BI Monitor Interface Specification

For PBlaze5 series Product

Revision History

Version	Change Description	Date	Editors
V0.1	Initial & Draft	June 5, 2016	Fengbiao
V0.2	Reviewed	June 8, 2016	Fengbiao
V0.3	Update for Adenridge/FoM special output	Aug 5, 2016	Fengbiao

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1. Introduction

1.1. Purpose and Scope

The purpose of this document is to describe the interface and data output format between SM-Bus and a monitor PC (host) – BI Monitor in BI process for Memblaze PBlaze5 series product. BI Monitor is used to display the data from SM-Bus visually. This document is intended to be referred by BI Monitor developer, and also can be a reference for BI Monitor users.

1.2. Abbreviation

SM-Bus	System Management Bus
BI	Burn-in
OOB	Out of Band

2. Interface Description

2.1. Basic description

The communicate model is showed in Figure 2.1-1.

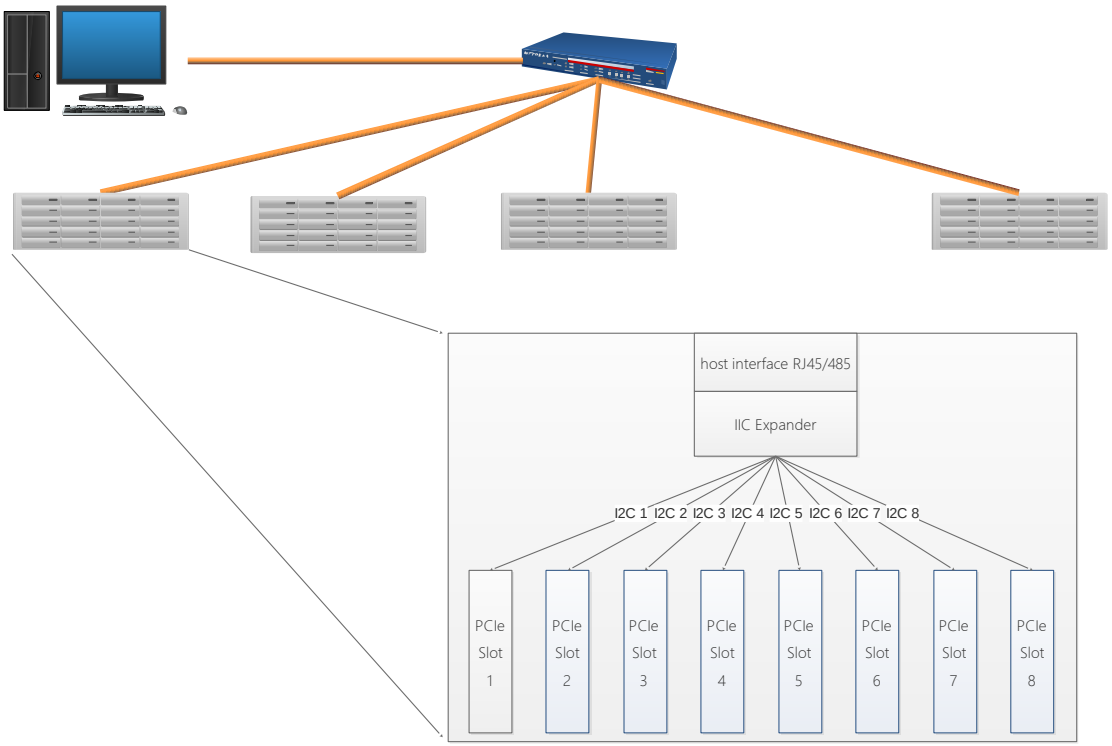

Figure 2.1-1 BI Monitor communication diagram

From the figure, OOB firmware over SM-Bus send its running data to host through IIC expander, which can provide the unique IIC address in slave BI board, and also mounting to a MCU to provide a convert way to output the network data packet to the RJ45, BI Monitor over host side program to manage the data via different network router.

2.2. Message Rule

2.2.1. Message format

All the running data sent out dependent on the host's request. BI Monitor in host side can access multiple drive at the same time using the polling way. BI Monitor driver to request firstly, as the slave side, OOB firmware response the running data to finish a communication within 300 milliseconds.

In order to know where the new frame running data starts from, the data headers of two Words are added before all the running data. The first Word is the length of the whole frame and the second Word is the data header ID 0xffff. For every data kind, the first Word is the length of this data kind; the second Word is the data ID; then the followings are the real data.

