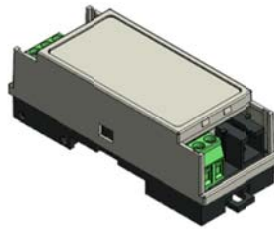


OCI Series

OCI417.10

for use with LME7... Flame Safeguards



OCI417.10

Description

The OCI417.10 provides the LME7... family of flame safeguards with a Modbus RTU or BACnet MS/TP interface. This allows the interconnection of one or more LME7... to a PLC or building management system (BMS).

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Compatible Controls

Flame Safeguards

- LME71...
- LME73...

PME Modules

- PME71...
- PME73...

Physical Connections

Power

Power to the OCI417.10 must be either 9-24VDC or 9-24VAC (nominal). Power consumption is 2.5W or less.

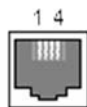
Terminal designations:

Label	Function
L+	DC + / AC ~
N-	DC - / AC ~

Connection to LME7...

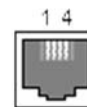
The connection from the OCI417.10 to the LME7... should be made with a 4-wire RJ-11 cable with reversed connections (voice cable), such as **SCC part number TDC207**. **Maximum allowed cable length is 3 meters.**

X56 Port LME7...



Pin 1: 5V Out
Pin 2: Transmit
Pin 3: Receive
Pin 4: 0V Out

OCI417.10



Pin 1: 0V In
Pin 2: Transmit
Pin 3: Receive
Pin 4: 5V In

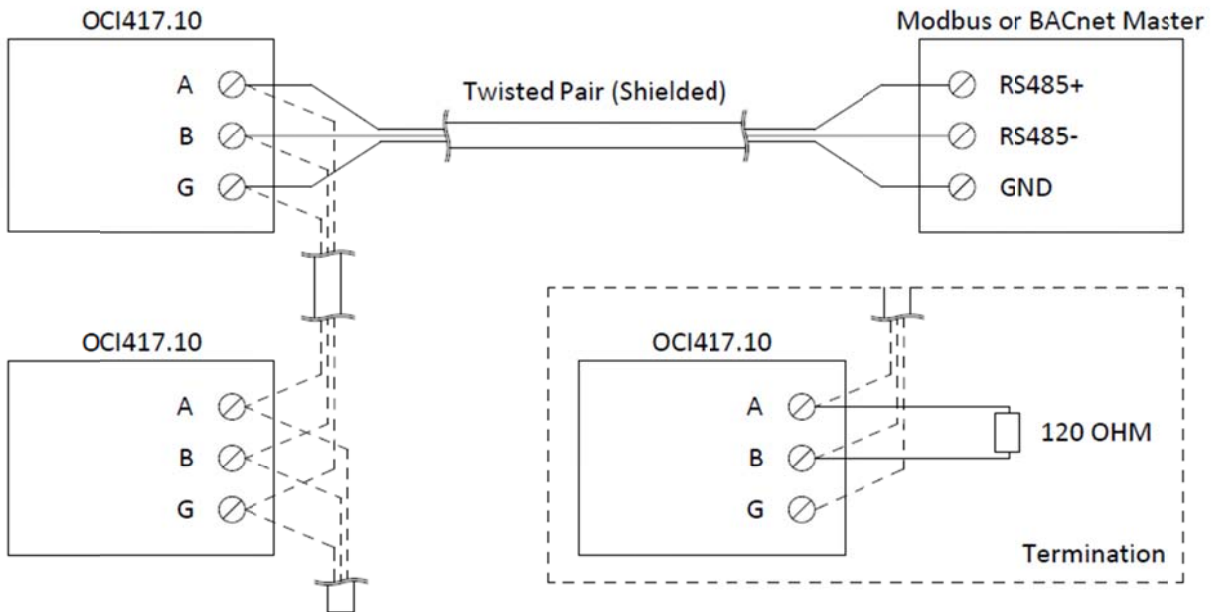
Note that while the OCI417.10 is connected, the AZL2... or PC tool ACS410 via OCI410... may not be simultaneously connected. Connecting multiple interfaces to the LME7... using a multi-way cable or splitter may result in damage to the connected LME7..., OCI417.10, AZL2... or OCI410...



