PMBus™ Commands

This application note is applicable to the following members of the D1U54-HD-1200-12-HxxPC Series:

MPS#	Model Number	Serial Communication Slave Addressing	Airflow	Standby (Vdc)
M5004	D1U54-HD-1200-12-HA4C	ADDR_Select (External Resistor)	Back-to-Front	5

Standard PMBus™ Commands

All data communicated over the PMBus™ interface uses PEC (Packet Error Checking) as defined by the standard for PMBus™ Power Systems Management Protocol Part 1 – General Requirements Rev 1.1.
Linear data formatting is used for all passed parameters. It is strongly recommended to fully utilize the PEC byte to validate all transactions and to repeat if not validated. Block reads (where the loose byte received denotes the remaining byte to be clocked out) are not supported on this product series.
A minimum of 300µs delay between transactions (between the STOP of one command and the START of the next command) is recommended for robust communications.
Note: 100KHz I^2C communications is supported for the PMBus™ interface.
Note: The PMBus™ slave controller does "clock stretch" on ACK or NAK.

Device Details

Power Supply Controllers			
Vendor	**MFG Part Number**	**Package**	**Description**
Microchip Technology Inc.	PIC24FJ32GA002T-I/SS	28-pin SSOP	(Primary) 16-bit PIC, 32K flash, 8K SRAM, -40C to 85C
Microchip Technology Inc.	PIC24FJ64GA306T-I/PT	64-pin TQFP	(Secondary) 16-bit PIC, 64K flash, 8K SRAM, -40C to 85C

Power Supply External EEPROM			
Vendor	**MFG Part Number**	**Package**	**Description**
Microchip Technology Inc.	24AA024T-I/MS	8-pin MSOP	2Kbit, 2.5-5.5V 400kHz, 1.8-2.5V 100kHz, 85C serial EEPROM

Device Addressing Methods

(See D1U54P-12-CONC Interface Card; Application Note ACAN-64 for Additional Details):

There are two methods whereby the three lower order address bits of the seven bit address structure of the internal addressable devices can be assigned (for the secondary microcontroller and the EEPROM device A0, A1 & A2; see the PMBus™ standard). These are as follows:

1. Using the ADDR signal pin (Pin# A3) in digital mode by either:
   a. Un-terminating (leaving open circuit); this will set a default setting of "111" for the last three addressable bits (A0, A1 & A2) of the seven bit address byte.
   b. Terminating the pin to RTN/ground (Pin numbers A2/B2); this method will set a default address of "000" for the last three addressable bits (A0, A1 & A2) of the address byte.
2. Using the ADDR signal pin (Pin# A3) in analogue mode by connection of an external resistance to RTN/ground (pin numbers A2/B2).
   For the possible external resistance values this will result in the following address combinations:

HEX Address Combinations by Analogue Method; ADDR External Resistance Values		
ADDR External Resistance to RTN/Ground (KΩ; ±5% Tolerance)	Power Module Secondary Main Controller (Serial Slave Address)*	Power Module EEPROM (Serial Slave Address)*
0.82	0xB0	0xA0
2.7	0xB2	0xA2
5.6	0xB4	0xA4
8.2	0xB6	0xA6
15	0xB8	0xA8
27	0xBA	0xAA
56	0xBC	0xAC
180	0xBE	0xAE

*The D1U54-HD-1200-12-HxxPC uses 7-bit left shifted" device addressing; the EEPROM addressing follows a similar convention (commences at base address 0xA0); the lowest order bit of the address is the Read/Write bit. It is assumed that the Read Write bit is set to logic "0" (for addresses shown in the table above).

PMBus™ Commands

Command Code (Hex)	Command Name	Read / Write	Page	Data Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
00	PAGE	R/W	All		1			Command to provide ability to configure, control & monitor multiple outputs	YES
01	OPERATION Link to returned results	R/W	All	Bit Flags	1	5:0		Set output margin high/low voltages	NO
						7:6		Turn the unit on/off in conjunction with digital input from PSON_H	YES
02	ON_OFF_CONFIG CMD_02	R	All	Bit Flags	1	0	ON_OFF_DELAY	Set when Turn off immediately (default) / 0 = Use delay @ turn-off	YES
						1	ON_OFF_POLARITY	Set when Power on processing is active high (default)	YES
						2	USE_CONTROL	Set when Use CONTROL pin for on/off power processing (default)	YES
						3	USE_OPERATION	Set when Use OPERATION command for on/off power processing (default)	YES
						4	USE_CNTL_AND _OP	Set when Use both CONTROL pin & OPERATION command (default)	YES
						5	RESERVED		NO
						6	RESERVED		NO
						7	RESERVED		NO
03	CLEAR_FAULTS	W	All		1			Write only command clears all faults that have been set in all the STATUS_XXXX registers simultaneously	YES
20	VOUT_MODE	R	0	Bit Flags	1			Not supported. All Output Voltage related readings are calculated into real world values per PMBus™ Spec part II version 1.1 section 7.1 “Linear Data Format”	NO
20	VSTBY_MODE	R	1	Bit Flags	1				NO
25	VOUT_MARGIN_HIGH	R/W	0	Linear	2			Main Output - Load the unit with the voltage to which the output is to be changed when the OPERATION command set to "Margin High"	NO
25	VSTBY_MARGIN_LOW	R/W	1	Linear	2			Standby Output - Load the unit with the voltage to which the output is to be changed when the OPERATION command set to "Margin High"	NO
26	VOUT_MARGIN_HIGH	R/W	0	Linear	2			Main Output - Load the unit with the voltage to which the output is to be changed when the OPERATION command set to "Margin Low"	NO
26	VSTBY_MARGIN_LOW	R/W	1	Linear	2			Standby Output - Load the unit with the voltage to which the output is to be changed when the OPERATION command set to "Margin Low"	NO
3A	FAN_CONFIG_1_2	R	All	Bit Flags	1	0	FAN_2_TACH_PULSES	Fan 2 Tachometer pulses per revolution (lower bit)	NO
						1	FAN_2_TACH_PULSES	Fan 2 Tachometer pulses per revolution (upper bit)	NO
						2	FAN_2_SETTING_MODE	Set when fan is commanded in RPM (Clear when fan is commanded in Duty Cycle)	NO
						3	FAN_2_INSTALLATION	Set when fan is installed in position 2	NO
						4	FAN_1_TACH_PULSES	Fan 1 Tachometer pulses per revolution (lower bit)	YES
						5	FAN_1_TACH_PULSES	Fan 1 Tachometer pulses per revolution (upper bit)	YES
						6	FAN_1_SETTING_MODE	Set when fan is commanded in RPM (Clear when fan is commanded in Duty Cycle)	YES
						7	FAN_1_INSTALLATION	Set when fan is installed in position 1	YES
3B	FAN_COMMAND_1	R/W	All	R/W	2			Manual fan override command fan speed value in Duty Cycle	YES
								Command speed formatted in Linear as per command 0x90 - READ_FAN_SPEED_1	
3C	FAN_COMMAND_2	R/W	All	R/W	2			Manual fan override command fan speed value in Duty Cycle	NO
								Command speed formatted in Linear as per command 0x90 - READ_FAN_SPEED_2	