Segment	Field	Length (in Word)	Offset (in Word)
Buffer Header	0x0222	1	0
	0xffff	1	1
Message contents	Length of Data ID 1	1	2
	Data ID 1	1	3
	Data 1	Data length 1	4
	Length of Data ID 2	1	5 + Data length 1
	Data ID 2	1	6 + Data length 1
	Data 2	Data length 2	7 + Data length 1
	…	…	…
	Length of Data ID n	1	
	Data ID n	1	
	Data n	Data length n	

2.2.2. Message list

Trace ID	Length (Max Bytes)	Content Description	Content Group
0	1	Request (refer to 3.1)	0-Request
1	20	Serial Number	1-Basic
2	40	Model Number	1-Basic
3	12	OOB firmware version	1-Basic
4	12	BI firmware version	1-Basic
5	10	Temperature (refer to 3.2)	2-OOB
6	18	OOB information(refer to 3.3)	2-OOB
7	1	PGOOD (refer to 3.4)	2-OOB
8	1	BI_LOOP (refer to 3.5)	3-BI
9	4	BI_ERROR (refer to 3.6)	3-BI
10	4	BI_LOG (refer to 3.7)	3-BI
11	4	BI_ELAPSED (refer to 3.8)	3-BI

3. Message Description

3.1. Request

BI Monitor sent to slave side, for OOB firmware running data request. Message content data IDs can refer to the content group information in above message list.
If want to request basic information, data package format:

```
0005  package length
ffff  package header flag
0003  data length
0001  data ID, means request '1-Basic' information
0000  stuffing word
```

Figure 3.1-1 Basic information request package

If want to request OOB related information, data package format:

```
0005  package length
ffff  package header flag
0003  data length
0002  data ID, means request '2-OOB' information
0000  stuffing word
```

Figure 3.1-2 OOB information request package

If want to request BI related information, data package format:

```
0005  package length
ffff  package header flag
0003  data length
0003  data ID, means request '3-BI' information
0000  stuffing word
```

Figure 3.1-3 BI information request package

If want to request all running information, data package format:

```
0005  package length
ffff  package header flag
0003  data length
0000  data ID, means request all monitor information
0000  stuffing word
```

Figure 3.1-4 all running information request package

3.2. Temperature

Length (Max Bytes)	Content Description
2	Temperature IN
2	Temperature OUT
2	Temperature OOB
2	Temperature CORE
2	Temperature BOARD

3.3. OOB monitor information

Length (Max Bytes)	Content Description	Comments	Typical Value
2	MON_Current	System current consumption	Unit - Amp
2	MON_VCore	PMC Core Voltage	0.92V
2	MON_VDDR	DDR4 Voltage	1.2V
2	MON_VFIO	Flash IO Voltage	1.2V
2	MON_VBUS	System Bus Voltage	12V or 10V
2	MON_VIO	CMOS IO Voltage	3.3V
2	MON_VFCore	Flash Core Voltage	2.9V
2	MON_CCap	Capacitance retention Capacity	1800uF
2	MON_VCap	Capacitance retention Voltage	34V

3.4. PGOOD

Error code	Content Description
0x63	OR power error
0x65	CAP power error
0x66	12V power error
0x64	CAP power and 12V power error
0x62	OR power and 12V power error
0x61	OR power and CAP power error
0x60	OR CAP and 12V power all error
0x67	All OK

3.5. BI loop

To indicate the current BI execute loop number.

3.6. BI error

To indicate the current BI execute error code.

Error code	Content Description
0x13	FT1 not pass
0x43	PMC detected correctable error, need to dump the EEPROM to analysis
0x44	PMC detected uncorrectable error
0x81	NAND flash error

3.7. BI log

Output the BI running string log ID, with max 4 bytes.

Log ID	Content Description
0x45304D4D	elc_NandFomCycleTestEnd
0x53304D4D	elc_NandFomCycleTestStart
0x46314D4D	elc_NandFomInvalidConfiguration
0x49314D4D	elc_NandFomStartOfStep1
0x46324D4D	elc_NandFomInvalidEccCnt
0x49324D4D	elc_NandFomStep1ProgComplete
0x49334D4D	elc_NandFomStartOfStep2
0x49344D4D	elc_NandFomStep2CycleComplete
0x49354D4D	elc_NandFomEraseFailStep1
0x49364D4D	elc_NandFomProgFailStep1
0x49374D4D	elc_NandFomEraseFailStep2
0x49384D4D	elc_NandFomProgFailStep2
0x49394D4D	elc_NandFomReadFailStep2
0x49414D4D	elc_NandFomEarlyRetireBlock
0xFF00014D	mb_TempDeltaLog

3.8. BI elapsed

To indicate BI current running elapsed times.

Update Records

Version	Chapter	Page	Change Descriptions
V0.2	3.3	8	Update OOB Monitor information
	3.1	6-7	Update Details of Request command
	3.4	8	Update PGOOD error code
V0.3	3.3	8	Update from Capacitance retention time(s) to capacity(uF), and update typical value to 1800uF
	3.3	8	Update Flash IO Voltage typical value to 1.2V
	2.2.2	6	Update BI_LOG length to 4 bytes, only sign the Log ID
	3.7	9	Add BI log details description