] | |
| | Target Set Point (16) | | 1415 [16] | |
| | [cascade] Inner Set Point (17) | | r/w | |
| | Set Point 1 (18) | | | |
| | Set Point 1 bar [graph] (19) | | | |
| | % Power 1A (20) | | | |
| | % Power 1B (21) | | | |
| | % Power 1A bar [graph] (22) | | | |
| | % Power 1B bar [graph] (23) | | | |
| | Tune Status 1 (24) | | | |
| | ***Digital Inputs (25) | | | |
| | Active Ch1 PID Set (26) | | | |
| Process Display | | | | |
| Main > Setup > Process Display | | | | |
| Process Display | Input 1 (0) | Input 1 | 1910 r/w | Appears only if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _ _). |
| Select how the upper display will function. | Alternating (1) | | | |
| Display Time | 0 to 999 seconds | 2 seconds | Input | Appears only if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _ _) and Process Display is set to Alternating. |
| Select the time, in seconds, that each input will appear in the upper display. | | | 1911 [1] | |
| | | | 1912 [2] | |
| | | | 1913 [3] | |
| | | | r/w | |

Setup Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|--------------------------------------|---|---|--|---|--|
| LED Intensity | Set the brightness level of the upper display. | 0 to 15 | 8 | 1914 r/w | Appears only if the controller is the enhanced version (F4P_ - _ _ AB- _ _ _ _) and Process Display is set to Alternating. |
| Static Message | | | | | |
| Main > Setup > Static Message | | | | | |
| Message x (1 to 4) | Enter or change messages that can be displayed by activating a digital input. | 4 lines of 17 characters each The first line serves as the message name. | Message x Name Message x Line 1 Message x Line 2 Message x Line 3 | mess. 4501-4517 [1] 4521-4537 [1] 4541-4557 [1] 4561-4577 [1] 4581-4597 [2] 4601-4617 [2] 4621-4637 [2] 4641-4657 [2] 4661-4677 [3] 4681-4697 [3] 4701-4717 [3] 4721-4737 [3] 4741-4757 [4] 4761-4777 [4] 4781-4797 [4] 4801-4817 [4] | Active: Always. |

Factory Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|---|--|--|-------------|---|--|
| Set Lockout | | | | | |
| Main Page > Factory > Set Lockout | | | | | |
| Set Point | Set the set point access level. | Full Access (0) Read Only (1) | Full Access | 1300 r/w | Active: Always. |
| Operations, Autotune PID | Set access to this menu. | Full Access (0) Read Only (1) Password (2) Hidden (3) | Full Access | 1306 r/w | Active: Always. |
| Operations, Edit PID | Set access to this menu. | Full Access (0) Read Only (1) Password (2) Hidden (3) | Full Access | 1307 r/w | Active: Always. |
| Operations, Alarm Set Point | Set access to this menu. | Full Access (0) Read Only (1) Password (2) Hidden (3) | Full Access | 1308 r/w | Active: Always. |
| Setup Page | Set access to this page. | Full Access (0) Read Only (1) Password (2) Hidden (3) | Full Access | 1302r/w | Active: Always. |
| Factory Page | Set access to this page. | Full Access (0) Read Only (1) Password (2) | Full Access | 1303 r/w | Active: Always. |
| Set/Change Password | Reset or change password. Choose Yes to change the password. | 4 characters | none | 1330 [1] 1331 [2] 1332 [3] 1333 [4] r/w | Active: Always. |
| Clear Locks | Unlock set point and all pages and menus. | Yes (0) | | 1315 r/w | Active: Always. |
| Operations, PID Crossover | Set access to PID Crossover. | Full Access (0) Read Only (1) Password (2) Hidden (3) | Full Access | 1316 r/w | Active: Always. |
| Operations, Ramp Set Point | Set access to the Ramp Set Point. | Full Access (0) Read Only (1) Password (2) Hidden (3) | Full Access | 1317 r/w | Active: Always. |
| Operations, Control Set Point | Set access to the Control Set Point. | Full Access (0) Read Only (1) Password (2) Hidden (3) | Full Access | 1318 r/w | Active if any Digital Input is set to Digital Set Point. |
| Operations, Local/Remote Set Point | Set access to the Local/Remote Set Point. | Full Access (0) Read Only (1) Password (2) Hidden (3) | Full Access | 1319 r/w | Active if any Digital Input is set to Remote Set Point. |

