

# MPM, APM, PPM, & LTI Series Modbus<sup>®</sup> Register Tables

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### **WARNING**

As is typical with most instruments, the addition of serial communications carries an inherent risk; it allows a remote operator to change the operation and/or characteristics of the device being digitally communicated with. Inappropriate communication could have serious consequences in meter or system operation.

Ultimately, it is up to the system designer to provide for the safe operation of a process. But certainly, no single event should make the difference between a safe situation and a catastrophe. Please use the appropriate level of caution when implementing serial communication.



**CAUTION:** If the Interlock Relay function is being used on any MPM, APM, PPM, or LTI meter, its proper operation can be affected by inappropriate digital communications. Please take the steps necessary to provide for reliable interlock protection.

### **Disclaimer**

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## Introduction

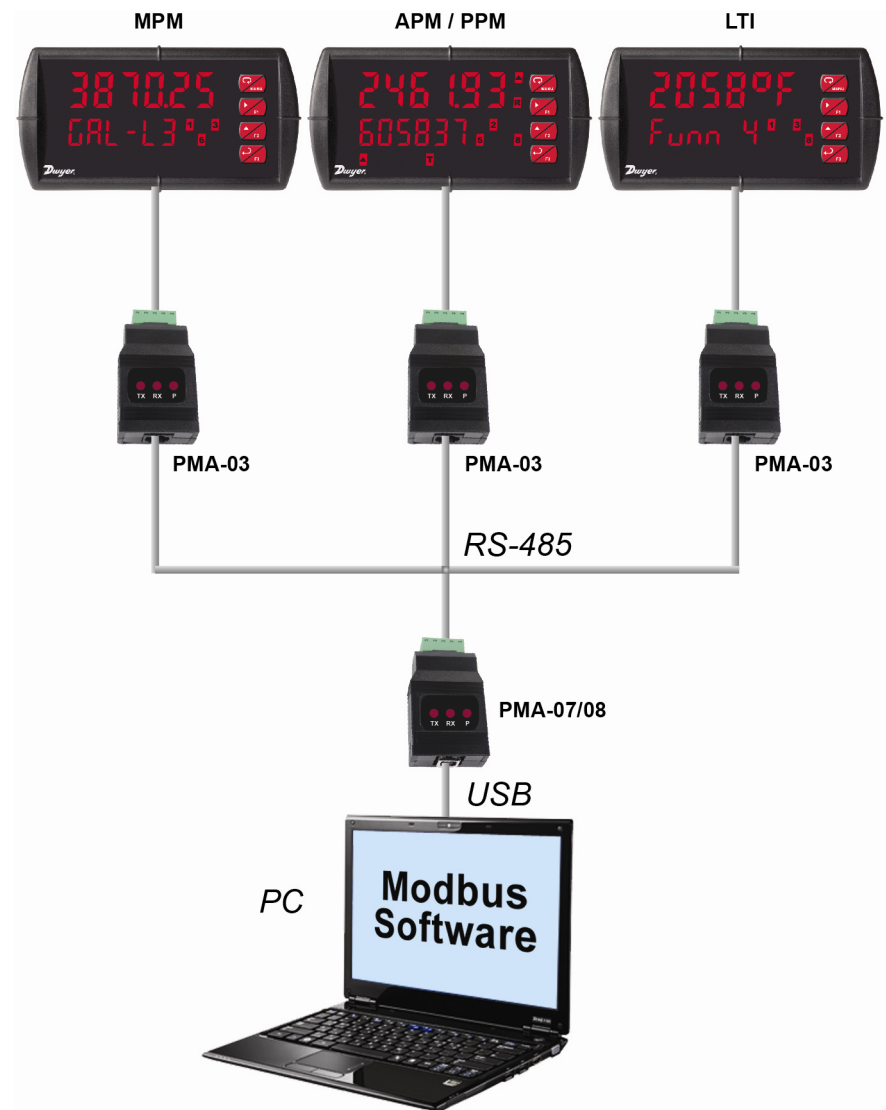
This document describes how to communicate with the MPM, APM, PPM, or LTI Series of meters using the Modbus® RTU Serial Communication Protocol. The user should be familiar with Modbus serial communication and the meters. Refer to the meter instruction manual and the serial communication adapters' manual for setup and wiring instructions.

Go to <http://www.modbus.org/> to obtain a copy of the Modbus Specifications and to find Modbus Technical Resources.

Note that although there are no specific 3x Registers, all 4x Registers are mirrored into 3x register space, and are therefore capable of being read by Modbus function 04 (Read Input Registers).

## Register Overview

- 40001 – 40047: Process Value (PV), Max PV, Min PV, Total, and Grand Total in floating point and long integer formats, with interspersed relay status & digital I/O status, for block reading; Start & Stop batch, Relay acknowledge, Reset Max & Min, Reset Total, Grand Total & Batch count.
- 40051 – 40089: Manual control of relays, analog output, and digital outputs; Modbus input display settings to use the meter as a Modbus display.
- 40101 – 40125: Input selection, Decimal points, totalizer settings, display settings, and display intensity.
- 40126 – 40145: Adjust, RTD number to average, Filter & Bypass, Gate settings for pulse input, Serial communication settings, Transfer function, Number of points, Exponent, Round horizontal tank parameters, and Cutoff.
- 40152 – 40180: Function keys, Digital I/O, Passwords.
- 40181 – 40187: Dual-scale model: PV2 settings and PV2 value, PV1 Percent.
- 40301 – 40372: Relays; Set & Reset points, Turn-on & Turn-off delays, Operating Mode.
- 40401 – 40413: Analog output value and setup parameters.
- 41001 – 41129: Remote Scaling for 4-20 mA input.
- 42001 – 42129: Remote Scaling for voltage input.
- 43001 – 43129: Remote Scaling for pulse input.
- 44001 – 44129: Remote Scaling for 4-20 mA input PV2.
- 45001 – 45129: Remote Scaling for voltage input PV2.
- 49901 – 49908: Product ID and Firmware Version.
- 49999: Load Factory Defaults



Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments																																																
Number	Address (hex)																																																							
40001 – 40002	0 – 1 (0000 – 0001)	PV/Rate Display value	Read Only	-99999 to 999999	User defined	Floating point	03, 04	Represents the PV/Rate display value including the decimal point. Under Range = -99999, Over Range = 999999, and Open = -99999																																																
40003	2 (0002)	Alarm and Relay status	Read Only	1 = In Alarm  1 = relay energized	None	Word; Bits	03, 04	Read alarm status and energized/non-energized status of relays. Alm = Alarm. Rly = Relay.  <table border="1" style="width:100%; text-align:center; border-collapse: collapse;"> <tr> <td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> <tr> <td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Rly</td><td>Rly</td><td>Rly</td><td>Rly</td><td>Rly</td><td>Rly</td><td>Rly</td><td>Rly</td> </tr> <tr> <td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td> </tr> </table>	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Rly	Rly	Rly	Rly	Rly	Rly	Rly	Rly	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																																									
Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Rly	Rly	Rly	Rly	Rly	Rly	Rly	Rly																																									
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1																																									
40004	3 (0003)	Digital Inputs and Outputs status	Read Only	1 = Input selected  1 = Output active	None	Word; Bits	03, 04	Read the state of the digital inputs and outputs.  <table border="1" style="width:100%; text-align:center; border-collapse: collapse;"> <tr> <td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> <tr> <td>DI</td><td>DI</td><td>DI</td><td>DI</td><td>DI</td><td>DI</td><td>DI</td><td>DI</td><td>DO</td><td>DO</td><td>DO</td><td>DO</td><td>DO</td><td>DO</td><td>DO</td><td>DO</td> </tr> <tr> <td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td> </tr> </table>	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	DI	DI	DI	DI	DI	DI	DI	DI	DO	DO	DO	DO	DO	DO	DO	DO	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																																									
DI	DI	DI	DI	DI	DI	DI	DI	DO	DO	DO	DO	DO	DO	DO	DO																																									
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1																																									
40005 – 40006	4 – 5 (0004 – 0005)	Maximum Display value	Read Only	-99999 to 999999	User defined	Floating point	03, 04	Represents the Maximum display value, including the decimal point, since last power up or Max Value reset.																																																
40007 – 40008	6 – 7 (0006 – 0007)	Minimum Display value	Read Only	-99999 to 999999	User defined	Floating point	03, 04	Represents the Minimum display value, including the decimal point, since last power up or Min Value reset.																																																
40009 – 40010	8-9 (0008 – 0009)	Total value	Read Only	0 to 999999999	User defined	Floating point	03, 04	Represents the Total value, including the decimal point, since last Total reset.																																																
40011 – 40012	10 – 11 (000A – 000B)	Grand Total value	Read Only	0 to 999999999	User defined	Floating point	03, 04	Represents the Grand Total value, including the decimal point, since last Grand Total reset.																																																
40013 – 40014	12 – 13 (000C – 000D)	Total overflow value	Read Only	0 to 999	User defined	Floating point	03, 04	Represents the Total overflow value, since last Total reset.																																																
40015 – 40016	14 – 15 (000E – 000F)	Total non-overflow value	Read Only	0 to 999999	User defined	Floating point	03, 04	Represents the Total non-overflow value, since last Total reset.																																																
40017 – 40018	16 – 17 (0010 – 0011)	Grand Total overflow value	Read Only	0 to 999	User defined	Floating point	03, 04	Represents the Grand Total overflow value, since last Grand Total reset.																																																
40019 – 40020	18 – 19 (0012 – 0013)	Grand Total non-overflow value	Read Only	0 to 999999	User defined	Floating point	03, 04	Represents the Grand Total non-overflow value, since last Grand Total reset.																																																
40021	20 (0014)	PV/Rate Display value	Read Only	-99999 to 999999	User defined	Long Hi	03, 04	Represents the PV/Rate display value excluding the decimal point. Decimal point setting in 40102.																																																
40022	21 (0015)	PV/Rate Display value	Read Only		User defined	Long Lo	03, 04	Must be read with 40021.																																																

