

This application note describes the PMBus™ digital communications protocol for the **D1U54T-W-800-12-HBxC** series front end power supplies:

| Model Number | Airflow Direction |
|----------------------|-------------------|
| D1U54T-W-800-12-HB3C | Front to Back |
| D1U54T-W-800-12-HB4C | Back to Front |

General Notes

- Complies with PMBus™ Specification Part 1 & 2 Rev.1.2.
- This product is PEC (Packet Error Checking) enabled.
- [Linear data format](#) is used for all supported parameters.
- 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: The PMBus™ slave controller does “clock stretch” on ACK or NAK.

Device Details

| Power Supply Module Main (Secondary side) Controller | | |
|--|------------------------|---|
| Vendor | MFG Part Number | Description |
| Microchip Technology Inc. | DSPIC33EP64GS506T-I/PT | (Secondary) IC Dig SMT Microcontroller dsPIC33 64kB 8kB 70MHz |

| Power Supply Module EEPROM | | |
|----------------------------|-----------------|---|
| Vendor | MFG Part Number | Description |
| Microchip Technology Inc. | 24AA024T-I/MSG | IC Dig SMT EEPROM CMOS Serial I2C AT24CXX 2kB |

Device Addressing Methods

The power supply module address signal pin is used to set the Main Controller and EEPROM address. The following list summarizes the optional methods:

- 1) Un-terminated (leaving open circuit): results in address 0xBE (PSU Secondary controller) and AE (PSU internal EEPROM)
- 2) Terminating the address pin to RTN/ground: results in address 0xB0 (PSU Secondary controller) and A0 (PSU internal EEPROM) Using the ADDR signal pin (Pin# A3)
- 3) Terminating a fixed resistor to RTN/ground: A wider range of addresses may be selected by pulling the address pin down via a fixed resistor, summarized:

| Address pin resistance to RTN/Ground (KΩ; ±5% Tolerance) | Resultant slave device addresses | |
|---|----------------------------------|--------|
| | Secondary (Main) Controller | EEPROM |
| 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 |

PMBus™ Supported Commands

| Command Code (Hex) | Command Name | Read / Write | Page | 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 (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 | | 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 | | Varies | | 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 | | Varies | | 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 Store memory | NO | |

| Command Code (Hex) | Command Name | Read / Write | Page | Format | # of Bytes | Bit # | Bit Name | Definition | Supported |
|--------------------|-----------------------|---------------------------------------|------|--------------------|------------|-------|-----------------|---|-----------|
| 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 |
| 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 |

| Command Code (Hex) | Command Name | Read / Write | Page | Format | # of Bytes | Bit # | Bit Name | Definition | Supported |
|--------------------|---------------------|---------------------------------------|------|--------------------|------------|-------|---|---|-----------|
| 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 |
| 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 powerconversion 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; Automode resumed by recycling the input ac, issuing an out-of-range duty cycle value; OTP or warning event | YES | |
| 3C | FAN_COMMAND_2 | R/W | All | Linear Data Format | 2 | | Manual fan override command fan speed value in Duty Cycle | NO | |
| | | | | | | | Command speed formatted in Linear as per command 0x91 - READ_FAN_SPEED_2 | | |

| Command Code (Hex) | Command Name | Read / Write | Page | Format | # of Bytes | Bit # | Bit Name | Definition | Supported |
|--------------------|----------------------------|--------------|------|--------------------|------------|--|---|--|-----------|
| 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 |
| 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 | Link to Limits, warnings and response details | 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 | | 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 High (Vin > 100V) | YES | |
| 46 | IOUT_OC_FAULT_LIMIT | R | 1 | Linear Data Format | 2 | | Main Output Overcurrent Fault Limit Medium (90V < Vin < 100V) | YES | |
| 46 | IOUT_OC_FAULT_LIMIT | R | 2 | Linear Data Format | 2 | | Main Output Overcurrent Fault Limit Low (Vin < 90V) | YES | |
| 46 | ISTBY_OC_FAULT_LIMIT | R | 3 | 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 | 3 | 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 | | |