Factory Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|---|--|-------------------------|---------|--|---|
| Calibrate Input x (1 to 3) | | | | | |
| Main Page > Factory > Calibration > Calibrate Input x (1 to 3) | | | | | |
| 0.00mV Thermocouple | Store 0.000mV calibration for input thermocouple. | Yes (1) | | 1603 [1] 1608 [2] 1613 [3] r/w | Active: Always. Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). |
| 50.00mV Thermocouple | Store 50.000mV calibration for input thermocouple. | Yes (2) | | 1603 [1] 1608 [2] 1613 [3] r/w | Active: Always. Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). |
| 32°F Type J | Store 32°F type J calibration. | Yes (3) | | 1603 [1] 1608 [2] 1613 [3] r/w | Active: Always. Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). |
| Ground | Store calibration for ground at gains of 1 and 32. | Yes (4) | | 1603 [1] 1608 [2] 1613 [3] r/w | Active: Always. Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). |
| Lead | Store calibration for lead resistance. | Yes (5) | | 1603 [1] 1608 [2] 1613 [3] r/w | Active: Always. Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). |
| 15.0 Ohms RTD | Store 15.00Ω calibration for input RTD. | Yes (6) | | 1603 [1] 1608 [2] 1613 [3] r/w | Active: Always. Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). |
| 15.0 Ohms Slidewire | Store 15.00Ω calibration for input slidewire. | Yes (12) | | 1613 [3] r/w | Active: Always. Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). |
| 380.0 Ohms | Store 380.00Ω calibration for input RTD. | Yes (7) | | 1603 [1] 1608 [2] 1613 [3] r/w | Active: Always. Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). |
| 1000 Ohms Slidewire | Store 1000.00Ω calibration for input slidewire. | Yes (13) | | 1613 [3] r/w | Active: Always. Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). |
| 0.000V | Store 0.000V calibration for input process. | Yes (8) | | 1603 [1] 1608 [2] 1613 [3] r/w | Active: Always. Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). |
| 10.000V | Store 10.000V calibration for input process. | Yes (9) | | 1603 [1] 1608 [2] 1613 [3] r/w | Active: Always. Inputs 2 and 3 appear only if the controller is the enhanced version (F4P _ - _ _ AB - _ _ _ _). |

Factory Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|-----------------|--|-------------------------|---------|--|---|
| 4.000mA | Store 4mA calibration for input process. | Yes (10) | | 1603 [1] 1608 [2] 1613 [3] r/w | Active: Always. Inputs 2 and 3 appear only if the controller is the enhanced ver- sion (F4P _ - _ _ AB - _ _ _ _). |
| 20.000mA | Store 20mA calibra- tion for input process. | Yes (11) | | 1603 [1] 1608 [2] 1613 [3] r/w | Active: Always. Inputs 2 and 3 appear only if the controller is the enhanced ver- sion (F4P _ - _ _ AB - _ _ _ _). |

Calibrate Output x (1A or 1B) and Retransmit x (1 and 2)