Command Code (Hex)	Command Name	Read / Write	Page	Data Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
40	VOUT_OV_FAULT_LIMIT	R	0	Linear	2		Link to returned results: CMD_40_6B	Main Output Overvoltage Fault Limit	YES
40	VSTBY_OV_FAULT_LIMIT	R	1	Linear	2			Standby(Auxiliary) Output Overvoltage Fault Limit	YES
41	VOUT_OV_FAULT_RESPONSE	R	0	Bit Flags	1			Main Output Overvoltage Fault Response Actions	YES
41	VSTBY_OV_FAULT_RESPONSE	R	1	Bit Flags	1			Standby(Auxiliary) Output Overvoltage Fault Response Actions	YES
42	VOUT_OV_WARN_LIMIT	R	0	Linear	2			Main Output Overvoltage Warning Limit	YES
42	VSTBY_OV_WARN_LIMIT	R	1	Linear	2			Standby(Auxiliary) Output Overvoltage Warning Limit	YES
43	VOUT_UV_WARN_LIMIT	R	0	Linear	2			Main Output Undervoltage Warning Limit	YES
43	VSTBY_U V_WARN_LIMIT	R	1	Linear	2			Standby(Auxiliary) Output Undervoltage Warning Limit	YES
44	VOUT_UV_FAULT_LIMIT	R	0	Linear	2			Main Output Undervoltage Fault Limit	YES
44	VSTBY_UV_FAULT_LIMIT	R	1	Linear	2			Standby(Auxiliary) Output Undervoltage Fault Limit	YES
45	VOUT_UV_FAULT_RESPONSE	R	0	Bit Flags	1			Main Output Undervoltage Fault Response Actions	YES
45	VSTBY_UV_FAULT_RESPONSE	R	1	Bit Flags	1			Standby(Auxiliary) Output Undervoltage Fault Response Actions	YES
46	IOUT_OC_FAULT_LIMIT	R	0	Linear	2			Main Output Overcurrent Fault Limit	YES
46	ISTBY_OC_FAULT_LIMIT	R	2	Linear	2			Standby(Auxiliary) Output Overvoltage Fault Limit	YES
47	IOUT_OC_FAULT_RESPONSE	R	0	Bit Flags	1			Main Output Overcurrent Fault Response Actions	YES
47	IOUT_OC_FAULT_RESPONSE	R	1	Bit Flags	1			Main Output Overcurrent Fault Response Actions	YES
47	ISTBY_OC_FAULT_RESPONSE	R	2	Bit Flags	1			Standby(Auxiliary) Output Overcurrent Fault Response Actions	YES
4A	IOUT_OC_WARN_LIMIT	R	0	Linear	2			Main Output Overcurrent Warning Limit	YES
4A	ISTBY_OC_WARN_LIMIT	R	2	Linear	2			Standby(Auxiliary) Output Overvoltage Warning Limit	YES
4F	AIRFLOW_1_OT_FAULT_LIMIT	R	0	Linear	2			Airflow 1 Overtemperature Fault Limit	YES
4F	HOTSPOT_1_OT_FAULT_LIMIT	R	1	Linear	2			Hotspot 1 Overtemperature Fault Limit	YES
4F	AIRFLOW_2_OT_FAULT_LIMIT	R	2	Linear	2			Airflow 2 Overtemperature Fault Limit	YES
4F	HOTSPOT_2_OT_FAULT_LIMIT	R	3	Linear	2			Hotspot 2 Overtemperature Fault Limit	YES
50	AIRFLOW_1_OT_FAULT_RESPONSE	R	0	Bit Flags	1			Airflow 1 Overtemperature Fault Response Actions	YES
50	HOTSPOT_1_OT_FAULT_RESPONSE	R	1	Bit Flags	1			Hotspot 1 Overtemperature Fault Response Actions	YES
50	AIRFLOW_2_OT_FAULT_RESPONSE	R	2	Bit Flags	1			Airflow 2 Overtemperature Fault Response Actions	YES
50	HOTSPOT_2_OT_FAULT_RESPONSE	R	3	Bit Flags	1			Hotspot 2 Overtemperature Fault Response Actions	YES
51	AIRFLOW_1_OT_WARN_LIMIT	R	0	Linear	2			Airflow 1 Overtemperature Warning Limit	YES
51	HOTSPOT_1_OT_WARN_LIMIT	R	1	Linear	2			Hotspot 1 Overtemperature Warning Limit	YES
51	AIRFLOW_2_OT_WARN_LIMIT	R	2	Linear	2			Airflow 2 Overtemperature Warning Limit	YES
51	HOTSPOT_2_OT_WARN_LIMIT	R	3	Linear	2			Hotspot 2 Overtemperature Warning Limit	YES
55	VIN_OV_FAULT_LIMIT	R	0	Linear	2			Input Overvoltage Fault Limit	YES
56	VIN_OV_FAULT_RESPONSE	R	0	Bit Flags	1			Input Overvoltage Fault Response Actions	YES
57	VIN_OV_WARN_LIMIT	R	0	Linear	2			Input Overvoltage Warning Limit	YES
58	VIN_UV_WARN_LIMIT	R	0	Linear	2			Input Undervoltage Warning Limit	YES
59	VIN_UV_FAULT_LIMIT	R	0	Linear	2			Input Undervoltage Fault Limit	YES
5A	VIN_UV_FAULT_RESPONSE	R	0	Bit Flags	1			Input Undervoltage Fault Response Actions	YES
5B	IIN_OC_FAULT_LIMIT	R	0	Linear	2			Input Overcurrent Fault Limit	YES
5C	IIN_OC_FAULT_RESPONSE	R	0	Bit Flags	1			Input Overcurrent Fault Response Actions	YES
5D	IIN_OC_WARN_LIMIT	R	0	Linear	2			Input Overcurrent Warning Limit	YES
5E	POWER_GOOD_ON	R	0	Linear	2			Power Good On Main Output Voltage Limit	YES
5F	POWER_GOOD_OFF	R	0	Linear	2			Power Good Off Main Output Voltage Limit	YES

