This application note describes the supported PMBus™ Digital Communications supported command list for the **D1U54-D-2000-12-HxxC-xx** series power supplies.

PMBus™ General Notes

- Complies with PMBus™ Power Systems Management Protocol Part 1 – General Requirements Rev 1.2 and Power System Mgt Protocol Specification – Part II , Revision 1.2. Refer to these documents for additional details.
- PEC is enabled; Ensure system/host PEC enabled to avoid registering CML errors when issuing write commands.
- Linear data formatting is used for all passed parameters.
- 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
- 400KHz I²C communications is supported for the PMBus™ interface.
- The PMBus™ slave controller does "clock stretch" on ACK or NAK.
- "Page" is supported, generally, page "0"contains main output parameters and page "1" contains the standby output parameters.

Device Details

Power Supply Controllers			
Vendor	MFG Part Number	Package	Description
Microchip Technology Inc.	DSPIC33FJ64GS606T-50I/PT	TQFP64	(Secondary) IC Dig SMT Microcontroller PIC33 TQFP64 64k 9kB 50MHz
Microchip Technology Inc.	DSPIC33EP32GS504T-70I/PT	TQFP44	(Primary) IC Dig SMT Controller

Power Supply External EEPROM			
Vendor	MFG Part Number	Package	Description
Microchip Technology Inc.	24AA024T-I/MS	MSOP8	IC Dig SMT EEPROM CMOS Serial I2C AT24CXX MSOP8 2kB

Device [1]Addressing

The Power Module's internal slave devices (Main Controller and External EEPROM) can be assigned one of the address values listed in table below by placing and an external resistor between ADDR and RTN/ground (pins D2 and P2 respectively).

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

[1] ADDR Pin "D2" is a multifunction signal used not only to set the PMBus address but also to detect presence in the system (used by the power module for internal processing). Left open, power module operation is inhibited; however a default slave address will be assigned (0x80h) to allow communication with slave devices. Select and place one of the above resistor values to RTN/GND for normal power module operation.

PMBus™ Command List

Command Code (Hex)	Command Name	Read / Write	Pg.	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	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	Send	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 (defult)	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		0			Write only command clears all faults that have been set in all the STATUS_XXXX registers simultaneously	YES
04	PHASE	R/W	All		1			Command to provide the ability to configure, control, and monitor multiple phases on one PMBus unit.	NO
05	PAGE_PLUS_WRITE	Block Write	All		Variable			Command used to set the page within a device, send a command, and send the data for the command in one packet	YES
06	PAGE_PLUS_READ	Block Write / Block Read Process Call	All		Variable			Command used to set the page within a device, send a command, and read the data returned by the command in one packet	YES
10	WRITE_PROTECT	R/W	All		1			Command to provide ability to configure, control & monitor multiple outputs	YES
11	STORE_DEFAULT_ALL	Send	All		0			Command instructs PMBus device to copy contents of Operating Memory to matching NVM	NO
12	RESTORE_DEFAULT_ALL	Send	All		0			Command instructs PMBus device to copy contents of NVM to matching Operating Memory	NO
13	STORE_DEFAULT_CODE	W	All		1			Command instructs the PMBus device to copy the parameter whose Command Code matches value in the data byte, from Operating Memory to matching NVM	NO
14	RESTORE_DEFAULT_CODE	W	All		1			Command instructs the PMBus device to copy the parameter whose Command Code matches value in the data byte, from NVM to matching Operating Memory	NO
15	STORE_USER_ALL	Send	All		0			Command instructs the PMBus device to copy the entire contents of Operating Memory to matching NVM	NO
16	RESTORE_USER_ALL	Send	All		0			Command instructs the PMBus device to copy the entire contents of NVM to matching Operating Memory	NO
17	STORE_USER_CODE	W	All		1			Command instructs the PMBus device to copy the parameter whose Command Code matches value in the data byte from Operating Memory to matching NVM User Store memory	NO
18	RESTORE_USER_CODE	W	All		1			Command instructs the PMBus device to copy the parameter whose Command Code matches value in the data byte from NVM to matching Operating memory Store memory	NO
19	CAPABILITY	R	All	Bit Flags	1	0:3	RESERVED		NO
						4	SMBALERT_L	Set when device has SMBALERT_L pin which supports the SMBus Alert Response protocol	YES
						6:5	MAX_BUS_SPEED	01 = Max supported bus speed = 400kHz; 00 Max supported bus speed = 100kHz	NO
						7	PEC	Set when packet error checking is supported	YES
1A	QUERY	Block Write / Block Read Process Call	All	Bit Flags	1	1:0	RESERVED		NO
						4:2	DATA FORMAT	PMBus 1.2 Spec Section 11.13 Table 8.	YES
						5	READ_SUPPORT	1 = Supported ; 0 = Not Supported	YES
						6	WRITE_SUPPORT	1 = Supported ; 0 = Not Supported	YES
						7	COMMAND_SUPPORT	1 = Supported ; 0 = Not Supported	YES

Command Code (Hex)	Command Name	Read / Write	Pg.	Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
1B	SMBALERT_MASK	Block Write / Block Read Process Call	All		2			Command may be used to prevent a warning or fault condition from asserting the SMBALERT# signal	YES
20	VOUT_MODE	R	0	Bit Flags	1			Single data byte sets the READ_VOUT sensor to linear mode data format and supplies N exponent for translation to volts PMBus Spec - Part II - Revision 1.2 - Sections 8.1-8.3	YES
20	VSTBY_MODE	R	1	Bit Flags	1			Single data byte sets the READ_VSTBY sensor to linear mode data format and supplies N exponent for translation to volts PMBus Spec - Part II - Revision 1.2 - Sections 8.1-8.3	YES
21	VOUT_COMMAND	R/W	0	Linear Data Format	2			Manual override main output setpoint command - Voltage range setting 11.5V - 12.75V Command speed formatted in Linear as per command 0x8B - VOUT_COMMAND	YES
21	VSTBY_COMMAND	R/W	1	Linear Data Format	2			Manual override standby output setpoint command - Voltage range setting x. Command speed formatted in Linear as per command 0x8B - VOUT_COMMAND	NO
22	VOUT_TRIM	R/W	0	Linear Data Format	2			Command used to apply a fixed offset voltage to the output voltage command value	NO
23	VSTBY_TRIM	R/W	1	Linear Data Format	2			Command used to apply a fixed offset voltage to the output voltage command value	NO
23	VOUT_CAL_OFFSET	R/W	0	Linear Data Format	2			Command used to apply a fixed offset voltage to the output voltage command value	NO
23	VSTBY_CAL_OFFSET	R/W	1	Linear Data Format	2			Command used to apply a fixed offset voltage to the output voltage command value	NO
24	VOUT_MAX	R/W	0	Linear Data Format	2			Command sets upper limit output voltage can be set regardless of other command/combination	NO
24	VSTBY_MAX	R/W	1	Linear Data Format	2			Command sets upper limit output voltage can be set regardless of other command/combination	NO
25	VOUT_MARGIN_HIGH	R/W	0	Linear Data Format	2			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 Data Format	2			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 Data Format	2			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 Data Format	2			Load the unit with the voltage to which the output is to be changed when the OPERATION command set to "Margin Low"	NO
27	VOUT_TRANSITION_RATE	R/W	0	Linear Data Format	2			Command sets the rate in mV/µs at which the output should change voltage	NO
27	VSTBY_TRANSITION_RATE	R/W	1	Linear Data Format	2			Command sets the rate in mV/µs at which the output should change voltage	NO
28	VOUT_DROOP	R/W	0	Linear Data Format	2			Command sets the rate (mV/A) which output voltage decreases (or increases) with increasing (or decreasing) output current (in Adaptive Voltage Positioning/passive current sharing)	NO
28	VSTBY_DROOP	R/W	1	Linear Data Format	2			Command sets the rate (mV/A) which output voltage decreases (or increases) with increasing (or decreasing) output current (in Adaptive Voltage Positioning/passive current sharing)	NO

Command Code (Hex)	Command Name	Read / Write	Pg.	Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
29	VOUT_SCALE_LOOP	R/W	0	Linear Data Format	2			PMBus Spec - Part II - Revision 1.2 - Section 13.10	NO
29	VSTBY_SCALE_LOOP	R/W	1	Linear Data Format	2			PMBus Spec - Part II - Revision 1.2 - Section 13.10	NO
2A	VOUT_SCALE_MONITOR	R/W	0	Linear Data Format	2			PMBus Spec - Part II - Revision 1.2 - Section 13.11	NO
2A	VSTBY_SCALE_MONITOR	R/W	1	Linear Data Format	2			PMBus Spec - Part II - Revision 1.2 - Section 13.11	NO
30	COEFFICIENTS	Block Write / Block Read Process Call	All		5			Command used to retrieve the m, b and R coefficients needed by data in the DIRECT format	NO
31	POUT_MAX	R/W	All	Linear Data Format	2			Commands sets output power (watts) which unit starts regulating in constant power mode	NO
32	MAX_DUTY	R/W	All	Linear Data Format	2			Command sets maximum duty cycle (%) of the unit's power conversion stage	NO
33	FREQUENCY_SWITCH	R/W	All	Linear Data Format	2			Command sets switching frequency (kHz) of a PMBus device	NO
35	VIN_ON	R/W	All	Linear Data Format	2			Command sets value of input voltage (Vdc/Vrms) at which unit should start power conversion	NO
36	VIN_OFF	R/W	All	Linear Data Format	2			Command sets value of input voltage (Vdc/Vrms) at which unit should stop power conversion	NO
37	INTERLEAVE	R/W	All	Bit Flags	2			PMBus Spec - Part II - Revision 1.2 - Section 14.7	NO
38	IOUT_CAL_GAIN	R/W	All	Linear Data Format	2			Command used to set the ratio of the voltage at the current sense pins to the sensed current	NO
39	IOUT_CAL_OFFSET	R/W	All	Linear Data Format	2			Command used to null out any offsets in the output current sensing circuit	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	Linear Data Format	2			Manual fan override command fan speed value in Duty Cycle Command speed formatted in Linear as per command 0x90 - READ_FAN_SPEED_1	YES
3C	FAN_COMMAND_2	R/W	All	Linear Data Format	2			Manual fan override command fan speed value in Duty Cycle Command speed formatted in Linear as per command 0x91 - READ_FAN_SPEED_2	NO
3D	FAN_CONFIG_3_4	R	All	Bit Flags	1	0	FAN_4_TACH_PULSES	Fan 4 Tachometer pulses per revolution (lower bit)	NO
						1	FAN_4_TACH_PULSES	Fan 4 Tachometer pulses per revolution (upper bit)	NO
						2	FAN_4_SETTING_MODE	Set when fan is commanded in RPM (Clear when fan is commanded in Duty Cycle)	NO
						3	FAN_4_INSTALLATION	Set when fan is installed in position 4	NO
						4	FAN_3_TACH_PULSES	Fan 3 Tachometer pulses per revolution (lower bit)	NO
						5	FAN_3_TACH_PULSES	Fan 3 Tachometer pulses per revolution (upper bit)	NO
						6	FAN_3_SETTING_MODE	Set when fan is commanded in RPM (Clear when fan is commanded in Duty Cycle)	NO
						7	FAN_3_INSTALLATION	Set when fan is installed in position 3	NO

