MPT Electric Fire Pump Controller

Modbus Setup Instructions

This manual provides general information, installation, and configuration information for Modbus communications for Metron MPT Electric Fire Pump Controllers and Metron MPT Electric Fire Pump Controllers with Metron Transfer Switch.

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History of Changes

Rev. No.	Date	Description of Changes
A	April 2016	Initial Release
B	November 2016	Update text so manual can be used with non-MTS controllers.

Introduction

Modbus is a simple and open serial communication protocol that enables communication between a master device and one or more slave devices all connected to the same network. The MPT Electric Fire Pump Controller operates as a slave device.

For more information about Modbus, refer to www.modbus.org.

NOTICE Read these instructions thoroughly before installing and operating the controller. If there are still questions, contact your Metron factory representative for assistance.

Hardware Setup

Precautions

CAUTION To avoid risk of **SERIOUS INJURY or DEATH,** and to avoid damage to the controller, READ THIS SECTION CAREFULLY. If questions or concerns still exist, contact the Metron factory for further clarification.

If work must be carried out on the motor or controller, ensure the controller is ISOLATED AND LOCKED OFF from the AC mains supply before work commences. Lockout/Tag out procedures should be followed in accordance with NFPA standard and any local standards that may apply.

During installation and maintenance, to prevent automatic starting of the motor press and hold the STOP key. The system will be in a configuration mode and will not start the motor. Configuration mode will last for five (5) minutes, unless the on-screen "Exit Config Mode" button is pressed.

RS-485 Connections

The Modbus option uses a 2-wire (half-duplex) RS-485 port, which is located on the backside of the OID stackup. The OID has a panel covering the CPU board, but the RS-485 port is accessible. Figure 1 below shows the location of the port, which is labeled J9. The plug for the connector is provided and should be removed while connecting your wires.

Figure 2 below shows the wiring diagram for the RS-485 port.

Pin 1 is the A pin, also known as '+', 'D+', and 'TxD+/RxD+'
Pin 2 is the Ground pin
Pin 3 is the B pin, also known as '–', 'D-', and 'TxD-/RxD-'

The voltage tolerance for Pin1 and Pin 3 is –9V to +14V

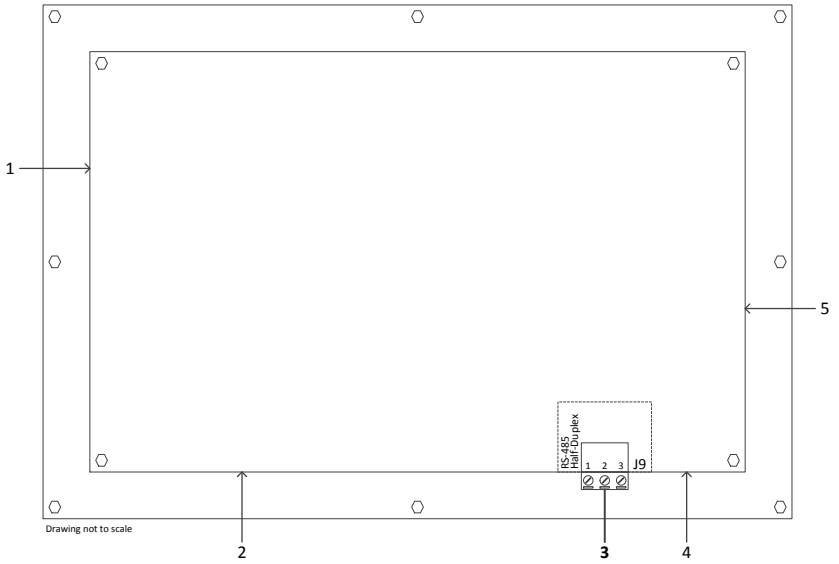

Figure 1: Back view of the OID (located on the cabinet door).

Item	Description
1	USB Port
2	Pressure Transducer Cable
3	**RS-485 Port and Connector**
4	Horn cable
5	Power cable

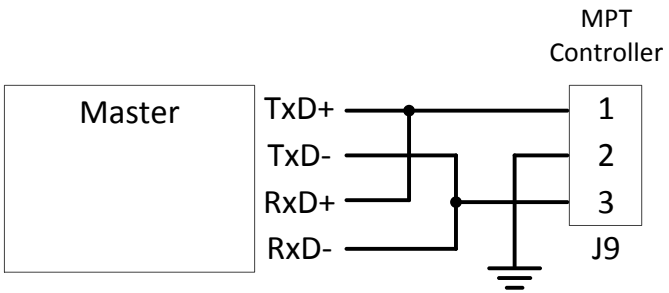

Figure 2: RS-485 Wiring Diagram

Set Point Configurations

To configure the Modbus set points: press the Main Menu button on the OID, then touch the Devices icon, and then touch the Modbus icon. The Modbus configuration screen will be displayed, listing the set points on the right-side and the Modbus enable/disable button on the lower-left.