Physical Connections (continued)

Connection to BMS

The connection from the BMS to the OCI417.10 is via terminal block. The physical medium is RS-485. Multiple RS-485 nodes may be connected in a daisy-chain if termination is present on the end node.



Terminal designations:

Label	Function
A	RS-485 Data (+)
B	RS-485 Data (-)
G	RS-485 Common Ground

Status LED

The status LED annunciates the status of the OCI417.10 and the connection to the LME7...

Color	Status
Green Flashing	No Connection to LME7...
Green / Red Alternating	Communicating with LME7...
Red Flashing	Internal Error OCI417.10

Tx/Rx LED

The LED will flash green to indicate incoming communication on the RS-485 connection. The LED will flash red to indicate outgoing communication. With normal communication, the LED will rapidly alternate between green and red. NOTE: If the incoming poll rate is fast the red flashes may be very brief and hard to notice.

Modbus RTU Connection Details

Modbus RTU protocol selection and addressing is done using the PC tool **OCI417 Configuration Utility** (see next section). **Note that the LME7... must be disconnected from the OCI417.10 while connection via USB is made or damage may result to the LME7..., OCI417.10 or PC.**

Supported addresses: 1-247

Supported baud rates: 2400, 4800, 9600, 19200, 38400, 57600 and 115200

Supported data bits: 8

Supported parity and stop bits: none (1 or 2 stop bits), odd (1 stop bit) and even (1 stop bit)

Supported function codes: 3 (read holding registers), 4 (read input registers)

Maximum read length: 100 (if beginning and ending registers are valid addresses)

BACnet MS/TP Connection Details

BACnet MS/TP protocol selection and addressing is done using the PC tool **OCI417 Configuration Utility** (see next section). **Note that the LME7... must be disconnected from the OCI417.10 while connection via USB is made or damage may result to the LME7..., OCI417.10 or PC.**

Supported addresses: 0-127

Supported baud rates: 9600, 19200, 38400, 57600, 76800 and 115200

Supported data bits: 8

Supported parity and stop bits: none (1 stop bit)