| Command Code (Hex) | Command Name | Read / Write | Page | Format | # of Bytes | Bit # | Bit Name | Definition | Supported |
|--------------------|-----------------------------|--------------|------|--------------------|------------|-------|----------|---|-----------|
| 4A | IOUT_OC_WARN_LIMIT | R | 0 | Linear Data Format | 2 | | | Main Output Overcurrent Warning Limit High (Vin > 100V) | YES |
| 4A | IOUT_OC_WARN_LIMIT | R | 1 | Linear Data Format | 2 | | | Main Output Overcurrent Warning Limit Medium (90V < Vin < 100V) | YES |
| 4A | IOUT_OC_WARN_LIMIT | R | 2 | Linear Data Format | 2 | | | Main Output Overcurrent Warning Limit Low (Vin < 90V) | YES |
| 4A | ISTBY_OC_WARN_LIMIT | R | 3 | 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 |
| 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 | AIRFLOW_1_OT_FAULT_LIMIT | R | 0 | Linear Data Format | 2 | | | Airflow 1 Overtemperature Fault Limit | YES |
| 4F | HOTSPOT_1_OT_FAULT_LIMIT | R | 1 | Linear Data Format | 2 | | | Hotspot 1 Overtemperature Fault Limit | YES |
| 4F | AIRFLOW_2_OT_FAULT_LIMIT | R | 2 | Linear Data Format | 2 | | | Airflow 2 Overtemperature Fault Limit | YES |
| 4F | HOTSPOT_2_OT_FAULT_LIMIT | R | 3 | Linear Data Format | 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 Data Format | 2 | | | Airflow 1 Overtemperature Warning Limit | YES |
| 51 | HOTSPOT_1_OT_WARN_LIMIT | R | 1 | Linear Data Format | 2 | | | Hotspot 1 Overtemperature Warning Limit | YES |
| 51 | AIRFLOW_2_OT_WARN_LIMIT | R | 2 | Linear Data Format | 2 | | | Airflow 2 Overtemperature Warning Limit | YES |
| 51 | HOTSPOT_2_OT_WARN_LIMIT | R | 3 | Linear Data Format | 2 | | | Hotspot 2 Overtemperature Warning Limit | YES |
| 52 | AIRFLOW_1_UT_FAULT_LIMIT | R | 0 | Linear Data Format | 2 | | | Airflow 1 Undertemperature Fault Limit | NO |
| 52 | HOTSPOT_1_UT_FAULT_LIMIT | R | 1 | Linear Data Format | 2 | | | Hotspot 1 Undertemperature Fault Limit | NO |
| 52 | AIRFLOW_2_UT_FAULT_LIMIT | R | 2 | Linear Data Format | 2 | | | Airflow 2 Undertemperature Fault Limit | NO |
| 52 | HOTSPOT_2_UT_FAULT_LIMIT | R | 3 | Linear Data Format | 2 | | | Hotspot 2 Undertemperature Fault Limit | NO |
| 53 | AIRFLOW_1_UT_FAULT_RESPONSE | R | 0 | Bit Flags | 1 | | | Airflow 1 Undertemperature Fault Response Actions | NO |
| 53 | HOTSPOT_1_UT_FAULT_RESPONSE | R | 1 | Bit Flags | 1 | | | Hotspot 1 Undertemperature Fault Response Actions | NO |
| 53 | AIRFLOW_2_UT_FAULT_RESPONSE | R | 2 | Bit Flags | 1 | | | Airflow 2 Undertemperature Fault Response Actions | NO |
| 53 | HOTSPOT_2_UT_FAULT_RESPONSE | R | 3 | Bit Flags | 1 | | | Hotspot 2 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 |

Link to [Limits, warnings and response details](#)

| Command Code (Hex) | Command Name | Read / Write | Page | Format | # of Bytes | Bit # | Bit Name | Definition | Supported |
|--------------------|------------------------|---|------|--------------------|------------|-------|-----------------|---|-----------|
| 5A | VIN_UV_FAULT_RESPONSE | R | All | Bit Flags | 1 | | | Input Undervoltage Fault Response Actions | YES |
| 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 | NO |
| 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 | NO |
| 64 | TOFF_DELAY | R | All | Linear Data Format | 2 | | | 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 | | | 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 | | | 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 | 0 | Linear Data Format | 2 | | | Output Overpower Fault Limit High (Vin > 100V) | YES |
| 68 | POUT_OP_FAULT_LIMIT | R | 1 | Linear Data Format | 2 | | | Output Overpower Fault Limit Medium (90V < Vin < 100V) | YES |
| 68 | POUT_OP_FAULT_LIMIT | R | 2 | Linear Data Format | 2 | | | Output Overpower Fault Limit Low (Vin < 90V) | YES |
| 69 | POUT_OP_FAULT_RESPONSE | R | All | Bit Flags | 1 | | | Output Overpower Fault Response Actions | YES |
| 6A | POUT_OP_WARN_LIMIT | R | 0 | Linear Data Format | 2 | | | Output Overpower Warning Limit High (Vin > 100V) | YES |
| 6A | POUT_OP_WARN_LIMIT | R | 1 | Linear Data Format | 2 | | | Output Overpower Warning Limit Medium (90V < Vin < 100V) | YES |
| 6A | POUT_OP_WARN_LIMIT | R | 2 | Linear Data Format | 2 | | | Output Overpower Warning Limit Low (Vin < 90V) | YES |
| 6B | PIN_OP_WARN_LIMIT | R | 0 | Linear Data Format | 2 | | | Input Overpower Warning Limit High (Vin > 100V) | YES |
| 6B | PIN_OP_WARN_LIMIT | R | 1 | Linear Data Format | 2 | | | Input Overpower Warning Limit Medium (90V < Vin < 100V) | YES |
| 6B | PIN_OP_WARN_LIMIT | R | 2 | Linear Data Format | 2 | | | Input Overpower Warning Limit Low (Vin < 87V) | YES |
| 78 | 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 | | | | | | |

Link to [Limits, warnings and response details](#)

| Command Code (Hex) | Command Name | Read / Write | Page | 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 | 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 undervoltage fault has occurred | YES |
| | | | | | | 5 | VOUT_UV_W | Set when an output undervoltage 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 undervoltage fault has occurred | NO |
| | | | | | | 5 | VOUT_UV_W | Set when an output undervoltage 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 |

| Command Code (Hex) | Command Name | Read / Write | Page | Format | # of Bytes | Bit # | Bit Name | Definition | Supported |
|--------------------|--------------------|--------------|------|-----------|------------|-------|------------------|--|-----------|
| 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 |
| 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 |

