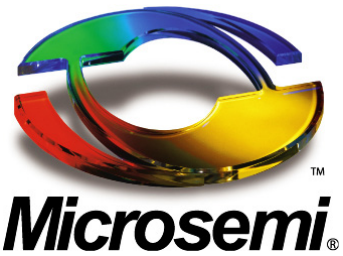
PD63000/G & PD69000 & PD69100

Serial Communication Protocol

User Guide



Revision 1.2

Catalog Number: PD63000_UG

1 Enterprise, Aliso Viejo, CA 92656, USA ; Phone (USA): (800) 713-4113, (ROW): (949) 221-7100 Fax: (949) 756-0308

This document is applicable for the following software:

- PD63000/G Software Rel. 6.0.x and on.
- PD69000 Software Rel. 2.0.x and on.
- PD69100 Software Rel. 1.x and on.

Notes **MiP:** Refers to PD63000 applications **ONLY.**
AT: Refers to PD69000 & PD69100 applications **ONLY**.
BPM: Refers to PD69000 & PD69100 applications **ONLY**.
Layer2 (LLDP): Refers to PD69000 & PD69100 applications **ONLY**.

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1 General

This document describes the communication protocol developed by Microsemi™ for its Power over Ethernet (PoE) integrated solution, serving modules and PoE devices. This protocol facilitates serial communications between a Host CPU (meaning a PoE-enabled, Layer 2 Ethernet switch or power source equipment/PSE) and the PoE controller. By using the communication protocol, the programmer can write control commands to power ports, read their status and manage PoE parameters. The protocol supports systems having up to 96 ports.

Possible PoE devices:

- **IEEE802.3af standard ICs (AF ICs)**: PD64012/G , PD64004/A, PD69012 , PD69008 , PD69108, PD69104
- **Medium Power ICs (MiP ICs)**: PD64012GH and PD64004AH.
- **IEEE802.3at standard (AT ICs)**: PD69012 , PD69008 , PD69108, PD69104

Notes

1. Flash memory is a special type E^2PROM. All data is erased at once; it can be erased 100,000 times.
2. For information related to the PD66000 and PD64008 products refer to Version 3.1.

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2 Data Transfer

The communication protocol provides the designer with great flexibility in system control.

- Data sent from the Host CPU to the PoE Controller:
  - General system settings
  - PoE system reset
  - Software downloads to the PoE controller
  - Advanced power management settings
  - Ports enable/disable command
  - Forced-power command
  - Define port priority command
  - Define port matrix command
  - Define port standard (IEEE802.3af or IEEE802.3at) – for PD69012 and PD69008 only
  - General port parameter settings
  - General PoE device parameter settings
  - Interrupt parameter settings
- Data sent from the PoE Controller upon request from the Host CPU:
  - System status and parameters
  - PoE device status and parameters
  - General and per port measurements
  - All ports and per port parameters
  - All ports and per port status
  - PoE built-in-test results
  - Power management status and telemetries
  - Ports priority
  - Port matrix
  - Port class
  - Interrupt information

3 Basic Communication Information

The communication protocol is a bi-directional Master/Slave protocol type. The Master is the Ethernet PSE Host CPU and the Slave is the PoE unit controller (see Figure 1). Figure 2 illustrates a simplified representation of the protocol. The Host CPU can utilize a TTL-leveled asynchronous serial communication (UART) or I^2C protocol. The PoE controller communicates with PoE devices via an SPI bus.

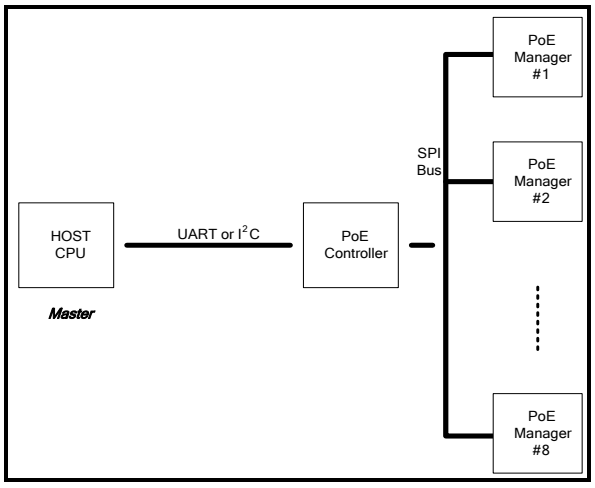

Figure 1: Basic Communication Diagram

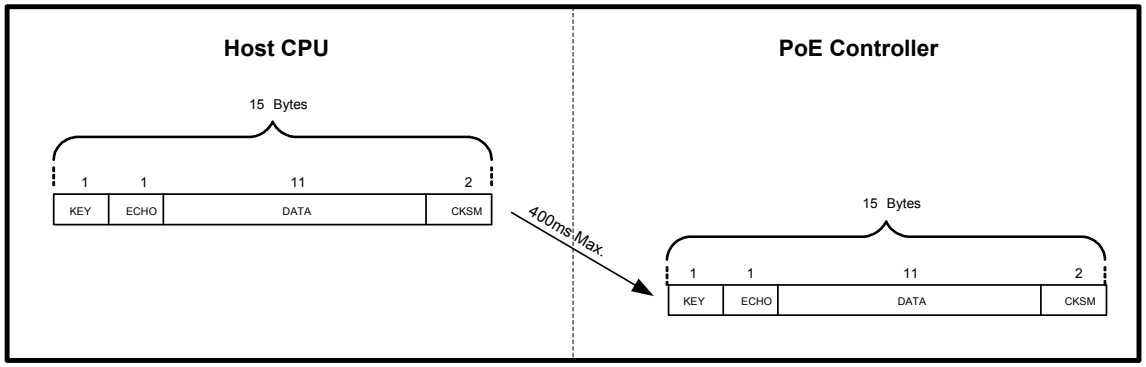

Figure 2: Protocol Representation

Communication parameters are transferred in Big-endian format (MSB is transmitted first). Table 1 lists the communication options.

Table 1: Communication Options

RS-232/UART	I^2C
Bits per second: 19,200 bps	Speed: 100 kHz (max)
Data bits: 8	7-bit address
Parity: None	
Stop bits: 1	
Flow control: None	
	Clock Stretching : Yes

Notes Clock stretching must be supported by the host CPU as well.

Table 2: I2C recommended times

Time Criteria	Description	Value
Read back time	Minimum waiting time since last 15 bytes transmission and before reading back the telemetry/report from the PoE controller	100ms
Time between commands	Minimum waiting time since last telemetry and before sending a new command to the PoE controller	40ms
I2C buffer clear timeout	Time limit for clearing the PoE controller's internal I2C receive buffer, if it doesn't contain 15 bytes.	500ms

4 Messages Structure

The following sections detail the message structure.

4.1 Definitions

The message types are:

- **Commands and Programs**: Transmitted by the Host to configure the PoE unit. No data is required in response, except a success/failure report.
- **Request**: Transmitted by the Host as a request for information from the PoE unit. Telemetry is sent back in response.
- **Reports**: Transmitted back from the PoE controller in response to commands and programs.
- **Telemetry**: Transmitted back from the controller in response to requests. Received in response to a Request or after PoE unit reset.

Notes

1. **Numeric Base**: Unless otherwise specified, all numeric parameters are in HEX-base format. If a decimal value is expected (for example power level), the user should convert bases before or after sending/retrieving data.

2. **Time Out**: Unless otherwise specified, reports must be sent back to the Host within 400 ms. The Host should maintain a minimum time-out period of 400 ms, before declaring a time-out and resending a message.

Messages are identified by name as soon as they start. Certain messages are applicable only to a single PoE device type. If this is the case, it is also indicated at the beginning of the message.

Table 3 shows the packet structure for messages **sent** from the Host CPU to the PoE controller.

Table 3: Example of Packet Structure of Messages Sent

[1]KEY	[2]ECHO	[3]Subject	[4]Subject1	[5]Subject 2	[6]DATA	[7]DATA	[8]DATA
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSumH**	**[15]CSumL**	

Table 4 shows the packet structure for messages **received** by the Host CPU from the PoE controller.

Table 4: Example of Packet Structure of Messages Received

[1]KEY	[2]ECHO	[3]DATA	[4]DATA	[5]DATA	[6]DATA	[7]DATA	[8]DATA
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSumH**	**[15]CSumL**	

- *Italic* font: Represents byte fixed value
- Regular font: Represents byte variable values and modifications by the Host.
- The various data fields in message packets are described hereafter.
- The top right hand side table shows the cases where the command is supported by the Controller.
- √ = command supported
- - = not supported

4.1.1 Byte 1: KEY

The KEY field defines the type of message sent or received. When the Host CPU transmits a message, the PoE controller acknowledges it by sending a response, according to the sent KEY type. Key field font is *Italic.*

KEY (hex)	Description	Traffic Flow
0x00	Command	Host CPU → PoE controller
0x01	Program	Host CPU → PoE controller
0x02	Request	Host CPU → PoE controller
0x03	Telemetry	PoE controller → Host CPU
0x52	Report	PoE controller → Host CPU

Note Upon power on (or RESET), the Host CPU receives a System Status *Telemetry* Packet, sent by the PoE controller. When using I^2C interface, the message must be read.

4.1.2 Byte 2: ECHO

The ECHO field synchronizes the sent and received messages. The Host inserts a number between 0x00 to 0xFE and the corresponding response echoes this number. The Host can use any sequence, as long as two consecutive messages do not use the same ECHO number.

Note Using the same ECHO number for two consecutive messages can cause a communication loss.

4.1.3 Byte 3 to 5: SUBJECT, SUBJECT1, SUBJECT2

The SUBJECT fields are utilized to define the sent message character. The actual values are specific to each message and are detailed at each command. See Table 7, “Labels to Codes Conversion”. The font is italic for all subject fields appearing in Table 7.

Note SUBJECT2 can sometimes serve as a DATA field.

4.1.4 Byte 6 to 13: DATA

The DATA fields hold the data transmitted by the Host, or received from the PoE controller. The actual values are specific to each message and are detailed at each command.

Note The lowest accuracy of measurements is: 2% for PS voltage, 6% for power, 3% for current.

4.1.5 Byte 14 to 15: CHECKSUM

The CHECKSUM data confirms message integrity. The CHECKSUM is a 16-bit word, containing the arithmetic sum of the first 13 message bytes (without checksum bytes). The Host CPU has to calculate this sum before sending it as part of the message. The PoE controller performs the same calculation for the data received and compares the result with the received checksum. If the received data does not match the CHECKSUM sent, the PoE controller will send a Report message containing a CHECKSUM error indication. In that case the Host CPU must resend this command.

4.2 Port Number Identification

When creating messages, it is sometimes necessary to identify one or more port numbers. This is especially true when setting various parameters (***Set*** commands) or when requesting a port status (***Get*** or ***Request*** commands):

PoE Devices	System	Port Number
Up to 8 PoE devices	Up to 96	• [0 - 95] for individual ports • [128] for all ports

4.3 Software Default Parameters

Certain important parameters are assigned default values during manufacturing. These default values may vary according to a customer request. Table 5 details the factory default values:

Table 5: Factory Default Values

Parameter	Definition	Value	Remarks	Link
Enable/Disable	Enable/Disable ports	'1'	All ports enabled	4.5.12
Force Power	Forces port enable, regardless of detection	'0'	All ports normal operation	4.5.17
Port Power Limit	Power per AF port	16.8W	Maximum configurable is 40W	4.5.13
	Power per Medium Power port	30W		
	Power per AT port	36W		
Sum Power Limit	Maximum of sum of square currents on ASIC	4148	One value for all ASICs	4.5.21
Port Priority	Ports Priority	3	Lowest priority set for all ports	4.5.14
Port Standard	IEEE802.3af or IEEE802.3at	'1'	For PD69000 only	4.5.6 & 4.5.12
Masks Status	Mask bit-1	'1'	Resistor and capacitor detection	4.5.4
Temporary Matrix	Physical→ Logical	1-to-1	Physical =logical	4.5.10
Private Label	Assist in detecting reset events	0		4.5.4
User Byte	Assist in detecting Restore-Factory-Default	'FF'		4.5.5
NVM#i	Non-volatile memory, 9	'FF'		**Error!**
PM Mode	Power Management Mode parameters	0x000200	Cat. Ref – D. PM mode	4.5.8
Power Bank 0-15	Maximum power for each bank	1612 W		4.5.7
Max Volt	If exceeded, the PoE ports shutdown	57 V	Maximum configurable is 58.5 V	4.5.7
Min Volt	Below this value, the PoE ports shutdown	44 V	Minimum configurable is 44 V	4.5.7
Guard Band	To prevent connection of additional ports	19 W	1 W value means dynamic Guard Band	4.5.7
Mask Register	Interrupt Mask register	'0'	All masked	4.5.18
Blink Register	System OK pin Blink Mask	'0'		4.5.20
Light Register	System OK pin Light Mask	'8192'	Illuminates when Vmain is out of range	4.5.20
Temperature Alarm	Temperature Alarm limit, used for interrupt	120^0 C	Refer to Set PoE Device	4.5.6

Parameter	Definition	Value	Remarks	Link
PoE Device Parameter	Auto detection of PoE devices	‘0’	PoE controller automatically detects PD64012/G/H and	4.5.6
Backoff Time	Selects one of two valid four wire connections	‘0’	Alternative A	4.5.19
Disconnect Method	Select the disconnection method	‘0’	AC Disconnect method for PD63000	4.5.19
		'1'	DC Disconnect method for PD69000 & PD69100	

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4.4 Commands Index

The following is a list of protocol functions with related system parameters:

Parameter	SET	Para.	GET	Para.
System				
	Reset Command	4.5.1	-	
	Restore Factory Defaults	4.5.2	-	
	Save System Settings	4.5.3	-	
	Download	5.4.1	-	
Global				
Software Version	-		Get Software Version	4.7.1
Non-volatile memory	Save Non-volatile memory	**Error! Reference source not found.**	Get Non-volatile memory	**Error! Reference source not found.**
PoE Device	Set PoE Device Parameters	4.5.6	Get PoE Device status Get PoE Device Version	4.7.3 4.7.2
Private Label (RAM)	Set System Status	4.5.4	Get System Status	4.7.4
User Byte	Save User Byte	4.5.5	Get System Status	4.7.4
Power Banks (0-15)	Set Power Banks	4.5.7	Get Power Banks	4.7.8
Channels Matrix	Set Temporary Matrix Program Global Matrix	4.5.10 4.5.11	Get Physical Port Number from Temp. Matrix Get Physical Port Number from Active Matrix	4.7.17 4.7.18
Underload Counters	-		Get UDL Counters	4.7.19
Detection Failure Counters	-		Get Detection Failure Counters	4.7.26
Bit Masks	Set System Masks	4.5.9	Get Masks Status	4.7.5
glAcDisconnect	Set Individual Masks		Get Individual Masks	
glUserDelta	Set Individual Masks		Get Individual Masks	
glDcModulation	Set Individual Masks		Get Individual Masks	
glBackOff	Set Individual Masks		Get Individual Masks	
glPowerBanks	Set Individual Masks		Get Individual Masks	
glPowerBanksIRQ	Set Individual Masks		Get Individual Masks	
Power Parameters	-		Get Power Supply Parameters or Get Total Power	4.7.6 4.7.21
Power Available	-		Get Power Supply Parameters	4.7.6
Main Voltage	-		Get Power Supply Voltage	4.7.7
Power Management	Set PM method	4.5.8	Get PM Method	4.7.20
			Get Total Power	4.7.21
			Get All Ports Class	4.7.22
Temperature Alarm	Set PoE Device Parameters	4.5.6	Get PoE Device Status	4.7.3

Parameter	SET	Para.	GET	Para.
Interrupt Mask	Set Interrupt Mask	4.5.18	Get Interrupt Mask	4.7.24
Blink Register Light Register	Set System OK LED Mask Registers	4.5.20	Get System OK LED Mask Registers	4.7.25
Channel				
Enable/Disable Mode	Set Enable/Disable Channels	4.5.12	Get Single Port Status or Get All Ports Enable/Disable Mode	4.7.13 4.7.12
Power Limit	Set Power Limit for Channels	4.5.13	Get Port Power Limit	4.7.14
Temporary Power Limit	Set Temporary Power Limit for Channels	4.5.15	Get Port Power Limit	4.7.14
Priority	Set Port Priority	4.5.14	Get Port Priority	4.7.15
Enable/Disable Mode, Power Limit, Priority	Set Port Parameters	4.5.16	Get Single Port Status Get Port Priority Get Port Power Limit	4.7.13 4.7.15 4.7.14
Port Standard	Set Enable/Disable Channels Set PoE Device Parameters	4.5.6	Get Single Port Status Get PoE Device Status	4.7.3
Force Power Mode	Set Force Power	4.5.17	-	
Class	-		Get All Ports Class	4.7.22
Status	-		Get Single Port Status or Get All Ports Status	4.7.13 4.7.9
Event Latch	-		Get Latches	4.7.23
Power Consumption	-		Get Port Measurements or Get All Ports Power or Get All HIP Ports Power	4.7.16 4.7.10 4.6.12
Voltage, Current			Get Port Measurements	4.7.16
Backoff Time Disconnect Method	Set Individual Mask	4.5.19	Get Individual Mask	4.7.27
Sum Power Limit	Set Extended PoE Device Parameters	4.5.21	Get Extended PoE Device Parameters	4.7.28
Power consumption per priority level and delta power			Get BPM Data	4.7.30
Requested power consumption per priority level			Get BPM Request Data	4.7.31

4.5 Command and Program Keys

The messages used with the Command and Program Keys are described below:

4.5.1 Reset Command

[1] KEY	[2] ECHO	[3] Subject	[4] Subject1	[5] Subject2	[6] DATA	[7] DATA	[8] DATA
Command (0x00)	##	*Global (0x07)*	*Reset (0x55)*	*(0x00)*	*Reset (0x55)*	*(0x00)*	*Reset (0x55)*
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

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This command resets the PoE Controller. The PoE Controller generates an internal hardware reset for the PoE devices. All ports are shut down for the boot and detection period. A System Status Telemetry message (refer to **Get System Status** command (Section 4.7.4) is then transmitted back to the Host within *T_{WAKEUP} from reset completion. If communication between the PoE Controller and the Host CPU is I^2C bus, then the Host CPU must read this status telemetry. The Host recognizes this telemetry by the echo number which is 0xFF in this case.

*T_{WAKEUP} = 0 3 seconds typical, depending on system architecture.

4.5.2 Restore Factory Defaults

[1] KEY	[2] ECHO	[3] Subject	[4] Subject1	[5] Subject2	[6] DATA	[7] DATA	[8] DATA
Program (0x01)	##	*RestoreFact (0x2D)*	*N*	*N*	*N*	*N*	*N*
[9] DATA	**[10] DATA**	**[11]DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
N	*N*	*N*	*N*	*N*	##	##	
This command restores modified values to factory default values (refer to Table 5)							

4.5.3 Save System Settings

[1] KEY	[2] ECHO	[3] Subject	[4] Subject1	[5] Subject2	[6] DATA	[7] DATA	[8] DATA
Program (0x01)	##	*E2 (0x06)*	*SaveConfig (0x0F)*	*N*	*N*	*N*	*N*
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command saves the current user values into the Non-volatile memory and these user values become the defaults. The default parameters are shown in Table 5. To restore factory defaults, refer to **Restore Factory Defaults** command (Section 4.5.2).
Example: If the Host set the Power Limit to '400' and this value is to be a default value, then 'save' must be carried out.

Notes

1. When saving values into the memory, no PoE management activity is executed. Working ports are protected by hardware, but new ports are not served. The save process takes 30 ms.
2. During the save process, if a **Power_Good** interrupt occurs, all ports are turned off until the end of the save operation.