Command Code (Hex)	Command Name	Read / Write	Pg.	Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
3E	FAN_COMMAND_3	R/W	All	Linear Data Format	2			Manual fan override command fan speed value in Duty Cycle Command speed formatted in Linear as per command 0x92 - READ_FAN_SPEED_3	NO
3F	FAN_COMMAND_4	R/W	All	Linear Data Format	2			Manual fan override command fan speed value in Duty Cycle Command speed formatted in Linear as per command 0x93 - READ_FAN_SPEED_4	NO
40	VOUT_OV_FAULT_LIMIT	R	0	Linear Data Format	2			Main Output Overvoltage Fault Limit	YES
40	VSTBY_OV_FAULT_LIMIT	R	1	Linear Data Format	2			Standby(Auxilliary) 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(Auxilliary) Output Overvoltage Fault Response Actions	YES
42	VOUT_OV_WARN_LIMIT	R	0	Linear Data Format	2			Main Output Overvoltage Warning Limit	YES
42	VSTBY_OV_WARN_LIMIT	R	1	Linear Data Format	2			Standby(Auxilliary) Output Overvoltage Warning Limit	YES
43	VOUT_UV_WARN_LIMIT	R	0	Linear Data Format	2		Link to Fault, Warning, Response limits: HaxC-xx models HBxC-xx models HCxC-xx models	Main Output Undervoltage Warning Limit	YES
43	VSTBY_UV_WARN_LIMIT	R	1	Linear Data Format	2			Standby(Auxilliary) Output Undervoltage Warning Limit	YES
44	VOUT_UV_FAULT_LIMIT	R	0	Linear Data Format	2			Main Output Undervoltage Fault Limit	YES
44	VSTBY_UV_FAULT_LIMIT	R	1	Linear Data Format	2			Standby(Auxilliary) 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(Auxilliary) Output Undervoltage Fault Response Actions	YES
46	IOUT_OC_FAULT_LIMIT	R	0	Linear Data Format	2			Main Output Overcurrent Fault Limit	YES
46	ISTBY_OC_FAULT_LIMIT	R	1	Linear Data Format	2			Standby(Auxilliary) Output Overcurrent Fault Limit	YES
47	IOUT_OC_FAULT_RESPONSE	R	0	Bit Flags	1			Main Output Overcurrent Fault Response Actions	YES
47	ISTBY_OC_FAULT_RESPONSE	R	1	Bit Flags	1			Standby(Auxilliary) Output Overcurrent Fault Response Actions	YES
48	IOUT_OC_LV_FAULT_LIMIT	R	0	Linear Data Format	2			Main Output Overcurrent Foldback Fault Limit	NO
48	ISTBY_OC_LV_FAULT_LIMIT	R	1	Linear Data Format	2			Standby(Auxilliary) Output Overcurrent Foldback Fault Limit	NO
49	IOUT_OC_LV_FAULT_RESPONSE	R	0	Bit Flags	1			Main Output Overcurrent Foldback Fault Response Actions	NO
49	ISTBY_OC_LV_FAULT_RESPONSE	R	1	Bit Flags	1			Standby(Auxilliary) Output Overcurrent Foldback Fault Response Actions	NO
4A	IOUT_OC_WARN_LIMIT	R	0	Linear Data Format	2			Main Output Overcurrent Warning Limit	YES
4A	ISTBY_OC_WARN_LIMIT	R	1	Linear Data Format	2			Standby(Auxilliary) Output Overvoltage Warning Limit	YES
4B	IOUT_UC_FAULT_LIMIT	R	0	Linear Data Format	2			Main Output Undercurrent Fault Limit	NO
4B	ISTBY_UC_FAULT_LIMIT	R	1	Linear Data Format	2			Standby(Auxilliary) Output Undercurrent Fault Limit	NO

Command Code (Hex)	Command Name	Read / Write	Pg.	Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
4C	IOUT_UC_FAULT_RESPONSE	R	0	Bit Flags	1			Main Output Undercurrent Fault Response Actions	NO
4C	ISTBY_UC_FAULT_RESPONSE	R	1	Bit Flags	1			Standby(Auxilliary) Output Undercurrent Fault Response Actions	NO
4F	INTAKE_AIRFLOW_OT_FAULT_LIMIT	R	0	Linear Data Format	2			Intake Airflow Overtemperature Fault Limit	YES
4F	EXHAUST_AIRFLOW_OT_FAULT_LIMIT	R	1	Linear Data Format	2			Exhaust Airflow Overtemperature Fault Limit	YES
4F	DOWN_CONVERTER_HOTSPOT_OT_FAULT_LIMIT	R	2	Linear Data Format	2			Down Converter Hotspot Overtemperature Fault Limit	YES
4F	BOOST_CONVERTER_HOTSPOT_OT_FAULT_LIMIT	R	3	Linear Data Format	2			Boost Converter Hotspot Overtemperature Fault Limit	YES
50	INTAKE_AIRFLOW_OT_FAULT_RESPONSE	R	0	Bit Flags	1			Intake Airflow Overtemperature Fault Response Actions	YES
50	EXHAUST_AIRFLOW_OT_FAULT_RESPONSE	R	1	Bit Flags	1			Exhaust Airflow Overtemperature Fault Response Actions	YES
50	DOWN_CONVERTER_HOTSPOT_OT_FAULT_RESPONSE	R	2	Bit Flags	1		Link to Fault, Warning, Response limits: HaxC-xx models HBxC-xx models HCxC-xx models	Down Converter Hotspot Overtemperature Fault Response Actions	YES
50	BOOST_CONVERTER_HOTSPOT_OT_FAULT_RESPONSE	R	3	Bit Flags	1			Boost Converter Hotspot Overtemperature Fault Response Actions	YES
51	INTAKE_AIRFLOW_OT_WARNING_LIMIT	R	0	Linear Data Format	2			Intake Airflow Overtemperature Warning Limit	YES
51	EXHAUST_AIRFLOW_OT_WARNING_LIMIT	R	1	Linear Data Format	2			Exhaust Airflow Overtemperature Warning Limit	YES
51	DOWN_CONVERTER_HOTSPOT_OT_WARNING_LIMIT	R	2	Linear Data Format	2			Down Converter Hotspot Overtemperature Warning Limit	YES
51	BOOST_CONVERTER_HOTSPOT_OT_WARNING_LIMIT	R	3	Linear Data Format	2			Boost Converter Hotspot Overtemperature Warning Limit	YES
52	INTAKE_AIRFLOW_UT_FAULT_LIMIT	R	0	Linear Data Format	2			Intake Airflow Undertemperature Fault Limit	NO
52	EXHAUST_AIRFLOW_UT_FAULT_LIMIT	R	1	Linear Data Format	2			Exhaust Airflow Undertemperature Fault Limit	NO
52	DOWN_CONVERTER_HOTSPOT_UT_FAULT_LIMIT	R	2	Linear Data Format	2			Down Converter Hotspot Undertemperature Fault Limit	NO
52	BOOST_CONVERTER_HOTSPOT_UT_FAULT_LIMIT	R	3	Linear Data Format	2			Boost Converter Hotspot Undertemperature Fault Limit	NO
53	INTAKE_AIRFLOW_UT_FAULT_RESPONSE	R	0	Bit Flags	1			Intake Airflow Undertemperature Fault Response Actions	NO
53	EXHAUST_AIRFLOW_UT_FAULT_RESPONSE	R	1	Bit Flags	1			Exhaust Airflow Undertemperature Fault Response Actions	NO
53	DOWN_CONVERTER_HOTSPOT_UT_FAULT_RESPONSE	R	2	Bit Flags	1			Down Converter Hotspot Undertemperature Fault Response Actions	NO
53	BOOST_CONVERTER_HOTSPOT_UT_FAULT_RESPONSE	R	3	Bit Flags	1			Boost Converter Hotspot Undertemperature Fault Response Actions	NO
55	VIN_OV_FAULT_LIMIT	R	All	Linear Data Format	2			Input Overvoltage Fault Limit	YES
56	VIN_OV_FAULT_RESPONSE	R	All	Bit Flags	1			Input Overvoltage Fault Response Actions	YES
57	VIN_OV_WARN_LIMIT	R	All	Linear Data Format	2			Input Overvoltage Warning Limit	YES
58	VIN_UV_WARN_LIMIT	R	All	Linear Data Format	2			Input Undervoltage Warning Limit	YES
59	VIN_UV_FAULT_LIMIT	R	All	Linear Data Format	2			Input Undervoltage Fault Limit	YES
5A	VIN_UV_FAULT_RESPONSE	R	All	Bit Flags	1			Input Undervoltage Fault Response Actions	YES

