



PF2200-SB

MODBUS REGISTERS

Doc_v1.2 / FW 1.3.1



REGISTERS FOR THE PF2200 MODBUS

The Input Registers (300xx) are mirrored in corresponding Holding Registers (400xx) for convenience and to maintain compatibility with some PLCs.

Use the Read Input Register command (0x04) to read the Input Registers (300xx).

Use the Read Holding Registers command (0x03) to read the Holding Registers (400xx).

Example 1: Read Single Register - Reading 1 register starting from Register Offset 3 will result in two data bytes being returned. The first byte will be the most significant byte of Register Offset 3, and the second byte will be the least significant byte.

Example 2: Read Multiple Registers - Reading 2 registers starting from Register Offset 3 will result in four data bytes being returned. The first byte will be the most significant byte of Register Offset 3, the second byte will be the least significant byte of Register Offset 3, the third byte will be the most significant byte of Register Offset 4, and the fourth byte will be the least significant byte of Register Offset 4.

Example 3: Read Float or uint32_t - Reading 1 float register starting from Register Offset 3 will result in four data bytes being returned. The first byte will be the most significant byte of the Register Offset 3, the second byte will be the least significant byte of Register offset 3, the third byte will be the most significant byte of Register Offset 4, and the fourth byte will be the least significant byte of Register Offset 4.

To help find registers more efficiently, use the links in the table below.

Register Headings		
TEMPERATURES	LEVELS/VALVES/AUX	PRESSURES
FLAME	4-20	PID
MODBUS	COMMISSIONING/SE TUP	RTD/THERMOCOUPLE/ANALOG
1X MISCELLANEOUS REGISTERS	3X/4X MISCELLANEOUS REGISTERS	

TEMPERATURES

Register Address (offset)	Description
10029 /20029 (28)	<p>Hi-Temp Alarm</p> <p>0 = No Alarm 1 = Alarm</p> <p>The Hi-Temp Alarm shows the state of the High Temperature Shutdown. If the process temperature is below the High Temperature Shutdown limit, the bit is clear. If the High Temperature Shutdown limit is exceeded, the bit will be set.</p> <p>*PF2100 compatible register</p>
10045 /20045 (44)	<p>Hi-Temp Alarm (Latched) Latched version of 10029.</p> <p>*PF2100 compatible register</p>
30003 /40003 (2)	<p>High Temp Thermocouple Reading</p> <p>Type: Int16</p> <p>Range:-50 to 1350°C</p> <p>This is the current reading of the High Temp Thermocouple encoded as a 16-bit signed integer in °C.</p> <p>*PF2100 compatible register</p>
30004 /40004 (3)	<p>Process Thermocouple Reading</p> <p>Type: Int16</p> <p>Range: -50 to 1350°C</p> <p>This is the current reading of the Process Thermocouple encoded as a 16-bit signed integer in °C.</p> <p>*PF2100 compatible register</p>
30005 /40005 (4)	<p>Aux Thermocouple Reading</p> <p>Type: Int16</p> <p>Range: -50 to 1350°C</p>

Register Address (offset)	Description
	<p>This is the current reading of the Aux Thermocouple encoded as a 16-bit signed integer in °C.</p> <p>*PF2100 compatible register</p>
<p>30008 /40008 (7)</p>	<p>High Fire/Process Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 to 1350°C</p> <p>This is the current High Fire Setpoint (sometimes called the Process Setpoint).</p> <p>*PF2100 compatible register</p>
<p>30009 /40009 (8)</p>	<p>Low Fire Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 to 1350°C</p> <p>This is the current Low Fire Setpoint. Valve has no meaning if Low Fire is disabled.</p> <p>*PF2100 compatible register</p>
<p>30010 /40010 (9)</p>	<p>Pilot Off Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 to 1350°C</p> <p>This is the current Pilot Off Setpoint. Valve has no meaning if Pilot Off is disabled.</p> <p>*PF2100 compatible register</p>
<p>30018 /40018 (17)</p>	<p>Ambient Board Temp</p> <p>Type: Int16</p> <p>Range: -100 to 1350 °C</p> <p>This is the current ambient temperature reading of the BMS board. The value is given in Celsius only.</p>

Register Address (offset)	Description
	*PF2100 compatible register - Previously called Board Temperature
30101 /40101 (100)	<p>Process Setpoint Change Request</p> <p>Type: UInt16</p> <p>Range: 0 - 1350°C</p> <p>This register is used to request the PF2200 to change the process SP to the specified value and will clear when the setpoint is accepted. Read register 30008/40008 to verify that the change was accepted.</p> <p>*PF2100 compatible register</p>
30102 /40102 (101)	<p>Low Fire Setpoint Change Request</p> <p>Type: UInt16</p> <p>Range: 0 - 1350°C</p> <p>This register is used to request the PF2200 to change the LF SP and will clear when the setpoint is accepted. Read register 30009/40009 to verify that the change was accepted.</p> <p>*PF2100 compatible register</p>
30103 /40103 (102)	<p>Pilot Off Setpoint Change Request</p> <p>Type: UInt16</p> <p>Range: 0 - 1350°C</p> <p>This register is used to request the PF2200 to change the PO SP and will clear when setpoint is accepted. Read register 30010/40010 to verify that the change was accepted.</p> <p>*PF2100 compatible register</p>
31001 /41001 (1000)	<p>Bath Type</p> <p>Type: UInt16</p> <p>Range: 0,1</p>

Register Address (offset)	Description
	Temperature sensor type. 0 - TC 1 - RTD
31002 /41002 (1001)	<p>Bath Mode</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>Control mode type. 0 - Process Control 1 - High Temp ESD</p>
31003 /41003 (1002)	<p>Bath Input</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>Number of temperature elements. 0 - Dual 1 - Single</p>
31004 /41004 (1003)	<p>Bath High Temp Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>High temperature setpoint. * Must be greater than pilot off setpoint + 1 if pilot off is enabled. If pilot off is not enabled the setpoint must be greater than the main off setpoint + 1.</p>
31005 /41005 (1004)	<p>Bath Pilot Off Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Pilot off temperature setpoint. *Must be greater than main off setpoint + 1. Must be less than high temp setpoint - 1.</p>
31006 /41006 (1005)	<p>Bath Main Off Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p>

Register Address (offset)	Description
	Main off temperature setpoint. * Must be less than pilot off setpoint - 1 if pilot off is enabled. Must be greater than process setpoint + 1.
31007 /41007 (1006)	<p>Bath Process Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Process temperature setpoint. *Must be greater than the larger of the deadband or the low temperature setpoint. Must be less than main off setpoint - 1.</p>
31008 /41008 (1007)	<p>Bath Low Temp Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Low temperature setpoint. * Must be less than process setpoint.</p>
31009 /41009 (1008)	<p>Bath Deadband</p> <p>Type: UInt16</p> <p>Range: 0 - 100 °C (32 - 212 °F)</p> <p>Process setpoint deadband</p>
31010 /41010 (1009)	<p>Outlet Type</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>Temperature sensor type. 0 - TC 1 - RTD</p>
31011 /41011 (1010)	<p>Outlet Mode</p> <p>Type: UInt16</p> <p>Range: 0 - 3</p>

Register Address (offset)	Description
	Control mode type. 0 - Disabled 1 - Process Control 2 - High Temp ESD 3 - Display Only
31012 /41012 (1011)	<p>Outlet High Temp Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>High temperature setpoint. * Must be greater than pilot off setpoint + 1 if pilot off is enabled. If pilot off is not enabled the setpoint must be greater than the main off setpoint + 1.</p>
31013 /41013 (1012)	<p>Outlet Pilot Off Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Pilot off temperature setpoint. *Must be greater than main off setpoint + 1. Must be less than high temp setpoint - 1.</p>
31014 /41014 (1013)	<p>Outlet Main Off Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Main off temperature setpoint. * Must be less than pilot off setpoint - 1 if pilot off is enabled. Must be greater than process setpoint + 1.</p>
31015 /41015 (1014)	<p>Outlet Process Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Process temperature setpoint. *Must be greater than the larger of the deadband or the low temperature setpoint. Must be less than main off setpoint - 1.</p>
31016 /41016 (1015)	Outlet Low Temp Setpoint

Register Address (offset)	Description
	<p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Low temperature setpoint. * Must be less than process setpoint.</p>
31017 /41017 (1016)	<p>Outlet Deadband</p> <p>Type: UInt16</p> <p>Range: 0 - 100 °C (32 - 212 °F)</p> <p>Process setpoint deadband.</p>
31018 /41018 (1017)	<p>Stack Type</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>Temperature sensor type. 0 - TC 1 - RTD</p>
31019 /41019 (1018)	<p>Stack Mode</p> <p>Type: UInt16</p> <p>Range: 0 - 2</p> <p>Control mode type. 0 - Disabled 1 - High Temp ESD 2 - Display Only</p>
31020 /41020 (1019)	<p>Stack High Temp Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>High temperature setpoint. * Must be greater than the deadband.</p>
31021 /41021 (1020)	<p>Stack Deadband</p> <p>Type: UInt16</p>

Register Address (offset)	Description
	<p>Range: 0 - 100 °C (32 - 212 °F)</p> <p>High temperature setpoint deadband.</p>
33605 /43605 (3604)	<p>Bath Temp</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Temperature of bath sensor probe one in temperature units. Value is in 10x. A temperature of 134.5 °C will be represented as 1345. 0 - Bath is cross compared against Bath 2. 1 - For Bath Temp <= 100C, tolerance = 10C 2 - For Bath Temp > 100C, tolerance = 10% of Bath Temp</p>
33606 /43606 (3605)	<p>Bath 2 Temp</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Temperature of bath sensor probe two in temperature units. Value is in 10x. A temperature of 134.5 °C will be represented as 1345.</p>
33607 /43607 (3606)	<p>Outlet Temp</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Temperature of outlet sensor in temperature units. Value is in 10x. A temperature of 134.5 °C will be represented as 1345.</p>
33608 /43608 (3607)	<p>Stack Temp</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Temperature of stack sensor in temperature units. Value is in 10x. A temperature of 134.5 °C will be represented as 1345.</p>

Register Address (offset)	Description
33609 /43609 (3608)	<p>Aux Temp</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Temperature of the auxiliary sensor in temperature units. Value is in 10x. A temperature of 134.5 °C will be represented as 1345. 0 - For Aux Temp < 100C, tolerance = 10C 1 - For Aux Temp >= 100C, tolerance = 10% of Aux Temp</p>
33610 /43610 (3609)	<p>Ambient Temp 1</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Ambient temperature sensor one. Value is in 10x. A temperature of 134.5 °C will be represented as 1345. 0 - Ambient Temp 1 is cross compared against Ambient Temp 2. 1 - tolerance = 5C</p>
33611 /43611 (3610)	<p>Ambient Temp 2</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Ambient temperature sensor two. Value is in 10x. A temperature of 134.5 °C will be represented as 1345.</p>
33612 /43612 (3611)	<p>Bath Faults</p> <p>Type: Bitset</p> <p>Range: 5 bits</p> <p>Board bath temperature probe one fault bits. A 1 indicates a fault is set at that index. 0 - TC Open 1 - RTD Open 2 - RTD Short 3 - Out of Range 4 - Stale Data</p>
33622 /43622 (3621)	<p>Bath 2 Faults</p> <p>Type: Bitset</p>