The Modbus option must be disabled in order the modify settings. Refer to Publication 245 (Setup and Operating Instructions for MPT Electric Fire Pump Controllers) for general instructions on navigating the menu system and configuring set points.

The Address set point is used to set the Modbus address for the MPT controller. All Modbus devices on a network must have a unique address.

The Protocol, Baud Rate, and Parity set points must be configured to match the settings of all other Modbus devices on the network.

Modbus Registers

All registers are 16-bit word. Maps of registers are summarized in Table 1 and Table 2. Italisized text indicates value that are only for controllers equipted with MTS. For non-MTS controllers, these values are always set to zero.

Input Register (Function Code 4)

Register	Name	Value
40001	Pressure	0 – 600 PSI
40002	Normal Source AB Voltage	Normal source AB voltage rounded to the nearest volt.
40003	Normal Source BC Voltage	Normal source BC voltage rounded to the nearest volt.
40004	Normal Source AC Voltage	Normal source AC voltage rounded to the nearest volt.
40005	*Emergency Source AC Voltage*	*Emergency source AB voltage rounded to the nearest volt.*
40006	*Emergency Source BC Voltage*	*Emergency source BC voltage rounded to the nearest volt.*
40007	*Emergency Source AC Voltage*	*Emergency source AC voltage rounded to the nearest volt.*
40008	Phase A Current	Phase A current rounded to the nearest amp
40009	Phase B Current	Phase B current rounded to the nearest amp
40010	Phase C Current	Phase C current rounded to the nearest amp
40011	System Status	Bit 0 Normal Source Power Available *Bit 1 Emergency Source Power Available* Bit 2 Phase Reversal Bit 3 Phase Failure Bit 4 Pump Running Bit 5 Pump On Demand *Bit 6 Emergency Source Isolation Switch Open* *Bit 7 Transfer Switch Connected to Emergency* Bit 8 System Fault Bit 9 Not in Auto Bit 10 Lockout Bit 11 Interlock Bit 12 System Idle Bit 13 Automatic Shutdown Enabled

Register	Name	Value	
40012	Pressure Status	Bit 0	Low Pressure Alarm
		Bit 1	High Pressure Alarm
		Bit 2	Pressure Transducer Fault
40013	Normal Source Alarms	Bit 0	Phase AB Failure
		Bit 1	Phase BC Failure
		Bit 2	Phase AC Failure
		Bit 3	Phase Reversal
		Bit 4	Phase AB Over Voltage
		Bit 5	Phase BC Over Voltage
		Bit 6	Phase AC Over Voltage
		Bit 7	Phase AB Under Voltage
		Bit 8	Phase BC Under Voltage
		Bit 9	Phase AC Under Voltage
		Bit 10	Phase AB Over Frequency
		Bit 11	Phase BC Over Frequency
		Bit 12	Phase AC Over Frequency
		Bit 13	Phase AB Under Frequency
		Bit 14	Phase BC Under Frequency
		Bit 15	Phase AC Under Frequency
40014	*Emergency Source Alarms*	*Bit 0*	*Phase AB Failure*
		Bit 1	*Phase BC Failure*
		Bit 2	*Phase AC Failure*
		Bit 3	*Phase Reversal*
		Bit 4	*Phase AB Over Voltage*
		Bit 5	*Phase BC Over Voltage*
		Bit 6	*Phase AC Over Voltage*
		Bit 7	*Phase AB Under Voltage*
		Bit 8	*Phase BC Under Voltage*
		Bit 9	*Phase AC Under Voltage*
		Bit 10	*Phase AB Over Frequency*
		Bit 11	*Phase BC Over Frequency*
		Bit 12	*Phase AC Over Frequency*
		Bit 13	*Phase AB Under Frequency*
		Bit 14	*Phase BC Under Frequency*
		Bit 15	*Phase AC Under Frequency*

Register	Name	Value	
40015	Motor Alarms	Bit 0	Soft Start Fault
		Bit 1	Run Contact Fault
		Bit 2	Start Contact Fault
		Bit 3	No Load
		Bit 4	Fail to Start
		Bit 5	Fail to Stop
		Bit 6	Locked Rotor
		Bit 7	Motor Overload
40016	*Transfer Switch Alarms*	*Bit 0*	*Transfer Switch Fault*
		Bit 1	*Genset Fail to Start*
		Bit 2	*Emergency Source Power Failure*
40017	Other Alarms	Bit 0	Supervisory Power Failure
		Bit 1	Low Suction Alarm
		Bit 2	Low Suction Motor Shutdown
		Bit 3	Low Zone Fail to Start
		Bit 4	Low Zone Quit
40018	Start Conditions	Bit 0	Low Pressure Start
		Bit 1	Emergency Start
		Bit 2	Manual Start
		Bit 3	Remote Start
		Bit 4	Remote Test Start
		Bit 5	Deluge Start
		Bit 6	Aux Program Start
		Bit 7	RESERVED
		Bit 8	High Zone Start
		Bit 9	Pressure Transducer Failure Start
		Bit 10	Supervisory Power Failure Start
		Bit 11	Manual Test Start
		Bit 12	Automatic Weekly Test Start
40019	Diagnostics	Bit 0	Low Clock Battery
		Bit 1	Clock not set
		Bit 2	12-Channel I/O PCB Fault
		Bit 3	Power Monitor PCB Fault
		Bit 4	*Transfer Switch PCB Fault*