4.5.4 Set System Status

[1] KEY	[2] ECHO	[3] Subject	[4] Subject1	[5] Subject2	[6] DATA	[7] DATA	[8] DATA
Command (0x00)	##	*Global (0x07)*	*SystemStatus (0x3D)*	Private Label	***N***	***N***	*N*
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command assists in verifying that a reset has occurred.
Private label: It is recommended that any value higher than 0x00, will be stored in the RAM.
The Host can set the Private Label. If a "reset occurred", the Private Label value is changed to zero upon reset. To read the Private Label, refer to **Get System Status** command (Section 4.7.4).

4.5.5 Save User Byte

[1] KEY	[2] ECHO	[3] Subject	[4] Subject1	[5] Subject2	[6] DATA	[7] DATA	[8] DATA
Program (0x01)	##	*UserByte (0x41)*	UserByte	*N*	***N***	***N***	*N*
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command assists in verifying that a restore factory default has occurred (refer to Restore Factory Defaults command (Section 4.5.2)). The Host can set the User-Byte and then the **Save System Setting** command must be sent (refer to Save System Settings command, Section 4.5.3).
It is easy to recognize that a factory default has occurred, because this value becomes '**FF**' upon issuing the **Restore Factory Default** command. To read the User Byte, refer to **Get System Status** command (Section 4.7.4).
User Byte: Store any value between 0x00 and 0xFE in the RAM.

4.5.6 Set PoE Device Parameters

[1] KEY	[2] ECHO	[3] Subject	[4] Subject1	[5] Subject2	[6] DATA	[7] DATA	[8] DATA
Command (0x00)	##	*Global (0x07)*	*DeviceParams (0x87)*	CSNum	**IC-Exp**	**TSH**	MIP/AT-Req
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command is applicable only for PD63000 & PD69000 devices.

- **CS-Num**: PoE device number can be '0' – '7', according to the HW connection between PoE Controller chip select pins and PoE devices.
- **TSH** (Temperature Switch High): The upper temperature limit per PoE device.

Whenever the PoE device temperature exceeds the TSH limit, an interrupt is indicated in the user defined temperature event (bit 9 of the Event register).

The maximum temperature for the PD64012/G , PD64004A, PD69012 and PD96008 is 150° C; for the PD64004 120° C

Refer to the **Get PoE Device Status** command (Section 4.7.3).

- **IC-Exp** = 0x00 for PD63000/G/H & PD69000
- For PD64004, set to 0x04, for PD64012/G and PD69012, set to 0x0C, for PD69008 set to 0x08.
- **MIP/AT-Req** Device Mid-power operation or AT request: For MiP operation or AT set to 0x01, for regular AF operation set to 0x00 (See Note 1 below).

The LSB of this byte is the **MIP-Req** field (see Note 2 below).
Bits 1 – 7 of '**MiP/AT-reg**' are for future use; set them to '0'.

Note 1
AT: Refers to PD69000 & PD69100 applications **ONLY**.
MiP: Refers to PD63000 applications **ONLY.**

Note 2

How to Switch to Mid-Power Mode:

Assuming that the hardware is MidPower compliant, the only parameter that must be saved and reset is the MIP-Register; The other parameters do not affect the direct operation of the ASIC as MidPower or AF.

1. Send A Set PoE Device Params command with MIP-Req = 1. A single command per PoE Device should be sent.
2. Set appropriate port power limit per each port for the appropriate PoE Devices (Section 4.5.13).
3. Optional: change Guard Band value (Section 4.5.7)
4. Save new configuration (Section 4.5.3)
5. Reset the system (Section, 4.5.1)
6. After turning the system on, verify that the PoE Devices are configured as detailed in MiP Section 4.7.3

4.5.7 Set Power Banks

[1]KEY	[2]ECHO	[3]Subject	[4]Subject 1	[5]Subject 2	[6]DATA	[7]DATA	[8]DATA
Command (0x00)	##	*Global (0x07)*	*Supply (0x0B)*	*PowerBudget (0x57)*	**Bank**	**Power Limit**	
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Max Shutdown Voltage		Min Shutdown Voltage		Guard Band	##	##	

Settings

- This command sets the Power Management Limit (PML). This is the maximum total power consumption permitted before entering the power management procedure. Above this level, the lowest priority ports will be disconnected (refer **Set Port Priority** command, Section 4.5.14).
- **Maximum voltage level**: If V_{main} is above this level, the PoE ports shutdown.
- **Minimum voltage level**: If V_{main} is below this level, the PoE ports shutdown.
- **Power Guard Band** (PGB): If power consumption is greater than [PML – PGB] and **MaskBit0** is set to '1' (refer to **Set Masks Status** command, Section 4.7.5), no additional port will be connected.

Bank — Specifies the power bank number to be configured (1 to 7 for PD63000, 0 to 15 for PD69000 & PD69100).

- In case of configuring a temporary power bank, Bank = 0x80 + bank number.
- In case of sending "Activate" command, Bank = 0xFF (other parameters in the command are ignored).
- When using a single power supply, use the **Get Power Supply Parameters** command, Section 4.7.6, to identify the bank number and then set the required power limit for the relevant bank/s.
- When utilizing more than a single power supply, verify which power supply corresponds to each bank and then utilize the Set Power Bank command to set the power limit per each bank.

Power Limit(1) — These values are to be set from 0 to 4000 watts depending on the power supplies capability. If power consumption exceeds this level, lowest priority ports will be disconnected.
Important: Power limit values should be sequenced in a 'low to high' order, in accordance with the Power Bank numbers (PB1: lowest Power Limit Value, PB7: highest Power Limit Value).

Max Shutdown Voltage(2) — Maximum voltage level: above this value, the PoE ports shutdown.

Min Shutdown Voltage(2) — Minimum voltage level: below this value, the PoE ports shutdown.

Guard Band(1) — Power guard band to prevent connection of additional ports. Recommended value: 0x13(PD63000) or 0x01(PD69000 & PD69100).
Value = 0x01 indicates that the PoE controller should utilizes a dynamic Guard Band.

1. Power in watts (for example 380 W = 380 = 0x17C)
2. Voltages are in decivolts (for example 48.2 V = 482 = 0x1E2)

Max Volt > **Min Volt** + 3 V, **Min Volt** ≥ 44 V; **Max Volt** ≤ 58.5 V.

If the set values are not within this range, the value is not changed and an error will be reported.

Dynamic Guard Band (DGB): The guard band is set automatically to the expected power of a port, prior to turning the port on. For Guard Band rules see **Set PM Method**, Section 4.5.9

DGB may work according to port priority. If a high priority port can not start because of the Guard Band, then lower priority ports will not start. The DGB can ignore port priority; if a high priority port can not start because

of the GB, then a lower priority port with power consumption lower than the GB starts. See **Set Individual Mask** (Section 4.5.19) for more details.

Selecting power banks:

- For the PoE Controller PD63000: three digital pins are utilized (PG3, PG2, PG1).
- For PD69000 & PD69100: four digital pins are utilized (PG3, PG2, PG1, PG0).

Save System Settings command (refer to **Save System Settings** command, Section 4.5.3) must be sent to make these parameters permanent. To read the power management parameters and status, refer to **Get Power Banks** command, Section 4.7.8.

Power Banks Definition – PD63000

Power Bank	PG3	PG2	PG1
PB1	0	0	1
PB2	0	1	0
PB3	0	1	
PB4	1	0	0
PB5	1	0	1
PB6	1	1	0
PB7	1	1	1

When PG1 = 0, PG2 = 0 and PG3 = 0, the power limit is according to PB2. The 'power good' pins determine the default bank.

Power Banks Definition – PD69000 & PD69100

Power Bank	PG3	PG2	PG1	PG0
PB0	0	0	0	0
PB1	0	0	0	1
PB2	0	0	1	0
PB3	0	0	1	1
PB4	0	1	0	0
PB5	0	1	0	1
PB6	0	1	1	0
PB7	0	1	1	1
PB8	1	0	0	0
PB9	1	0	0	1
PB10	1	0	1	0
PB11	1	0	1	1
PB12	1	1	0	0
PB13	1	1	0	1
PB14	1	1	1	0
PB15	1	1	1	1

Note 1 For more details on Power Management, including interrupt support, see Technical Note TN-113, Catalogue Number 06-0002-081.

Note 2 For additional information on Emergency Power Management, refer to Technical Note TN-134, Catalogue Number 06-0014-081.

Note 3 **Set Power Source 1, Set Power Source 2** commands are relevant for old systems and are still supported and appear in Ver. 4.1.

Note 4 When using Dynamic guard band make sure that the PPL of each port is at least its' real power consumption (see Section 4.5.13)

4.5.8 Set PM Method

[1]KEY	[2]ECHO	[3]Subject	[4]Subject 1	[5]Subject2	[6]DATA	[7]DATA	[8]DATA
Command (0x00)	##	*Global (0x07)*	*Supply (0x0B)*	**PowerManageMode** *(0X5F)*	PM Mode		
					PM1	PM2	PM3
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command sets the Power Management mode of operation.

- **PM1**: Selects the total allocated power and Flexible Guard Band (see below and Section 4.5.7 for more details).
- **PM2**: Selects the power limit at the port (maximum or according to class).
- **PM3**: Selects the start condition.

PM Description	PM Value
PM-1 How to calculate system power(Summed)	0 - Full Dynamics (Consumption) 1 - Classes 1 to 3 = Class power, classes 0,4 = Dynamic 2 - Classes 0 to 3 = Class power, class 4 = Dynamic 3 - Classes 1 to 4 = Class power, class 0 = Dynamic 4 - classes 0 to 4 = Class power.
PM-2 Port Power Limit	0 - Table set by the user (PPL) 1 - Class Limit 2 - Max (AT/AF flag)
PM-3 Start up conditions: The port will not start up in case detected class power is higher than the pre defined.	0 - No Condition 1 - Condition on Classes 1 to 3 2 - Condition on Classes 0 to 3 3 - Condition on Classes 1 to 4 4 - Condition on Classes 0 to 4

	PM Mode			Management Mode	Cat Ref	Total Allocated Power	Port Power Limit	Start Condition
	PM-1	PM-2	PM-3					
Default ->	0x00	0x02	0x00	Dynamic	D	Consumption	Max.	None
Layer2 ->	0x00	0x00	0x00	Static	S1	Consumption	Predefined	None
	0x00	0x00	0x01		S2	Consumption	Predefined	Class
	> 0	0x01	0x00	Class	C1	Class	class	None
	> 0	0x02	0x00		C2	Class	Max.	None

Definitions

- **PM Mode**: Power Management mode (bytes 6, 7, 8) is a hexadecimal value. PM1 - PM3 values define the PM type.
- **Management Mode**: There are three modes:
  - Dynamic: Based on actual power used

- Static: Preset by the user
- Class: Set by the PD classification and also according to the IEEE 802.3af standard

- **Cat Ref**: Sub-categories of the power management.
- **PPL**: Port Power Limit Table
- **Total Allocated Power**: The method by which the total power is calculated. This calculated power is compared to the power limit, defined by the **Set Power Banks** command (Section 4.5.7).
- **Consumption**: Total power consumed by all ports, measured in real-time.
- **Class**: Total ports power according to their class*, for classes 1, 2 and 3. Classes 0 and 4 follow the rules of the following table:
  - **Layer 2**: This mode must be selected to work with the Layer 2 (LLDP) feature.

PM1 Value	Class 0	Class 4 – AFICs	Class 4 – MiP ICs	Class 4 – AT ICs
1	Consumption	Consumption	Consumption	Consumption
2	Class*	Consumption	Consumption	Consumption
3 (Layer 2)	Consumption	Class*	PPL	Class*
4	Class*	Class*	PPL	Class*

  - **Dynamic Guard Band**: The value of the Guard Band is also influenced by **PM1**. Classes 1, 2 and 3 always get a Guard Band according to their class*. Classes 0 and 4 follow the rules of the following table:

PM1 Value	Class 0 PD63000	Class 0 PD69000 & PD69100	Class 4: AF/AT ICs	Class 4: MiP ICs
0	PPL	PPL	PPL	PPL
1	Class*	PPL	PPL	PPL
2	Class*	Class*	PPL	PPL
3	Class*	PPL	Class*	PPL
4	Class*	Class*	Class*	PPL

- **Port Power Limit**: Conditions at which a port is disconnected due to high consumption, regardless of system power consumption:
  - **Predefined**: A user defined limit set by the **Set Power Limit for Channels** command (see Section 4.5.13).
  - **Class**: If a PD's consumed power exceeds its class predefined power, it is disconnected*. In Class 4, if the ASIC is utilized as a MiP then the port gets full power, in accordance with the MiP current limits.
  - **Max**: If a PD's consumed power in an AF ASIC exceeds full power as specified in the 802.3af standard (15.4 W @ 44 V) or the 802.3at standard (36 W @ 44 V) it is disconnected. If the ASIC is of the MiP type, then port disconnection occurs when the power exceeds maximum MiP power limits.
- **Start Condition**: Defines the additional start condition, if Port Power Limit condition is predefined.
  - **None:** No additional conditions.
  - ***Class:** Start port only in cases where predefined Power Limit is higher than the maximum allowed class power.
    - PD class 1 power = 4 w
    - PD class 2 power = 7 w
    - PD class 0, 3, 4 (AF IC) power = 15.4 w
    - PD class 4 (AT IC) =36 w

Note 1 The '>' sign means greater than….

Note 2 For additional description of Power Management, refer to Technical Note TN-113 Catalogue Number 06-0002-081.

Note 3
AT: Refers to PD69000 & PD69100 applications **ONLY**.
MiP: Refers to PD63000 applications **ONLY**.

4.5.9 Set System Masks

[1]KEY	[2]ECHO	[3]Subject	[4]Subject 1	[5]Subject 2	[6]DATA	[7]DATA	[8]DATA
Command (0x00)	##	*Global (0x07)*	*Maskz (0x2B)*	*Mask*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

The system masks control the following:

- Power Management disconnection method.
- Capacitor Detection enable / disable.

Mask: Only the first two bits are used (MaskBit0 and MaskBit1).

MS								LS
Bit8						Bit2	Bit1	Bit0

- **MaskBit0** (Power Management): Bit0 handles the power-disconnect process. When total consumed power exceeds the power budget, the PoE controller initiates ports disconnection which prevents overloading the power supply. The controller can use one of two ways to implement the disconnection procedure, as set by this bit:
  - **1 (default)**: After the power budget has been exceeded, the next port attempting to power-up is denied, regardless of its priority.
  - **0**: After the power budget has been exceeded, the next port attempting to power-up causes the port with the lowest priority to shut down which enables higher-priority ports to power-up.

- **MaskBit1** (Capacitor Detection): Bit1 handles the proprietary Microsemi Capacitor Detection method.
  - 0 = RES mode. Capacitor Detection is disabled; only Resistor Detection is enabled.
  - 1 (default) = RES+CAP mode. Resistor Detection is implemented first and only if this fails, this Capacitor Detection is used.

MaskBit2 = must be always '1':

To read the Mask status parameters refer to **Get Masks Status** command (Section 4.7.5).

4.5.10 Set Temporary Matrix

[1]KEY	[2]ECHO	[3]Subject	[4]Subject1	[5]Subject 2	[6]DATA	[7]DATA	[8]DATA
Command (0x00)	##	*Channel (0x05)*	*TmpMatrix (0x43)*	CH Num	*Physical Number A*	*Physical Number B*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command sets values in the port conversion matrix. Programming this matrix sets the internal port numbering arrangement with respect to the Host system port numbering. This matrix feature gives the designer flexibility in laying out PCB traces.

For example, if ports 0 and 1 of the PD64012/G (physical numbers) are connected to Ethernet PSE port number 5 (logical number), then 5 should be programmed to Physical port A – 0, Physical port B - 1.

If port is two pairs, then it must be configured as followed: CH Num = 0, Physical Number A = 0,

Physical Number B = 0xFF. It means that port B is undefined.

Steps for configuring a 4pair matrix:

1. Matrix4PairCommandEnable (mask number 0x34) must be set to 1.
2. If Matrix4PairCommandEnable was changed, **Save System Settings** command must be issued.
3. If configuring a logical port which consisted of 2 physical ports on a same Asic – DvDtFlexible (mask number 0x31) must be set (**for PD69000 devices only)**.
4. Configure the temporary matrix using this command.

Once all ports have been programmed, the **Program Global Matrix** command (refer to Section 4.5.11) is issued, which validates the new matrix.

After all Those steps were done, ports must be 4pair enables using **Set Enable/Disable 4 pair for channels** command (section 4.5.30).

- **CH Num**: The logical port number, as referred to by the Host CPU and shown on the PSE's front panel. Refer to Section 4.2.
- **Physical Number A**: The physical port number, according to the output pins of the integrated solution (e.g.: PD64012/G).
- **Physical Number B**: Optional. Only valid if individual mask 0x34 is set to '1'. Othewise = *N*

To read the current matrix, refer to commands **Get Physical Port Number from Temporary Matrix** command (Section 4.7.17) and **Get Physical Port Number from Active Matrix** command (Section 4.7.18).

4.5.11 Program Global Matrix

[1]KEY	[2]ECHO	[3]Subject	[4]Subject 1	[5]Subject 2	[6]DATA	[7]DATA	[8]DATA
Command (0x00)	##	*Global (0x07)*	*TmpMatrix (0x43)*	*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command causes temporary matrix values (refer to **Set Temporary Matrix** command, Section 4.5.10) to be programmed into the working matrix. Upon completion of this command, reset occurs and the PoE ports statuses are refreshed according to the new matrix.

4.5.12 Set Enable/Disable Channels

[1]KEY	[2]ECHO	[3]Subject	[4]Subject 1	[5]Subject 2	[6]DATA	[7]DATA	[8]DATA
Command (0x00)	##	*Channel (0x05)*	*EnDis (0x0C)*	*CH Num*	*Cmd*	AF Mask	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Sets individual port Enable (power enable) or Disable (power disable).

- **CH Num**: The logical port number, as referred to by the Host CPU and usually shown on the PSE front panel. Refer to Section 0.
- **Cmd**: 0 - Disable; 1 (default) - Enable.

For Forced-on and Disable conflict, refer to the note mentioned in the **Set Test Force Power** command (Section 4.5.17).

If a port is disabled, the controller does not perform the detection function.

- **AF Mask (PD69000 & PD69100 only)**: 0 - only IEEE802.3af operation; N - stay with the last mode (IEEE802.3af or IEEE802.3at).

When changing a working port from AT to AF (or the reverse) the port is turned off.

4.5.13 Set Power Limit for Channels

[1]KEY	[2]ECHO	[3]Subject	[4]Subject 1	[5]Subject 2	[6]DATA	[7]DATA	[8]DATA
Command (0x00)	##	*Channel (0x05)*	*Supply (0x0B)*	CH Num	PPL		*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Sets the maximum power per single port. If a port exceeds its power limit, the PoE system shuts down that port.

- **CH Num**: The logical port number, as referred to by the Host CPU and usually shown on the PSE front panel. Refer to Section 4.2.
- **PPL (Port Power Limit)**: If a port power exceeds PPL level, the PoE system disconnects that port.

Power can be set up to 40,000 mW. Default is 16,800 mW (0x41A0) for PD63000 & 36,000mW (0x8CA0) for PD69000 & PD69100.

To read the PPL value, refer to **Get Port Power Limit** command, Section 4.7.14.

Note 1 Peak power may exceed the PPL value for a short period before the port enters an overload state. The port will then shutdown or return to normal operation below the PPL value.

Note 2 The average disconnection margin is 4% higher than the PPL, to ensure that no disconnection occurs under the preset disconnection level.

4.5.14 Set Temporary Power Limit for Channels

[1]KEY	[2]ECHO	[3]Subject	[4]Subject 1	[5]Subject 2	[6]DATA	[7]DATA	[8]DATA
Command (0x00)	##	*Channel (0x05)*	*Temporary Supply (0xA2)*	*CH Num*	**TPPL**		*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Sets the maximum power value per single active port. This value will be the port's new power limit only when the port is still 'on'. When the port is turned off, the maximum power for a specific port returns to the PPL. If a port exceeds its power limit, the PoE system shuts down the appropriate port.

