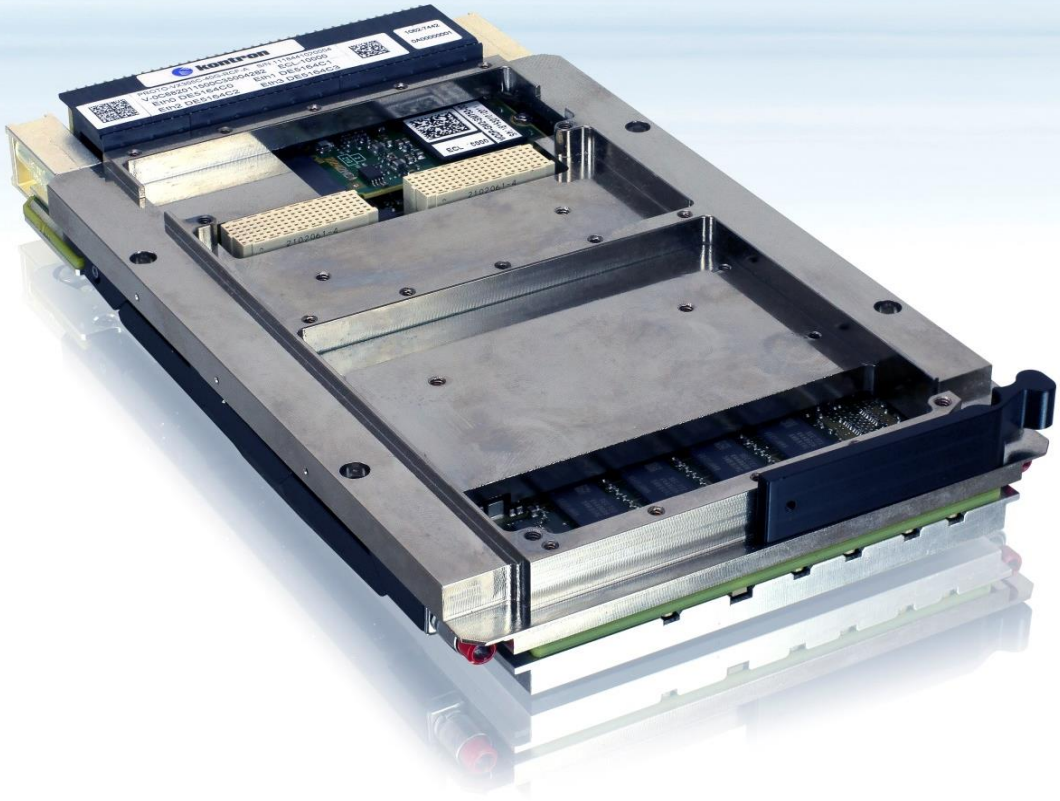
RELEASE NOTE



VX305x-40G

VITA 46.11 Firmware Release Note

D218432-1.3 - November 2019

VX305x-40G - VITA 46.11 Firmware Release Note

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Revision History

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1.0	Preliminary version.	12-2018
1.1	EFT release for IPMI FW revision V1.04	05-2019
1.2	Updated after project review	06-2019
1.3	VITA 46.11 Firmware release note updated for FW revision V1.05	11-2019

Customer Support

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As a trusted technology innovator and global solutions provider, Kontron extends its embedded market strengths into a services portfolio allowing companies to break the barriers of traditional product lifecycles. Proven product expertise coupled with collaborative and highly-experienced support enables Kontron to provide exceptional peace of mind to build and maintain successful products.

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Symbols

The following symbols may be used in this user guide

⚠DANGER	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
⚠WARNING	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠CAUTION	CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.
NOTICE	NOTICE indicates a property damage message.
	**Electric Shock!** This symbol and title warn of hazards due to electrical shocks (> 60 V) when touching products or parts of products. Failure to observe the precautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your material.
	**ESD Sensitive Device!** This symbol and title inform that the electronic boards and their components are sensitive to static electricity. Care must therefore be taken during all handling operations and inspections of this product in order to ensure product integrity at all times.
	**HOT Surface!** Do NOT touch! Allow to cool before servicing.
	**Laser!** This symbol inform of the risk of exposure to laser beam and light emitting devices (LEDs) from an electrical device. Eye protection per manufacturer notice shall review before servicing.
	This symbol indicates general information about the product and the user guide. This symbol also indicates detail information about the specific product configuration.
	This symbol indicates important information which must be read carefully.
	This symbol precedes helpful hints and tips for daily use.

For Your Safety

Your new Kontron product was developed and tested carefully to provide all features necessary to ensure its compliance with electrical safety requirements. It was also designed for a long fault-free life. However, the life expectancy of your product can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and of the correct operation of your new Kontron product, you are requested to conform with the following guidelines.

High Voltage Safety Instructions

As a precaution and in case of danger, the power connector must be easily accessible. The power connector is the product's main disconnect device.

⚠CAUTION

Warning

All operations on this product must be carried out by sufficiently skilled personnel only.

⚠CAUTION

Electric Shock!

Before installing a non hot-swappable Kontron product into a system always ensure that your mains power is switched off. This also applies to the installation of piggybacks. Serious electrical shock hazards can exist during all installation, repair, and maintenance operations on this product. Therefore, always unplug the power cable and any other cables which provide external voltages before performing any work on this product.

Earth ground connection to vehicle's chassis or a central grounding point shall remain connected. The earth ground cable shall be the last cable to be disconnected or the first cable to be connected when performing installation or removal procedures on this product.

Special Handling and Unpacking Instruction

NOTICE

ESD Sensitive Device!

Electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.

Do not handle this product out of its protective enclosure while it is not used for operational purposes unless it is otherwise protected.
Whenever possible, unpack or pack this product only at EOS/ESD safe work stations. Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools. This is most easily done by touching a metal part of your system housing.

It is particularly important to observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings etc. If the product contains batteries for RTC or memory backup, ensure that the product is not placed on conductive surfaces, including anti-static plastics or sponges. They can cause short circuits and damage the batteries or conductive circuits on the product.

General Instructions on Usage

In order to maintain Kontron's product warranty and CE compliance, this product must not be altered or modified in any way. Changes or modifications to the product, that are not explicitly approved by Kontron and described in this user guide or received from Kontron Support as a special handling instruction, will void your warranty and CE compliance.

This product should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This also applies to the operational temperature range of the specific board version that must not be exceeded. If batteries are present, their temperature restrictions must be taken into account.

In performing all necessary installation and application operations, only follow the instructions supplied by the present user guide.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the product then re-pack it in the same manner as it was delivered.

Special care is necessary when handling or unpacking the product. See Special Handling and Unpacking Instruction.

Environmental Protection Statement

This product has been manufactured to satisfy environmental protection requirements where possible. Many of the components used (structural parts, printed circuit boards, connectors, batteries, etc.) are capable of being recycled.

Final disposition of this product after its service life must be accomplished in accordance with applicable country, state, or local laws or regulations.

Environmental protection is a high priority with Kontron.
Kontron follows the WEEE directive
You are encouraged to return our products for proper disposal.

The Waste Electrical and Electronic Equipment (WEEE) Directive aims to:

- Reduce waste arising from electrical and electronic equipment (EEE)
- Make producers of EEE responsible for the environmental impact of their products, especially when the product become waste
- Encourage separate collection and subsequent treatment, reuse, recovery, recycling and sound environmental disposal of EEE
- Improve the environmental performance of all those involved during the lifecycle of EEE

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1/ Introduction

This document defines the VITA 46.11 Firmware Release Note for VX305x-40G boards.

The actual VITA 46.11 FW revision applied to this document is **V1.05**.