Supported device instances: 0-4194302

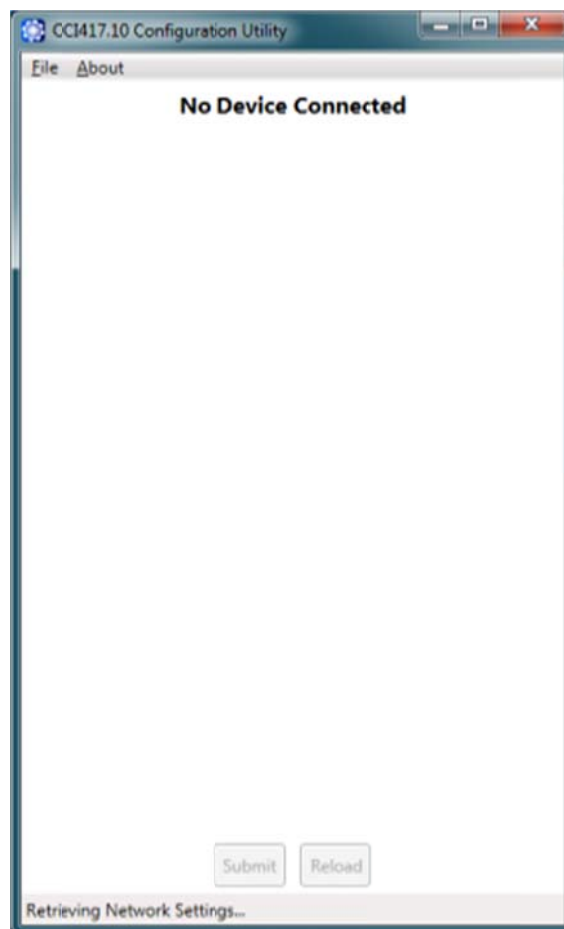
Configuration Utility

Using the Configuration Utility

1. Double-click the icon to open the configuration utility.

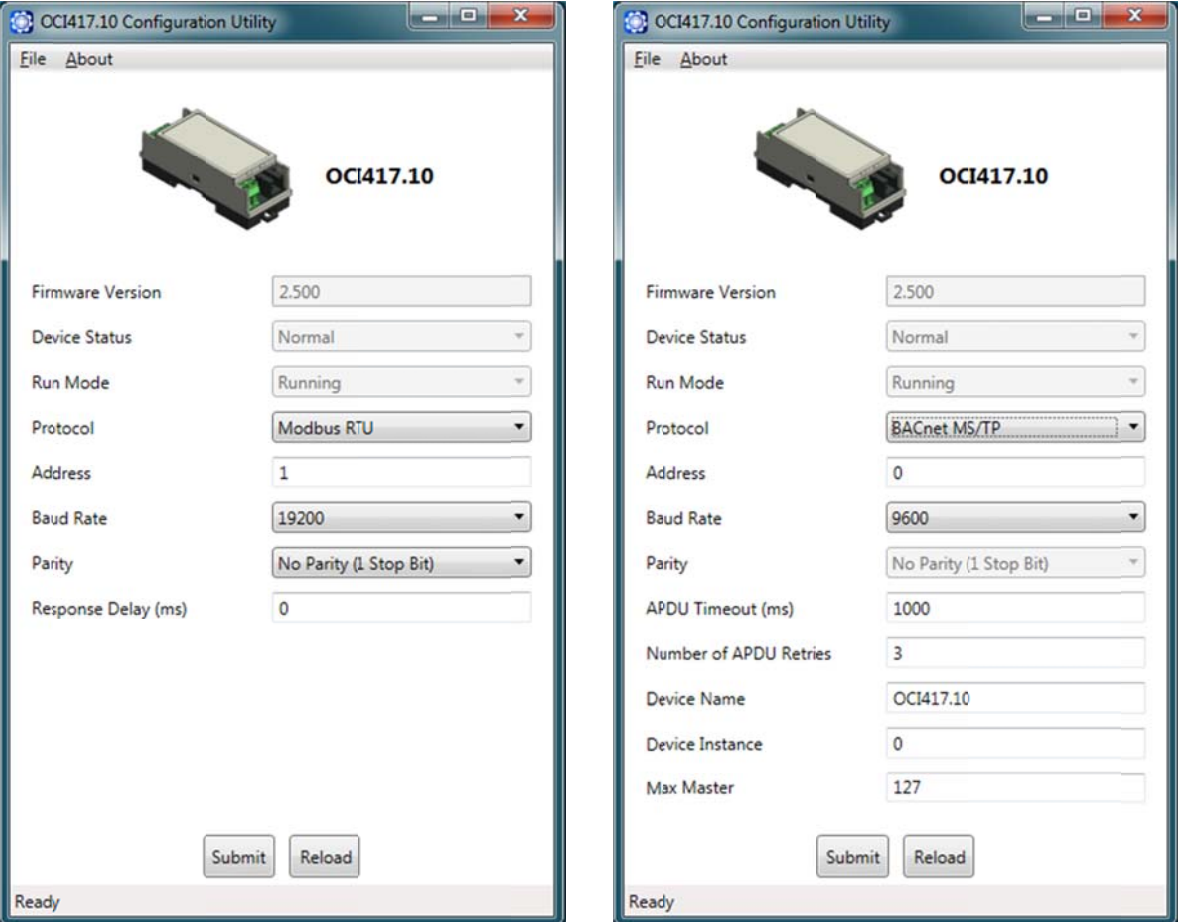


2. The utility will open and show the connection status of the OCI417.10.



Configuration Utility (continued)

3. Use a mini-USB cable to connect the OCI417.10 to the computer. A driver may self-install the first time a connection is made. The connected device will then be indicated on the screen.



The image displays two side-by-side screenshots of the 'OCI417.10 Configuration Utility' window. Both windows show a top menu bar with 'File' and 'About'. Below the menu is a header area featuring a small image of the OCI417.10 device and the text 'OCI417.10'. The main area contains a list of configuration parameters, each with a label and a corresponding input field or dropdown menu. At the bottom of each window are 'Submit' and 'Reload' buttons, and a 'Ready' status indicator.