Main > Factory > Calibration > **Calibrate Output x (1A or 1B) and Retransmit x (1 and 2)**

| | | | | | |
|-----------------|--|--------------------|----------|---|-----------------|
| 4.000mA | Store 4mA calibration for output process. | 0.000mA to 6.000mA | 4.000mA | Output 1604 [1A] 1609 [1B] Rexmit 1624 [1] 1629 [2] r/w | Active: Always. |
| 20.000mA | Store 20mA calibra- tion for output process. | 0.000 to 24.000mA | 20.000mA | Output 1605 [1A] 1610 [1B] Rexmit 1625 [1] 1630 [2] r/w | Active: Always. |
| 1.000V | Store 1.000V calibra- tion for output process. | 0.000 to 3.000V | 1.000V | Output 1606 [1A] 1611 [1B] Rexmit 1626 [1] 1631 [2] r/w | Active: Always. |
| 10.000V | Store 10.000V calibra- tion for output process. | 0.000 to 12.000V | 10.000V | Output 1607 [1A] 1612 [1B] Rexmit 1627 [1] 1632 [2] r/w | Active: Always. |

Restore Input x (1 to 3) Calibration

Main > Factory > Calibration > **Restore Input x (1 to 3) Calibration**

| | | | | | |
|---|---|---|---|--------------------|---|
| Restore Input x (1 to 3) Calibration | Restores original factory calibration values. | Input 1 (0) Input 2 (1) Input 3 (2) | — | 1601 write only | Active: Always. Inputs 2 and 3 appear only if the controller is the enhanced ver- sion (F4P _ - _ _ AB - _ _ _ _). |
|---|---|---|---|--------------------|---|

Factory Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|------------------------------------|---|--|----------------|--|--|
| Diagnostic | | | | | |
| Main > Factory > Diagnostic | | | | | |
| Model | Identifies the 12-digit Series F4P part number. | F4Px-xxxx-xxxx | F4Px-xxxx-xxxx | 0 r | Active: Always. |
| Manufacturing Date | Identifies the manufacture date. | xxxx | 0198 | 5 r | Active: Always. |
| Serial Number | Identifies the individual controller. | 000000 to 99,9999 | 000000 | 1 [1st part] 2 [2nd part] r | Active: Always. |
| Software Number | Identifies the software revision. | 00 to 99 | 1 | 3 r | Active: Always. |
| Revision | Identifies the hardware revision. | 0.00 to 9.99 | 1.00 | 4 r | Active: Always. |
| Input x (1 to 3) | Displays the input type. | Univ (7) | | 8 Input [1] 9 [2] 10 [3] r | Active: Always. |
| Output x (1A or 1B) | Displays the output type. | None (0) [Out 1B only] Mechanical Relay (1) SSR (2) DC (3) Process (4) | | 16 Output [1A] 17 [1B] r | Active: Always. |
| Retransmit x (1 or 2) | Displays the retransmit option. | None (0) Process (4) | | 20 Retransmit [1] 21 [2] r | Active: Always. |
| Input x (1 to 3) A to D | Factory use only. | HHHH | | 1504 Input [1] 1505 [2] 1506 [3] r | Active: Always. |
| CJCx (1 to 3) A to D | Factory use only. | HHHH | | 1501 Input [1] 1532 [2] 1532 [3] r | Active: Always. |
| CJCx (1 to 3) Temp | Cold junction compensation for the analog input. Reads the ambient temperature of the controller. | xx.x | | 1500 Input [1] 1531 [2] 1531 [3] r | Active: Always. |

Factory Page Parameter Table

| Parameter | Description | Range (Modbus Value) | Default | Modbus Register read/write [I/O, Set] | Conditions for Parameters to Appear |
|------------------------------|--|--|---------|--|--|
| Line Frequency | Display the ac line frequency in hertz. | xx | | 1515 r | Active: Always. |
| Test | | | | | |
| Main > Factory > Test | | | | | |
| Test Outputs | Choose output to test. | All Off (0) Output 1A (1) Output 1B (2) Retransmit 1 (5) Retransmit 2 (6) Alarm 1 (7) Alarm 2 (8) All On (9) Communications (10) | | 1514 w | Active: Always. |
| Display Test | Checks LED display segments by turning them on and off. | (1) | | 1513 w | Active: Always. |
| Full Defaults | Causes all parameter values to revert to their factory default settings. | Yes (800) | | 1602 w | Active: Always. |

Operations Page Parameter Record

Make a photocopy of this page and enter your settings on that copy.