1.1. Related Documents

- VX305x-40G 3U VPX Computing Node User's Guide……D212135
- VX305x-40G AMI BIOS User Manual……D213792
- VX305C-40G EFT RELEASE NOTES……D213764
- VX305H-40G EFT RELEASE NOTES……D219738

1.2. Terms

Term	Definition
ACPI	Advanced Configuration and Power Interface
AMI	American Megatrend Inc. (BIOS vendor)
Backplane	A printed circuit board that includes two or more connectors on its primary side and interconnects these connectors to one another via signal traces.
BIOS	Basic Input/Output System
BMC	Board Management Controller IPMI generic term to design ChMC in VITA 46.11 specification
BT	Block Transfer (System Interface for IPMI)
Chassis	A physical frame or structure that minimally houses a set of plug-in modules and optionally houses other support entities such as power supplies and thermal management components.
ChMC	Chassis Management Controller A physical entity in the VPX System Management architecture that is an IPMC that includes additional support for some to all of the functionality required by a Chassis Manager. The Chassis Manager is the middle level logical management layer in the VPX System Management architecture.
Chassis Manager	A logical entity in the VPX System Management architecture whose primary responsibility is to manage the IPMCs within a Chassis and provide a communication path between the System Manager and the IPMCs.
EEPROM	Electrically Erasable Programmable Read-Only Memory
EFI	Extensible Firmware Interface
EFT	Early Field Trial
FRU	Field Replaceable Unit
FW	Acronym for Firmware
GPIO	Global Purpose Input/Ouput
GUID	Global Unique Identifier
HOST	Hardware Open System Technologies
IPMB	Intelligent Platform Management Bus
IPMC	Intelligent Platform Management Controller The portion of a FRU that interfaces with a Chassis' IPMB and represents the FRU and any devices subsidiary to it. The IPMC is the lowest level physical management entity in the VPX System Management architecture. This term can apply either to the physical or logical entity which performs this function (depending on context).
IPMI	Intelligent Platform Management Interface
KCS	Keyboard Controller Style (System Interface for IPMI)

Term	Definition
Nuvoton	This is the term for the Health Device that the vendor is Nuvoton and the part number is NCT7802Y.
NVMRO	Non-Volatile Memory Read-Only (VPX signal)
Payload	All portions of a FRU that are responsible for the application processing functionality that the FRU provides. This can include hardware, software, and firmware and does not include any portion of the hardware, software, and firmware associated with the VITA 46.11 System Management function.
PEF	Platform Event Filter
RTM	Rear Transition Module
SDR	Sensor Data Record
SDRR	SDR Repository
SEL	System Event Log
SMBIOS	System Management BIOS
SMC	Satellite Management Controller IPMI Generic term to design IPMC in VITA 46.11 Specification
SPI	Serial Peripheral Interface (System Flash bus)
SW	Acronym for Software
System Manager	A logical entity in the VPX System Management architecture whose primary purpose is to manage the entire System. The System Manager interfaces directly to Chassis Manager(s) within the System and indirectly to each IPMC via its respective Chassis Manager. The System Manager is the highest level management Layer in the VPX System Management architecture.
UEFI	Unified EFI
VPX	A commonly used acronym for referencing VITA 46 based standards.

2/ IPMI Firmware

2.1. Overview

The VX305x-40G provides an IPMI controller (NXP® LPC2368) with 512 kB of internal firmware flash as well as external firmware flash for firmware upgrade and rollback. The IPMI controller carries out IPMI commands such as monitoring several onboard temperature conditions, board voltages and the power supply status. The IPMI controller is accessible via one IPMB or one host Keyboard Controller Style (KCS) interface.

The VX305X-40G is fully compliant with the VITA 46.11 specification.

The following are key features of the VX305X-40G's IPMI firmware:

- Keyboard Controller Style (KCS) interface
- Dual-port IPMB interface for out-of-band management and sensor monitoring
- Sensor Device functionality with configurable thresholds for monitoring board, temperatures, voltages...
- FRU Inventory functionality
- System Event Log (SEL), Event Receiver functionalities
- IPMI Watchdog functionality (power-cycle, reset)
- Board monitoring and control extensions:
  - Graceful shutdown support
  - UEFI BIOS fail-over control: selection of the SPI boot flash (standard/recovery)
- Field-upgradeable IPMI firmware:
  - via the KCS or IPMB interfaces
  - Download of firmware does not break the currently running firmware or payload activities
- Two flash banks with rollback capability: manual rollback or automatic in case of upgrade failure

2.2. IPMI Firmware and KCS Interface Configuration

Initially the default configuration of the IPMI firmware KCS interface is:

- IRQ = 11
- MODE = SMC
- IPMB = single-ported

If the configuration needs to be modified, the ***kipmi*** UEFI Shell command may be used to modify the configuration as required, e.g. "***kipmi irq [0|11]***", "***kipmi mode [smc|bmc]***", and "***kipmi ipmb [single-ported|dual-ported]***".

For information on the ***kipmi*** UEFI Shell command, refer to the UEFI BIOS Document.

1. The IPMC must only be configured in SMC mode. BMC mode is not supported by IPMI Firmware. Currently, a VX305x-40G board does not play the role of a ChMC (= BMC) in a VPX backplane.
2. The number of IPMB (single or dual) depends of the VPX backplane configuration.

The KCS interface serves for the communication between the VX305X-40G's payload and the IPMI controller. The IPMI OS kernel requires the KCS interface configuration during their loading time. The KCS interface configuration is available in the "IPMI Device Information Record" included in the SMBIOS table (Type 38).

2.3. Supported IPMI Commands

2.3.1. Standard IPMI Commands

Table 1 shows the standard IPMI commands list compatible with **IPMI v1.5** Specification as specified in the **VITA 46.11** Specification. The shaded table cells indicate commands not currently supported by the VX305x-40G IPMI firmware.

The commands are split in Tier-1 or Tier-2 IPMC capabilities.

The minimum capabilities of a Tier-1 IPMC are:

- To be responsible for System IPMB start-up and fault handling
- To support the discovery of the FRU it controls
- To support access to the management information for the FRU it controls

In addition to the Tier-1 capabilities, the Tier-2 capabilities are:

- To participate in event generation and reception
- To support a Dynamic Sensor Population
- To optionally support Subsidiary FRUs

M = mandatory, O = optional, NA = Not Applicable.

Table 1: Standard IPMI Commands

COMMAND	IPMI v1.5 Spec. Section	NETFN	CMD	IPMC Tier-1	IPMC Tier-2	IPMI FW Support
IPM DEVICE "GLOBAL" COMMANDS						
Get Device ID	17.1	App (06h)	01h	M	M	Yes
Cold Reset	17.2	App (06h)	02h	O	M	Yes
Warm Reset	17.3	App (06h)	03h	O	O	No
Get Self Test Results	17.4	App (06h)	04h	M	M	Yes
Manufacturing Test On	17.5	App (06h)	05h	O	O	No
Set ACPI Power State	17.6	App (06h)	06h	O	O	No
Get ACPI Power State	17.7	App (06h)	07h	O	O	No
Get Device GUID	17.8	App (06h)	08h	O	O	No
Broadcast "Get Device ID"	17.9	App (06h)	01h	M	M	Yes
BMC WATCHDOG TIMER COMMANDS						
Reset Watchdog Timer	21.5	App (06h)	22h	O	O	Yes
Set Watchdog Timer	21.6	App (06h)	24h	O	O	Yes
Get Watchdog Timer	21.7	App (06h)	25h	O	O	Yes
BMC DEVICE AND MESSAGING COMMANDS						
Set BMC Global Enables	18.1	App (06h)	2Eh	O	O	Yes
Get BMC Global Enables	18.2	App (06h)	2Fh	O	O	Yes