Parameter	Left Screenshot Value	Right Screenshot Value
Firmware Version	2.500	2.500
Device Status	Normal	Normal
Run Mode	Running	Running
Protocol	Modbus RTU	BACnet MS/TP
Address	1	0
Baud Rate	19200	9600
Parity	No Parity (1 Stop Bit)	No Parity (1 Stop Bit)
Response Delay (ms)	0	-
APDU Timeout (ms)	-	1000
Number of APDU Retries	-	3
Device Name	-	OCI417.10
Device Instance	-	0
Max Master	-	127

4. The protocol can be changed between Modbus RTU and BACnet MS/TP from this screen. See the previous sections for further details on the protocol-specific settings that can be changed. Once the desired settings have been entered, click **Submit** to apply. Click **Reload** to refresh the displayed settings.

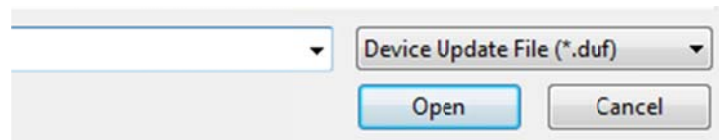
Configuration Utility (continued)

Updating Firmware

1. From the OCI417.10 Configuration Utility, click **File -> Update Device...**



2. Locate the supplied update file with a **.duf** extension and click **Open**.



3. The device will automatically reboot and reconnect with the OCI417.10 Configuration Utility once the firmware update is complete. When a device is connected, the firmware version is shown as one of the read-only parameters.

Firmware Version 2.500

Modbus Mapping

Point Name	Address	Words	Format	Access	Notes
PHASE	0	1	U16	R	
FLAME INTENSITY	1	1	U16	R	x10
MAINS VOLTAGE	2	1	U16	R	x10
STARTUPS RESETTABLE	3	2	U32	R	
STARTUPS TOTAL	5	2	U32	R	
RELAY K12 CYCLES	7	2	U32	R	
RELAY K11 CYCLES	9	2	U32	R	
RELAY K2 CYCLES	11	2	U32	R	
RELAY K1 CYCLES	13	2	U32	R	
MAX RELAY CYCLES	15	2	U32	R	
CURRENT OUTPUT PERCENT	17	1	U16	R	> 100 IS STAGES (101=S1, 102=S2)
ACTUATOR ACTUAL PERCENT	18	1	U16	R	65535 (-1) IS NOT OPTIONED
ACTUATOR TARGET PERCENT	19	1	U16	R	65535 (-1) IS NOT OPTIONED
EXT LOAD CONTROLLER PERCENT	20	1	U16	R	65535 (-1) IS NOT OPTIONED
FAN SPEED RPM	21	1	U16	R	65535 (-1) IS NOT OPTIONED
FAN SPEED PERCENT	22	1	U16	R	65535 (-1) IS NOT OPTIONED
TARGET FAN SPEED PERCENT	23	1	U16	R	65535 (-1) IS NOT OPTIONED
PWM SIGNAL PERCENT	24	1	U16	R	65535 (-1) IS NOT OPTIONED
STATUS INPUT WORD	25	1	U16	R	SEE BIT BREAKDOWN
>>> SAFETY LIMIT	B0		BIT	R	TERMINAL X3.04.1
>>> PROOF OF CLOSURE	B1		BIT	R	TERMINAL X2.02.4
>>> PRESS SW VALVE PROVING	B4		BIT	R	TERMINAL X9.04.2
>>> LOW GAS PRESSURE SWITCH	B5		BIT	R	TERMINAL X5.01.2
>>> CONTROL SWITCH	B6		BIT	R	TERMINAL X5.03.1
>>> COMBUSTION AIR SWITCH	B7		BIT	R	TERMINAL X3.02.1
>>> RESET REMOTE TERMINAL	B8		BIT	R	TERMINAL X2.03.1
>>> INCREASE MODULATION	B10		BIT	R	TERMINAL X5.03.3
>>> DECREASE MODULATION	B11		BIT	R	TERMINAL X5.03.2
>>> RESET BUTTON LME	B14		BIT	R	
STATUS OUTPUT WORD	26	1	U16	R	SEE BIT BREAKDOWN
<<< FLAME PRESENT	B0		BIT	R	
<<< ALARM	B1		BIT	R	TERMINAL X2.03.3
<<< NO COMM TO LME	B2		BIT	R	STATUS FROM OCI417
>>> ACTUATOR FEEDBACK (SA-R)	B6		BIT	R	TERMINAL X2.09.4
<<< SAFETY VALVE (SV)	B7		BIT	R	TERMINAL X6.03.3
<<< ACTUATOR LOW-FIRE (SA-KL)	B8		BIT	R	TERMINAL X2.09.2
<<< ACTUATOR HIGH-FIRE (SA-NL)	B9		BIT	R	TERMINAL X2.09.3
<<< PILOT VALVE (PV)	B10		BIT	R	TERMINAL X7.01.3
<<< IGNITION (Z)	B12		BIT	R	TERMINAL X4.02.3
<<< FAN	B13		BIT	R	TERMINAL X2.01.3
<<< VALVE 1 (V1)	B14		BIT	R	TERMINAL X7.04.4
<<< VALVE 2 (V2)	B15		BIT	R	TERMINAL X7.02.3
PRODUCT ID	50	10	STRING	R	
BURNER ID	60	10	STRING	R	
OEM PRODUCT ID	70	10	STRING	R	