Name _____ Date _____

Autotune PID Menu

| | |
|--------------------|--|
| Autotune PID | |
| Cascade Inner Loop | |
| Cascade Outer Loop | |
| Autotune PID Type | |

| PID Set Channel 1 | PID Set 1 | PID Set 2 | PID Set 3 | PID Set 4 | PID Set 5 |
|---------------------|-----------|-----------|-----------|-----------|-----------|
| Proportional Band A | | | | | |
| IntegralA / ResetA | | | | | |
| DerivativeA / RateA | | | | | |
| Dead Band A | | | | | |
| Hysteresis A | | | | | |
| Proportional Band B | | | | | |
| IntegralB / ResetB | | | | | |
| DerivativeB / RateB | | | | | |
| Dead Band B | | | | | |
| Hysteresis B | | | | | |

| Cascade PID Set | PID Set 1 | PID Set 2 | PID Set 3 | PID Set 4 | PID Set 5 |
|---------------------|-----------|-----------|-----------|-----------|-----------|
| Proportional Band A | | | | | |
| IntegralA / ResetA | | | | | |
| DerivativeA / RateA | | | | | |
| Dead Band A | | | | | |
| Hysteresis A | | | | | |
| Proportional Band B | | | | | |
| IntegralB / ResetB | | | | | |
| DerivativeB / RateB | | | | | |
| Dead Band B | | | | | |
| Hysteresis B | | | | | |

| Alarm Set Point Menu | Alarm 1 | Alarm 2 |
|----------------------|---------|---------|
| Low Set Point | | |
| High Set Point | | |
| Low Deviation | | |
| High Deviation | | |
| Rate | | |

| PID Crossover | PID 1 to 2 | PID 2 to 3 | PID 3 to 4 | PID 4 to 5 |
|---------------|------------|------------|------------|------------|
| PID Cross | | | | |

| Ramp x to Set Point | |
|-------------------------|--|
| Ramp to Set Point Mode | |
| Ramp to Set Point Rate | |
| Ramp to Set Point Scale | |

Control Set Points

| | | | | | |
|---|-----------|-----------|-----------|-----------|--|
| Boost Power | | | | | |
| Boost Delay Time | | | | | |
| Remote/Local Set Point | | | | | |
| Boost Set Point | | | | | |
| | Dig. SP 1 | Dig. SP 2 | Dig. SP 3 | Dig. SP 4 | |
| Digital Set Point x (1 to 4) | | | | | |
| Digital Differential Set Point x (1 to 4) | | | | | |
| Digital Ratio Set Point x (1 to 4) | | | | | |

Setup Page Parameter Record

Make a photocopy of this page and enter your settings on that copy.