- **CH Num**: The logical port number, as referred to by the Host CPU and is usually shown on the PSE front panel. Each command cannot be implemented on all ports ('*AllChannels*', refer to Section 4.2), but on a single port only.
- **TPPL (Temporary Port Power Limit)**: If a port power exceeds the TPPL level, the PoE system disconnects that port.

When such a command is received from the Host, the MCU provides the extra power regardless of port configuration. It overrides class and port power table and AF limits. If Icut is based on full power, this command has no effect when asking for more or less power.

If the requested power is higher than Icut, the maximum possible power is provided (max Icut). If the requested power is higher than the maximum power per port definitions, an Out of Range (1) error will be returned to the Host CPU. If the port number is '**AllChannels**' an Out of Range (0xB) error is returned.

When a port operates in the Layer 2 mode, this value overwrites the TPPL value determined by the Layer 2. When this port stops functioning in Layer 2, the TPPL is initialized to zero. It is not recommended to use this command with a port operating in Layer 2.

To read the TPPL value, refer to **Get Port Power Limit** command (Section 4.7.14).

Note To avoid disconnection of a port due to overload state while using this command, follow the following procedure:

- When increasing the port power, first send this command to set higher power limit. After that, increase the PD power consumption.
- When decreasing the port power, first decrease the PD power consumption. After that, send this command to set a lower power limit.

4.5.15 Set Port Priority

[1]KEY	[2]ECHO	[3]Subject	[4]Subject 1	[5]Subject 2	[6]DATA	[7]DATA	[8]DATA
Command (0x00)	##	*Channel (0x05)*	*Priority (0x0A)*	CH Num	Priority	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Port priority affects:

1. **Power-up order**: After a reset, the ports are powered up according to their priority.
2. **Shutdown order**: When exceeding the power budget.

- **CH Num**: The logical port number, as referred to by the Host CPU and usually shown on the PSE front panel. Refer to Section 4.2.
- **Priority**: Critical – 1; high – 2; low – 3 (default)

To read the port priority, refer to **Get Port Priority** command, Section 4.7.15.

For ports with the same priority status, the PoE Controller sets the sub-priority according to the logic port number.

4.5.16 Set Port Parameters

[1]KEY	[2]ECHO	[3]Subject	[4]Subject 1	[5]Subject 2	[6]DATA	[7]DATA	[8]DATA
Command (0x00)	##	*Channel (0x05)*	*PortFullInit (0x4A)*	CH Num	**Cmd**	PPL	
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Priority	*N*	*N*	*N*	*N*	##	##	

This command can enable/disable, set the power limit or set the priority of a single port or of all ports.

There are three separate commands for each parameter. Refer to the **Set Enable/Disable Channels**, **Set Power Limit for Channels** and **Set Port Priority** commands, directly above.

- **CH Num**: The logical port number, as referred to by the Host CPU and usually shown on the PSE front panel. Refer to Section 4.2.
- **Cmd**: 0 - Disable; 1 (Default) - Enable.
- **PPL (Port Power Limit)**: If a port power exceeds PPL level, the PoE system disconnects that port;
- Power can be set up to 20,000 milliwatts. The default value is 16,800 milliwatts (0x41A0) for the PD63000 or 36,000 mW (0x8CA0) for the PD69000 & PD69100; See Note 2 on page 24.
- **Priority**: Critical – 1; high – 2; low – 3 (default).

4.5.17 Set Force Power

[1]KEY	[2]ECHO	[3]Subject	[4]Subject 1	[5]Subject 2	[6]DATA	[7]DATA	[8]DATA
Command (0x00)	##	*Channel (0x05)*	*ForcePower (0x51)*	CH Num	*Cmd*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command forces ports to be connected, regardless of the line detection results.

- **CH Num**: The logical port number, as referred to by the Host CPU and usually shown on the PSE front panel. Refer to Section 4.2.
- **Cmd**: 1 - Force connection; 0 (default) - Normal operation.

Note Take extra care when using this mode, since no PD detection is performed and power is automatically injected. Use this mode only after you have made sure that either the PoE unit is connected to a valid PD capable of receiving PoE power, or during the manufacturers testing. If a port is disabled and then forced on, the port remains off until the port is enabled, and only then is the port connected. If a port was forced on and then disabled, the PoE system ignores the Disable command and returns an error report.

4.5.18 Set Interrupt Mask

[1]KEY	[2]ECHO	[3]Subject	[4]Subject1	[5]Subject2	[6]DATA	[7]DATA	[8]DATA
Command (0x00)	##	*Global (0x07)*	*IRQMask (0x63)*	Mask register		*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command sets the interrupt mask which enables/disables interrupt function events.

Each **Mask register** bit defines whether an event, represented in its corresponding bit of the Interrupt register, is to be masked or unmasked. This masking affects the Interrupt pin output and does not affect the Interrupt register itself.

(0= masked, 1 = unmasked)

For more details concerning the Interrupt function, refer to **Get System Status** command (Section 4.7.4).

Example: If = 1111 1111 1111 0111 b:

Then the event of bit #3 *(port fault)* is masked. If overload occurs, bit #3 of the Interrupt Register changes to '1', but the Interrupt pin voltage level remains 'high' since this event is masked.

If bit #3 of the Mask Register had been '1' (mask register = 0xFFFF), then Interrupt pin voltage level would have dropped to 'low'.

4.5.19 Set Individual Mask

1	2	3	4	5	6	7	8
KEY	**ECHO**	**DATA**	**DATA**	**DATA**	**DATA**	**DATA**	**DATA**
Command (0x00)	##	*Global (0x07)*	*Individual_ Mask (0x56)*	**Mask Key Number**	*En/Dis*	*N*	*N*
9	**10**	**11**	**12**	**13**	**14**	**15**	
DATA	**DATA**	**DATA**	**DATA**	**DATA**	**CSum H**	**CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command sets the individual mask bit:

- **Mask Key Number = 0x00**: Ignores higher priority = '1': not turning off low priority ports in order to turn on higher priority ports.
- **Mask Key Number = 0x01**: Supports capacitor detection = '1': allow capacitor investigations.
- **Mask Key Number = 0x09****: Selects the disconnection method as follows: En/Dis = '1' means AC disconnect method, En/Dis = '0' means DC disconnect method. Default value = AC disconnect method ('1').

  Note: To implement the command, port should be reactivated by disconnecting / connecting or by using the disable / enable command, by restarting the system after 'Save system settings' or by using any other means of reinitializing the port.
- **Mask Key Number = 0x0A**:** EnforcementVmainByVbudget = '1': system budget is set according to table predefined values and the current budget number. EnforcementVmainByVbudget = '0': default system budget is used.
- **Mask Key Number = 0x0C:** This mask is operative only when mask 0x00 = '0'.

  Expanded ignore higher = '1': Ports are grouped according to "critical", "high", and "low" priorities. Behavior:

  1. Delivering power ports at "low" priority will be turned off to free power budget for "critical" or

"high" priority non delivering power port that is requesting power for startup.

2. Delivering power ports at "high" priority will be turned off to free power budget for "critical" priority non-delivering power port that is requesting power for startup.
3. Delivering power ports at the same priority as non delivering power port will not be turned off to free power budget.

Expanded ignore higher = '0': Ports are grouped according to "critical", "high", and "low" priorities and the port numbering of each group (lower numbering = higher priority in a group).

- **Mask Key Number = 0x11**: Selects one of two valid four wire connections (related to back off time) as follows:
  - En/Dis = '0' means Alternative A., En/Dis = '1' means Alternative B. Default value is Alternative A (0).
  - Alternative B should be set for a Midspan PSE or Endspan that utilizes Alternative B pairs as specified in the IEEE 802.3af standard.
- **Mask Key Number = 0x12****: ClassAfterCap = '1': Performs classification after capacitor detection. Only class 0 is reported.
- **Mask Key Number = 0x14**: Hardware reset on ASIC error. En/Dis = '0': if ASIC fails (stops functioning) mark it as 'disabled' and continue working with other ASICs. En/Dis = '1': if ASIC fails perform HW reset.

  See Sections 4.7.3 and 4.7.4 for details on ASIC and system conditions.
- **Mask Key Number = 0x15**: StaticPowerDisconnectFlag = '1': Enables ports disconnection using the calculated static power.
- **Mask Key Number = 0x1A****: RecoveryEnabled = '1': Reset is not generated to the PoE Asics when generated for the PoE controller.
- **Mask Key Number = 0x1B**: Initializes the I2C module system every 10 seconds of inactivity.

  En/Dis = '1': Enables initialization. En/Dis = '0': Disables initialization.
- **Mask Key Number = 0x1E****: I^2C ready notify.
  - En/Dis = '1': Enables notification; when it is activated, the interrupt out pin is used for the notification. In this case, the interrupt out pin events is not active. The interrupt register is still available and updated in real time according to setting of the interrupt mask.
  - En/Dis = '0': Disables notification.
- **Mask Key Number = 0x1F:** RonPwrRonInvestigation = '1': Enables Ron Powering Ron investigation.
- **Mask Key Number = 0x27**:** Software_Disable_PDU = '1': Enables software temporary shutdown.
- **Mask Key Number = 0x28:** System OK LED pin: En/Dis = '1' LED indicates System OK, En/Dis = '0' LED indicates Vmain status (see Set System OK LED Mask Registers, Section 4.5.20).
- **Mask Key Number = 0x29**: Ignore priority upon port startup when using a Dynamic Guard Band. En/Dis = '0' means priority is considered. This means: do not start the port if a higher priority port has PM status. En/Dis = '1' means priority is ignored. If a higher priority port works under the PM mode, a lower priority port will be turned on if it is within the Guard Band limits.
- **Mask Key Number = 0x2A****: Enable ASIC Refresh: En/Dis = '1': check if disabled ASICs can be enabled again. This option requires that Mask Key Number 0x14 be '0' (see above). Read the note below on how to activate this feature. En/Dis = '0': disabled ASIC cannot be enabled until the HW resets.
- **Mask Key Number = 0x2B****: Do not Skip AF Inrush sequence at port startup.

  En/Dis = '1': Normal IEEE802.3at operation. En/Dis = '0': Skip AF Inrush sequence.
- **Mask Key Number = 0x2C****: 1. Power goods lines are connected to the Asic. 0: Connected to the PD69000 or PD69100.
- **Mask Key Number = 0x2D**: DownloadWithoutReset = '1': no ports reset after new software download.
- **Mask Key Number = 0x2E**: Layer 2 (LLPD) Enable / Disable.
  - En/Dis = '1': Layer 2 operation is enabled. Layer 2 commands are processed.
  - En/Dis = '0': Layer 2 PD commands will be Ignored and Layer 2 PSE requests will return with zero allocation.

- **Mask Key Number = 0x2F**: PD defines Port Priority by Layer 2. This operation works only if Layer 2 operation is enabled. En/Dis = '1': Port Priority can be defined by PD. En/Dis = '0': Priority information received from LLDP PD message is ignored.

  To read the **Mask Key Number** value, refer to **Get Individual Mask** command (Section 4.7.27).
- **Mask Key Number = 0x30**: Extra power enable.
  - En/Dis = '1': Enables AT ports to supply up to 36W power
  - En/Dis = '0': Disabled. AT ports supply up to 30W (AT standard)
- **Mask Key Number = 0x31****:2 physical ports (of a single logical port) on a same asic.
  - En/Dis = '1': enable user to set the ports matrix and use 2 physical ports (of a single logical port) on a same asic.
  - En/Dis = '0' : user cannot set the matrix and use 2 physical ports on a same asic. He must configure each port of the two on a separate asic. Both can't be on the same asic

  To configure the ports matrix, refer to **Set Temporary Matrix** command (Section 4.5.11).
- **Mask Key Number = 0x32** :Temperature Derating Feature.
  - En/Dis = '1' : feature is enabled
  - En/Dis = '0' : feature is disabled.
- **Mask Key Number = 0x33** :Temperature Derating Positive Delta.
  - En/Dis = '1' : Positive delta calculation
  - En/Dis = '0' : Negative delta calculation
- **Mask Key Number = 0x34** : Matrix 4Pair Commands Enable
  - En/Dis = '1' : uses new 4pair matrix commands
  - En/Dis = '0' : uses old matrix command (2pair regular commands)
- **Mask Key Number = 0x35** : Group Power Management Enable
  - En/Dis = '1' : uses group power management
  - En/Dis = '0' : feature is disabled
- **Mask Key Number = 0x36** : Asic Reset Config feature.
  - En/Dis = '1' : Asic reset pin is configured as output high after reset
  - En/Dis = '0' : Asic reset pin is configured as high impedance
- **Mask Key Number = 0x37**: Enables or disables the Reduced Capacitor feature:
  - En/Dis = '1' feature is enabled – capacitor detection is cancelled, and capacitance range is limited as described in the table below (this feature is enabled only if mask number 0x02 is enabled too)
  - En/Dis = '0' : feature is disabled

Typical detected loads range when "Reduce Cap = Enable" and the following loads are connected after single serial diode	
Resistance	Parallel Capacitance range [uF]
40 Kohm	3.1 to 4.3
34 Kohm	2.6 to 4.6
25 Kohm	0 to 5.3
19 Kohm	0 to 3.9

- **Mask Key Number = 0x38**: Class0_Eq_AF = '1': when port is AT enabled make class 0 AF.
- **Mask Key Number = 0x39**: Class123_Eq_AF = '1': when port is AT enabled make class 123 AF.
- **Mask Key Number = 0x3A**: ClassBypass2ndError = '1': if second class finger is not class 4 bypass error.
- **Mask Key Number = 0x3B**: ClassErr_Eq_0 = '1': treat class error as class 0.
- **Mask Key Number = 0x3C**: ClassErr_Eq_4 = '1': treat class error as class 4.
- **Mask Key Number = 0x3D:** SysPoH_Enable = '1': enable PoH system flag.

Note ** Not available in PD69100.

Note To enable "ASIC refresh" feature activation:

1. For each existing ASIC, set "IC-Exp" byte (See Section 4.5.6), to 0x0C.
2. Set Mask Key Number 0x14 to '0'.
3. Set Mask Key Number 0x2A to '1'.
4. Save new configuration (see Section 4.5.3)

4.5.20 Set System OK LED Mask Registers

1	2	3	4	5	6	7	8
KEY	**ECHO**	**DATA**	**DATA**	**DATA**	**DATA**	**DATA**	**DATA**
Command (0x00)	##	*Global (0x05)*	*SystemOK Mask (0xA1)*	Blink Register		Light Register	
9	**10**	**11**	**12**	**13**	**14**	**15**	
DATA	**DATA**	**DATA**	**DATA**	**DATA**	**CSum H**	**CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

If the System OK pin is connected to a LED, it can indicate the system overall status. Each one of the following registers bits corresponds to the relevant Interrupt Register bits.

For more details related to the Interrupt function, refer to **Get System Status** command (Section 4.7.4).

The system OK pin functions are:

- If both 'n' bits in the **Blink Register** and in the Interrupt Register are ’1’ then the System OK LED blinks.
- If both 'n' bits in the **Light Register** and in the Interrupt register are ’1’ then the System OK LED illuminates continuously.

The blink rate is 1 Hz.

This command causes the MCU to update the System OK Mask registers.

Note This pin acts as a System OK pin only if the **SystemOKOutBlinkEnable** bit in the Mask flags is set to '1'. Refer to Section 4.5.19 for details on setting this flag.

4.5.21 Set Extended PoE Device Parameters

[1]KEY	[2]ECHO	[3]Subject	[4]Subject1	[5]Subject2	[6]DATA	[7]DATA	[8]DATA
Command (0x00)	##	*Global (0x07)*	*ExtendDeviceParams (0xA3)*	CS Num	SumPowerLimit		*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSumH**	**[15]CSumL**	
N	*N*	*N*	*N*	*N*	##	##	

This command is applicable only for PD69000 devices.

- **CS Num**: Must be 0x08.
- **SumPowerLimit**: The sum of the square expected currents of all ports per single chip divided by 1000. The maximum value is 65535.

Example: If a maximum of 580 mA on each port is required, then the value is $12*580^2/1000 = 4036$.

This limit does not prevent ports from delivering more than 580 mA. It prevents a port from turning on if the summation of the square-currents of ports has already exceeded this value.

To read the **SumPowerLimit** value, refer to **Get Extended PoE Device Params** command, Section 4.7.28.

4.5.22 Set Port Layer2 PD Data

[1] KEY	[2] ECHO	[3] Subject	[4] Subject1	[5] Subject2	[6] DATA	[7] DATA	[8] DATA
Command (0x00)	##	*Channel (0x05)*	*Layer2_PD (0xA6)*	*CH Num*	*Type*	*PD Request Power*	
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
PSE Allocated Power		*Cable Length*	*Execute LLDP*	*N*	##	##	

- **CH Num**: The logical port number, as referred to by the Host CPU and usually shown on the PSE front panel (see Section 4.2).
- **Type**: Layer 2 PD type as specified in the IEEE802.3at / D3.2 standard.

Bits 7:6	Power type	1, 1 = Type 1 PD. 0, 1 = Type 2 PD
Bits 5:4	Power source	1, 1 = PSE and Local 1, 0 = Local 0, 1 = PSE 0, 0 = Unknown
Bits 3:2	Reserved	
Bits 1:0	Power priority	1, 1 = Low 1, 0 = High 0, 1 = Critical 0, 0 = Unknown (default)

When 'Layer 2 (LLDP)' flag is enabled and 'Port priority defined by PD' flag is set and the received priority is unknown, port priority is updated according to the received information. Refer to **Set Individual Command** (Section 4.5.19).
If these conditions are not met, the received priority information is ignored.

- **PD Request Power**: PD requested power value at the PD input. Power = 0.1 x (Decimal value) watts. Value ranges are:
  - 2 pair: from 1 to 255
  - 4 pair:- from 1 to 650
- **PSE Allocated Power**: PSE allocated power value at the PD input. Power = 0.1 x (Decimal value) watts. Value ranges from 1 to 255.
- **Cable Length**: This value is used to calculate the cable resistance.
  The length value is given in meters; the initial value is 100 meters and the corresponding resistance for 100 meters is 12.5 Ohm.
- **Execute LLDP**: This parameter is used to synchronize the execution of the LLDP function, after receiving single PD request, or several PD requests. The synchronization is required to eliminate the possibility that PSE advertisements will not be synchronized to the PD requests, thus, generating wrong power allocations.

  Using this parameter, the Host can determine whether to synchronize the execution of the LLDP function at each PD request, or to store many PD requests as possible and execute all of them at once. Execute as many requests as possible to maintain allocation according to priority.
- Execute LLDP bit 0 = '0' – LLDP is not executed.
- Execute LLDP bit 0 = '1' – LLDP is executed.
- Other bits are reserved for future use and should be set to "0".

After synchronization, it is highly recommended to wait one second before reading the PSE allocations.

4.5.23 Set Power Bank Power Source Type

[1] KEY	[2] ECHO	[3] Subject	[4] Subject1	[5] Subject2	[6] DATA	[7] DATA	[8] DATA
Command (0x00)	##	*Global (0x07)*	*Supply (0x0B)*	*PowerBudgetSourceType (0xA7)*	Bank	SourceType (2 Bit)	N
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
N	N	N	N	N	##	##	

Definition of PSE power source type for each power bank. Two bit per bank as specified in the IEEE802.3at / D3.2 standard, Table 33-23 / page 98. To get the Bank source type, refer to **Get Power Banks**, Section 4.7.8.

- **Bank**: Specifies the power bank number to be configured (1 to 7 for PD63000, 0 to 15 for PD69000 & PD69100).
- **Source Type**: Power Bank Source Type comprises two bit information per bank.
  - 1, 1 = Reserved
  - 1, 0 = Backup source
  - 0, 1 = Primary power source
  - 0, 0 = Unknown

Only the two LSB bits are used; other bits are reserved for future use and should be set to '0.