Command Code (Hex)	Command Name	Read / Write	Page	Data Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
68	POUT_OP_FAULT_LIMIT	R	0	Linear	2			Output Overpower Fault Limit	YES
69	POUT_OP_FAULT_RESPONSE	R	0	Bit Flags	1			Output Overpower Fault Response Actions	NO
6A	POUT_OP_WARN_LIMIT	R	0	Linear t	2			Output Overpower Warning Limit	YES
6B	PIN_OP_WARN_LIMIT	R	0	Linear	2			Input Overpower Warning Limit	YES
6B	PIN_OP_WARN_LIMIT	R	1	Linear	2			Input Overpower Warning Limit - Low line	YES
79	STATUS_BYTE	R	All	Bit Flags	1	0	NONE_F_W	Set when a fault not listed in [7:1] occurred	NO
						1	CML_F	Set when a communications, memory, or logic fault has occurred	YES
						2	TEMPERATURE_F_W	Set when an overtemperature fault or warning has occurred	YES
						3	INPUT_UV_F	Set when an input undervoltage fault has occurred	YES
						4	OUTPUT_OC_F	Set when an output overcurrent fault has occurred	YES
						5	OUTPUT_OV_F	Set when an output overvoltage fault has occurred	YES
						6	UNIT_OFF	Set when unit not providing power to the output	YES
						7	BUSY_F	Asserted when device busy and unable to respond fault	YES
79	STATUS_WORD	R	All	Bit Flags	2	0	NONE_F_W	Set when a fault not listed in [7:1] occurred	NO
						1	CML_F	Set when a communications, memory, or logic fault has occurred	YES
						2	TEMPERATURE_F_W	Set when an overtemperature fault or warning has occurred	YES
						3	INPUT_UV_F	Set when an input undervoltage fault has occurred	YES
						4	OUTPUT_OC_F	Set when an output overcurrent fault has occurred	YES
						5	OUTPUT_OV_F	Set when an output overvoltage fault has occurred	YES
						6	UNIT_OFF	Set when unit not providing power to the output	YES
						7	BUSY_F	Asserted when device busy and unable to respond fault	YES
						8	UNKNOWN_F_W	Set when a fault not listed in [15:1] has occurred	NO
						9	STATUS_OTHER_F_W	Set when a bit in command STATUS_OTHER set	NO
						10	FANS_F_W	Set when a fan fault or warning has occurred	YES
						11	POWER_GOOD_L	Set when the POWER_GOOD signal is negated	YES
						12	MFG_SPECIFIC_F_W	Manufacturer specific fault or warning has occurred	NO
						13	INPUT_F_W	Set when an Input voltage/current/power fault or warning has occurred	YES
						14	IOUT_POUT_F_W	Set when an output current / output power fault or warning has occurred	YES
						15	VOUT_F_W	Set when an output voltage fault or warning has occurred	YES
7A	STATUS_VOUT	R	0	Bit Flags	1	0	VOUT_TRACKING_E	Set when an error in the output voltage during power-up/down has occurred	NO
						1	TON_MAX_W	Set when the output turn-on timing has exceeded the TON_MAX warning timing	NO
						2	TON_MAX_F	Set when the output turn-on timing has exceeded the TON_MAX fault timing	NO
						3	VOUT_MAX_F	Set when the output is set higher than the commanded VOUT_MAX limit	NO
						4	VOUT_UV_F	Set when an output undervotlage fault has occurred	YES
						5	VOUT_UV_W	Set when an output undervotlage warning has occurred	YES
						6	VOUT_OV_W	Set when an output overvoltage warning has occurred	YES
						7	VOUT_OV_F	Set when an output overvoltage fault has occurred	YES
7A	STATUS_VSTBY	R	1	Bit Flags	1	0	VOUT_TRACKING_E	Set when an error in the output voltage during power-up/down has occurred	NO
						1	TON_MAX_W	Set when the output turn-on timing has exceeded the TON_MAX warning timing	NO
						2	TON_MAX_F	Set when the output turn-on timing has exceeded the TON_MAX fault timing	NO

Command Code (Hex)	Command Name	Read / Write	Page	Data Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
						3	VOUT_MAX_F	Set when the output is set higher than the commanded VOUT_MAX limit	NO
						4	VOUT_UV_F	Set when an output undervotlage fault has occurred	YES
						5	VOUT_UV_W	Set when an output undervotlage warning has occurred	YES
						6	VOUT_OV_W	Set when an output overvoltage warning has occurred	YES
						7	VOUT_OV_F	Set when an output overvoltage fault has occurred	YES
7B	STATUS_IOUT	R	0	Bit Flags	1	0	POUT_OP_W	Set when an output overpower warning has occurred	YES
						1	POUT_OP_F	Set when an output overpower fault has occurred	YES
						2	POWER_LIMIT_MODE	Set when the unit has entered output power limiting mode	NO
						3	CURRENT_SHARE_F	Set when an output current share fault has occurred	NO
						4	IOUT_UC_W	Set when an output undercurrent fault has occurred	NO
						5	IOUT_OC_W	Set when an output overcurrent warning has occurred	YES
						6	IOUT_OC_SHUTDOWN	Set when an output overcurrent and low voltage shutdown fault has occurred	YES
						7	IOUT_OC_F	Set when an output overcurrent fault has occurred	YES
7B	STATUS_ISTBY	R	1	Bit Flags	1	0	POUT_OP_W	Set when an output overpower warning has occurred	YES
						1	POUT_OP_F	Set when an output overpower fault has occurred	YES
						2	POWER_LIMIT_MODE	Set when the unit has entered output power limiting mode	NO
						3	CURRENT_SHARE_F	Set when an output current share fault has occurred	NO
						4	IOUT_UC_W	Set when an output undercurrent fault has occurred	NO
						5	IOUT_OC_W	Set when an output overcurrent warning has occurred	YES
						6	IOUT_OC_SHUTDOWN	Set when an output overcurrent and low voltage shutdown fault has occurred	YES
						7	IOUT_OC_F	Set when an output overcurrent fault has occurred	YES
7C	STATUS_INPUT	R	All	Bit Flags	1	0	PIN_OP_W	Set when an input overpower warning has occurred	YES
						1	IIN_OC_W	Set when an input overcurrent warning has occurred	YES
						2	IIN_OC_F	Set when an input overcurrent fault has occurred	YES
						3	VIN_UV_OFF	Set when the Unit is OFF for insufficient input voltage	YES
						4	VIN_UV_F	Set when an input undervoltage fault has occurred	NO
						5	VIN_UV_W	Set when an input undervoltage warning has occurred	YES
						6	VIN_OV_W	Set when an input overvoltage warning has occurred	YES
						7	VIN_OV_F	Set when an input overvoltage fault has occurred	YES
7D	STATUS_TEMPERATURE	R	All	Bit Flags	1	0	RESERVED	Reserved	NO
						1	RESERVED	Reserved	NO
						2	RESERVED	Reserved	NO
						3	RESERVED	Reserved	NO
						4	TEMPERATURE_UT_F	Set when an undertemperature fault has occurred	NO
						5	TEMPERATURE_UT_W	Set when an undertemperature warning has occurred	NO
						6	TEMPERATURE_OT_W	Set when an overtemperature warning has occurred	YES
						7	TEMPERATURE_OT_F	Set when an overtemperature fault has occurred	YES