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments																																
Number	Address (hex)																																							
40023	22 (0016)	Alarm and Relay status	Read Only	1 = In Alarm  1 = relay energized	None	Word; Bits	03, 04	Mirror of 40003. Read alarm status and energized/non-energized status of relays. Alm = Alarm. Rly = Relay.  <table border="1"> <tr> <td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> <tr> <td>Alm 8</td><td>Alm 7</td><td>Alm 6</td><td>Alm 5</td><td>Alm 4</td><td>Alm 3</td><td>Alm 2</td><td>Alm 1</td><td>Rly 8</td><td>Rly 7</td><td>Rly 6</td><td>Rly 5</td><td>Rly 4</td><td>Rly 3</td><td>Rly 2</td><td>Rly 1</td> </tr> </table>	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Alm 8	Alm 7	Alm 6	Alm 5	Alm 4	Alm 3	Alm 2	Alm 1	Rly 8	Rly 7	Rly 6	Rly 5	Rly 4	Rly 3	Rly 2	Rly 1
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																									
Alm 8	Alm 7	Alm 6	Alm 5	Alm 4	Alm 3	Alm 2	Alm 1	Rly 8	Rly 7	Rly 6	Rly 5	Rly 4	Rly 3	Rly 2	Rly 1																									
40024	23 (0017)	Digital Inputs and Outputs status	Read Only	1 = Input selected  1 = Output active	None	Word; Bits	03, 04	Mirror of 40004. Read the state of the digital inputs and outputs.  <table border="1"> <tr> <td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> <tr> <td>DI 8</td><td>DI 7</td><td>DI 6</td><td>DI 5</td><td>DI 4</td><td>DI 3</td><td>DI 2</td><td>DI 1</td><td>DO 8</td><td>DO 7</td><td>DO 6</td><td>DO 5</td><td>DO 4</td><td>DO 3</td><td>DO 2</td><td>DO 1</td> </tr> </table>	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	DI 8	DI 7	DI 6	DI 5	DI 4	DI 3	DI 2	DI 1	DO 8	DO 7	DO 6	DO 5	DO 4	DO 3	DO 2	DO 1
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																									
DI 8	DI 7	DI 6	DI 5	DI 4	DI 3	DI 2	DI 1	DO 8	DO 7	DO 6	DO 5	DO 4	DO 3	DO 2	DO 1																									
40025	24 (0018)	Maximum Display value	Read Only	-99999 to 999999	User defined	Long Hi	03, 04	Represents the Maximum display value, excluding the decimal point, since last power up or Max Value reset.																																
40026	25 (0019)	Maximum Display value	Read Only		User defined	Long Lo	03, 04	Must be read with 40025.																																
40027	26 (001A)	Minimum Display value	Read Only	-99999 to 999999	User defined	Long Hi	03, 04	Represents the Maximum display value, excluding the decimal point, since last power up or Max Value reset.																																
40028	27 (001B)	Minimum Display value	Read Only		User defined	Long Lo	03, 04	Must be read with 40027.																																
40029	28 (001C)	Total value	Read Only	0 to 999999999	User defined	Long Hi	03, 04	Represents the Total value, excluding the decimal point, since last Total reset. Decimal point setting in 40103.																																
40030	29 (001D)	Total value	Read Only		User defined	Long Lo	03, 04	Must be read with 40029.																																
40031	30 (001E)	Grand Total value	Read Only	0 to 999999999	User defined	Long Hi	03, 04	Represents the Grand Total value, excluding the decimal point, since last Total reset. Decimal point setting in 40104.																																
40032	31 (001F)	Grand Total value	Read Only		User defined	Long Lo	03, 04	Must be read with 40031.																																
40033	32 (0020)	Total overflow value	Read Only	0 to 999	User defined	Integer	03, 04	Represents the Total overflow value, since last Total reset.																																
40034	33 (0021)	Total non-overflow value	Read Only	0 to 999999	User defined	Long Hi	03, 04	Represents the Total non-overflow value, since last Total reset.																																
40035	34 (0022)	Total non-overflow value	Read Only		User defined	Long Lo	03, 04	Must be read with 40034.																																
40036	35 (0023)	Grand Total overflow value	Read Only	0 to 999	User defined	Integer	03, 04	Represents the Grand Total overflow value, since last Grand Total reset.																																
40037	36 (0024)	Grand Total non-overflow value	Read Only	0 to 999999	User defined	Long Hi	03, 04	Represents the Grand Total non-overflow value, since last Grand Total reset.																																
40038	37 (0025)	Grand Total non-overflow value	Read Only		User defined	Long Lo	03, 04	Must be read with 40037.																																
40039	38 (0026)	Start Batch	Write Only	Not applicable	None	Bit	06, 16	Set bit to 1 to start the batch process.																																

# MPM, APM, PPM, & LTI Series Modbus® Register Tables

# Serial Communication

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments																																																
Number	Address (hex)																																																							
40040	39 (0027)	Stop Batch	Write Only	Not applicable	None	Bit	06, 16	Set bit to 1 to pause the batch process; set bit to 1 again to stop batch process.																																																
40041	40 (0028)	Alarm Acknowledge	Write Only	Not applicable	None	Word; Bits	06, 16	Clear Relay <i>n</i> alarm condition. Set bit equal to 1 to acknowledge. Only has effect on relays programmed to allow manual acknowledging. Bits 0-7 mirror Bits 8-15, Alm = Alarm <table border="1" style="width: 100%; text-align: center; font-size: small;"> <tr> <td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> <tr> <td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td><td>Alm</td> </tr> <tr> <td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td> </tr> </table>	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																																									
Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm	Alm																																									
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1																																									
40042	41 (0029)	Reset Maximum Display value	Write Only	Not applicable	None	Bit	06, 16	Set bit to 1 to reset the Maximum Display value.																																																
40043	42 (002A)	Reset Minimum Display value	Write Only	Not applicable	None	Bit	06, 16	Set bit to 1 to reset the Minimum Display value.																																																
40044	43 (002B)	Reset Maximum/Minimum Display value	Write Only	Not applicable	None	Bit	06, 16	Set bit to 1 to reset the Maximum/ Minimum Display values.																																																
40045	44 (002C)	Reset Total value	Write Only	Not applicable	None	Bit	06, 16	Set bit to 1 to reset the Total value.																																																
40046	45 (002D)	Reset Grand Total value	Write Only	Not applicable	None	Bit	06, 16	Set bit to 1 to reset the Grand Total value.																																																
40047	46 (002E)	Reset Batch Count value	Write Only	Not applicable	None	Bit	06, 16	Set bit to 1 to reset the Batch Count value.																																																
40048	47 (002F)							Reserved for future use.																																																
40049 – 40050	48 – 49 (0030 – 0031)							Reserved for future use.																																																
40051	50 (0032)	Control Mode	Read Write	Not applicable	None	Bit	03, 04, 06, 16	0 = auto, 1 = manual																																																
40052	51 (0033)	Manual Control Analog Output Setting	Read Write	0 to 23999	µA	Integer	03, 04, 06, 16	Represents the Manual Control Analog Output value. Note: Register 40051 must be set to 1 = manual mode for registers 40052-40069 to take effect.																																																
40053	52 (0034)							Reserved for future use.																																																
40054	53 (0035)	Manual Control Relay 1 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Relay 1 setting. 0 = off, 1 = on																																																

# MPM, APM, PPM, & LTI Series Modbus® Register Tables

# Serial Communication

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
40055	54 (0036)	Manual Control Relay 2 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Relay 2 setting. 0 = off, 1 = on
40056	55 (0037)	Manual Control Relay 3 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Relay 3 setting. 0 = off, 1 = on
40057	56 (0038)	Manual Control Relay 4 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Relay 4 setting. 0 = off, 1 = on
40058	57 (0039)	Manual Control Relay 5 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Relay 5 setting. 0 = off, 1 = on
40059	58 (003A)	Manual Control Relay 6 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Relay 6 setting. 0 = off, 1 = on
40060	59 (003B)	Manual Control Relay 7 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Relay 7 setting. 0 = off, 1 = on
40061	60 (003C)	Manual Control Relay 8 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Relay 8 setting. 0 = off, 1 = on
40062	61 (003D)	Manual Control DO 1 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Digital Output 1 setting. 0 = off, 1 = on
40063	62 (003E)	Manual Control DO 2 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Digital Output 2 setting. 0 = off, 1 = on
40064	63 (003F)	Manual Control DO 3 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Digital Output 3 setting. 0 = off, 1 = on
40065	64 (0040)	Manual Control DO 4 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Digital Output 4 setting. 0 = off, 1 = on
40066	65 (0041)	Manual Control DO 5 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Digital Output 5 setting. 0 = off, 1 = on
40067	66 (0042)	Manual Control DO 6 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Digital Output 6 setting. 0 = off, 1 = on
40068	67 (0043)	Manual Control DO 7 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Digital Output 7 setting. 0 = off, 1 = on
40069	68 (0044)	Manual Control DO 8 Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Manual Control Digital Output 8 setting. 0 = off, 1 = on
40070	69 (0045)	Modbus Big Display Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Modbus Big Display setting. 0 = display based on register 40072-40073. 1 = display based on register 40076-40081. Modbus display mode must be set to 18 in register 40117.
40071	70 (0046)	Modbus Little Display Setting	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the Modbus Little Display setting. 0 = display based on register 40074-40075. 1 = display based on register 40082-40087. Modbus display mode must be set to 18 in register 40118.