COMMAND	IPMI v1.5 Spec. Section	NETFN	CMD	IPMC Tier-1	IPMC Tier-2	IPMI FW Support
Clear Message Flags	18.3	App (06h)	30h	O	O	Yes
Get Message Flags	18.4	App (06h)	31h	O	O	Yes
Enable Message Channel Receive	18.5	App (06h)	32h	O	O	Yes
Get Message	18.6	App (06h)	33h	O	O	No
Send Message	18.7	App (06h)	34h	O	O	No
Read Event Message Buffer	18.8	App (06h)	35h	O	O	No
Get BT Interface Capabilities	18.9	App (06h)	36h	O	O	No
Master Write-Read	18.10	App (06h)	52h	O	O	Yes
Get System GUID	18.13	App (06h)	37h	O	O	No
Get Channel Authentication Capabilities	18.12	App (06h)	38h	O	O	Yes
Get Session Challenge	18.14	App (06h)	39h	O	O	No
Activate Session	18.15	App (06h)	3Ah	O	O	No
Set Session Privilege Level	18.16	App (06h)	3Bh	O	O	No
Close Session	18.17	App (06h)	3Ch	O	O	Yes
Get Session Info	18.18	App (06h)	3Dh	O	O	Yes
Get AuthCode	18.19	App (06h)	3Fh	O	O	No
Set Channel Access	18.20	App (06h)	40h	O	O	No
Get Channel Access	18.21	App (06h)	41h	O	O	Yes
Get Channel Info	18.22	App (06h)	42h	O	O	Yes
Set User Access	18.23	App (06h)	43h	O	O	No
Get User Access	18.24	App (06h)	44h	O	O	Yes
Set User Name	18.25	App (06h)	45h	O	O	Yes
Get User Name	18.26	App (06h)	46h	O	O	Yes
Set User Password	18.27	App (06h)	47h	O	O	Yes
CHASSIS DEVICE COMMANDS						
Get Chassis Capabilities	22.1	Chassis	00h	O	O	Yes
Get Chassis Status	22.2	Chassis	01h	O	O	Yes
Chassis Control	22.3	Chassis	02h	O	O	Yes
Chassis Reset	22.4	Chassis	03h	O	O	No
Chassis Identify	22.5	Chassis	04h	O	O	No
Set Chassis Capabilities	22.6	Chassis	05h	O	O	No
Set Power Restore Policy	22.7	Chassis	06h	O	O	No
Get System Reset Cause	22.9	Chassis	07h	O	O	No
Set System Boot Options	22.10	Chassis	08h	O	O	Yes
Get System Boot Options	22.11	Chassis	09h	O	O	Yes
Get POH Counter	22.12	Chassis	0Fh	O	O	No
EVENT COMMANDS						
Set Event Receiver	29.1	S/E (04h)	00h	NA	M	Yes
Get Event Receiver	29.2	S/E (04h)	01h	NA	M	Yes
Platform Event (a.k.a. "Event Message")	29.3	S/E (04h)	02h	NA	M	Yes
PEF and Alerting Commands						

COMMAND	IPMI v1.5 Spec. Section	NETFN	CMD	IPMC Tier-1	IPMC Tier-2	IPMI FW Support
Get PEF Capabilities	24.1	S/E (04h)	10h	NA	O	No
Arm PEF Postpone Timer	24.2	S/E (04h)	11h	NA	O	No
Set PEF Configuration Parameters	24.3	S/E (04h)	12h	NA	O	No
Get PEF Configuration Parameters	24.4	S/E (04h)	13h	NA	O	No
Set Last Processed Event ID	24.5	S/E (04h)	14h	NA	O	No
Get Last Processed Event ID	24.6	S/E (04h)	15h	NA	O	No
Alert Immediate	24.7	S/E (04h)	16h	NA	O	No
PET Acknowledge	24.8	S/E (04h)	17h	NA	O	No
SENSOR DEVICE COMMANDS						
Get Device SDR Info	29.2	S/E (04h)	20h	M	M	Yes
Get Device SDR	29.3	S/E (04h)	21h	M	M	Yes
Reserve Device SDR Repository	29.4	S/E (04h)	22h	M	M	Yes
Get Sensor Reading Factors	29.5	S/E (04h)	23h	O	O	No
Set Sensor Hysteresis	29.6	S/E (04h)	24h	O	O	Yes
Get Sensor Hysteresis	29.7	S/E (04h)	25h	O	O	Yes
Set Sensor Threshold	29.8	S/E (04h)	26h	O	O	Yes
Get Sensor Threshold	29.9	S/E (04h)	27h	O	O	Yes
Set Sensor Event Enable	29.10	S/E (04h)	28h	O	O	Yes
Get Sensor Event Enable	29.11	S/E (04h)	29h	O	O	Yes
Re-arm Sensor Events	29.12	S/E (04h)	2Ah	O	O	No
Get Sensor Event Status	29.13	S/E (04h)	2Bh	O	O	No
Get Sensor Reading	29.14	S/E (04h)	2Dh	O	O	Yes
Set Sensor Type	29.15	S/E (04h)	2Eh	O	O	No
Get Sensor Type	29.16	S/E (04h)	2Fh	O	O	No
FRU DEVICE COMMANDS						
Get FRU Inventory Area Info	28.1	Storage (0Ah)	10h	M	M	Yes
Read FRU Data	28.2	Storage (0Ah)	11h	M	M	Yes
Write FRU Data	28.3	Storage (0Ah)	12h	M	M	Yes
SDR DEVICE COMMANDS						
Get SDR Repository Info	27.9	Storage (0Ah)	20h	O	O	No
Get SDR Repository Allocation Info	27.10	Storage (0Ah)	21h	O	O	No
Reserve SDR Repository	27.11	Storage (0Ah)	22h	O	O	No
Get SDR	27.12	Storage (0Ah)	23h	O	O	No
Add SDR	27.13	Storage (0Ah)	24h	O	O	No
Partial Add SDR	27.14	Storage (0Ah)	25h	O	O	No

COMMAND	IPMI v1.5 Spec. Section	NETFN	CMD	IPMC Tier-1	IPMC Tier-2	IPMI FW Support
Delete SDR	27.15	Storage (0Ah)	26h	0	0	No
Clear SDR Repository	27.16	Storage (0Ah)	27h	0	0	No
Get SDR Repository Time	27.17	Storage (0Ah)	28h	0	0	No
Set SDR Repository Time	27.18	Storage (0Ah)	29h	0	0	No
Enter SDR Repository Update Mode	27.19	Storage (0Ah)	2Ah	0	0	No
Exit SDR Repository Update Mode	27.20	Storage (0Ah)	2Bh	0	0	No
Run Initialization Agent	27.21	Storage (0Ah)	2Ch	0	0	No
SEL DEVICE COMMANDS						
Get SEL Info	25.2	Storage (0Ah)	40h	0	0	Yes
Get SEL Allocation Info	25.3	Storage (0Ah)	41h	0	0	Yes
Reserve SEL	25.4	Storage (0Ah)	42h	0	0	Yes
Get SEL Entry	25.5	Storage (0Ah)	43h	0	0	Yes
Add SEL Entry	25.6	Storage (0Ah)	44h	0	0	Yes
Partial Add SEL Entry	25.7	Storage (0Ah)	45h	0	0	No
Delete SEL Entry	25.8	Storage (0Ah)	46h	0	0	Yes
Clear SEL	25.9	Storage (0Ah)	47h	0	0	Yes
Get SEL Time	25.10	Storage (0Ah)	48h	0	0	Yes
Set SEL Time	25.11	Storage (0Ah)	49h	0	0	Yes
Get Auxiliary Log Status	25.12	Storage (0Ah)	5Ah	0	0	No
Set Auxiliary Log Status	25.13	Storage (0Ah)	5Bh	0	0	No
LAN DEVICE COMMANDS						
Set LAN Configuration Parameters	19.1	Transport (0Ch)	01h	0	0	No
Get LAN Configuration Parameters	19.2	Transport (0Ch)	02h	0	0	No
Suspend BMC ARPs	19.3	Transport (0Ch)	03h	0	0	No
Get IP/UDP/RMCP Statistics	19.4	Transport (0Ch)	04h	0	0	No
SERIAL/MODEM DEVICE COMMANDS						
Set Serial/Modem Configuration	20.1	Transport (0Ch)	10h	0	0	No
Get Serial/Modem Configuration	20.2	Transport (0Ch)	11h	0	0	No
Set Serial/Modem Mux	20.3	Transport	12h	0	0	No