Register Address (offset)	Description
	<p>Range: 5 bits</p> <p>Board bath temperature probe two fault bits. A 1 indicates a fault is set at that index.</p>
33632 /43632 (3631)	<p>Outlet Faults</p> <p>Type: Bitset</p> <p>Range: 5 bits</p> <p>Board outlet temperature fault bits. A 1 indicates a fault is set at that index.</p>
33642 /43642 (3641)	<p>Stack Faults</p> <p>Type: Bitset</p> <p>Range: 5 bits</p> <p>Board stack temperature fault bits. A 1 indicates a fault is set at that index.</p>
33652 /43652 (3651)	<p>Ambient Temp 1 Faults</p> <p>Type: Bitset</p> <p>Range: 5 bits</p> <p>Board ambient temperature sensor one fault bits. A 1 indicates a fault is set at that index.</p>
33662 /43662 (3661)	<p>Ambient Temp 2 Faults</p> <p>Type: Bitset</p> <p>Range: 5 bits</p> <p>Board ambient temperature sensor two fault bits. A 1 indicates a fault is set at that index.</p>
33731 /43731 (3730)	<p>4-20 Temp Echo</p> <p>Type: Int16</p>

Register Address (offset)	Description
	<p>Range: Int16</p> <p>4-20mA temperature echo output value. Value is in 10x. A current of 12.4mA will be represented as 124.</p>
31005 /41005 (1004)	<p>Bath Pilot Off Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Pilot off temperature setpoint. *Must be greater than main off setpoint + 1. Must be less than high temp setpoint - 1.</p>
31006 /41006 (1005)	<p>Bath Main Off Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Main off temperature setpoint. * Must be less than pilot off setpoint - 1 if pilot off is enabled. Must be greater than process setpoint + 1.</p>
31007 /41007 (1006)	<p>Bath Process Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Process temperature setpoint. *Must be greater than the larger of the deadband or the low temperature setpoint. Must be less than main off setpoint - 1.</p>
31009 /41009 (1008)	<p>Bath Deadband</p> <p>Type: UInt16</p> <p>Range: 0 - 100 °C (32 - 212 °F)</p> <p>Process setpoint deadband.</p>
31013 /41013 (1012)	<p>Outlet Pilot Off Setpoint</p>

Register Address (offset)	Description
	<p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Pilot off temperature setpoint. *Must be greater than main off setpoint + 1. Must be less than high temp setpoint - 1.</p>
31014 /41014 (1013)	<p>Outlet Main Off Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Main off temperature setpoint. * Must be less than pilot off setpoint - 1 if pilot off is enabled. Must be greater than process setpoint + 1.</p>
31015 /41015 (1014)	<p>Outlet Process Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Process temperature setpoint. *Must be greater than the larger of the deadband or the low temperature setpoint. Must be less than main off setpoint - 1</p>
31017 /41017 (1016)	<p>Outlet Deadband</p> <p>Type: UInt16</p> <p>Range: 0 - 100 °C (32 - 212 °F)</p> <p>Process setpoint deadband.</p>
31021 /41021 (1020)	<p>Stack Deadband</p> <p>Type: UInt16</p> <p>Range: 0 - 100 °C (32 - 212 °F)</p> <p>High temperature setpoint deadband.</p>
31025 /41025 (1024)	<p>Aux Pilot Off Setpoint</p>

Register Address (offset)	Description
	<p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Pilot off temperature setpoint. *Must be greater than main off setpoint + 1. Must be less than high temp setpoint - 1.</p>
31026 /41026 (1025)	<p>Aux Main Off Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Main off temperature setpoint. * Must be less than pilot off setpoint - 1 if pilot off is enabled. Must be greater than process setpoint + 1.</p>
31027 /41027 (1026)	<p>Aux Process Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Process temperature setpoint. *Must be greater than the larger of the deadband or the low temperature setpoint. Must be less than main off setpoint - 1.</p>
31029 /41029 (1028)	<p>Aux Deadband</p> <p>Type: UInt16</p> <p>Range: 0 - 100 °C (32 - 212 °F)</p> <p>Process setpoint deadband.</p>
31109 /41109 (1108)	<p>Process Proportional Band</p> <p>Type: UInt16</p> <p>Range: 0 - 10000 °C (320 - 18320) °F</p> <p>PID proportional band. Value in 10x. A proportional band of 345.6°C will be represented as 3456. Base value is in temperature units.</p>

PRESSURES

Register Address (offset)	Description
10020 /20020 (19)	<p>High Pressure Input</p> <p>0 = Closed 1 = Open</p> <p>The High-Pressure Input bit shows the state of the High-Pressure Input. When the High-Pressure Input is closed (normal condition), the High-Pressure Input bit is clear. When the High-Pressure Input is open (alarm condition), the bit is set.</p> <p>*PF2100 compatible register</p>
10024 /20024 (23)	<p>Low Pressure</p> <p>0 = Closed 1 = Open</p> <p>The Low-Pressure Input bit shows the state of the Low-Pressure Input. When the Low-Pressure Input is closed (normal condition), the Low-Pressure Input bit is clear. When the Low-Pressure Input is open (alarm condition), the bit is set.</p> <p>*PF2100 compatible register</p>
10036 /20036 (35)	<p>High Pressure Input (Latched)</p> <p>Latched version of 10020.</p> <p>*PF2100 compatible register</p>
31034 /41034 (1033)	<p>Pressure Type</p> <p>Type: UInt16</p> <p>Range: 0 - 2</p> <p>Input type. 0 - Disabled 1 - Digital 2 - 4-20</p>
31035 /41035 (1034) to	<p>Pressure Span Min</p> <p>Type: Int32</p>

Register Address (offset)	Description
31036 /41036 (1035)	<p>Range: Int32 (Pressure Units)</p> <p>Pressure input 4-20mA span minimum. Value is 10x. 145.6 kPa is provided as 1456 in the register.</p> <p>*Must be less than span maximum.</p>
31037 /41037 (1036) to 31038 /41038 (1037)	<p>Pressure Span Max</p> <p>Type: Int32</p> <p>Range: Int32 (Pressure Units)</p> <p>Pressure input 4-20mA span maximum. Value is 10x. 145.6 kPa is provided as 1456 in the register.</p> <p>*Must be greater than span minimum.</p>
31039 /41039 (1038) to 31040 /41040 (1039)	<p>Pressure Low Trip</p> <p>Type: Int32</p> <p>Range: Int32 (Pressure Units)</p> <p>Pressure input low trip setpoint. Value is 10x. 145.6 kPa is provided as 1456 in the register.</p> <p>*Must be less than high trip setpoint - deadband. Must be greater than span minimum.</p>
31041 /41041 (1040) to 31042 /41042 (1041)	<p>Pressure High Trip</p> <p>Type: Int32</p> <p>Range: Int32 (Pressure Units)</p> <p>Pressure input low trip setpoint + deadband. Value is 10x. 145.6 kPa is provided as 1456 in the register.</p> <p>*Must be greater than high trip setpoint. Must be less than span maximum.</p>
31043 /41043 (1042)	<p>Pressure Deadband</p> <p>Type: UInt16</p>

Register Address (offset)	Description
	<p>Range: UInt16 (Pressure Units)</p> <p>Pressure input low and high setpoint deadband. Value is 10x. 1.6 kPa is provided as 16 in the register.</p>
31044 /41044 (1043)	<p>Low Pressure Delay</p> <p>Type: UInt16</p> <p>Range: 2 - 20 seconds</p> <p>Low pressure trip delay time.</p>
31045 /41045 (1044)	<p>Low Pressure Mode</p> <p>Type: UInt16</p> <p>Range: 0 - 3</p> <p>Low pressure operation mode. 0 - Alarm 1 - Wait 2 - Warning 3 - Main Permissive</p>
31046 /41046 (1045)	<p>Pressure High Type</p> <p>Type: UInt16</p> <p>Range: 0 - 2</p> <p>Input type. 0 - Disabled 1 - Digital 2 - 4-20</p>
31047 /41047 (1046)	<p>Pressure High</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>Pressure high feature. 0 - Disabled 1 - Enabled</p>

LEVELS/VALVES/AUXILIARY

Register Address (offset)	Description
10017 /20017 (16)	<p>Level Input</p> <p>0 = Closed, 1 = Open</p> <p>The Level Input bit shows the state of the Level Input. When the Level Input is closed (normal condition), the Level Input bit is off. When the Level Input is open (alarm condition), the bit is on.</p> <p>*PF2100 compatible register</p>
10018 /20018 (17)	<p>Main Solenoid Feedback</p> <p>0 = SSV1 & SSV2 & HFV De-energized, 1 = SSV1 or SSV2 or HF Energized</p> <p>The Main Solenoid Feedback bit can be used to verify the proper operation of the circuitry and wiring that powers the Main Solenoids (both Low Fire and High Fire). This bit will be set if either output has voltage present on it, regardless of the source of the voltage. Therefore, if this bit is set, but both 10003 and 10004 are clear, a circuitry/wiring short to 12/24V may be present. Similarly, if this bit is clear, but either 10003 or 10004 are set, a circuitry/wiring short to ground may be present. This is not a proof of position.</p> <p>*PF2100 compatible register</p>
10033 /20033 (32)	<p>Level Input (Latched)</p> <p>Latched version of 10017.</p> <p>*PF2100 compatible register</p>
10034 /20034 (33)	<p>Main Solenoid Feedback (Latched)</p> <p>Latched version of 10018.</p> <p>*PF2100 compatible register</p>

Register Address (offset)	Description
10035 /20035 (34)	<p>Pilot Solenoid Feedback (Latched)</p> <p>Latched version of 10019.</p> <p>*PF2100 compatible register</p>
10036 /20036 (35)	<p>High Pressure Input (Latched)</p> <p>Latched version of 10020.</p> <p>*PF2100 compatible register</p>
30002 /40002 (1)	<p>Input Status and Flags (non-latching shutdowns)</p> <p>BIT 0 - Level Input 0 = Closed, BIT 1 - Main Solenoid Feedback 0 = De-energized BIT 2 - Pilot Solenoid Feedback 0 = De-energized BIT 3 - High Pressure Input 0 = Closed BIT 4 - Proof of Closure 0 = Closed BIT 5 - ESD Input 0 = Closed BIT 6 - Start Input 0 = Closed BIT 7 - Low Pressure 0 = Closed BIT 8 - Flame Detected 0 = No Flame BIT 9 - Flame Test Fail 0 = Flame Test OK BIT 10 - Unit Failure 0 = Unit OK BIT 11 - Low or High Voltage 0 = Voltage OK BIT 12 - Hi-Temp Alarm 0 = No Alarm BIT 13 - 4-20 Card Alarm 0 = No Alarm</p> <p>*PF2100 compatible register</p>
30007 /40007 (6)	<p>Input Status and Flags (latching shutdowns)</p> <p>BIT 0 - Level, Input 0 = Closed, BIT 1 - Main Solenoid Feedback 0 = De-energized, BIT 2 - Pilot Solenoid Feedback 0 = De-energized, BIT 3 - High Pressure Input 0 = Closed, BIT 4 - Proof of Closure 0 = Closed, BIT 5 - ESD Input 0 = Closed, BIT 6 - Start Input 0 = Closed, BIT 7 - Low Pressure 0 = Closed, BIT 8 - Flame Detected 0 = No Flame, BIT 9 - Flame Test Fail 0 = Flame Test OK, BIT 10 - Unit Failure 0 = Unit OK, BIT 11 - Low or High Voltage 0 = Voltage OK, BIT 12 - Hi-Temp Alarm 0 =</p>

