



PF2200 - DB

Modbus Configuration Guide

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1 CONFIGURATION

This document outlines configuration details for using Modbus with the PF2200-DB BMS and is applicable for the following hardware and firmware versions:

BMS Card Hardware Version	UI Card Hardware Version	PF2200-DB Firmware Version
v2.3.x	v3.2.x	DB 1.1.0 DB 1.0.3

The protocol used is Modbus RTU as a slave device and the physical implementation is half-duplex RS-485.

1.1 PF2200 MODBUS CONFIGURATION SETTINGS

Navigate to the Modbus Menu (Settings > Setup > Modbus) on the PF2200 User Interface to configure the following settings:

Name	Default	Options	Description
Modbus RTU Communication	Disabled	Disabled Enabled	Enables or disables Modbus the Modbus port on the User Interface Card. This must be enabled to utilize Modbus functionality.
Modbus Termination	Disabled	Disabled Enabled	Enables or disables a 100 Ω termination resistor across the A and B signal lines. This should be enabled if this device is the last drop on the Modbus line.
Baud Rate	9600	9600 19200	Baud rate of the communication protocol. 9600 should be used for noisy or long run lengths. Ensure that master and slave are using the same baud rate.
Stop Bits	1	1 2	Number of stop bits used for Modbus communication.
Parity	None	None Odd Even	Parity bit used for Modbus communication.
Slave Address	1	1 - 247	Modbus slave address of the PF2200. Ensure that the address is not used by any other devices on the Modbus line, and ensure that the master device is configured to match.

1.2 MODBUS MASTER CONFIGURATION REQUIREMENTS

1. Modbus Master must be in RTU mode and not ASCII mode
2. The minimum delay between Modbus poll packets should be longer than 20ms. Recommended interpacket delay is 20ms.
3. Response timeout should be longer than 500ms. The recommended timeout is 1 second.
4. Writing settings values via Modbus will overwrite any local user settings changes. It is recommended to keep setting writes to a minimum and either only write settings when changed, or if continually writing settings keep the write rate to a minimum of 5 seconds.
5. When reading settings, the fastest scan rate is recommended to be greater than 1 second.
6. Many of the registers use units that match the configured user interface units (i.e. unless otherwise noted all temperatures will either be reported in Celsius or Fahrenheit depending on the temperature unit configured on the UI). Units for Registers read or written should be confirmed on the user interface and converted on the Modbus master side if required.
7. Many of the registers are represented as 10 times their actual value to increase the resolution of the data. For example, a register with a value of 12.1 may be multiplied by a factor of 10 to return a value of 121, this allows once decimal place to be retained over the Modbus read/write. Check each register description to see if it is multiplied by this factor. The Modbus master will be required to convert the value back to a decimal format by dividing by 10.

1.3 TROUBLESHOOTING

The following section outlines some common issues with Modbus configuration and installation.

Problem	Proposed Solutions
Device not responding	<ol style="list-style-type: none"> 1. Check that configuration parameters match between the Master and Slave device such as baud rate, stop bits and parity. 2. Check that the slave address matches. 3. Check the Modbus response timeout is greater than 1000ms. 4. Check that the RS-485 Lines are not connected backwards. A wire connects to A or D-. B wire connects to B or D+. 5. Confirm a signal ground wire is connected between the Master and Slave device. 6. Confirm the Slave device is enabled in settings. 7. Try communication with termination enabled or disabled. Sometimes termination enabled can cause the Modbus Master to be incorrectly biased. 8. Confirm if the Modbus master has internal pullup and pulldown termination on the data lines. Some Master devices require external biasing resistors to be installed
CRC Errors	<ol style="list-style-type: none"> 1. Check that configuration parameters match between the Master and Slave device such as baud rate, stop bits and parity. 2. Check if there is noise on the line. This can be caused by external equipment or long run lengths. 3. Check if the data lines are reversed.
Data returned is always 0	<ol style="list-style-type: none"> 1. Check that the Modbus port is enabled on the user interface. 2. Check that the UI is communicating with the BMS. The Modbus communication register will return a value of 1 if communications have been lost with the BMS. 3. Check that the correct register is addressed. If the register is invalid it will return an exception code or a zero.
BMS shuts down when writing setpoints	<ol style="list-style-type: none"> 1. The setpoints may not be formatted correctly. Check the register definition. 2. The units may not be configured as expected. Check the temperature units in the UI units configuration. 3. The setpoints may be written out of range. Check the PF2200 user manual for setpoint configuration errors. For example, if the process setpoint is written to be higher than the high temperature setpoint the system will shut down.
BMS will not start when Start command sent via Modbus	<ol style="list-style-type: none"> 1. Confirm the correct value is written to the start register. 2. Confirm the lockout code is cleared and no alarms are present prior to attempting to start the system.
Read values don't make sense	<ol style="list-style-type: none"> 1. Check the pressure, level and temperature units configured on the UI. The Modbus representation matches the UI Units. For example, pressure can be in PSI, kPa, etc. 2. Check if the register is using a multiplier such as x10. If this is the case then the Modbus Master will need to divide by 10 to get the actual value.
Can't tell if read/write is working	<ol style="list-style-type: none"> 1. Read the available Test Registers and confirm the results match as described. These registers always return a specific value when read so that addressing and formatting can be confirmed. These registers may also be written. If the write is incorrect, they will return an exception code. 2. Modbus Master may require the address offset (index starting at 0) or the address itself (index starting at 1). Attempt to read the test registers at both the address and the offset to see which result provides the correct response.

1.3.1 MODBUS DIAGNOSTICS

Check the Modbus Diagnostics screen (System > Diagnostics > Modbus) for useful troubleshooting information.

Diagnostic Name	Description	Potential Cause
Transmitted Packets	The total number of packets transmitted.	N/A
Checksum Error	The Modbus packet has been received but the CRC check has failed indicating a corrupt packet.	Noise or missed bits on the RS485 line.
Illegal Function Code	The requested Modbus function code is not supported.	Modbus master programming error
Invalid Address count	The number of received packets that are not addressed to this slave device.	Configured Slave Address setting is incorrect
Frame Error	The received Modbus packet has frames that do not match the current configuration.	Configured Baud Rate, Parity, and/or Stop Bits settings do not match the Modbus master communication settings
Noise Error	The slave Modbus port has detected noise on the RS-485 line.	Incorrect configuration or noise from external sources.
Received Packets	The total number of packets received without protocol error.	N/A
Illegal Register Address	The requested register address is not supported.	Modbus master programming error
Parity Error	The received Modbus packet has a parity failure.	Corruption, noise, or incorrect configuration
Illegal Data Value	The data written to the register is out of range, or if the register spans multiple addresses not all addresses are written to in a single write request.	Modbus master programming error
Exceptions	The total count of illegal packet codes.	Incorrect configuration or Modbus master programming error

1.4 MODBUS COMMANDS

Only the Modbus RTU commands specified below are supported. All other Modbus RTU commands are not supported and will return an exception code for invalid command. Modbus TCP is not directly supported but can be used if a third-party bridge is used.