Bank 0 is a copy of bank 2 and cannot be defined.

4.5.24 Set Power Limits for 4 Pair Channels

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Command (0x00)	##	*Channel (0x05)*	*Supply4Pair (0xAD)*	CH Num	PPL4Pair		*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	*N*	##	##	

This function sets the maximum power per single port. If a port exceeds its power limit, the PoE system shuts down that port.

- **CH Num**: The logical port number, as referred to by the Host CPU and usually shown on the PSE front panel.
- **PPL4Pair (Port Power Limit 4Pair)**: If a port power exceeds the PPL level, the PoE system shuts down that port.

Power can be set in steps of 5 mW, to enable settings of 72 W and above, at a 4 pair port.
Value set of 14400 (0x3840) is equal to 72 W.

4.5.25 Set Temporary Power Limits for 4 Pair Channels

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Command (0x00)	##	*Channel (0x05)*	*Temporary Supply4Pair (0xAE)*	CH Num	TPPL4Pair		*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	*N*	##	##	

Sets the maximum power value per single active port. This value is the port's new power limit only when the port is still 'on'. When the port is turned off, the maximum power for a specific port returns to the PPL. If a port exceeds its power limit, the PoE system shuts down that port.

- **CH Num**: The logical port number, as referred to by the Host CPU and is usually shown on the PSE front panel. Each command cannot be implemented on all ports ('*AllChannels*', refer to Section 4.2), but on a single port only.
- **TPPL4Pair (Temporary Port Power Limit 4 Pair)**: If a port power exceeds the TPPL4Pair level, the PoE system disconnects that port.(5mW per bit)

When this command is received from the Host, the MCU provides the extra power regardless of port configuration. It overrides class and port power table and AF limits. If Icut is based on full power, this command has no effect when asking for more or less power.

If the requested power is higher than Icut, the maximum possible power is provided (max Icut). If the requested power is higher than the maximum power per port definitions, an Out of Range (1) error is returned to the Host CPU. If the port number is '**AllChannels**' an Out of Range (0xB) error is returned.

When a port operates in Layer 2 mode, setting this value will overwrite the value determined by the Layer 2. When this port stops functioning in Layer 2, the TPPL4Pair is initialized to zero.

It is not recommended to use this command with a port operating in Layer 2.

4.5.26 Set 4Pair Port Parameters

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Command (0x00)	##	*Channel (0x05)*	*PortFullInit 4Pair (0xAF)*	CH Num	Cmd	PPL4Pair	
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
Priority	*N*	*N*	*N*	*N*	##	##	

This command can enable/disable, set the power limit or set the priority of a single port or of all ports.

There are three separate commands for each parameter. Refer to the **Set Enable/Disable Channels**, **Set Power Limit for Channels** and **Set Port Priority** commands, directly above.

- **CH Num**: The logical port number, as referred to by the Host CPU and usually shown on the PSE front panel. Refer to Section 4.2.
- **Cmd**: 0 - Disable; 1 (Default) - Enable.
- **PPL4Pair (Port Power Limit 4 Pair)**: If a port power exceeds PPL4Pair level, the PoE system disconnects that port. Power can be set in steps of 5 mW, to allow settings up to 72 W, at a 4 pair port. Value set of 14400 (0x3840) is equal to 72 W..
- **Priority**: Critical – 1; high – 2; low – 3 (default).

4.5.27 Set Derating Data

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Command (0x00)	##	*Global (0x07)*	*Derating (0xBA)*	*PowerBudget* (0x57)	Bank	Max PS Power	
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
Tstart	Tshutdown	Derating Delta Power		*N*	##	##	

Settings

This command sets the Power Derating parameters. This is the maximum total power consumption permitted before entering the power management procedure. Above this level, the lowest priority ports are disconnected (refer **Set Port Priority** command, Section 4.5.14).

- **Max PS Power** : The maximum power supply capability, at normal temperature, according to the power supply datasheets (value in watts).
- **Tstart** : Temperature derating start point. This parameter is part of the derating curve definition. If the temperature is above this level, the actual available budget is changed according to the derating curve settings (DegC).
- **Tshutdown**: Temperature derating end point. This parameter is part of the derating curve definitions. (DegC).
- **Derating Delta Power**: This parameter defines how much power needs to be reduced between the two temperature points (Tstart, Tshutdown). The derating curve slope is calculated as dP/(Tstart-Tshutdown) (value in watts).
- **Bank:** Specifies the power bank number to be configured 0 to 15 for PD69000 & PD69100).

  When using a single power supply, use the **Get Power Supply Parameters** command, Section 4.7.6, to identify the bank number and then set the required power limit for the relevant bank(s).

  When utilizing more than a single power supply, verify which power supply corresponds to each bank and then utilize the Set Power Bank command to set the power limit per each bank.

4.5.28 Set Derating User Temperature

[1] KEY	**[2] ECHO**	**[3] Subject**	**[4] Subject1**	**[5] Subject2**	**[6] DATA**	**[7] DATA**	**[8] DATA**
Command (0x00)	##	*Global (0x07)*	*Derating (0xBA)*	DeratingUserTemp (0x00)	*Temperature (in DeciCelsius)*		*N*
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command enables the user to configure the derating temperature.
Temperature: Write the temperature in DeciCelsius, or write 0x7FFF to disable user temperature and enable reading from temperature sensor.
e.g. setting 40 degrees → write 400 (0x190)

4.5.29 Set Enable/Disable 4 Pair for Channels

[1]KEY	[2]ECHO	[3]Subject	[4]Subject1	[5]Subject2	[6]DATA	[7]DATA	[8]DATA
Command (0x00)	##	*Channel (0x05)*	*EnDis4pair (0x2)*	*CH Num*	*Cmd*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Enables 4 pair functionality for a single logical port -

When 4 pair functionality is enabled for a port, the port is treated as a 4 pair port, assuming that the matrix was configured to support 4 pair for this port, as well.

If 4 pair functionality is disabled for a port, it is treated as a regular port. The matrix is treated as two pair for the selected logical port.

- **CH Num**: The logical port number, as referred to by the Host CPU and usually shown on the PSE front panel. Refer to Section 4.2.
- **Cmd**: 0 - Disables 4 pair functionality.
  1 - Enables 4 pair functionality.

4.5.30 Set BPM Private Label

[1] KEY	[2] ECHO	[3] Subject	[4] Subject1	[5] Subject2	[6] DATA	[7] DATA	[8] DATA
Command (0x00)	##	*Global (0x07)*	*BPMPrivate Label (0x00)*	BPM Private Label	***N***	***N***	*N*
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command verifies that a reset has occurred.
Private label: It is recommended that any value higher than 0x00 be stored in the RAM.
If a "reset occurred", the Private Label value is changed to zero upon reset. To read the Private Label, refer to **Get BPM Data** command (Section 4.7.31).

4.5.31 Set Class Power

[1] KEY	[2] ECHO	[3] Subject	[4] Subject1	[5] Subject2	[6] DATA	[7] DATA	[8] DATA
Command (0x00)	##	*Global (0x07)*	*ClassPower (0xBB)*	Class Type	Class power		*N*
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command sets the class power according to user definition.

Class Type:

- 0 – Class power for class 0.
- 1 – Class power for class 1.
- 2 – Class power for class 2.
- 3 – Class power for class 3.
- >= 4 – Class power for class 4.

Class power (in DeciWatts):
For example, setting class 4 AT power to 40W will be: Class Type=4/5/6/7 Class Power = 400.

This command should be used only when all ports are off.
.

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4.6 Report Key

Each message containing a **Command** or **Program Key** transmitted from the Host to the PoE controller is followed by a **Report Message** sent back from the PoE controller within 400 ms.

4.6.1 Command Received/Correctly Executed

[1]KEY	[2]ECHO	[3]DATA	[4]DATA	[5]DATA	[6]DATA	[7]DATA	[8]DATA
Report (0x52)	##	*(0x00)*	*(0x00)*	*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This report indicates that the PoE controller received the command/program message and that it was properly executed.

4.6.2 Command Received/Wrong Checksum

[1]KEY	[2]ECHO	[3]DATA	[4]DATA	[5]DATA	[6]DATA	[7]DATA	[8]DATA
Report (0x52)	##	*0xFF*	*0xFF*	*0xFF*	*0xFF*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This report indicates that the controller received the command/program message, but its checksum was incorrect; therefore, the command/program is not executed.

4.6.3 Failed Execution/Conflict in Subject Bytes

[1]KEY	[2]ECHO	[3]DATA	[4]DATA	[5]DATA	[6]DATA	[7]DATA	[8]DATA
Report (0x52)	##	*0x0001-0x7FFF*		*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This report indicates that the controller received the command/program message but the subject fields did not match; therefore the command/program is not executed. Any value between 0x0001-0x7FFF in bytes 3 and 4 indicates this type of error.

4.6.4 Failed Execution/Wrong Data Byte Value

[1]KEY	[2]ECHO	[3]DATA	[4]DATA	[5]DATA	[6]DATA	[7]DATA	[8]DATA
Report (0x52)	##	*0x8001-0x8FFF*		*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This report indicates that the controller received the command/program message, but the data fields did not match; therefore, the command/program is not executed. Any value between 0x8001-0x8FFF in bytes 3 and 4 indicates this type of error.

4.6.5 Failed Execution/Undefined Key Value

[1]KEY	[2]ECHO	[3]DATA	[4]DATA	[5]DATA	[6]DATA	[7]DATA	[8]DATA
Report (0x52)	##	*0xFF*	*0xFF*	*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	
This report indicates that the controller received the command/program message, but the KEY fields did not match; therefore the command/program is not executed.							

4.7 Request and Telemetry Keys

Each message with a *Request* KEY, transmitted from the Host to the controller (to obtain information relating to the PoE unit's status) is to be followed by a *Telemetry* message received from the PoE controller within 400 ms.

4.7.1 Get Software Version

The following sections detail the Get Software commands.

4.7.1.1 Host Request

[1]KEY	[2]ECHO	[3]Subject	[4]Subject1	[5]Subject2	[6]DATA	[7]DATA	[8]DATA
Request (0x02)	##	*Global (0x07)*	*Versionz (0x1E)*	*SWversion (0x21)*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

4.7.1.2 Controller Response

[1]KEY	[2]ECHO	[3]DATA	[4]DATA	[5]DATA	[6]DATA	[7]DATA	[8]DATA
Telemetry (0x03)	##	H.W. Version	*N*	Prod #	S.W. Version		*Param #*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Build Num	Internal SW #		*Asic Patch Version*		##	##	

This command is used to retrieve the PoE controller hardware and software versions.

- **H.W. Version**: Identifies the PCB version according to Microsemi's internal conversion table (usually #0).
- **Prod #**: Product Number representing the product that this firmware is aimed for. 0x07 and 0xb is for the PD69000 PoE Controller. For the PD69100 - 0x0D.
- **S.W. Version**: Identifies the software version by a 4-digit number: **Ma** (2 dig) **Mi** (1 dig) **Pa** (1 dig)
- Ma: Major revision, Mi: Minor revision, Pa: Patch revision.
- **Param #**: Parameters codes number. 0x00 means that the default factory parameters are as published in this document. Any other number represents other factory defaults.

  Available:
  - 00 = Default Resistor and Capacitor
  - 01 = DC disconnect instead of AC disconnect
  - 02 = Reserved. Detection only
  - 03 = DC disconnect and Res. Detection = defaults
  - 04 = AC disconnect Resistor and Capacitor
- **Build Num**: For internal use
- **Internal SW #**: For internal use
- **Asic Patch Version:** Asic patch version number
- **Example**: SW Ver = 0x0191 -> 0410d -> Ma =04, Mi =1, Pa =0

  Software version = 04.1.0

  Full Software version is: Product number. SW Version, Parameter number

  Example: 00.0410.02

4.7.2 Get PoE Device Version

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject 2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Versionz (0x1E)*	*PoEDevice Version (0x5E)*	*N*	***N***	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	PoE Device–0 Version		PoE Device–1 Version		PoE Device–2 Version	
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
PoE Device–3 Version		*N*	*N*	*N*	##	##	

Telemetry retrieving of hardware versions for PoE devices.

PoE Device-0 Version, PoE Device-1 Version, PoE Device-2 Version, PoE Device-3 Version:

For PD63000:

- Bits 0 – 9 define the hardware version.
- Bits 10 –15 are the port numbers.

For example, 0x3005 is a 12-port PoE device, hardware version 5.

For PD69000 & PD69100:

- Bits 0 – 6 define the software version.
- Bits 7 – 9 define the RTL version.
- Bits 10 – 11 define the analog version.
- Bits 12 – 15 define the family prefix.

To get PoE device 4/5/6/7 version, Refer to the **Get PoE Device Status** command (Section 4.7.3).

4.7.3 Get PoE Device Status

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Device Params (0x87)*	CS Num	*(0x00)*	*(0x00)*	*(0x00)*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
(0x00)	*(0x00)*	*(0x00)*	*(0x00)*	*(0x00)*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry *(0x03)*	##	CS Num	PoE Device – Version		ASIC status	IC-Exp	IC-HW
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
IC - ports	Tempr	TSH	MIP/AT data	Comm status	##	##	

The 'Auto PoE device detection procedure' is executed during the system initialization stage, when the PoE Controller is reset or powered-up. It is also executed after ASIC changes from 'disabled' to 'enabled' (see 4.5.19). The purpose of this procedure is to assign port numbers per PoE device without any interference from the Host side. It is essential to maintain port numbering even if one or more PoE devices do not operate or do not communicate. Three main parameters are included in this procedure:

- **IC-HW**: Number of ports verified by the internal communication. Whenever the PoE Controller is initialized (reset or powered-up), it communicates with all PoE devices so as to detect their types:
  - **0** = Invalid/non-existing PoE device
  - **4** = 4-port PoE device, for example PD64004/A
  - **8** = 8-port PoE device, for example PD69008
  - **12** = 12-port PoE device, for example PD64012/G, PD69012
- **IC-Exp:** Expected number of PoE device ports. The Host CPU can update the PoE Controller with the expected PoE devices types in the system. It is not necessary in most systems.
- **IC-Ports**: Allocated number of PoE device ports. When the PoE Controller detects all PoE device types at the initialization stage, it compares it to the expected PoE device type to finally allocate a number of ports (0, 4, 8, or 12) per PoE device.

Detailed explanation of the PoE device Auto detection: IC-Ports are the final decision of number of ports allocated to a PoE Device. The decision is based on IC-HW and IC-Exp. The table below shows all options upon start-up.

Line#	IC-Exp	IC-HW	IC-Ports	ASIC Status	Status Description
1	0	0	0	0x00	None – no PoE device
2	0	4/8/12	4/8/12	0x03	Unexpected PoE detection (1)
3	4/8/12	4/8/12	4/8/12	0x01	OK – expected PoE device detection
4	4/8/12	0	4/8/12	0x04	Fail/Missing PoE device
5	4/8/12	12/4/8	12/4/8	0x05	Different PoE device was detected
6	4/8/12	12/4/8	12/4/8	0x06	Different PoE device was detected (1)
7	0	4/8/12	4/8/12	0x02	Unexpected PoE detection

(1) Because of *Auto Save* Mask flag (**AsicAutoDetectSaveParams** bit), IC-Exp changes to IC-HW; the next time reset occurs, the status will be 'OK'.

- **ASIC Status** value is determined only at start-up. It summarizes the relations between IC-Exp, IC-HW and IC-Ports. It determines the on-going ASIC failures. Refer to **Get System Status** command (Section 4.7.4).
- **CS-Num**: PoE device number can be '0' –'7', according to the hardware connection between PoE Controller chip select pins and PoE devices.
- **PoE Device Version – for PD63000**: Bits 0 - 9 define the hardware version, Bits 10 -15 are the port numbers.
- For example: 0x3005 is a 12-port PoE device, hardware version 5.
- For PD69000 & PD69100: bits 0-6 define the SW version; bits 7-9: RTL version; bits 10-11: analog version; bits 12-15: family prefix
- **Temperature**: Temperature telemetry measured by the PoE device. If PoE device doesn't exist, the

response is 0xFF. Units are in Celsius.

- **TSH -** Temperature Switch High is the upper temperature limit per PoE device. Whenever the PoE device temperature exceeds the TSH limit, an interrupt is indicated in the user defined temperature event (bit9 of the Event Register). The highest temperature for the PD64012/G, PD64004A, PD69012 and PD69008 is 150° C and 120° C for the PD64004.
- **MIP/AT Data -** Device Mid-power operation or AT:
  - Bits 0-1 indicates the MiP requests that were set by the "Set PoE Device Parameters" command or by the default values:

    MiP operation/AT - 0x01; Regular AF operation - 0x00.
  - Bits 2-3 indicate the ASIC hardware compatibility
    - MidPower support: 0x01
    - Only AF support: 0x00
    - Always: 0x01 for PD69000 & PD69100
  - Bits 4-5 indicate the ASIC MiP/AT actual status after the decision:
    - MiP operation/AT - 0x1
    - Regular AF operation - 0x0
- **Comm Status -** Bits 0-3 define ASIC Communication error:
  - 0 = No error.
  - 1 = ASIC error.
  - 2 = All ASIC reset.
  - 3 = ASIC reset.
  - 4 = Bus error.
  - 5 = ASIC verification after configuration failed. '5' value can appear upon system startup or after ASIC soft reset.

  This status is "clear on read".

To set parameters values, refer to **Set PoE Device Parameters** command (Section 4.5.6).

4.7.4 Get System Status

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	**SystemStatus** *(0x3D)*	*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry *(0x03)*	##	CPU Status 1	CPU Status 2	Factory Default	GIE	Private label	User Byte
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Device Fail	Temperature disconnect	Temperature alarm	Interrupt register		##	##	

This telemetry indicates the actual system status including that of the CPU, memory and the PoE device as monitored by the Built-In-Test (BIT). This response is the only response initiated by the MCU, regardless of a

request after start-up or after reset (refer to Section 4.5.1).

- **CPU status-1: Bit0** = '1' indicates PoE controller error. **Bit1** = '1' indicates that firmware download is required.
- **CPU status-2: Bit0** = '1' indicates PoE controller memory error. **Bit1** = '1' indicates error (if there are less than eight PoE devices in the system, then **Bit1**= '1').
- **Factory default: Bit0** = '1' indicates that factory default parameters are currently set.
- **GIE (General Internal Error)**: When different from 0x00, it indicates a general internal error.
- **Private Label**: Saved in the RAM. Equals 0x00 after reset. Refer to **Set System Status** command (Section 4.5.4).
- **User Byte:** Saved in memory. Equals 0xFF, once set to factory default.
- **Device Fail:** [(1)]Bits 0 to 7 indicate a failed PoE device(s).

  '1' = Fail or missing PoE Device, '0' = PoE Device is OK.

  Temperature disconnect: [(1)] Bits 0 to 7 indicate overheated PoE device(s).

  This over-heating causes disconnection of all ports.

  '1' = This PoE device caused disconnection due to high temperature, '0' = Temperature is OK.

  Temperature alarm: [(1)] Bits 0 to 7 indicate over heated PoE device(s).

  If temperature exceeds a pre-defined user defined limit, (**Set PoE Device Parameter** command; refer to Section 4.5.7), then the appropriate bit changes to '1'.

  '1' = High temperature, '0' = Temperature is OK.

  To set the alarm limit, refer to **Set PoE Device Parameter** command (Section 4.5.6).
- **Interrupt register** latches a transition when an event occurs. The transition might be one or more of several port status changes, PoE device status event/s or system event/s, depending on event definition.

[(1)] Bit 0 – PoE Device-'0', Bit 1 – PoE Device-'1', Bit 2 – PoE Device-2, Bit 7 – PoE Device-7. Device number is set according to its connectivity to the controller.