| Command Code (Hex) | Command Name | Read / Write | Page | Format | # of Bytes | Bit # | Bit Name | Definition | Supported |
|--------------------|---------------------|--------------|------|--------------------|------------|-------------------------------------|----------------------------------|--|-----------|
| 7E | STATUS_CML | R/W | All | Bit Flags | 1 | 0 | OTHER_MEMORY_F | Set when another memory or logic fault has occurred | YES |
| | | | | | | 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 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/W | All | Bit Flags | 1 | 0 | VINT_RANGE_F | Set when an internal voltage (VCC2, VCC4, or VDD) out-of-range fault has occurred | YES |
| | | | | | | 1 | IIN_CH1_OC_F | Set when lin CH1 over current fault has occurred | YES |
| | | | | | | 2 | IIN_CH2_OC_F | Set when lin CH2 over current fault has occurred | YES |
| | | | | | | 3 | VBUS_SOFTSTART_F | Set when the primary boost output bus does not reach regulation in specified time | 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 |
| 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 | 6 | | Input Energy Consumption Sensor | YES | |
| 87 | READ_EOUT | BLOCK READ | All | PMBus Spec 18.13 | 6 | | Output Energy Consumption Sensor | YES | |
| 88 | READ_VIN | R | All | Linear Data Format | 2 | Link to Sensor Data | Input Voltage Sensor Reading | YES | |
| 89 | READ_IIN | R | All | Linear Data Format | 2 | | Input Current Sensor Reading | YES | |

| Command Code (Hex) | Command Name | Read / Write | Page | Format | # of Bytes | Bit # | Bit Name | Definition | Supported | |
|--------------------|---------------------|--------------------------|------|--------------------|------------|-------|---|---|---------------------------|-----|
| 8A | READ_VCAP | R | All | Linear Data Format | 2 | | Link to Sensor Data | 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 | | | 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 | | | Inlet Temperature Sensor Reading | YES | |
| 8E | READ_TEMPERATURE_2 | R | All | Linear Data Format | 2 | | | Outlet Temperature Sensor Reading | YES | |
| 8F | READ_TEMPERATURE_3 | R | 0 | Linear Data Format | 2 | | | Secondary Hotspot Temperature Sensor Reading | YES | |
| 8F | READ_TEMPERATURE_3 | R | 1 | Linear Data Format | 2 | | | Primary Hotspot Temperature 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 | NO | |
| 96 | READ_POUT | R | All | Linear Data Format | 2 | | | Output Power Sensor Reading | YES | |
| 97 | READ_PIN | R | All | Linear Data Format | 2 | | | 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 | | | Link to returned results | 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 | | 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 | | Varies | | 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 | | Link to returned results | Power Supply Input Voltage Minimum Specification | YES | |
| A1 | MFR_VIN_MAX | R | All | Linear Data Format | 2 | | | Power Supply Input Voltage Maximum Specification | YES | |

| Command Code (Hex) | Command Name | Read / Write | Page | Format | # of Bytes | Bit # | Bit Name | Definition | Supported |
|--------------------|-------------------|--------------|------|--------------------|------------|-------|--|---|------------|
| 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 | | | 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 |
| AA | MFR_EFFICIENCY_LL | R | All | Linear Data Format | 2 | | Link to Returned Results | 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 | | | 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 - Intake | YES |
| C1 | MFR_MAX_TEMP_2 | R | All | Linear Data Format | 2 | | | Maximum temperature (degC) associated with READ_TEMPERATURE_2 - Exhaust | YES |
| C2 | MFR_MAX_TEMP_3 | R | 0 | Linear Data Format | 2 | | | Maximum temperature (degC) associated with READ_TEMPERATURE_3 - LLC Hotspot | YES |
| C2 | MFR_MAX_TEMP_3 | R | 1 | Linear Data Format | 2 | | | Maximum temperature (degC) associated with READ_TEMPERATURE_3 - PFC Hotspot | YES |

| Command Code (Hex) | Command Name | Read / Write | Page | Format | # of Bytes | Bit # | Bit Name | Definition | Supported |
|--------------------|------------------------------------|---|------|--------------------|------------|-------|--|---|-----------|
| 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 | BOOTLOAD_MODE | Set when in bootload mode | YES |
| | | | | | | 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 | YES | |
| E2 | READ_HOURS_USED | BLOCK READ | All | Linear Data Format | 3 | | Link to Sensor Data Power Supply Accumulated Main Output Power-On Hours | 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 | Default = 0 | NO |
| | | | | | | 8:15 | CMD_KEY | Command activation/verification key = 0x5A Default = 0 | YES |
| EF | LED_CONTROL_INPUT | R/W | 0 | 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 |
| EF | LED_CONTROL_OUTPUT | R/W | 1 | 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 | |
| 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 | |

| Command Code (Hex) | Command Name | Read / Write | Page | Format | # of Bytes | Bit # | Bit Name | Definition | Supported |
|--------------------|-----------------|--------------|------|-----------|------------|-------|-------------------|---|-----------|
| FB | BOOTLOAD_STATUS | R | All | Bit Flags | 1 | 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 | | | | | | |

The following tables represent examples of returned results and response that can be expected and are presented to assist the designer in interpreting the results of the unit under test. Actual results will vary depending upon the specific model under test. For example, an HB4C model will have different overtemperature parameters for faults and warning than HB3C, due to airflow direction differences.