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
40072 – 40073	71 – 72 (0047 – 0048)	Modbus Big Display value	Read Write	-99999 to +999999	User defined	Long Hi Long Lo	03, 04, 06, 16	Represents the Modbus Big display value excluding the decimal point. Register 40088 contains the decimal point. Set Register 40070 = 0, Register 40117 = 18
40074 – 40075	73 – 74 (0049 – 004A)	Modbus Little Display value	Read Write	-99999 to +999999	User defined	Long Hi Long Lo	03, 04, 06, 16	Represents the Modbus Little display value excluding the decimal point. Register 40089 contains the decimal point. Register 40071 = 0, Register 40118 = 18
40076	75 (004B)	Modbus Big Display MSD value	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Big Display MSD (Most Significant Digit) value. The hex value represents the allowable ASCII character, see Table 7. Register 40117 = 18 Register 40070 = 1 for registers 40076-81. Register 40088 contains the decimal point.
40077	76 (004C)	Modbus Big Display MSD-1 value	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Big Display MSD-1 value. The hex value represents the allowable ASCII character.
40078	77 (004D)	Modbus Big Display MSD-2 value	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Big Display MSD-2 value. The hex value represents the allowable ASCII character.
40079	78 (004E)	Modbus Big Display MSD-3 value	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Big Display MSD-3 value. The hex value represents the allowable ASCII character.
40080	79 (004F)	Modbus Big Display MSD-4 value	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Big Display MSD-4 value. The hex value represents the allowable ASCII character.
40081	80 (0050)	Modbus Big Display MSD-5 (LSD) value	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Big Display MSD-5 (which is the LSD) value. The hex value represents the allowable ASCII character.
40082	81 (0051)	Modbus Little Display MSD value	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Little Display MSD (Most Significant Digit) value. The hex value represents the allowable ASCII character, see Table 7. Register 40118 = 18 Register 40071 = 1 for registers 40082-87. Register 40089 contains the decimal point.
40083	82 (0052)	Modbus Little Display MSD-1 value	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Little Display MSD-1 value. The hex value represents the allowable ASCII character.
40084	83 (0053)	Modbus Little Display MSD-2 value	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Little Display MSD-2 value. The hex value represents the allowable ASCII character.



# MPM, APM, PPM, & LTI Series Modbus® Register Tables

# Serial Communication

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
40085	84 (0054)	Modbus Little Display MSD-3 value	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Little Display MSD-3 value. The hex value represents the allowable ASCII character.
40086	85 (0055)	Modbus Little Display MSD-4 value	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Little Display MSD-4 value. The hex value represents the allowable ASCII character.
40087	86 (0056)	Modbus Little Display MSD-5 (LSD) value	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Little Display MSD-5 (which is the LSD) value. The hex value represents the allowable ASCII character.
40088	87 (0057)	Modbus Big Display decimal point	Read Write	0 to 5	None	Integer	03, 04, 06, 16	Selects based on number of digits to the right of the decimal point (e.g. 0 = no decimal point and 5 = d.ddddd). Register 40070 = 1 or 0
40089	88 (0058)	Modbus Little Display decimal point	Read Write	0 to 5	None	Integer	03, 04, 06, 16	Selects based on number of digits to the right of the decimal point (e.g. 0 = no decimal point and 5 = d.ddddd). Register 40071 = 1 or 0
40090	89 (0059)	Level Meter	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the selection for LEVEL meter with dual scale for PV1 and PV2. 0 = No, 1 = Yes
40091	90 (005A)	Process Total	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the selection for Process Total. 0 = No, 1 = Yes
40092	91 (005B)	Pulse Total	Read Write	Not applicable	None	Bit	03, 04, 06, 16	Represents the selection for Pulse Total. 0 = No, 1 = Yes
40093	92 (005C)	Meter Model	Read Only	Not applicable	None	Integer	03, 04, 06, 16	0 = Process/Temperature      4 = Reserve 1 = Process Total              5 = Process Batch 2 = Pulse Total                 6 = Pulse Batch 3 = Dual-Input Process        7 = No Module
40094	93 (005D)	Relay & Digital IO count	Read Only	Not applicable	None	Word; bytes	03, 04, 06, 16	Relay & Digital IO count LSByte = Relay count (4 or 8) MSByte = Digital IO count (0, 4, or 8)
40095	94 (005E)	Analog Output	Read Only	Not applicable	None	Bit	03, 04, 06, 16	Represents the analog output option 0 = Not installed 1 = Installed
40101	100 (0064)	Input Selection	Read Write	Not applicable	None	Word; bits	03, 04, 06, 16	See Table 1.

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
40102	101 (0065)	PV/Rate decimal point	Read Write	0 to 7	None	Integer	03, 04, 06, 16	Selects based on number of digits to the right of the decimal point (e.g. 0 = no decimal point and 5 = d.ddddd), also selections for Temp Decimal Point using 0 = dddd, 1 = dddd.d, 6 = dddd*u, and 7 = dddd.du, where "u" is the units (F or C).
40103	102 (0066)	Total decimal point	Read Write	0 to 5	None	Integer	03, 04, 06, 16	Selects based on number of digits to the right of the decimal point (e.g. 0 = no decimal point and 5 = d.ddddd).
40104	103 (0067)	Grand Total decimal point	Read Write	0 to 5	None	Integer	03, 04, 06, 16	Selects based on number of digits to the right of the decimal point (e.g. 0 = no decimal point and 5 = d.ddddd).
40105	104 (0068)	Total time base	Read Write	0 to 4	None	Integer	03, 04, 06, 16	0 = sec, 1 = min, 2 = hour, 3 = day
40106 – 40107	105 – 106 (0069 – 006A)	Total Conversion Factor	Read Write	0.00001 to 999999	None	Floating point	03, 04, 06, 16	
40108	107 (006B)	Total Reset mode	Read Write	Not applicable	None	Bit	03, 04, 06, 16	0 = auto, 1 = manual
40109	108 (006C)	Total Reset Delay	Read Write	0 to 9999	1/10 of Seconds (0 to 999.9)	Integer	03, 04, 06, 16	
40110	109 (006D)	Grand Total time base	Read Write	0 to 4	None	Integer	03, 04, 06, 16	0 = sec, 1 = min, 2 = hour, 3 = day
40111 – 40112	110 – 111 (006E – 006F)	Grand Total Conversion Factor	Read Write	0.00001 to 999999	None	Floating point	03, 04, 06, 16	
40113	112 (0070)	Grand Total Reset mode	Read Write	Not applicable	None	Bit	03, 04, 06, 16	0 = auto, 1 = manual
40114	113 (0071)	Grand Total Reset Delay	Read Write	0 to 9999	1/10 of Seconds (0 to 999.9)	Integer	03, 04, 06, 16	
40115 – 40116	114 – 115 (0072 – 0073)	Pulse K- Factor	Read Write	0.00001 to 999999	None	Floating point	03, 04, 06, 16	
40117	116 (0074)	Big Display Setting	Read Write	0 to 20	None	Integer	03, 04, 06, 16	See Table 2.
40118	117 (0075)	Little Display Setting	Read Write	0 to 23	None	Integer	03, 04, 06, 16	See Table 2.
40119	118 (0076)	Units 1	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Little Display MSD (Most Significant Digit) value. The hex value represents the allowable ASCII character.
40120	119 (0077)	Units 2	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Little Display MSD-1 value. The hex value represents the allowable ASCII character.
40121	120 (0078)	Units 3	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Little Display MSD-2 value. The hex value represents the allowable ASCII character.

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
40122	121 (0079)	Units 4	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Little Display MSD-3 value. The hex value represents the allowable ASCII character.
40123	122 (007A)	Units 5	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Little Display MSD-4 value. The hex value represents the allowable ASCII character.
40124	123 (007B)	Units 6	Read Write	Not applicable	None	Byte	03, 04, 06, 16	Represents the Modbus Little Display MSD-5 (which is the LSD) value. The hex value represents the allowable ASCII character.
40125	124 (007C)	Display Intensity	Read Write	1 to 8	None	Integer	03, 04, 06, 16	8 is the brightest level. Writing out of range data results in level 1 or 8.
40126	125 (007D)	Adjust Value	Read Write	-500 to 500	1/10 of °C or °F	Integer	03, 04, 06, 16	Actually represents -50.0 to +50.0. Offset value is only applied to temperature inputs. If Adjust is greater than 27.7°C and the temperature units are switched to °F, it will be set to 50.0 (lower than -27.7, set to -50.0).
40127	126 (007E)	RTD Total Value	Read Write	1 to 10	None	Integer	03, 04, 06, 16	Value represents the number of parallel RTDs connected to the signal input. Any other value than these results in a setting of 1.
40128	127 (007F)	Lo Gate Setting	Read Write	1 to 999	None	Integer	03, 04, 06, 16	Actually represents 0.1 to 99.9 setting.
40129	128 (0080)	High Gate Setting	Read Write	20 to 9999	None	Integer	03, 04, 06, 16	Actually represents 2.0 to 999.9 setting.
40130	129 (0081)	Filter Setting	Read Write	0, 2 to 199 or 202 to 250, 900	Unit-less	Integer	03, 04, 06, 16	Display filtering. 0 = no filtering. 2 to 199 = old + ((new - old)/Filter). For pulse input 900 = Hi-Speed, 202 to 250 = Lo-Speed where the range is 2 to 50.
40131	130 (0082)	Bypass Setting	Read Write	2 to 999	Percent of full scale or °F	Integer	03, 04, 06, 16	Actually represents 0.2 to 99.9. If the input steps greater than the bypass value, it will be displayed immediately, with no filtering occurring. The number represents percent of full-scale for process inputs and °F for temperature inputs. No effect if filter = 0.
40132	131 (0083)	Serial Address	Read Write	1 to 247	None	Integer	03, 04, 06, 16	Changes to this register are saved but don't take effect until next meter reset (Modbus command or power-up). Writing out of range data results in an address of 247.
40133	132 (0084)	Serial Baud Rate	Read Write	0 to 6	None	Integer	03, 04, 06, 16	0 = 300, 1 = 600, 2 = 1200, 3 = 2400, 4 = 4800, 5 = 9600, & 6 = 19200. Changes to this register are saved but don't take effect until next meter reset (Modbus command or power-up). Writing out of range data results in a baud rate of 2400.
40134	133 (0085)	Serial Transmit Delay	Read Write	0 to 199	ms	Integer	03, 04, 06, 16	Transmit delay to minimize collisions on the RS-485 network.
40135	134 (0086)	Serial Parity	Read Write	0 to 3	None	Integer	03, 04, 06, 16	0 = None with 1 stop bit, 1 = None with 2 stop bits, 2 = Odd, 3 = Even. Changes to this register are saved but don't take effect until next meter re-initialization (Writing 0xFF00 to 40299 or power-up). Writing out of range data results in a parity setting of Even.