When the system sends telemetry after reset or power on, the echo number is 0xFF (as described in the Reset command) and the structure of the message changes when an error is reported. The message structure in this case is as follows:

System status message indicating error							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	*##*	*CPU Status 1*	*N*	*N*	*GIE*	*Private label*	*User Byte*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	*##*	*##*	

CPU status-1: Bit0 ='1' indicates PoE controller error. Bit1 ='1' indicates that firmware download is required.

Field description table in case of error:

Name	GIE value	Private Label Value	User Byte value
Need Download	'N' (0x4E)	'N'	'N'
SW error	1	Boot version	Kernel version
HW error	2	Boot CPU Type	Kernel CPU Type

Sys Type error	3	Boot Sys Type	Kernel Sys Type

When a HW_Error is reported the values could be:

CPU Type	Value
44 Pin – old application	11
64 Pin	0
44 Pin – PD69000	22
36 Pin – PD69100	33

When a Sys Type Error is reported the values could be:

System type	Product	Value
PD33000	PoE+	0x50
PD62000G	Mid-range	0x10
PD63000/G/H	Enhanced	0x50
PD83000G	High power	0xB0
PD69000	Enhanced Rotem	0x30
PD69100	Enhanced Eyal	0x10

In case of error, the system will keep sending this message every second and will only enable initiation of software download protocol as described in Section 4.7.39.

Note Temperature alarm and interrupt registers are of the 'clear-on-read' type (except for bit#8, bit #13) and are cleared immediately after this command is issued.

4.7.4.1 Interrupt Register

The structure of the Interrupt register is described below:

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	Per system event: Each bit represents a system event. Bit = '1' means a system event occurred and the interrupt pin drops to 'LOW'				**Per PoE device event**: Each bit represents a PoE device event. Bit = '1' means a PoE device event occurred, and the interrupt pin drops to 'LOW'				**Per port event**: Each bit represents a port event. If the bit is '1', then a port event occurred, and the interrupt pin drops to 'LOW'							

Event	Bit	Description
Port turned on	0	When any port turns on (its status changes to 0, 1, 43 or 64), this bit is set to '1'.
Port turned off	1	When any port turns off (its status changes from 0, 1, 43 or 64), this bit is set to '1'.
Detection unsuccessful	2	When any port failed in capacitor and resistor detection, (its status changes to 28 or 37), this bit is set to '1'.
Port fault	3	When any port turns off due to over-load, short circuit or port thermal protection (its status changes to 31, 49, 52, 53, 56 or 57), this bit is set to '1'.
Port was in under-load	4	When any port turns off due to under-load (its status changes to 30), this bit is set to '1'.
Port was in overload	5	When any port is overloaded during start-up, (its status changes to 31or 49), this bit is set to '1'.
Port was in PM	6	When any port turns off due to power management (its status changes to 32, 50, 60, 61, 62, or 63), this bit is set to '1'.
Port spare event	7	Future use
Disconnection	8	When all ports turn off due to high temperature (its status changes to 54 or

Event	Bit	Description
temperature		58), this bit is set to '1'. The overheated PoE device can be identified by reading the Temperature Disconnect byte 10.
User defined temperature	9	When any PoE device exceeded the predefined user temperature limit, this bit is set to '1'. The overheated PoE device can be identified by reading the Temperature Alarm byte 11.
PoE device fault	10	When any PoE device is faulty, this bit is set to '1'. The faulty PoE device can be identified by reading the Device Fail byte 9.
PoE device spare event	11	Future use
No more connect	12	When consumed/calculated power is within the Guard Band range (Power limit – Guard Band), this bit is set to '1'. If consumed power is still in the GB range and the interrupt is cleared, this bit remains '0'.
Vmain fault	13	When Vmain is out of range, ports will be disconnected (its status changes to 6, 7, 45 or 46), this bit is set to '1' and remains '1' as long as Vmain is out of range.
System spare event	14, 15	Future use

4.7.4.2 Recommended Interrupt Operations

When Host receives an interrupt, the following operations are recommended:

- Upon receiving the interrupt, the Host CPU should send the **Get System Status** command immediately.
- The Host CPU reads the interrupt register.
- The Host CPU determines what is the next step to be performed, according to the interrupt event.
  - When under-load or overload events occur (bit 4, 5), the Host CPU should send the Get Latches command (refer to Section 4.7.23).
  - When other ports interrupts event occurs, the Host CPU should read all ports statuses in less than three seconds; otherwise port status may change and this information may no longer exist.
  - When a PoE device event occurs the appropriate information is within the **Get System Status** command itself.
  - The Host CPU can issue a request for Vmain or power telemetries.

4.7.5 Get Masks Status

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Maskz (0x2B)*	*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Mask	*N*	*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Telemetry for Mask Command request, to perform the following functions:

- **Mask Bit0 (LSB)**: (Bit0) Enables connection of high priority ports, within the Power Guard Band.
- The Power Guard Band is a range below the Power Limit. When total power consumption is within this range, new ports cannot be connected.
  - 0 = Lowest priority ports shut down when new higher priority port(s) attempts to connect.
  - 1 = A new port attempting to connect is denied access.
- **Mask Bit1**: (Bit1) Detection method
  - 0 = Disable Capacitor Detection (RES mode).
  - 1 = Enable Capacitor Detection (RES+CAP mode).

All other bits (2-7) are ignored. To set these masks, refer to **Set System Mask** command (Section 4.5.9).

4.7.6 Get Power Supply Parameters

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject 1**	**[5]Subject 2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Supply (0x0B)*	*Main (0x17)*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	*Power Consumption*		**Max Shutdown Voltage**		*Min Shutdown Voltage*	
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	Power Bank	Power Limit		*N*	##	##	

Telemetry for main power supply parameters (within the working power budget):

- **Power Consumption**: Actual momentary total power consumption (in watts).
- **Max Shutdown Voltage**: Maximum voltage level set; above this level, PoE ports shutdown.
- **Min Shutdown Voltage**: Minimum voltage level set; below this level, PoE ports shutdown.
- **Power Bank**: The current active Power Bank.
- **Power Limit**: If power consumption exceeds this level, lowest priority ports will be disconnected. To set the desired value, refer to **Set Power** Banks command (Section 4.5.7)

4.7.7 Get Power Supply Voltage

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject 1**	**[5]Subject 2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Supply (0x0B)*	*Measurement (0X1A)*	*N*	***N***	*N*

[9]DATA	[10]DATA	[11]DATA	[12]DATA	[13]DATA	[14]CSum H	[15]CSum L
N	*N*	*N*	*N*	*N*	##	##

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	*Vmain Voltage*		*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	
Telemetry of the main power supply voltage. • **Vmain Voltage**: Actual momentary input line voltage in decivolts.							

4.7.8 Get Power Banks

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject**	**[5]Subject**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Supply (0x0B)*	*PowerBudget (0x57)*	*Bank*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Power Budget		Max Shutdown Voltage		Min Shutdown Voltage	
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Guard Band	Source Type (2 Bits)	*N*	*N*	*N*	##	##	

Retrieves Power Banks settings:

- **Bank**: regular bank number, or bank=0xC0 + bank number for the minimum power budget.
- **Power Budget**: System maximum available power for all PoE ports (PSU power limit).
- **Max Shutdown Voltage**: Maximum voltage level; above this value PoE ports shutdown.
- **Min Shutdown Voltage**: Minimum voltage level; below this value PoE ports shutdown.
- **Guard Band**: A range below the Power Limit. When total power consumption is within this range, new ports cannot be connected.
- **Source Type**: Power Bank Source Type consists of two bit information per bank. Refer to **Set Power Bank Power Source Type** command, Section 4.5.23.
  - 1, 1 = Reserved
  - 1, 0 = Backup source
  - 0, 1 = Primary power source
  - 0, 0 = Unknown

Only the two LSB bits are used; other bits are reserved for future use and should be set to '0'.

For more information on the Power Management commands, refer to **Set Power Banks** command (Section 4.5.7).

Notes

Set Power Source 1 and **Set Power Source 2** commands are relevant for old systems. It is recommended to use only the **Set Power Banks** command for the PoE Controller systems.
These commands are still supported and appear in Version 4.1.

4.7.9 Get All Ports Status

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subjec**	**[4]Subject1**	**[5]Subj**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	**PortsStatus1(0x31)/ PortsStatus2(0x32)/ PortsStatus3(0x33)/ PortsStatus10(0x8F)*	*N*	*N*	***N***	*N*
[9]DATA	**[10]DATA**	**[11]DAT**	**[12]DATA**	**[13]DA**	**[14]CSum**	**[15]Csum**	
N	*N*	*N*	*N*	*N*	##	##	

* PortsStatus1 - PortsStatus10 values are not consecutive; refer to Table 7.

Controller Response (for Subject1 = PortsStatus1), Status for Ports 0 to 10							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 0 Status	Port 1 Status	Port 2 Status	Port3 Status	Port 4 Status	Port 5 Status
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 6 Status	Port 7 Status	Port 8 Status	Port 9 Status	Port 10 Status	##	##	

Controller Response (for Subject1 = PortsStatus2), Status for Ports 11 to 21							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	*Port11 Status*	*Port12 Status*	*Port13 Status*	*Port14 Status*	*Port15 Status*	*Port16 Status*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 17 Status	Port 18 Status	Port 19 Status	Port 20 Status	Port 21 Status	##	##	

Controller Response (for Subject1 = PortsStatus3), Status for Ports 22 to 25							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 22 Status	Port 23 Status	Reserved	Reserved	Reserved	Port 24 Status
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 25 Status	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Subject1 = PortsStatus4), Status for Ports 26 to 36							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 26 Status	Port 27 Status	Port 28 Status	Port 29 Status	Port 30 Status	Port 31 Status
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 32 Status	Port 33 Status	Port 34 Status	Port 35 Status	Port 36 Status	##	##	

Controller Response (for Subject1 = PortsStatus5), Status for Ports 37 to 47							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 37 Status	Port 38 Status	Port 39 Status	Port 40 Status	Port 41 Status	Port 42 Status
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 43 Status	Port 44 Status	Port 45 Status	Port 46 Status	Port 47 Status	##	##	

Controller Response (for Subject 1= PortsStatus6), Status for Ports 48 to 58							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 48 Status	Port 49 Status	Port 50 Status	Port 51 Status	Port 52 Status	Port 53 Status

[9]DATA	[10]DATA	[11]DATA	[12]DATA	[13]DATA	[14]CSum H	[15]CSum L
Port 54 Status	Port 55 Status	Port 56 Status	Port 57 Status	Port 58 Status	##	##

Controller Response (for Subject 1= PortsStatus7), Status for Ports 59 to 69							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 59 Status	Port 60 Status	Port 61 Status	Port 62 Status	Port 63 Status	Port 64 Status
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 65 Status	Port 66 Status	Port 67 Status	Port 68 Status	Port 69 Status	##	##	

Controller Response (for Subject 1= PortsStatus8), Status for Ports 70 to 80							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 70 Status	Port 71 Status	Port 72 Status	Port 73 Status	Port 74 Status	Port 75 Status
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 76 Status	Port 77 Status	Port 78 Status	Port 79 Status	Port 80 Status	##	##	

Controller Response (for Subject 1= PortsStatus9), Status for Ports 81 to 91							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry *(0x03)*	##	Port 81 Status	Port 82 Status	Port 83 Status	Port 84 Status	Port 85 Status	Port 86 Status
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 87 Status	Port 88 Status	Port 89 Status	Port 90 Status	Port 91 Status	##	##	

Controller Response (for Subject 1= PortsStatus10), Status for Ports 92 to 95							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 92 Status	Port 93 Status	Port 94 Status	Port 95 Status	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

The above telemetries show the port status of ports 0 to 95. To accommodate all ports, the commands are divided into 10 different requests, as established by the Subject1 field. This field can receive one of the following parameters: *PortsStatus1* through *PortsStatus10;* a different telemetry is retrieved for each parameter, as specified above. The value returned for the Port Status is described in Table 6. PD63000/G/H

or PD69000 & PD69100 Status = 8 bit.

Table 6: Actual Port Status

Value		Status	Comments
Hex	Dec.		
The following values are suitable for all applications:			
0x00	0	Port is on: Valid capacitor detected	Legacy PD was detected.
0x01	1	Port is on: Valid resistor detected	802.3af-compliant PD was detected.
0x02	2	Port is on 4pair	802.3af/at-compliant PD is powered on 4 pair lines.
0x06	6	Port is off: Main supply voltage is high	Mains voltage is higher than Max Voltage limit
0x07	7	Port is off: Main supply voltage is low	Mains voltage is lower than Min Voltage limit
0x08	8	Port is off: 'Disable all ports' pin is active	Hardware pin disables all ports.
0x0C	12	Port is off: Non-existing port number	Fewer ports are available than the maximum number of ports that the Controller can support. Unavailable ports are considered 'off'.
0x11	17	Port is yet undefined	Getting this status means software problem.
0x12	18	Port is off: Internal hardware fault	Port does not respond, hardware fault, or system initialization.
0x1A	26	Port is off: User setting	User command set port to off.
0x1B	27	Port is off: Detection is in process	Interim state during line detection. Status will change after detection process is completed.
0x1C	28	Port is off: Non-802.3af powered device	Non-standard PD connected.
0x1D	29	Port is off: Overload & Underload states	Succession of Underload and Overload states caused port shutdown. May be also caused by a PD's DC/DC fault.
0x1E	30	Port is off: Underload state	Underload state according to 802.3af (current is below Imin).
0x1F	31	Port is off: Overload state	Overload state according to 802.3af (current is above Icut)
0x20	32	Port is off: Power budget exceeded	Power Management function shuts down port, due to lack of power. Port is shut down or remains off.
0x21	33	Port is off: Internal hardware fault	Hardware problems preventing port operation.
0x24	36	Port is off: Voltage injection into the port	Port fails Capacitor Detection due to voltage being applied to the port from external source (in Capacitor Detection mode).
0x25	37	Port is off: Improper Capacitor Detection results	Fail due to out-of-range capacitor value.
0x26	38	Port is off: Discharged load	Port fails Capacitor Detection due to discharged capacitor.

Table 6: Actual Port Status

Value		Status	Comments
Hex	Dec.		
0x2B	43	Port is on: Detection regardless (Force On)	Port is forced to turn on, unless system error occurs.
0x2C	44	Undefined error during Force On	Reserved for future use.
0x2D	45	Supply voltage higher than settings	These errors appear only after port is in Force On.
0x2E	46	Supply voltage lower than settings	
0x2F	47	Disable_PDU flag raised during Force On	
0x30	48	Port is forced on, then disabled	Disabling is performed by the "Set Enable/Disable" command.
0x31	49	Port is off: Forced power error due to Overload	Overload condition according to 802.3af during Force On.
0x32	50	Port is off: "Out of power budget" during Force On	The port is not ON in spite of Force On activation since the maximal power level has been crossed or there is not sufficient power.
0x33	51	Communication error with PoE devices after Force On	This error appears only after port is forced on.
0x34	52	Port is off: Short condition	Short condition was detected.
0x35	53	Port is off: Over temperature at the port.	Port temperature protection mechanism was activated
0x36	54	Port is off: Device is too hot.	The die temperature is above safe operating value.
0x37	55	Unknown device port status	The device returns an unknown port status for the software.
0x38	56	Force Power Error Short Circuit	Short condition during Force On
0x39	57	Force Power Error Channel Over Temperature	Channel over temperature during Force On
0x3A	58	Force Power Error Chip Over Temperature	Device over temperature during Force On
0x3C	60	Power Management-Static	Calculated power > power limit
0x3D	61	Power Management-Static -ovl	PD class report > user predefined power value
0x3E	62	Force Power Error Management Static	Calculated power > power limit during Force On
0x3F	63	Force Power Error Management Static -ovl	PD class report > user predefined power value during Force On
0x40	64	High power port is ON	High power device was detected
0x41	65	Chip Over Power	Sum of square currents exceeded SumPowerLimit (See Section 4.5.21)
0x42	66	Force Power Error Chip Over Power	Same as previous line, during Force On
0x43	67	Port is off: Class Error	Illegal class

4.7.10 Get All Ports Power

Host Request							
[1]KEY	[2]ECHO	[3]Subjec	[4]Subject1	[5]Subje	[6]DATA	[7]DATA	[8]DATA
Request (0x02)	*##*	*Global (0x07)*	*PortsPower1(0x4B)/ PortsPower2(*	*N*	*N*	*N*	*N*

			0x4C)/ PortsPower3(0x4D)/ ... PortsPower10 (0x94)				
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

* PortsStatus1 to PortsStatus10 values are not consecutive; refer to Table 7.

Controller Response (for Subject1 = PortsPower1), Ports 0 to 10 power consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 0 Power	Port 1 Power	Port 2 Power	Port 3 Power	Port 4 Power	Port 5 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 6 Power	Port 7 Power	Port 8 Power	Port 9 Power	Port 10 Power	##	##	

Controller Response (for Subject1 = PortsPower2), Ports 11 to 21 power consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 11 Power	Port 12 Power	Port 13 Power	Port 14 Power	Port 15 Power	Port 16 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port17 Power	Port18 Power	Port19 Power	Port20 Power	Port21 Power	##	##	

Controller Response (for Subject1 = PortsPower3), Ports 22 to 25 power consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 22 Power	Port 23 Power	Vmain Voltage		Power Consumption	
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Max Power Available		Port 24 Power	Port 25 Power	*N*	##	##	

Controller Response (for Subject1 = PortsPower4), Ports 26 to 36 power consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 26 Power	Port 27 Power	Port 28 Power	Port 29 Power	Port 30 Power	Port31 Power

[9]DATA	[10]DATA	[11]DATA	[12]DATA	[13]DATA	[14]CSum H	[15]CSum L
Port 32 Power	Port 33 Power	Port 34 Power	Port 35 Power	Port 36 Power	##	##

Controller Response (for Subject1 = PortsPower5), Ports 37 to 47 power consumption							
[1]KEY	[2]ECHO	[3]DATA	[4]DATA	[5]DATA	[6]DATA	[7]DATA	[8]DATA
Telemetry (0x03)	##	Port 37 Power	Port 38 Power	Port 39 Power	Port 40 Power	Port 41 Power	Port 42 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 43 Power	Port 44 Power	Port 45 Power	Port 46 Power	Port 47 Power	##	##	

Controller Response (for Subject 1= PortsPower 6), Ports 48 to 58 power consumption							
[1]KEY	[2]ECHO	[3]DATA	[4]DATA	[5]DATA	[6]DATA	[7]DATA	[8]DATA
Telemetry (0x03)	##	Port 48 Power	Port 49 Power	Port 50 Power	Port 51 Power	Port 52 Power	Port 53 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 54 Power	Port 55 Power	Port 56 Power	Port 57 Power	Port 58 Power	##	##	

Controller Response (for Subject 1= PortsPower7), Ports 59 to 69 power consumption							
[1]KEY	[2]ECHO	[3]DATA	[4]DATA	[5]DATA	[6]DATA	[7]DATA	[8]DATA
Telemetry (0x03)	##	Port 59 Power	Port 60 Power	Port 61 Power	Port 62 Power	Port 63 Power	Port 64 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 65 Power	Port 66 Power	Port 67 Power	Port 68 Power	Port 69 Power	##	##	

Controller Response (for Subject 1= PortsPower8), Ports 70 to 80 power consumption							
[1]KEY	[2]ECHO	[3]DATA	[4]DATA	[5]DATA	[6]DATA	[7]DATA	[8]DATA
Telemetry *(0x03)*	##	Port 70 Power	Port 71 Power	Port 72 Power	Port 73 Power	Port 74 Power	Port 75 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 76 Power	Port 77 Power	Port 78 Power	Port 79 Power	Port 80 Power	##	##	

Controller Response (for Subject 1= PortsPower9), Ports 81 to 91 power consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 81 Power	Port 82 Power	Port 83 Power	Port 84 Power	Port 85 Power	Port 86 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 87 Power	Port 88 Power	Port 89 Power	Port 90 Power	Port 91 Power	##	##	

Controller Response (for Subject 1= PortsPower10), Ports 92 to 95 power consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	*Port 92 Power*	*Port 93 Power*	*Port 94 Power*	*Port 95 Power*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

The above telemetries indicate power consumption of ports 0 through 95. The results are indicated in deciwatts. If a port power exceeds the maximum value of 25.5 W, the data byte shows the maximum value (25.5W). This field can receive one of the following parameters: PortsPower1 through PortsPower10. For each parameter, a different telemetry is retrieved, as specified above in the Controller Response heading.