Settings may be written one by one or multiple settings may be written at once if they are sequential in the register table.

Some settings such as floats and uint32_t span multiple registers and hence all registers for each of these settings must be written at the same time or else the write request will fail.

Registers may be read one by one or multiple registers can be requested in one packet

If an individual register is requested that does not exist an exception code will be returned

If multiple registers are requested - as long as the first register has a valid address, the following registers regardless of their validity will return successfully. This allows for multiple registers to be read out without worrying about breaking up the register table for reads. Registers without a valid address will simply return 0.

Name	Command	Description
Read Input Registers	4 = 0x04	Two bytes per register are returned.
Read Coil	1 = 0x01	Bits pack the response.
Read Holding Registers	3 = 0x03	Two bytes per register are returned.
Read Discrete Input	2 = 0x02	Bits pack the response.
Write Multiple Holding Registers	16 = 0x10	Two bytes per register must be sent.
Write Single Holding Register	6 = 0x06	Two bytes per register must be sent.
Write Multiple Coils	15 = 0x0F	NOT SUPPORTED.
Write Single Coil	5 = 0x05	NOT SUPPORTED.

1.5 REGISTER ADDRESS VS REGISTER OFFSET

Some Modbus configuration software requires the 5-digit Register Address to be entered while other software uses the 1 to 4 digit Register Offset. Consult the software documentation for your Modbus master device to determine which is required in your case. This guide displays both numbers for each register.

1.6 REGISTER DATA FORMAT

The PF2200 supports multiple data formats in addition to the standard Modbus definitions. These include floats, uint32_t and arrays. These types require multiple (16bit) registers for representation and are described as follows:

- uint32_t are held in two sequential registers: (ABCD) = Reg 1: AB, Reg 2: CD
- uint64_t are held in four sequential registers: (ABCDEFGH) = Reg 1: AB, Reg 2: CD, Reg 3: EF, Reg 4: GH
- Arrays are held in sequential registers with 2 bytes per register. The number of registers to read/write will be the length of the array divided by 2. If the size of the array is odd the last byte is extended to a full word.
- Floating Point numbers (ABCD) are held in two sequential registers (Reg 1 - AB, Reg 2 - CD) and are represented in IEEE-754 Standard format.

All registers must be read/written in one request. Hence a multi-read or multi-write command must be used with a minimum length of the size of the data type.

Big-Endian format - the most significant byte and the most significant word are sent first (in the lower register).

1.7 LATCHED VS UNLATCHED REGISTERS

Latched registers have the same function as their corresponding unlatched registers, but once set will remain set until the system is stopped and then restarted. All registers are unlatched unless explicitly listed as latched.

1.8 SYSTEM UNITS

Settings and status registers may be displayed in the same unit as the user interface is configured for. If a register does not follow the corresponding UI unit it will be mentioned in the register description. Commonly temperature, pressures, levels and aux inputs will use the UI display unit. Registers that show the span of an input (such as pressure, level, or aux span min and max) when set to a unit of % or ma will display as 0 from Modbus. The reason for this is because span cannot be mapped back into its own base unit (of ma or %). In these cases, the span will always be 4 - 20mA as 0 - 100% of the span of the input.

1.9 COMMUNICATION LOSS

The PF2200 user interface communicates to the BMS card via a proprietary communication protocol called PFN. With the Slave Modbus port being accessible on the user interface data must be transferred from the BMS card to the user interface over the PFN link. If the user interface loses communication to the BMS card it can no longer retrieve Modbus setting and status information. In this case the Modbus registers will return all zeros except for the Modbus communication loss register (which will indicate a 1) and the communication loss counter (which will increment every second that communication is not present between the UI and BMS card).

2 MODBUS REGISTER MAP

2.1 TEST REGISTERS

The following registers can be used to test whether the Modbus Master is correctly configured and to confirm that both unsigned and signed values can be read properly.

Address (Offset)	Read/Write	Name	Type	Read Value if Modbus master is configured correctly
30123/40123 (122)	Read Only	Test Read - Unsigned	uint16	1234
30124/40124 (123)	Read Only	Test Read - Signed	Int16	-1234

2.2 READ ONLY COILS & DISCRETE INPUTS [0X01, 0X02]

Function codes 0x01 (Read Coil) and 0x02 (Read Input Status) can both be used to access the single-bit, read-only values from the following table. Reading one input will result in a single byte being returned with the least significant bit holding the value. Reading multiple inputs per command will result in a bit packed vector being returned.

Example 1: Read Single

Reading 1 register starting from Register Offset 3 will result in one data byte being returned with the least significant bit containing the value from Register Offset 3. All other unused bits will be set to zero.

Example 2: Read Multiple

Reading 12 registers starting from Register Offset 3 will result in two data bytes being returned. The value of the registers will be populated in the bits of each byte, beginning with the least significant bit of each byte. All other unused bits will be set to zero.

Address (Offset)	Name	0	1
10028/20028 (27)	Voltage Alarm	No High or Low Voltage Alarm	High/Low Voltage alarm present
10029/20029 (28)	High Temperature Alarm	No High Temperature Alarm	High Temperature alarm present

2.3 INPUT/HOLDING REGISTERS [READ: 0X03, 0X04 WRITE: 0X06, 0X10]

The Input Registers (300xx) are duplicated in the 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).

Use the Write Single/Multiple Register commands (0x06/0x10) to write these registers.

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.

Example 4: Write Single Register

Writing 1 register starting from Register Offset 100 will require two data bytes to be sent. The first byte will be the most significant byte of Register Offset 100 and the second byte will be the least significant byte.

Example 5: Write Multiple Register

Writing 2 registers starting from Register Offset 100 will require four data bytes to be sent. The first byte will be the most significant byte of Register Offset 100, the second byte will be the least significant byte of Register Offset 100, the third byte will be the most significant byte of Register Offset 101, and the fourth byte will be the least significant byte of Register Offset 101.