Name _____ Date _____

| | | | | | | | | | | |
|-----------------------------|---------------------|---------------------|---------------------|---------------------|----------|----------|----------|----------|----------|-----------|
| °F or °C | | | | | | | | | | |
| Show °F or °C | | | | | | | | | | |
| Maximum Transfer Heat | | | | | | | | | | |
| Maximum Transfer Cool | | | | | | | | | | |
| Manual to Auto Transfer | | | | | | | | | | |
| Autotune Set Point | | | | | | | | | | |
| Failure Mode | | | | | | | | | | |
| Input 1 Fail | | | | | | | | | | |
| Open Loop Detect | | | | | | | | | | |
| Analog Input Menu | Analog In 1 | Analog In 2 | Analog In 3 | | | | | | | |
| Sensor | | | | | | | | | | |
| Type | | | | | | | | | | |
| Control Type | | | | | | | | | | |
| Units Name | | | | | | | | | | |
| Decimal | | | | | | | | | | |
| Scale Low | | | | | | | | | | |
| Scale High | | | | | | | | | | |
| Set Point Low Limit | | | | | | | | | | |
| Set Point High Limit | | | | | | | | | | |
| Offset Type | | | | | | | | | | |
| Input Offsets | In Off 1 | In Off 2 | In Off 3 | In Off 4 | In Off 5 | In Off 6 | In Off 7 | In Off 8 | In Off 9 | In Off 10 |
| Clear Input Offsets | | | | | | | | | | |
| Offset Point | | | | | | | | | | |
| Calibration Offset Value | | | | | | | | | | |
| Filter Time | | | | | | | | | | |
| Error Latch | | | | | | | | | | |
| Square Root | | | | | | | | | | |
| Auto/Manual Slidewire Cali. | | | | | | | | | | |
| Slidewire Deadband | | | | | | | | | | |
| Slidewire Hysteresis | | | | | | | | | | |
| Control Type | | | | | | | | | | |
| Cascade | | | | | | | | | | |
| Cascade Low Range | | | | | | | | | | |
| Cascade High Range | | | | | | | | | | |
| Cascade Low Deviation | | | | | | | | | | |
| Cascade High Deviation | | | | | | | | | | |
| Digital Input Menu | Digital In 1 | Digital In 2 | Digital In 3 | Digital In 4 | | | | | | |
| Function | | | | | | | | | | |
| Name | | | | | | | | | | |
| Activate Message | | | | | | | | | | |
| Message Display Time | | | | | | | | | | |
| Condition | | | | | | | | | | |
| Control Output Menu | Output 1A | Output 1B | | | | | | | | |
| Function | | | | | | | | | | |
| Cycle Time Type | | | | | | | | | | |
| Cycle Time Value | | | | | | | | | | |
| Process | | | | | | | | | | |
| Duplex | | | | | | | | | | |
| High Power Limit | | | | | | | | | | |
| Low Power Limit | | | | | | | | | | |
| Boost Type (1B) | | | | | | | | | | |
| Boost Power Mode (1B) | | | | | | | | | | |
| Boost Set Point Type (1B) | | | | | | | | | | |

| Alarm Output Menu | Alarm 1 | Alarm 2 |
|-------------------------------|------------------|------------------|
| Name | | |
| Alarm Type | | |
| Alarm Source | | |
| Latching | | |
| Silencing | | |
| Alarm Hysteresis | | |
| Alarm Sides | | |
| Alarm Logic | | |
| Alarm Messages | | |
| Retransmit Output Menu | Retrans 1 | Retrans 2 |
| Retransmit Source | | |
| Analog Range | | |
| Low Scale | | |
| High Scale | | |
| Scale Offset | | |
| Communications Menu | Setting | |
| Baud Rate | | |
| Address | | |

Custom Main Page (see Custom Main Page Parameter Record)

| Process Display | |
|------------------------|--|
| Display Time | |
| LED Intensity | |
| Static Message | |
| Message 1, Line 1 | |
| Message 1, Line 2 | |
| Message 1, Line 3 | |
| Message 1, Line 4 | |
| Message 2, Line 1 | |
| Message 2, Line 2 | |
| Message 2, Line 3 | |
| Message 2, Line 4 | |
| Message 3, Line 1 | |
| Message 3, Line 2 | |
| Message 3, Line 3 | |
| Message 3, Line 4 | |
| Message 4, Line 1 | |
| Message 4, Line 2 | |
| Message 4, Line 3 | |
| Message 4, Line 4 | |

Custom Main Page Parameter Record

Make a photocopy of this page and enter your settings on that copy.