- **Vmain Voltage:** Actual momentary input line voltage, in decivolts.
- **Power Consumption**: Actual momentary total power consumption (in watts).
- **Max Power Available**: The Power Management Limit according to the current active Power Bank.

4.7.11 Get All HIP Ports Power

Host Request							
[1] KEY	**[2] ECHO**	**[3] Subject**	**[4] Subject1**	**[5] Subject2**	**[6]**	**[7] DATA**	**[8] DATA**
Request (0x02)	##	*Global (0x07)*	*AllPortsPower (0x9c)*	*Group*	*N*	*N*	*N*
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14]**	**[15] CSum**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Group = 0), Ports 0 to 10 power consumption							
[1] KEY	**[2] ECHO**	**[3] DATA**	**[4] DATA**	**[5] DATA**	**[6] DATA**	**[7] DATA**	**[8] DATA**
Telemetry	##	*PPW0*	*PPW1*	*PPW2*	*PPW3*	*PPW4*	*PPW5*
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
PPW6	PPW7	PPW8	PPW9	PPW10	##	##	

Controller Response (for Group = 1), Ports 11 to 21 power consumption							
[1] KEY	**[2] ECHO**	**[3] DATA**	**[4] DATA**	**[5] DATA**	**[6] DATA**	**[7] DATA**	**[8] DATA**
Telemetry	##	PPW11	PPW12	PPW132	PPW14	PPW15	PPW16
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
PPW17	PPW18	PPW19	PPW20	PPW21	##	##	

Controller Response (for Group = 2) Ports 22 to 32 power consumption							
[1] KEY	**[2] ECHO**	**[3] DATA**	**[4] DATA**	**[5] DATA**	**[6] DATA**	**[7] DATA**	**[8] DATA**
Telemetry	##	*PPW22*	*PPW23*	*PPW24*	*PPW25*	*PPW26*	*PPW27*
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
PPW28	PPW29	PPW30	PPW31	PPW32	##	##	

Controller Response (for Group = 3), Ports 33 to 43 power consumption							
[1] KEY	**[2] ECHO**	**[3] DATA**	**[4] DATA**	**[5] DATA**	**[6] DATA**	**[7] DATA**	**[8] DATA**
Telemetry	##	*PPW33*	*PPW34*	*PPW35*	*PPW36*	*PPW37*	*PPW38*
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
PPW39	PPW40	PPW41	PPW42	PPW43	##	##	

Controller Response (for Group = 4), Ports 44 to 54 power consumption							
[1] KEY	**[2] ECHO**	**[3] DATA**	**[4] DATA**	**[5] DATA**	**[6] DATA**	**[7] DATA**	**[8] DATA**
Telemetry	##	*PPW44*	*PPW45*	*PPW46*	*PPW47*	*PPW48*	*PPW49*
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
PPW50	PPW51	PPW52	PPW53	PPW54	##	##	

Controller Response (for Group = 5), Ports 55 to 65 power consumption							
[1] KEY	**[2] ECHO**	**[3] DATA**	**[4] DATA**	**[5] DATA**	**[6] DATA**	**[7] DATA**	**[8] DATA**
Telemetry	##	*PPW55*	*PPW56*	*PPW157*	*PPW58*	*PPW59*	*PPW60*
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
PPW61	PPW62	PPW63	PPW64	PPW65	##	##	

Controller Response (for Group = 6) Ports 66 to 76 power consumption							
[1] KEY	**[2] ECHO**	**[3] DATA**	**[4] DATA**	**[5] DATA**	**[6] DATA**	**[7] DATA**	**[8] DATA**
Telemetry	##	PPW66	PPW67	PPW68	PPW59	PPW70	PPW71
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
PPW72	PPW73	PPW74	PPW75	PPW76	##	##	

Controller Response (for Group = 7), Ports 77 to 87 power consumption							
[1] KEY	**[2] ECHO**	**[3] DATA**	**[4] DATA**	**[5] DATA**	**[6] DATA**	**[7] DATA**	**[8] DATA**
Telemetry	##	PPW77	PPW78	PPW79	PPW80	PPW81	PPW82
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
PPW83	PPW84	PPW85	PPW86	PPW87	##	##	

Controller Response (for Group = 8), Ports 88 to 95 power consumption							
[1] KEY	**[2] ECHO**	**[3] DATA**	**[4] DATA**	**[5] DATA**	**[6] DATA**	**[7] DATA**	**[8] DATA**
Telemetry	##	PPW88	PPW89	PPW90	PPW91	PPW92	PPW93
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
PPW94	PPW95	*N*	*N*	*N*	##	##	

The above telemetries indicate ports power of 0 thru 95. To accommodate all ports, the commands are divided into nine (9) different requests, as established by the Group field. This field can receive the values from 0-8*;* a different telemetry is retrieved for each group, as specified above.

PPW #i: Indicates the power consumed by the logical port #i.
Port power #i = PPW#i / 5 [watt]
For example if PPW#3 = 64, then Port power #3 = 64 / 5 = 12.8 [watt]

4.7.12 Get All Ports Enable/Disable Mode

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject 1**	**[5]Subject 2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*EnDis (0x0C)/ EnDis2 (0x88)*	*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Subject 1= EnDis), Ports 0-47							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	En/Dis 0-7	En/Dis 8-15	En/Dis 16-23	*(0x00)*	En/Dis 24-31	En/Dis 32-39
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
En/Dis 40-47	*(0x00)*	N	N	N	##	##	

Controller Response (for Subject 1= EnDis2), Ports 48-95							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	*En/Dis 48-55*	*En/Dis 56-63*	*En/Dis 64-71*	*(0x00)*	*En/Dis 72-79*	*En/Dis 80-87*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
En/Dis 88-95	*(0x00)*	*N*	*N*	*N*	##	##	

Telemetry of all system ports, indicating their Enable/Disable status.

Status – 1 = Enable; 0 = Disable. Refer to **Set Enable/Disable Channels** command, Section 4.5.12**.**

4.7.13 Get Single Port Status

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject 1**	**[5]Subject 2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Channel (0x05)*	*PortStatus (0x0E)*	CH Num	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	En/Dis	Port Status	Normal/Test	Latch	Class	N
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	AF/AT	4PairEn	*N*	##	##	

This telemetry indicates the port status as follows:

- **CH Num**: The logical port number, as referred to by the Host CPU and shown on the PSE front panel. Refer to Section 4.2.
- **En/Dis**: Indicates whether the port is enabled (1) or disabled (0).
- **Port Status**: Indicates the actual port status as defined in Table 6. For PD63000/G/H or PD69000 & PD69100, status = 8 bit.
- **Normal/Test**: for future use
- **Latch**: (Port latch) Indicates that certain events have occurred. The latches are of the Clear-On-Read type.
  - *bit0* = 1 indicates an Underload latch condition
  - *bit1* = 1 indicates an Overload latch condition
  - *bit2* = 1 indicates a Force On current condition
  - *bit3, bit4* = indicate Underload (UDL) sticky counter
  - *bit5* =1 indicates short circuit condition
  - *Bit6, 7* = indicate detection failure sticky counter
- **Class**: Power class of the PD according to 802.3at definitions.

Class Type	Value
Class 0	0
Class 1	1
Class 2	2
Class 3	3
Class 4	4 - 7

- **AF/AT (for PD69000 & PD69100): 0** – only IEEE802.3af operation; 1 - IEEE802.3at operation. For PD63000 the value is always 'N'.
- **4PairEn:** 1 – 4 pair operation is enabled; 0 – 4 pair operation is disabled, the port behaves like a 2 pair port.

4.7.14 Get Port Power Limit

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject 1**	**[5]Subject 2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Channel (0x05)*	*Supply (0x0B)*	CH Num	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	PPL		*TPPL*		*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Telemetry for port's pre-defined power limit.

- **CH Num**: The logical port number, as referred to by the Host CPU and usually shown on the PSE front panel. Refer to Section 4.2 (the 'All_Ports' option is not applicable).
- **PPL (Port Power Limit)**: If port power exceeds the PPL level, the PoE system disconnects that port. The results are indicated in mW **TPPL (Temporary Port Power Limit)**: The power limit of a working port referring to a specific PD

Refer to **Set Power Limit for Channels**, Section 4.5.13 and **Set Temporary Power Limit for Channels**, Section 4.5.14.

4.7.15 Get Port Priority

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject**	**[5]Subject**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Channel (0x05)*	*Priority (0x0A)*	CH Num	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	*Priority*	*N*	*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Telemetry retrieving a single port priority.

- **CH Num**: The logical port number, as referred to by the Host CPU and usually shown on the PSE front panel. Refer to Section 4.2 (the All_Ports option is not applicable).
- **Priority:** 1 = Critical; 2 = High; 3 = Low

Refer to **Set Port Priority** command, Section 4.5.14.

4.7.16 Get Port Measurements

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject 1**	**[5]Subject 2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Channel (0x05)*	*Paramz (0x25)*	CH Num	*N*	*N*	*N*

[9]DATA	[10]DATA	[11]DATA	[12]DATA	[13]DATA	[14]CSum H	[15]CSum L
N	*N*	*N*	*N*	*N*	##	##

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Vmain Voltage		Calculated Current		Power Consumption	
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	Port Voltage		N	N	##	##	

Telemetry for momentary port electrical parameters.

- **CH Num**: The logical port number as referred to by the Host CPU and usually shown on the PSE front panel. Refer to Section 4.2 (the All_Ports option is not applicable).
- **Vmain Voltage**: Actual momentary input line voltage, in decivolts.
- **Calculated Current**: Port momentary calculated current (in milliamps) = Power/Vmain
- **Power Consumption**: Actual momentary total power consumption (in milliwatts).
- **Port Voltage**: For PD69000 & PD69100: Actual momentary voltage on the port, in decivolts. For PD63000: each byte has a value of 'N'.

4.7.17 Get Physical Port Number from Temporary Matrix

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject**	**[5]Subject**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Channel (0x05)*	*TmpMatrix (0x43)*	CH Num	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Physical Number A	Physical Number B	*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	*N*	##	##	

Telemetry for temporary matrix data.

- **CH Num**: The logical port number, as referred by the Host CPU and usually shown on the front panel of the PSE. Refer to Section 4.2 (the All_Ports option is not applicable).
- **Physical Number A:** The port number, according to the output pins of the integrated solution (for example PD64012/G).
- **Physical Number B:** Optional; only valid if individual mask 0x34 is set to '1'.

For example: Port number 4 in device number 2 is physical number 15.

Factory default: Physical Number A = CH Num, Physical Number B = 0xFF.

4.7.18 Get Physical Port Number from Active Matrix

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject 1**	**[5]Subject 2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Channel (0x05)*	*ChannelMatrix (0x44)*	CH Num	*N*	***N***	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Physical Number A	Physical Number B	*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Telemetry for active matrix data.

- **CH Num**: The logical port number, as referred to by the Host CPU and usually shown on the PSE front panel. Refer to Section 4.2 (the All_Ports option is not applicable).
- **Physical Number A:** The port numbers, according to the output pins of the integrated solution (e.g.: PD64012/G).
- **Physical Number B:** Optional. Only valid if individual mask 0x34 is set to '1'.

For example: port number 4, in device number 2, is physical number 15.

Factory default: Physical Number A = CH Num, Physical Number B = 0xFF.

4.7.19 Get UDL Counters

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*UDLCounter1(0x59)/ UDLCounter2(0x5A)/ UDLCounter3(0x89)/ UDLCounter4(0x8A)*	*N*	*N*	***N***	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Subject1= UDLCounter1), Ports 0 to 23							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Ports 0 to 3	Ports 4 to 7	**Ports 8 to 11**	**Ports 12 to 15**	**Ports 16 to 19**	**Ports 20 to 23**
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Subject1= UDLCounter2), Ports 24 to 47							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Ports 24 to 27	Ports 28 to 31	**Ports 32 to 35**	**Ports 36 to 39**	**Ports 40 to 43**	**Ports 44 to 47**
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Subject1= UDLCounter3), Ports 48 to 71							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Ports 48 - 51	Ports 52 - 55	Ports 56 - 59	Ports 60 - 63	Ports 64 - 67	Ports 68 - 71
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Subject1= UDLCounter4), Ports 72 to 95							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Ports 72 - 75	Ports 76 - 79	Ports 80 - 83	Ports 84 - 87	Ports 88 - 91	Ports 92 - 95
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Settings

The above commands retrieve underload counters state for ports 0 through 95. To accommodate all ports, the commands are divided into four different requests, as established by the Subject1 field. This field can receive one of the following parameters: UDLCounter1 through UDLCounter4. A different telemetry is retrieved for each parameter, as specified above.

These commands are related to the **Get Single Port Status** command (Section 4.7.13), via the sticky counter status, bits 3 and 4 of the port latch.

Remarks

- The user should advance its 32-bit UDL counter **only** according to changes in the sticky counter. Implementing this sticky counter reduces communication periods to one every four seconds. As for the rest of the MIB counters, the user can utilize the port status reports.
- In each byte, the lowest channel number is represented by the LSB bits; the highest channel number is represented by the MSB bits.
- The counter is 2-bit wide per port. The counter will count up to 3 and get stuck until **Get UDL Counter** command (Section 4.7.19) is performed. The read action clears the counter.
- The counters refer to logic ports.

4.7.20 Get PM Method

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject 1**	**[5]Subject 2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Supply (0x0B)*	*PowerManageMode (0X5F)*	*N*	***N***	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	PM Mode			*N*	*N*	*N*
		PM1	PM2	PM3			
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	
PM Mode: Refer to **Set PM Method** command (Section 4.5.8).							

4.7.21 Get Total Power

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject 1**	**[5]Subject 2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Supply (0x0B)*	*ExpendedPowerInfo (0x60)*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Power Consumption		**Calculated Power**		*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

- **Power Consumption**: The actual power consumed by all ports.
- **Calculated Power**: The sum of all ports power, allocated as defined by IEEE standard 802.3af-2003, or actually consumed, according to the Calculated Power Management Mode; refer to **Set PM Method** command, Section 4.5.8.
  - If the calculated power is greater than the Power Budget limit, then ports are disconnected, until the calculated power is less than the Power Budget limit.
  - If the [(calculated power > Power Budget limit) – Guard Band], then new ports are not connected.

4.7.22 Get All Ports Class

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject 1**	**[5]Subject 2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*AllPortClass (0x61)*	Group	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Group=0), Ports 0-15 classes							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Group = 0	CI – 0, 1	CI – 2, 3	CI – 4, 5	CI – 6, 7	CI – 8, 9
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
CI – 10, 11	*CI – 12, 13*	*CI – 14, 15*	*N*	*N*	##	##	

Controller Response (for Group=1), ports 16-31 classes							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Group = 1	CI – 16, 17	CI – 18, 19	CI – 20, 21	CI – 22, 23	CI – 24, 25
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
CI – 26, 27	*CI – 28, 29*	*CI – 30, 31*	*N*	*N*	##	##	

Controller Response (for Group=2), ports 32-47 classes							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Group = 2	*CI – 32, 33*	CI – 34, 35	CI – 36, 37	CI – 38, 39	CI – 40, 41
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
CI – 42, 43	*CI – 44, 45*	*CI – 46, 47*	*N*	*N*	##	##	

Controller Response (for Group=3), Ports 48-63 classes							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Group = 3	CI – 48, 49	CI – 50, 51	CI – 52, 53	CI – 54, 55	CI – 56, 57
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
CI – 58, 59	*CI – 60, 61*	*CI – 63, 63*	*N*	*N*	##	##	

Controller Response (for Group=4), Ports 64-79 classes							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Group = 4	CI – 64, 65	CI – 66, 67	CI – 68, 69	CI – 70, 71	CI – 72, 73
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
CI – 74, 75	*CI – 76, 77*	*CI – 78, 79*	*N*	*N*	##	##	

Controller Response (for Group=5), Ports 80-95 classes							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Group = 5	CI – 80, 81	CI – 82, 83	CI – 84, 85	CI – 86, 87	CI – 88, 89
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
CI – 90, 91	*CI – 92, 93*	*CI – 94, 95*	*N*	*N*	##	##	

The above commands retrieve the class for ports 0 through 95. To accommodate all ports, the commands are divided into 5 different requests, as established by the Group field. This field can receive one of the following 0 to 5 values. A different telemetry is retrieved for each parameter, as specified above.

In each class data byte, the LSB is the lower port class and the MSB is the higher port class.

MSB	LSB
Port2	Port1

For example: if byte #8 in the controller response for class group #0 is 0x23, then port # 8 is of class “3” and port #9 is of class ”2”.

4.7.23 Get Latches

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Latches(0x3A)/ Latches2(0x49)/ Latches3(0x95)/ Latches4(0x96)*	*N*	*N*	*N*	*N*

[9]DATA	[10]DATA	[11]DATA	[12]DATA	[13]DATA	[14]CSum H	[15]CSum L
N	*N*	*N*	*N*	*N*	##	##

Controller Response (for Subject 1= Latches), Ports 0 to 23							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Ports 0 to 3	Ports 4 to 7	Ports 8 to 11	Ports 12 to 15	Ports 16 to 19	Ports 20 to 23
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Subject 1= Latches2), Ports 24 to 47							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Ports 24 to 27	Ports 28 to 31	Ports 32 to35	Ports 36 to 39	Ports 40 to 43	Ports 44 to 47
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Subject 1= Latches3), Ports 48 to 71							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry *(0x03)*	##	Ports 48 to 51	Ports 52 to 55	Ports 56 to 59	Ports 60 to 63	Ports 64 to 67	Ports 68 to 71
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

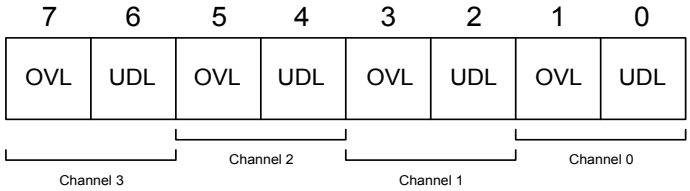
Controller Response (for Subject 1= Latches4), Ports 72 to 95							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Ports 72 to 75	Ports 76 to 79	Ports 80 to 83	Ports 84 to 87	Ports 88 to 91	Ports 92 to 95
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

The above commands retrieve latches status for ports 0 through 95. To accommodate all ports, the commands are divided into four different requests, as established by the Subject1 field. This field can receive one of the following parameters: Latches through Latches 4. A different telemetry is retrieved for each parameter, as specified above.

Port Latch: Each byte covers four ports. Indicates that certain events occurred:

For example, Ports0-3 byte:

- *bit 0*, 2, 4, 6 = 1 indicates an under load (UDL) latch condition in the corresponding channel (0, 1, 2, 3).
- *bit 1, 3, 5, 7* = 1 indicates an overload (OVL) latch condition in the corresponding channel(0, 1, 2, 3)



Note: The latched bit refers to a logic port.

4.7.24 Get Interrupt Mask

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*IRQMask (0x63)*	*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Mask register		*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command retrieves the register mask value that enables each event of the interrupt function.

The **Mask Register** bits define either masked or unmasked for the Interrupt Register (0 = masked, 1 = unmasked).

For detailed bits description, refer to **Get System Status** command, Section 4.7.4.