Example 6: Write float or uint32_t

Writing 2 registers starting from Register Offset 100 will require four data bytes to be sent. The first byte will be the most significant byte of Register Offset 100, the second byte will be the least significant byte of Register Offset 100, the third byte will be the most significant byte of Register Offset 101, and the fourth byte will be the least significant byte of Register Offset 101.

Address (Offset)	Read/Write	Name	Type	10x	Range
30100/40100 (99)	R/W	Appliance Start Stop	uint16		Read 0 = Command Accepted Write 1234 = Start both burners * Write 4321 = Stop both burners
* Writing a start command to this register will start any burner that is in the Ready state only if the other burner is not running.					
30110/40110 (109)	R/W	UI Clock Seconds	uint16		0 - 59 seconds
30111/40111 (110)	R/W	UI Clock Minutes	uint16		0 - 59 minutes
30112/40112 (111)	R/W	UI Clock Hour	uint16		0 - 23 hours
30113/40113 (112)	R/W	UI Clock Day	uint16		1 - 31 days
30114/40114 (113)	R/W	UI Clock Month	uint16		1 - 12 months
30115/40115 (114)	R/W	UI Clock Year	uint16		2000 - 2099 years
30121/40121 (120)	R/W	Modbus Remote Echo for Aux Out	uint16	10x	Sets Aux output when configured in Modbus Echo Mode
30143/40143 (142)	R/W	Clear Shutdown Code	uint16		0 = No effect 1 = Acknowledge Lockout
30144/40144 (143)	Read Only	Burner A Shutdown Code	uint16		0 = No shutdown code set on Burner A Not 0 = Burner A shutdown code
30145/40145 (144)	Read Only	Burner B Shutdown Code	uint16		0 = No shutdown code set on Burner B Not 0 = Burner B shutdown code
30151/40151 (150)	R/W	Burner A Start/Stop	uint16		Read 0 = Command Accepted Write 1234 = Start Burner A * Write 4321 = Stop Burner A
* Writing a start command to this register will start Burner A only if it is in the Ready state and Burner B is stopped.					
30152/40152 (151)	R/W	Burner B Start/Stop	uint16		Read 0 = Command Accepted Write 1234 = Start Burner B * Write 4321 = Stop Burner B
* Writing a start command to this register will start Burner B only if it is in the Ready state and Burner A is stopped.					
31001/41001 (1000)	Read Only	Bath Type	uint16		0 = TC 1 = RTD
31002/41002 (1001)	Read Only	Bath Mode	uint16		0 = Process Control 1 = High Temp ESD
31003/41003 (1002)	Read Only	Bath Input	uint16		0 = Dual 1 = Single
31004/41004 (1003)	Read Only	Bath High Temp Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
31005/41005 (1004)	R/W	Bath Pilot Off Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
* Write must be between the Bath Main Off Setpoint and the Bath High Temp Setpoint while running. Writes below or above the bounds while running will cause the system to shutdown and a configuration error alarm.					
31006/41006 (1005)	R/W	Bath Main Off Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
* Write must be between the Bath Process Setpoint and the Bath Pilot Off Setpoint while running. Writes below or above the bounds while running will cause the system to shutdown and a configuration error alarm.					
31007/41007 (1006)	R/W	Bath Process Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
* Write must be between the Bath Low Temp Setpoint and the Bath Main Off Setpoint while running. Writes below or above the bounds while running will cause the system to shutdown and a configuration error alarm.					
31008/41008 (1007)	Read Only	Bath Low Temp Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
31009/41009 (1008)	R/W	Bath Deadband	uint16		0 - 100 °C (32 - 212 °F)
31010/41010 (1009)	Read Only	Outlet/Stack B Type	uint16		0 = TC 1 = RTD
31011/41011 (1010)	Read Only	Outlet/Stack B Mode	uint16		0 = Disabled 1 = Outlet Process Control 2 = Outlet High Temp ESD 3 = Outlet Display Only 4 = Stack B High Temp ESD 5 = Stack B Display Only
31012/41012 (1011)	Read Only	Outlet/Stack B High Temp Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
31013/41013 (1012)	R/W	Outlet Pilot Off Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
* Write must be between the Outlet Main Off Setpoint and the Outlet High Temp Setpoint while running. Writes below or above the bounds while running will cause the system to shutdown and a configuration error alarm.					
31014/41014 (1013)	R/W	Outlet Main Off Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
* Write must be between the Outlet Process Setpoint and the Outlet Pilot Off Setpoint while running. Writes below or above the bounds while running will cause the system to shutdown and a configuration error alarm.					
31015/41015 (1014)	R/W	Outlet Process Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
* Write must be between the Outlet Low Temp Setpoint and the Outlet Main Off Setpoint while running. Writes below or above the bounds while running will cause the system to shutdown and a configuration error alarm.					