Name _____ Date _____

| | | |
|--|---|--|
| Will always appear if active: | Main Page Input 1 Error Input 2 Error Input 3 Error | |
| Will appear if active and set up to appear: | Alarm 1 Condition Alarm 2 Condition Autotuning (Position on Main Page) | (Possible parameters) |
| Choose from the column at the far right the information you want to appear on the Main Page (in any order): | P1 _____ P2 _____ P3 _____ P4 _____ P5 _____ P6 _____ P7 _____ P8 _____ P9 _____ P10 _____ P11 _____ P12 _____ P13 _____ P14 _____ P15 _____ P16 _____ | None Input 1 [value] Input 1 Value bar [graph] Input 2 [value] Input 2 Value bar [graph] Input 3 [value] Input 3 Value bar [graph] Dgt [digital] Ratio Value * Ratio Set Point * Set Ratio * Dgt [digital] Diff. [differential] Value ** Diff [differential] Set Point** Set Differential ** Digital Set Point Remote Set Point 2 Remote Set Point 3 Target Setpoint [cascade] Inner Set Point Set Point 1 Set Point 1 bar [graph] % Power 1A % Power 1B % Power 1A bar [graph] % Power 1B bar [graph] Tune Status 1 Digital Inputs Active Ch1 PID Set * appears if Input 3 is set to Ratio ** appears if Input 3 is set to Differential |
| Will always appear: | Go to Operations Go to Setup Go to Factory | |

Communications Wiring



WARNING:

To avoid damage to property and equipment, and/or injury or loss of life, use National Electric Code (NEC) standard wiring practices to install and operate the Series F4P. Failure to do so could result in such damage, and/or injury or death.

Figure 37a — EIA/TIA 485 and EIA/TIA 232 Communications

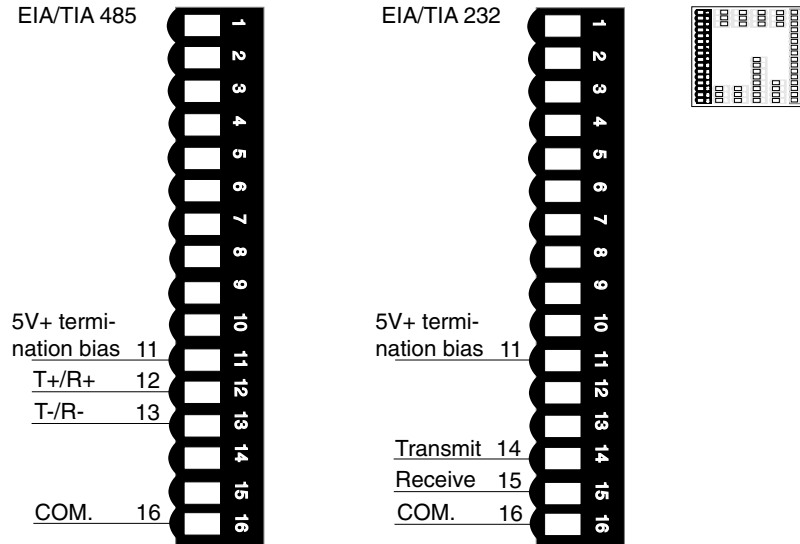
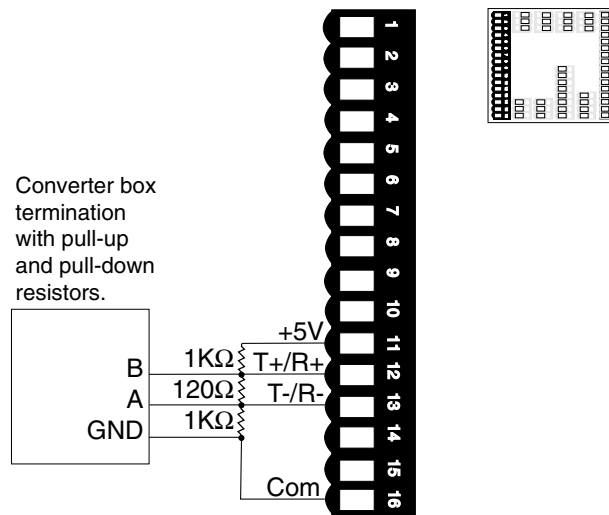


Figure 37b — Termination for EIA-232 to EIA-485 Converter



Communications Wiring (continued)