Register Address (offset)	Description
	<p>No Alarm, BIT 13 - 4-20 Card Alarm 0 = No Alarm (Not used in PF2200)</p> <p>*PF2100 compatible register</p>
30019 /40019 (18)	<p>Aux 1 Input Current</p> <p>Type: UInt16</p> <p>Range: 0 to 300</p> <p>This is the input current reading at the Aux 1 input multiplied by 10. A value of 4.5ma will be represented as 45.</p> <p>*PF2100 incompatible register - Previously called 0-30V Input Reading. This register now only supports mA readings.</p>
30020 /40020 (19)	<p>Aux 2 Input Voltage/Current</p> <p>Type: UInt16</p> <p>Range: 0 to 300</p> <p>This is the current reading at the Aux 2 input multiplied by 10. A value of 4.5ma will be represented as 45.</p> <p>*PF2100 compatible register - Previously called 4-20mA Input Reading (Datalogger card)</p>
31022 /41022 (1021)	<p>Aux Temp Mode</p> <p>Type: UInt16</p> <p>Range: 0 – 3</p> <p>Control mode type. 0 - Disabled, 1 - Process Control, 2 - High Temp ESD, 3 - Display Only</p>
31023 /41023 (1022)	<p>Aux Temp Type</p> <p>Type: UInt16</p> <p>Range: 0 – 2</p> <p>Input type. 0 - Disabled, 1 - Digital, 2 - 4-20</p>

Register Address (offset)	Description
31024 /41024 (1023)	<p>Aux High Temp Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>High temperature setpoint.</p> <p>* Must be greater than pilot off setpoint + 1 if pilot off is enabled. If pilot off is not enabled the setpoint must be greater than the main off setpoint + 1.</p>
31025 /41025 (1024)	<p>Aux Pilot Off Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Pilot off temperature setpoint.</p> <p>*Must be greater than main off setpoint + 1. Must be less than high temp setpoint - 1.</p>
31026 /41026 (1025)	<p>Aux Main Off Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Main off temperature setpoint.</p> <p>* Must be less than pilot off setpoint - 1 if pilot off is enabled. Must be greater than process setpoint + 1.</p>
31027 /41027 (1026)	<p>Aux Process Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Process temperature setpoint.</p> <p>*Must be greater than the larger of the deadband or the low temperature setpoint. Must be less than main off setpoint - 1.</p>

Register Address (offset)	Description
31028 /41028 (1027)	<p>Aux Low Temp Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 - 1350 °C (32 - 2462 °F)</p> <p>Low temperature setpoint.</p> <p>* Must be less than process setpoint.</p>
31029 /41029 (1028)	<p>Aux Deadband</p> <p>Type: UInt16</p> <p>Range: 0 - 100 °C (32 - 212 °F)</p> <p>Process setpoint deadband</p>
31030 /41030 (1029)	<p>Aux Temp Span Min</p> <p>Type: Int16</p> <p>Range: -100 - 1350 °C (-459 - 2462 °F)</p> <p>Aux temperature 4-20mA input span minimum.</p> <p>*Must be less than span maximum.</p>
31031 /41031 (1030)	<p>Aux Temp Span Max</p> <p>Type: Int16</p> <p>Range: -100 - 1350 °C (-459 - 2462 °F)</p> <p>Aux temperature 4-20mA input span maximum.</p> <p>*Must be greater than span minimum.</p>
31032 /41032 (1031)	<p>Proof of Closure</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>Proof of closure feature. 0 - Disabled, 1 - Enabled</p>

Register Address (offset)	Description
31048 /41048 (1047)	<p>Level Type</p> <p>Type: UInt16</p> <p>Range: 0 – 2</p> <p>Input type. 0 - Disabled, 1 - Digital, 2 - 4-20</p>
31049 /41049 (1048)	<p>Digital Mode</p> <p>Type: UInt16</p> <p>Range: 0 – 2</p> <p>Level mode when configured as a digital input. 0 - Alarm, 1 - Wait, 2 - Warning</p>
31050 /41050 (1049)	<p>Low Trip Mode</p> <p>Type: UInt16</p> <p>Range: 0 – 2</p> <p>Level low trip mode when configured as a 4-20mA input.</p>
31051 /41051 (1050)	<p>High Trip Mode</p> <p>Type: UInt16</p> <p>Range: 0 – 2</p> <p>Level low trip mode when configured as a 4-20mA input.</p>
31052 /41052 (1051) to 31053 /41053 (1052)	<p>Level Span Min</p> <p>Type: Int32</p> <p>Range: Int32 (Level Units)</p> <p>Level input 4-20mA span minimum. Value is 10x. 145.6 liters is provided as 1456 in the register.</p> <p>*Must be less than span maximum.</p>

Register Address (offset)	Description
31054 /41054 (1053) to 31055 /41055 (1054)	<p>Level Span Max</p> <p>Type: Int32</p> <p>Range: Int32 (Level Units)</p> <p>Level input 4-20mA span maximum. Value is 10x. 145.6 liters is provided as 1456 in the register.</p> <p>*Must be greater than span minimum.</p>
31056 /41056 (1055) to 31057 /41057 (1056)	<p>Level Low Trip</p> <p>Type: Int32</p> <p>Range: Int32 (Level Units)</p> <p>Level input low trip setpoint. Value is 10x. 145.6 Liters is provided as 1456 in the register.</p> <p>*Must be less than high trip setpoint - deadband. Must be greater than span minimum.</p>
31058 /41058 (1057) to 31059 /41059 (1058)	<p>Level High Trip</p> <p>Type: Int32</p> <p>Range: Int32 (Level Units)</p> <p>Level input low trip setpoint + deadband. Value is 10x. 145.6 liters is provided as 1456 in the register.</p> <p>*Must be greater than high trip setpoint. Must be less than span maximum.</p>
31060 /41060 (1059)	<p>Level Deadband</p> <p>Type: UInt16</p> <p>Range: UInt16 (Level Units)</p> <p>Level input low and high setpoint deadband.</p>
31061 /41061 (1060)	<p>Level Delay</p>

Register Address (offset)	Description
	Type: UInt16 Range: 2 - 20 seconds Low- and high-level trip delay time.
31065 /41065 (1064)	Aux In 1 Type Type: UInt16 Range: 0 - 2 Input type. 0 - Disabled, 1 - Digital, 2 - 4-20
31067 /41067 (1066)	Aux In 1 Digital Mode Type: UInt16 Range: 0 - 3 Aux in 1 mode when configured as a digital input. 0 - Alarm, 1 - Wait, 2 - Warning, 3 - Main Permissive
31068 /41068 (1067)	Aux In 1 Low Trip Mode Type: UInt16 Range: 0 - 3 Aux in 1 low trip mode when configured as a 4-20mA input.
31069 /41069 (1068)	Aux In 1 High Trip Mode Type: UInt16 Range: 0 - 3 Aux in 1 high trip mode when configured as a 4-20mA input.
31070 /41070 (1069) to 31071 /41071 (1070)	Aux In 1 Low Trip Type: Int32 Range: Int32 (Aux In 1 Units)

Register Address (offset)	Description
	<p>Aux 1 input low trip setpoint. Value is 10x. 15.6mA is provided as 156 in the register.</p> <p>*Must be less than high trip setpoint - deadband. Must be greater than span minimum.</p>
<p>31072 /41072 (1071) to 31073 /41073 (1072)</p>	<p>Aux In 1 High Trip</p> <p>Type: Int32</p> <p>Range: Int32 (Aux In 1 Units)</p> <p>Aux 1 input low trip setpoint + deadband. Value is 10x. 15.6mA is provided as 156 in the register.</p> <p>*Must be greater than high trip setpoint. Must be less than span maximum.</p>
<p>31074 /41074 (1073)</p>	<p>Aux In 1 Deadband</p> <p>Type: UInt16</p> <p>Range: UInt16 (Aux In 1 Units)</p> <p>Aux 1 input low and high setpoint deadband. Value is 10x. 1.6 % is provided as 16 in the register.</p>
<p>31076 /41076 (1075) to 31077 /41077 (1076)</p>	<p>Aux In 1 Span Min</p> <p>Type: Int32</p> <p>Range: Int32 (Aux In 1 Units)</p> <p>Aux 1 input 4-20mA span minimum. Value is 10x. 145.6 is provided as 1456 in the register.</p> <p>*Must be less than span maximum</p>
<p>31078 /41078 (1077) to 31079 /41079 (1078)</p>	<p>Aux In 1 Span Max</p> <p>Type: Int32</p> <p>Range: Int32 (Aux In 1 Units) Aux 1 input, 4-20mA span maximum. Value is 10x. 145.6 liters is provided as 1456 in the register.</p>

Register Address (offset)	Description
	*Must be greater than span minimum.
31080 /41080 (1079)	Aux In 2 Type Type: UInt16 Range: 0 – 2 Input type. 0 - Disabled, 1 - Digital, 2 - 4-20
31081 /41081 (1080)	Process Setpoint Adjust Mode Type: UInt16 Range: 0 – 3 Aux in 2 setpoint adjust feature. 0 - Disabled, 1 - Bath, 2 - Outlet, 3 - Aux Temp
31082 /41082 (1081)	Aux In 2 Digital Mode Type: UInt16 Range: 0 – 3 Aux in 1 mode when configured as a digital input. 0 - Alarm, 1 - Wait, 2 - Warning, 3 - Main Permissive
31083 /41083 (1082)	Aux In 2 Low Trip Mode Type: UInt16 Range: 0 – 3 Aux in 2 low trip mode when configured as a 4-20mA input.
31084 /41084 (1083)	Aux In 2 High Trip Mode Type: UInt16 Range: 0 – 3 Aux in 2 high trip mode when configured as a 4-20mA input.

Register Address (offset)	Description
31085 /41085 (1084) to 31086 /41086 (1085)	<p>Aux In 2 Low Trip</p> <p>Type: Int32</p> <p>Range: Int32 (Aux In 2 Units)</p> <p>Aux 2 input low trip setpoint. Value is 10x. 15.6mA is provided as 156 in the register.</p> <p>*Must be less than high trip setpoint - deadband. Must be greater than span minimum.</p>
31087 /41087 (1086) to 31088 /41088 (1087)	<p>Aux In 2 High Trip</p> <p>Type: Int32</p> <p>Range: Int32 (Aux In 2 Units)</p> <p>Aux 2 input low trip setpoint + deadband. Value is 10x. 15.6mA is provided as 156 in the register.</p> <p>*Must be greater than high trip setpoint. Must be less than span maximum.</p>
31089 /41089 (1088)	<p>Aux In 2 Deadband</p> <p>Type: UInt16</p> <p>Range: UInt16 (Aux In 2 Units)</p> <p>Aux 2 input low and high setpoint deadband. Value is 10x. 1.6 % is provided as 16 in the register.</p>
31090 /41090 (1089) to 31091 /41091 (1090)	<p>Aux In 2 Span Min</p> <p>Type: Int32</p> <p>Range: Int32 (Aux In 2 Units)</p> <p>Aux 2 input 4-20mA span minimum. Value is 10x. 145.6 is provided as 1456 in the register.</p> <p>*Must be less than span maximum.</p>