Modbus Mapping (continued)

Point Name	Address	Words	Format	Access	Notes
PME PRODUCT ID	80	10	STRING	R	
OCI PRODUCT ID	90	10	STRING	RW	WRITABLE DATA AREA
CURRENT ERROR CODE	100	1	U16	R	
CURRENT ERROR STARTUPS	101	2	U32	R	
CURRENT ERROR PHASE	103	1	U16	R	PHASE IS 0 WHEN NO ERROR
CURRENT ERROR LOAD	104	1	U16	R	255 IS NO LOAD RECORDED
HISTORY 1 ERROR CODE	110	1	U16	R	
HISTORY 1 ERROR STARTUPS	111	2	U32	R	
HISTORY 1 ERROR PHASE	113	1	U16	R	PHASE IS 0 WHEN NO ERROR
HISTORY 1 ERROR LOAD	114	1	U16	R	255 IS NO LOAD RECORDED
HISTORY 2 ERROR CODE	120	1	U16	R	
HISTORY 2 ERROR STARTUPS	121	2	U32	R	
HISTORY 2 ERROR PHASE	123	1	U16	R	PHASE IS 0 WHEN NO ERROR
HISTORY 2 ERROR LOAD	124	1	U16	R	255 IS NO LOAD RECORDED
HISTORY 3 ERROR CODE	130	1	U16	R	
HISTORY 3 ERROR STARTUPS	131	2	U32	R	
HISTORY 3 ERROR PHASE	133	1	U16	R	PHASE IS 0 WHEN NO ERROR
HISTORY 3 ERROR LOAD	134	1	U16	R	255 IS NO LOAD RECORDED
HISTORY 4 ERROR CODE	140	1	U16	R	
HISTORY 4 ERROR STARTUPS	141	2	U32	R	
HISTORY 4 ERROR PHASE	143	1	U16	R	PHASE IS 0 WHEN NO ERROR
HISTORY 4 ERROR LOAD	144	1	U16	R	255 IS NO LOAD RECORDED
HISTORY 5 ERROR CODE	150	1	U16	R	
HISTORY 5 ERROR STARTUPS	151	2	U32	R	
HISTORY 5 ERROR PHASE	153	1	U16	R	PHASE IS 0 WHEN NO ERROR
HISTORY 5 ERROR LOAD	154	1	U16	R	255 IS NO LOAD RECORDED
HISTORY 6 ERROR CODE	160	1	U16	R	
HISTORY 6 ERROR STARTUPS	161	2	U32	R	
HISTORY 6 ERROR PHASE	163	1	U16	R	PHASE IS 0 WHEN NO ERROR
HISTORY 6 ERROR LOAD	164	1	U16	R	255 IS NO LOAD RECORDED
HISTORY 7 ERROR CODE	170	1	U16	R	
HISTORY 7 ERROR STARTUPS	171	2	U32	R	
HISTORY 7 ERROR PHASE	173	1	U16	R	PHASE IS 0 WHEN NO ERROR
HISTORY 7 ERROR LOAD	174	1	U16	R	255 IS NO LOAD RECORDED
HISTORY 8 ERROR CODE	180	1	U16	R	
HISTORY 8 ERROR STARTUPS	181	2	U32	R	
HISTORY 8 ERROR PHASE	183	1	U16	R	PHASE IS 0 WHEN NO ERROR
HISTORY 8 ERROR LOAD	184	1	U16	R	255 IS NO LOAD RECORDED
HISTORY 9 ERROR CODE	190	1	U16	R	
HISTORY 9 ERROR STARTUPS	191	2	U32	R	
HISTORY 9 ERROR PHASE	193	1	U16	R	PHASE IS 0 WHEN NO ERROR
HISTORY 9 ERROR LOAD	194	1	U16	R	255 IS NO LOAD RECORDED
HISTORY 10 ERROR CODE	200	1	U16	R	
HISTORY 10 ERROR STARTUPS	201	2	U32	R	
HISTORY 10 ERROR PHASE	203	1	U16	R	PHASE IS 0 WHEN NO ERROR
HISTORY 10 ERROR LOAD	204	1	U16	R	255 IS NO LOAD RECORDED