COMMAND	IPMI v1.5 Spec. Section	NETFN	CMD	IPMC Tier-1	IPMC Tier-2	IPMI FW Support
		(0Ch)				
Get TAP Response Codes	20.4	Transport (0Ch)	13h	0	0	No
Set PPP UDP Proxy Transmit Data	20.5	Transport (0Ch)	14h	0	0	No
Get PPP UDP Proxy Transmit Data	20.6	Transport (0Ch)	15h	0	0	No
Send PPP UDP Proxy Packet	20.7	Transport (0Ch)	16h	0	0	No
Get PPP UDP Proxy Packet	20.8	Transport (0Ch)	17h	0	0	No
Serial/Modem Connection Active	20.9	Transport (0Ch)	18h	0	0	No
Callback	20.10	Transport (0Ch)	19h	0	0	No
Set User Callback Options	20.11	Transport (0Ch)	1Ah	0	0	No
Get User Callback Options	20.12	Transport (0Ch)	1Bh	0	0	No

2.3.2. VITA 46.11 Defined Commands

Table 2 shows the IPMI commands list specified in the **VITA46.11** Specification.
The shaded table cells indicate commands not supported by the IPMI firmware.

M = mandatory, O = optional, NA = Not Applicable.

Table 2: VITA 46.11 Commands

COMMAND	VITA 46.11 Section	NETFN	CMD	IPMC Tier-1	IPMC Tier-2	IPMI FW Support
Get VSO Capabilities	10.1.3.1	Group Extension (2Ch)	00h	M	M	Yes
Get Chassis Address Table Info	10.1.3.2	Group Extension (2Ch)	01h	NA	NA	No
Get Chassis Identifier	10.1.3.4	Group Extension (2Ch)	02h	NA	NA	No
Set Chassis Identifier	10.1.3.5	Group Extension (2Ch)	03h	NA	NA	No

COMMAND	VITA 46.11 Section	NETFN	CMD	IPMC Tier-1	IPMC Tier-2	IPMI FW Support
FRU Control	10.1.3.6	Group Extension (2Ch)	04h	O	O	No
Get FRU LED Properties	10.1.3.27	Group Extension (2Ch)	05h	O	O	No
Get LED Color Properties	10.1.3.28	Group Extension (2Ch)	06h	O	O	No
Set FRU LED State	10.1.3.30	Group Extension (2Ch)	07h	O	O	No
Get FRU LED State	10.1.3.29	Group Extension (2Ch)	08h	O	O	No
Set IPMB State	10.1.3.7	Group Extension (2Ch)	09h	O	O	Yes
Set FRU State Policy Bits	10.1.3.9	Group Extension (2Ch)	0Ah	O	O	Yes
Get FRU State Policy Bits	10.1.3.8	Group Extension (2Ch)	0Bh	O	O	Yes
Set FRU Activation	10.1.3.10	Group Extension (2Ch)	0Ch	O	O	Yes
Get Device Locator Record ID	10.1.3.11	Group Extension (2Ch)	0Dh	O	O	Yes
Get Fan Speed Properties	10.1.3.12	Group Extension (2Ch)	14h	O	O	No
Set Fan Level	10.1.3.14	Group Extension (2Ch)	15h	O	O	No
Get Fan Level	10.1.3.13	Group Extension (2Ch)	16h	O	O	No
Get IPMB Link Info	10.1.3.17	Group Extension (2Ch)	18h	O	O	No
Get Chassis Manager IPMB Address	10.1.3.21	Group Extension (2Ch)	1Bh	NA	NA	No
Set Fan Policy	10.1.3.15	Group Extension (2Ch)	1Ch	NA	NA	No
Get Fan Policy	10.1.3.16	Group Extension (2Ch)	1Dh	NA	NA	No
FRU Control Capabilities	10.1.3.18	Group Extension (2Ch)	1Eh	O/M	M	Yes

COMMAND	VITA 46.11 Section	NETFN	CMD	IPMC Tier-1	IPMC Tier-2	IPMI FW Support
FRU Inventory Device Lock Control	10.1.3.19	Group Extension (2Ch)	1Fh	NA	NA	No
FRU Inventory Device Write	10.1.3.20	Group Extension (2Ch)	20h	NA	NA	No
Get Chassis Manager IP Addresses	10.1.3.22	Group Extension (2Ch)	21h	NA	NA	No
Get FRU Address Info	10.1.3.3	Group Extension (2Ch)	40h	M	M	Yes
Get FRU Persistent Control	10.1.3.23	Group Extension (2Ch)	41h	O	O	No
Set FRU Persistent Control	10.1.3.24	Group Extension (2Ch)	42h	O	O	No
FRU Persistent Control Capabilities	10.1.3.25	Group Extension (2Ch)	43h	O	O	No
Get Mandatory Sensor Numbers	10.1.3.26	Group Extension (2Ch)	44h	O	O/M	Yes

2.3.3. HOST Defined Commands

Table 3 represents the additional IPMI formatted messages mandated by **HOST**. Some commands or messages need to be compatible with **IPMI V2.0** Specification. All commands are mandatory for IPMC Tier-2.

Table 3: HOST Commands

COMMAND	Standard Section	NETFN	CMD	IPMC Tier-1	IPMC Tier-2	IPMI FW Support
Get SEL Info	IPMI V2.0 Section 31.2	Storage (0Ah)	40h	O	M	Yes
Get SEL Entry	IPMI V2.0 Section 31.5	Storage (0Ah)	43h	O	M	Yes
Get SEL Time	IPMI V2.0 Section 31.10	Storage (0Ah)	48h	O	M	Yes
Set SEL Time	IPMI V2.0 Section 31.11	Storage (0Ah)	49h	O	M	Yes
Set Sensor Reading And Event Status	IPMI V2.0 Section 35.17	S/E (04h)	30h	O	M	Yes
FRU Control	VITA 46.11 Section 10.1.3.6	Group Extension (2Ch)	04h	O	M	Yes
Set FRU State Policy Bits	VITA 46.11 Section 10.1.3.9	Group Extension (2Ch)	0Ah	O	M	Yes

COMMAND	Standard Section	NETFN	CMD	IPMC Tier-1	IPMC Tier-2	IPMI FW Support
Get FRU State Policy Bits	VITA 46.11 Section 10.1.3.8	Group Extension (2Ch)	0Bh	O	M	Yes
Set FRU Activation	VITA 46.11 Section 10.1.3.10	Group Extension (2Ch)	0Ch	O	M	Yes
FRU Control Capabilities	VITA 46.11 Section 10.1.3.18	Group Extension (2Ch)	1Eh	O	M	Yes
Get Mandatory Sensor Numbers	VITA 46.11 Section 10.1.3.26	Group Extension (2Ch)	44h	O	M	Yes

2.4. Firmware Identification

2.4.1. Get Device ID Command

Table 4: Get Device ID Command

COMMAND			LUN	NetFn	CMD
Get Device ID			00h	App = 06h	01h
REQUEST DATA					
Byte	Data Field				
--	--				
RESPONSE DATA					
Byte	Data Field				
1	Completion code				
2	10h	Device ID 10h = Kontron IPMC based on NXP LPC 2368 Microcontroller			
3	80h	Device Revision [7] 1b = device provides Device SDRs [6:0] 0000000b = reserved			
4	**01h**	Firmware Revision 1: Bit 7 = Device Available, 0 = Normal Operation, 1=Device Busy Bits 6-0 = Major Firmware Revision, BCD encoded (varies depending on firmware revision)			
5	**05h**	Firmware Revision 2: Minor Firmware Revision, BCD encoded (varies depending on firmware revision)			
6	51h	IPMI Version, holds IPMI command specification version, BCD encoded IPMI v1.5 is encoded for VITA 46.11			
7	BDh	Additional Device Support (varies depending on feature set: 0b - not supported, 1b - supported) [7] Chassis Device (device functions as chassis device) [6] Bridge (device responds to Bridge NetFn commands) [5] IPMB Event Generator (device generates event messages onto the IPMB) [4] IPMB Event Receiver (device accepts event messages from the IPMB) [3] FRU Inventory Device [2] SEL Device			

		[1] SDR Repository Device [0] Sensor Device
8..10	98h 3Ah 00h	Manufacturer ID, LSB first 03A98h = 15000 = Kontron IANA ID
11..12	49h 00h or 4Bh 00h	Product ID, LSB first Identifies the board 0049h = VX305C-40G 004Bh = VX305H-40G
13*	**03h**	SDR revision
14*	02h	Board Geographical Address/slot number (GEO ID)
15..16*	00h 00h	Reserved

* Bytes 13 through 16 = Auxiliary Firmware Revision Information are optional and defined by Kontron.