Limits and Response, D1U54T-W-800-12-HB4C

Link back to: [command 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 | 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 | | | | | 14 | |
| 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 | | | | | 13.5 | |
| 42 | VSTBY_OV_WARN_LIMIT | R | 1 | Linear Data Format | 2 | Vdc | -6 | | | | | 13.5 | |
| 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 | -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 | 2 | Adc | -3 | | | | | 73.5 | IOUT OC High Vin > 100V |
| 46 | IOUT_OC_FAULT_LIMIT | R | 1 | Linear Data Format | 2 | Adc | -3 | | | | | 62.5 | IOUT OC Med 90V < Vin < 100V |
| 46 | IOUT_OC_FAULT_LIMIT | R | 2 | Linear Data Format | 2 | Adc | -3 | | | | | 43 | IOUT OC Low Vin < 90V |
| 46 | ISTBY_OC_FAULT_LIMIT | R | 3 | Linear Data Format | 2 | Adc | -8 | | | | | 1.36 | |

| Command Code (Hex) | Command Name | Read / Write | Page | Format | # of Bytes | Units | Scaling Coefficients | | | | Bit # | Reading | Comments |
|--------------------|-----------------------------|--------------|------|--------------------|------------|-------|----------------------|---|---|---|-------|---------|--|
| | | | | | | | N | m | R | b | | | |
| 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 | 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 | -3 | | | | | 69.5 | IOUT OC Warning High Vin > 100V |
| 4A | IOUT_OC_WARN_LIMIT | R | 1 | Linear Data Format | 2 | Adc | -3 | | | | | 61 | IOUT OC Warning Med 90V < Vin < 100V |
| 4A | IOUT_OC_WARN_LIMIT | R | 2 | Linear Data Format | 2 | Adc | -3 | | | | | 41.5 | IOUT OC Warning Low Vin < 90V |
| 4A | ISTBY_OC_WARN_LIMIT | R | 3 | Linear Data Format | 2 | Adc | -8 | | | | | 1.2 | |
| 4F | AIRFLOW_1_OT_FAULT_LIMIT | R | 0 | Linear Data Format | 2 | °C | 0 | | | | | 75 | Intake Airflow |
| 4F | AIRFLOW_2_OT_FAULT_LIMIT | R | 1 | Linear Data Format | 2 | °C | 0 | | | | | 95 | Exhaust Airflow |
| 4F | HOTSPOT_1_OT_FAULT_LIMIT | R | 2 | Linear Data Format | 2 | °C | 0 | | | | | 130 | Down Converter Hotspot |
| 4F | HOTSPOT_2_OT_FAULT_LIMIT | R | 3 | Linear Data Format | 2 | °C | 0 | | | | | 115 | Boost Converter Hotspot |
| 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_2_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 |

| Command Code (Hex) | Command Name | Read / Write | Page | Format | # of Bytes | Units | Scaling Coefficients | | | | Bit # | Reading | Comments |
|--------------------|-------------------------|--------------|------|--------------------|------------|-------|----------------------|---|---|---|-------|---------|--|
| | | | | | | | N | m | R | b | | | |
| 51 | AIRFLOW_1_OT_WARN_LIMIT | R | 0 | Linear Data Format | 2 | °C | 0 | | | | | 70 | Intake Airflow |
| 51 | AIRFLOW_2_OT_WARN_LIMIT | R | 1 | Linear Data Format | 2 | °C | 0 | | | | | 85 | Exhaust Airflow |
| 51 | HOTSPOT_1_OT_WARN_LIMIT | R | 2 | Linear Data Format | 2 | °C | 0 | | | | | 110 | Down Convertor Hotspot |
| 51 | HOTSPOT_2_OT_WARN_LIMIT | R | 3 | Linear Data Format | 2 | °C | 0 | | | | | 110 | Boost Convertor Hotspot |
| 55 | VIN_OV_FAULT_LIMIT | R | 0 | Linear Data Format | 2 | Vrms | -1 | | | | | 272 | Recoverable |
| 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 | -1 | | | | | 268 | Recoverable |
| 58 | VIN_UV_WARN_LIMIT | R | 0 | Linear Data Format | 2 | Vrms | -1 | | | | | 80 | Recoverable |
| 59 | VIN_UV_FAULT_LIMIT | R | 0 | Linear Data Format | 2 | Vrms | -1 | | | | | 72 | Recoverable |
| 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 | -6 | | | | | 12.2 | |
| 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 | -6 | | | | | 12 | |
| 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 | |
| 68 | POUT_OP_FAULT_LIMIT | R | 0 | Linear Data Format | 2 | Watts | 0 | | | | | 880 | Pout High (Vin > 100V) |
| 68 | POUT_OP_FAULT_LIMIT | R | 1 | Linear Data Format | 2 | Watts | 0 | | | | | 750 | Pout Med (90V < Vin < 100V) |
| 68 | POUT_OP_FAULT_LIMIT | R | 2 | Linear Data Format | 2 | Watts | 0 | | | | | 515 | Pout Low (Vin < 90V) |
| 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 |

| Command Code (Hex) | Command Name | Read / Write | Page | Format | # of Bytes | Units | Scaling Coefficients | | | | Bit # | Reading | Comments |
|--------------------|--------------------|--------------|------|--------------------|------------|-------|----------------------|---|---|---|-------|---------|-------------------------------|
| | | | | | | | N | m | R | b | | | |
| 6A | POUT_OP_WARN_LIMIT | R | 0 | Linear Data Format | 2 | Watts | 0 | | | | | 835 | |
| 6A | POUT_OP_WARN_LIMIT | R | 1 | Linear Data Format | 2 | Watts | 0 | | | | | 730 | |
| 6A | POUT_OP_WARN_LIMIT | R | 2 | Linear Data Format | 2 | 0 | 0 | | | | | 500 | |
| 6B | PIN_OP_WARN_LIMIT | R | 0 | Linear Data Format | 2 | Watts | 0 | | | | | 590 | POUT_OP_WARN_LIMIT HIGH/ 0.84 |
| 6B | PIN_OP_WARN_LIMIT | R | 1 | Linear Data Format | 2 | Watts | 0 | | | | | 590 | POUT_OP_WARN_LIMIT MED/ 0.84 |
| 6B | PIN_OP_WARN_LIMIT | R | 2 | Linear Data Format | 2 | Watts | 0 | | | | | 590 | POUT_OP_WARN_LIMIT SMALL 0.84 |

External EEPROM IPMI compliant DATA, returned results, D1U54T-W-800-12-HB4C. Illustration Purposes

| 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 | M1888 | S | Product / project number (Mxxxx) |
| Part/product number | D1U54T-W-800-12-HB4C | D | Marketing / customer p/n (D1U54T...) |
| Version | | N/A | Not used |
| Serial number | SSYYWRRxxxx | 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 |

Manufacturers Internal FRU Data (PMBus Inventory Information Registers)

Commands 99h – 9Eh are **Varies** length blocks of data that represent the vital manufacturer's FRU data where the first byte indicates QTY of bytes of the block and each remaining byte is an ASCII formatted text character.