Command Code (Hex)	Command Name	Read / Write	Page	Data Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
7E	STATUS_CML	R	All	Bit Flags	1	0	OTHER_MEMORY_F	Set when another memory or logic fault has occurred	NO
						1	OTHER_COMM_F	Set when a communication fault not listed in [7:3] has occurred (example: UART or SPI)	YES
						2	RESERVED	Reserved	NO
						3	PROCESSOR_F	Set when a processor fault is detected	NO
						4	MEMORY_F	Set when a memory fault is detected (example: Checksum errors during bootload)	NO
						5	PEC_ERROR_F	Set when a packet error checking (PEC) failed has occurred	YES
						6	DATA_ERROR_F	Set when invalid or unsupported data is received	YES
						7	COMMAND_ERROR_F	Set when an invalid or unsupported command is received	YES
7F	STATUS_OTHER	R	All	Bit Flags	1	0	RESERVED	Reserved	NO
						1	ORING_OUTPUT_F	Set when output ORing device fault occurs	NO
						2	ORING_INPUT_B_F	Set when input B ORing device fault occurs	NO
						3	ORING_INPUT_A_F	Set when input A ORing device fault occurs	NO
						4	FUSE_INPUT_B_F	Set when input B fuse/breaker fault occurs	NO
						5	FUSE_INPUT_A_F	Set when input A fuse/breaker fault occurs	NO
						6	RESERVED	Reserved	NO
						7	RESERVED	Reserved	NO
80	STATUS_MFR_SPECIFIC	R	All	Bit Flags	1	0	RESERVED	Reserved	NO
						1	RESERVED	Reserved	NO
						2	VINT_RANGE_W	Set when an internal voltage (VCC2, VCC4, or VDD) out-of-range warning has occurred	NO
						3	VINT_RANGE_F	Set when an internal voltage (VCC2, VCC4, or VDD) out-of-range fault has occurred	NO
						4	VBUS_UV_F	Set when the primary boost output bus undervoltage fault has occurred	NO
						5	VBUS_UV_W	Set when the primary boost output bus undervoltage warning has occurred	NO
						6	VBUS_OV_W	Set when the primary boost output bus overvoltage warning has occurred	NO
						7	VBUS_OV_F	Set when the primary boost output bus overvoltage fault has occurred	NO
81	STATUS_FANS_1_2	R	All	Bit Flags	1	0	FAN_AIRFLOW_W	Airflow warning	NO
						1	FAN_AIRFLOW_F	Airflow fault	NO
						2	FAN_2_OVERRIDE	Fan 2 speed overridden	NO
						3	FAN_1_OVERRIDE	Fan 1 speed overridden	YES
						4	FAN_2_W	Fan 2 warning	NO
						5	FAN_1_W	Fan 1 warning	NO
						6	FAN_2_F	Fan 2 fault	YES
						7	FAN_1_F	Fan 1 fault	YES
82	STATUS_FANS_3_4	R	All	Bit Flags	1	0	FAN_AIRFLOW_W	Airflow warning	NO
						1	FAN_AIRFLOW_F	Airflow fault	NO
						2	FAN_4_OVERRIDE	Fan 4 speed overridden	NO
						3	FAN_3_OVERRIDE	Fan 3 speed overridden	NO
						4	FAN_4_W	Fan 4 warning	NO
						5	FAN_3_W	Fan 3 warning	NO
						6	FAN_4_F	Fan 4 fault	NO
						7	FAN_3_F	Fan 3 fault	NO
88	READ_VIN	R	All	Linear	2		Link to: Sensor data and resolution: CMD_88_97	Input Voltage Sensor Reading	YES
89	READ_IIN	R	All	Linear	2			Input Current Sensor Reading	YES
8B	READ_VOUT	R	0	Linear	2			Main Output Voltage Sensor Reading	YES
8B	READ_VSTBY	R	1	Linear	2			Standby(Auxiliary) Output Voltage Sensor Reading	YES
8C	READ_IOUT	R	0	Linear	2			Main Output Current Sensor Reading	YES
8C	READ_ISTBY	R	1	Linear	2			Standby(Auxiliary) Output Current Sensor Reading	YES