Command Code (Hex)	Command Name	Read / Write	Pg.	Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
5B	IIN_OC_FAULT_LIMIT	R	All	Linear Data Format	2			Input Overcurrent Fault Limit	YES
5C	IIN_OC_FAULT_RESPONSE	R	All	Bit Flags	1			Input Overcurrent Fault Response Actions	YES
5D	IIN_OC_WARN_LIMIT	R	All	Linear Data Format	2			Input Overcurrent Warning Limit	YES
5E	POWER_GOOD_ON	R	All	Linear Data Format	2			Power Good On Main Output Voltage Limit	YES
5F	POWER_GOOD_OFF	R	All	Linear Data Format	2			Power Good Off Main Output Voltage Limit	YES
60	TON_DELAY	R	All	Linear Data Format	2			Sets the time (mSec) from when a start condition is received (as programmed by the ON_OFF_CONFIG command) until the output voltage starts to rise	NO
61	TON_RISE	R	All	Linear Data Format	2			Sets the time (mSec) from when the output starts to rise until the voltage has entered the regulation band.	NO
62	TON_MAX_FAULT_LIMIT	R	All	Linear Data Format	2			Command sets an upper limit (mSec) on how long the unit can attempt to power up the output without reaching the output undervoltage fault limit	YES
63	TON_MAX_FAULT_RESPONSE	R	All	Bit Flags	1			Command instructs the device on what action to take in response to a TON_MAX fault	YES
64	TOFF_DELAY	R	All	Linear Data Format	2		Link to Fault, Warning, Response limits:	Sets the time (mSec) from a stop condition is received (as programmed by the ON_OFF_CONFIG command) until the unit stops transferring energy to the output	NO
65	TOFF_FALL	R	All	Linear Data Format	2		HaxC-xx models HBxC-xx models	Sets the time (mSec) from the end of the turn-off delay time until the voltage is commanded to zero.	NO
66	TOFF_MAX_WARN_LIMIT	R	All	Linear Data Format	2		HCxC-xx models	Command sets an upper limit(mSec), on how long unit can attempt to power down output without reaching 12.5% of the output voltage programmed at the time the unit is turned off	NO
68	POUT_OP_FAULT_LIMIT	R	All	Linear Data Format	2			Output Overpower Fault Limit	YES
69	POUT_OP_FAULT_RESPONSE	R	All	Bit Flags	1			Output Overpower Fault Response Actions	YES
6A	POUT_OP_WARN_LIMIT	R	All	Linear Data Format	2			Output Overpower Warning Limit	YES
6B	PIN_OP_WARN_LIMIT	R	All	Linear Data Format	2			Input Overpower Warning Limit	YES
79	STATUS_BYTE	R/W	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

Command Code (Hex)	Command Name	Read / Write	Pg.	Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
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	MFR_SPECIFIC_F_W	Manufacturer specific fault or warning has occurred	YES
						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/W	0	Bit Flags	1	0	VOUT_TRACKING_E	Set when an error in the output voltage during power-up/down has occurred	YES
						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	YES
						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/W	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
						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	NO
						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/W	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/W	1	Bit Flags	1	0	POUT_OP_W	Set when an output overpower warning has occurred	NO
						1	POUT_OP_F	Set when an output overpower fault has occurred	NO
						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

Command Code (Hex)	Command Name	Read / Write	Pg.	Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
7C	STATUS_INPUT	R/W	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/W	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
7E	STATUS_CML	R/W	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/W	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 An 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/W	All	Bit Flags	1	0	VOUT_SOFTSTART_F	Set when a main output voltage softstart fault has occurred	YES
						1	IIN_CH1_OC_F	Set when the primary boost switch current exceeds a specified number of power-limited cycles	YES
						2	IIN_CH2_OC_F	Set when the primary boost switch current exceeds a specified number of power-limited cycles	YES
						3	VBUS_SOFTSTART_F	Set when a boost bus voltage soft-start fault has occurred	YES
						4	VBUS_UV_F	Set when the primary boost output bus undervoltage fault has occurred	YES
						5	VBUS_UV_W	Set when the primary boost output bus undervoltage warning has occurred	YES
						6	VBUS_OV_W	Set when the primary boost output bus overvoltage warning has occurred	YES
						7	VBUS_OV_F	Set when the primary boost output bus overvoltage fault has occurred	YES
81	STATUS_FANS_1_2	R/W	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	YES
						6	FAN_2_F	Fan 2 fault	NO
						7	FAN_1_F	Fan 1 fault	YES

Command Code (Hex)	Command Name	Read / Write	Pg.	Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
82	STATUS_FANS_3_4	R/W	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
86	READ_EIN	BLOCK READ	All	PMBus Spec 18.13	5			Input Energy Consumption Sensor	YES
87	READ_EOUT	BLOCK READ	All	PMBus Spec 18.13	5			Output Energy Consumption Sensor	YES
88	READ_VIN	R	All	Linear Data Format	2			Input Voltage Sensor Reading	YES
89	READ_IIN	R	All	Linear Data Format	2			Input Current Sensor Reading	YES
8A	READ_VCAP	R	All	Linear Data Format	2			PFC Output Voltage Sensor Reading	YES
8B	READ_VOUT	R	0	Linear Data Format	2			Main Output Voltage Sensor Reading	YES
8B	READ_VSTBY	R	1	Linear Data Format	2		Sensor Tolerance HaxC HbxC HcxC	Standby(Auxilliary) Output Voltage Sensor Reading	YES
8C	READ_IOUT	R	0	Linear Data Format	2			Main Output Current Sensor Reading	YES
8C	READ_ISTBY	R	1	Linear Data Format	2			Standby(Auxilliary) Output Current Sensor Reading	YES
8D	READ_TEMPERATURE_1	R	All	Linear Data Format	2			Intake Temperature Sensor Reading	YES
8E	READ_TEMPERATURE_2	R	All	Linear Data Format	2			Exhaust Temperature Sensor Reading	YES
8F	READ_TEMPERATURE_3	R	0	Linear Data Format	2			Down Converter HotspotTemperature Sensor Reading	YES
8F	READ_TEMPERATURE_3	R	1	Linear Data Format	2			Boost Converter HotspotTemperature Sensor Reading	YES
90	READ_FAN_SPEED_1	R	All	Linear Data Format	2			Fan 1 Speed Sensor Reading	YES
91	READ_FAN_SPEED_2	R	All	Linear Data Format	2			Fan 2 Speed Sensor Reading	NO
92	READ_FAN_SPEED_3	R	All	Linear Data Format	2			Fan 3 Speed Sensor Reading	NO
93	READ_FAN_SPEED_4	R	All	Linear Data Format	2			Fan 4 Speed Sensor Reading	NO
94	READ_DUTY CYCLE	R	All	Linear Data Format	2			Command returns the duty of the PMBus device's main power converter in percent	NO
95	READ_FREQUENCY	R	All	Linear Data Format	2			Command returns the switching frequency of PMBus device's main power converter in KHz	YES
96	READ_POUT	R	All	Linear Data Format	2			Output Power Sensor Reading	YES

Command Code (Hex)	Command Name	Read / Write	Pg.	Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
97	READ_PIN	R	All	Linear Data Format	2		Sensor Tolerance HaxC HbxC HcxC	Input Power Sensor Reading	YES
98	PMBUS_REVISION	R	All	HEX	1			PMBus Specification Revision	YES
99	MFR_ID	BLOCK READ	All	Ascii Text Block	10			Power Supply Company Name	YES
9A	MFR_MODEL	BLOCK READ / BLOCK WRITE	All	Ascii Text Block	32 Max			Power Supply Model Number	YES
9B	MFR_REVISION	BLOCK READ	0	Ascii Text Block	17			Power Supply Firmware Revision	YES
9B	MFR_REVISION	BLOCK READ	1	Ascii Text Block	17		Returned Results Illustration	Power Supply Firmware Revision	YES
9B	MFR_REVISION	BLOCK READ	2	Ascii Text Block	17			Power Supply Firmware Revision	NO
9C	MFR_LOCATION	BLOCK READ / BLOCK WRITE	All	Ascii Text Block	16 Max			Power Supply Manufacture Location	YES
9D	MFR_DATE	BLOCK READ / BLOCK WRITE	All	Ascii Text Block	16 Max			Power Supply Manufacture Date	YES
9E	MFR_SERIAL	BLOCK READ / BLOCK WRITE	All	Ascii Text Block	16 Max			Power Supply Serial Number	YES
9F	APP_PROFILE SUPPORT	BLOCK READ	All		3			Command provides a mean for a host to determine which PMBus Applications Profiles, and the revision of those profiles, that the device supports	YES
A0	MFR_VIN_MIN	R	All	Linear Data Format	2			Power Supply Input Voltage Minimum Specification	YES
A1	MFR_VIN_MAX	R	All	Linear Data Format	2			Power Supply Input Voltage Maximum Specification	YES
A2	MFR_IIN_MAX	R	All	Linear Data Format	2			Power Supply Input Current Maximum Specification	YES
A3	MFR_PIN_MAX	R	All	Linear Data Format	2		Returned Results:	Power Supply Input Power Maximum Specification	YES
A4	MFR_VOUT_MIN	R	All	Linear Data Format	2			Power Supply Main Output Voltage Minimum Specification	YES
A5	MFR_VOUT_MAX	R	All	Linear Data Format	2			Power Supply Main Output Voltage Maximum Specification	YES
A6	MFR_IOUT_MAX	R	All	Linear Data Format	2			Power Supply Main Output Current Maximum Specification	YES
A7	MFR_POUT_MAX	R	All	Linear Data Format	2			Power Supply Output Power Maximum Specification	YES
A8	MFR_TAMBIENT_MAX	R	All	Linear Data Format	2			Power Supply Operating Ambient Temperature Maximum Specification	YES
A9	MFR_TAMBIENT_MIN	R	All	Linear Data Format	2			Power Supply Operating Ambient Temperature Minimum Specification	YES