Register Address (offset)	Description
31092 /41092 (1091) to 31093 /41093 (1092)	<p>Aux In 2 Span Max</p> <p>Type: Int32</p> <p>Range: Int32 (Aux In 2 Units)</p> <p>Aux 2 input 4-20mA span maximum. Value is 10x. 145.6 liters is provided as 1456 in the register.</p> <p>*Must be greater than span minimum.</p>
31095 /41095 (1094)	<p>Aux Out 1 Mode</p> <p>Type: UInt16</p> <p>Range: 0 – 8</p> <p>Aux out 1 operating mode. 0 - Disabled, 1 - Level Echo, 2 - Aux In 1 Echo, 3 - Aux In 2 Echo, 4 - Modbus Echo, 5 - Bath Temp Echo, 6 - Outlet Temp Echo, 7 - Stack Temp Echo, 8 - Aux Temp Echo</p>
31096 /41096 (1095)	<p>Aux Out 2 Mode</p> <p>Type: UInt16</p> <p>Range: 0 – 8</p> <p>Aux out 2 operating mode. 0 - Disabled, 1 - Level Echo, 2 - Aux In 1 Echo, 3 - Aux In 2 Echo, 4 - Modbus Echo, 5 - Bath Temp Echo, 6 - Outlet Temp Echo, 7 - Stack Temp Echo, 8 - Aux Temp Echo</p>
31097 /41097 (1096)	<p>Aux Out 1 Temp Echo Span Min</p> <p>Type: Int16</p> <p>Range: -100 - 1350 °C</p> <p>Aux Out 1 temp echo minimum span.</p>
31098 /41098 (1097)	<p>Aux Out 1 Temp Echo Span Max</p> <p>Type: Int16</p>

Register Address (offset)	Description
	Range: -100 - 1350 °C Aux Out 1 temp echo maximum span.
31099 /41099 (1098)	Aux Out 2 Temp Echo Span Min Type: Int16 Range: -100 - 1350 °C Aux Out 2 temp echo minimum span.
31100 /41100 (1099)	Aux Out 2 Temp Echo Span Max Type: Int16 Range: -100 - 1350 °C Aux Out 2 temp echo maximum span.
31101 /41101 (1100)	Pilot Valve PWM Type: UInt16 Range: 10 - 100 % Pilot valve pwm in %.
31102 /41102 (1101)	SSV PWM Type: UInt16 Range: 10 - 100 % SSV pwm in %.
31103 /41103 (1102)	Aux PWM Type: UInt16 Range: 10 - 100 % Aux pwm in %.

Register Address (offset)	Description
31104 /41104 (1103)	TCV Min Position Type: UInt16 Range: 0 - 70 % TCV min position in %
31105 /41105 (1104)	TCV Purge Position Type: UInt16 Range: 0 - 100 % TCV purge position in %.
31106 /41106 (1105)	TCV Pilot Position Type: UInt16 Range: 0 - 100 % TCV pilot position in %.
31107 /41107 (1106)	TCV Manual Override Type: UInt16 Range: 0,1 TCV Manual Override feature. 0 - Disabled, 1 - Enabled
31108 /41108 (1107)	TCV Manual Position Type: UInt16 Range: 0 - 100 % TCV manual position in %.
33725 /43725 (3724)	Valve Driver Status Type: Bitset Range: 5 bits

Register Address (offset)	Description
	Valve output state. A 1 indicates the output is energized at that index. 0 - Pilot 1, 1 - Pilot 2, 2 - SSV 1, 3 - SSV 2, 4 - HFV
33737 /43737 (3736)	TCV Output Percent Type: UInt16 Range: 0 - 100 % Temperature control valve output in %.
33746 /43746 (3745)	SSV 1 Voltage Type: Int16 Range: Int16 SSV 1 valve voltage in Volts. Value is 10x. A voltage of 10.4V is represented as 104.
33747 /43747 (3746)	SSV 1 Current Type: Int16 Range: Int16 SSV 1 valve current in mA. Value is 10x. A current of 51.6mA is represented as 516.
33748 /43748 (3747)	SSV 2 Voltage Type: Int16 Range: Int16 SSV 2 valve voltage in Volts. Value is 10x. A voltage of 10.4V is represented as 104.
33749 /43749 (3748)	SSV 2 Current Type: Int16 Range: Int16

Register Address (offset)	Description
	SSV 2 valve current in mA. Value is 10x. A current of 51.6mA is represented as 516.
33750 /43750 (3749)	<p>HFV Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>HFV valve voltage in Volts. Value is 10x. A voltage of 10.4V is represented as 104.</p>
33751 /43751 (3750)	<p>HFV Current</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>HFV valve current in mA. Value is 10x. A current of 51.6mA is represented as 516.</p>
33768 /43768 (3767)	<p>SSV Run Time</p> <p>Type: UInt16</p> <p>Range: UInt16</p> <p>Accumulated SSV solenoid valve on time since power on in hours.</p>
33769 /43769 (3768)	<p>HFV Run Time</p> <p>Type: UInt16</p> <p>Range: UInt16</p> <p>Accumulated High fire solenoid valve on time since power on in hours.</p>

FLAME

Register Address (offset)	Description
10002 /20002 (1)	<p>Pilot</p> <p>0 = De-energized, 1 = Energized</p> <p>The Pilot bit is set whenever the controller is attempting to drive the Pilot Solenoid to an open position. This is not a proof of position.</p> <p>*PF2100 compatible register</p>
10003 /20003 (2)	<p>Stage 1 (low fire)</p> <p>0 = De-energized, 1 = Energized</p> <p>The Low Fire bit is set whenever the controller is attempting to drive the Low Fire Solenoid to an open position. This is not a proof of position.</p> <p>*PF2100 compatible register</p>
10004 /20004 (3)	<p>Stage 2 (high fire)</p> <p>0 = De-energized, 1 = Energized</p> <p>The High Fire bit is set whenever the controller is attempting to drive the High Fire Solenoid to an open position. This is not a proof of position.</p> <p>*PF2100 compatible register</p>
10021 /20021 (20)	<p>Proof of Closure</p> <p>0 = Closed, 1 = Open</p> <p>The Proof of Closure Input bit shows the state of the Proof of Closure Input. When the Proof of Closure Input is closed (normal condition), the Proof of Closure Input bit is clear. When the Proof of Closure Input is open (unit not safe to start condition), the bit is set.</p> <p>*PF2100 compatible register</p>

Register Address (offset)	Description
10025 /20025 (24)	<p>Flame Detected</p> <p>0 = No Flame, 1 = Flame Detected</p> <p>The Flame Detected bit shows the state of the flame detection circuitry. When there is no flame or the flame does not meet minimum requirements, the bit is clear. When the flame meets or exceeds the minimum flame detection requirements, the bit is set.</p> <p>*PF2100 compatible register</p>
10026 /20026 (25)	<p>Flame Test Fail</p> <p>0 = Flame Test OK, 1 = Flame Test Failed</p> <p>The Flame Test Fail bit shows the state of the flame test system. The flame detection circuitry routinely performs a self-test, if the flame test is OK the Flame Test Fail bit is off. If the flame test fails, the Flame Test Fail bit will be on.</p> <p>*PF2100 compatible register</p>
10041 /20041 (40)	<p>Flame Detected (Latched)</p> <p>Latched version of 10025.</p> <p>*PF2100 compatible register</p>
10042 /20042 (41)	<p>Flame Test Fail (Latched)</p> <p>Latched version of 10026.</p> <p>*PF2100 compatible register</p>
30006 /40006 (5)	<p>Pilot Flame Quality</p> <p>Type: UInt16</p> <p>0% = No Flame, 100% = Good Flame</p> <p>This number represents the quality of the pilot flame. The higher the number the better the flame. On the PF2200 this</p>

Register Address (offset)	Description
	<p>references the Pilot 1 Flame quality and is a mirror of register 30.</p> <p>*PF2100 compatible register</p>
30031 /40031 (30)	<p>Pilot One Flame Quality</p> <p>Type: UInt16</p> <p>Range: 0 – 100</p> <p>Pilot one flame quality in %.</p>
30032 /40032 (31)	<p>Pilot Two Flame Quality</p> <p>Type: UInt16</p> <p>Range: 0 – 100</p> <p>Pilot Two flame quality in %.</p>
31062 /41062 (1061)	<p>Proof of Light Off Position Type</p> <p>Type: UInt16</p> <p>Range: 0 – 2</p> <p>Input type. 0 - Disabled, 1 - Digital, 2 - 4-2</p>
31063 /41063 (1062)	<p>Proof of Light Off Position Setpoint</p> <p>Type: UInt16</p> <p>Range: 0 – 1000</p> <p>Position setpoint in %. Value is in 10x. 54.3% is represented as 543.</p>
31064 /41064 (1063)	<p>Proof of Light Off Position Tolerance</p> <p>Type: UInt16</p> <p>Range: 0 – 60</p>

Register Address (offset)	Description
	Position setpoint deadband in %. Value is in 10x. 5.3% is represented as 53.
31066 /41066 (1065)	<p>Firing Rate Enable</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>Aux input 1 firing rate feature. 0 - Disabled, 1 - Enabled</p>
31120 /41120 (1119)	<p>Pilot Off Mode</p> <p>Type: UInt16</p> <p>Range: 0-2</p> <p>Pilot off mode operation. 0 - Disabled, 1 - Off at Pilot Off Setpoint, 2 - Follow Main</p>
31121 /41121 (1120)	<p>Pilot 2</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>Pilot 2 feature. 0 - Disabled, 1 - Enabled</p>
31122 /41122 (1121)	<p>Relight Attempts</p> <p>Type: UInt16</p> <p>Range: 0-3</p> <p>Number of relight attempts.</p>
31123 /41123 (1122)	<p>Ignition Mode</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>Ignition output type. 0 - Coil, 1 - HEI</p>

Register Address (offset)	Description
31124 /41124 (1123)	Purge Time Type: UInt16 Range: 10 - 900 sec Purge time in seconds.
31125 /41125 (1124)	Pilot Startup Delay Time Type: UInt16 Range: 5 - 600 sec Pilot startup time in seconds. 0 - Time spent in the Pilot Startup Delay state.
33672 /43672 (3671)	Pilot 1 Flame Status Type: UInt16 Range: 0,1 Pilot one flame status. 0 for no flame. 1 for flame.
33673 /43673 (3672)	Pilot 2 Flame Status Type: UInt16 Range: 0,1 Pilot two flame status. 0 for no flame. 1 for flame.
33674 /43674 (3673)	UV Fire Status Type: UInt16 Range: 0,1 UV pilot flame status . 0 for no flame. 1 for flame.
33675 /43675 (3674)	Pilot Faults Type: Bitset

Register Address (offset)	Description
	<p>Range: 6 bits</p> <p>Pilot fault bits. A 1 indicates a fault is set at that index. 0 - Flame 1 Load Monitor Check Failure, 1 - Flame 2 Load Monitor Check Failure, 2 - Flame 1 Voltage Fault, 3 - Flame 2 Voltage Fault, 4 - Flame 1 DC Input Open Fault, 5 - Flame 2 DC Input Open Fault</p>
33680 /43680 (3679)	<p>UV Faults</p> <p>Type: Bitset</p> <p>Range: 2 bits</p> <p>UV fault bits. A 1 indicates a fault is set at that index. 0 - UV Flame Detect Fault, 1 - UV Flame Detect Mismatch</p>
33695 /43695 (3694)	<p>UV Flame Fault Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>UV Flame Fault digital input voltage. Value is in 10x. A voltage of 13.5 °C will be represented as 135.</p>
33696 /43696 (3695)	<p>UV Flame on Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>UV Flame On digital input voltage. Value is in 10x. A voltage of 13.5 °C will be represented as 135.</p>
33697 /43697 (3696)	<p>UV Flame Off Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>UV Flame Off digital input voltage. Value is in 10x. A voltage of 13.5 °C will be represented as 135.</p>