Command Code (Hex)	Command Name	Read / Write	Page	Data Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
8D	READ_TEMPERATURE_1	R	0	Linear	2			Airflow 1 Temperature Sensor Reading	YES
8E	READ_TEMPERATURE_2	R	0	Linear	2			Airflow 2 Temperature Sensor Reading	YES
8F	READ_TEMPERATURE_3	R	0	Linear	2			Hotspot 1 Temperature Sensor Reading	YES
8F	READ_TEMPERATURE_3	R	1	Linear	2			Hotspot 2 Temperature Sensor Reading	YES
90	READ_FAN_SPEED_1	R	0	Linear	2			Fan 1 Speed Sensor Reading	YES
91	READ_FAN_SPEED_2	R	0	Linear	2			Fan 2 Speed Sensor Reading	NO
96	READ_POUT	R	All	Linear	2			Output Power Sensor Reading	YES
97	READ_PIN	R	All	Linear	2			Input Power Sensor Reading	YES
98	PMBUS_REVISION	R	All	HEX	1			PMBus™ Specification Revision	YES
99	MFR_ID	R	All	Ascii Text Block	Variable		Link to Returned Results: CMD_99	Power Supply Company Name	YES
9A	MFR_MODEL	R	All	Ascii Text Block	10		Link to Returned Results: CMD_9A	Power Supply Model Number	YES
9B	MFR_REVISION	R	All	Ascii Text Block	15		Link to Returned Results: CMD_9B	Power Supply Firmware Revision	YES
9C	MFR_LOCATION	R/W	All	Ascii Text Block	Variable		Link to Returned Results: CMD_9C	Power Supply Manufacture Location	YES
9D	MFR_DATE	R/W	All	Ascii Text Block	5		Link to Returned Results: CMD_9D	Power Supply Manufacture Date	YES
9E	MFR_SERIAL	R/W	All	Ascii Text Block	Variable		Link to Returned Results: CMD_9E	Power Supply Serial Number	YES
A0	MFR_VIN_MIN	R	All	Linear	2		Link to Returned Data: **CMD_A0_AB**	Power Supply Input Voltage Minimum Specification	YES
A1	MFR_VIN_MAX	R	All	Linear	2			Power Supply Input Voltage Maximum Specification	YES
A2	MFR_IIN_MAX	R	All	Linear	2			Power Supply Input Current Maximum Specification	YES
A3	MFR_PIN_MAX	R	All	Linear	2			Power Supply Input Power Maximum Specification	YES
A4	MFR_VOUT_MIN	R	All	Linear	2			Power Supply Main Output Voltage Minimum Specification	YES
A5	MFR_VOUT_MAX	R	All	Linear	2			Power Supply Main Output Voltage Maximum Specification	YES
A6	MFR_IOUT_MAX	R	All	Linear	2			Power Supply Main Output Current Maximum Specification	YES
A7	MFR_POUT_MAX	R	All	Linear	2			Power Supply Output Power Maximum Specification	YES
A8	MFR_TAMBIENT_MAX	R	All	Linear	2			Power Supply Operating Ambient Temperature Maximum Specification	YES
A9	MFR_TAMBIENT_MIN	R	All		2			Power Supply Operating Ambient Temperature Minimum Specification	YES
AA	MFR_EFFICIENCY_LL	R	All	Linear	2			Power Supply Low-Line Input Voltage Specification	YES
				Linear	2			Power Supply Low-Line Low Power Specification	YES
				Linear	2			Power Supply Low-Line Low Power Efficiency Specification	YES
				Linear	2			Power Supply Low-Line Medium Power Specification	YES
				Linear	2			Power Supply Low-Line Medium Power Efficiency Specification	YES
				Linear	2			Power Supply Low-Line High Power Specification	YES
				Linear	2			Power Supply Low-Line HIgh Power Efficiency Specification	YES

Command Code (Hex)	Command Name	Read / Write	Page	Data Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
AB	MFR_EFFICIENCY_HL	R	All	Linear	2			Power Supply High-Line Input Voltage Specification	YES
				Linear	2			Power Supply High-Line Low Power Specification	YES
				Linear	2			Power Supply High-Line Low Power Efficiency Specification	YES
				Linear	2			Power Supply High-Line Medium Power Specification	YES
				Linear	2			Power Supply High-Line Medium Power Efficiency Specification	YES
				Linear	2			Power Supply High-Line High Power Specification	YES
				Linear	2			Power Supply High-Line HIgh Power Efficiency Specification	YES
E0	PS_STATUS	R	All	Bit Flags	2	0	CALIBRATION	Set when the unit is in Calibration mode	YES
						1	VSTBY_SELECT	Set when Vstby set to 5V; de-Set when Vstby set to 3.3V	NO
						2	PS_KILL	Set when the PS_KILL pin is defeated and the unit is properly seated in the chassis	YES
						3	VIN_OK	Set when the input voltage is within operating specification	YES
						4	VIN_RANGE	Set when input voltage range is high; de-Set when input voltage range is low	YES
						5	PFC_BUS	Set when the PFC BUS is within operating specification	YES
						6	PS_ON	Set when the PS_ON logic set to enable the main output	YES
						7	POWER_GOOD	Set when main output power delivered to unit is OK; mirrors the digital output signal	YES
						8	POWER_DOWN	Set when bootloader is taking control and the main output and PFC need to be shutdown	YES
						9	BOOTLOAD_COMPLETED	Set when the bootloader has completed and system reset needs to be Set	YES
						10	UNUSED		NO
						11	UNUSED		NO
						12	UNUSED		NO
						13	UNUSED		NO
						14	WARNING	Set when power supply warning has occurred; tracks 'WARNING' status LED	YES
						15	FAULT	Set when power supply fault has occurred; tracks 'FAULT' status LED	YES
E1	EEPROM_WP	R/W	All	Integer	1		Link to Returned Data: CMD_E1	Byte to enable (write 0x9A) or disable (write 0x56) writes to the external EEPROM	YES
E2	READ_HOURS_USED	R	All	Linear Data Format	3			Power Supply Accumulated Main Output Power-On Hours	YES
F8	BOOTLOAD_RESTART	R/W	All	HEX	1			Bootloader completion and application restart request command	YES
FA	BOOTLOAD_REQUEST	R/W	All	HEX	1			Bootloader request command	YES

Command Code (Hex)	Command Name	Read / Write	Page	Data Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
FB	BOOTLOAD_STATUS	R	All	Bit Flags	2	0	BOOTLOADING_PRI	Set when primary µC bootloading in process	YES
						1	BOOTLOADING_FLOAT	Set when floating µC bootloading in process	NO
						2	BOOTLOADING_SEC	Set when secondary µC bootloading in process	YES
						3	BOOTLOADED_PRI	Set when primaryµC bootloading completed; reset required	YES
						4	BOOTLOADED_FLOAT	Set when floatingµC bootloading completed; reset required	NO
						5	BOOTLOADED_SEC	Set when secondaryµC bootloading completed; reset required	YES
						6	RESET_PRI	Set when primaryµC reset	YES
						7	RESET_FLOAT	Set when floatingµC reset	NO
						8	RESET_SEC	Set when secondaryµC reset	YES
						9	RESERVED		NO
						10	RESERVED		NO
						11	RESERVED		NO
						12	RESERVED		NO
						13	RESERVED		NO
						14	RESERVED		NO
						15	RESERVED		NO

Returned results and expected data tables

Note: the actual returned results in the following tables may vary.