Command Code (Hex)	Command Name	Read / Write	Pg.	Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
AA	MFR_EFFICIENCY_LL	R	All	Linear Data Format	2			Power Supply Low-Line Input Voltage Specification	YES
				Linear Data Format	2			Power Supply Low-Line Low Power Specification	YES
				Linear Data Format	2			Power Supply Low-Line Low Power Efficiency Specification	YES
				Linear Data Format	2			Power Supply Low-Line Medium Power Specification	YES
				Linear Data Format	2			Power Supply Low-Line Medium Power Efficiency Specification	YES
				Linear Data Format	2			Power Supply Low-Line High Power Specification	YES
				Linear Data Format	2		Returned Results:	Power Supply Low-Line High Power Efficiency Specification	YES
AB	MFR_EFFICIENCY_HL	R	All	Linear Data Format	2			Power Supply High-Line Input Voltage Specification	YES
				Linear Data Format	2			Power Supply High-Line Low Power Specification	YES
				Linear Data Format	2			Power Supply High-Line Low Power Efficiency Specification	YES
				Linear Data Format	2			Power Supply High-Line Medium Power Specification	YES
				Linear Data Format	2			Power Supply High-Line Medium Power Efficiency Specification	YES
				Linear Data Format	2			Power Supply High-Line High Power Specification	YES
				Linear Data Format	2			Power Supply High-Line High Power Efficiency Specification	YES
AC	MFR_PIN_ACCURACY	R	All	Linear Data Format	2			Command returns the accuracy (%) of the value returned by the READ_PIN command	YES
AD	IC_DEVICE_ID	BLOCK READ	All	Ascii Text Block	32 Max			Command used to set or read the type or part number of IC embedded within a PMBus that is used for the PMBus interface	YES
AE	IC_DEVICE_REV	BLOCK READ	All	Ascii Text Block	32 Max			Command is used set or read the revision of the IC whose type or part number is set or read with the IC_DEVICE_ID command	NO
B0	USER_DATA_00	R/W	All	Ascii Text Block	24			Customer text data block 00	NO
B1	USER_DATA_01	R/W	All	Ascii Text Block	24			Customer text data block 01	NO
B2	USER_DATA_02	R/W	All	Ascii Text Block	24			Customer text data block 02	NO
B3	USER_DATA_03	R/W	All	Ascii Text Block	24			Customer text data block 03	NO
C0	MFR_MAX_TEMP_1	R	All	Linear Data Format	2			Maximum temperature (degC) associated with READ_TEMPERATURE_1 - Inlet	YES
C1	MFR_MAX_TEMP_2	R	All	Linear Data Format	2			Maximum temperature (degC) associated with READ_TEMPERATURE_2 - Outlet	YES

Command Code (Hex)	Command Name	Read / Write	Pg.	Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
C2	MFR_MAX_TEMP_3	R	0	Linear Data Format	2			Maximum temperature (degC) associated with READ_TEMPERATURE_3 - Hotspot 1	YES
C2	MFR_MAX_TEMP_3	R	1	Linear Data Format	2			Maximum temperature (degC) associated with READ_TEMPERATURE_3 - Hotspot 2	YES
DC	MFR_BLACKBOX	R	All	Ascii Text Block	238			Power Supply Black Box Data	YES
DD	MFR_REAL_TIME_BLACK_BOX	R/W	All	Ascii Text Block	4			IPMI 2.0 Format Real Time Clock Data	YES
DE	MFR_SYSTEM_BLACK_BOX	R/W	All	Ascii Text Block	40			System / Motherboard assembly & serial numbers	YES
DF	MFR_BLACKBOX_CONFIG	R/W	All	Bit Flags	1	0	BLACK_BOX_ON_OFF	0-Disable Black Box Function; 1-Enable Black Box Function	YES
						1 -7	RESERVED		NO
E0	MFR_CLEAR_BLACKBOX	W	All		0			Clear all black box record simultaneously	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			Byte to enable (write 0x9A) or disable (write 0x56) writes to the external EEPROM	NO
E2	READ_HOURS_USED	BLOCK READ	All	Linear Data Format	3		Sensor Tolerance HaxC HbxC HcxC	Power Supply Accumulated Main Output Power-On Hours	YES
E3	UART_STATUS_FLAGS	R	All	Bit Flags	6	0	BYTE_0	Primary status flags - byte 0	YES
						1	BYTE_1	Primary status flags - byte 1	YES
						2	BYTE_2	Secondary status flags 1 - byte 0	YES
						3	BYTE_3	Secondary status flags 1 - byte 1	YES
						4	BYTE_4	Secondary status flags 2 - byte 0	YES
						5	BYTE_5	Secondary status flags 2- byte 1	YES
EA	MFR_VIN_OK_CR_SELECT	R/W	All	HEX	2			0x9669 - Enable AC_OK / DC_OK functionality 0x6996 - Enable 'COLD REDUNDANT' mode functionality	YES
EC	MFR_VSTBY_SELECT	R/W	All	HEX	2			0xA55A - Configure power supply to 3.3V standby model 0x5AA5 - Configure power supply to 5V standby model (not valid for 12V standby model)	YES

Command Code (Hex)	Command Name	Read / Write	Pg.	Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
ED	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	NO
						9	BOOTLOAD_COMPLETED	Set when the bootloader has completed, and system reset needs to be Set	NO
						10	VIN_TYPE	Set when Vin = HVDC; clear when Vin = AC/DC	NO
						11	FAN_DIRECTION	Set when airflow front-to back; clear when airflow back-to-front	YES
						12	BB_DEBUG	Internal debug flag	YES
						13	DEFAULT	Set when default calibration data used at power-up	YES
						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
EE	PMBUS_CONFIG	R/W	All	Bit Flags	2	0	DATA_FORMAT	0 = Linear data format 1 = Direct data format	NO
						1	SMBALERT_L	0 = SMBALERT_L implemented & supported 1 = SMBALERT not implemented	YES
						2	MAX_BUS_SPEED	0 = 100kHz 1 = 400kHz	NO
						3	PEC	0 = PEC not supported 1 = PEC supported	YES
						4:7	RESERVED		NO
						8:15	CMD_KEY	Command activation/verification key = 0x5A	YES
EF	LED_CONTROL	R	All	Bit Flags	1	0:2	LED_MODE	LED mode change bits	YES
						3:6	RESERVED		NO
						7	LED_CONTROL	LED manual/auto control toggle bit	NO
F0	READ_RESETS	R	All	Bit Flags	2			RCON register status flags for troubleshooting	YES
				Bit Flags	2			RCON2 register status flags for troubleshooting	
F6	READ_PERIOD	R	All	Linear Data Format	2		Sensor Tolerance HaxC HbxC HcxC	Command returns the switching period of PMBus device's main power converter in uSec	YES
F8	BOOTLOAD_RESTART	R/W	All	HEX	1			Bootloader completion and application restart request command	YES
FA	BOOTLOAD_REQUEST	R/W	All	Ascii Text Block	6			Bootloader request command	YES
FB	BOOTLOAD_STATUS	R	All	Bit Flags	2	0	BOOTLOADING_PRI	Set when primary uC bootloading in process	YES
						1	BOOTLOADING_FLOAT	Set when floating uC bootloading in process	YES
						2	BOOTLOADING_SEC	Set when secondary uC bootloading in process	YES
						3	BOOTLOADED_PRI	Set when primary uC bootloading completed; reset required	YES
						4	BOOTLOADED_FLOAT	Set when floating uC bootloading completed; reset required	YES
						5	BOOTLOADED_SEC	Set when secondary uC bootloading completed; reset required	YES
						6	RESET_PRI	Set when primary uC reset	YES
						7	RESET_FLOAT	Set when floating uC reset	YES
						8	RESET_SEC	Set when secondary uC reset	YES
						9	RESERVED		NO
						10	RESERVED		NO
						11	RESERVED		NO
						12	RESERVED		NO
						13	RESERVED		NO
						14	RESERVED		NO
						15	RESERVED		NO

Command Code (Hex)	Command Name	Read / Write	Pg.	Format	# of Bytes	Bit #	Bit Name	Definition	Supported?
FC	SMART_ON_CONFIG	R/W	All	Integer	1			Smart-on / Cold Redundancy Mode Command	YES

The following tables represents typical results / responses returned from respective command code entries and is provided as an illustration of what could be expected.

Parameters, Limits and Response: HAxC-xx Models

NOTE: See I2C sensor table for tolerance
Link back to: Commands List

Command Code (Hex)	Command Name	Read / Write	Page	Format	# of Bytes	Units	N	m	R	b	Bit #	Reading	Comments
40	VOUT_OV_FAULT_LIMIT	R	0	Linear Data Format	2	Vdc	-6					14	
40	VSTBY_OV_FAULT_LIMIT	R	1	Linear Data Format	2	Vdc	-7					5.7	
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 Data Format	2	Vdc	-6					13.1	
42	VSTBY_OV_WARN_LIMIT	R	1	Linear Data Format	2	Vdc	-7					5.5	
43	VOUT_UV_WARN_LIMIT	R	0	Linear Data Format	2	Vdc	-6					11.4	
43	VSTBY_UV_WARN_LIMIT	R	1	Linear Data Format	2	Vdc	-7					4.5	
44	VOUT_UV_FAULT_LIMIT	R	0	Linear Data Format	2	Vdc	-6					10.9	
44	VSTBY_UV_FAULT_LIMIT	R	1	Linear Data Format	2	Vdc	-7					4.2	
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
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