Invoking the IPMI command **Get Device ID** returns among other information the following data:

- Manufacturer ID (Bytes8:10) = 3A98h (Kontron IANA ID)
- Product ID (Bytes 11:12) = Board ID
- Firmware revision (Bytes 4:5) reflects the version of the running firmware, which will change after each firmware update.
- Release Number of the SDR (Byte 13) will be incremented if sensor device list is updated in new Firmware revision

2.4.2. Device Locator Record

The device ID string, which can be found by reading the Device Locator Record (SDR Type 12h), contains the string of the board. For example, invoking the Linux "ipmitool" command **ipmitool sdr list mcloc** will return the device ID strings of all available boards.
As the IPMI controller is in SMC mode, the string displayed is "Sxx:..." where S stand for "Satellite" and xx is the slot number where the board is residing, for instance:

```
S02:VX305C      | Dynamic MC @ 84h  | ok
```

which indicates that the board is in slot #2.

2.5. Board Control Extensions

2.5.1. SPI Boot Flash Selection — UEFI BIOS Failover Control

The UEFI BIOS code is stored in two different SPI boot flash devices designated as the MAIN SPI boot flash and the RESCUE SPI boot flash.

By default, the UEFI BIOS code stored in the MAIN SPI boot flash is executed first. If this fails, the UEFI BIOS code in the RESCUE SPI boot flash can be then executed.

During boot-up, the UEFI BIOS reports its operational status to the IPMI controller within a given time. If the status is "failed" or not reported within the given time, the IPMI controller selects the RESCUE SPI boot flash, resets the board's processor, and waits for the status report from the UEFI BIOS again.

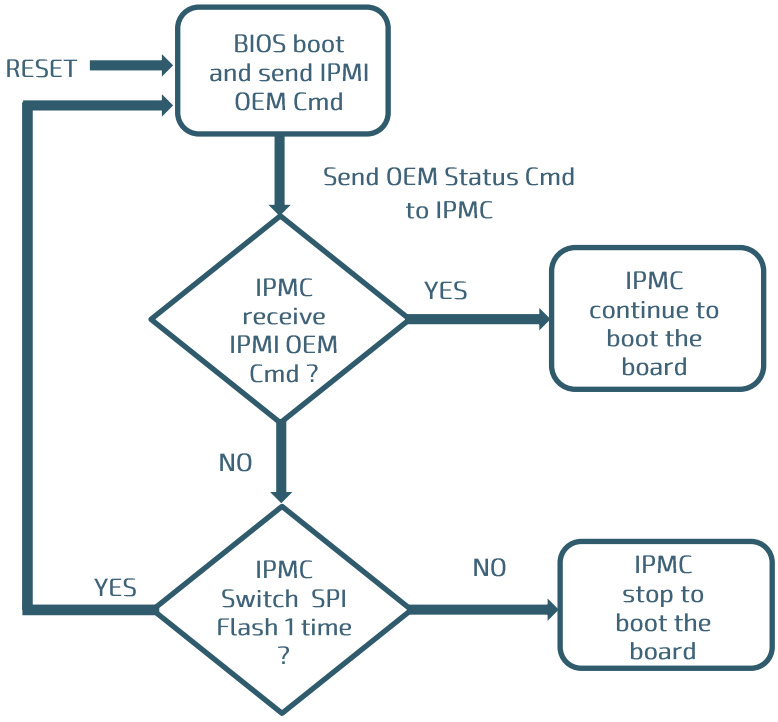
In the event the recovery boot operation fails, the IPMI controller reports it, but takes no further action of its own.

When a boot operation fails, a "Boot Error - Invalid boot sector" event is asserted for the related sensor:

"FWH0 Boot Err" sensor indicates the MAIN SPI boot flash has failed

"FWH1 Boot Err" sensor indicates the RESCUE SPI boot flash has failed

Figure 1: UEFI BIOS Failover State machine



2.5.2. Set Control State (SPI Boot Flash Selection)

Below is described the Kontron OEM command for changing SPI Boot Flash Selection.

Table 5: Set Control State

COMMAND		LUN	NetFn	CMD
Set Control State (SPI Boot Flash Selection)		00h	OEM = 3Eh	20h
REQUEST DATA				
Byte	Data Field			
1	Control ID: 00h = SPI boot flash selection			
2	**Control state for SPI boot flash selection (00h):** 00h = MAIN SPI boot flash is selected (default) 01h = RESCUE SPI boot flash is selected **Note:** The DIP switch SW2.1 may overwrite the above selection.			
RESPONSE DATA				
Byte	Data Field			
1	Completion code			

NOTICE

The settings mentioned above are stored in EEPROM and applied (to logic) each time the IPMI controller detects power-on.

2.5.3. Get Control State (SPI Boot Flash Selection)

This command is used to read out the SPI boot flash and boot order settings.

Table 6: Get Control State

COMMAND	LUN	NetFn	CMD
Get Control State (SPI Boot Flash)	00h	OEM = 3Eh	21h
REQUEST DATA			
Byte	Data Field		
1	Control ID: 00h = SPI boot flash selection		
RESPONSE DATA			
Byte	Data Field		
1 4	Completion code Current control state (see section "Set Control State") 00h.. 01h for control ID = SPI boot flash selection		

2.6. Sensors Implemented on the Board

The IPMI controller includes several sensors for voltage or temperature monitoring and various others for pass/fail type signal monitoring. Every sensor is associated with a Sensor Data Record (SDR). Sensor Data Records contain information about the sensor's identification such as sensor type, sensor name, and sensor unit. SDRs also contain the configuration of a specific sensor such as threshold, hysteresis or event generation capabilities that specify the sensor's behavior. Some fields of the sensor SDR are configurable using IPMI commands, others are always set to built-in default values.

The IPMI controller supports sensor device commands and uses the static sensor population feature of IPMI. All Sensor Data Records can be queried using Device SDR commands.

The sensor name (ID string) has a name prefix which is 'NNN:' in the **Table 7**. When reading the sensor name after board insertion, this prefix becomes automatically adapted to the role (BMC or SMC) and the physical position (slot number) of the board in a rack.
As IPMC is set up as "Satellite" mode (SMC), the prefix will be 'Sxx:' where xx is the slot number where the board resides.

The Linux IPMI utility "ipmitool" displays for the command "***ipmitool -m <address> sdr list***" the contents of the sensor data record repository (SDRR) of the VPX board in the slot at **address = 0x80 + 2*Slot_ID** where Slot_ID is numbered from 1 to 31 corresponding to the VPX slot number in the rack.

2.6.1. Sensor List

The **Table 7** indicates all sensors available on the VX305X-40G. For further information on Kontron's OEM-specific sensor types and sensor event type codes presented in the following table, refer to section "OEM Event/Reading Types".