Address (Offset)	Read/Write	Name	Type	10x	Range
31016/41016	(1015) Read Only	Outlet Low Temp Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
31017/41017	(1016) R/W	Outlet/Stack B Deadband	uint16		0 - 100 °C (32 - 212 °F)
31018/41018	(1017) Read Only	Stack Type	uint16		0 = TC 1 = RTD
31019/41019	(1018) Read Only	Stack Mode	uint16		0 = Disabled 1 = High Temp ESD 2 = Display Only
31020/41020	(1019) Read Only	Stack High Temp Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
31021/41021	(1020) R/W	Stack Deadband	uint16		0 - 100 °C (32 - 212 °F)
31022/41022	(1021) Read Only	Aux Temp Mode	uint16		0 = Disabled 1 = Process Control 2 = High Temp ESD 3 = Display Only
31023/41023	(1022) Read Only	Aux Temp Type	uint16		0 = Invalid 1 = Invalid 2 = 4-20
31024/41024	(1023) Read Only	Aux High Temp Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
31025/41025	(1024) R/W	Aux Pilot Off Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
* Write must be between the Aux Temp Main Off Setpoint and the Aux Temp High Temp Setpoint while running. Writes below or above the bounds while running will cause the system to shutdown and a configuration error alarm.					
31026/41026	(1025) R/W	Aux Main Off Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
* Write must be between the Aux Temp Process Setpoint and the Aux Temp Pilot Off Setpoint while running. Writes below or above the bounds while running will cause the system to shutdown and a configuration error alarm.					
31027/41027	(1026) R/W	Aux Process Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
* Write must be between the Aux Temp Low Temp Setpoint and the Aux Temp Main Off Setpoint while running. Writes below or above the bounds while running will cause the system to shutdown and a configuration error alarm.					
31028/41028	(1027) Read Only	Aux Low Temp Setpoint	uint16		0 - 1350 °C (32 - 2462 °F)
31029/41029	(1028) R/W	Aux Deadband	uint16		0 - 100 °C (32 - 212 °F)
31030/41030	(1029) Read Only	Aux Temp Span Min	int16		-100 - 1350 °C (-459 - 2462 °F)
31031/41031	(1030) Read Only	Aux Temp Span Max	int16		-100 - 1350 °C (-459 - 2462 °F)
31032/41032	(1031) Read Only	Proof of Closure A (POC A)	uint16		0 = Disabled 1 = Enabled
31033/41033	(1032) Read Only	Remote Start	uint16		0 = Disabled 1 = Enabled
31034/41034	(1033) Read Only	Upstream Pressure Type	uint16		0 = Disabled 1 = Digital 2 = 4-20
31035/41035	(1034) Read Only	Upstream Pressure Span Min	int32	10x	Reading multiplied by 10 in configured Pressure Units
31037/41037	(1036) Read Only	Upstream Pressure Span Max	int32	10x	Reading multiplied by 10 in configured Pressure Units
31039/41039	(1038) Read Only	Upstream Pressure Low Trip	int32	10x	Reading multiplied by 10 in configured Pressure Units
31041/41041	(1040) Read Only	Upstream Pressure High Trip	int32	10x	Reading multiplied by 10 in configured Pressure Units
31043/41043	(1042) Read Only	Upstream Pressure Deadband	uint16	10x	Reading multiplied by 10 in configured Pressure Units
31044/41044	(1043) Read Only	Upstream Pressure Low Pressure Delay	uint16		2 - 20 seconds
31045/41045	(1044) Read Only	Upstream Pressure Low Pressure Mode	uint16		0 = Alarm 1 = Wait 2 = Warning 3 = Main Permissive
31048/41048	(1047) Read Only	Level/Flow Type	uint16		0 = Disabled 1 = Digital 2 = 4-20
31049/41049	(1048) Read Only	Level/Flow Digital Mode	uint16		0 = Alarm 1 = Wait 2 = Warning

Address (Offset)	Read/Write	Name	Type	10x	Range
31050/41050	(1049) Read Only	Level/Flow Low Trip Mode	uint16		0 = Alarm 1 = Wait 2 = Warning
31051/41051	(1050) Read Only	Level/Flow High Trip Mode	uint16		0 = Alarm 1 = Wait 2 = Warning
31052/41052	(1051) Read Only	Level/Flow Span Min	int32	10x	Reading multiplied by 10 in configured Level/Flow Units
31054/41054	(1053) Read Only	Level/Flow Span Max	int32	10x	Reading multiplied by 10 in configured Level/Flow Units
31056/41056	(1055) Read Only	Level/Flow Low Trip	int32	10x	Reading multiplied by 10 in configured Level/Flow Units
31058/41058	(1057) Read Only	Level/Flow High Trip	int32	10x	Reading multiplied by 10 in configured Level/Flow Units
31060/41060	(1059) Read Only	Level/Flow Deadband	uint16	10x	Reading multiplied by 10 in configured Level/Flow Units
31061/41061	(1060) Read Only	Level/Flow Delay	uint16		2 - 20 seconds
31065/41065	(1064) Read Only	Aux In 1 Type	uint16		0 = Disabled 1 = Digital 2 = 4-20
31066/41066	(1065) Read Only	Aux In 1 4-20 Mode	uint16		0 = High/Low Trip 1 = Burner A High/Low Trip 2 = Burner B High/Low Trip 3 = Appliance Firing Rate 4 = Bath Process SP Adjust 5 = Outlet Process SP Adjust 6 = Aux Temp Process SP Adjust
31067/41067	(1066) Read Only	Aux In 1 Digital Mode	uint16		0 = Alarm 1 = Wait 2 = Warning 3 = Main Permissive
31068/41068	(1067) Read Only	Aux In 1 Low Trip Mode	uint16		0 = Alarm 1 = Wait 2 = Warning 3 = Main Permissive
31069/41069	(1068) Read Only	Aux In 1 High Trip Mode	uint16		0 = Alarm 1 = Wait 2 = Warning 3 = Main Permissive
31070/41070	(1069) Read Only	Aux In 1 Low Trip	int32	10x	Reading multiplied by 10 in configured Aux In 1 Units
31072/41072	(1071) Read Only	Aux In 1 High Trip	int32	10x	Reading multiplied by 10 in configured Aux In 1 Units
31074/41074	(1073) Read Only	Aux In 1 Deadband	uint16	10x	Reading multiplied by 10 in configured Aux In 1 Units
31076/41076	(1075) Read Only	Aux In 1 Span Min	int32	10x	Reading multiplied by 10 in configured Aux In 1 Units
31078/41078	(1077) Read Only	Aux In 1 Span Max	int32	10x	Reading multiplied by 10 in configured Aux In 1 Units
31080/41080	(1079) Read Only	Aux In 2 Type	uint16		0 = Disabled 1 = Digital 2 = 4-20
31081/41081	(1080) Read Only	Aux In 2 4-20 Mode	uint16		0 = High/Low Trip 1 = Burner A High/Low Trip 2 = Burner B High/Low Trip 3 = Appliance Firing Rate 4 = Bath Process SP Adjust 5 = Outlet Process SP Adjust 6 = Aux Temp Process SP Adjust