Command Code (Hex)	Command Name	Read / Write	Page	Format	# of Bytes	Units	Scaling Coefficients N	m	R	b	Bit #	Reading	Comments
46	IOUT_OC_FAULT_LIMIT	R	0	Linear Data Format	0	Adc	-2					192	(205A Override)
46	ISTBY_OC_FAULT_LIMIT	R	3	Linear Data Format	3	Adc	-8					3.8	
47	IOUT_OC_FAULT_RESPONSE	R	0	Bit Flags	1						2:0	0	Delay Time - None
											5:3	6	Retry Setting - Unit attempts 6 auto-restarts before entering res-settable latch condition
											7:6	3	Response - Continuous restart (self-recovery)
47	ISTBY_OC_FAULT_RESPONSE	R	2	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 Data Format	2	Adc	-2					186	
4A	ISTBY_OC_WARN_LIMIT	R	3	Linear Data Format	2	Adc	-8					3.4	
4F	INTAKE_AIRFLOW_OT_FAULT_LIMIT	R	0	Linear Data Format	2	°C	0					75	Intake airflow OT fault
4F	EXHAUST_AIRFLOW_OT_FAULT_LIMIT	R	1	Linear Data Format	2	°C	0					100	Exhaust airflow OT fault RC: Gui reads 100C not 95c
4F	DOWN_CONVERTER_HOTSPOT_OT_FAULT_LIMIT	R	2	Linear Data Format	2	°C	0					130	Down converter hotspot OT fault
4F	BOOST_CONVERTER_HOTSPOT_OT_FAULT_LIMIT	R	3	Linear Data Format	2	°C	0					120	Boost converter hotspot OT fault
50	INTAKE_AIRFLOW_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	0	Response - Output disabled while fault is present & remains disabled until fault cleared
50	EXHAUST_AIRFLOW_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	0	Response - Output disabled while fault is present & remains disabled until fault cleared
50	DOWN_CONVERTER_HOTSPOT_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	0	Response - Output disabled while fault is present & remains disabled until fault cleared
50	BOOST_CONVERTER_HOTSPOT_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	0	Response - Output disabled while fault is present & remains disabled until fault cleared
51	INTAKE_AIRFLOW_OT_WARNING_LIMIT	R	0	Linear Data Format	2	°C	0					70	Intake airflow OT warning
51	EXHAUST_AIRFLOW_OT_WARNING_LIMIT	R	1	Linear Data Format	2	°C	0					95	Exhaust airflow OT warning
51	DOWN_CONVERTER_HOTSPOT_OT_WARNING_LIMIT	R	2	Linear Data Format	2	°C	0					125	Down converter hotspot OT warning
51	BOOST_CONVERTER_HOTSPOT_OT_WARNING_LIMIT	R	3	Linear Data Format	2	°C	0					110	Boost converter hotspot OT warning
55	VIN_OV_FAULT_LIMIT	R	0	Linear Data Format	2	Vrms	-3					74	Recoverable (100V fast OV detect)

Command Code (Hex)	Command Name	Read / Write	Page	Format	# of Bytes	Units	Scaling Coefficients N	m	R	b	Bit #	Reading	Comments
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 Data Format	2	Vrms	-3					73	Recoverable
58	VIN_UV_WARN_LIMIT	R	0	Linear Data Format	2	Vrms	-3					37.5	Recoverable
59	VIN_UV_FAULT_LIMIT	R	0	Linear Data Format	2	Vrms	-3					36	NOT IMPLEMENTED
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 Data Format	2	Arms	-4					63	
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 Data Format	2	Arms	-4					60	
5E	POWER_GOOD_ON	R	0	Linear Data Format	2	Vdc	-6					10.9	
5F	POWER_GOOD_OFF	R	0	Linear Data Format	2	Vdc	-6					10.9	
62	TON_MAX_FAULT_LIMIT			Linear Data Format	2	mSec	0					100	
63	TON_MAX_FAULT_RESPONSE	R	0	Bit Flags	1						2:0	0	Delay Time - None
											5:3	7	Retry Setting - Unit attempts 10 auto-restarts before entering res-settable latch condition
											7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
68	POUT_OP_FAULT_LIMIT	R	0	Linear Data Format	2	Watts	2					2300	
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	0	Response - Output disabled while fault is present & remains disabled until fault cleared
6A	POUT_OP_WARN_LIMIT	R	0	Linear Data Format	2	Watts	2					2230	
6B	PIN_OP_WARN_LIMIT	R	1	Linear Data Format	2	Watts	2					2480	POUT_OP_WARN_LIMIT / 0.90

Parameters, Limits and Response: HbxC-xx Models

NOTE: See I2C sensor table for tolerance
Link back to: Commands List

Command Code (Hex)	Command Name	Read / Write	Page	Format	# of Bytes	Units	Scaling Coefficients N	m	R	b	Bit #	Reading	Comments
40	VOUT_OV_FAULT_LIMIT	R	0	Linear Data Format	2	Vdc	-6					14	
40	VSTBY_OV_FAULT_LIMIT	R	1	Linear Data Format	2	Vdc	-6					13.5	
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 Data Format	2	Vdc	-6					13.1	
42	VSTBY_OV_WARN_LIMIT	R	1	Linear Data Format	2	Vdc	-6					13.3	
43	VOUT_UV_WARN_LIMIT	R	0	Linear Data Format	2	Vdc	-6					11.4	
43	VSTBY_UV_WARN_LIMIT	R	1	Linear Data Format	2	Vdc	-6					11.3	
44	VOUT_UV_FAULT_LIMIT	R	0	Linear Data Format	2	Vdc	-6					10.9	
44	VSTBY_UV_FAULT_LIMIT	R	1	Linear Data Format	2	Vdc	-6					11.1	
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
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 Data Format	0	Adc	-2					192	(205A Override)
46	ISTBY_OC_FAULT_LIMIT	R	3	Linear Data Format	3	Adc	-8					3.8	
47	IOUT_OC_FAULT_RESPONSE	R	0	Bit Flags	1						2:0	0	Delay Time - None
											5:3	6	Retry Setting - Unit attempts 6 auto-restarts before entering res-settable latch condition
											7:6	3	Response - Continuous restart (self-recovery)
47	ISTBY_OC_FAULT_RESPONSE	R	2	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

Command Code (Hex)	Command Name	Read/Write	Page	Format	# of Bytes	Units	Scaling Coefficients N	m	R	b	Bit #	Reading	Comments
4A	IOUT_OC_WARN_LIMIT	R	0	Linear Data Format	2	Adc	-2					186	
4A	ISTBY_OC_WARN_LIMIT	R	3	Linear Data Format	2	Adc	-8					3.4	
4F	INTAKE_AIRFLOW_OT_FAULT_LIMIT	R	0	Linear Data Format	2	°C	0					75	Intake airflow OT fault
4F	EXHAUST_AIRFLOW_OT_FAULT_LIMIT	R	1	Linear Data Format	2	°C	0					100	Exhaust airflow OT fault
4F	DOWN_CONVERTER_HOTSPOT_OT_FAULT_LIMIT	R	2	Linear Data Format	2	°C	0					130	Down converter hotspot OT fault
4F	BOOST_CONVERTER_HOTSPOT_OT_FAULT_LIMIT	R	3	Linear Data Format	2	°C	0					120	Boost converter hotspot OT fault
50	INTAKE_AIRFLOW_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	0	Response - Output disabled while fault is present & remains disabled until fault cleared
50	EXHAUST_AIRFLOW_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	0	Response - Output disabled while fault is present & remains disabled until fault cleared
50	DOWN_CONVERTER_HOTSPOT_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	0	Response - Output disabled while fault is present & remains disabled until fault cleared
50	BOOST_CONVERTER_HOTSPOT_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	0	Response - Output disabled while fault is present & remains disabled until fault cleared
51	INTAKE_AIRFLOW_OT_WARNING_LIMIT	R	0	Linear Data Format	2	°C	0					70	Intake airflow OT warning
51	EXHAUST_AIRFLOW_OT_WARNING_LIMIT	R	2	Linear Data Format	2	°C	0					95	Exhaust airflow OT warning
51	DOWN_CONVERTER_HOTSPOT_OT_WARNING_LIMIT	R	1	Linear Data Format	2	°C	0					125	Down converter hotspot OT warning
51	BOOST_CONVERTER_HOTSPOT_OT_WARNING_LIMIT	R	3	Linear Data Format	2	°C	0					110	Boost converter hotspot OT warning
55	VIN_OV_FAULT_LIMIT	R	0	Linear Data Format	2	Vrms	-3					74	Recoverable (100V fast OV detect)
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 Data Format	2	Vrms	-3					73	Recoverable
58	VIN_UV_WARN_LIMIT	R	0	Linear Data Format	2	Vrms	-3					37.5	Recoverable
59	VIN_UV_FAULT_LIMIT	R	0	Linear Data Format	2	Vrms	-3					36	NOT IMPLEMENTED (Unit off 36Vdc)

Command Code (Hex)	Command Name	Read / Write	Page	Format	# of Bytes	Units	Scaling Coefficients				Bit #	Reading	Comments
							N	m	R	b			
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 Data Format	2	Arms	-4					63.8	
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 Data Format	2	Arms	-4					60	
5E	POWER_GOOD_ON	R	0	Linear Data Format	2	Vdc	-6					10.9	
5F	POWER_GOOD_OFF	R	0	Linear Data Format	2	Vdc	-6					10.9	
62	TON_MAX_FAULT_LIMIT			Linear Data Format	2	mSec	0					100	
63	TON_MAX_FAULT_RESPONSE	R	0	Bit Flags	1						2:0	0	Delay Time - None
											5:3	7	Retry Setting - Unit attempts 10 auto-restarts before entering res-settable latch condition
											7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
68	POUT_OP_FAULT_LIMIT	R	0	Linear Data Format	2	Watts	2					2300	
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 Data Format	2	Watts	2					2230	
6B	PIN_OP_WARN_LIMIT	R	1	Linear Data Format	2	Watts	2					2480	POUT_OP_WARN_LIMIT / 0.90

Parameters, Limits and Response: HcxC-xx Models

NOTE: See I2C sensor table for tolerance
Link back to: Commands List

Command Code (Hex)	Command Name	Read / Write	Page	Format	# of Bytes	Units	Scaling Coefficients				Bit #	Reading	Comments
							N	m	R	b			
40	VOUT_OV_FAULT_LIMIT	R	0	Linear Data Format	2	Vdc	-6					14	
40	VSTBY_OV_FAULT_LIMIT	R	1	Linear Data Format	2	Vdc	-8					3.7	
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