To display all objects in SDR of the board in slot #2 for example, using Linux IPMI utility "ipmitool":
ipmitool -m 0x84 sdr list

Table 7: Sensor List

SENSOR NUMBER	SENSOR Name	SENSOR TYPE (CODE)	EVENT/READING TYPE (CODE)	Assertion Mask / Deassertion Mask / Reading Mask	Description	Unit
0	NNN:FRU State	FRU Operational State (F0h)	Sensor-Specific (6Fh)	00FFh/0000h/00FFh	FRU State Sensor	Discrete
1	NNN:IPMB Link	IPMB Link (F1h)	Sensor-Specific (6Fh)	000Fh /0000h/000Fh	System IPMB Link Sensor	Discrete
2	NNN:FRU Health	FRU Health (F2h)	Predictive Failure asserted/deasserted (04h)	0003h/0000h /0003h	FRU Health Sensor	Discrete
3	NNN:FRU Voltage	FRU Voltage (02h)	Limit Not Exceeded/Limit Exceeded (05h)	0002h/0002h/0003h	FRU Voltage Sensor (OK/not OK)	Discrete
4	NNN:FRU Thermal	FRU Temperature (F3h)	Sensor-Specific (6Fh)	003Fh/0000h/003Fh	FRU Temperature Sensor	Discrete
5	NNN:Test Result	Payload Test Results (F4h)	Predictive Failure asserted/deasserted (04h)	0003h/0000h/0003h	Payload Test Results Sensor (OK/not OK)	Discrete
6	NNN:Test Status	Payload Test Status (F5h)	State asserted/deasserted (03h)	0003h/0000h/0003h	Payload Test Status Sensor (Running/Not Running)	Discrete
7	NNN: FRU Mode	FRU Mode (F6h)	Sensor-Specific (6Fh)	0002h/0000h/0003h	FRU Mode Sensor	Discrete
8	NNN:Temp CPU	Temperature (01h)	Threshold (01h)	1A81h/7A81h/3939h	CPU Temperature	Degrees C
9	NNN:Temp Board	Temperature (01h)	Threshold (01h)	7A95h/7A95h/3F3Fh	Board Temperature	Degrees C
10	NNN: Pwr Good	Power Supply (08h)	OEM (73h)	0000h/0000h/0007h	Status of all Power Lines	Discrete
11	NNN:Pwr Good Evt	Power Supply (08h)	OEM (73h)	0007h/0007h/0007h	Power fail events for all Power Lines	Discrete
12	NNN: DDR4 Voltage	Voltage (02h)	Threshold (01h)	2204h/2204h/1212h	DDR4 Voltage	Volt
13	NNN:VPX +12V	Voltage (02h)	Threshold (01h)	2204h/2204h/1212h	VPX +12V (= V_12V = V_VS1_VPX)	Volt
14	NNN: VPX +5V	Voltage (02h)	Threshold (01h)	2204h/2204h/1212h	Board +5V (= V_5V0 from VPX 12V)	Volt
15	NNN: Board +3V3SB	Voltage (02h)	Threshold (01h)	2204h/2204h/1212h	Board 3V3SB (= V_3V3SB = BMC power)	Volt
16	NNN:Last Reset	OEM (CFh)	State asserted/deasserted (03h)	0002h/0000h/0003h	Board Reset Event	Discrete

SENSOR NUMBER	SENSOR Name	SENSOR TYPE (CODE)	EVENT/READING TYPE (CODE)	Assertion Mask / Deassertion Mask / Reading Mask	Description	Unit
17	NNN: Slot System	Entity Presence (25h)	Sensor-specific (6Fh)	0000h/0000h/0003h	Board Slot System	Discrete
18	NNN: IPMI WD	Watchdog2 (23h)	Sensor-specific (6Fh)	010Fh/0000h/010Fh	IPMI Watchdog	Discrete
19	NNN: ACPI State	System ACPI Power State (22h)	Sensor-specific (6Fh)	7FFFh/0000h/7FFFh	System ACPI power state	Discrete
20	NNN: CPU 0 Status	Processor (07h)	Sensor-specific (6Fh)	0463h/0400h/04E3h	CPU status: "Processor Throttled, THERMTRIP# or CAT_ERR#"	Discrete
21	NNN: POST Value	POST value OEM (C6h)	Sensor-specific (6Fh)	4000h/0000h/40FFh	POST code value (port 80h)	Discrete
22	NNN: FWH0 BootErr	Boot error (1Eh)	Sensor-specific (6Fh)	0008h/0008h/0008h	Boot error on MAIN SPI Flash	Discrete
23	NNN: FWH1 BootErr	Boot error (1Eh)	Sensor-specific (6Fh)	0008h/0008h/0008h	Boot error on RESCUE SPI Flash	Discrete
24	NNN: IPMC Storage	Management Subsystem Health (28h)	Sensor-specific (6Fh)	0002h/0000h/0003h	IPMI controller storage access error	Discrete
25	NNN: IPMC Reboot	Platform Alert (24h)	State asserted/deasserted (03h)	0002h/0000h/0003h	2 = (Re-)Boot of IPMC	Discrete
26	NNN: IPMC FwUp	OEM FW Update (C7h)	Sensor-specific (6Fh)	010Fh/0000h/010Fh	IPMI FW update /manual rollback /automatic rollback	Discrete
27	NNN: Ver change	Firmware version changed (2Bh)	Sensor-specific (6Fh)	0002h/0000h/0002h	IPMI FW version, UEFI BIOS version, and CPLD version changed	Discrete
28	NNN: SEL State	Event Logging Disabled (10h)	Sensor-specific (6Fh)	003Ch/0000h/003Ch	State of event logging	Discrete
29	NNN: IPMI Info-1	OEM Firmware Info 1 (C0h)	OEM (70h)	0003h/0000h/7FFFh	For internal use only	Discrete
30	NNN: IPMI Info-2	OEM Firmware Info 2 (C0h)	OEM (71h)	0003h/0000h/7FFFh	For internal use only	Discrete
31	NNN: Board Rev	OEM Board Revision (CEh)	Sensor-specific (6Fh)	0000h/0000h/7FFFh	Board revision information	Discrete

2.6.2. Sensor Thresholds

The **Table 8** and **Table 9** describe the default sensor thresholds set by IPMI Firmware.

Note that thresholds can be changed by IPMI **Set Sensor Thresholds** Command.

For example, to modify sensor "Temp CPU" Upper Critical threshold using Linux IPMI utility "ipmitool":

ipmitool -m 0x84 sensor thresh "Temp CPU" ucr 104

The format of the command is:

ipmitool -m <address> sensor thresh <sensor name> <threshold> <value>

Thresholds are: unr, ucr, unc, lnc, lcr, lnr

Table 8: Temperature Thresholds (for all classes)

Sensor Number / Sensor Name	07h / NNN:Temp CPU	08h / NNN:Temp Board
Upper non-recoverable	114 °C	100 °C
Upper critical	107 °C	95 °C
Upper non-critical	100 °C	90 °C
Normal max.	85 °C	85 °C
Nominal	50 °C	70 °C
Normal min.	-40 °C	0 °C
Lower non-critical	-40 °C	-40 °C
Lower critical	NA	-45 °C
Lower non-recoverable	NA	-50 °C

Table 9: Voltage Thresholds (for all classes)

Sensor Number / Sensor Name	0Bh / NNN:DDR4 Voltage	0Ch / NNN:VPX +12V	0Dh / NNN:VPX +5V	0Eh / NNN:Board +3V3SB
Upper non-recoverable	NA	NA	NA	NA
Upper critical	1.264 V	12.760 V	5.280 V	3.456 V
Upper non-critical	NA	NA	NA	NA
Normal max.	1.264 V	12.760 V	5.280 V	3.456 V
Nominal	1.200 V	12.056 V	4.992 V	3.296 V
Normal min.	1.136 V	11.176 V	4.832 V	3.136 V
Lower non-critical	NA	NA	NA	NA
Lower critical	1.136 V	11.176	4.832 V	3.136 V
Lower non-recoverable	NA	NA	NA	NA

2.7. OEM Event/Reading Types

Table 10 describes OEM (Kontron) specific sensor types and codes.