Address (Offset)	Read/Write	Name	Type	10x	Range
31082/41082	(1081) Read Only	Aux In 2 Digital Mode	uint16		0 = Alarm 1 = Wait 2 = Warning 3 = Main Permissive
31083/41083	(1082) Read Only	Aux In 2 Low Trip Mode	uint16		0 = Alarm 1 = Wait 2 = Warning 3 = Main Permissive
31084/41084	(1083) Read Only	Aux In 2 High Trip Mode	uint16		0 = Alarm 1 = Wait 2 = Warning 3 = Main Permissive
31085/41085	(1084) Read Only	Aux In 2 Low Trip	int32	10x	Reading multiplied by 10 in configured Aux In 2 Units
31087/41087	(1086) Read Only	Aux In 2 High Trip	int32	10x	Reading multiplied by 10 in configured Aux In 2 Units
31089/41089	(1088) Read Only	Aux In 2 Deadband	uint16	10x	Reading multiplied by 10 in configured Aux In 2 Units
31090/41090	(1089) Read Only	Aux In 2 Span Min	int32	10x	Reading multiplied by 10 in configured Aux In 2 Units
31092/41092	(1091) Read Only	Aux In 2 Span Max	int32	10x	Reading multiplied by 10 in configured Aux In 2 Units
31094/41094	(1093) Read Only	Status Contact Mode	uint16		0 = Run Status 1 = Heating Status 2 = Low Temp Warning
31095/41095	(1094) Read Only	Aux Out 1 Mode	uint16		0 = Disabled 1 = Level/Flow Echo 2 = N/A 3 = Aux In 1 Echo 4 = Aux In 2 Echo 5 = N/A 6 = N/A 7 = N/A 8 = Modbus Echo 9 = Bath Temp Echo 10 = Outlet Temp Echo 11 = Stack Temp Echo 12 = Aux Temp Echo
31097/41097	(1096) Read Only	Aux Out Temp Echo Span Min	int16		-100 - 1350 °C
31098/41098	(1097) Read Only	Aux Out Temp Echo Span Max	int16		-100 - 1350 °C
31101/41101	(1100) Read Only	Pilot Valve A PWM	uint16		10 - 100 %
31102/41102	(1101) Read Only	SSV A PWM	uint16		10 - 100 %
31103/41103	(1102) Read Only	SSV UP PWM	uint16		10 - 100 %
31104/41104	(1103) Read Only	TCV Min Position	uint16		0 - 70 %
31105/41105	(1104) Read Only	TCV Purge Position	uint16		0 - 100 %
31106/41106	(1105) Read Only	TCV Pilot Position	uint16		0 - 100 %
31107/41107	(1106) Read Only	TCV Manual Override	uint16		0 = Disabled 1 = Enabled
31108/41108	(1107) Read Only	TCV Manual Position	uint16		0 - 100 %
31109/41109	(1108) R/W	Process Proportional Band	uint16	10x	°C Range: 0 - 10000 (0 - 1000°C) °F Range: 320 - 18320 (32 - 1832°F)
31110/41110	(1109) R/W	Process Integral Time	uint16	10x	0 - 10000 (0 - 1000 min/rep)
31111/41111	(1110) R/W	Process Derivative Time	uint16	10x	0 - 10000 (0 - 1000 min)
31112/41112	(1111) R/W	Process Integral Reset Range	uint16	10x	°C Range: 0 - 10000 (0 - 1000°C) °F Range: 320 - 18320 (32 - 1832°F)
31113/41113	(1112) R/W	Cascade SP Proportional Band	uint16	10x	°C Range: 0 - 10000 (0 - 1000°C) °F Range: 320 - 18320 (32 - 1832°F)
31114/41114	(1113) R/W	Cascade SP Integral Time	uint16	10x	0 - 10000 (0 - 1000 mins/rep)

Address (Offset)	Read/Write	Name	Type	10x	Range
31115/41115	(1114) R/W	Cascade SP Derivative Time	uint16	10x	0 - 10000 (0 - 1000 min)
31116/41116	(1115) R/W	Cascade SP Integral Reset Range	uint16	10x	°C Range: 0 - 10000 (0 - 1000°C) °F Range: 320 - 18320 (32 - 1832°F)
31117/41117	(1116) R/W	PID Output Rate Limit	uint16	10x	1 - 1000 (0.1 = 100 %/sec)
31118/41118	(1117) R/W	PID Ramp Time	uint16		0 - 255 seconds
31119/41119	(1118) Read Only	Process Control Mode	uint16		0 = On/Off Control 1 = Bath PID Control 2 = Outlet PID Control 3 = Aux PID Control 4 = Cascaded PID Control 5 = External Firing Rate
31120/41120	(1119) Read Only	Pilot Off Mode	uint16		0 = Disabled 1 = Off At Pilot Off Setpoint 2 = Off At Main Off Setpoint
31121/41121	(1120) Read Only	Minimum Burners Running	uint16		1 - 2
31122/41122	(1121) Read Only	Relight Attempts	uint16		0 - 3
31123/41123	(1122) Read Only	Ignition Mode	uint16		0 = Coil 1 = HEI
31124/41124	(1123) Read Only	Purge Time	uint16		10 - 900 seconds
31125/41125	(1124) Read Only	Pilot Startup Delay Time	uint16		5 - 600 seconds
31126/41126	(1125) Read Only	Main Startup Delay Time	uint16		30 - 600 seconds
31127/41127	(1126) Read Only	Voltage Setting	uint16		0 = 12V 1 = 24V
31128/41128	(1127) Read Only	Voltage Restart	uint16		0 = Disabled 1 = Enabled
31129/41129	(1128) Read Only	L1 Password Enable	uint16		0 = Disabled 1 = Enabled
31130/41130	(1129) Read Only	Commissioning Complete	uint16		0 = Incomplete 1 = Complete
31131/41131	(1130) Read Only	Slave Address	uint16		1 - 247
31132/41132	(1131) Read Only	Baud Rate	uint16		0 = 9600 1 = 19200
31133/41133	(1132) Read Only	Stop Bits	uint16		0 = 1 1 = 2
31134/41134	(1133) Read Only	Parity	uint16		0 = None 1 = Odd 2 = Even
31135/41135	(1134) Read Only	Modbus Termination	uint16		0 = Disabled 1 = Enabled
31136/41136	(1135) Read Only	Remote Access	uint16		0 = Disabled 1 = Enabled
31137/41137	(1136) Read Only	Temperature Units	uint16		0 = Celsius 1 = Fahrenheit
31138/41138	(1137) Read Only	Pressure Units	uint16		0 = kPa 1 = psi 2 = inch wc 3 = oz/in2 4 = kg/cm2 5 = Percent 6 = Milliamps
31139/41139	(1138) Read Only	Level Units	uint16		0 = Litres 1 = m3 2 = US Gallons 3 = bbl 4 = ft3 5 = Percent 6 = Milliamps