MANUFACTURERS GENERAL PARAMETRIC DATA Commands A1 through AB:
Link Back to Command Table: CMD_A0_AB_Back

Command Code (Hex)	Command Name	Value	Units	N	Value (Dec)	MSB LSB
A0	MFR_VIN_MIN	80	V	-1	160	0 160
A1	MFR_VIN_MAX	264	V	-1	528	2 16
A2	MFR_IIN_MAX	12	A	-6	768	3 0
A3	MFR_PIN_MAX	1300	W	1	650	2 138
A4	MFR_VOUT_MIN	11.64	V	-6	745	2 233
A5	MFR_VOUT_MAX	12.36	V	-6	791	3 23
A6	MFR_IOUT_MAX	100	A	-3	800	3 32
A7	MFR_POUT_MAX	1200	W	1	600	2 88
A8	MFR_TAMBIENT_MAX	60	C	0	60	0 60
A9	MFR_TAMBIENT_MIN	0	C	0	0	0 0
AA	MFR_EFFICIENCY_LL_VIN	115	V	-1	230	0 230
	MFR_EFFICIENCY_LL_POUT1	220	W	1	110	0 110
	MFR_EFFICIENCY_LL_EFF1	0.87		-10	891	3 123
	MFR_EFFICIENCY_LL_POUT2	550	W	1	275	1 19
	MFR_EFFICIENCY_LL_EFF2	0.91		-10	932	3 164
	MFR_EFFICIENCY_LL_POUT3	1100	W	1	550	2 38
	MFR_EFFICIENCY_LL_EFF3	0.88		-10	901	3 133
AB	MFR_EFFICIENCY_HL_VIN	230	V	-1	460	1 204
	MFR_EFFICIENCY_HL_POUT1	240	W	1	120	0 120
	MFR_EFFICIENCY_HL_EFF1	0.9		-10	922	3 154
	MFR_EFFICIENCY_HL_POUT2	600	W	1	300	1 44
	MFR_EFFICIENCY_HL_EFF2	0.94		-10	963	3 195
	MFR_EFFICIENCY_HL_POUT3	1200	W	1	600	2 88
	MFR_EFFICIENCY_HL_EFF3	0.91		-10	932	3 164

OPERATION COMMAND CODE 01h:

Link Back to Command Table: CMD_01_Back

Bit # / Bit Description								Valid Values		Power Supply On/Off Mode
7	6	5	4	3	2	1	0	Dec	Hex	
On/off 1	On/off 0	Margin on/off/high/low 1	Margin on/off/high/low 0	Margin fault control 1	Margin fault control 0	not used	not used			
0	0	x	x	x	x	x	x	0 - 63	0 - 3F	Disable power supply when OPERATION command supported
1	0	x	x	x	x	x	x	128 - 191	80 - BF	Enable power supply when OPERATION command supported **(Default)**

ON/OFF COMMAND CODE 02h:

Link Back to Command Table: CMD_02_Back

Bit # / Bit Description								Valid Values		Power Supply On/Off Mode
7	6	5	4	3	2	1	0	Dec	Hex	
reserved	reserved	reserved	CONTROL pin / OPERATION command PS on/off	OPERATION command on/off	CONTROL pin on/off	CONTROL pin polarity	CONTROL pin action			
0	0	0	1	0	1	0	1	21	15	Control pin only ; active low polarity
0	0	0	1	0	1	1	1	23	17	Control pin only ; active high polarity
0	0	0	1	1	0	x	1	25 or 27	19 or 1B	Operation command only
0	0	0	1	1	1	0	1	29	1D	Operation command and control pin ; active low polarity (Default)
0	0	0	1	1	1	1	1	31	1F	Operation command and control pin ; active high polarity

RETURNED RESULTS COMMANDS 40h-6Bh:

Link Back to Command Table: CMD_40_6B_Back

Command Code (Hex)	Command Name	Read / Write	Page	Data Format	# of Bytes	Units	Scaling Coefficients				Bit #	Reading	Comments
							N	m	R	b			
40	VOUT_OV_FAULT_LIMIT	R	0	Linear	2	Vdc	-6					13	
40	VSTBY_OV_FAULT_LIMIT	R	1	Linear	2	Vdc	-7					5.5	
41	VOUT_OV_FAULT_RESPONSE	R	0	Bit Flags	1						2:0	0	Delay Time - None
											5:3	0	Retry Setting - Unit does not attempt to restart & output remains disabled until fault clear
											7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
41	VSTBY_OV_FAULT_RESPONSE	R	1	Bit Flags	1						2:0	0	Delay Time - None
											5:3	0	Retry Setting - Unit does not attempt to restart & output remains disabled until fault clear
											7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
42	VOUT_OV_WARN_LIMIT	R	0	Linear	2	Vdc	-6					12.5	
42	VSTBY_OV_WARN_LIMIT	R	1	Linear	2	Vdc	-7					5.4	
43	VOUT_UV_WARN_LIMIT	R	0	Linear	2	Vdc	-6					11.5	
43	VSTBY_UV_WARN_LIMIT	R	1	Linear	2	Vdc	-7					4.7	
44	VOUT_UV_FAULT_LIMIT	R	0	Linear	2	Vdc	-6					10.9	
44	VSTBY_UV_FAULT_LIMIT	R	1	Linear	2	Vdc	-7					4.5	
45	VOUT_UV_FAULT_RESPONSE	R	0	Bit Flags	1						2:0	0	Delay Time - None
											5:3	0	Retry Setting - Unit does not attempt to restart & output remains disabled until fault clear
											7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared

Command Code (Hex)	Command Name	Read / Write	Page	Data Format	# of Bytes	Units	Scaling Coefficients	Bit #	Reading	Comments
45	VSTBY_UV_FAULT_RESPONSE	R	1	Bit Flags	1			2:0	0	Delay Time - None
								5:3	0	Retry Setting - Unit does not attempt to restart & output remains disabled until fault clear
								7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
46	IOUT_OC_FAULT_LIMIT	R	0	Linear	2	Adc	-3		115	
46	ISTBY_OC_FAULT_LIMIT	R	2	Linear	2	Adc	-7		4	
47	IOUT_OC_FAULT_RESPONSE	R	0	Bit Flags	1			2:0	0	Delay Time - None
								5:3	7	Retry Setting - Unit does not attempt to restart & output remains disabled until fault clear
								7:6	3	Response - Continuous restart (self-recovery)
47	ISTBY_OC_FAULT_RESPONSE	R	1	Bit Flags	1			2:0	0	Delay Time - None
								5:3	7	Response - Continuous restart (self-recovery)
								7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
4A	IOUT_OC_WARN_LIMIT	R	0	Linear	2	Adc	-3		110	
4A	ISTBY_OC_WARN_LIMIT	R	2	Linear	2	Adc	-7		3.8	
4F	AIRFLOW_1_OT_FAULT_LIMIT	R	0	Linear	2	°C	0		95	Primary
4F	HOTSPOT_1_OT_FAULT_LIMIT	R	1	Linear	2	°C	0		105	Primary
4F	AIRFLOW_2_OT_FAULT_LIMIT	R	2	Linear	2	°C	0		65	Secondary
4F	HOTSPOT_2_OT_FAULT_LIMIT	R	3	Linear	2	°C	0		130	Secondary
50	AIRFLOW_1_OT_FAULT_RESPONSE	R	0	Bit Flags	1			2:0	0	Delay Time - None
								5:3	0	Retry Setting - Unit does not attempt to restart & output remains disabled until fault clear
								7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
50	HOTSPOT_1_OT_FAULT_RESPONSE	R	1	Bit Flags	1			2:0	0	Delay Time - None
								5:3	0	Retry Setting - Unit does not attempt to restart & output remains disabled until fault clear
								7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
50	AIRFLOW_1_OT_FAULT_RESPONSE	R	2	Bit Flags	1			2:0	0	Delay Time - None
								5:3	0	Retry Setting - Unit does not attempt to restart & output remains disabled until fault clear
								7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
50	HOTSPOT_2_OT_FAULT_RESPONSE	R	3	Bit Flags	1			2:0	0	Delay Time - None
								5:3	0	Retry Setting - Unit does not attempt to restart & output remains disabled until fault clear
								7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
51	AIRFLOW_1_OT_WARN_LIMIT	R	0	Linear	2	°C	0		85	Primary
51	HOTSPOT_1_OT_WARN_LIMIT	R	1	Linear	2	°C	0		100	Primary
51	AIRFLOW_2_OT_WARN_LIMIT	R	2	Linear	2	°C	0		60	Secondary
51	HOTSPOT_2_OT_WARN_LIMIT	R	3	Linear	2	°C	0		125	Secondary
55	VIN_OV_FAULT_LIMIT	R	0	Linear	2	Vrms	-1		280	
56	VIN_OV_FAULT_RESPONSE	R	0	Bit Flags	1			2:0	0	Delay Time - None
								5:3	0	Retry Setting - Unit does not attempt to restart & output remains disabled until fault clear
								7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
57	VIN_OV_WARN_LIMIT	R	0	Linear	2	Vrms	-1		420	
58	VIN_UV_WARN_LIMIT	R	0	Linear	2	Vrms	-1		222	

Command Code (Hex)	Command Name	Read / Write	Page	Data Format	# of Bytes	Units	Scaling Coefficients	Bit #	Reading	Comments
59	VIN_UV_FAULT_LIMIT	R	0	Linear	2	Vrms	-1		208	
5A	VIN_UV_FAULT_RESPONSE	R	0	Bit Flags	1			2:0	0	Delay Time - None
								5:3	0	Retry Setting - Unit does not attempt to restart & output remains disabled until fault clear
								7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
5B	IIN_OC_FAULT_LIMIT	R	0	Linear	2	Arms	-6		13	
5C	IIN_OC_FAULT_RESPONSE	R	0	Bit Flags	1			2:0	0	Delay Time - None
								5:3	0	Retry Setting - Unit does not attempt to restart & output remains disabled until fault clear
								7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
5D	IIN_OC_WARN_LIMIT	R	0	Linear	2	Arms	-6		7	
5E	POWER_GOOD_ON	R	0	Linear	2	Vdc	-6		10.9	
5F	POWER_GOOD_OFF	R	0	Linear	2	Vdc	-6		10.9	
68	POUT_OP_FAULT_LIMIT	R	0	Linear	2	Watts	1		1350	
69	POUT_OP_FAULT_RESPONSE	R	0	Bit Flags	1			2:0	0	Delay Time - None
								5:3	0	Retry Setting - Unit does not attempt to restart & output remains disabled until fault clear
								7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
6A	POUT_OP_WARN_LIMIT	R	0	Linear	2	Watts	1		1300	
6B	PIN_OP_WARN_LIMIT	R	0	Linear	2	Watts	1		1450	

SENSOR DATA AND RESOLUTION, COMMANDS 88h-97h:

Link Back to Command Table: CMD_88_97_Back

Command Code (Hex)	Command Name	Description	Page	Data Format	Units	Scaling Coefficients				Raw Sensor		PMBus™ Reporting Sensor		
						N	m	R	b	Full-scale / Range	Resolution	Full-scale / Range	Resolution	Accuracy
88	READ_VIN	Input Voltage Sensor Reading	All	Linear	Vdc	-1				477	0.466	511.5	0.5	+ / - 2% of Reporting Full-Scale
89	READ_IIN	Input Current Sensor Reading	All	Linear	Adc	-7				7.7	0.0078	7.99	0.0078	+ / - 5% of Reporting Full-Scale
8B	READ_VOUT	Main Output Voltage Sensor Reading	0	Linear	Vdc	-6				14.68	0.0143	15.98	0.0156	+ / - 2% of Reporting Full-Scale
8B	READ_VSTBY	Standby(Auxiliary) Output Voltage Sensor Reading	1	Linear	Vdc	-7				4.38	0.00428	7.992	0.00781	+ / - 2% of Reporting Full-Scale
8C	READ_IOUT	Main Output Current Sensor Reading	0	Linear	Adc	-3				148.5	0.145	127.88	0.125	+ / - 2% of Reporting Full-Scale
8C	READ_ISTBY	Standby(Auxiliary) Output Current Sensor Reading	1	Linear	Adc	-7				4.87	0.00476	7.992	0.00781	+ / - 2% of Reporting Full-Scale
8D	READ_TEMPERATURE_1	Temperature Sensor Reading - Inlet (Secondary Side)	0	Linear	°C	0				-40 to 150		-40 to 150	1	+ / - 5°C
8E	READ_TEMPERATURE_2	Temperature Sensor Reading - Outlet (Primary Side)	0	Linear	°C	0				-40 to 150		-40 to 150	1	+ / - 5°C
8F	READ_TEMPERATURE_3	Temperature Sensor Reading - Main Output Hotspot (Secondary Side)	0	Linear	°C	0				-40 to 150		-40 to 150	1	+ / - 5°C
8F	READ_TEMPERATURE_3	Temperature Sensor Reading - PFC Hotspot (Primary Side)	1	Linear	°C	0				-40 to 150		-40 to 150	1	+ / - 5°C

