



# CMB-3U - 3U Chassis Monitoring Board

CA.DT.B11-2e - September 2017

 CMB-3U User's Guide

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## Symbols

The following symbols may be used in this manual:



**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION** indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.



**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 them. 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 from an electrical device. Eye protection per manufacturer notice shall review before servicing.



This symbol indicates general information about the product and the user manual.

This symbol also indicates detail information about the specific product configuration.



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 device must be carried out by sufficiently skilled personnel only.

#### ▲ CAUTION



##### 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 Instructions



##### 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, 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 manual or received from Kontron's Technical Support as a special handling instruction, will void your warranty.

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 manual.

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.




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

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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 they 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

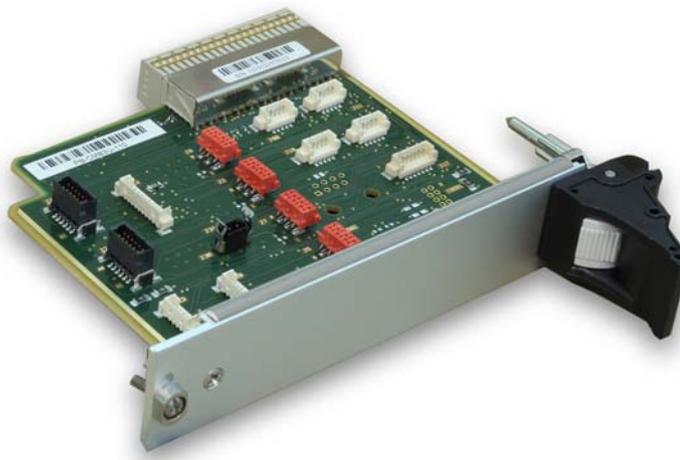
CMB-3U is the 3U slot version of the popular CMB (chassis management controller) from Kontron.

Dedicated to systems integrators, this rackable solution comes in 2 parts, a field replaceable chassis management controller (CMB-3U, Figure 1) and a rear transition module (PB-CMB3U, Figure 2).

Figure 1: CMB-3U Overview



Figure 2: PB-CMB3U Overview



### ► CMB-3U Unique Selling Points:

- ▶ CMB-3U offers the operator interface (SLI and Network interface, Health status LED) directly on the product. No need to design a dedicated operator panel interface
- ▶ CMB-3U fits existing standard 3U card cages from most subrack vendors. Existing 3U computers can be upgraded with this high end health management controller.
- ▶ CMB-3U receives all computer I/O from its dedicated Rear Transition module. This allows fast MTTR in the unlikely case of a Chassis Management module replacement.

## 1.1 Manual Overview

### 1.1.1 Objective

This guide provides general information, operating instructions, functional description, software interface of the CMB-3U board and its associated rear transition module PB-CMB3U




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This hardware technical documentation reflects the most recent version of the product. The Hardware Release Notes (see section 1.7 "Related Publications") might help to keep track of potential evolutions.

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Functional changes that differ from previous version of the document are identified by a vertical bar in the margin.

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These boards need to be used with a 3U 1 slot cPCI backplane. Refer to section 1.4 page 4 for Ordering Information (Schroff part number 23006-811)

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### 1.1.2 Audience

This guide is written to cover, as far as possible the range of people who will handle or use the CMB-3U and the PB-CMB3U, from unpackers/inspectors, through system managers and installation technicians to hardware and software engineers. Most chapters assume a certain amount of knowledge on the subjects of single board computer architecture, interfaces, peripherals, system, cabling, grounding and communications.

### 1.1.3 Scope

This guide describes all variants of the CMB-3U and the PB-CMB3U series.

### 1.1.4 Structure

This guide is structured in a way that will reflect the sequence of operations from receipt of the board up to getting it working in your system. Each topic is covered in a separate chapter and each chapter begins with brief introduction that tells you what the chapter contains. In this way, you can skip any chapters that are not applicable or with which you are already familiar.