The following tables detail the returned results that can be expected.

Summary of internal FRU data, D1U54T-W-800-12-HB4C

[Link back to command 99](#)

| PMBus Register Name | PMBus Register / Command Number | Register Contents | Static or Dynamic Register? (S/D) |
|---------------------|---------------------------------|---|-----------------------------------|
| MFR_ID | 0x99 | Murata-PS | S |
| MFR_MODEL | 0x9A | D1U54T-W-800-12-HB4C | D |
| MFR_REVISION | 0x9B (paged) | 9151001888-vv-rr (page 0) 9157001888-vv-rr (page 1) 915400xxxx-vv-rr (page 2) | S |
| MFR_LOCATION | 0x9C | China / Canada | D |
| MFR_DATE | 0x9D | YYWW | D |
| MFR_SERIAL | 0x9E | SSYYWRRxxxx | D |

Command Code 99 HEX (MAN_ID) Byte by Byte breakdown:

[Link back to commands: CMD 99](#)

| Command Code (Hex) | Command Name | Value | ID Length/Bit#ID/ASCII Text |
|--------------------|--------------|-----------|-----------------------------|
| 99 | MFR_ID | Murata-PS | MFR_ID_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 9A HEX (MFR_MODEL), D1U54T-W-800-12-HB3C shown , example:

[Link back to commands: Command Back 9A](#)

| Command Code (Hex) | Command Name | Value | ID Length/Bit#ID/ASCII Text |
|--------------------|--------------|----------------------|-----------------------------|
| 9A | MFR_MODEL | D1U54T-W-800-12-HB3C | MFR_MODEL_LENGTH 22 |
| | | | MFR_MODEL_0 'D' |
| | | | MFR_MODEL_1 '1' |
| | | | MFR_MODEL_2 'U' |
| | | | MFR_MODEL_3 '5' |
| | | | MFR_MODEL_4 '4' |
| | | | MFR_MODEL_5 'T' |
| | | | MFR_MODEL_6 '.' |
| | | | MFR_MODEL_7 'W' |
| | | | MFR_MODEL_8 '.' |
| | | | MFR_MODEL_9 '8' |
| | | | MFR_MODEL_10 '0' |
| | | | MFR_MODEL_11 '0' |
| | | | MFR_MODEL_12 '.' |
| | | | MFR_MODEL_13 '1' |
| | | | MFR_MODEL_14 '2' |
| | | | MFR_MODEL_15 '.' |
| | | | MFR_MODEL_16 'H' |
| | | | MFR_MODEL_17 'B' |
| | | | MFR_MODEL_18 '3' |
| | | | MFR_MODEL_19 'C' |
| | | | MFR_MODEL_20 0 |
| | | | MFR_MODEL_21 0 |
| | | | MFR_MODEL_22 0 |
| | | | MFR_MODEL_23 0 |
| | | | MFR_MODEL_24 0 |
| | | | MFR_MODEL_25 0 |
| | | | MFR_MODEL_26 0 |
| | | | MFR_MODEL_27 0 |
| MFR_MODEL_28 0 | | | |

Command Code 9B HEX (MFR_REVISION),
Page 0 shown for illustration purposes.

Link Back to Commands: [Command 9B](#)

| Command Code (Hex) | Command Name | Value | ID Length/Bit#ID/ASCII Text | | |
|--------------------|--------------|----------------|-----------------------------|--------------------|---------------------------------|
| 9B | MFR_REVISION | 0000-0000-0000 | MFR_REVISION_LENGTH | 14 | |
| | | | MFR_REVISION_0 | '0' | |
| | | | MFR_REVISION_1 | '0' | |
| | | | MFR_REVISION_2 | '0' | |
| | | | MFR_REVISION_3 | '0' | |
| | | | MFR_REVISION_4 | '-' | |
| | | | MFR_REVISION_5 | SEC_MAJOR_FW_REV_0 | // Secondary FW major rev byte0 |
| | | | MFR_REVISION_6 | SEC_MAJOR_FW_REV_1 | // Secondary FW major rev byte1 |
| | | | MFR_REVISION_7 | SEC_MINOR_FW_REV_0 | // Secondary FW minor rev byte0 |
| | | | MFR_REVISION_8 | SEC_MINOR_FW_REV_1 | // Secondary FW minor rev byte1 |
| | | | MFR_REVISION_9 | '-' | |
| | | | MFR_REVISION_10 | '0' | |
| | | | MFR_REVISION_11 | '0' | |
| | | | MFR_REVISION_12 | '0' | |
| MFR_REVISION_13 | '0' | | | | |

Command Code 9C HEX (MFR_LOCATION):

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

Command Code 9D HEX (MFR_DATE) results dependent upon date of manufacture:

Link Back to Commands List: [Command Back 9D](#)

| Command Code (Hex) | Command Name | Value | ID Length/Bit#ID/ASCII Text | |
|--------------------|--------------|-------|-----------------------------|-----|
| 9D | MFR_DATE | 1800 | MFR_LOCATION_LENGTH | 4 |
| | | | MFR_DATE_0 | "1" |
| | | | MFR_DATE_1 | "8" |
| | | | MFR_DATE_2 | "0" |
| | | | MFR_DATE_3 | "0" |

.Command Code 9E HEX (MFR_SERIAL) results **Varies:**
 Link Back to Commands List: [CMD_99](#)

| Command Code (Hex) | Command Name | Value | ID Length/Bit#ID/ASCII Text | |
|--------------------|--------------|---------------|-----------------------------|-----|
| 9E | MFR_SERIAL | QEyywwR1xxxxx | MFR_SERIAL_LENGTH | |
| | | | 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 | 'x' | | | |

SENSOR DATA AND RESOLUTION: D1U54T-W-800-12-HB3C

Link Back to: [command 88](#)

| Command Code (Hex) | Command Name | Description | Page | 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 Data Format | Vrms | -1 | | | | 404.73 | 0.3956 | 511.5 | 0.5 | + / - 2% of Reporting Full-Scale |
| 88 | READ_VIN | Input Voltage Sensor Reading | All | Linear Data Format | Vrms | -1 | | | | 404.73 | 0.3956 | 511.5 | 0.5 | + / - 2% of Reporting Full-Scale |
| 89 | READ_IIN | Input Current Sensor Reading | All | Linear Data Format | Arms | -7 | | | | 26.32 | 0.0257 | 7.99 | 0.0078 | + / - 5% of Reporting Full-Scale |
| 8A | READ_VCAP | PFC Output Voltage Sensor Reading | All | Linear Data Format | Vdc | -1 | | | | 463 | 0.4526 | 511.50 | 0.5000 | + / - 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 | 15.984 | 0.01563 | + / - 2% of Reporting Full-Scale |
| 8C | READ_IOUT | Main Output Current Sensor Reading | 0 | Linear Data Format | Adc | -3 | | | | 87.09 | 0.0851 | 127.88 | 0.125 | + / - 2% of Reporting Full-Scale |
| 8C | READ_ISTBY | Standby(Auxilliary) Output Current Sensor Reading | 1 | Linear Data Format | Adc | -8 | | | | 4.33 | 0.0042 | 3.996 | 0.00391 | + / - 2% of Reporting Full-Scale |
| 8D | READ_TEMPERATURE_1 | Temperature Sensor Reading - Inlet (Secondary Side) | All | Linear Data Format | °C | 0 | | | | -40 to 150 | | -40 to 150 | 1 | + / - 5°C |
| 8E | READ_TEMPERATURE_2 | Temperature Sensor Reading - Outlet (Primary Side) | All | Linear Data Format | °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 Data Format | °C | 0 | | | | -40 to 150 | | -40 to 150 | 1 | + / - 5°C |
| 8F | READ_TEMPERATURE_3 | Temperature Sensor Reading - PFC Hotspot (Primary Side) | 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 | | | | 16, 000 | | 32736 | 32 | + / - 5% of Reporting Full-Scale |
| 96 | READ_POUT | Output Power Sensor Reading | All | Linear Data Format | Watts | 0 | | | | | | 1023 | 1 | + / - 5% of Reporting Full-Scale |

SENSOR DATA AND RESOLUTION continued:

| Command Code (Hex) | Command Name | Description | Page | Format | Units | Scaling Coefficients | | | | Raw Sensor | | PMBus Reporting Sensor | | |
|--------------------|---------------------|--|------|--------------------|-------|----------------------|---|---|---|--------------------|------------|------------------------|------------|----------------------------------|
| | | | | | | N | m | R | b | Full-scale / Range | Resolution | Full-scale / Range | Resolution | Accuracy |
| 97 | READ_PIN | Input Power Sensor Reading | All | Linear Data Format | Watts | 0 | | | | | | 1023 | 1 | + / - 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% |

MANUFACTURER'S GENERAL PARAMETRIC DATA D1U54T-W-800-12-HBxxC

 Link back to: [command list](#)