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
40136	135 (0087)	Serial Byte-to-Byte Timeout	Read Write	0 to 254	1/100 of Seconds	Integer	03, 04, 06, 16	This is the timeout between bytes of a Modbus frame. Note that a value less than the minimum value for the present baud rate cannot be saved. Minimums are: 300 baud = 0.06 sec, 600 = 0.03, 1200 = 0.02 and 0.01 for 2400 to 19200. Changes to this register are saved but don't take effect until next meter reset (Modbus command or power-up). Writing out of range data results in a timeout of 2.54 seconds.
40137	136 (0088)	Function Mode	Read Write	0 to 3	None	Integer	03, 04, 06, 16	0 = Linear, 1 = Square Root, 2 = Exponent, and 3 = Round Horizontal Tank
40138	137 (0089)	PV/Rate Number of Points	Read Write	2 to 32	None	Integer	03, 04, 06, 16	This register is only used when register 40137 is set to Linear.
40139	138 (008A)	Exponent	Read Write	10001 to 29999	None	Integer	03, 04, 06, 16	Actually represents 1.0001 to 2.9999. Set register 40137 = 2
40140 – 40141	139 – 140 (008B – 008C)	Round Horizontal Tank Diameter	Read Write	0 to 999.999	Inches	Floating point	03, 04, 06, 16	Decimal point is fixed. The unit of measure is inches; the volume calculation is in US gallons. The display may be re-scaled to represent the volume in any engineering units.
40142 – 40143	141 – 142 (008D – 008E)	Round Horizontal Tank Length	Read Write	0 to 999.999	Inches	Floating point	03, 04, 06, 16	
40144 – 40145	143 – 144 (008F – 0090)	Cutoff	Read Write	0 to 999999	User defined	Floating point	03, 04, 06, 16	Represents the cutoff value.
40146	145 (0091)	Total Count Direction	Read Write	Not applicable	None	Bit	03, 04, 06, 16	0 = count up, 1 = count down
40147 – 40148	146 – 147 (0092 – 0093)	Total Count Preset	Read Write	0 to 999999999	User defined	Floating point	03, 04, 06, 16	Same as 40302 – 40303 Relay 1 set point.
40149	148 (0094)	Grand Total Count Direction	Read Write	Not applicable	None	Bit	03, 04, 06, 16	0 = count up, 1 = count down
40150 – 40151	149 – 150 (0095 – 0096)	Grand Total Count Preset	Read Write	0 to 999999999	User defined	Floating point	03, 04, 06, 16	
40152	151 (0097)	Programmable User F1 Setting	Read Write	0 to 39	User defined	Integer	03, 04, 06, 16	See Table 3.
40153	152 (0098)	Programmable User F2 Setting	Read Write	0 to 39	User defined	Integer	03, 04, 06, 16	See Table 3.
40154	153 (0099)	Programmable User F3 Setting	Read Write	0 to 39	User defined	Integer	03, 04, 06, 16	See Table 3.
40155	154 (009A)	Programmable User Digital Input 1 Setting	Read Write	0 to 43	User defined	Integer	03, 04, 06, 16	See Table 3.

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
40156	155 (009B)	Programmable User Digital Input 2 Setting	Read Write	0 to 43	User defined	Integer	03, 04, 06, 16	See Table 3.
40157	156 (009C)	Programmable User Digital Input 3 Setting	Read Write	0 to 43	User defined	Integer	03, 04, 06, 16	See Table 3.
40158	157 (009D)	Programmable User Digital Input 4 Setting	Read Write	0 to 43	User defined	Integer	03, 04, 06, 16	See Table 3.
40159	158 (009E)	Programmable User Digital Input 5 Setting	Read Write	0 to 43	User defined	Integer	03, 04, 06, 16	See Table 3.
40160	159 (009F)	Programmable User Digital Input 6 Setting	Read Write	0 to 43	User defined	Integer	03, 04, 06, 16	See Table 3.
40161	160 (00A0)	Programmable User Digital Input 7 Setting	Read Write	0 to 43	User defined	Integer	03, 04, 06, 16	See Table 3.
40162	161 (00A1)	Programmable User Digital Input 8 Setting	Read Write	0 to 43	User defined	Integer	03, 04, 06, 16	See Table 3.
40163	162 (00A2)	Programmable User Digital Output 1 Setting	Read Write	0 to 20	User defined	Integer	03, 04, 06, 16	See Table 3.
40164	163 (00A3)	Programmable User Digital Output 2 Setting	Read Write	0 to 20	User defined	Integer	03, 04, 06, 16	See Table 3.
40165	164 (00A4)	Programmable User Digital Output 3 Setting	Read Write	0 to 20	User defined	Integer	03, 04, 06, 16	See Table 3.
40166	165 (00A5)	Programmable User Digital Output 4 Setting	Read Write	0 to 20	User defined	Integer	03, 04, 06, 16	See Table 3.
40167	166 (00A6)	Programmable User Digital Output 5 Setting	Read Write	0 to 20	User defined	Integer	03, 04, 06, 16	See Table 3.
40168	167 (00A7)	Programmable User Digital Output 6 Setting	Read Write	0 to 20	User defined	Integer	03, 04, 06, 16	See Table 3.

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
40169	168 (00A8)	Programmable User Digital Output 7 Setting	Read Write	0 to 20	User defined	Integer	03, 04, 06, 16	See Table 3.
40170	169 (00A9)	Programmable User Digital Output 8 Setting	Read Write	0 to 20	User defined	Integer	03, 04, 06, 16	See Table 3.
40171 – 40172	170 – 171 (00AA-00AB)	Password 1	Read Write	000000 to 999999	None	Floating point	03, 04, 06, 16	See Note 4.
40173 – 40174	172 – 173 (00AC-00AD)	Password 2	Read Write	000000 to 999999	None	Floating point	03, 04, 06, 16	See Note 4.
40175 – 40176	174 – 175 (00AE-00AF)	Password 3	Read Write	000000 to 999999	None	Floating point	03, 04, 06, 16	See Note 4.
40177 – 40178	176 – 177 (00B0 – 00B1)	Total Password	Read Write	000000 to 999999	None	Floating point	03, 04, 06, 16	See Note 4.
40179 – 40180	178 – 179 (00B2 – 00B3)	Grand Total Password	Read Write	000000 to 999999	None	Floating point	03, 04, 06, 16	See Note 4.
40181	180 (00B4)	PV2 Decimal Point	Read Write	0 to 5	None	Integer	03, 04, 06, 16	Selects based on number of digits to the right of the decimal point (e.g. 0 = no decimal point and 5 = d.ddddd).
40182	181 (00B5)	PV2 Number of Points	Read Write	2 to 8	None	Integer	03, 04, 06, 16	This register is only used when register 40137 is set to Linear.
40183 – 40184	182 – 183 (00B6 – 00B7)	PV2 Display Value	Read Only	-99999 to 999999	User defined	Floating point	03, 04	Represents the PV2 display value including the decimal point. Under Range = -99999, Over Range = 999999, and Open = -99999
40185	184 (00B8)	PV2 Display value	Read Only	-99999 to 999999	User defined	Long Hi	03, 04	Represents the display value excluding the decimal point. Decimal point setting in 40181.
40186	185 (00B9)	PV2 Display value	Read Only		User defined	Long Lo	03, 04	Must be read with 40185.
40187	186 (00BA)	PV1% Display value	Read Only	-100 to 100	User defined	Integer	03, 04	Represents the PV1% display value.
40301	300 (012C)	Relay 1 Mode	Read Write	Not applicable	None	Word; bits	03, 04, 06, 16	See Table 4 for operating modes and bit assignments.
40302 – 40303	301 – 302 (012D – 012E)	Relay 1 Set Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40304 – 40305	303 – 304 (012F – 0130)	Relay 1 Reset Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40306	305 (0131)	Relay 1 On Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
40307	306 (0132)	Relay 1 Off Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	
40308 – 40309	307 – 308 (0133 – 0134)	Relay 1 Sample Time	Read Write	0 to 59999	1/10 of Seconds	Floating point	03, 04, 06, 16	
40310	309 (0135)	Relay 2 Mode	Read Write	Not applicable	None	Word; bits	03, 04, 06, 16	See Table 4 for operating modes and bit assignments.
40311 – 40312	310 – 311 (0136 – 0137)	Relay 2 Set Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40313 – 40314	312 – 313 (0138 – 0139)	Relay 2 Reset Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40315	314 (013A)	Relay 2 On Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	
40316	315 (013B)	Relay 2 Off Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	
40317 – 40318	316 – 317 (013C – 013D)	Relay 2 Sample Time	Read Write	0 to 59999	1/10 of Seconds	Floating point	03, 04, 06, 16	
40319	318 (013E)	Relay 3 Mode	Read Write	Not applicable	None	Word; bits	03, 04, 06, 16	See Table 4 for operating modes and bit assignments.
40320 – 40321	319 – 320 (013F – 0140)	Relay 3 Set Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40322 – 40323	321 – 322 (0141 – 0142)	Relay 3 Reset Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40324	323 (0143)	Relay 3 On Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	
40325	324 (0144)	Relay 3 Off Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	
40326 – 40327	325 – 326 (0145 – 0146)	Relay 3 Sample Time	Read Write	0 to 59999	1/10 of Seconds	Floating point	03, 04, 06, 16	
40328	327 (0147)	Relay 4 Mode	Read Write	Not applicable	None	Word; bits	03, 04, 06, 16	See Table 4 for operating modes and bit assignments.
40329 – 40330	328 – 329 (0148 – 0149)	Relay 4 Set Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40331 – 40332	330 – 331 (014A – 014B)	Relay 4 Reset Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40333	332 (014C)	Relay 4 On Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	
40334	333 (014D)	Relay 4 Off Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	