Address (Offset)	Read/Write	Name	Type	10x	Range
31140/41140	(1139) Read Only	Aux In 1 Units	uint16		0 = Percent 1 = Milliamps 2 = Temperature 3 = Pressure 4 = Level 5 = Flow
31141/41141	(1140) Read Only	Aux In 2 Units	uint16		0 = Percent 1 = Milliamps 2 = Temperature 3 = Pressure 4 = Level 5 = Flow
31201/41201	(1200) Read Only	Request Light Off Delay Time	uint16		30 - 600 seconds
32031/42031	(2030) Read Only	Upstream Pressure Digital Type	uint16		0 = Low 1 = High
32032/42032	(2031) Read Only	Proof of Closure B (POC B)	uint16		0 = Disabled 1 = Enabled
32033/42033	(2032) Read Only	Upstream Proof of Closure (POC Up)	uint16		0 = Disabled 1 = Enabled
32034/42034	(2033) Read Only	Pressure A Type	uint16		0 = Disabled 1 = Digital 2 = 4-20
32035/42035	(2034) Read Only	Pressure A Span Min	int32	10x	Reading multiplied by 10 in configured Pressure Units
32037/42037	(2036) Read Only	Pressure A Span Max	int32	10x	Reading multiplied by 10 in configured Pressure Units
32039/42039	(2038) Read Only	Pressure A Low Trip	int32	10x	Reading multiplied by 10 in configured Pressure Units
32041/42041	(2040) Read Only	Pressure A High Trip	int32	10x	Reading multiplied by 10 in configured Pressure Units
32043/42043	(2042) Read Only	Pressure A Deadband	uint16	10x	Reading multiplied by 10 in configured Pressure Units
32044/42044	(2043) Read Only	Pressure A Low Pressure Delay	uint16		2 - 20 seconds
32045/42045	(2044) Read Only	Pressure A Low Pressure Mode	uint16		0 = Alarm 1 = Wait 2 = Warning 3 = Main Permissive
32054/42054	(2053) Read Only	Pressure B Type	uint16		0 = Disabled 1 = Digital 2 = 4-20
32055/42055	(2054) Read Only	Pressure B Span Min	int32	10x	Reading multiplied by 10 in configured Pressure Units
32057/42057	(2056) Read Only	Pressure B Span Max	int32	10x	Reading multiplied by 10 in configured Pressure Units
32059/42059	(2058) Read Only	Pressure B Low Trip	int32	10x	Reading multiplied by 10 in configured Pressure Units
32061/42061	(2060) Read Only	Pressure B High Trip	int32	10x	Reading multiplied by 10 in configured Pressure Units
32063/42063	(2063) Read Only	Pressure B Deadband	uint16	10x	Reading multiplied by 10 in configured Pressure Units
32064/42064	(2063) Read Only	Pressure B Low Pressure Delay	uint16		2 - 20 seconds
32065/42065	(2064) Read Only	Pressure B Low Pressure Mode	uint16		0 = Alarm 1 = Wait 2 = Warning 3 = Main Permissive
32101/42101	(2100) Read Only	Pilot Valve B PWM	uint16		10 - 100 %
32102/42102	(2101) Read Only	SSV B PWM	uint16		10 - 100 %
32103/42103	(2102) Read Only	Shared TCV	uint16		0 = Disabled 1 = Enabled

Address (Offset)	Read/Write	Name	Type	10x	Range
32121/42121	(2120) Read Only	Valve Sync	uint16		0 = Disabled 1 = Enabled
33001/43001	(3000) Read Only	Controller A State	int16		-1 = Invalid
33002/43002	(3001) Read Only	Controller B State			0 = Lockout 1 = Alarm 2 = Power On 3 = Ready 4 = Waiting – Confirm start 5 = Waiting 6 = Ignition – Pre-ignition 7 = Ignition 8 = Pilot – Pilot startup delay 9 = Pilot 10 = Main Light Off - Request light off 11 = Main Light Off – Main Delay 12 = Main 13 = PID Control
33003/43003	(3002) Read Only	Burner A Shutdown Code	uint16		0 - 255
33004/43004	(3003) Read Only	Burner B Shutdown Code	uint16		0 - 255
33005/43005	(3004) Read Only	Burner A Relights Remaining	uint16		0 - 3
33006/43006	(3005) Read Only	Burner A State Timer	uint16		Current state timer in seconds.
33007/43007	(3006) Read Only	Burner A Purge Timer	uint16		Purge timer in seconds.
33008/43008	(3007) Read Only	Delta Time	uint16		Processors delta time in milliseconds.
33101/43101	(3100) Read Only	Alarm Bits	Bitset		0 - 256 bits (AL000 - AL255)
33201/43201	(3200) Read Only	Wait Bits	Bitset		0 - 64 bits (WT000 - WT063)
33301/43301	(3300) Read Only	Warning Bits	Bitset		0 - 64 bits (WN000 - WN063)
33401/43401	(3400) Read Only	Main Permissive Bits	Bitset		0 - 64 bits (MP000 - MP063)
33501/43501	(3500) Read Only	System Voltage	int16	10x	System Voltage reading multiplied by 10
33502/43502	(3501) Read Only	Authentication Level	uint16		0 = None 1 = Remote 2 = L1 3 = L2 4 = SYS
33503/43503	(3502) Read Only	Appliance Running	uint16		0 = No burners in a running state 1 = Any burner in a running state
33504/43504	(3503) Read Only	Sync Count	uint32		Processor synchronization count
33507/43507	(3506) Read Only	Hardware Model Number	uint32		Expected reading: 0x220002
33509/43509	(3508) Read Only	Firmware Product Variant	uint16		0 = Invalid 2 = Dual Burner
33510/43510	(3509) Read Only	Region Code	uint16		0 = Invalid 1 = North America
33511/43511	(3510) Read Only	Bundle Version	uint32		BYTE 0 = Release Number BYTE 1 = Minor BYTE 2 = Major BYTE 3 = Product Variant
33513/43513	(3512) Read Only	Firmware Version	uint32		BYTE 0= Release number low byte BYTE 1 = Release number high byte BYTE 2 = Minor BYTE 3 = Major
33515/43515	(3514) Read Only	Bootloader Version	uint32		BYTE 0= Release number low byte BYTE 1 = Release number high byte BYTE 2 = Minor BYTE 3 = Major
33517/43517	(3516) Read Only	BOM Version	uint32		BYTE 0= Release number low byte BYTE 1 = Release number high byte BYTE 2 = Minor BYTE 3 = Major