Command Code (Hex)	Command Name	Read / Write	Page	Format	# of Bytes	Units	Scaling Coefficients N	m	R	b	Bit #	Reading	Comments
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 Data Format	2	Vdc	-6					13.1	
42	VSTBY_OV_WARN_LIMIT	R	1	Linear Data Format	2	Vdc	-8					3.6	
43	VOUT_UV_WARN_LIMIT	R	0	Linear Data Format	2	Vdc	-6					11.4	
43	VSTBY_UV_WARN_LIMIT	R	1	Linear Data Format	2	Vdc	-8					2.96	
44	VOUT_UV_FAULT_LIMIT	R	0	Linear Data Format	2	Vdc	-6					10.9	
44	VSTBY_UV_FAULT_LIMIT	R	1	Linear Data Format	2	Vdc	-8					2.76	
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
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 Data Format	0	Adc	-2					192	(205A Override)
46	ISTBY_OC_FAULT_LIMIT	R	3	Linear Data Format	3	Adc	-8					3.8	
47	IOUT_OC_FAULT_RESPONSE	R	0	Bit Flags	1						2:0	0	Delay Time - None
											5:3	6	Retry Setting - Unit attempts 6 auto-restarts before entering res-settable latch condition
											7:6	3	Response - Continuous restart (self-recovery)
47	ISTBY_OC_FAULT_RESPONSE	R	2	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 Data Format	2	Adc	-2					186	
4A	ISTBY_OC_WARN_LIMIT	R	3	Linear Data Format	2	Adc	-8					3.4	
4F	INTAKE_AIRFLOW_OT_FAULT_LIMIT	R	0	Linear Data Format	2	°C	0					75	Intake airflow OT fault
4F	EXHAUST_AIRFLOW_OT_FAULT_LIMIT	R	1	Linear Data Format	2	°C	0					100	Exhaust airflow OT fault
4F	DOWN_CONVERTER_HOTSPOT_OT_FAULT_LIMIT	R	2	Linear Data Format	2	°C	0					130	Down converter hotspot OT fault
4F	BOOST_CONVERTER_HOTSPOT_OT_FAULT_LIMIT	R	3	Linear Data Format	2	°C	0					120	Boost converter hotspot OT fault

Command Code (Hex)	Command Name	Read / Write	Page	Format	# of Bytes	Units	Scaling Coefficients N	m	R	b	Bit #	Reading	Comments
50	INTAKE_AIRFLOW_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	0	Response - Output disabled while fault is present & remains disabled until fault cleared
50	EXHAUST_AIRFLOW_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	0	Response - Output disabled while fault is present & remains disabled until fault cleared
50	DOWN_CONVERTER_HOTSPOT_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	0	Response - Output disabled while fault is present & remains disabled until fault cleared
50	BOOST_CONVERTER_HOTSPOT_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	0	Response - Output disabled while fault is present & remains disabled until fault cleared
51	INTAKE_AIRFLOW_OT_WARNING_LIMIT	R	0	Linear Data Format	2	°C	0					70	Intake airflow OT warning
51	EXHAUST_AIRFLOW_OT_WARNING_LIMIT	R	2	Linear Data Format	2	°C	0					95	Exhaust airflow OT warning
51	DOWN_CONVERTER_HOTSPOT_OT_WARNING_LIMIT	R	1	Linear Data Format	2	°C	0					125	Down converter hotspot OT warning
51	BOOST_CONVERTER_HOTSPOT_OT_WARNING_LIMIT	R	3	Linear Data Format	2	°C	0					110	Boost converter hotspot OT warning
55	VIN_OV_FAULT_LIMIT	R	0	Linear Data Format	2	Vrms	-3					74	Recoverable (100V fast OV detect)
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 Data Format	2	Vrms	-3					73	Recoverable
58	VIN_UV_WARN_LIMIT	R	0	Linear Data Format	2	Vrms	-3					37.5	Recoverable
59	VIN_UV_FAULT_LIMIT	R	0	Linear Data Format	2	Vrms	-3					36	NOT IMPLEMENTED (unit off, 36Vdc)
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 Data Format	2	Arms	-4					63.8	

Command Code (Hex)	Command Name	Read / Write	Page	Format	# of Bytes	Units	N	m	R	b	Bit #	Reading	Comments
							Scaling Coefficients						
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 Data Format	2	Arms	-4					60	
5E	POWER_GOOD_ON	R	0	Linear Data Format	2	Vdc	-6					10.9	
5E	POWER_GOOD_OFF	R	0	Linear Data Format	2	Vdc	-6					10.9	
62	TON_MAX_FAULT_LIMIT			Linear Data Format	2	mSec	0					100	
63	TON_MAX_FAULT_RESPONSE	R	0	Bit Flags	1						2:0	0	Delay Time - None
											5:3	7	Retry Setting - Unit attempts 10 auto-restarts before entering res-settable latch condition
											7:6	3	Response - Output disabled while fault is present & remains disabled until fault cleared
68	POUT_OP_FAULT_LIMIT	R	0	Linear Data Format	2	Watts	2					2300	
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 Data Format	2	Watts	2					2230	
6B	PIN_OP_WARN_LIMIT	R	1	Linear Data Format	2	Watts	2					2480	POUT_OP_WARN_LIMIT / 0.90

RETURNED RESULTS: OPERATION SETTINGS
Link back to: Commands list, CMD_01

7	6	5	4	3	2	1	0	Dec	Hex	Power Supply On/Off Mode
Bit # / Bit Description								Valid Values		
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	40-80	Enable power supply when OPERATION command supported – **DEFAULT=80**

RETURNED RESULTS: ON_OFF CONFIG
Link back to: Commands list, CMD_02

7	6	5	4	3	2	1	0	Dec	Hex	Power Supply On/Off Mode
Bit # / Bit Description								Valid Values		
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

The following tables contain the PMBus Reading Sensor Tolerance and Resolution

SENSOR DATA AND RESOLUTION FOR MODEL **HaxC-xx:**

Link back to: Commands list_CMD_88

Command Code (Hex)	Command Name	Description	Page	Format	Units	Scaling Coeff. N	Raw Sensor Full-scale / Range	Raw Sensor Resolution	PMBus Reporting Sensor Full-scale / Range	PMBus Reporting Sensor Resolution	PMBus Reporting Sensor Accuracy
88	READ_VIN	Input Voltage Sensor Reading	All	Linear Data Format	Vdc	-3	106.681	0.1043	127.875	0.125	+ / - 2% of Reporting Full-Scale
89	READ_IIN	Input Current Sensor Reading	All	Linear Data Format	Arms	-4	76.79	0.0751	63.94	0.0625	+ / - 5% of Reporting Full-Scale
8A	READ_VCAP	PFC Output Voltage Sensor Reading	All	Linear Data Format	Vdc	-3	110.1	0.1076	127.875	0.125	+ / - 2% of Reporting Full-Scale
8B	READ_VOUT	Main Output Voltage Sensor Reading	0	Linear Data Format	Vdc	-6	14.79	0.0145	15.98	0.0156	+ / - 2% of Reporting Full-Scale
8B	READ_VSTBY	Standby(Auxilliary) Output Voltage Sensor Reading	1	Linear Data Format	Vdc	-7	6.6	0.0065	7.992	0.00781	+ / - 2% of Reporting Full-Scale
8C	READ_IOUT	Main Output Current Sensor Reading	0	Linear Data Format	Adc	-2	217.65	0.2128	255.75	0.250	+ / - 2% of Reporting Full-Scale
8C	READ_ISTBY	Standby(Auxilliary) Output Current Sensor Reading	1	Linear Data Format	Adc	-8	6.3	0.0062	3.996	0.00391	+ / - 2% of Reporting Full-Scale
8D	READ_TEMPERATURE_1	Temperature Sensor Reading - Intake Airflow	All	Linear Data Format	°C	0	-40 to 150		-40 to 150	1	+ / - 5°C
8E	READ_TEMPERATURE_2	Temperature Sensor Reading - Exhaust Airflow	All	Linear Data Format	°C	0	-40 to 150		-40 to 150	1	+ / - 5°C
8F	READ_TEMPERATURE_3	Temperature Sensor Reading - Down Converter Hotspot	0	Linear Data Format	°C	0	-40 to 150		-40 to 150	1	+ / - 5°C
8F	READ_TEMPERATURE_3	Temperature Sensor Reading - Boost Converter Hotspot	1	Linear Data Format	°C	0	-40 to 150		-40 to 150	1	+ / - 5°C
90	READ_FAN_SPEED_1	Fan 1 Speed Sensor Reading	All	Linear Data Format	RPM	5	24, 000		32736	32	+ / - 5% of Reporting Full-Scale
95	READ_FREQUENCY	Main output switching frequency	All	Linear Data Format	kHz	-2	255.75		255.75	0.250	+ / - 5% of Reporting Full-Scale
96	READ_POUT	Output Power Sensor Reading	All	Linear Data Format	Watts	2			4092	4	+ / - 5% of Reporting Full-Scale
97	READ_PIN	Input Power Sensor Reading	All	Linear Data Format	Watts	2			4092	4	+ / - 5% of Reporting Full-Scale
E2	READ_POWER_ON_HOURS	Accumulated Main Output Power-On Hours	All	Linear Data Format	Hours	0	~1,900 (Years)		~1,900 (Years)	1	+ / - 3%
F6	READ_PERIOD	Main outputs switching period	All	Linear Data Format	uSec	-6	15.984375		15.984375	0.0156	+ / - 5% of Reporting Full-Scale

SENSOR DATA AND RESOLUTION FOR MODEL **HbxC-xx:**
Link back to: Commands list_CMD_88