4.7.25 Get System OK LED Mask Registers

1	2	3	4	5	6	7	8
KEY	**ECHO**	**DATA**	**DATA**	**DATA**	**DATA**	**DATA**	**DATA**
Request (0x02)	##	*Global (0x07)*	*SystemOK Mask (0xA1)*	*N*	*N*	*N*	*N*

9	10	11	12	13	14	15
DATA	DATA	DATA	DATA	DATA	CSum H	CSum L
N	*N*	*N*	*N*	*N*	##	##

Controller Response							
1	2	3	4	5	6	7	8
KEY	ECHO	DATA	DATA	DATA	DATA	DATA	DATA
Telemetry (0x03)	##	Blink Register		Light Register		*N*	*N*
9	10	11	12	13	14	15	
DATA	DATA	DATA	DATA	DATA	CSum H	CSum L	
N	*N*	*N*	*N*	*N*	##	##	

If both 'n' bits in the **Blink Register** and in the **Interrupt Register** are '1' then the System OK LED blinks.

If both 'n' bits in the **Light Register** and in the **Interrupt Register** are '1' then the System OK LED illuminates continuously.

For more details refer to **Set System OK Led Mask Registers** (Section 4.5.20).

4.7.26 Get Detection Failure Counters

Host Request							
[1]KEY	[2]ECHO	[3]Subject	[4]Subject 1	[5]Subject 2	[6]DATA	[7]DATA	[8]DATA
Request (0x02)	##	*Global (0x07)*	*DetCnt1 (0x85)/ DetCnt2 (0x86)/ DetCnt3 (0x98)/ DetCnt4 (0x99)*	*N*	*N*	*N*	*N*
[9]DATA	[10]DATA	[11]DATA	[12]DATA	[13]DATA	[14]CSum H	[15]CSum L	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Subject 1= DetCnt1), Ports 0 to 23							
[1]KEY	[2]ECHO	[3]DATA	[4]DATA	[5]DATA	[6]DATA	[7]DATA	[8]DATA
Telemetry (0x03)	##	Ports 0 to 3	Ports 4 to 7	Ports 8 to 11	Ports 12 to 15	Ports 16 to 19	Ports 20 to 23
[9]DATA	[10]DATA	[11]DATA	[12]DATA	[13]DATA	[14]CSum H	[15]CSum L	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Subject 1= DetCnt2), Ports 24 to 47							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Ports 24 to 27	Ports 28 to 31	Ports 32 to 35	Ports 36 to 39	Ports 40 to 43	Ports 44 to 47
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Subject 1= DetCnt3), Ports 48 to 71							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	*Ports 48 to 51*	*Ports 52 to 55*	*Ports 56 to 59*	*Ports 60 to 63*	*Ports 64 to 67*	*Ports 68 to 71*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Subject 1= DetCnt4), Ports 72 to 95							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	*Ports 72 to 75*	*Ports 76 to 79*	*Ports 80 to 83*	*Ports 84 to 87*	*Ports 88 to 91*	*Ports 92 to 95*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

The above commands retrieve Detection Failure counters for ports 0 through 95. To accommodate all ports, the commands are divided into four different requests, as established by the Subject 1 field. This field can receive one of the following parameters: DetCnt1 through DetCnt4. A different telemetry is retrieved for each parameter, as specified above.

Remarks

- The user should advance its 32-bit UDL counter **only** according to changes in the sticky counter. Implementing this sticky counter reduces communication periods to once every four seconds. As for the rest of the MIB counters, the user can utilize the port status reports.
- In each byte, the lowest channel number is represented by the LSB bits; the highest channel number is represented by the MSB bits
- The counter is 2-bit wide per port. The counter counts up to 3 and remains there until **Get UDL Counter** command (Section 4.7.19) is performed. The read action clears the counter.

Note: The counters refer to logic ports.

4.7.27 Get Individual Mask

Host Request							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
KEY	**ECHO**	**Subject**	**Subject1**	**Subject2**	**DATA**	**DATA**	**DATA**
Request (0x02)	##	*Global (0x07)*	*Individual_Mask (0x56)*	Mask Key Number	*N*	*N*	*N*

9	10	11	12	13	14	15
DATA	DATA	DATA	DATA	DATA	CSum H	CSum L
N	*N*	*N*	*N*	*N*	##	##

Controller Response							
1	2	3	4	5	6	7	8
KEY	ECHO	DATA	DATA	DATA	DATA	DATA	DATA
Telemetry	##	En/Dis	*N*	*N*	*N*	*N*	*N*
9	10	11	12	13	14	15	
DATA	DATA	DATA	DATA	DATA	CSum H	CSum L	
N	*N*	*N*	*N*	*N*	##	##	

Telemetry of Individual Mask bit.

To write the **Mask Key Number** value and for more information on the various key numbers, refer to **Set Individual Mask** command, Section 4.5.20

4.7.28 Get Extended PoE Device Parameters

Host Request							
[1]KEY	[2]ECHO	[3]Subject	[4]Subject1	[5]Subject2	[6]DATA	[7]DATA	[8]DATA
Request (0x02)	##	*Global (0x07)*	*ExtendDeviceParams (0xA3)*	CS Num	*N*	*N*	*N*
[9]DATA	[10]DATA	[11]DATA	[12]DATA	[13]DATA	[14]CSum H	[15]CSum L	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	[2]ECHO	[3]DATA	[4]DATA	[5]DATA	[6]DATA	[7]DATA	[8]DATA
Telemetry (0x03)	##	CS Num	SumPowerLimit		N	N	N
[9]DATA	[10]DATA	[11]DATA	[12]DATA	[13]DATA	[14]CSum H	[15]CSum L	
N	*N*	*N*	*N*	*N*	##	##	

This request will return the value of the Over Power Limit. For further details related to this value, see **Set Extended PoE Device Params**, Section 4.5.21.

CS Num: Only a single SumPowerLimit value currently exists in the system. Hence, CS Num will have no effect and will be returned to the Host CPU within the response message.

4.7.29 Get Port Layer2 PSE Data

4.7.29.1 Host Request

[1] KEY	[2] ECHO	[3] Subject	[4] Subject1	[5] Subject2	[6] DATA	[7] DATA	[8] DATA
Request (0x02)	##	*Channel (0x05)*	*Layer2_PSE (0xA8)*	CH Num	N	N	N
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
N	N	N	N	N	##	##	

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4.7.29.2 Controller Response

[1] KEY	[2] ECHO	[3] Subject	[4] Subject1	[5] Subject2	[6] DATA	[7] DATA	[8] DATA
Telemetry (0x03)	##	PSE Allocated Power		PD Requested Power		PSE Power Type	Power Class
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
PSE Power Pair	MDI Power Status	Cable Length	Port indication + Power Consumption		##	##	

This request returns the port Layer 2 data.

Refer to **Set Port Layer2 PD Data**, Section 4.5.22 and **Set Power Bank Power Source Type**, Section 4.5.23.

- **CS Num:** The logical port number, as referred to by the Host CPU and usually shown on the PSE front panel. Refer to Section 4.2.
- **PSE Allocated Power:** PSE allocated power value at the PD input. Power = 0.1 x (Decimal value) watts. Value ranges from 1 to 650. ('0' means inactive port).
- **PD Request Power:** PD requested power value at the PD input. Power = 0.1 x (Decimal value) watts. Value ranges from 1 to 650. ('0' means inactive port)
- **PSE Power Type:** Layer 2 PSE type as specified in the IEEE802.3at / D3.2 standard.
  - bits 7:6: Power type
    - 1, 0 = Type 1 PSE.
    - 0, 0 = Type 2 PSE.
  - bits 5:4: Power source
    - 1, 1 = Reserved
    - 1, 0 = Backup source
    - 0, 1 = Primary power source
    - 0, 0 = Unknown

    These bits are defined according to the 'power good' pins' status and power bank definitions.
  - bits 3:2: Reserved
  - bits 1:0: Power priority
    - 1, 1 = Low
    - 1, 0 = High
    - 0, 1 = Critical
- **Power Class**: The classification value that was detected by the PSE. Class 0 detection returns '1'value., Class 1 detection returns '2' value and so on.
- **PSE Power Pair:** Data Pair – Returns '1' value.

  Spare Pair – Returns '0' value.
- **MDI Power Status**:
  - bit 7:4 = "0000"
  - bit 3 = '0' – Pairs control capability. Host needs to perform OR function for this bit with '0' / '1' according to system capabilities.
  - bit 2 = Port En/Dis.
  - bit 1 = '1' (Support PoE).
  - bit 0 = '1' (PSE).
- **Power Consumption**:
  - Bit 15:13 – Reserved.
  - Bit 12 – Port is on/off (1-on, 0-off).
  - Bit 11:0 – Port Power Consumption.

4.7.30 Get BPM Data

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Supply (0x0B)*	*BackplanePowerData (0xA4)*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	*Calculated Power Critical*		Calculated Power High		Calculated Power Low	
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Delta Power		*BPM Private Label*	*N*	*N*	##	##	

- **Calculated Power Critical**: The sum of all ports power with Critical priority, allocated as defined by the IEEE standard 802.3af-2003, or actually consumed, according to the Calculated Power Management Mode; refer to **Set PM Method** command (Section 4.5.8).
- **Calculated Power High**: The sum of all ports power with High priority, allocated as defined by the IEEE standard 802.3af-2003, or actually consumed, according to the Calculated Power Management Mode; refer to **Set PM Method** command (Section 4.5.8).
- **Calculated Power Low**: The sum of all ports power with Low priority, allocated as defined by the IEEE standard 802.3af-2003, or actually consumed, according to the Calculated Power Management Mode; refer to **Set PM Method** command (Section 4.5.8).
- **Delta Power**: The difference between the system allocated power budget and the actual power budget available for the system (can be the GB number).
- **BPM Private Label**: Set by **Set BPM Private Label** command. (Section 4.5.30).

4.7.31 Get BPM Request Data

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Supply (0x0B)*	*BPMReqData (0xA5)*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Requested Power Critical		Requested Power High		Requested Power Low	
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Requested Power Critical/High/Low: The power sum of all critical/high/low (respectively) priority ports that did not turned on, due to PM limitation. The power is derived from PPL level or from the detected port's class; refer to **Set PM Method** command (Section 4.5.8).

4.7.32 Get All 4Pair Ports Power

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Ports4PairPower1..10 (0xB0…0xB9)*	*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port0 Power	Port1 Power	Port2 Power	Port3 Power	Port4 Power	Port5 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
Port 6 Power	Port 7 Power	Port 8 Power	Port 9 Power	Port 10 Power	##	##	

Controller Response (for Subject1 = *Ports4Pair*Power2), Ports 11 to 21 Power Consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 11 Power	Port 12 Power	Port 13 Power	Port 14 Power	Port 15 Power	Port 16 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 17 Power	Port 18 Power	Port 19 Power	Port 20 Power	Port 21 Power	##	##	

Controller Response (for Subject1 = Ports4PairPower3), Ports 22 to 25 Power Consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 22 Power	Port 23 Power	Vmain Voltage		Power Consumption	
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Max Power Available		Port 24 Power	Port 25 Power	*N*	##	##	

Controller Response (for Subject1 = Ports4PairPower4), Ports 26 to 36 Power Consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 26 Power	Port 27 Power	Port 28 Power	Port 29 Power	Port 30 Power	Port31 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 32 Power	Port 33 Power	Port 34 Power	Port 35 Power	Port 36 Power	##	##	

Controller Response (for Subject1 = Ports4PairPower5), Ports 37 to 47 Power Consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 37 Power	Port 38 Power	Port 39 Power	Port 40 Power	Port 41 Power	Port 42 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 43 Power	Port 44 Power	Port 45 Power	Port 46 Power	Port 47 Power	##	##	

Controller Response (for Subject 1= Ports4PairPower 6), Ports 48 to 58 Power Consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 48 Power	Port 49 Power	Port 50 Power	Port 51 Power	Port 52 Power	Port 53 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 54 Power	Port 55 Power	Port 56 Power	Port 57 Power	Port 58 Power	##	##	

Controller Response (for Subject 1= Ports4PairPower7), Ports 59 to 69 Power Consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 59 Power	Port 60 Power	Port 61 Power	Port 62 Power	Port 63 Power	Port 64 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 65 Power	Port 66 Power	Port 67 Power	Port 68 Power	Port 69 Power	##	##	

Controller Response (for Subject 1= Ports4PairPower8), Ports 70 to 80 Power Consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 70 Power	Port 71 Power	Port 72 Power	Port 73 Power	Port 74 Power	Port 75 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 76 Power	Port 77 Power	Port 78 Power	Port 79 Power	Port 80 Power	##	##	

Controller Response (for Subject 1= Ports4PairPower9), Ports 81 to 91 Power Consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 81 Power	Port 82 Power	Port 83 Power	Port 84 Power	Port 85 Power	Port 86 Power
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 87 Power	Port 88 Power	Port 89 Power	Port 90 Power	Port 91 Power	##	##	

Controller Response (for Subject 1= Ports4PairPower10), Ports 92 to 95 Power Consumption							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	*Port 92 Power*	*Port 93 Power*	*Port 94 Power*	*Port 95 Power*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

The above telemetries display the power consumption of ports 0 through 95. The results are indicated in 0.5 watts. If a port power exceeds the maximum value of 127.5 W, the data byte will show the maximum value (127.5 W). This field can receive one of the following parameters: Ports4PairPower1 through Ports4PairPower10; for each parameter, a different telemetry is retrieved, as specified above, in the Controller Response heading.

- **V_{main} Voltage**: Actual momentary input line voltage, in decivolts
- **Power Consumption**: Actual momentary total power consumption (in watts)
- **Max Power Available**: The Power Management Limit according to the current active Power Bank

4.7.33 Get 4Pair Port Power Limit

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Channel (0x05)*	*Supply4Pair (0xAD)*	Ch Num	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	PPL4Pair		TPPL4Pair		*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	*N*	##	##	

Telemetry for port's pre-defined power limit.

- **CH Num**: The logical port number, as referred to by the Host CPU and usually shown on the PSE front panel. Refer to Section 4.2 (the 'All_Ports' option is not applicable).
- **PPL4Pair (Port Power Limit 4Pair)**: If port power exceeds the PPL4Pair level, the PoE system disconnects that port. The results are indicated in 5 mW **TPPL4Pair (Temporary Port Power Limit 4Pair)**: The power limit of a working port referring to a specific PD

Refer to **Set Power Limit for Channels**, Section 4.5.14 and **Set Temporary Power Limit for Channels**, Section 4.5.15.

4.7.34 Get 4Pair Port Measurments

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Channel (0x05)*	*Paramz4Pair (0x01)*	Ch Num	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Vmain Voltage		Calculated current		*Power Consumption* 4Pair	
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*Port Voltage*		*N*	*N*	##	##	

Telemetry for momentary port electrical parameters.

- **CH Num**: The logical port number as referred to by the Host CPU and usually shown on the PSE front panel. Refer to Section 4.2 (the All_Ports option is not applicable).
- **Vmain Voltage**: Actual momentary input line voltage, in decivolts.
- **Calculated Current**: Port momentary calculated current (in milliamps) = Power/V_{main}
- **Power Consumption 4Pair** : Actual momentary total power consumption (in 5 milliwatts)
- **Port Voltage**: for PD69000 & PD69100: Actual momentary voltage on the port, in decivolts. For PD63000: each byte has a value of 'N'.

4.7.35 Get Derating Data

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Derating (0xBA)*	*PowerBudget* (0x57)	Bank	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	##	##		

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Max PS Power		Tstart	Tshutdown	Derating Delta Power	
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	*N*	##	##	

Retrieves Power Derating Banks settings:

- **Max PS Power** : The maximum power supply power capability, at normal temperature conditions, according to the power supply datasheets (value in watts).
- **T_{start}**: Temperature derating start point. This parameter is part of the derating curve definition. If The temperature is above this level, the actual available budget is changed according to the derating curve settings. (DegC)
- **$T_{shutdown}$**: Temperature derating end point. This parameter is part of the derating curve definitions. (DegC)
- **Derating Delta Power**: This parameter defines how much power needs to be reduced between the two temperature points (T_{start}, $T_{shutdown}$). The derating curve slope is calculated as dP/(Tstart-Tshutdown) (value in watts).

4.7.36 Get System Measurments

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Supply (0x0B)*	*ActualSystemData* (0xAD)	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	##	##		

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Power Budget Index	Power Budget		Actual Budget (After temperature derating delta calculation)		Temperature zone
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
Derating Temperature (DeciCelsius)		*N*	*N*	*N*	##	##	

Retrieves power actual derating information. The purpose of this request is to enable the host to read power information related to each budget when derating function is active.

- **Power_Budget Index**: The current active Power Bank
- **Power Budget**: The current user defined budget (related to the Power Bank setting)
- **Actual Budget**: Actual budget used by power management (calculated using a combination of user-defined budget and derating temperature algorithm)

  Temperature zone: This parameter is used to give the host a fast view for derating problems.
  The first 3 bits are zone numbers, arranged according to severity 1 through 4 (Highest severity):
  1 - Measured temperature < T_{start}
  2 - T_{start} < Measured temperature < $T_{shutdown}$
  3 - $T_{shutdown}$ < Measured temperature < ($T_{shutdown}$ + 20 degree Celsius)
  4 - Measured temperature > ($T_{shutdown}$ + 20 degree Celsius)
  Bit7: This bit is set whenever the system's power consumption passes the user's defined budget (it can happen only when derating temperature feature is enabled).
- **Derating Temperature**: The temperature that was used for derating calculations (measured by an external temperature sensor or set by Host) in DeciCelsius units.

4.7.37 Get Derating User Temperature

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*Derating (0xBA)*	DeratingUserTemp (0x00)	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	##	##		

Controller Response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	User Temperature		*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum**	**[15]CSum**	
N	*N*	*N*	*N*	*N*	##	##	
This command returns the user temperature that was set by the Host. The value is in DeciCelsius units.							

4.7.38 Get All Ports Enable/Disable 4pair Mode

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*EnDis4Pair (0x02) or EnDis4Pair2 (0x03)*	*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller Response (for Subject 1= EnDis), Ports 0-47							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	En/Dis4P 0-7	En/Dis4P 8-15	En/Dis4P 16-23	*(0x00)*	En/Dis4P 24-31	En/Dis4P 32-39
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
En/Dis4P 40-47	*(0x00)*	N	N	N	##	##	

Controller Response (for Subject 1= EnDis2), Ports 48-95							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	En/Dis4P *48-55*	En/Dis4P *56-63*	En/Dis4P *64-71*	*(0x00)*	En/Dis4P *72-79*	En/Dis4P *80-87*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
En/Dis4P *88-95*	*(0x00)*	*N*	*N*	*N*	##	##	

Telemetry of all system ports, indicating their 4PairEnable/Disable option.

Status – 1 = Enable; 0 = Disable. Also refer to **Set Enable/Disable 4pair for Channels** Command.

4.7.39 Get New Port Status

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Channel (0x05)*	*NewPortStatus (0xB0)*	CH Num	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Defined Port Configuration	Actual Port Configuration	Port Status	*Class*	UDL cnt	OVL cnt
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
SC cnt	**InvalidSigCnt**	**PowerDeniedCnt**	**N**	*N*	##	##	

This command returns essential port params

- **Defined Port Configuration***:*
  - *Bit 7:5 – Reserved*
  - *Bit 4 – Port enabled*
  - *Bit 3 – Port 4pair enable*
  - *Bit 2 – Port force power enable*
  - *Bit 0:1 - Port standard configuration (AF/AT/PoH)*
- **Actual Port Configuration***:*
  - *Bit 7:4 - Reserved*
  - *Bit 3 - Port 4pair behavior*
  - *Bit 2 - Port force power behavior*
  - *Bit 0:1 - Port standard behavior (AF/AT/PoH)*

Counters are cleared on read – also when using the old "Get Port Status" command.