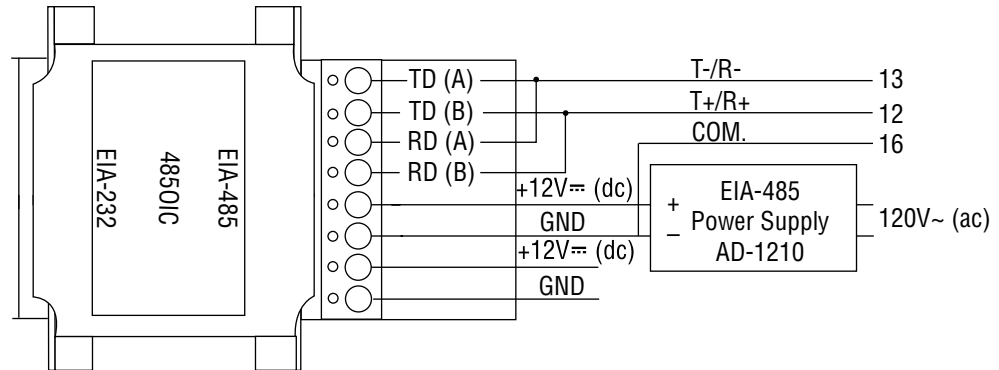
WARNING:

To avoid damage to property and equipment, and/or injury or loss of life, use National Electric Code (NEC) standard wiring practices to install and operate the Series F4P. Failure to do so could result in such damage, and/or injury or death.

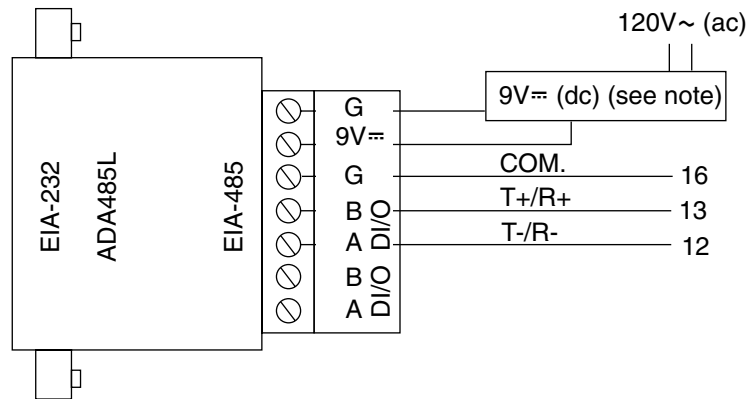
NOTE:

The CMC converter requires an external power supply when used with a laptop computer.

Figure 38 — EIA/TIA 232 to EIA/TIA 485 Conversion



B&B Converter (B&B Electronics Manufacturing Company, (815) 433-5100).



CMC Converter (CMC Connecticut Micro-Computer, Inc., 800-426-2872).

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How to Reach Us



Quality and Mission Statement:

Watlow Controls will be the world's best supplier of industrial temperature control products, services and systems by exceeding our customers', employees' and shareholders' expectations.

Contact

Your Authorized Watlow Distributor:

- Phone: 507/454-5300.
- Fax: 507/452-4507.
- For technical support, ask for an Applications Engineer (ext. 6430).
- To place an order, ask for Customer Service.
- To discuss a custom option, ask for a Series F4P Product Manager.

Warranty

The Watlow Series F4P is warranted to be free of defects in material and workmanship for 36 months after delivery 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. Watlow's obligations hereunder, at Watlow's 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.

Returns

- Call or fax Customer Service for a Return Material Authorization (RMA) number before returning a controller.
- Put the RMA number on the shipping label, and also on a written description of the problem.
- A restocking charge of 20% of the net price is charged for all standard units returned to stock.

Watlow Series F4P User's Manual

Watlow Controls, 1241 Bundy Blvd., P.O. Box 5580, Winona, Minnesota USA 55987-5580,
Phone: 507/454-5300, Fax: 507/452-4507