BACnet Mapping

Point Name	Type	Instance	Units	Active Text	Inactive Text
PHASE	ANALOG VALUE	1	NO UNITS	-	-
FLAME INTENSITY	ANALOG VALUE	2	PERCENT	-	-
MAINS VOLTAGE	ANALOG VALUE	3	VOLTS	-	-
STARTUPS RESETTABLE	ANALOG VALUE	4	NO UNITS	-	-
STARTUPS TOTAL	ANALOG VALUE	5	NO UNITS	-	-
RELAY K12 CYCLES	ANALOG VALUE	6	NO UNITS	-	-
RELAY K11 CYCLES	ANALOG VALUE	7	NO UNITS	-	-
RELAY K2 CYCLES	ANALOG VALUE	8	NO UNITS	-	-
RELAY K1 CYCLES	ANALOG VALUE	9	NO UNITS	-	-
MAX RELAY CYCLES	ANALOG VALUE	10	NO UNITS	-	-
CURRENT OUTPUT PERCENT	ANALOG VALUE	11	PERCENT	-	-
ACTUATOR ACTUAL PERCENT	ANALOG VALUE	12	PERCENT	-	-
ACTUATOR TARGET PERCENT	ANALOG VALUE	13	PERCENT	-	-
EXT LOAD CONTROLLER PERCENT	ANALOG VALUE	14	PERCENT	-	-
FAN SPEED RPM	ANALOG VALUE	15	RPM	-	-
FAN SPEED PERCENT	ANALOG VALUE	16	PERCENT	-	-
TARGET FAN SPEED PERCENT	ANALOG VALUE	17	PERCENT	-	-
PWM SIGNAL PERCENT	ANALOG VALUE	18	PERCENT	-	-
CURRENT ERROR CODE	ANALOG VALUE	19	NO UNITS	-	-
CURRENT ERROR STARTUPS	ANALOG VALUE	20	NO UNITS	-	-
CURRENT ERROR PHASE	ANALOG VALUE	21	NO UNITS	-	-
CURRENT ERROR LOAD	ANALOG VALUE	22	PERCENT	-	-
HISTORY 1 ERROR CODE	ANALOG VALUE	23	NO UNITS	-	-
HISTORY 1 ERROR STARTUPS	ANALOG VALUE	24	NO UNITS	-	-
HISTORY 1 ERROR PHASE	ANALOG VALUE	25	NO UNITS	-	-
HISTORY 1 ERROR LOAD	ANALOG VALUE	26	PERCENT	-	-
HISTORY 2 ERROR CODE	ANALOG VALUE	27	NO UNITS	-	-
HISTORY 2 ERROR STARTUPS	ANALOG VALUE	28	NO UNITS	-	-
HISTORY 2 ERROR PHASE	ANALOG VALUE	29	NO UNITS	-	-
HISTORY 2 ERROR LOAD	ANALOG VALUE	30	PERCENT	-	-
HISTORY 3 ERROR CODE	ANALOG VALUE	31	NO UNITS	-	-
HISTORY 3 ERROR STARTUPS	ANALOG VALUE	32	NO UNITS	-	-
HISTORY 3 ERROR PHASE	ANALOG VALUE	33	NO UNITS	-	-
HISTORY 3 ERROR LOAD	ANALOG VALUE	34	PERCENT	-	-
HISTORY 4 ERROR CODE	ANALOG VALUE	35	NO UNITS	-	-
HISTORY 4 ERROR STARTUPS	ANALOG VALUE	36	NO UNITS	-	-
HISTORY 4 ERROR PHASE	ANALOG VALUE	37	NO UNITS	-	-
HISTORY 4 ERROR LOAD	ANALOG VALUE	38	PERCENT	-	-
HISTORY 5 ERROR CODE	ANALOG VALUE	39	NO UNITS	-	-
HISTORY 5 ERROR STARTUPS	ANALOG VALUE	40	NO UNITS	-	-
HISTORY 5 ERROR PHASE	ANALOG VALUE	41	NO UNITS	-	-
HISTORY 5 ERROR LOAD	ANALOG VALUE	42	PERCENT	-	-
HISTORY 6 ERROR CODE	ANALOG VALUE	43	NO UNITS	-	-
HISTORY 6 ERROR STARTUPS	ANALOG VALUE	44	NO UNITS	-	-
HISTORY 6 ERROR PHASE	ANALOG VALUE	45	NO UNITS	-	-