| Command Code (h) | Page | Command Name | Units | N | Value (d) | Notes | |
|-------------------------|------|--------------------------|-------|-----|-----------|-------|---------------------------|
| A0 | 0 | MFR_VIN_MIN | 90 | V | -1 | 180 | |
| A1 | 0 | MFR_VIN_MAX | 264 | V | -1 | 528 | |
| A2 | 0 | MFR_IIN_MAX | 9 | A | -6 | 576 | |
| A3 | 0 | MFR_PIN_MAX | 900 | W | 0 | 900 | |
| A4 | 0 | MFR_VOUT_MIN | 11.88 | V | -6 | 760 | Linear format, V-Out Mode |
| A5 | 0 | MFR_VOUT_MAX | 12.12 | V | -6 | 776 | Linear format, V-Out Mode |
| A6 | 0 | MFR_IOUT_MAX | 66.66 | A | -3 | 533 | |
| A4 | 1 | MFR_VSTBY_MIN | 11.7 | V | -6 | 749 | |
| A5 | 1 | MFR_VSTBY_MAX | 12.3 | V | -6 | 787 | |
| A6 | 1 | MFR_ISTBY_MAX | 1 | A | -8 | 256 | |
| A7 | 0 | MFR_POUT_MAX | 810 | W | 0 | 810 | |
| A8 | 0 | MFR_TAMBIENT_MAX | 50 | C | 0 | 2043 | |
| A9 | 0 | MFR_TAMBIENT_MIN | -5 | C | 0 | 2043 | |
| AA | 0 | MFR_EFFICIENCY_LL_LENGTH | 14 | | | | |
| | | MFR_EFFICIENCY_LL_VIN | 115 | Vac | -1 | 230 | |
| | | MFR_EFFICIENCY_LL_POUT1 | 81 | W | 0 | 81 | |
| | | MFR_EFFICIENCY_LL_EFF1 | 0.89 | % | -10 | 911 | |
| | | MFR_EFFICIENCY_LL_POUT2 | 405 | W | 0 | 405 | |
| | | MFR_EFFICIENCY_LL_EFF2 | 0.94 | % | -10 | 963 | |
| | | MFR_EFFICIENCY_LL_POUT3 | 810 | W | 0 | 810 | |
| AB | 0 | MFR_EFFICIENCY_LL_EFF3 | 0.92 | % | -10 | 942 | |
| | | MFR_EFFICIENCY_HL_LENGTH | 14 | | | | |
| | | MFR_EFFICIENCY_HL_VIN | 230 | Vac | -1 | 460 | |
| | | MFR_EFFICIENCY_HL_POUT1 | 81 | W | 0 | 81 | |
| | | MFR_EFFICIENCY_HL_EFF1 | 0.9 | % | -10 | 922 | |
| | | MFR_EFFICIENCY_HL_POUT2 | 405 | W | 0 | 405 | |
| | | MFR_EFFICIENCY_HL_EFF2 | 0.96 | % | -10 | 983 | |
| MFR_EFFICIENCY_HL_POUT3 | 810 | W | 0 | 810 | | | |
| | | MFR_EFFICIENCY_HL_EFF3 | 0.952 | % | -10 | 975 | |

OPERATION COMMAND CODE 01 HEX

 Link Back to Commands: [command 01](#)

| 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 02 HEX

Link Back to Command list: [command 02](#)

| 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 |
| 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 31 | 1F | Operation command and control pin; active high polarity |

External EEPROM write protect settings:

Link back to command list: [E1](#)

| Bit # / Bit Description | | | | | | | | Valid Values | | Read / Write | FRU EEPROM Write Protect CONTROL |
|-------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------------|-----|--------------|--|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Dec | Hex | | |
| WP Control Bit 7 | WP Control Bit 6 | WP Control Bit 6 | WP Control Bit 4 | WP Control Bit 3 | WP Control Bit 2 | WP Control Bit 1 | WP Control Bit 0 | | | | |
| 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 154 | 9A | Read / Write | EEPROM write protect enabled - write to device not allowed |
| 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 86 | 56 | Read / Write | EEPROM write protect disabled - write to device allowed |

PMBUS Configuration Defaults (Note: changes to configuration requires power supply restart)

Link back to: [command EE](#)

| Bit # / Bit Description | | | | | | | | | | | | | | | Read / Write | PMBus Configuration | |
|-------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------|----------|----------|----------|-----|-----------|----------|--------------|---------------------|--|
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | | | 0 |
| CMD Key Bit 7 | CMD Key Bit 6 | CMD Key Bit 5 | CMD Key Bit 4 | CMD Key Bit 3 | CMD Key Bit 2 | CMD Key Bit 1 | CMD Key Bit 0 | reserved | reserved | reserved | reserved | PEC | Bus Speed | SMBALERT | Data Format | | |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | X | X | X | X | 0 | 0 | 0 | 0 | Read | 1.No PEC Support 2.100kHz 3. SMBALERT supported 4. Linear Data format |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | X | X | X | X | 0 | 0 | 0 | 1 | Read | 1.No PEC Support 2.100kHz 3. SMBALERT supported 4. Direct Data format |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | X | X | X | X | 0 | 0 | 1 | 0 | Read | 1.No PEC Support 2.100kHz 3. No SMBALERT support 4. Linear Data format |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | X | X | X | X | 0 | 0 | 1 | 1 | Read | 1.No PEC Support 2.100kHz 3. No SMBALERT support 4. Direct Data format |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | X | X | X | X | 0 | 1 | 0 | 0 | Read | 1.No PEC Support 2.400kHz 3. SMBALERT supported 4. Linear Data format |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | X | X | X | X | 0 | 1 | 1 | 0 | Read | 1.No PEC Support 2.400kHz 3. No SMBALERT support 4. Linear Data format |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | X | X | X | X | 1 | 0 | 0 | 0 | Read | 1.PEC supported 2.100kHz 3. SMBALERT supported 4. Linear Data format |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | X | X | X | X | 1 | 0 | 0 | 1 | Read | 1.PEC supported 2.100kHz 3. SMBALERT supported 4. Direct Data format |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | X | X | X | X | 1 | 0 | 1 | 0 | Read | 1.PEC supported 2.100kHz 3. No SMBALERT support 4. Linear Data format |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | X | X | X | X | 1 | 0 | 1 | 1 | Read | 1.PEC supported 2.100kHz 3. No SMBALERT support 4. Direct Data format |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | X | X | X | X | 1 | 1 | 0 | 0 | Read | 1.PEC supported 2.400kHz 3. SMBALERT supported 4. Linear Data format |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | X | X | X | X | 1 | 1 | 0 | 1 | Read | 1.PEC supported 2.400kHz 3. SMBALERT supported 4. Direct Data format |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | X | X | X | X | 1 | 1 | 1 | 0 | Read | 1.PEC supported 2.400kHz 3. No SMBALERT support 4. Linear Data format |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | X | X | X | X | 1 | 1 | 1 | 1 | Read | 1.PEC supported 2.400kHz 3. SMBALERT support 4. Direct Data format |