Register Address (offset)	Description
33770 /43770 (3769)	<p>Average Firing Rate</p> <p>Type: UInt16</p> <p>Range: UInt16</p> <p>Average firing rate of the system since power on in percent.</p>
33771 /43771 (3770)	<p>Pilot 1 Flame Fail Count</p> <p>Type: UInt16</p> <p>Range: UInt16</p> <p>Accumulated pilot 1 flame fail count since power on.</p>
33772 /43772 (3771)	<p>Pilot 2 Flame Fail Count</p> <p>Type: UInt16</p> <p>Range: UInt16</p> <p>Accumulated pilot 2 flame fail count since power on.</p>
33773 /43773 (3772)	<p>Pilot 1 Flame Strength</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Pilot 1 flame strength in milliVolts.</p>
33774 /43774 (3773)	<p>Pilot 2 Flame Strength</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Pilot 1 flame strength in milliVolts.</p>

4-20

Register Address (offset)	Description
10046 /20046 (45)	4-20 Alarm (Latched) Latched version of 10030. *PF2100 compatible register
30011 /40011 (10)	4-20mA Level Reading Type: UInt16 Range: Level Units This is encoded as a 16-bit unsigned integer in the units specified in the PF2200 settings. *PF2100 compatible register
30012 /40012 (11)	4-20mA Pressure Reading Type: UInt16 Range: Pressure Units This is encoded as a 16-bit unsigned integer in units specified in the PF2200 settings, but the value is encoded x10 (ie. 30psi would be encoded as 300). *PF2100 compatible register
30014 /40014 (13)	4-20mA Input Alarm BIT 0 - Level Low Alarm 0 = No Alarm, BIT 1 - Level High Alarm 0 = No Alarm, BIT 2 - Pressure Low Alarm 0 = No Alarm BIT 3 - Pressure High Alarm 0 = No Alarm BIT 4 - 4-20 Card Failure 0 = No Alarm (Not used on PF2200) *PF2100 compatible register
33701 /43701 (3700) to 33702 /43702 (3701)	4-20 Level Type: Int32 Range: Int32 (Level Units)

Register Address (offset)	Description
	4-20 level input value in level units. Value is in 10x. A current of 12.4mA is represented as 124.
33703 /43703 (3702) to 33704 /43704 (3703)	4-20 Pressure Type: Int32 Range: Int32 (Pressure Units) 4-20 pressure input value in pressure units. Value is in 10x. A current of 12.4mA is represented as 124.
33705 /43705 (3704) to 33706 /43706 (3705)	4-20 High Pressure Type: Int32 Range: Int32 (Pressure Units) 4-20 high pressure input value in pressure units. Value is in 10x. A current of 12.4mA is represented as 124.
33707 /43707 (3706)	4-20 Proof of Light Off Type: Int16 Range: Int16 % 4-20 proof of light off input value in percentage. Value is in 10x. A current of 12.4mA is represented as 124.
33708 /43708 (3707)	4-20 Aux Temp Type: Int16 Range: Int16 4-20 aux temperature input value in mA. Value is in 10x. A current of 12.4mA is represented as 124.
33709 /43709 (3708) to 33710 /43710 (3709)	4-20 Aux In Type: Int32 Range: Int32 (Aux 1 Units)

Register Address (offset)	Description
	4-20 aux input 1 value in aux 1 units. Value is in 10x. A current of 12.4mA is represented as 124.
33711 /43711 (3710) to 33712 /43712 (3711)	4-20 Aux In 2 Type: Int32 Range: Int32 (Aux 2 Units) 4-20 aux input 2 value in aux 2 units. Value is in 10x. A current of 12.4mA is represented as 124.

PID

Register Address (offset)	Description
31109 /41109 (1108)	Process Proportional Band Type: UInt16 Range: 0 - 10000 °C (320 - 18320) °F PID proportional band. Value in 10x. A proportional band of 345.6°C will be represented as 3456. Base value is in temperature units.
31110 /41110 (1109)	Process Integral Time Type: UInt16 Range: 0 - 10000 min/rep PID integral time. Value in 10x. An integral of 345.6 will be represented as 3456. Base value is in minutes per repeat
31111 /41111 (1110)	Process Derivative Time Type: UInt16 Range: 0 - 10000 min

Register Address (offset)	Description
	PID derivative time. Value in 10x. A derivative of 345.6 will be represented as 3456. Base value is in minutes.
31112 /41112 (1111)	<p>Process Integral Reset Range</p> <p>Type: UInt16</p> <p>Range: 0 - 10000 °C (320 - 18320) °F</p> <p>PID integral reset range. Value in 10x. A reset range of 345.6°C will be represented as 3456. Base value is in temperature units.</p>
31113 /41113 (1112)	<p>Cascade SP Proportional Band</p> <p>Type: UInt16</p> <p>Range: 0 - 10000 °C (320 - 18320) °F</p> <p>Cascaded PID proportional band. Value in 10x. A proportional band of 345.6°C will be represented as 3456. Base value is in temperature units.</p>
31114 /41114 (1113)	<p>Cascade SP Integral Time</p> <p>Type: UInt16</p> <p>Range: 0 - 10000 mins/rep</p> <p>Cascaded PID integral time. Value in 10x. An integral of 345.6 will be represented as 3456. Base value is in minutes per repeat.</p>
31115 /41115 (1114)	<p>Cascade SP Derivative Time</p> <p>Type: UInt16</p> <p>Range: 0 - 10000 min</p> <p>Cascaded PID derivative time. Value in 10x. A derivative of 345.6 will be represented as 3456. Base value is in minutes.</p>
31116 /41116 (1115)	Cascade SP Integral Reset Range

Register Address (offset)	Description
	<p>Type: UInt16</p> <p>Range: 0 - 10000 °C (320 - 18320) °F</p> <p>Cascaded PID integral reset range. Value in 10x. A reset range of 345.6°C will be represented as 3456. Base value is in temperature units.</p>
31117 /41117 (1116)	<p>PID Output Rate Limit</p> <p>Type: UInt16</p> <p>Range: 1 - 1000 %/sec</p> <p>PID output rate limit. Value in 10x. A rate limit of 55.6% is represented as 556. Base value is in percentage.</p>
31118 /41118 (1117)	<p>PID Ramp Tim</p> <p>Type: UInt16</p> <p>Range: 0 - 255 sec</p> <p>PID start up ramp time in seconds.</p>
31119 /41119 (1118)	<p>Process Control Mode</p> <p>Type: UInt16</p> <p>Range: 0-5</p> <p>Process control mode operation. 0 - On/Off Control, 1 - Staged Heating, 2 - Bath PID Control, 3 - Outlet PID Control, 4 - Aux PID Control, 5 - Cascaded PID Control</p>
33739 /43739 (3738)	<p>PID Status</p> <p>Type: UInt16</p> <p>Range: 0 – 255</p> <p>PID status information. Reserved. 0 - TBD</p>

Register Address (offset)	Description
33740 /43740 (3739) to 33741 /43741 (3740)	<p>PID Status Data</p> <p>Type: Float</p> <p>Range: Float</p> <p>PID status data information. If in cascaded mode, this status will display the cascaded setpoint.</p>
31110 /41110 (1109)	<p>Process Integral Time</p> <p>Type: UInt16</p> <p>Range: 0 - 10000 min/rep</p> <p>PID integral time. Value in 10x. An integral of 345.6 will be represented as 3456. Base value is in minutes per repeat.</p>
31111 /41111 (1110)	<p>Process Derivative Time</p> <p>Type: UInt16</p> <p>Range: 0 - 10000 min</p> <p>PID derivative time. Value in 10x. A derivative of 345.6 will be represented as 3456. Base value is in minutes.</p>
31112 /41112 (1111)	<p>Process Integral Reset Range</p> <p>Type: UInt16</p> <p>Range: 0 - 10000 °C (320 - 18320) °F</p> <p>PID integral reset range. Value in 10x. A reset range of 345.6°C will be represented as 3456. Base value is in temperature units.</p>
31113 /41113 (1112)	<p>Cascade SP Proportional Band</p> <p>Type: UInt16</p> <p>Range: 0 - 10000 °C (320 - 18320) °F</p>

Register Address (offset)	Description
	Cascaded PID proportional band. Value in 10x. A proportional band of 345.6°C will be represented as 3456. Base value is in temperature units.
31114 /41114 (1113)	<p>Cascade SP Integral Time</p> <p>Type: UInt16</p> <p>Range: 0 - 10000 mins/rep</p> <p>Cascaded PID integral time. Value in 10x. An integral of 345.6 will be represented as 3456. Base value is in minutes per repeat.</p>
31115 /41115 (1114)	<p>Cascade SP Derivative Time</p> <p>Type: UInt16</p> <p>Range: 0 - 10000 min</p> <p>Cascaded PID derivative time. Value in 10x. A derivative of 345.6 will be represented as 3456. Base value is in minutes</p>
31116 /41116 (1115)	<p>Cascade SP Integral Reset Range</p> <p>Type: UInt16</p> <p>Range: 0 - 10000 °C (320 - 18320) °F</p> <p>Cascaded PID integral reset range. Value in 10x. A reset range of 345.6°C will be represented as 3456. Base value is in temperature units.</p>
31117 /41117 (1116)	<p>PID Output Rate Limit</p> <p>Type: UInt16</p> <p>Range: 1 - 1000 %/sec</p> <p>PID output rate limit. Value in 10x. A rate limit of 55.6% is represented as 556. Base value is in percentage.</p>
31118 /41118 (1117)	PID Ramp Time

Register Address (offset)	Description
	<p>Type: UInt16</p> <p>Range: 0 - 255 sec</p> <p>PID startup ramp time in seconds.</p>

MODBUS

Register Address (offset)	Description
30121 /40121 (120)	<p>Modbus Remote Echo for Aux 1</p> <p>Type: UInt16</p> <p>Range: 0 to 1000</p> <p>Sets the output value of the Aux 1 output on the BMS. Set as %x10 so 51.4% would be written as (514).</p>
30122 /40122 (121)	<p>Modbus Remote Echo for Aux 2</p> <p>Type: UInt16</p> <p>Range: 0 to 1000</p> <p>Sets the output value of the Aux 2 output on the BMS. Set as %x10 so 51.4% would be written as (514).</p>
30123 /40123 (122)	<p>Test Read Unsigned</p> <p>Type: UInt16</p> <p>Value: 1234</p> <p>This is a test register to confirm modbus unsigned reads and formatting is correctly configured for the Modbus Master. This register will return the decimal value of 1234 as a uint16_t.</p>
30124 /40124 (123)	<p>Test Read Signed</p>

Register Address (offset)	Description
	<p>Type: Int16</p> <p>Value: -1234</p> <p>This is a test register to confirm modbus signed reads and formatting is correctly configured for the Modbus Master. This register will return the decimal value of -1234 as a int16_t.</p>
31131 /41131 (1130)	<p>Slave Address</p> <p>Type: UInt16</p> <p>Range: 1 – 247</p> <p>Modbus device slave address.</p>
31132 /41132 (1131)	<p>Baud Rate</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>Modbus baud rate. 0 - Baud 9600, 1 - Baud 19200</p>
31133 /41133 (1132)	<p>Stop Bits</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>Modbus stop bits. 0 - Stop Bits 1, 1 - Stop Bits 2</p>
31134 /41134 (1133)	<p>Parity</p> <p>Type: UInt16</p> <p>Range: 0 – 2</p> <p>Modbus parity.</p> <p>0 - Parity None 1 - Parity Odd, 2 - Parity Even</p>
31135 /41135 (1134)	<p>Modbus Termination</p>