# MPM, APM, PPM, & LTI Series Modbus® Register Tables

# Serial Communication

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
40335 – 40336	334 – 335 (014E – 014F)	Relay 4 Sample Time	Read Write	0 to 59999	1/10 of Seconds	Floating point	03, 04, 06, 16	
40337	336 (0150)	Relay 5 Mode	Read Write	Not applicable	None	Word; bits	03, 04, 06, 16	See Table 4 for operating modes and bit assignments.
40338 – 40339	337 – 338 (0151 – 0152)	Relay 5 Set Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40340 – 40341	339 – 340 (153 – 0154)	Relay 5 Reset Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40342	341 (0155)	Relay 5 On Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	
40343	342 (0156)	Relay 5 Off Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	
40344 – 40345	343 – 344 (0157 – 0158)	Relay 5 Sample Time	Read Write	0 to 59999	1/10 of Seconds	Floating point	03, 04, 06, 16	
40346	345 (0159)	Relay 6 Mode	Read Write	Not applicable	None	Word; bits	03, 04, 06, 16	See Table 4 for operating modes and bit assignments.
40347 – 40348	346 – 347 (015A – 015B)	Relay 6 Set Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40349 – 40350	348 – 349 (015C – 015D)	Relay 6 Reset Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40351	350 (015E)	Relay 6 On Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	
40352	351 (015F)	Relay 6 Off Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	
40353 – 40354	352 – 353 (0160 – 0161)	Relay 6 Sample Time	Read Write	0 to 59999	1/10 of Seconds	Floating point	03, 04, 06, 16	
40355	354 (0162)	Relay 7 Mode	Read Write	Not applicable	None	Word; bits	03, 04, 06, 16	See Table 4 for operating modes and bit assignments.
40356 – 40357	355 – 356 (0163 – 0164)	Relay 7 Set Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40358 – 40359	357 – 358 (0165 – 0166)	Relay 7 Reset Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40360	359 (0167)	Relay 7 On Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	
40361	360 (0168)	Relay 7 Off Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	
40362 – 40363	361 – 362 (0169 – 016A)	Relay 7 Sample Time	Read Write	0 to 59999	1/10 of Seconds	Floating point	03, 04, 06, 16	



Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
40364	363 (016B)	Relay 8 Mode	Read Write	Not applicable	None	Word; bits	03, 04, 06, 16	See Table 4 for operating modes and bit assignments.
40365 – 40366	364 – 365 (016C – 016D)	Relay 8 Set Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40367 – 40368	366 – 367 (016E – 016F)	Relay 8 Reset Point	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40369	368 (0170)	Relay 8 On Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	
40370	369 (0171)	Relay 8 Off Delay	Read Write	0 to 1999	1/10 of Seconds	Integer	03, 04, 06, 16	
40371 – 40372	370 – 371 (0172 – 0173)	Relay 8 Sample Time	Read Write	0 to 59999	1/10 of Seconds	Floating point	03, 04, 06, 16	
40401	400 (0190)	Analog Output Value	Read Only	0 to 23999	µA	Integer	03, 04	
40402	401 (0191)	Analog Output Mode	Read Write	0 to 15	None	Integer	03, 04, 06, 16	See Table 5 for selection of the 4-20mA output source.
40403	402 (0192)	Analog Output Overrange value	Read Write	0 to 23999	µA	Integer	03, 04, 06, 16	
40404	403 (0193)	Analog Output Underrange value	Read Write	0 to 23999	µA	Integer	03, 04, 06, 16	
40405	404 (0194)	Analog Output Sensor Break value	Read Write	0 to 23999, 32000	µA	Integer	03, 04, 06, 16	
40406	405 (0195)	Analog Output Maximum value allowed	Read Write	0 to 23999	µA	Integer	03, 04, 06, 16	
40407	406 (0196)	Analog Output Minimum value allowed	Read Write	0 to 23999	µA	Integer	03, 04, 06, 16	
40408 – 40409	407 – 408 (0197 – 0198)	Analog Output Display Value 1	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	Analog Output scaling is only saved to memory after receiving the Output 2 – register 40413.
40410 – 40411	409 – 410 (0199 – 019A)	Analog Output Display Value 2	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
40412	411 (019B)	Analog Output Output 1	Read Write	0 to 23999	µA	Integer	03, 04, 06, 16	
40413	412 (019C)	Analog Output Output 2	Read Write	0 to 23999	µA	Integer	03, 04, 06, 16	

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
41001 – 41002	1000 – 1001 (3E8 – 3E9)	Scale mA Display 1	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	After all the Display and Input values have been sent, write 0xFF00 to register 41129.
41003 – 41004	1002 – 1003 (3EA – 3EB)	Scale mA Display 2	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41005 – 41006	1004 – 1005 (3EC – 3ED)	Scale mA Display 3	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41007 – 41008	1006 – 1007 (3EE – 3EF)	Scale mA Display 4	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41009 – 41010	1008 – 1009 (3F0 – 3F1)	Scale mA Display 5	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41011 – 41012	1010 – 1011 (3F2 – 3F3)	Scale mA Display 6	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41013 – 41014	1012 – 1013 (3F4 – 3F5)	Scale mA Display 7	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41015 – 41016	1014 – 1015 (3F6 – 3F7)	Scale mA Display 8	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41017 – 41018	1016 – 1017 (3F8 – 3F9)	Scale mA Display 9	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41019 – 41020	1018 – 1019 (3FA – 3FB)	Scale mA Display 10	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41021 – 41022	1020 – 1021 (3FC – 3FD)	Scale mA Display 11	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41023 – 41024	1022 – 1023 (3FE – 3FF)	Scale mA Display 12	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41025 – 41026	1024 – 1025 (400 – 401)	Scale mA Display 13	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41027 – 41028	1026 – 1027 (402 – 403)	Scale mA Display 14	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41029 – 41030	1028 – 1029 (404 – 405)	Scale mA Display 15	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41031 – 41032	1030 – 1031 (406 – 407)	Scale mA Display 16	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41033 – 41034	1032 – 1033 (408 – 409)	Scale mA Display 17	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41035 – 41036	1034 – 1035 (40A – 40B)	Scale mA Display 18	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41037 – 41038	1036 – 1037 (40C – 40D)	Scale mA Display 19	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	

# MPM, APM, PPM, & LTI Series Modbus® Register Tables

# Serial Communication

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
41039 – 41040	1038 – 1039 (40E – 40F)	Scale mA Display 20	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41041 – 41042	1040 – 1041 (410 – 411)	Scale mA Display 21	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41043 – 41044	1042 – 1043 (412 – 413)	Scale mA Display 22	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41045 – 41046	1044 – 1045 (414 – 415)	Scale mA Display 23	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41047 – 41048	1046 – 1047 (416 – 417)	Scale mA Display 24	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41049 – 41050	1048 – 1049 (418 – 419)	Scale mA Display 25	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41051 – 41052	1050 – 1051 (41A – 41B)	Scale mA Display 26	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41053 – 41054	1052 – 1053 (41C – 41D)	Scale mA Display 27	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41055 – 41056	1054 – 1055 (41E – 41F)	Scale mA Display 28	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41057 – 41058	1056 – 1057 (420 – 421)	Scale mA Display 29	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41059 – 41060	1058 – 1059 (422 – 423)	Scale mA Display 30	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41061 – 41062	1060 – 1061 (424 – 425)	Scale mA Display 31	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41063 – 41064	1062 – 1063 (426 – 427)	Scale mA Display 32	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
41065 – 41066	1064 – 1065 (428 – 429)	Scale mA Input 1	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41067 – 41068	1066 – 1067 (42A – 42B)	Scale mA Input 2	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41069 – 41070	1068 – 1069 (42C – 42D)	Scale mA Input 3	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41071 – 41072	1070 – 1071 (42E – 42F)	Scale mA Input 4	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41073 – 41074	1072 – 1073 (430 – 431)	Scale mA Input 5	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41075 – 41076	1074 – 1075 (432 – 433)	Scale mA Input 6	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	