DEFAULT

| | | | | |
|-------------|-------|---|--|---------|
| Data Format | Bit 0 | 1 | Direct Data Format | |
| | | 0 | Linear Data Format | |
| SMBALERT | Bit 1 | 1 | PS does not have SMBALERT pin or does not support SMBus alert protocol | Default |
| | | 0 | PS does have SMBALERT pin and supports SMBus alert protocol | Default |
| Bus Speed | Bit 2 | 1 | Maximum supported bus speed = 400kHz | Default |
| | | 0 | Maximum supported bus speed = 100kHz | |
| PEC support | Bit 3 | 1 | Packed error checking supported | Default |
| | | 0 | Packed error checking not supported | |

LED CONTROL (Paged)

Link back to command EF: [LED Control](#)

The following list the PMBus reading for each of the possible states of each LED and describe the indicators characteristics:

| Bit # / Bit Description | | | | | | | | Dec | Hex | Read / Write | LED Status & Control |
|----------------------------|----------|----------|----------|----------|----------------|----------------|----------------|---------|--------|--------------|--------------------------------------|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | |
| CONTROL Bit | reserved | reserved | reserved | reserved | LED Mode Bit 2 | LED Mode Bit 1 | LED Mode Bit 0 | | | | |
| Page 0 - INPUT LED | | | | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Read | Auto - LED off - Default |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | Read | Auto - LED solid green – Default |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 2 | Read | Auto - LED blinking green – Default |
| 0 | X | X | X | X | X | X | X | 0 - 127 | 0 - 7F | Write | Set to Auto LED control |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 128 | 80 | Read / Write | Set to Manual - LED off |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 129 | 81 | Read / Write | Set to Manual - LED solid green |
| 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 130 | 82 | Read / Write | Set to Manual - LED blinking green |
| Page 1 - OUTPUT LED | | | | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Read | Auto - LED off – Default |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | Read | Auto - LED solid green – Default |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 2 | Read | Auto - LED blinking green – Default |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 3 | Read | Auto - LED solid red |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 4 | 4 | Read | Auto - LED blinking red |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 5 | 5 | Read | Auto - LED solid yellow – Default |
| 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 6 | 6 | Read | Auto - LED blinking yellow – Default |
| 0 | X | X | X | X | X | X | X | 0 - 127 | 0 - 7F | Write | Set to Auto LED control |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 128 | 80 | Read / Write | Set to Manual - LED off |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 129 | 81 | Read / Write | Set to Manual - LED solid green |
| 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 130 | 82 | Read / Write | Set to Manual - LED blinking green |
| 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 131 | 83 | Read / Write | Set to Manual - LED solid red |
| 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 132 | 84 | Read / Write | Set to Manual - LED blinking red |
| 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 133 | 85 | Read / Write | Set to Manual - LED solid yellow |
| 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 134 | 86 | Read / Write | Set to Manual - LED blinking yellow |

Data Format

This product supports Linear data format

Linear mode and associated real world values are calculated as follows:

Link back to [front page](#)

Linear Data Format

The Linear Data Format is typically used for commanding and reporting the parameters such as (but not only) the following:

- Output Current,
- Input Voltage,
- Input Current,
- Operating Temperatures,
- Time (durations), and
- Energy Storage Capacitor Voltage.

The Linear Data Format is a two byte value with:

- An 11 bit, two's complement mantissa and
- A 5 bit, two's complement exponent (scaling factor).

The format of the two data bytes is illustrated in Figure 4.

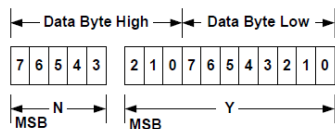


Figure 4. Linear Data Format Data Bytes

The relation 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 complement integer; and

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

Devices that use the Linear format must accept and be able to process any value of N.

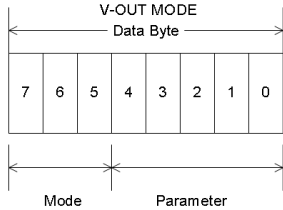
Command Code 20h (V_Out mode) returned results:

Link back to [command 20](#)

V-OUT Mode Protocol:

Commanding and/or reading output voltage requires two steps and applies to this product except as noted:

- 1) CMD_20 (V-OUT MODE) defines which of the three formats (LINEAR, VID OR DIRECT) is used:



| 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:

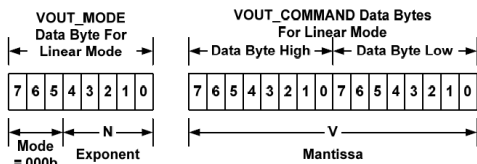


Figure 6. Linear Format Data Bytes

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.

Manual Fan speed control: Command Code 3Bh (**FAN_COMMAND_1**) [Link Back to Fan Command](#)

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 speed control and enters automatic fan speed control by any of the following conditions or methods:

- 1) Any overtemperature fault or warning (manual fan speed control mode can be resumed after the faults and warnings have ended)
- 2) Recycling of AC input voltage
- 3) 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) | % 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 | | | | | | | | | | | | | | | | |

Murata Power Solutions, Inc.
 129 Flanders Road
 Westborough, MA 01581-1030 U.S.A.
 ISO 9001 and 14001 REGISTERED



This product is subject to the following operating requirements and the Life and Safety Critical Application Sales Policy:

Refer to: <http://www.murata-ps.com/requirements/>

Murata Power Solutions, Inc. makes no representation that the use of its products in the circuits described herein, or the use of other technical information contained herein, will not infringe upon existing or future patent rights. The descriptions contained herein do not imply the granting of licenses to make, use, or sell equipment constructed in accordance therewith. Specifications are subject to change without notice.
 © 2016 Murata Power Solutions, Inc.