Register Address (offset)	Description
	Type: UInt16 Range: 0,1 Modbus 100R termination. 0 - Disabled, 1 - Enabled
31136 /41136 (1135)	Remote Access Type: UInt16 Range: 0,1 BMS access via Modbus. 0 - Disabled, 1 - Enabled

COMMISSIONING & SETUP

Register Address (offset)	Description
30021 /40021 (20)	UI Clock Seconds Type: UInt16 Range: 0 - 59 Seconds *PF2100 compatible register
30022 /40022 (21)	UI Clock Minutes Range: 0 - 59 Minutes *PF2100 compatible register
30023 /40023 (22)	UI Clock Hour Type: UInt16 Range: 0 - 23 Hours *PF2100 compatible register

Register Address (offset)	Description
30024 /40024 (23)	<p>UI Clock Day</p> <p>Type: UInt16</p> <p>Range: 1 - 31 Days</p> <p>*PF2100 compatible register</p>
30025 /40025 (24)	<p>UI Clock Month</p> <p>Type: UInt16</p> <p>Range: 1 - 12 Months</p> <p>*PF2100 compatible register</p>
30026 /40026 (25)	<p>UI Clock Year</p> <p>Type: UInt16_t</p> <p>Range: 2000 - 2099 Years</p> <p>*PF2100 compatible register</p>
30030 /40030 (29)	<p>System Bundle Firmware Version</p> <p>Type: UInt16</p> <p>Byte 1 - Major release, Byte 2 - Minor Release</p> <p>*PF2100 register Format not supported. Previously this register returned the logging card firmware version x10.</p>
30110 /40110 (109)	<p>UI Clock Seconds</p> <p>Type: UInt16</p> <p>Range: 0 - 59 Seconds</p> <p>Set clock second value.</p> <p>*PF2100 compatible register</p>
30111 /40111 (110)	<p>UI Clock Minutes</p>

Register Address (offset)	Description
	Type: UInt16 Range: 0 - 59 Minutes Set clock minute value. *PF2100 compatible register
30112 /40112 (111)	UI Clock Hour Type: UInt16 Range: 0 - 23 Hours Set clock hour value. *PF2100 compatible register
30113 /40113 (112)	UI Clock Day Type: UInt16 Range: 1 - 31 Days Set clock day value. *PF2100 compatible register
30114 /40114 (113)	UI Clock Month Type: UInt16 Range: 1 - 12 Months Set clock month value. *PF2100 compatible register
30115 /40115 (114)	UI Clock Year Type: UInt16 Range: 2000 - 2099 Years Set clock year value. *PF2100 compatible register

Register Address (offset)	Description
30116 /40116 (115)	<p>Apply Clock Changes</p> <p>This register is no longer used and is here as a place holder. Reading or writing to it has no effect.</p> <p>*PF2100 compatible register</p>
31126 /41126 (1125)	<p>Main Startup Delay Time</p> <p>Type: UInt16</p> <p>Range: 30 - 600 sec</p> <p>Main startup time in seconds. 0 - Time spent in the Main Delay state on startup.</p>
31127 /41127 (1126)	<p>Voltage Setting</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>BMS voltage mode. 0 - 12V, 1 - 24V</p>
31128 /41128 (1127)	<p>Voltage Restart</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>BMS low or high voltage restart. 0 - Disabled, 1 - Enabled</p>
31129 /41129 (1128)	<p>L1 Password Enable</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>Level one password feature. 0 - Disabled, 1 - Enabled</p>
31130 /41130 (1129)	<p>Commissioning Complete</p> <p>Type: UInt16</p>

Register Address (offset)	Description
	Range: 0,1 Commissioning completed. 0 - Incomplete, 1 - Complete
31137 /41137 (1136)	Temperature Units Type: UInt16 Range: 0,1 Temperature units. 0 - Celsius, 1 - Fahrenheit
31138 /41138 (1137)	Pressure Units Type: UInt16 Range: 0 - 6 Pressure units. 0 - kPa, 1 - psi, 2 - inch wc, 3 - oz/in2, 4 - kg/cm2, 5 - Percent, 6 - Milliamps
31139 /41139 (1138)	Volume Units Type: UInt16 Range: 0 - 6 Volume units. 0 - Litres, 1 - m3, 2 - US Gallons, 3 - bbl, 4 - ft3, 5 - Percent, 6 - Milliamps
31140 /41140 (1139)	Aux In 1 Units Type: UInt16 Range: 0 - 4 Aux in 1 unit. 0 - Percent, 1 - Milliamps, 2 - Temperature, 3 - Pressure, 4 - Volume
31141 /41141 (1140)	Aux In 2 Units Type: UInt16 Range: 0 - 4

Register Address (offset)	Description
	Aux in 2 units. 0 - Percent, 1 - Milliamps, 2 - Temperature, 3 - Pressure, 4 - Volume
31142 /41142 (1141) to 31147 /41147 (1146)	Status Element Priority Type: UInt8 Array Range: 12 Elements Status element priority list for the user interface display. Represented as a uint8_t array of 12 elements. 0 - Bath, 1 - Outlet, 2 - Stack, 3 - Level, 4 - Pressure, 5 - Firing Rate, 6 - Aux Temp, 7 - Aux In 1, 8 - Aux In 2, 9 - Pressure High, 10 - Flame 1 Strength, 11 - Flame 2 Strength
31162 /41162 (1161)	UI Status Screen Sizing Type: UInt16 Range: 0 – 2 Current status screen size. 0 - One Element, 1 - Five Element, 2 - Eight Element
33005 /43005 (3004)	Relights Remaining Type: UInt16 Range: 0 – 255 Number of relights remaining
33006 /43006 (3005)	State Timer Type: UInt16 Range: UInt16 Current state timer in seconds
33007 /43007 (3006)	Purge Timer Type: UInt16

Register Address (offset)	Description
	<p>Range: UInt16</p> <p>Purge timer in seconds.</p>
33008 /43008 (3007)	<p>Delta Time</p> <p>Type: UInt16</p> <p>Range: UInt16</p> <p>Processors RTL loop delta time in milliseconds.</p>
33101 /43101 (3100) to 33116 /43116 (3115)	<p>Alarm Bits</p> <p>Type: Bitset</p> <p>Range: 0 - 256 bits</p> <p>Alarm bits. An alarm is set if the alarm index is set. 0 - Alarm Bits are OR'd between processors. 1 - See Alerts Document for alarm details.</p>
33201 /43201 (3200) to 33202 /43202 (3201)	<p>Wait Bits</p> <p>Type: Bitset</p> <p>Range: 0 - 24 bits</p> <p>Wait bits. A wait is set if the wait index is set. 0 - See Alerts Document for wait details.</p>
33301 /43301 (3300) to 33302 /43302 (3301)	<p>Warning Bits</p> <p>Type: Bitset</p> <p>Range: 0 - 32 bits</p> <p>Warning bits. A warning is set if the warning index is set. 0 - See Alerts Document for warning details.</p>
33401 /43401 (3400)	<p>Main Permissive Bits</p> <p>Type: Bitset</p>

Register Address (offset)	Description
	<p>Range: 0 - 8 bits</p> <p>Alarm bits. An alarm is set if the alarm index is set. 0 - See Alerts Document for main permissive details.</p>
33501 /43501 (3500)	<p>System Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>System input voltage. Value is in 10x. A voltage of 12.4V is represented as 124.</p>
33502 /43502 (3501)	<p>Authentication Level</p> <p>Type: UInt16</p> <p>Range: 0 - 4</p> <p>BMS authentication level. 0 - None, 1 - Remote, 2 - L1, 3 - L2, 4 - SYS</p>
33510 /43510 (3509)	<p>Region Code</p> <p>Type: UInt16</p> <p>Range: 0 - 4</p> <p>Region code. 0 - Development, 1 - North America, 2 - European Union, 3 - Australia, 4 - World</p>
33511 /43511 (3510) to 33512 /43512 (3511)	<p>Bundle Version</p> <p>Type: UInt32</p> <p>BMS Firmware bundle version. Formatted as 4 bytes: [Product Variant] [Major] [Minor] [Release Number]</p>
33513 /43513 (3512) to 33514 /43514 (3513)	<p>Firmware Version</p> <p>Type: UInt32</p>

Register Address (offset)	Description
	BMS Firmware version. Formatted as 4 bytes: [Major] [Minor] [Release number high byte] [Release number low byte]
33515 /43515 (3514) to 33516 /43516 (3515)	Bootloader Version Type: UInt32 BMS Bootloader version. Formatted as 4 bytes: [Major] [Minor] [Release number high byte] [Release number low byte]
33517 /43517 (3516) to 33518 /43518 (3517)	BOM Version Type: UInt32 BMS BOM version. Formatted as 4 bytes: [Major] [Minor] [Release number high byte] [Release number low byte]
33519 /43519 (3518) to 33521 /43521 (3520)	Manufacturer Serial Number Type: Array BMS unique serial number. Formatted as 6 bytes.
33522 /43522 (3521) to 33523 /43523 (3522)	Manufacture Date Type: UInt32 Manufacture date formatted as 3 bytes: [2000 + value = year] [Month] [day]
33524 /43524 (3523) to 33525 /43525 (3524)	Manufacture Test Date Type: UInt32 Manufacture test date formatted as 3 bytes: [2000 + value = year] [Month] [day]
33526 /43526 (3525) to 33527 /43527 (3526)	PFN Version Type: UInt32

Register Address (offset)	Description
	PFN communication protocol version formatted as 4 bytes. [Major] [Minor] [Release number high byte] [Release number low byte]
33528 /43528 (3527)	Calibration Format Number Type: UInt16 Range: 0 - 255 Calibration version number

RTD/THERMOCOUPLE/ANALOG

Register Address (offset)	Description
33569 /43569 (3568) to 33570 /43570 (3569)	RTD 1A Slope Type: Float Range: Float Factory calibration factor
33571 /43571 (3570) to 33572 /43572 (3571)	RTD 1A Offset Type: Float Range: Float Factory calibration factor
33573 /43573 (3572) to 33574 /43574 (3573)	RTD 1B Slope Type: Float Range: Float Factory calibration factor

Register Address (offset)	Description
33575 /43575 (3574) to 33576 /43576 (3575)	RTD 1B Offset Type: Float Range: Float Factory calibration factor
33577 /43577 (3576) to 33578 /43578 (3577)	RTD 2 Slope Type: Float Range: Float Factory calibration factor
33579 /43579 (3578) to 33580 /43580 (3579)	RTD 2 Offset Type: Float Range: Float Factory calibration factor
33581 /43581 (3580) to 33582 /43582 (3581)	RTD 3 Slope Type: Float Range: Float Factory calibration factor
33583 /43583 (3582) to 33584 /43584 (3583)	RTD 3 Offset Type: Float Range: Float Factory calibration factor
33585 /43585 (3584) to 33586 /43586 (3585)	TC 1A Slope Type: Float Range: Float

Register Address (offset)	Description
	Factory calibration factor
33587 /43587 (3586) to 33588 /43588 (3587)	TC 1A Offset Type: Float Range: Float Factory calibration factor
33589 /43589 (3588) to 33590 /43590 (3589)	TC 1B Slope Type: Float Range: Float Factory calibration factor
33591 /43591 (3590) to 33592 /43592 (3591)	TC 1B Offset Type: Float Range: Float Factory calibration factor
33593 /43593 (3592) to 33594 /43594 (3593)	TC 2 Slope Type: Float Range: Float Factory calibration factor
33595 /43595 (3594) to 33596 /43596 (3595)	TC 2 Offset Type: Float Range: Float Factory calibration factor