# MPM, APM, PPM, & LTI Series Modbus® Register Tables

# Serial Communication

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
41077 – 41078	1076 – 1077 (434 – 435)	Scale mA Input 7	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41079 – 41080	1078 – 1079 (436 – 437)	Scale mA Input 8	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41081 – 41082	1080 – 1081 (438 – 439)	Scale mA Input 9	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41083 – 41084	1082 – 1083 (43A – 43B)	Scale mA Input 10	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41085 – 41086	1084 – 1085 (43C – 43D)	Scale mA Input 11	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41087 – 41088	1086 – 1087 (43E – 43F)	Scale mA Input 12	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41089 – 41090	1088 – 1089 (440 – 441)	Scale mA Input 13	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41091 – 41092	1090 – 1091 (442 – 443)	Scale mA Input 14	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41093 – 41094	1092 – 1093 (444 – 445)	Scale mA Input 15	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41095 – 41096	1094 – 1095 (446 – 447)	Scale mA Input 16	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41097 – 41098	1096 – 1097 (448 – 449)	Scale mA Input 17	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41099 – 41100	1098 – 1099 (44A – 44B)	Scale mA Input 18	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41101 – 41102	1100 – 1101 (44C – 44D)	Scale mA Input 19	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41103 – 41104	1102 – 1103 (44E – 44F)	Scale mA Input 20	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41105 – 41106	1104 – 1105 (450 – 451)	Scale mA Input 21	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41107 – 41108	1106 – 1107 (452 – 453)	Scale mA Input 22	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41109 – 41110	1108 – 1109 (454 – 455)	Scale mA Input 23	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41111 – 41112	1110 – 1111 (456 – 457)	Scale mA Input 24	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41113 – 41114	1112 – 1113 (458 – 459)	Scale mA Input 25	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
41115 – 41116	1114 – 1115 (45A – 45B)	Scale mA Input 26	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41117 – 41118	1116 – 1117 (45C – 45D)	Scale mA Input 27	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41119 – 41120	1118 – 1119 (45E – 45F)	Scale mA Input 28	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41121 – 41122	1120 – 1121 (460 – 461)	Scale mA Input 29	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41123 – 41124	1122 – 1123 (462 – 463)	Scale mA Input 30	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41125 – 41126	1124 – 1125 (464 – 465)	Scale mA Input 31	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41127 – 41128	1126 – 1127 (466 – 467)	Scale mA Input 32	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
41129	1128 (468)	Remote Scale mA Flag	Write Only	0xFF00 to execute remote scaling.	None	Unsigned integer	06, 16	Used to remote scale the mA input. Caution! See Note 5.
42001 – 42002	2000 – 2001 (7D0 – 7D1)	Scale Volts Display 1	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	After all the Display and Input values have been sent, write 0xFF00 to register 42129.
42003 – 42004	2002 – 2003 (7D2 – 7D3)	Scale Volts Display 2	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42005 – 42006	2004 – 2005 (7D4 – 7D5)	Scale Volts Display 3	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42007 – 42008	2006 – 2007 (7D6 – 7D7)	Scale Volts Display 4	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42009 – 42010	2008 – 2009 (7D8 – 7D9)	Scale Volts Display 5	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42011 – 42012	2010 – 2011 (7DA – 7DB)	Scale Volts Display 6	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42013 – 42014	2012 – 2013 (7DC – 7DD)	Scale Volts Display 7	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42015 – 42016	2014 – 2015 (7DE – 7DF)	Scale Volts Display 8	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42017 – 42018	2016 – 2017 (7E0 – 7E1)	Scale Volts Display 9	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42019 – 42020	2018 – 2019 (7E2 – 7E3)	Scale Volts Display 10	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
42021 – 42022	2020 – 2021 (7E4 – 7E5)	Scale Volts Display 11	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42023 – 42024	2022 – 2023 (7E6 – 7E7)	Scale Volts Display 12	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42025 – 42026	2024 – 2025 (7E8 – 7E9)	Scale Volts Display 13	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42027 – 42028	2026 – 2027 (7EA – 7EB)	Scale Volts Display 14	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42029 – 42030	2028 – 2029 (7EC – 7ED)	Scale Volts Display 15	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42031 – 42032	2030 – 2031 (7EE – 7EF)	Scale Volts Display 16	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42033 – 42034	2032 – 2033 (7F0 – 7F1)	Scale Volts Display 17	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42035 – 42036	2034 – 2035 (7F2 – 7F3)	Scale Volts Display 18	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42037 – 42038	2036 – 2037 (7F4 – 7F5)	Scale Volts Display 19	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42039 – 42040	2038 – 2039 (7F6 – 7F7)	Scale Volts Display 20	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42041 – 42042	2040 – 2041 (7F8 – 7F9)	Scale Volts Display 21	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42043 – 42044	2042 – 2043 (7FA – 7FB)	Scale Volts Display 22	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42045 – 42046	2044 – 2045 (7FC – 7FD)	Scale Volts Display 23	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42047 – 42048	2046 – 2047 (7FE – 7FF)	Scale Volts Display 24	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42049 – 42050	2048 – 2049 (800 – 801)	Scale Volts Display 25	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42051 – 42052	2050 – 2051 (802 – 803)	Scale Volts Display 26	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42053 – 42054	2052 – 2053 (804 – 805)	Scale Volts Display 27	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42055 – 42056	2054 – 2055 (806 – 807)	Scale Volts Display 28	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42057 – 42058	2056 – 2057 (808 – 809)	Scale Volts Display 29	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	

# MPM, APM, PPM, & LTI Series Modbus® Register Tables

# Serial Communication

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
42059 – 42060	2058 – 2059 (80A – 80B)	Scale Volts Display 30	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42061 – 42062	2060 – 2061 (80C – 80D)	Scale Volts Display 31	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42063 – 42064	2062 – 2063 (80E – 80F)	Scale Volts Display 32	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
42065 – 42066	2064 – 2065 (810 – 811)	Scale Volts Input 1	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42067 – 42068	2066 – 2067 (812 – 813)	Scale Volts Input 2	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42069 – 42070	2068 – 2069 (814 – 815)	Scale Volts Input 3	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42071 – 42072	2070 – 2071 (816 – 817)	Scale Volts Input 4	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42073 – 42074	2072 – 2073 (818 – 819)	Scale Volts Input 5	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42075 – 42076	2074 – 2075 (81A – 81B)	Scale Volts Input 6	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42077 – 42078	2076 – 2077 (81C – 81D)	Scale Volts Input 7	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42079 – 42080	2078 – 2079 (81E – 81F)	Scale Volts Input 8	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42081 – 42082	2080 – 2081 (820 – 821)	Scale Volts Input 9	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42083 – 42084	2082 – 2083 (822 – 823)	Scale Volts Input 10	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42085 – 42086	2084 – 2085 (824 – 825)	Scale Volts Input 11	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42087 – 42088	2086 – 2087 (826 – 827)	Scale Volts Input 12	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42089 – 42090	2088 – 2089 (828 – 829)	Scale Volts Input 13	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42091 – 42092	2090 – 2091 (82A – 82B)	Scale Volts Input 14	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42093 – 42094	2092 – 2093 (82C – 82D)	Scale Volts Input 15	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42095 – 42096	2094 – 2095 (82E – 82F)	Scale Volts Input 16	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
42097 – 42098	2096 – 2097 (830 – 831)	Scale Volts Input 17	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42099 – 42100	2098 – 2099 (832 – 833)	Scale Volts Input 18	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42101 – 42102	2100 – 2101 (834 – 835)	Scale Volts Input 19	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42103 – 42104	2102 – 2103 (836 – 837)	Scale Volts Input 20	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42105 – 42106	2104 – 2105 (838 – 839)	Scale Volts Input 21	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42107 – 42108	2106 – 2107 (83A – 83B)	Scale Volts Input 22	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42109 – 42110	2108 – 2109 (83C – 83D)	Scale Volts Input 23	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42111 – 42112	2110 – 2111 (83E – 83F)	Scale Volts Input 24	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42113 – 42114	2112 – 2113 (840 – 841)	Scale Volts Input 25	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42115 – 42116	2114 – 2115 (842 – 843)	Scale Volts Input 26	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42117 – 42118	2116 – 2117 (844 – 845)	Scale Volts Input 27	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42119 – 42120	2118 – 2119 (846 – 847)	Scale Volts Input 28	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42121 – 42122	2120 – 2121 (848 – 849)	Scale Volts Input 29	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42123 – 42124	2122 – 2123 (84A – 84B)	Scale Volts Input 30	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42125 – 42126	2124 – 2125 (84C – 84D)	Scale Volts Input 31	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42127 – 42128	2126 – 2127 (84E – 84F)	Scale Volts Input 32	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
42129	2128 (850)	Remote Scale Volts Flag	Write Only	0xFF00 to execute remote scaling.	None	Unsigned integer	06, 16	Used to remote scale the Volt input. Caution! See Note 5.
43001 – 43002	3000 – 3001 (BB8 – BB9)	Scale Pulse Display 1	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	After all the Display and Input values have been sent, write 0xFF00 to register 43129.



Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
43003 – 43004	3002 – 3003 (BBA – BBB)	Scale Pulse Display 2	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43005 – 43006	3004 – 3005 (BBC – BBD)	Scale Pulse Display 3	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43007 – 43008	3006 – 3007 (BBE – BBF)	Scale Pulse Display 4	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43009 – 43010	3008 – 3009 (BC0 – BC1)	Scale Pulse Display 5	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43011 – 43012	3010 – 3011 (BC2 – BC3)	Scale Pulse Display 6	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43013 – 43014	3012 – 3013 (BC4 – BC5)	Scale Pulse Display 7	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43015 – 43016	3014 – 3015 (BC6 – BC7)	Scale Pulse Display 8	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43017 – 43018	3016 – 3017 (BC8 – BC9)	Scale Pulse Display 9	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43019 – 43020	3018 – 3019 (BCA – BCB)	Scale Pulse Display 10	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43021 – 43022	3020 – 3021 (BCC – BCD)	Scale Pulse Display 11	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43023 – 43024	3022 – 3023 (BCE – BCF)	Scale Pulse Display 12	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43025 – 43026	3024 – 3025 (BD0 – BD1)	Scale Pulse Display 13	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43027 – 43028	3026 – 3027 (BD2 – BD3)	Scale Pulse Display 14	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43029 – 43030	3028 – 3029 (BD4 – BD5)	Scale Pulse Display 15	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43031 – 43032	3030 – 3031 (BD6 – BD7)	Scale Pulse Display 16	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43033 – 43034	3032 – 3033 (BD8 – BD9)	Scale Pulse Display 17	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43035 – 43036	3034 – 3035 (BDA – BDB)	Scale Pulse Display 18	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43037 – 43038	3036 – 3037 (BDC – BDD)	Scale Pulse Display 19	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43039 – 43040	3038 – 3039 (BDE – BDF)	Scale Pulse Display 20	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
43041 – 43042	3040 – 3041 (BE0 – BE1)	Scale Pulse Display 21	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43043 – 43044	3042 – 3043 (BE2 – BE3)	Scale Pulse Display 22	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43045 – 43046	3044 – 3045 (BE4 – BE5)	Scale Pulse Display 23	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43047 – 43048	3046 – 3047 (BE6 – BE7)	Scale Pulse Display 24	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43049 – 43050	3048 – 3049 (BE8 – BE9)	Scale Pulse Display 25	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43051 – 43052	3050 – 3051 (BEA – BEB)	Scale Pulse Display 26	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43053 – 43054	3052 – 3053 (BEC – BED)	Scale Pulse Display 27	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43055 – 43056	3054 – 3055 (BEE – BEF)	Scale Pulse Display 28	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43057 – 43058	3056 – 3057 (BF0 – BF1)	Scale Pulse Display 29	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43059 – 43060	3058 – 3059 (BF2 – BF3)	Scale Pulse Display 30	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43061 – 43062	3060 – 3061 (BF4 – BF5)	Scale Pulse Display 31	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43063 – 43064	3062 – 3063 (BF6 – BF7)	Scale Pulse Display 32	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
43065 – 43066	3064 – 3065 (BF8 – BF9)	Scale Pulse Input 1	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43067 – 43068	3066 – 3067 (BFA – BFB)	Scale Pulse Input 2	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43069 – 43070	3068 – 3069 (BFC – BFD)	Scale Pulse Input 3	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43071 – 43072	3070 – 3071 (BFE – BFF)	Scale Pulse Input 4	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43073 – 43074	3072 – 3073 (C00 – C01)	Scale Pulse Input 5	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43075 – 43076	3074 – 3075 (C02 – C03)	Scale Pulse Input 6	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43077 – 43078	3076 – 3077 (C04 – C05)	Scale Pulse Input 7	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
43079 – 43080	3078 – 3079 (C06 – C07)	Scale Pulse Input 8	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43081 – 43082	3080 – 3081 (C08 – C09)	Scale Pulse Input 9	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43083 – 43084	3082 – 3083 (C0A – C0B)	Scale Pulse Input 10	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43085 – 43086	3084 – 3085 (C0C – C0D)	Scale Pulse Input 11	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43087 – 43088	3086 – 3087 (C0E – C0F)	Scale Pulse Input 12	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43089 – 43090	3088 – 3089 (C10 – C11)	Scale Pulse Input 13	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43091 – 43092	3090 – 3091 (C12 – C13)	Scale Pulse Input 14	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43093 – 43094	3092 – 3093 (C14 – C15)	Scale Pulse Input 15	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43095 – 43096	3094 – 3095 (C16 – C17)	Scale Pulse Input 16	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43097 – 43098	3096 – 3097 (C18 – C19)	Scale Pulse Input 17	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43099 – 43100	3098 – 3099 (C1A – C1B)	Scale Pulse Input 18	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43101 – 43102	3100 – 3101 (C1C – C1D)	Scale Pulse Input 19	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43103 – 43104	3102 – 3103 (C1E – C1F)	Scale Pulse Input 20	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43105 – 43106	3104 – 3105 (C20 – C21)	Scale Pulse Input 21	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43107 – 43108	3106 – 3107 (C22 – C23)	Scale Pulse Input 22	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43109 – 43110	3108 – 3109 (C24 – C25)	Scale Pulse Input 23	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43111 – 43112	3110 – 3111 (C26 – C27)	Scale Pulse Input 24	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43113 – 43114	3112 – 3113 (C28 – C29)	Scale Pulse Input 25	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43115 – 43116	3114 – 3115 (C2A – C2B)	Scale Pulse Input 26	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
43117 – 43118	3116 – 3117 (C2C – C2D)	Scale Pulse Input 27	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43119 – 43120	3118 – 3119 (C2E – C2F)	Scale Pulse Input 28	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43121 – 43122	3120 – 3121 (C30 – C31)	Scale Pulse Input 29	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43123 – 43124	3122 – 3123 (C32 – C33)	Scale Pulse Input 30	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43125 – 43126	3124 – 3125 (C34 – C35)	Scale Pulse Input 31	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43127 – 43128	3126 – 3127 (C36 – C37)	Scale Pulse Input 32	Read Write	0.0 to 99999.9	Hz	Floating point	03, 04, 06, 16	
43129	3128 (C38)	Remote Scale Pulse Flag	Write Only	0xFF00 to execute remote scaling.	None	Unsigned integer	06, 16	Used to remote scale the Pulse input. Caution! See Note 5.
44001 – 44002	4000 – 4001 (FA0 – FA1)	Scale PV2 mA Display 1	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	After all the Display and Input values have been sent, write 0xFF00 to register 44129.
44003 – 44004	4002 – 4003 (FA2 – FA3)	Scale PV2 mA Display 2	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
44005 – 44006	4004 – 4005 (FA4 – FA5)	Scale PV2 mA Display 3	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
44007 – 44008	4006 – 4007 (FA6 – FA7)	Scale PV2 mA Display 4	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
44009 – 44010	4008 – 4009 (FA8 – FA9)	Scale PV2 mA Display 5	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
44011 – 44012	4010 – 4011 (FAA – FAB)	Scale PV2 mA Display 6	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
44013 – 44014	4012 – 4013 (FAC – FAD)	Scale PV2 mA Display 7	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
44015 – 44016	4014 – 4015 (FAE – FAF)	Scale PV2 mA Display 8	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
44017 – 44018	4016 – 4017 (FB0 – FB1)	Scale PV2 mA Input 1	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
44019 – 44020	4018 – 4019 (FB2 – FB3)	Scale PV2 mA Input 2	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
44021 – 44022	4020 – 4021 (FB4 – FB5)	Scale PV2 mA Input 3	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
44023 – 44024	4022 – 4023 (FB6 – FB7)	Scale PV2 mA Input 4	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
44025 – 44026	4024 – 4025 (FB8 – FB9)	Scale PV2 mA Input 5	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
44027 – 44028	4026 – 4027 (FBA – FBB)	Scale PV2 mA Input 6	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
44029 – 44030	4028 – 4029 (FBC – FBD)	Scale PV2 mA Input 7	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
44031 – 44032	4030 – 4031 (FBE – FBF)	Scale PV2 mA Input 8	Read Write	-99.999 to 99.999	mA	Floating point	03, 04, 06, 16	
44129	4128 (1020)	Remote Scale PV2 mA Flag	Write Only	0xFF00 to execute remote scaling.	None	Unsigned integer	06, 16	Used to remote scale the PV2 mA input. Caution! See Note 5.
45001 – 45002	5000 – 5001 (1388 – 1389)	Scale PV2 Volts Display 1	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	After all the Display and Input values have been sent, write 0xFF00 to register 45129.
45003 – 45004	5002 – 5003 (138A – 138B)	Scale PV2 Volts Display 2	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
45005 – 45006	5004 – 5005 (138C – 138D)	Scale PV2 Volts Display 3	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
45007 – 45008	5006 – 5007 (138E – 138F)	Scale PV2 Volts Display 4	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
45009 – 45010	5008 – 5009 (1390 – 1391)	Scale PV2 Volts Display 5	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
45011 – 45012	5010 – 5011 (1392 – 1393)	Scale PV2 Volts Display 6	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
45013 – 45014	5012 – 5013 (1394 – 1395)	Scale PV2 Volts Display 7	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
45015 – 45016	5014 – 5015 (1396 – 1397)	Scale PV2 Volts Display 8	Read Write	-99999 to 999999	User defined	Floating point	03, 04, 06, 16	
45017 – 45018	5016 – 5017 (1398 – 1399)	Scale PV2 Volts Input 1	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
45019 – 45020	5018 – 5019 (139A – 139B)	Scale PV2 Volts Input 2	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
45021 – 45022	5020 – 5021 (139C – 139D)	Scale PV2 Volts Input 3	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
45023 – 45024	5022 – 5023 (139E – 139F)	Scale PV2 Volts Input 4	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	

Register <sup>1</sup>		Name	Access	Limits or Range <sup>2</sup>	Units	Data Type <sup>3</sup>	Function Code(s)	Comments
Number	Address (hex)							
45025 – 45026	5024 – 5025 (13A0 – 13A1)	Scale PV2 Volts Input 5	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
45027 – 45028	5026 – 5027 (13A2 – 13A3)	Scale PV2 Volts Input 6	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
45029 – 45030	5028 – 5029 (13A4 – 13A5)	Scale PV2 Volts Input 7	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
45031 – 45032	5030 – 5031 (13A6 – 13A7)	Scale PV2 Volts Input 8	Read Write	-99.999 to 99.999	Volt	Floating point	03, 04, 06, 16	
45129	5128 (1408)	Remote Scale PV2 Volts Flag	Write Only	0xFF00 to execute remote scaling.	None	Unsigned integer	06, 16	Used to remote scale the PV2 Volts input. Caution! See Note 5.
49901 – 49904	9900-9903 (26AC – 26AF)	Product Identifier	Read Only	Not applicable	None	ASCII characters	03, 04	8 characters indicating the product digit software release number (for SFT039 this would be 039), three ASCII hex character value of the Main board input, and two ASCII hex characters of the Input card (see Table 6).
49905 – 49908	9904-9907 (26B0 – 26B3)	Firmware Version	Read Only	Not applicable	None	ASCII characters	03, 04	8 characters indicating the firmware version number
49999	9998 (270E)	Load Factory Defaults	Write Only	0xFF00 to initialize	None	Unsigned integer	06, 16	Write 0xFF00 to load factory defaults to the meter. Writing any other data has no effect.

Notes

Note 1. The Register numbers and addresses follow the Modbus format:

- 3xxxx are for Input Registers and are read – only.
- 4xxxx are for Holding Registers and are read/write.

Although there are no specific 3x Registers, all 4x Registers are mirrored into 3x register space, and are therefore capable of being read by Modbus function 04 (Read Input Registers). All data addresses in Modbus messages are referenced to zero (0), while Register addresses are referenced to one (1). For example, Register 40100 is sent in the Modbus message as 0x0063 (100 - 1 = 99 ≡ 63 hex). If two addresses are shown separated by a “ – ”, they form a register pair to make the parameter into a 4-byte (32 bit) value.

Note 2. Limits or Range: Writing a value that is outside the parameters range will force it to be limited to the closest value within the range. For example, if the range is -1.99 to +1.99 and the value sent is 3.21, the value used is 1.99. Likewise for the lower side of the range. Exceptions are noted in the comments.

Note 3. Data Types:

Data format is highest byte first.

Word = 16 bit

Integer = -32768 to 32767

Unsigned integer = 0 to 65535

Long = -2,147,483,648 to 2,147,483,647

Float = IEEE floating point format, 4 bytes

Integers data: The values represent the number without regard to the decimal point. The decimal point setting can be found in Holding Register 40102.

For example, if the number 1234.56 is displayed, a read of both 40021 – 40022 together will return 1 – 23456 (0x0001 – 0xE240). Register 40102 will contain 2 (0x0002) to indicate a decimal point setting of two places to the right of the decimal point. A floating point version of the displayed number, with the decimal point included, is also available by accessing register 40001 – 40002.