BACnet Mapping (continued)

Point Name	Type	Instance	Units	Active Text	Inactive Text
HISTORY 6 ERROR LOAD	ANALOG VALUE	46	PERCENT	-	-
HISTORY 7 ERROR CODE	ANALOG VALUE	47	NO UNITS	-	-
HISTORY 7 ERROR STARTUPS	ANALOG VALUE	48	NO UNITS	-	-
HISTORY 7 ERROR PHASE	ANALOG VALUE	49	NO UNITS	-	-
HISTORY 7 ERROR LOAD	ANALOG VALUE	50	PERCENT	-	-
HISTORY 8 ERROR CODE	ANALOG VALUE	51	NO UNITS	-	-
HISTORY 8 ERROR STARTUPS	ANALOG VALUE	52	NO UNITS	-	-
HISTORY 8 ERROR PHASE	ANALOG VALUE	53	NO UNITS	-	-
HISTORY 8 ERROR LOAD	ANALOG VALUE	54	PERCENT	-	-
HISTORY 9 ERROR CODE	ANALOG VALUE	55	NO UNITS	-	-
HISTORY 9 ERROR STARTUPS	ANALOG VALUE	56	NO UNITS	-	-
HISTORY 9 ERROR PHASE	ANALOG VALUE	57	NO UNITS	-	-
HISTORY 9 ERROR LOAD	ANALOG VALUE	58	PERCENT	-	-
HISTORY 10 ERROR CODE	ANALOG VALUE	59	NO UNITS	-	-
HISTORY 10 ERROR STARTUPS	ANALOG VALUE	60	NO UNITS	-	-
HISTORY 10 ERROR PHASE	ANALOG VALUE	61	NO UNITS	-	-
HISTORY 10 ERROR LOAD	ANALOG VALUE	62	PERCENT	-	-
SAFETY LIMIT	BINARY VALUE	1	-	CLOSED	OPEN
PROOF OF CLOSURE	BINARY VALUE	2	-	CLOSED	OPEN
PRESS SW VALVE PROVING	BINARY VALUE	3	-	CLOSED	OPEN
LOW GAS PRESSURE SWITCH	BINARY VALUE	4	-	CLOSED	OPEN
CONTROL SWITCH	BINARY VALUE	5	-	CLOSED	OPEN
COMBUSTION AIR SWITCH	BINARY VALUE	6	-	CLOSED	OPEN
RESET REMOTE TERMINAL	BINARY VALUE	7	-	CLOSED	OPEN
INCREASE MODULATION	BINARY VALUE	8	-	CLOSED	OPEN
DECREASE MODULATION	BINARY VALUE	9	-	CLOSED	OPEN
RESET BUTTON LME	BINARY VALUE	10	-	CLOSED	OPEN
FLAME PRESENT	BINARY VALUE	11	-	FLAME	NO FLAME
ALARM	BINARY VALUE	12	-	ALARM	NO ALARM
NO COMM TO LME	BINARY VALUE	13	-	OK	NO COMM
ACTUATOR FEEDBACK (SA-R)	BINARY VALUE	14	-	CLOSED	OPEN
SAFETY VALVE (SV)	BINARY VALUE	15	-	CMD ON	CMD OFF
ACTUATOR LOW-FIRE (SA-KL)	BINARY VALUE	16	-	CMD ON	CMD OFF
ACTUATOR HIGH-FIRE (SA-NL)	BINARY VALUE	17	-	CMD ON	CMD OFF
PILOT VALVE (PV)	BINARY VALUE	18	-	CMD ON	CMD OFF
IGNITION (Z)	BINARY VALUE	19	-	CMD ON	CMD OFF
FAN	BINARY VALUE	20	-	CMD ON	CMD OFF
VALVE 1 (V1)	BINARY VALUE	21	-	CMD ON	CMD OFF
VALVE 2 (V2)	BINARY VALUE	22	-	CMD ON	CMD OFF