Register Address (offset)	Description
33597 /43597 (3596) to 33598 /43598 (3597)	TC 3 Slope Type: Float Range: Float Factory calibration factor
33599 /43599 (3598) to 33600 /43600 (3599)	TC 3 Offset Type: Float Range: Float Factory calibration factor
33529 /43529 (3528) to 33530 /43530 (3529)	Analog Output 1 Slope Type: Float Range: Float Factory calibration factor
33531 /43531 (3530) to 33532 /43532 (3531)	Analog Output 1 Offset Type: Float Range: Float Factory calibration factor
33533 /43533 (3532) to 33534 /43534 (3533)	Analog Output 2 Slope Type: Float Range: Float Factory calibration factor
33535 /43535 (3534) to 33536 /43536 (3535)	Analog Output 2 Offset Type: Float Range: Float

Register Address (offset)	Description
	Factory calibration factor
33537 /43537 (3536) to 33538 /43538 (3537)	Analog Output 3 Slope Type: Float Range: Float Factory calibration factor
33539 /43539 (3538) to 33540 /43540 (3539)	Analog Output 3 Offset Type: Float Range: Float Factory calibration factor
33541 /43541 (3540) to 33542 /43542 (3541)	Analog Input 1 Slope Type: Float Range: Float Factory calibration factor
33543 /43543 (3542) to 33544 /43544 (3543)	Analog Input 1 Offset Type: Float Range: Float Factory calibration factor
33545 /43545 (3544) to 33546 /43546 (3545)	Analog Input 2 Slope Type: Float Range: Float Factory calibration factor

Register Address (offset)	Description
33547 /43547 (3546) to 33548 /43548 (3547)	Analog Input 2 Offset Type: Float Range: Float Factory calibration factor
33549 /43549 (3548) to 33550 /43550 (3549)	Analog Input 3 Slope Type: Float Range: Float Factory calibration factor
33551 /43551 (3550) to 33552 /43552 (3551)	Analog Input 3 Offset Type: Float Range: Float Factory calibration factor
33553 /43553 (3552) to 33554 /43554 (3553)	Analog Input 4 Slope Type: Float Range: Float Factory calibration factor
33555 /43555 (3554) to 33556 /43556 (3555)	Analog Input 4 Offset Type: Float Range: Float Factory calibration factor
33557 /43557 (3556) to 33558 /43558 (3557)	Analog Input 5 Slope Type: Float Range: Float

Register Address (offset)	Description
	Factory calibration factor
33559 /43559 (3558) to 33560 /43560 (3559)	Analog Input 5 Offset Type: Float Range: Float Factory calibration factor
33561 /43561 (3560) to 33562 /43562 (3561)	Analog Input 6 Slope Type: Float Range: Float Factory calibration factor
33563 /43563 (3562) to 33564 /43564 (3563)	Analog Input 6 Offset Type: Float Range: Float Factory calibration factor
33565 /43565 (3564) to 33566 /43566 (3565)	Analog Input 7 Slope Type: Float Range: Float Factory calibration factor
33567 /43567 (3566) to 33568 /43568 (3567)	Analog Input 7 Offset Type: Float Range: Float Factory calibration factor

1X MISCELLANEOUS REGISTERS

Register Address (offset)	Description
10001 /20001 (0)	<p>Run</p> <p>0 = Not Running, 1 = Running</p> <p>The Run bit is set when the PF2200 is running in any state other than Ready, Alarm, Shutdown. It is also set when the system is waiting for an enabled wait condition before relighting. This indicates that the system is actively firing or is attempting to light. Note: the status contact does not always match the state of the run bit. Please refer to the 2200 user manual for more information on the status contact.</p> <p>*PF2100 compatible register</p>
10019 /20019 (18)	<p>Pilot Solenoid Feedback</p> <p>0 = De-energized, 1 = Energized</p> <p>The Pilot Solenoid Feedback bit can be used to verify the proper operation of the circuitry and wiring that powers the Pilot Solenoid. This bit will be set if the output has voltage present on it, regardless of the source of the voltage. Therefore, if this bit is set but 10002 is clear, a circuitry/wiring short to 12/24V may be present. Similarly, if this bit is clear but 10002 is set, a circuitry/wiring short to ground may be present. This is not a proof of position.</p> <p>*PF2100 compatible register</p>
10022 /20022 (21)	<p>ESD Input</p> <p>0 = Closed, 1 = Open</p> <p>The ESD Input bit shows the state of the ESD Input. When the ESD Input is closed (normal condition), the ESD Input bit is clear. When the ESD Input is open (alarm condition), the bit is set. *PF2100 compatible register</p>
10023 /20023 (22)	<p>Start Input</p>

Register Address (offset)	Description
	<p>0 = Closed, 1 = Open</p> <p>The Start Input bit shows the state of the Start Input. When the Start Input is closed (normal condition), the Start Input bit is clear. When the Start Input is open, (unit off), the bit is set. *PF2100 compatible register</p>
10027 /20027 (26)	<p>Unit Failure</p> <p>0 = Unit OK, 1 = Unit Failed</p> <p>The Unit Failure bit shows the state of the unit self-tests. During operation the unit does many self-tests and verifications of the internal operation of the unit. If the unit is passing these tests, the Unit Failure bit is clear. If any of the tests fail, the Unit Failure bit will be set.</p> <p>*PF2100 compatible register</p>
10028 /20028 (27)	<p>Low or High Voltage</p> <p>0 = Voltage OK, 1 = Voltage Bad</p> <p>The Low or High Voltage bit shows whether the voltage applied to the controller is within acceptable limits. If the voltage is within limits, the Low or High Voltage bit is clear. If the voltage is out of limits, the bit is set.</p> <p>*PF2100 compatible register</p>
10037 /20037 (36)	<p>Proof of Closure (Latched)</p> <p>Latched version of 10021.</p>
10038 /20038 (37)	<p>ESD Input (Latched)</p> <p>Latched version of 10022.</p> <p>*PF2100 compatible register</p>
10039 /20039 (38)	<p>Start Input (Latched)</p> <p>Latched version of 10023.</p>

Register Address (offset)	Description
	*PF2100 compatible register
10040 /20040 (39)	Low Pressure (Latched) Latched version of 10024. *PF2100 compatible register
10043 /20043 (42)	Unit Failure (Latched) Latched version of 10027. *PF2100 compatible register
10044 /20044 (43)	Low or High Voltage (Latched) Latched version of 10028. *PF2100 compatible register

3X/4X MISCELLANEOUS REGISTERS

Register Address (offset)	Description
30001 /40001 (0)	<p>Run and Valve Status Bits BIT</p> <p>0 - Run 0 = Not Running, BIT 1 - Pilot 0 = De-energized, BIT 2 - Low Fire</p> <p>0 = De-energized, BIT 3 - High Fire 0 = De-energized</p> <p>*PF2100 compatible register</p>
30015 /40015 (14)	<p>Modbus - Terminal Communication Error</p> <p>Type: UInt16</p> <p>0 = No Error, 1 = Communication Error</p> <p>If there is a Modbus Card to Terminal Card Communication Error, this register will be set to 1 and all other Modbus registers will clear to zero.</p> <p>*PF2100 compatible register</p>
30016 /40016 (15)	<p>Modbus - Terminal Comm Error Counter</p> <p>Type: UInt16</p> <p>Range: 0 to 65535</p> <p>Counts consecutive communications timeouts within the Terminal Card when register 30015/40015 = 1. Will reset to zero when register 30015/40015 = 0.</p> <p>*PF2100 compatible register</p>
30100 /40100 (99)	<p>Start Stop Register</p> <p>Type: UInt16</p> <p>Values: 0, 1234, 4321</p> <p>Set register to decimal 1234 to start unit. Set register to decimal 4321 to stop unit. This register is used to remotely stop or start the PF2200 and will clear when the command is accepted.</p>

Register Address (offset)	Description
	*PF2100 compatible register
30143 /40143 (142)	<p>Clear Shutdown Code</p> <p>Type: UInt16</p> <p>Range: 0, 1</p> <p>Set register value to 1 to acknowledge shutdown.</p>
31033 /41033 (1032)	<p>Remote Start</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>Remote Start feature.</p> <p>0 - Disabled, 1 - Enabled</p>
31081 /41081 (1080)	<p>Process Setpoint Adjust Mode</p> <p>Type: UInt16</p> <p>Range: 0 - 3</p> <p>Aux in 2 setpoint adjust feature, 0 - Disabled, 1 - Bath, 2 - Outlet, 3 - Aux Temp</p>
31094 /41094 (1093)	<p>Status Contact Mode</p> <p>Type: UInt16</p> <p>Range: 0 - 3</p> <p>Status contact operating mode.</p> <p>0 - Run Status, 1 - Heating Status, 2 - Low Temp Warning, 3 - Level Control</p>
33001 /43001 (3000)	<p>Controller State</p> <p>Type: Int16</p> <p>Range: -1 - 15</p>

Register Address (offset)	Description
	<p>BMS Controller state. A value of -1 is an invalid state.</p> <ul style="list-style-type: none"> 0 - Lockout 1 - Alarm 2 - Power On 3 - Ready 4 - Confirm Start 5 - Waiting 6 - Ignition Stage 1 7 - Ignition Stage 2 8 - Pilot Start up Delay 9 - Pilot 10 - Request Light Off Position 11 - Main Delay 12 - Main 13 - Stage 1 14 - Stage 2 15 - PID Control
33002 /43002 (3001)	<p>Primary Next Controller Stat</p> <p>Type: Int16</p> <p>Range: -1 – 15</p> <p>Next BMS Controller state on primary processor. A value of -1 is an invalid state.</p>
33003 /43003 (3002)	<p>Secondary Next Controller State</p> <p>Type: Int16</p> <p>Range: -1 – 15</p> <p>Next BMS Controller state on secondary processor. A value of -1 is an invalid state.</p>
33004 /43004 (3003)	<p>Shutdown Code</p> <p>Type: UInt16</p> <p>Range: 0 – 255</p> <p>Shutdown code. 0 if no shutdown code present. 0 - Shutdown Code is OR'd between processors</p>

Register Address (offset)	Description
33503 /43503 (3502)	<p>Is Running</p> <p>Type: UInt16</p> <p>Range: 0,1</p> <p>Run status. 0 if not running. 1 if running.</p>
33504 /43504 (3503) to 33505 /43505 (3504)	<p>Sync Count</p> <p>Type: UInt32</p> <p>Range: UInt32</p> <p>Processor synchronization count.</p>
33506 /43506 (3505)	<p>Transition Status</p> <p>Type: Int16</p> <p>Range: -1 – 15</p> <p>BMS Transition state.</p> <p>0 - Lockout</p> <p>1 - Alarm</p> <p>2 - Power On</p> <p>3 - Ready</p> <p>4 - Confirm Start</p> <p>5 - Waiting</p> <p>6 - Ignition Stage 1</p> <p>7 - Ignition Stage 2</p> <p>8 - Pilot Start up Delay</p> <p>9 - Pilot</p> <p>10 - Request Light Off Position</p> <p>11 - Main Delay</p> <p>12 - Main</p> <p>13 - Stage 1</p> <p>14 - Stage 2</p> <p>15 - PID Control</p>
33507 /43507 (3506) to 33508 /43508 (3507)	<p>Hardware Model Number</p> <p>Type: UInt32</p>