Example (register values are shown in hexadecimal):

Process value displayed	Registers 40001 – 40002	Register 40021	Register 40022	Register 40102
123.456	42F6 – E979	0001	E240	0003
1234.56	449A – 51EC	0001	E240	0002
12345.6	4640 – E666	0001	E240	0001
-1234.5	C49A – 5000	FFFF	CFC7	0001

Note 4. A read of the Password register will return 0x000000 if the meter is unlocked, otherwise it will return 0xFFFFFFFF to indicate a locked meter. To unlock, the correct lock number must be written, which will then clear the lock number to 0x000000. If the wrong lock number is written, the reply will return 0xFFFFFFFF. If the correct lock number is written, the reply will be 0x000000. An unlocked meter can be locked by writing any non – zero value up to 0x999999.

Note 5. Remote scaling procedure:

- a. Write the desired values for the display, Display 1 & 2, for the active input type. The active input type is selected using the Input Selection register 40101 and Table 1.
- b. Write the desired values for the input, Input 1 & 2, for the active input type.
- c. Write to the remote scaling register for the active input type.

**Warning!**

*The scaling process takes the input values and converts them to A/D counts. Therefore, do NOT execute a remote scaling register write without first writing the display and input registers. In a similar vein, don't write to the mA registers and then execute a remote scale command for the volts input.*

**Warning!**

*Always allow the meter and the signal input circuitry to warm – up at least 20 minutes prior to calibrations. The scaling process takes the input values in mA or volts and converts them to A/D counts. Therefore, do NOT execute a remote scaling register write without first writing the display and input registers. In a similar vein, don't write to the mA (volts) registers and then execute a remote scale command for the volts (mA) input.*

Tables

Table 1. Input configuration (40101)

Valid input configuration settings are dependent on the meter type (i.e. temperature type and unit settings are only valid when the meter has a temperature input – otherwise the bits are 0's for both read and write).

Bit(s)	15, 14, 13, 12, 11, 10, 9, 8	7	6, 5, 4	3, 2, 1, 0
Function	Input Setting	Temperature Unit Setting	Decimal Point Setting	Temperature Type Setting

00000000	Volts	0 °C	000 ddddd (ddd for temperature)	0000 Type J thermocouple
00010001	Current	1 °F	001 dddd.d (ddd.d for temperature)	0001 Type K thermocouple
00100010	RTD		010 dddd.dd	0010 Type T thermocouple
00100011	Thermocouple		011 ddd.ddd	0011 Type E thermocouple
10000000	Pulse		100 dd.ddd	0100 Type R thermocouple
			101 d.ddd	0101 Type S thermocouple
			110 dddd°u (° symbol temp unit displayed)	0110 Type B thermocouple
			111 dddd.du (temperature unit displayed)	0111 Type N thermocouple
				1000 Type C thermocouple
				1001 100 Ω Platinum RTD (385)
				1010 100 Ω Platinum RTD (392)
				1011 1000 Ω Platinum RTD (385)
				1100 1000 Ω Platinum RTD (392)
				1101 10 Ω Copper RTD
				1110 120 Ω Nickel RTD



Table 2. Display Settings

**Big Display Settings (40117)**

Integer	Function
00	Display Process Value
01	Display Set Point 1
02	Display Set Point 2
03	Display Set Point 3
04	Display Set Point 4
05	Display Set Point 5
06	Display Set Point 6
07	Display Set Point 7
08	Display Set Point 8
09	Display Maximum Display Value
10	Display Minimum Display Value
11	Display Maximum / Minimum Display Value
12	Display Rate
13	Display Total
14	Display Grand Total
15	Display Rate / Total
16	Display Rate / Grand Total
17	Display Batch Counter
18	Modbus Display
19	Display PV2
20	Display PCT (PV1 %)

**Little Display Settings (40118)**

Integer	Function
00	Display Process Value
01	Display Set Point 1
02	Display Set Point 2
03	Display Set Point 3
04	Display Set Point 4
05	Display Set Point 5
06	Display Set Point 6
07	Display Set Point 7
08	Display Set Point 8
09	Display Maximum Display Value
10	Display Minimum Display Value
11	Display Maximum / Minimum Display Value
12	Display Rate
13	Display Total
14	Display Grand Total
15	Display Rate / Total
16	Display Rate / Grand Total
17	Display Batch Counter
18	Modbus Display
19	Display PV2
20	Display PCT (PV1 %)
21	Display Engineering Units
22	Display Set 1 / Rate (Batch only)
23	Display OFF

Table 3. User Programmable Settings

Digital Inputs & Function Keys Setting (40152 – 40162)

Integer	Function
0	Disable Function
1	Menu Key
2	Right Arrow Key
3	Up Arrow Key
4	Enter Key
5	Acknowledge Alarms
6	Select Reset Menu
7	Select Reset Batch Counter
8	Select Reset Total
9	Select Reset Grand Total
10	Select Reset Maximum Value
11	Select Reset Minimum Value
12	Select Reset Max & Min Values
13	Reserved
14	Reserved
15	Select Relay Menu
16	Select Set Point 1 Programming
17	Select Set Point 2 Programming
18	Select Set Point 3 Programming
19	Select Set Point 4 Programming
20	Select Set Point 5 Programming
21	Select Set Point 6 Programming
22	Select Set Point 7 Programming
23	Select Set Point 8 Programming
24	Select Start Batch
25	Select Stop Batch
26	Reserved
27	Select Relay Disable
28	Select Relay Enable
29	Select Relay Output Hold
30	Reserved
31	Select Display Menu
32	Select Big Display Menu
33	Select Maximum Value on Big Display
34	Select Minimum Value on Big Display
35	Select Maximum/Minimum Value on Big Display
36	Select Little Display Menu
37	Select Maximum Value on Little Display
38	Select Minimum Value on Little Display
39	Select Maximum/Minimum Value on Little Display
40	Force ON Relay #1 (Relay 1 Action must be set to Off)
41	Force ON Relay #2 (Relay 2 Action must be set to Off)
42	Force ON Relay #3 (Relay 3 Action must be set to Off)
43	Force ON Relay #4 (Relay 4 Action must be set to Off)
44	Select Grand Total Value on Little Display (Batch)
45	Select Batch Count Value on Little Display (Batch)

Key, DI	Reg. No.
F1	152
F2	153
F3	154
DI-1	155
DI-2	156
DI-3	157
DI-4	158
DI-5	159
DI-6	160
DI-7	161
DI-8	162

Digital Outputs Settings (40163 – 40169)

Integer	Function
0	Disable Function
1	Alarms Acknowledged
2	End of Batch
3	Batch Counter Reset
4	Total Reset
5	Grand Total Reset
6	Maximum Value Reset
7	Minimum Value Reset
8	Maximum/Minimum Value Reset
9	Reserved
10	Reserved
11	Alarm 1 Active
12	Alarm 2 Active
13	Alarm 3 Active
14	Alarm 4 Active
15	Alarm 5 Active
16	Alarm 6 Active
17	Alarm 7 Active
18	Alarm 8 Active
19	Start Batch Selected
20	Stop Batch Selected

DO	Reg. No.
DO-1	163
DO-2	164
DO-3	165
DO-4	166
DO-5	167
DO-6	168
DO-7	169
DO-8	170

Note: Some of the functions listed are dependent on model being used. For example: the batch functions are only available with the batch controller model.

Table 4. Relay Configuration Mode (40301, 310, ... 364)

Bit(s)	15 – 10	9 – 8	7	6	5 – 3	2 – 0
Function	Reserved	Sensor Break	Fail-Safe	Preclose	Action	Assignment
000000	00 Ignore	0 Normal	0 Normal	000 Automatic reset	000 Process Value (Temp/Rate)	
	01 OFF	1 Failsafe	1 Preclose	001 Auto & Manual reset	001 Total	
	10 ON			010 Latching	010 Grand Total	
				011 Latching with Clear	011 Modbus Input (40072 – 73) Big	
				100 Pump Alternation		
				101 Sample		
				110 Unused		
				111 Off (Disabled)		

Relay Registers
Rly1: 301
Rly2: 310
Rly3: 319
Rly4: 328
Rly5: 337
Rly6: 346
Rly7: 355
Rly8: 364

Table 5. 4-20 mA Output Data Source Modes (40402)

Integer	Function
0	Process Value (Temp/Rate)
1	Max Display Value
2	Min Display Value
3	Modbus Input (40072 – 73) Big Display
4	Total
5	Grand Total
6	Set Point 1
7	Set Point 2
8	Set Point 3
9	Set Point 4
10	Set Point 5
11	Set Point 6
12	Set Point 7
13	Set Point 8
14	Reserved
15	Factory Use Only

Table 6. Input Identification Configuration (49901 – 49904)

Firmware Identifier

Byte	Product
039	MPM, APM, PPM
063	LTI

Main Board Configuration

Byte	Function
000	Process / Temp
100	Process Totalizer
200	Pulse Totalizer
300	Dual Process
400	Reserved
500	Process Batching
600	Pulse Batching
700	Reserved

Input Board Configuration

Byte	Function
00	Reserved

Note: Each register holds two ASCII characters.

Example: APM (SFT039)

49901: 0x3033 = 03

49902: 0x3930 = 91

49903: 0x3030 = 00

49904: 0x3030 = 00

Table 7. Allowable ASCII Character Set (40076 – 81, 40082 – 87, 40119 – 124)

Display	HEX	ASCII
0	30	0
1	31	1
2	32	2
3	33	3
4	34	4
5	35	5
6	36	6
7	37	7
8	38	8
9	39	9

Display	HEX	ASCII
A	41	A
b	62	b
C	43	C
c	63	c
d	64	d
E	45	E
F	46	F
G	47	G
g	67	g
H	48	H
h	68	h
I	49	I
i	69	i

Display	HEX	ASCII
J	4A	J
K	4B	K
L	4C	L
m	6D	m
n	6E	n
O	4F	O
o	6F	o
P	50	P
q	71	q
r	72	r
S	53	S
t	74	t
u	75	u

Display	HEX	ASCII
V	56	V
w	77	w
X	58	X
Y	59	Y
Z	5A	Z
-	2D	-
/	2F	/
]	5B	]
[	5D	[
=	3D	=
SP	20	SP
<	3C	<