Additional Notes

Unused Inputs

Any inputs unused by the selected PME... will still annunciate. For example, although PME71.111A1 does not support valve proving, applying 120VAC to terminal X9-04.2 will still cause Modbus address 25, bit 4 to show this terminal as active.

Data Buffer (Modbus)

Modbus address 90 normally displays the string containing the OCI product ID. This can be overwritten with any string desired by the user. Alternatively, it may also be used as a data buffer for any type of Modbus values. This data occupies Modbus addresses 90 – 99.

Appendix - Phases

NUMBER	DESCRIPTION
0	LOCKOUT PHASE
1	UNDERVOLTAGE
2	OVERVOLTAGE
3	START PREVENTION SAFETY LOOP
4	START PREVENTION EXTRANEIOUS LIGHT
8	TEST
10	HOME RUN
12	STANDBY
21	START RELEASE
22	FAN ON
24	DRIVE TO PREPURGE
30	PREPURGE 1
32	PREPURGE 2
34	PREPURGE 3
36	DRIVE TO IGNITION
38	IGNITION ON
40	TSA1 VALVE ON
42	TSA1 IGNITION OFF
43	POSTIGNITION
44	INTERVAL 1
50	SAFETY TIME 2
52	INTERVAL 2
54	DRIVE TO LOW FIRE
60	NORMAL OPERATION
62	OPERATION AT LOW FIRE
70	AFTERBURN
72	DRIVE TO POSTPURGE
74	POSTPURGE 1
76	POSTPURGE 2
78	POSTPURGE 3
79	HOME RUN 2
80	VALVE PROVING EVACUATION
81	VALVE PROVING ATMOSPHERIC
82	VALVE PROVING FILLING
83	VALVE PROVING PRESSURE
90	GAS SHORTAGE
99	NO COMMUNICATION TO LME

Appendix – Error Codes

CODE	DESCRIPTION
0	NO ERROR
2	NO FLAME AT END OF SAFETY TIME TSA1
3	AIR PRESSURE FAILURE OFF
4	EXTRANEIOUS LIGHT ON BURNER START
5	AIR PRESSURE FAILURE ON
6	ACTUATOR FAILURE
7	LOSS OF FLAME
8	ERROR TIME EXCEEDED OIL PREHEATER
9	LOSS OF FLAME TWO-STAGE
10	INTERNAL ERROR
12	VALVE PROVING – VALVE 1 LEAKING
13	VALVE PROVING – VALVE 2 LEAKING
14	CPI / POC ERROR
20	LOW GAS PRESSURE SWITCH
21	HIGH GAS PRESSURE SWITCH
22	SAFETY LIMIT OPEN
60	LOAD CONTROLLER INPUT INVALID
83	FAN SPEED ERROR
137	RESTORE OR BACKUP ABORTED
138	LOCKOUT AFTER PME RESTORE
139	UNKNOWN PME MODULE
140	PC TOOL RESTORE NOT COMPLETED
167	MANUAL LOCKOUT
225	PARAMETER PLAUSIBILITY ERROR PWM
226	PARAMETER PLAUSIBILITY ERROR
227	PARAMETER PLAUSIBILITY ERROR MIN / MAX

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