Table 10: OEM Event/Reading Types

OEM SENSOR TYPE (CODE)	OEM EVENT/ READING TYPE (CODE)	DESCRIPTION	
Firmware Info 1 (C0h)	70h (OEM)	Internal Diagnostic Data for Debug purpose	
Firmware Info 2 (C0h)	71h (OEM)	Internal Diagnostic Data for Debug purpose	
Post Value (C6h)	6Fh (sensor type specific)	Error is detected if the POST code is != 0 and doesn't change for a defined amount of time. In case of no error: Bits [7:0] = POST code (payload Port 80h) In case of error: Bits [15:0] = 4000h Data2 = POST code, low nibble Data3 = POST code, high nibble	
Firmware Upgrade Manager (C7h)	6Fh (sensor type specific)	Offsets / events: 0: First Boot after upgrade 1: First Boot after rollback (error) 2: First Boot after errors (watchdog) 3: First Boot after manual rollback 4..7: Reserved 8: Reset occurred by Firmware Watchdog	
Board Reset (CFh)	03h ("digital" Discrete)	Data 2 contains the reset type: WARM = 0h COLD = 1h FORCED_COLD = 2h SOFT_RESET = 3h Data 3 contains the reset source: IPMI_WATCHDOG = 0h IPMI_COMMAND = 1h PROC_INT_CHECKSTOP = 2h PROC_INT_RST = 3h RESET_BUTTON = 4h POWER_UP = 5h LEG_INITIAL_WATCHDOG = 6h LEG_PROG_WATCHDOG = 7h SOFTWARE_INITIATED = 8h SETUP_RESET = 9h UNKNOWN = FFh	
Power Good (08h)	73h (OEM)	Sensor-specific Offset	Event

		0h	BMC_PWRGD_ALL = P2.11
		1h	BMC_3V3SENSE = P1.30
		2h	BMC_3V3AUXSENSE = P1.31
		3h..Fh	Not used
Power Good Event (08h)	73h (OEM)	PWRGD + SLP_Sx signals monitoring for detecting Power are stable	
Board revision (CEh)	6Fh (sensor type specific)	Bits[7:0] = Board Revision number	

2.8. System Event Log

The System Event Log is a non-volatile repository for system events and certain system configuration information. The device that fields the commands to access the SEL is referred to as the System Event Log Device or SEL Device. Event Message information is normally written into the SEL after being received by the Event Receiver functionality in the Event Receiver Device.

On VX305x-40G board, the SEL Device is the FRU EEPROM and the Event Receiver Device is the IPMC.

Table 11 describes the events present in SEL Device on VX305x-40G board after a Cold Reset or Power Cycle:

Table 11: Events in SEL Device after a Cold Reset

#	Event	Description
1	System ACPI Power State for "Sxx:ACPI State" Legacy OFF state Asserted	This event indicates correctly that a shutdown has occurred, all Power Supply are off and so, in ACPI term, we are in Legacy OFF State.
2	Digital State Platform Alert for "Sxx:IpmC Reboot" Asserted	This event indicates correctly that the IPMC has rebooted.
3	Power Supply for "Sxx:Pwr Good Evt" Failure detected Deasserted	This event indicates that the PowerGood signal has been correctly Asserted than Deasserted. The sensor for "Pwr Good Evt" detects an event for the Powergood signal and so after each Cold Reset, this event is logged in SEL to indicate that there are no failure on PowerGood signal.
4	Power Supply for "Sxx:Pwr Good Evt" Predictive failure Deasserted	Same as above.
5	Digital State Board Reset for "Sxx:Last Reset" State Asserted	This event is asserted correctly because a "Cold Reset" has occurred and so sensor is updated accordingly.
6	Digital State Board Reset for "Sxx:Last Reset" State Asserted	This event is displayed twice and this is an issue.
7	System Event for "Timestamp Clock Sync" Asserted	This event is asserted correctly because IPMC has received a message from BIOS to synchronize its clocks for SEL timestamping.
8	System Event for "Timestamp Clock Sync" Asserted	This event is displayed twice because BIOS has sent 2 messages for timestamping clock synchronization.
9	FRU State for "S02:FRU State" sensor "Transition to M1" Asserted	This event and the following are corrects regarding the VITA 46.11 FRU Operational State machine: IPMC starts FRU Operational State machine from "M1-Inactive" state and when all Power are enabled, will transition FRU to "M4-Active" state.
10	FRU State for "S02:FRU State" sensor "Transition to M4" Asserted	See above.

2.9. IPMI Firmware Code

2.9.1. Firmware Upgrade

The IPMI Firmware code can be upgraded via the UEFI BIOS commands. The upgrade tool/commands allow download and activation of new operational code and also rollback to the "last known good" operational code.
See **4/How to Upgrade IPMI Firmware** for further details.

2.9.2. IPMI Firmware and FRU EEPROM Write Protection

The FRU EEPROM (FRU+SEL) write protection is connected to the SYS_WP domain, but the protection on this device can also be disabled with the SW3.2 switch or temporarily by the IPMC GPIO P1[16] at 0.
The IPMC is expected to set the GPIO at 0 before updating the SEL, and set it back to high-z (input) after, and never drive it at 1 (to prevent a short circuit if switch is "on").

NOTICE

From IPMI FW Revision V1.05, the NVMRO signal is bypassed to allow the FW to write NVRAM parameters and SEL (System Event Log) in FRU EEPROM to be compliant with VITA 46.11 standard Observation 4.1.10-1: some IPMC implementations might choose to retain enablement of writes to some portion of its non-volatile memory even when NVMRO is asserted e.g. for sensor logging.

Note that other sections of the FRU EEPROM are still write-protected, only NVRAM and SEL area are un-protected when NVMRO is set.

2.10. SEL Timestamping

Timestamping is a key part of event logging in the System Event Log (SEL) and tracking changes to the Sensor Data Records. The timestamps used for SDR and SEL records are assumed to be specified in relative local time. That is, the difference between the timestamp does not include the GMT offset.

Another timestamping is done also for FRU: FRU Board Info Area has a field that needs the number of minutes since 1.1.1996 00:00 hours to the current date set.

So, it is recommended that BIOS set current date/time to have a correct timestamping for all those records.

Obviously, if the system is powered down without a battery, the date/time are lost and if the user want to have a correct timestamping in SEL, he must set again date/time in BIOS.

For FRU, the date/time is written only one time in FRU EEPROM and so, the value is kept through power cycles.

3/ Known issues and limitations

3.1. How to get the IPMI FW Revision

This can be achieved from 3 different ways:

- BIOS Setup:
  Enter into BIOS Setup and move to "**Server Mgmt**" menu: IPMI FW Revision is displayed after "**BMC Firmware Revision**" parameter.

- UEFI Shell:
  At UEFI Shell prompt, type "**kipmi info**" command: IPMI FW Revision is displayed on "Firmware Revision" line (Active). Note that Backup IPMI FW Revision is also displayed as shown in Figure 2:

Figure 2: kipmi info command

```
> kipmi info
IPMI Device and Firmware Information
Device ID           0x10
Device Revision     0x80
Product ID          0x0049
Manufacturer ID     0x3A98
IPMI Version        1.5
SDR Revision        02
Firmware Revision   01.05  (Active)
                    01.04  (Backup)
```

- Under Linux OS:
  Use "**ipmitool mc info**" command: IPMI FW Revision is displayed on "Firmware Revision" line as shown in Figure 3:

Figure 3: ipmitool mc info command

```
# ipmitool mc info
Device ID                 : 16
Device Revision           : 0
Firmware Revision         : 1.05
IPMI Version              : 1.5
Manufacturer ID           : 15000
Manufacturer Name         : Kontron
Product ID                : 73 (0x0049)
Product Name              : Unknown (0x49)
Device Available          : yes
Provides Device SDRs      : yes
Additional Device Support :
    Sensor Device
    SEL Device
    FRU Inventory Device
    IPMB Event Receiver
    IPMB Event Generator
    Chassis Device
Aux Firmware Rev Info     :
    0x02
    0x02
    0x00
    0x00
```

3.2. Issues Table

Check for a specific item in the table rows:

- A "X" (cross) in the FW Version column indicates this item applies to this Firmware release (issue is not fixed).
- No "X" (cross) in the FW Version column indicates this item does not apply to this release (issue is fixed).