Command Code (Hex)	Command Name	Description	Page	Format	Units	Scaling Coeff. N	Raw Sensor Full-scale / Range	Raw Sensor Resolution	PMBus Reporting Sensor Full-scale / Range	PMBus Reporting Sensor Resolution	PMBus Reporting Sensor Accuracy
88	READ_VIN	Input Voltage Sensor Reading	All	Linear Data Format	Vdc	-3	106.681	0.1043	127.875	0.125	+ / - 2% of Reporting Full-Scale
89	READ_IIN	Input Current Sensor Reading	All	Linear Data Format	Arms	-4	76.79	0.0751	63.94	0.0625	+ / - 5% of Reporting Full-Scale
8A	READ_VCAP	PFC Output Voltage Sensor Reading	All	Linear Data Format	Vdc	-3	110.1	0.1076	127.875	0.125	+ / - 2% of Reporting Full-Scale
8B	READ_VOUT	Main Output Voltage Sensor Reading	0	Linear Data Format	Vdc	-6	14.79	0.0145	15.98	0.0156	+ / - 2% of Reporting Full-Scale
8B	READ_VSTBY	Standby(Auxilliary) Output Voltage Sensor Reading	1	Linear Data Format	Vdc	-6	14.73	0.0144	15.98	0.01563	+ / - 2% of Reporting Full-Scale
8C	READ_IOUT	Main Output Current Sensor Reading	0	Linear Data Format	Adc	-2	217.65	0.2128	255.75	0.250	+ / - 2% of Reporting Full-Scale
8C	READ_ISTBY	Standby(Auxilliary) Output Current Sensor Reading	1	Linear Data Format	Adc	-8	6.3	0.0062	3.996	0.00391	+ / - 2% of Reporting Full-Scale
8D	READ_TEMPERATURE_1	Temperature Sensor Reading - Intake Airflow	All	Linear Data Format	°C	0	-40 to 150		-40 to 150	1	+ / - 5°C
8E	READ_TEMPERATURE_2	Temperature Sensor Reading - Exhaust Airflow	All	Linear Data Format	°C	0	-40 to 150		-40 to 150	1	+ / - 5°C
8F	READ_TEMPERATURE_3	Temperature Sensor Reading - Down Converter Hotspot	0	Linear Data Format	°C	0	-40 to 150		-40 to 150	1	+ / - 5°C
8F	READ_TEMPERATURE_3	Temperature Sensor Reading - Boost Converter Hotspot	1	Linear Data Format	°C	0	-40 to 150		-40 to 150	1	+ / - 5°C
90	READ_FAN_SPEED_1	Fan 1 Speed Sensor Reading	All	Linear Data Format	RPM	5	24, 000		32736	32	+ / - 5% of Reporting Full-Scale
95	READ_FREQUENCY	Main output switching frequency	All	Linear Data Format	kHz	-2	255.75		255.75	0.250	+ / - 5% of Reporting Full-Scale
96	READ_POUT	Output Power Sensor Reading	All	Linear Data Format	Watts	2			4092	4	+ / - 5% of Reporting Full-Scale
97	READ_PIN	Input Power Sensor Reading	All	Linear Data Format	Watts	2			4092	4	+ / - 5% of Reporting Full-Scale
E2	READ_POWER_ON_HOURS	Accumulated Main Output Power-On Hours	All	Linear Data Format	Hours	0	~1,900 (Years)		~1,900 (Years)	1	+ / - 3%
F6	READ_PERIOD	Main outputs switching period	All	Linear Data Format	uSec	-6	15.984375		15.984375	0.0156	+ / - 5% of Reporting Full-Scale

SENSOR DATA AND RESOLUTION FOR MODEL **HcxC-xx:**
Link back to: Commands list_CMD_88

Command Code (Hex)	Command Name	Description	Page	Format	Units	Scaling Coeff. N	Raw Sensor Full-scale / Range	Raw Sensor Resolution	PMBus Reporting Sensor Full-scale / Range	PMBus Reporting Sensor Resolution	Accuracy
88	READ_VIN	Input Voltage Sensor Reading	All	Linear Data Format	Vdc	-3	106.681	0.1043	127.875	0.125	+ / - 2% of Reporting Full-Scale
89	READ_IIN	Input Current Sensor Reading	All	Linear Data Format	Arms	-4	76.79	0.0751	63.94	0.0625	+ / - 5% of Reporting Full-Scale
8A	READ_VCAP	PFC Output Voltage Sensor Reading	All	Linear Data Format	Vdc	-3	110.1	0.1076	127.875	0.125	+ / - 2% of Reporting Full-Scale
8B	READ_VOUT	Main Output Voltage Sensor Reading	0	Linear Data Format	Vdc	-6	14.79	0.0145	15.98	0.0156	+ / - 2% of Reporting Full-Scale
8B	READ_VSTBY	Standby(Auxilliary) Output Voltage Sensor Reading	1	Linear Data Format	Vdc	-8	6.6	0.0065	3.996	0.00391	+ / - 2% of Reporting Full-Scale
8C	READ_IOUT	Main Output Current Sensor Reading	0	Linear Data Format	Adc	-2	217.65	0.2128	255.75	0.250	+ / - 2% of Reporting Full-Scale
8C	READ_ISTBY	Standby(Auxilliary) Output Current Sensor Reading	1	Linear Data Format	Adc	-8	6.3	0.0062	3.996	0.00391	+ / - 2% of Reporting Full-Scale
8D	READ_TEMPERATURE_1	Temperature Sensor Reading - Intake Airflow	All	Linear Data Format	°C	0	-40 to 150		-40 to 150	1	+ / - 5°C
8E	READ_TEMPERATURE_2	Temperature Sensor Reading - Exhaust Airflow	All	Linear Data Format	°C	0	-40 to 150		-40 to 150	1	+ / - 5°C
8F	READ_TEMPERATURE_3	Temperature Sensor Reading - Down Converter Hotspot	0	Linear Data Format	°C	0	-40 to 150		-40 to 150	1	+ / - 5°C
8F	READ_TEMPERATURE_3	Temperature Sensor Reading - Boost Converter Hotspot	1	Linear Data Format	°C	0	-40 to 150		-40 to 150	1	+ / - 5°C
90	READ_FAN_SPEED_1	Fan 1 Speed Sensor Reading	All	Linear Data Format	RPM	5	24, 000		32736	32	+ / - 5% of Reporting Full-Scale
95	READ_FREQUENCY	Main output switching frequency	All	Linear Data Format	kHz	-2	255.75		255.75	0.250	+ / - 5% of Reporting Full-Scale
96	READ_POUT	Output Power Sensor Reading	All	Linear Data Format	Watts	2			4092	4	+ / - 5% of Reporting Full-Scale
97	READ_PIN	Input Power Sensor Reading	All	Linear Data Format	Watts	2			4092	4	+ / - 5% of Reporting Full-Scale
E2	READ_POWER_ON_HOURS	Accumulated Main Output Power-On Hours	All	Linear Data Format	Hours	0	~1,900 (Years)		~1,900 (Years)	1	+ / - 3%
F6	READ_PERIOD	Main outputs switching period	All	Linear Data Format	uSec	-6	15.984375		15.984375	0.0156	+ / - 5% of Reporting Full-Scale

MANUFACTURER'S GENERAL PARAMETRIC DATA, typical, HA3C shown for illustration:
Link back to: Commands list

Command	Command Name	Value	Units	N	Value (dec)	Page
A0	MFR_VIN_MIN	40	V	-3	330	0
A1	MFR_VIN_MAX	72	V	-3	576	0
A2	MFR_IIN_MAX	56.6	A	-4	906	0
A3	MFR_PIN_MAX	2200	W	2	550	0
A4	MFR_VOUT_MIN	11.88	V	-6	760	0
A5	MFR_VOUT_MAX	12.19	V	-6	780	0
A6	MFR_IOUT_MAX	166.7	A	-2	667	0
A4	MFR_VSTBY_MIN	4.758	V	-8	804	1
A5	MFR_VSTBY_MAX	5.242	V	-8	886	1
A6	MFR_ISTBY_MAX	3	A	-8	768	1
A7	MFR_POUT_MAX	2000	W	2	500	0
A8	MFR_TAMBIENT_MAX	55	C	0	55	0
A9	MFR_TAMBIENT_MIN	0	C	0	0	0
AA	MFR_EFFICIENCY_LL_LENGTH	14				
	MFR_EFFICIENCY_LL_VIN	48	V	-3	384	0
	MFR_EFFICIENCY_LL_POUT1	400	W	2	100	0
	MFR_EFFICIENCY_LL_EFF1	0.92		-10	942	0
	MFR_EFFICIENCY_LL_POUT2	1000	W	2	250	0
	MFR_EFFICIENCY_LL_EFF2	0.95		-10	973	0
	MFR_EFFICIENCY_LL_POUT3	2000	W	2	500	0
	MFR_EFFICIENCY_LL_EFF3	0.93		-10	952	0
AB	MFR_EFFICIENCY_HL_LENGTH	14				
	MFR_EFFICIENCY_HL_VIN	60	V	-3	480	0
	MFR_EFFICIENCY_HL_POUT1	400	W	2	100	0
	MFR_EFFICIENCY_HL_EFF1	0.92		-10	942	0
	MFR_EFFICIENCY_HL_POUT2	1000	W	2	250	0
	MFR_EFFICIENCY_HL_EFF2	0.95		-10	973	0
	MFR_EFFICIENCY_HL_POUT3	2000	W	2	500	0
	MFR_EFFICIENCY_HL_EFF3	0.93		-10	952	0

RETURNED RESULTS : **LED CONTROL**
Command Code EFh
Link back to: Commands list CMD_EF

Bit # / Bit Description								Valid Values		Read / Write	LED Status & Control
7	6	5	4	3	2	1	0	Dec	Hex		
CONTROL Bit	reserved	reserved	reserved	reserved	LED Mode Bit 2	LED Mode Bit 1	LED Mode Bit 0				
0	0	0	0	0	0	0	0	0	0	Read	Auto - LED off
0	0	0	0	0	0	0	1	1	1	Read	Auto - LED solid green
0	0	0	0	0	0	1	0	2	2	Read	Auto - LED blinking green
0	0	0	0	0	1	0	1	5	5	Read	Auto – LED solid yellow
0	0	0	0	0	1	1	0	6	6	Read	Auto – LED blinking yellow

Cold Redundancy ("CR") Configuration Bytes:
Note - first requires Pin configuration CMD_EA to change signal function from INPUT_OK to RAPID_ON.
(Refer to application note "ACAN-80" should additional detail be required)