Register	Name	Value
40020	12-Channel I/O PCB Inputs	Bit Input 1 Closed (40/41) Bit Input 2 Closed (42/43) Bit Input 3 Closed (44/45) Bit Input 4 Closed (46/47) Bit Input 5 Closed (48/49) Bit Input 6 Closed (50/51) Bit Input 7 Closed (52/53) Bit Input 8 Closed (54/55) Bit Input 9 Closed (56/57) Bit Input 10 Closed (58/59) Bit Input 11 Closed (60/61) Bit Input 12 Closed (62/63)
40021	12-Channel I/O PCB Outputs	Bit 0 Relay K1 Energized … Bit 11 Relay K12 Energized
40022	Power Monitor PCB I/O	Bit 0 Relay K1 Energized (Emergency Measure) Bit 1 Relay K2 Energized (Emergency Measure) Bit 2 Relay K3 Energized (Shunt Trip) Bit 3 Relay K4 Energized (Dump Valve) Bit 4 Relay K5 Energized (CR71 Run) Bit 5 Relay K6 Energized (Soft Start) Bit 6 Relay K7 Energized (CR72 Start) Bit 7-9 RESERVED Bit 10 Relay K10 Energeized (Phase Reversal) Bit 11-15 RESERVED
40023	*Transfer Switch PCB I/O*	*Bit 0 Relay K1 Energized (Trip to Normal)* *Bit 1 Relay K2 Energized (Trip to Emergency)* *Bit 2 Relay K3 Energized (Shunt Trip)* *Bit 3 Relay K4 Energized (Engine Crank)* *Bit 4 Input 1,2 Closed* *Bit 5 Input 3/4 Closed*
40024	Aux Program 1–16	Bit 0 Aux Program 1 running … Bit 15 Aux Program 16 running
40025	Aux Program 17–32	Bit 0 Aux Program 17 running … Bit 15 Aux Program 32 running
40026	Aux Program 33–48	Bit 0 Aux Program 33 running … Bit 48 Aux Program 48 running

Register	Name	Value
40027	RESERVED	0
40028	RESERVED	0
40029	RESERVED	0
40030	RESERVED	0
40031	RESERVED	0
40032	RESERVED	0

Table 1: Input Registers

Read Device ID Register (Function Code 43)

The controller supports only Read Device ID code 4, individual access.

Objects 0x00–0x02 (basic identification) and 0x80–0x82 (extended identification) are supported.

Object ID	Object Name	Type	Value
0x00	Vendor Name	ASCII string	"Metron"
0x01	Product Code	ASCII string	"MPTxxx"
0x02	MajorMinorRevision	ASCII string	Major.Minor i.e. "V1.00"
0x80	Memory Map Version	ASCII string	"01"
0x81	Firmware Version	ASCII string	Major.Minor.Build.Revision i.e. "1.0.1284.3"
0x82	Controller Serial Number	ASCII string	i.e. "12345678"

Table 2: Read Device ID Registers

Replacement Parts

For replacement parts, contact your local Metron sales office or the Metron factory at:

United States	Telephone: +1 (336) 434-2800 ext. 202 FAX: +1 (336) 434-2809 Email: salesmail@metroninc.com
Europe	Telephone: +44 (0) 1476 516130 Email: jmcivor@metroninc.com

Technical Support

United States	**For 24-hour technical support:** Telephone: +1 (336) 434-2800 ext. 183 Email: fpctechsupport@metroninc.com
Europe	**Service & Commissioning** Telephone: +44 (0) 1476 516129 Email: wrichardson@metroninc.com **Emergency Contact:** Telephone: +44 (0) 7730 050100

www.metroninc.com www.metroneledyne.com.uk

Hubbell Industrial Controls, Inc.
Metron Fire Pump Controls Division
4301 Cheyenne Drive, Archdale NC 27263 USA, Tel: (336) 434-2800, Fax: (336) 434-2809

Metron Eledyne,
a Division of Hubbell Ltd.
18 Autumn Park, Dysart Rd, Grantham Lincolnshire, NG31 7DD, United Kingdom
Tel: +44 (0) 1476 516120, Fax: +44 (0) 1476 516121

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