A full description associated to a specific problem is available in the next chapter.

Item#	Issue#	Description	FW Version				
			V1.03	V1.04	V1.05		
1	46092	SDR limitation	X				
2	50302	BMC self-test FAILED at board power-ON	X				
3	61059	Upgrade FW IPMI with HPM do not restart after upgrade	X	X			
4	76436	NVMRO Write-protection bypassed for SEL	X	X			
5	77269	Access to FRU EEPROM corrupted data	X	X			
6	79070	"Version Change" sensor event faulty asserted in SEL	X	X			
7	50796	System Event Logging	X	X	X		

3.3. Detailed Issues Description

Item #1 Issue #46092: SDR limitation

Description: The following VITA 46.11 mandatory sensors has not been yet implemented as SDR:

Sensor Number	Sensor Name
0	FRU Operational State
1	IPMB Link
2	FRU Health
3	Voltage
4	Temperature
5	Payload Test
6	Payload Test Status

Impact: No impact

Workaround: None

Fix: Fixed in **V1.04**

Item #2 Issue #50302: BMC self-test FAILED at board Power-On

Description: BMC reports self-test status as FAILED after each board Power-On.

Impact: The "BMC Device ID" is displayed as UNKNOWN in BIOS setup (ServerMngt menu) and PBIT "ipmi" test is FAILED.

Workaround: A board reset allows the BMC self-test PASSED.

Fix: Fixed in **V1.04**

Item #3 Issue #61059: Upgrade FW IPMI with HPM do not restart after upgrade

Description: IPMI FW can be upgraded using PICMG HPM.1 command under EFI Shell with 'kipmi' utility. At the end of the process after the message "Activating firmware", the IPMC should restart automatically but with IPMI FW V1.04, the IPMC does not restart and stay in M1-Inactive state.
The root cause is that the last reset due to FW Change cause is not taken into account correctly in the FRU state machine.

Impact: None

Workaround: A board reset allows the FW to be correctly upgraded.

Fix: Fixed in **V1.05**

Item #4 Issue #76436: NVMRO Write-protection bypassed for SEL

Description: This issue is an enhancement concerning the write protection policy of IPMC FRU data. Actually, the WP of FRU EEPROM is connected to the WP of VPD EEPROM. Level of write protection is not adapted to the IPMC FRU even if it contains VPD info. VITA 46.11 Specification allows to write SEL in non-volatile device even if NVMRO signal is asserted.

Impact: IPMC cannot store new events in SEL if NVMRO signal is asserted.

Workaround: None.

Fix: Fixed in **V1.05**

Item #5 Issue #77269: Access to FRU EEPROM corrupted data

Description: New events are not logged in SEL (System Event Log) due to corrupted data in the FRU EEPROM even if a checksum protect each entry.

Impact: The SEL cannot be updated anymore with new events.

Workaround: Clearing the SEL solves the issue but old events are lost.

Fix: Fixed in **V1.05**

Item #6 Issue #79070: "Version Change" sensor event faulty asserted in SEL

Description: When a new hysteresis or threshold or event is set using either "Set Sensor Hysteresis" or "Set Sensor Threshold" or "Set Sensor Event Enable" command, a "Version change" event is faulty asserted in the SEL in addition to the event generated for the new hysteresis or threshold or event.

Impact: A new event for "Version Change" is added in the SEL each time "Set Sensor Hysteresis" or "Set Sensor Threshold" or "Set Sensor Event Enable" command is issued by user. This event does not reflect the FW update and do not be taken into account by user.
Note that in case of an actual FW update, a "Version Change" event is correctly added in the SEL.

Workaround: None.

Fix: Fixed in **V1.05**

Item #7 Issue #50796: System Event Logging

Description: Some events reported in System Event Log (SEL) shall not be taken into account

This is the case for the Discrete "Last Reset" sensor event, it is logged twice in the SEL Device and shall be considered as coming from only one reset source.

Impact: No impact on the functionality of the IPMC.
Those events that occur during initialization shall be filtered by ChMC.

Workaround: None.

Fix: None.

3.4. Limitations

Table 12 summarizes the limitations of IPMI FW.

Table 12: Limitations

Item#	Issue#	Description
1	50799	VCORE sensor reporting the VCCin_SOC voltage is not monitored
2	61378	CAT_ERR# assertion is not reported in "CPU0 Status" sensor
3	79342	VITA46.11 Event Messages Limitation

3.5. Detailed Limitations Description

Item #1 Issue #50599: VCORE sensor reporting the VCCin_SOC voltage is not monitored

Description: VCORE sensor reporting the VCCin_SOC voltage is not part of the SDR.
Note that this sensor does not have any corresponding limit registers in the Nuvoton but its value should not exceed a max value = 1,982 V on VX305x-40G board corresponding to a measured value 1,802V +10%.

Impact: No impact

Workaround: None

Fix: None

Item #2 Issue #61378 CAT_ERR# assertion is not reported in "CPU0 Status" sensor.

Description: The "CPU 0 Status" sensor do not displayed the CAT_ERR# assertion in SDR.
The "CPU0 Status" sensor capabilities for event assertion are:

- [IERR]
- [Thermal Trip]
- [Configuration Error]
- [SM BIOS Uncorrectable CPU-complex Error]
- [Throttled]

Impact: No impact

Workaround: None

Fix: None

Item #3 Issue #79342: VITA 46.11 Event Messages Limitation

Description: Following VITA 46.11 messages are not implemented:

- System IPMB Link Sensor Event Message
- FRU Health Sensor Event Message
- FRU Temperature Sensor Event Message
- Payload Test Results Sensor Event Message
- Payload Test Status Event Message

Impact: No impact

Workaround: None

Fix: None

4/ How to Upgrade IPMI Firmware

IPMI FW can be upgraded independently of any OSes using "kipmi" utility under UEFI Shell.
Follow step by step the procedure below to upgrade successfully the IPMI FW on IPMC.
Note that all commands have to be entered without the double quotes.

1. Power-On the board and enter into BIOS Setup
2. In Boot menu, select UEFI Shell as first Boot device
3. Save changes and Exit BIOS Setup
4. Copy the <filename>.hpm file containing the IPMI FW binary image on the root directory of a USB drive and plug the USB drive on one USB port of the system
5. At the UEFI Shell prompt, type "***map -r***"
6. Depending of your system, you have to type "***fsX:***" where X is the number of the device corresponding to the USB drive; for example, "***fs0:***" or "***fs1:***". The UEFI shell prompt is modified to "***fsX:***>"
7. Type "***kipmi hpm upgrade <filename>.hpm***"

At the end of the process after the message "Activating firmware", the IPMC restart automatically.
To check if the IPMI FW Revision is correct, refer to chapter **3.1 How to get the IPMI FW Revision**.

Note that IPMI FW may be upgraded using Linux "kipmitools" utility.
See Linux User's Guide Document for further details.

About Kontron – An S&R Company

Kontron is a global leader in embedded computing technology (ECT). As a part of technology group S&T, Kontron offers a combined portfolio of secure hardware, middleware and services for Internet of Things (IoT) and Industry 4.0 applications. With its standard products and tailor-made solutions based on highly reliable state-of-the-art embedded technologies, Kontron provides secure and innovative applications for a variety of industries. As a result, customers benefit from accelerated time-to-market, reduced total cost of ownership, product longevity and the best fully integrated applications overall.

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