2 modes of "CR" operation:
1) **Automatic Mode CR (INTEL CRPS):**
   0x0h = conventional redundancy
   0x1h = Master & Active PSU
   0x2h = Cold_redundanct_Level_1
   0x3h = Cold_redundanct_Level_2
   0x4h = Cold_redundanct_Level_3

2) **Manual**
   0x55h = Force unit on (Master and Active or Active & Slave)
   0x0h = Force unit into Standby_mode
Link back to CMD list

EEPROM DATA: Example, based on illustration D1U54-D-2000-12-HA3C. Actual results may vary according to variant.
Link back to: Command_E1

Product Info Area Field Name	Product Info Area Field Contents	Static or Dynamic Register? (S/D)	Description
Manufacturer name	Murata-PS	S	Manufacturer name
Model name	M1981	S	Product / project number (Mxxxx)
Part/product number	D1U54-D-2000-12-HA3C	D	Marketing / customer p/n
Version		N/A	Not used
Serial number	SSYYWWRRxxxx	D	MPS 12-digit serial number
Asset tag		N/A	Not used
FRU File ID		N/A	Not used
Custom field 1		N/A	Not used
Custom field 2		N/A	Not used
Custom field 3		N/A	Not used
Custom field 4		N/A	Not used
Fill unused space with 0x00			
Reference:	IPMI Platform Management FRU Information Storage Definition v1.0 http://www.intel.com/content/www/us/en/servers/ipmi/information-storage-definition.html		

An Example of the returned Manufacturing Data, PMBus™ register contents D1U54-D-2000-12-HA3C. Actual results may vary according to variant and latest firmware level.

Link Back: cmd_99

PMBus Register Name	PMBus Register Number	Register Contents	Static or Dynamic Register? (S/D)
MFR_ID	0x99	Murata-PS	S
MFR_MODEL	0x9A	D1U54-D-2000-12-HA3C	D
MFR_REVISION	0x9B (paged)	9151001984-vv-rr(page 0) 9157002008-vv-rr (page 1) 915400xxxx-vv-rr (page 2)	S
MFR_LOCATION	0x9C	China / Canada	D
MFR_DATE	0x9D	YYWW	D
MFR_SERIAL	0x9E	SSYYWWRRxxxx	D
Reference:	PMBus Specification Part II Rev 1.2 2010-09-06 http://pmbus.org/Specifications/OlderSpecifications		

Linear Data Format
(return to front page; return to Manual Fan Control)

Telemetry via sensor readings is expressed in Linear format, defined by PMBus Power System Mgt Protocol Specification – Part II – Revision 1.2 (summarized below)
Output Voltage readings are also expressed in linear format, VOUT_MODE supplies N exponent for translation to volts

Data Bit High						Data Bit Low							
7	6	5	4	3		2	1	0	7	6	5	4	3	2	1	0

N — MSB

Y — MSB
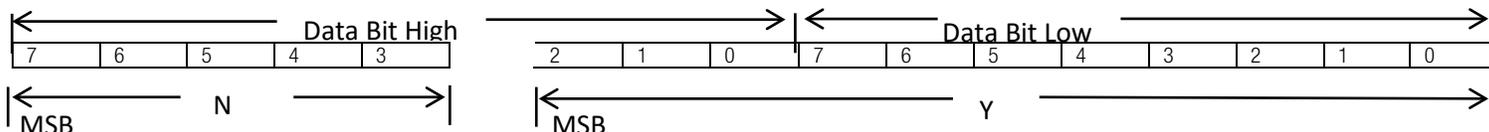
The Relationship between Y, N and the "real world" value is:

$$X = Y \cdot 2^N$$

Where, as described above:

X is the "real world" value;
**Y** is an 11-bit, two's compliment integer; and
N is a 5-bit, two's compliment integer.

Command Code 20h (V-OUT MODE) PROTOCOL and Returned results:

Link back to CMD_20 list

Output voltage reading telemetry is expressed in V-OUT MODE **Linear** format. The results can be converted to "real world" voltage reading by the following two steps and follows the requires output voltage related follow two steps. Refer to PMBus Power System Mgt Protocol Specification – Part II – Revision 1.2 for additional details.

1) CMD_20 (V-OUT MODE) defines which of the three formats (LINEAR, VID OR DIRECT) is used. For all output voltage commands for this product, LINEAR MODE is used, returning "000h" for bits 5,6,7:
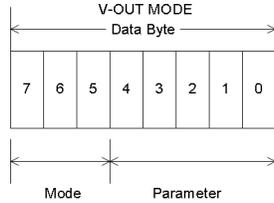
CMD_20h Reading results for this series:

Mode definition			Returned results for CMD_20h				
Mode	Bits (7:5)	Bits (4:0) (Parameter)	Command Code (Hex)	Command Name	Value	Bit#	Value
Linear (Default)	000b	Five-bit two's complement exponent for the mantissa delivered as the data bytes for an output voltage command. Bits 4:0 returned= 11010b = N=-6 (Default)	20	VOUT_MODE	1Ah	Bit 7	0
						Bit 6	0
						Bit 5	0
						Bit 4	1
						Bit 3	1
						Bit 2	0
						Bit 1	1
						Bit 0	0

2) The Command Bytes, or mantissa can then be used to calculate real world values for the output voltage commands and parameters:
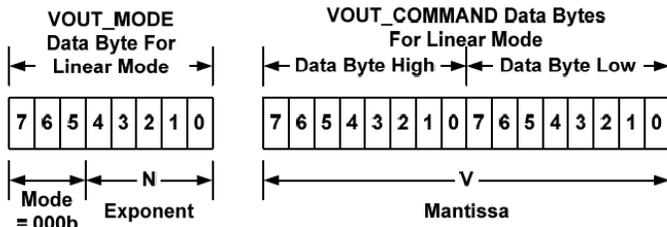
Figure 6. Linear Format Data Bytes

The Mode bits are set to 000b.

The Voltage, in volts, is calculated from the equation:

$$Voltage = V \cdot 2^N$$

Where:

Voltage is the parameter of interest in volts;

V is a 16 bit unsigned binary integer; and

N is a 5 bit two's complement binary integer.

RETURNED RESULTS : Command Code 3Bh **(FAN_COMMAND_1)** Link Back to Commands List: CMD_3B

Manual fan speed control via PMBus™ is a linear data mode two-byte command, speed expressed as fan duty cycle. This table below contains the manual fan speed command data in 1% increments, for illustration purposes.

The power supply automatically cancels manual fan sped control and enters automatic fan speed control by any of the following conditions or methods:

1) Writing the command "03h"(CLEAR_FAULTS).
2) Any overtemperature fault or warning (manual fan speed control mode can be resumed after the faults and warnings have ended)
3) Recycling of AC input voltage
4) Toggling PS_ON signal
5) Issuing a fan command that is outside the normal maximum limits, i.e., writing a fan speed of 110% duty cycle.

CMD 3B(h)	"Fan_COMMAND_1" (2 bytes)			CMD 3B(h)	"Fan_COMMAND_1" (2 bytes)			CMD 3B(h)	"Fan_COMMAND_1" (2 bytes)			CMD 3B(h)	"Fan_COMMAND_1" (2 bytes)		
% Duty Cycle	MSB(h)	LSB(h)	n(d)	% Duty Cycle	MSB(h)	LSB(h)	n(d)	% Duty Cycle	MSB(h)	LSB(h)	n(d)	% Duty Cycle	MSB(h)	LSB(h)	n(d)
0	B0	0	-10	26	B1	A	-10	51	B2	A	-10	76	B2	9	-10
1	B0	A	-10	27	B1	14	-10	52	B2	14	-10	77	B2	14	-10
2	B0	14	-10	28	B1	E1	-10	53	B2	1E	-10	78	B2	1E	-10
3	B0	1F	-10	29	B1	29	-10	54	B2	28	-10	79	B2	28	-10
4	B0	29	-10	30	B1	33	-10	55	B2	33	-10	80	B3	32	-10
5	B0	33	-10	31	B1	3D	-10	56	B2	3D	-10	81	B3	3D	-10
6	B0	3D	-10	32	B1	47	-10	57	B2	47	-10	82	B3	47	-10
7	B0	48	-10	33	B1	52	-10	58	B2	51	-10	83	B3	51	-10
8	B0	52	-10	34	B1	5C	-10	59	B2	5C	-10	84	B3	5B	-10
9	B0	5C	-10	35	B1	66	-10	60	B2	66	-10	85	B3	66	-10
10	B0	66	-10	36	B1	70	-10	61	B2	70	-10	86	B3	70	-10
11	B0	71	-10	37	B1	7B	-10	62	B2	7A	-10	87	B3	7A	-10
12	B0	7B	-10	38	B1	85	-10	63	B2	84	-10	88	B3	84	-10
13	B0	85	-10	39	B1	8F	-10	64	B2	8F	-10	89	B3	8E	-10
14	B0	8F	-10	40	B1	99	-10	65	B2	99	-10	90	B3	99	-10
15	B0	99	-10	41	B1	A3	-10	66	B2	A3	-10	91	B3	A3	-10
16	B0	A4	-10	42	B1	AE	-10	67	B2	AD	-10	92	B3	AD	-10
17	B0	AE	-10	43	B1	B8	-10	68	B2	B8	-10	93	B3	B7	-10
18	B0	B8	-10	44	B1	C2	-10	9	B2	C2	-10	94	B3	C2	-10
19	B0	C2	-10	45	B1	CC	-10	70	B2	CC	-10	95	B3	CC	-10
20	B0	CD	-10	46	B1	D7	-10	71	B2	D6	-10	96	B3	D6	-10
21	B0	D7	-10	47	B1	E1	-10	72	B2	E1	-10	97	B3	E0	-10
22	B0	E1	-10	48	B1	EB	-10	73	B2	EB	-10	98	B3	EB	-10
23	B0	EB	-10	49	B1	F5	-10	74	B2	F5	-10	99	B3	F5	-10
24	B0	F6	-10	50	B2	0	-10	75	B2	FF	-10	100	B3	FF	-10
25	B1	0	-10												

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