4.7.40 Get Global Port Counters

Host Request							
[1]KEY	**[2]ECHO**	**[3]Subject**	**[4]Subject1**	**[5]Subject2**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Request (0x02)	##	*Global (0x07)*	*PortCounters (0x04)*	Counter kind	*Ports Group Number*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Port 0 counter	Port 1 counter	Port 2 counter	Port 3 counter	Port 4 counter	Port 5 counter
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
Port 6 counter	Port 7 counter	Port 8 counter	Port 9 counter	Port 10 counter	##	##	

Counter kind: InvalidSigCnt=0, PowerDeniedCnt=1, PoE_OVLCnt=2, PoE_UDL_Cnt=3, PoE_SC_Cnt=4.
Ports Group Number:

- 0 – port0 – port10
- 1 – port11 – port21
- 2 – port22 – port32
- 3 - Port 33 – port43
- 4 – Port 44 - port47

Counters are cleared on read

4.7.41 Get Class Power

[1] KEY	[2] ECHO	[3] Subject	[4] Subject1	[5] Subject2	[6] DATA	[7] DATA	[8] DATA
Request (0x02)	##	*Global (0x07)*	*ClassPower (0xBB)*	Class Type	*N*	*N*	*N*
[9] DATA	**[10] DATA**	**[11] DATA**	**[12] DATA**	**[13] DATA**	**[14] CSum H**	**[15] CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

Controller response							
[1]KEY	**[2]ECHO**	**[3]DATA**	**[4]DATA**	**[5]DATA**	**[6]DATA**	**[7]DATA**	**[8]DATA**
Telemetry (0x03)	##	Class Power		*N*	*N*	*N*	*N*
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	

This command reads the class power of a specific class type.

Class Type:

- 0 – Class power for class 0.
- 1 – Class power for class 1.
- 2 – Class power for class 2.
- 3 – Class power for class 3.
- >= 4 – Class power for class 4.

Class power (in DeciWatts):
For example: reading class power = 320, means 32W.

5 Software Download

Note A PD62000G controller only accepts the PD62000G software. If other software types such as PD63000/G/H or PD83000G are downloaded, the controller will not run and an error will be reported after reset.

There are two methods to initiate a new firmware download:

- From an external PC, by implementing a "software bridge" on the Host and using a windows application on the PC. This option is explained in *Microsemi's Application Note 126, Software Download for PoE Units.*
- Directly from the Host CPU, utilizing a series of protocol commands, detailed in Sections 5.1 and 5.2. When utilizing the I^2C communication for the download process, refer to section d below.

5.1 Download Process (Valid Firmware Exists)

The following process specifies the download process for a Controller which has valid firmware.

In case of an "empty" Controller or invalid firmware, use the process as described in Section 5.2.

All letters signed with "" should be sent as characters or strings (ASCII value). "\r" and "\n" represent "carriage return" and "new line" ASCII codes.

Step	Action	Host Command	Controller Response		Comment
			OK	Error	
1	Enter program mode(1)	Send the "Download" command (Section 5.4.1).	OK report	Error report	Immediate response. Report types show in Section 0
2	Await for boot section response		"TPE\r\n"	-	Response within 100 ms.
3	Erase memory	"E"	"TOE\r\n"	None	Response within 100 ms.
4	Wait for erasure	-	"TE\r\n" and then "TPE\r\n" (Within 100 ms).	"TNE\r\n" or "TNV\r\n" or none.	Erasure may last up to 5 seconds.
5	Program memory	"P"	"TOP\r\n"	None	Response within 100 ms.
6	Send all lines of S19 file.	Send S19 lines, one by one, till EOF. Lines begin with "S0" should not be read.	"T*\r\n"	"TNP\r\n" or "TNV\r\n" or none.	Response within 100 ms per line.
7	End of file	-	"TP\r\n"	None	Response within 100 ms.
8	Await	-	-	-	Wait at least 400 ms.
9	Reset Controller(2)	"RST"	System status telemetry	-	Response within 10 s.

(1)- When using the non-volatile memory, the Host must read the nine bytes in order to save them, since the non-volatile memory is erased during S/W download process.

(2) - When using the non-volatile memory the Host should write the nine bytes that had been read previously (see note 1)

5.2 Download Process (Invalid or Non-existing Firmware)

When the Controller is “empty” (was not burnt in factory), or its firmware is invalid (for example: after a download process interrupted in the middle), follow the same process as in Section 5.1, except for Step 1. Substitute this step with the following entry.

Step	Action	Host Command	Controller Response		Comment
			OK	Error	
1	Enter program mode	**“E”, “N”, “T”, “R”**	“TPE\r\n”	None	Keep at least 10 ms delay between each transmitted character. Response within 100 ms (max)

Note Invalid or none-existing firmware can be monitored by a continuous System Status telemetry (refer to Get System Status command, Section 4.7.4) with Byte 3 bit 1 set to ‘1’ (Programming required), in less than 5 seconds.

5.3 Download File: S19

The “*.S19” is the download file containing data in lines beginning with “S”.

- Lines beginning with “S0” are remarks and should not be written to the controller.
- Lines beginning with “S1”/"S3" contain the data to be sent.
- "S7"/“S9” designates the last line.

S19 File Example 1

```
S0  Power Over Ethernet
S0  Product  Number:   00
S0  Software Number:   0400
S0  Param.   Number:   01
S0  Build:             001
S0  File Name - 00040001_001.s19
S0  Base On File - Kerenl_28102004.s19
S0  Time 18:21:25  Date  29/11/2004
S0
S1238000003BDF68BD37C6555B17C6AA5B17169D8CC6555B17C6AA5B1716C4AEC6555B17B4
S1238020C6AA5B1787C716A07ECC00011686B7393B343519FA886CA6866A70EC846C71EC95
.
.
.
S123808016A07E7B0819169F0A16A33AD72635CC0801169EB0F6081987B746E6EA088B7B76
S12380A0081AC6555B17C6AA5B17CC08013BF6081A8716ADA51B826B80F60819E0807B0892
S9030000FC
```

Line

S19 File Example 2

```
S0  Power Over Ethernet
S0  Product Number: 14
S0  Software Number: 0230
S0  Param Number:  01
S0  Build:  003
S0  File Name - 14023001_0616_003.s19
S0  Based On File - 2011_9_11_14_30_4Pair.elf
S0  Time 14:29:43  Date Sep 11 2011
S0
S02C000050443639313030202020202020202020202020202030323330313430323330303 15F303631365F30303331
S319080010C899CE0008A1CE0008A9CE0008B1CE0008B9CE00088B
S315080010DCC1CE0008C9CE0008D1CE0008D9CE00086A
S309080010ECFAFAFAFA0A
```

```
S309080010F06CC6F920A3
S309080010F4FAFAFAFA02
S319080010F834010000F810000857110008F01000080010000801
S3190800110CFBF30008FCF3000821060000100200207DED000809
S31108001120F8E8000816E9000800000000C6
S3190800112CFAFAFAFAFAFAFAFAFAFAFAFAFAFAFAFAFAFAFAFAFA19
.
.
S3190800F3E8FAFAFAFAFAFAFAFAFAFAFAFAFAFAFAFAFAFAFAFAFA7B
S3090800F3FC2E077E97B5
S7050800ED7D88
```

5.4 I²C Download Process

When utilizing the I²C communication for the download process, data is transmitted and received as single bytes.

Single byte includes: start bit, address, R/W bit, data byte, stop bit.

Perform the following:

- Send 'Get System Status' message (in single byte) to check firmware validity (CPU status-1 Bit 1 = 1 indicates invalid firmware).
  - If valid firmware is detected, perform the downloading process as described in Section 5.1.
  - If invalid firmware is detected, perform the downloading process as described in Section 5.2.

Note For more details on I2C firmware download, see Technical Note TN-140, Catalogue Number 06-0024-081.

5.4.1 Download Command

[1]KEY	[2]ECHO	[3]Subject	[4]Subject 1	[5]Subject 2	[6]DATA	[7]DATA	[8]DATA
Program (0x01)	##	*Flash (0xFF)*	0x99	0x15	0x16	0x16	0x99
[9]DATA	**[10]DATA**	**[11]DATA**	**[12]DATA**	**[13]DATA**	**[14]CSum H**	**[15]CSum L**	
N	*N*	*N*	*N*	*N*	##	##	
This command initiates the download process. Once the process is initiated, the above steps are accomplished.							

6 Code Encryption

Table 7: Labels to Codes Conversion

Key	Value (Dec)	Value (Hex)
##		0x00 to 0xFE
All_channels	128	80
AlllPortClass	97	61
Channel	5	05
ChannelMatrix	68	44
Command	0	00
DetCnt1, DetCnt2, DetCnt3, DetCnt4	133, 134, 152, 153	85, 86, 98, 99
DeviceParams	135	87
E2	6	06
EnDis	12	0C
EnDis2	136	88
ExpendedPowerInfo	96	60
Flash	255	FF
ForcePower	81	51
Global	7	07
Individual_Mask	86	56
IRQMask	99	63
Latches	58	3A
Latches2, Latches3, Latches4	73, 149, 150	49, 95, 96
Main	23	17
Maskz	43	2B
Measurementz	26	1A
N	0 to 254	0x00 to 0xFE
Non-Vol-Mem	151	97
Paramz	37	25
PoEDeviceVersion	94	5E
PortFullInit	74	4A
PortsPower,1 PortsPower2, PortsPower3, PortsPower4, PortsPower5	75,76,77,79,80	4B, 4C, 4D, 4F, 50
PortsPower,6 PortsPower7, PortsPower8, PortsPower9, PortsPower10	*144,*145,146,147, 148	*90,* 91, 92, 93, 94
PortsStatus,1 PortsStatus2, PortsStatus3, PortsStatus4, PortsStatus5	49, 50, 51, 71, 72	31, 32, 33, 47, 48
PortsStatus6, PortsStatus7, PortsStatus8, PortsStatus,9 PortsStatus10	139, 140, 141, 142, 143	8B, 8C, 8D, 8E, 8F
PortStatus	14	0E
PowerBudget	87	57
PowerManage Mode	95	5F
Priority	10	0A
Program	1	01
Report	82	52
Request	2	02
Reset	85	55
RestoreFact	45	2D
SaveConfig	15	0F
SWversion	33	21
Supply	11	0B
SystemStatus	61	3D
Telemetry	3	03
TmpMatrix	67	43
TMPset	98	62

Table 7: Labels to Codes Conversion

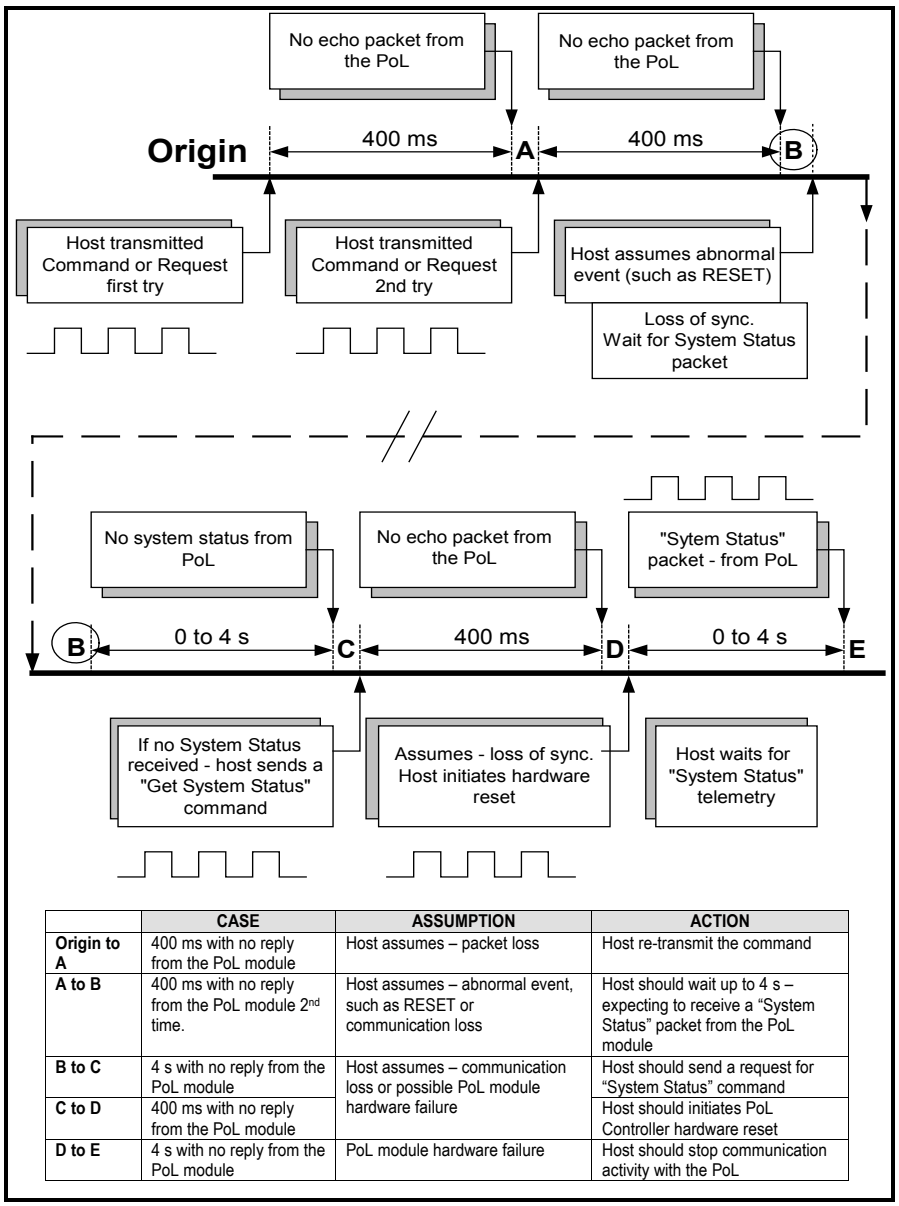
Key	Value (Dec)	Value (Hex)
UDLCounter1, UDLCounter2, UDLcounter3, UDLCounter4	89, 90, 137, 138	59, 5A, 89, 8A
UserByte	65	41
Versionz	30	1E
AllPortsPower	156	9C
TemporarySupply	162	A2
ExtendDeviceParams	163	A3
BackplanePowerData	164	A4
BPMReqData	165	A5
Layer2_PD	166	A6
PowerBudgetSourceType	167	A7
Layer2_PSE	168	A8

7 Synchronization during Communication Loss

As described in Section 3, each communication ***Command*** or ***Request*** is echoed to the Host with a ***Report*** or ***Telemetry***, respectively. The echo packet is designed to be transmitted back within 400 ms from the original packet sent from the Host. It is recommended that the Host receive the echo packet and use it as a command acknowledgement, or as verification for the communication feedback.

In cases where the echo packet was not received by the Host within 400 ms from the last transmitted packet, it is recommended that the Host communication be set to follow the command flow shown in Figure 3.

- If a "System Status" packet or other echo packet is correctly received during each one of the flow stages, the Host assumes a communication re-sync and return to normal operation.
- 15-byte packet Host transmission time should not exceed 100 ms.
- 15-byte packet Controller transmission time should not exceed 50 ms.



	CASE	ASSUMPTION	ACTION
Origin to A	400 ms with no reply from the PoL module	Host assumes – packet loss	Host re-transmit the command
A to B	400 ms with no reply from the PoL module 2nd time.	Host assumes – abnormal event, such as RESET or communication loss	Host should wait up to 4 s – expecting to receive a "System Status" packet from the PoL module
B to C	4 s with no reply from the PoL module	Host assumes – communication loss or possible PoL module hardware failure	Host should send a request for "System Status" command
C to D	400 ms with no reply from the PoL module		Host should initiates PoL Controller hardware reset
D to E	4 s with no reply from the PoL module	PoL module hardware failure	Host should stop communication activity with the PoL

Figure 3: Host Communication During Sync Loss

8 Communication Example

A typical example of a message sent by the Host CPU (PSE side) to the Controller is provided in Figure 4. This message turns off Port 7. This figure describes the transmission from the Host and from the CPU.

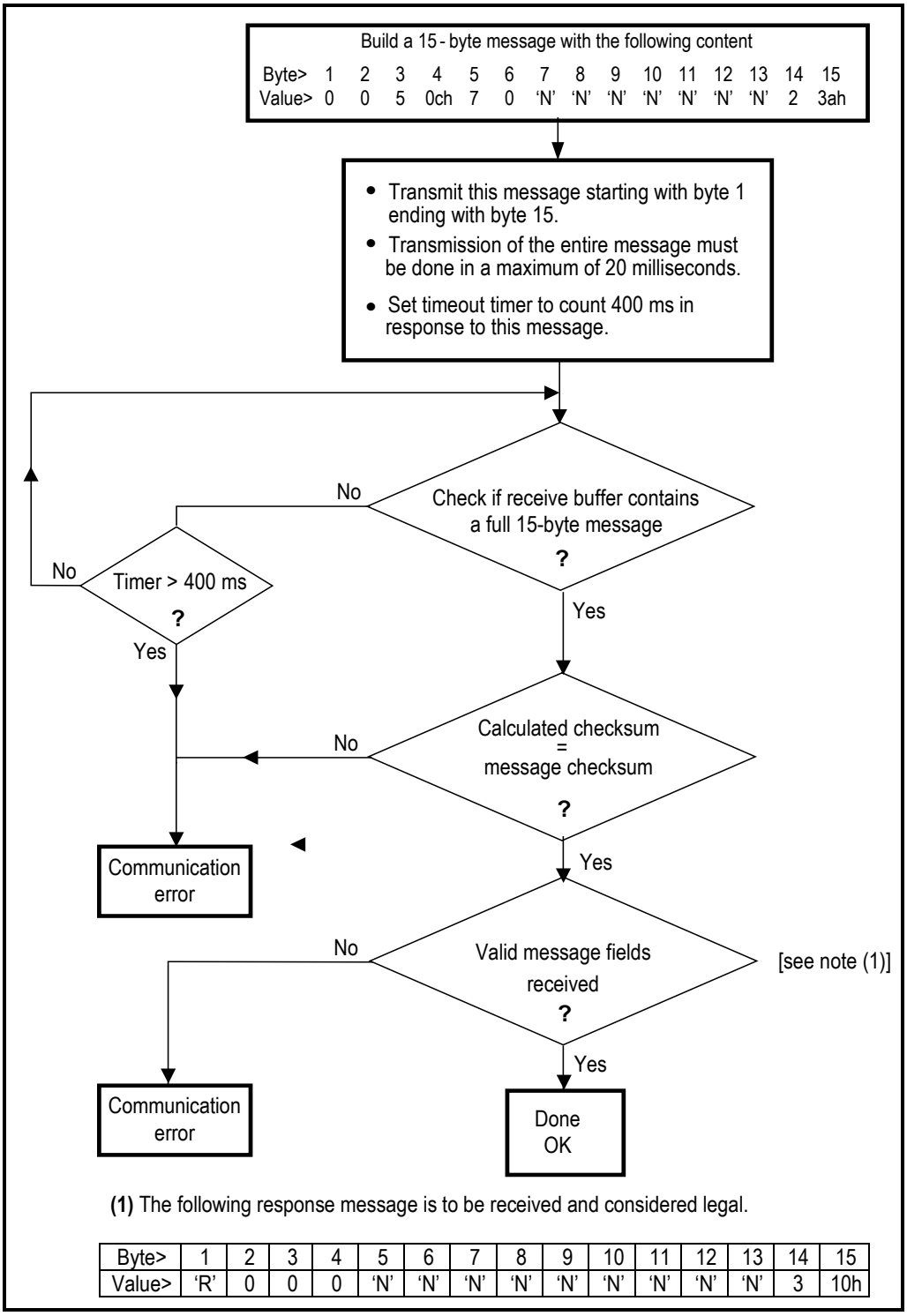


Figure 4: Typical Communication Flow

Revision History

Revision / Date	Para. Affected/Page	Description
1.0 / Oct 2011		Initial Release
1.1 / March 2012		Data Update
1.2 / Sept 2012		Data Update

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