Address (Offset)	Read/Write	Name	Type	10x	Range
33519/43519	(3518) Read Only	Manufacturer Serial Number	Array		BMS unique serial number. Formatted as 6 bytes
33522/43522	(3521) Read Only	Manufacture Date	uint32		BYTE 0 =day BYTE 1 = Month BYTE 2 = Year + 2000
33524/43524	(3523) Read Only	Manufacture Test Date	uint32		BYTE 0 =day BYTE 1 = Month BYTE 2 = Year + 2000
33526/43526	(3525) Read Only	PFN Version	uint32		BYTE 0= Release number low byte BYTE 1 = Release number high byte BYTE 2 = Minor BYTE 3 = Major
33605/43605	(3604) Read Only	Bath Temp	int16	10x	°C Range: -1000 - 13500 (-100 - 1350°C) °F Range: -1480 - 24620 (-148 - 2462°F)
33606/43606	(3605) Read Only	Bath 2 Temp	int16	10x	°C Range: -1000 - 13500 (-100 - 1350°C) °F Range: -1480 - 24620 (-148 - 2462°F)
33607/43607	(3606) Read Only	Outlet Temp	int16	10x	°C Range: -1000 - 13500 (-100 - 1350°C) °F Range: -1480 - 24620 (-148 - 2462°F)
33608/43608	(3607) Read Only	Stack Temp	int16	10x	°C Range: -1000 - 13500 (-100 - 1350°C) °F Range: -1480 - 24620 (-148 - 2462°F)
33609/43609	(3608) Read Only	Aux Temp	int16	10x	°C Range: -1000 - 13500 (-100 - 1350°C) °F Range: -1480 - 24620 (-148 - 2462°F)
33610/43610	(3609) Read Only	Ambient Temp 1	int16	10x	°C Range: -1000 - 13500 (-100 - 1350°C) °F Range: -1480 - 24620 (-148 - 2462°F)
33611/43611	(3610) Read Only	Ambient Temp 2	int16	10x	°C Range: -1000 - 13500 (-100 - 1350°C) °F Range: -1480 - 24620 (-148 - 2462°F)
33672/43672	(3671) Read Only	Pilot A Flame Status	uint16		0 = No Flame 1 = Flame
33673/43673	(3672) Read Only	Pilot B Flame Status	uint16		0 = No Flame 1 = Flame
33675/43675	(3674) Read Only	Pilot Faults	Bitset		BIT 0 = Flame A Load Monitor Check Failure 0 = No Alarm BIT 1 = Flame B Load Monitor Check Failure 0 = No Alarm BIT 2 = Flame A Voltage Fault 0 = No Alarm BIT 3 = Flame B Voltage Fault 0 = No Alarm BIT 4 = Flame A DC Input Open Fault 0 = No Alarm BIT 5 = Flame B DC Input Open Fault 0 = No Alarm
33685/43685	(3684) Read Only	Interlock Input Contact Status	Bitset		BIT 0 = Proof of Closure A 0 = De-energized BIT 1 = ESD 0 = De-energized BIT 2 = Start 0 = De-energized BIT 3 = Upstream Pressure 0 = De-energized BIT 4 = Pressure A 0 = De-energized BIT 5 = Pressure B 0 = De-energized BIT 6 = Level/Flow 0 = De-energized BIT 7 = Aux In 1 0 = De-energized BIT 8 = Aux In 2 0 = De-energized BIT 9 = Aux Temp 0 = De-energized BIT 10 = Proof of Closure B 0 = De-energized BIT 11 = Upstream Proof of Closure 0 = De-energized
33690/43690	(3689) Read Only	IO Short Faults	Bitset		BIT 0 = Switch Run 0 = No Alarm BIT 1 = Switch Ignition 0 = No Alarm BIT 2 = Start 0 = No Alarm BIT 3 = Proof of Closure A 0 = No Alarm BIT 4 = Terminal 52 0 = No Alarm BIT 5 = Proof of Closure B = No Alarm BIT 6 = ESD 0 = No Alarm

Address (Offset)	Read/Write	Name	Type	10x	Range
33695/43695	(3694) Read Only	POC B Voltage	int16		POC B Input Voltage divided by 10
33696/43696	(3695) Read Only	POC UP Voltage	int16		POC UP Input Voltage divided by 10
33698/43698	(3697) Read Only	ESD Voltage	int16		ESD Input Voltage divided by 10
33699/43699	(3698) Read Only	Start Voltage	int16		Start Input Voltage divided by 10
33700/43700	(3699) Read Only	POC A Voltage	int16		POC A Input Voltage divided by 10
33701/43701	(3700) Read Only	4-20 Level/Flow	int32	10x	4-20 Level/Flow Input reading multiplied by 10
33703/43703	(3702) Read Only	4-20 Upstream Pressure	int32	10x	4-20 Press Up Input reading multiplied by 10
33705/43705	(3704) Read Only	4-20 Pressure A	int32	10x	4-20 Press A Input reading multiplied by 10
33707/43707	(3706) Read Only	4-20 Pressure B	int16	10x	4-20 Press B Input reading multiplied by 10
33708/43708	(3707) Read Only	4-20 Aux Temp	int16	10x	4-20 Aux Temp Input reading multiplied by 10
33709/43709	(3708) Read Only	4-20 Aux In 1	int32	10x	4-20 Aux In 1 Input reading multiplied by 10
33711/43711	(3710) Read Only	4-20 Aux In 2	int32	10x	4-20 Aux In 2 Input reading multiplied by 10
33713/43713	(3712) Read Only	Process SP Adjust Setpoint	int16	10x	Process SP Adjust Setpoint Input reading multiplied by 10
33714/43714	(3713) Read Only	External Switch State	uint16		0 = Stop 1 = Run 2 = Ignite 3 = Invalid 4 = Stuck
33715/43715	(3714) Read Only	I2C Bus Faults	Bitset		BIT 0 = Upstream Pressure 0 = No Alarm BIT 1 = Pressure A 0 = No Alarm BIT 2 = Pressure B 0 = No Alarm BIT 3 = Level/Flow 0 = No Alarm BIT 4 = Aux Temp 0 = No Alarm BIT 5 = Aux In 1 0 = No Alarm BIT 6 = Aux In 2 0 = No Alarm BIT 7 = Pilot A 0 = No Alarm BIT 8 = Pilot B 0 = No Alarm BIT 9 = SSV A 0 = No Alarm BIT 10 = SSV B 0 = No Alarm BIT 11 =SSV UP 0 = No Alarm BIT 12 = System Current 0 = No Alarm
33720/43720	(3719) Read Only	ADC Faults	Bitset		BIT 0 = Pilot Start 0 = No Alarm BIT 1 = Pilot Read 0 = No Alarm BIT 2 = Pilot Stop 0 = No Alarm BIT 3 = System Start 0 = No Alarm BIT 4 = System Read 0 = No Alarm BIT 5 = System Stop 0 = No Alarm BIT 6 = Digital Input Start 0 = No Alarm BIT 7 = Digital Input Read 0 = No Alarm BIT 8 = Digital Input Stop 0 = No Alarm
33725/43725	(3724) Read Only	Valve Driver Status	Bitset		BIT 0 = Pilot A 0 = De-energized BIT 1 = Pilot B 0 = De-energized BIT 2 = SSV A 0 = De-energized BIT 3 = SSV B 0 = De-energized BIT 4 = SSV UP 0 = De-energized
33730/43730	(3729) Read Only	Status Contact State	uint16		0 = Deenergized 1 = Energized
33732/43732	(3731) Read Only	Analog Output 1 Fault	uint16		0 = Absent 1 = Present
33737/43737	(3736) Read Only	TCV A Output Percent	uint16		0 - 100%
33738/43738	(3737) Read Only	Firing Rate	uint16		0 - 100%
33739/43739	(3738) Read Only	Reserved			
33740/43740	(3739) Read Only	Cascade PID Setpoint	int16	10x	Cascaded PID setpoint in configured Temperature units multiplied by 10
33742/43742	(3741) Read Only	Pilot A Voltage	int16	10x	Pilot A Voltage multiplied by 10
33743/43743	(3742) Read Only	Pilot A Current	int16	10x	Pilot A Current multiplied by 10
33744/43744	(3743) Read Only	Pilot B Voltage	int16	10x	Pilot B Voltage multiplied by 10