Register Address (offset)	Description
	Formatted as 3 bytes such that the least significant byte is the board type: 0x00 - invalid 0x01- UI hardware 0x02 - BMS hardware The most significant bytes are: 0x0000 - Invalid 0x2200 - PF2200 platform. The PF2200 BMS should have a value of 0x220001 in this register.
33509 /43509 (3508)	<p>Product Variant</p> <p>Type: UInt16</p> <p>Range: 0 – 6</p> <p>Product type.</p> <p>0 - Default</p> <p>1 - Single Burner</p> <p>2 - Dual Burner</p> <p>3 - Forced Draft Combustor</p> <p>4 - Air Assist Flare</p> <p>5 - Forced Draft Incinerator</p> <p>6 - Forced Draft</p>
33601 /43601 (3600) to 33602 /43602 (3601)	<p>ADC Slope</p> <p>Type: Float</p> <p>Range: Float</p> <p>Factory calibration factor</p>
33603 /43603 (3602) to 33604 /43604 (3603)	<p>ADC Offset</p> <p>Type: Float</p> <p>Range: Float</p> <p>Factory calibration factor</p>
33685 /43685 (3684)	<p>Interlock Input Contact Status</p> <p>Type: Bitset</p> <p>Range: 13 bits</p> <p>Input contact status. A 1 indicates the input is energized (digital high) at that index.</p>

Register Address (offset)	Description
	<ul style="list-style-type: none"> 0 - Proof of Closure 1 - ESD 2 - Start 3 - Pressure Low 4 - Pressure High 5 - Proof of Main Light Off 6 - Level 7 - Aux In 8 - Process SP Adjust 9 - Aux Temp 10 - UV Fault 11 - UV Flame On 12 - UV Flame Off
33690 /43690 (3689)	<p>IO Short Faults</p> <p>Type: Bitset</p> <p>Range: 7 bits</p> <p>Input contact short faults. A 1 indicates a fault is set at that index.</p> <ul style="list-style-type: none"> 0 - Switch Run 1 - Switch Ignition 2 - Start 3 - Proof of Closure 4 - UV Flame Off 5 - UV Fault 6 - ESD
33698 /43698 (3697)	<p>ESD Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>ESD digital input voltage. Value is in 10x. A voltage of 13.5 °C will be represented as 135.</p>
33699 /43699 (3698)	<p>Start Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p>

Register Address (offset)	Description
	Start digital input voltage. Value is in 10x. A voltage of 13.5 °C will be represented as 135.
33700 /43700 (3699)	<p>POC Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>POC digital input voltage. Value is in 10x. A voltage of 13.5 °C will be represented as 135.</p>
33713 /43713 (3712)	<p>Process SP Adjust Setpoint</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Process setpoint adjust value. Value is in 10x. A temperature of 134.5 °C will be represented as 1345.</p>
33714 /43714 (3713)	<p>External Switch State</p> <p>Type: UInt16</p> <p>Range: 0 - 4</p> <p>Start/stop switch state.</p> <ul style="list-style-type: none"> 0 - Stop 1 - Run 2 - Ignite 3 - Invalid 4 - Stuck
33715 /43715 (3714)	<p>I2C Bus Faults</p> <p>Type: Bitset</p> <p>Range: 13 bits</p> <p>Internal board communication bus fault. A 1 indicates a fault is set at that index.</p> <ul style="list-style-type: none"> 0 - Pressure 1 - Pressure High 2 - Proof of Light Off

Register Address (offset)	Description
	<ul style="list-style-type: none"> 3 - Level 4 - Aux Temp 5 - Aux In 1 6 - Aux In 2 7 - Pilot 1 8 - Pilot 2 9 - SSV1 10 - SSV2 11 - High Fire 12 - System Voltage Current
33720 /43720 (3719)	<p>ADC Faults</p> <p>Type: Bitset</p> <p>Range: 9 bits</p> <p>Internal board adc fault. A 1 indicates a fault is set at that index.</p> <ul style="list-style-type: none"> 0 - Pilot Start 1 - Pilot Read 2 - Pilot Stop 3 - System Start 4 - System Read 5 - System Stop 6 - Digital Input Start 7 - Digital Input Read 8 - Digital Input Stop
33730 /43730 (3729)	<p>Status Contact State</p> <p>Type: UInt16</p> <p>Range: 0, 1</p> <p>Status output contact state.</p> <p>0 - De-energized, 1 - Energized</p>
33732 /43732 (3731)	<p>Analog Output Faults</p> <p>Type: Bitset</p> <p>Range: 3 bits</p>

Register Address (offset)	Description
	<p>4-20mA output faults. A 1 indicates a fault is set at that index.</p> <p>0 - Temp Echo, 1 - Level Echo, 2 - TCV</p>
33738 /43738 (3737)	<p>Firing Rate</p> <p>Type: UInt16</p> <p>Range: 0 - 100 %</p> <p>BMS firing rate in %.</p>
33742 /43742 (3741)	<p>Pilot 1 Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Pilot 1 valve voltage in Volts. Value is 10x.</p> <p>A voltage of 10.4V is represented as 104.</p>
33743 /43743 (3742)	<p>Pilot 1 Current</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Pilot 1 valve current in mA. Value is 10x. A current of 51.6mA is represented as 516.</p>
33744 /43744 (3743)	<p>Pilot 2 Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Pilot 2 valve voltage in Volts. Value is 10x. A voltage of 10.4V is represented as 104.</p>
33745 /43745 (3744)	<p>Pilot 2 Current</p> <p>Type: Int16</p> <p>Range: Int16</p>

Register Address (offset)	Description
	Pilot 2 valve current in mA. Value is 10x. A current of 51.6mA is represented as 516.
33752 /43752 (3751)	<p>System Current</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Supply current to BMS in mA. Value is 10x. A current of 51.6mA is represented as 516.</p>
33753 /43753 (3752)	<p>System Power</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>BMS power consumption in watts. Value is 10x. Wattage of 10.4W is represented as 104.</p>
33754 /43754 (3753)	<p>Pilot 1 Flame DC High Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Pilot 1 DC high voltage in millivolts.</p>
33755 /43755 (3754)	<p>Pilot 1 Flame DC Low Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Pilot 1 DC low voltage in millivolts.</p>
33756 /43756 (3755)	<p>Pilot 1 AC Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Pilot 1 AC voltage in millivolts.</p>

Register Address (offset)	Description
33757 /43757 (3756)	<p>Pilot 2 Flame DC High Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Pilot 2 DC high voltage in milliVolts.</p>
33758 /43758 (3757)	<p>Pilot 2 Flame DC Low Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Pilot 2 DC low voltage in milliVolts.</p>
33759 /43759 (3758)	<p>Pilot 2 AC Voltage</p> <p>Type: Int16</p> <p>Range: Int16</p> <p>Pilot 2 AC voltage in milliVolts.</p>
33760 /43760 (3759)	<p>Valve Power Status</p> <p>Type: Bitset</p> <p>Range: 5 bits</p> <p>Valve output status. A 1 indicates the valve is energized at that index.</p> <p>0 - Pilot 1</p> <p>1 - Pilot 2</p> <p>2 - SSV 1</p> <p>3 - SSV 2</p> <p>4 - HFV</p>
33765 /43765 (3764)	<p>System Up Time</p> <p>Type: UInt16</p> <p>Range: UInt16</p> <p>Accumulated system up time since power on in hours.</p>

Register Address (offset)	Description
33766 /43766 (3765)	<p>Average Hourly Energy Consumption</p> <p>Type: UInt16</p> <p>Range: UInt16</p> <p>Averaged energy consumption in watts/hour. Value is in 10x. A watt/hour of 0.5W/h will be represented as 5.</p>
33767 /43767 (3766)	<p>Pilot Solenoid Run Time</p> <p>Type: UInt16</p> <p>Range: UInt16</p> <p>Accumulated pilot solenoid valve on time since power on in hours.</p>
30100 /40100 (99)	<p>Start Stop Register</p> <p>Type: UInt16</p> <p>Values: 0, 1234, 4321</p> <p>Set register to decimal 1234 to start unit. Set register to decimal 4321 to stop unit. This register is used to remotely stop or start the PF2200, and will clear when the command is accepted.</p> <p>*PF2100 compatible register</p>
30101 /40101 (100)	<p>Process Setpoint Change Request</p> <p>Type: UInt16</p> <p>Range: 0 - 1350°C</p> <p>This register is used to request the PF2200 to change the process SP to the specified value and will clear when the setpoint is accepted. Read register 30008/40008 to verify that the change was accepted.</p> <p>*PF2100 compatible register</p>
30102 /40102 (101)	<p>Low Fire Setpoint Change Request</p>

Register Address (offset)	Description
	<p>Type: UInt16</p> <p>Range: 0 - 1350°C</p> <p>This register is used to request the PF2200 to change the LF SP, and will clear when the setpoint is accepted. Read register 30009/40009 to verify that the change was accepted.</p> <p>*PF2100 compatible register</p>
30103 /40103 (102)	<p>Pilot Off Setpoint Change Request</p> <p>Type: UInt16</p> <p>Range: 0 - 1350°C</p> <p>This register is used to request the PF2200 to change the PO SP, and will clear when setpoint is accepted. Read register 30010/40010 to verify that the change was accepted.</p> <p>*PF2100 compatible register</p>
30110 /40110 (109)	<p>UI Clock Seconds</p> <p>Type: UInt16</p> <p>Range: 0 - 59</p> <p>Seconds Set clock second value.</p> <p>*PF2100 compatible register</p>
30111 /40111 (110)	<p>UI Clock Minutes</p> <p>Type: UInt16</p> <p>Range: 0 - 59</p> <p>Minutes Set clock minute value.</p> <p>*PF2100 compatible register</p>
30112 /40112 (111)	<p>UI Clock Hour</p> <p>Type: UInt16</p>

Register Address (offset)	Description
	Range: 0 - 23 Hours Set clock hour value. *PF2100 compatible register
30113 /40113 (112)	UI Clock Day Type: UInt16 Range: 1 - 31 Days Set clock day value. *PF2100 compatible register
30114 /40114 (113)	UI Clock Month Type: UInt16 Range: 1 - 12 Months Set clock month value. *PF2100 compatible register
30115 /40115 (114)	UI Clock Year Type: UInt16 Range: 2000 - 2099 Years Set clock year value. *PF2100 compatible register
30116 /40116 (115)	Apply Clock Changes This register is no longer used and is here as a place holder. Reading or writing to it has no effect. *PF2100 compatible register
30121 /40121 (120)	Modbus Remote Echo for Aux 1 Type: UInt16

Register Address (offset)	Description
30122 /40122 (121)	<p data-bbox="634 289 841 319">Range: 0 to 1000</p> <p data-bbox="634 344 1349 411">Sets the output value of the Aux 1 output on the BMS. Set as %x10 so 51.4% would be written as (514).</p>
30122 /40122 (121)	<p data-bbox="634 489 1024 518">Modbus Remote Echo for Aux 2</p> <p data-bbox="634 543 792 573">Type: UInt16</p> <p data-bbox="634 598 841 630">Range: 0 to 1000</p> <p data-bbox="634 655 1349 724">Sets the output value of the Aux 2 output on the BMS. Set as %x10 so 51.4% would be written as (514).</p>
30143 /40143 (142)	<p data-bbox="634 800 902 829">Clear Shutdown Code</p> <p data-bbox="634 854 792 884">Type: UInt16</p> <p data-bbox="634 909 768 938">Range: 0, 1</p> <p data-bbox="634 963 1243 993">Set register value to 1 to acknowledge shutdown.</p>



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