Command Code (Hex)	Command Name	Description	Page	Data Format	Units	Scaling Coefficients				Raw Sensor		PMBus™ Reporting Sensor		
						N	m	R	b	Full-scale / Range	Resolution	Full-scale / Range	Resolution	Accuracy
90	READ_FAN_SPEED_1	Fan 1 Speed Sensor Reading	All	Linear	RPM	5				24,000		32736	32	+ / - 5% of Reporting Full-Scale
96	READ_POUT	Output Power Sensor Reading	All	Linear	Watts	1						2046	2	+ / - 5% of Reporting Full-Scale
97	READ_PIN	Input Power Sensor Reading	All	Linear	Watts	1						2046	2	+ / - 5% of Reporting Full-Scale

MANUFACTURERS VITAL PRODUCT DATA

Command Code 99h (MAN_ID):

Link Back to Command Table, CMD_88_97_Back: CMD_99_Back

Command Code (Hex)	Command Name	Value	Units	ID Length/Bit#ID/ASCII Text	
99	MFR_ID	Murata-PS	N/A	Length:	9
				MFR_ID_0	'M'
				MFR_ID_1	'u'
				MFR_ID_2	'r'
				MFR_ID_3	'a'
				MFR_ID_4	't'
				MFR_ID_5	'a'
				MFR_ID_6	'-'
				MFR_ID_7	'P'
				MFR_ID_8	'S'

Command Code 9Ah; (MFR_MODEL):

Link Back to Command Table: CMD_9A_Back

Command Code (Hex)	Command Name	Value	Units	ID Length/Bit#ID/ASCII Text	
9A	MFR_MODEL	D1U54-HD-1200-12-HA4C	N/A	Length:	21
					'D'
					'1'
					'U'
					'5'
					'4'
					'-'
					'H'
					'D'
					'-'
					'1'
					'2'
					'0'
					'0'
					'-'
					'1'
					'2'
					'-'
					'H'
					'A'
					'4'

Command Code 9Bh (MFR_REVISION):

Link Back to Command Table: CMD_9B_Back

Command Code (Hex)	Command Name	Value	ID Length/Bit#ID/ASCII Text	
9B	MFR_REVISION	0101-0202-0000	MFR_REVISION_LENGTH	14
			MFR_REVISION_0	'0'
			MFR_REVISION_1	'1'
			MFR_REVISION_2	'0'
			MFR_REVISION_3	'1'
			MFR_REVISION_4	'-'
			MFR_REVISION_5	'0'
			MFR_REVISION_6	'2'
			MFR_REVISION_7	'0'
			MFR_REVISION_8	'2'
			MFR_REVISION_9	'-'
			MFR_REVISION_10	'0'
			MFR_REVISION_11	'0'
			MFR_REVISION_12	'0'
			MFR_REVISION_13	'0'

Command Code 9Ch (MFR_LOCATION):

Link Back to Command Table: CMD_9C_Back

Command Code (Hex)	Command Name	Value	ID Length/Bit#ID/ASCII Text	
9C	MFR_LOCATION	China	MFR_LOCATION_LENGTH	5
			MFR_LOCATION_0	'C'
			MFR_LOCATION_1	'h'
			MFR_LOCATION_2	'i'
			MFR_LOCATION_3	'n'
			MFR_LOCATION_4	'a'

Command Code 9Dh (MFR_DATE):

Link Back to Command Table: CMD_9D_Back

Command Code (Hex)	Command Name	Value	Firmware Constants Table	
9D	MFR_DATE	1500	MFR_DATE_LENGTH	4
			MFR_DATE_0	'1'
			MFR_DATE_1	'5'
			MFR_DATE_2	'0'
			MFR_DATE_3	'0'

Command Code 9Eh (MFR_SERIAL):

Link Back to Command Table: CMD_9E_Back

Command Code (Hex)	Command Name	Value	Firmware Constants Table	
9E	MFR_SERIAL	QEyywwR1xxxx	MFR_SERIAL_LENGTH	14
			MFR_SERIAL_0	'Q'
			MFR_SERIAL_1	'E'
			MFR_SERIAL_2	'y'
			MFR_SERIAL_3	'y'
			MFR_SERIAL_4	'w'
			MFR_SERIAL_5	'w'
			MFR_SERIAL_6	'R'
			MFR_SERIAL_7	'1'
			MFR_SERIAL_8	'x'
			MFR_SERIAL_9	'x'
			MFR_SERIAL_10	'x'
			MFR_SERIAL_11	'x'
			MFR_SERIAL_12	0
			MFR_SERIAL_13	0

Internal EEPROM

Link Back to Command Table: CMD_E1_Back

Address (HEX)	Data Length	Register Contents (Hexadecimal Format) Order = Low Address -> High Address Dynamic Data Byte = xx	Register Name	Static or Dynamic Register ? (S/D)	R/W	Protected? (Y/N)	Data Type	Description
00 – 0A	11	01 00 00 00 01 00 00 FE 01 09 19	Header	S		N	HEX	
0B – 14	10	C9 4D 75 72 61 74 61 2D 50 53	Manufacturer Bytes	S		N	TEXT	Reads as “Murata-PS”
15 – 1A	6	C5 4D 35 30 30 34	Product Name	S		N	TEXT	Reads as “M5004”
1B – 30	22	D5 44 31 55 35 34 2D 48 44 2D 31 32 30 30 2D 31 32 2D 48 41 34 43	Part Number	S		N	TEXT	Reads as “D1U54-HD-1200-12-HA4C"
31	1	C0	Product Version Length	S		N	HEX	Product version, length =0
32 – 3E	13	CC pp pp yy yy ww ww rr rr XX XX XX XX	Product Serial Number	D		N	TEXT	CC = HEX 0xCC length identifier pp = Product Code yy = Serial Number Year ww = Serial Number Week rr = Serial Number Revision Level XX = Serial Number
3F – 44	6	C0 C0 C0 C0 C0 C0	Custom data	S		N	HEX	Asset tag, Custom data, FRU ID
45	1	C1	END	S		N	HEX	Signifies end of information
46 – 4E	9	00 00 00 … 00 00 00	UNUSED EEPROM	S		N	HEX	Fill all unused memory locations with 0x00
4F	1	XX	Checksum	D		N	HEX	XX = 2's complement checksum from 0x08 - 0x45
50-FF	176	00 00 00 … 00 00 00	UNUSED EEPROM	S		N	HEX	Fill all unused memory locations with 0x00