Address (Offset)	Read/Write	Name	Type	10x	Range
33745/43745	(3744) Read Only	Pilot B Current	int16	10x	Pilot B Current multiplied by 10
33746/43746	(3745) Read Only	SSV A Voltage	int16	10x	SSV A Voltage multiplied by 10
33747/43747	(3746) Read Only	SSV A Current	int16	10x	SSV A Current multiplied by 10
33748/43748	(3747) Read Only	SSV B Voltage	int16	10x	SSV B Voltage multiplied by 10
33749/43749	(3748) Read Only	SSV B Current	int16	10x	SSV B Current multiplied by 10
33750/43750	(3749) Read Only	SSV UP Voltage	int16	10x	SSV UP Voltage multiplied by 10
33751/43751	(3750) Read Only	SSV UP Current	int16	10x	SSV UP Current multiplied by 10
33752/43752	(3751) Read Only	System Current	int16	10x	System Current multiplied by 10
33753/43753	(3752) Read Only	System Power	int16	10x	System Power multiplied by 10
33754/43754	(3753) Read Only	Pilot A Flame DC High Voltage	int16		Pilot A Flame DC High Voltage in millivolts
33755/43755	(3754) Read Only	Pilot A Flame DC Low Voltage	int16		Pilot A Flame DC Low Voltage in millivolts
33756/43756	(3755) Read Only	Pilot A AC Voltage	int16		Pilot A AC Voltage in millivolts
33757/43757	(3756) Read Only	Pilot B Flame DC High Voltage	int16		Pilot B Flame DC High Voltage in millivolts
33758/43758	(3757) Read Only	Pilot B Flame DC Low Voltage	int16		Pilot B Flame DC Low Voltage in millivolts
33759/43759	(3758) Read Only	Pilot B AC Voltage	int16		Pilot B AC Voltage in millivolts
33760/43760	(3759) Read Only	Valve Power Status	Bitset		BIT 0 = Pilot A 0 = De-energized or Fault BIT 1 = Pilot B 0 = De-energized or Fault BIT 2 = SSV A 0 = De-energized or Fault BIT 3 = SSV B 0 = De-energized or Fault BIT 4 = SSV UP 0 = De-energized or Fault
33765/43765	(3764) Read Only	System Up Time	uint16		System Up Time since last power on in hours
33766/43766	(3765) Read Only	Average Hourly Energy Consumption	uint16	10x	Average Hourly Energy Consumption multiplied by 10 in Watts/hour
33767/43767	(3766) Read Only	Pilot A Solenoid Run Time	uint16		Pilot A Solenoid Run Time since last power on in hours
33768/43768	(3767) Read Only	SSV A Run Time	uint16		SSV A Run Time since last power on in hours
33769/43769	(3768) Read Only	SSV UP Run Time	uint16		SSV UP Run Time since last power on in hours
33770/43770	(3769) Read Only	Burner A Average Firing Rate	uint16		Average Firing Rate since last power on in %
33771/43771	(3770) Read Only	Pilot A Flame Fail Count	uint16		Pilot A Flame Fail Count since last power on
33772/43772	(3771) Read Only	Pilot B Flame Fail Count	uint16		Pilot B Flame Fail Count since last power on
33773/43773	(3772) Read Only	Pilot A Flame Strength	int16		Pilot A Flame Strength in millivolts
33774/43774	(3773) Read Only	Pilot B Flame Strength	int16		Pilot B Flame Strength in millivolts
33775/43775	(3774) Read Only	Pilot B Solenoid Run Time	uint16		Pilot B Solenoid Run Time since last power on in hours
33776/43776	(3775) Read Only	SSV B Solenoid Run Time	uint16		SSV B Solenoid Run Time since last power on in hours
33777/43777	(3776) Read Only	Burner B Average Firing Rate	uint16		Average Firing Rate since last power on in %
34005/44005	(4004) Read Only	Burner B Relights Remaining	uint16		0 - 3
34006/44006	(4005) Read Only	Burner B State Timer	uint16		Current state timer in seconds.
34007/44007	(4006) Read Only	Burner B Purge Timer	uint16		Purge timer in seconds.
34011/44011	(4010) Read Only	Burner A Running	uint16		0 = Burner not in a running state 1 = Burner in a running state
34012/44012	(4011) Read Only	Burner B Running	uint16		0 = Burner not in a running state 1 = Burner in a running state
34021/44021	(4020) Read Only	TCV B Output Percent	uint16		0 - 100%
34022/44022	(4021) Read Only	System Voltage Mismatch Fault	uint16		0 = Absent 1 = Present

3 DOCUMENT REVISION HISTORY

Document Version	Release Date	Applicable BMS Hardware	Applicable UI Hardware	Applicable Firmware
v1.0	13 OCT 2021	v2.3.x	v3.2.x	DB 1.1.0 DB 1.0.3



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