The chapters are:

- ▶ Chapter 1 - Introduction (this chapter)
- ▶ Chapter 2 - Boards Identification
- ▶ Chapter 3 - Installation
- ▶ Chapter 4 - Functional Description
- ▶ Chapter 5 - Connectors
- ▶ Chapter 6 - Software
- ▶ Chapter 7 - Command Line Interface
- ▶ Chapter 8 - Configuration
- ▶ Chapter 9 - Operation
- ▶ Chapter 10 - Board Management
- ▶ Chapter 11 - CMB-3U Shell Commands
- ▶ Chapter 12 - HTTP Interface
- ▶ Chapter 13 - SNMP Interface
- ▶ Chapter 14 - Update Software
- ▶ Chapter 15 - Software Changelog
- ▶ Chapter 18 - Overview of a CMB-3U in a Chassis
- ▶ Chapter 16 - Patching VPDs for Customization
- ▶ Chapter 17 - Known Limitations

## 1.2 Features

The chassis monitoring board and its associated rear transition module implement the following features:

- ▶ Power supply monitoring and control,
- ▶ Temperatures monitoring,
- ▶ Fan speed monitoring and control,
- ▶ Alarm reporting,
- ▶ Backplane signals control and monitoring: SYSRESET, ACFAIL, SYSFAIL, Maskable Resets, .....
- ▶ User's GPIO,
- ▶ Backplane I<sup>2</sup>C bus to control and monitor the boards in the backplane,
- ▶ Serial lines console interface for debug and control,
- ▶ Ethernet interface for remote monitoring and control using Telnet, HTTP or SNMP.

## 1.3 Acronyms

BDM .....	Background Debug Mode
CLI .....	Command Line Interface
CMB-3U .....	Chassis Monitoring Board 3U Form Factor
GPIO .....	General Purpose Input/Output
PSU .....	Power Supply Unit
PWM .....	Pulse With Modulation
PB-CMB3U .....	Rear Transition Module of the Chassis Monitoring Board 3U Form Factor
RSVD .....	Reserved

## 1.4 Ordering Information

Table 1: CMB-3U Order Code

ORDER CODE	FRONT PANEL SIZE (INCH)	DESCRIPTION	
CMB3U-SA-N00	No front panel	Fans: 3 wires	
CMB3U-SA-100	5 HP version (1")	Fans: 3 wires	
CMB3U-SA-N10	No front panel	Fans: 4 wires	
CMB3U-SA-110	5 HP version (1")	Fans: 4 wires	Preferred

Table 2: PB-CMB3U Order Code

ORDER CODE	FRONT PANEL SIZE (INCH)	DESCRIPTION	
PB-CMB3U-000	4 HP version (0.8")	Fans: 3 wires	
PB-CMB3U-100	5 HP version (1")	Fans: 3 wires	
PB-CMB3U-010	4 HP version (0.8")	Fans: 4 wires	
PB-CMB3U-110	5 HP version (1")	Fans: 4 wires	Preferred

Table 3: IFDP Order Code

ORDER CODE	SIZE	DESCRIPTION	MAIN FEATURES
IFDP01-3U-CPCIV2	1 Slot 3U	1 Slot cPCI Backplane with 2 connectors	No bussed signal. P2 compatible to 32-bit system slot pinout. Rear I/O functionality.

## 1.5 Technical Specifications

### 1.5.1 CMB-3U

Table 4: CMB-3U Technical Specifications

POWER SPECIFICATION	
Supply Voltage	5V (4.5V to 6V)
Consumption (W)	Typical 200 mA Max 250 mA
MECHANICAL SPECIFICATIONS	
Front panel Size	1 slot (5HP) for CMB-3U-SA-1x0
Dimensions (mm)	160 x 100
Weight (g)	170
ENVIRONMENTAL SPECIFICATIONS	
Conformal coating	Optional
Operating temperature	-20°C to 70°C
Storage temperature	-40°C to 85°C
Relative humidity	99% non-condensing

### 1.5.2 PB-CMB3U

Table 5: CMB-3U Technical Specifications

MECHANICAL SPECIFICATIONS	
Front panel Size	1 slot (4 HP or 5HP) for PB-CMB3U-xx0
Dimensions (mm)	80 x 100
Weight (g)	100
ENVIRONMENTAL SPECIFICATIONS	
Conformal coating	Optional
Operating temperature	-40°C to 85°C
Storage temperature	-40°C to 85°C
Relative humidity	99% non-condensing

## 1.6 Reliability

MTBF calculations are made according to the standard MIL-HDBK217F-2 for following types of environment:

- ▶ Ground Benign (GB)
- ▶ Naval Sheltered (NS),
- ▶ Air Rotary Wing (ARW)
- ▶ Air Inhabited Cargo (AIC)

**Table 6: CMB-3U and PB-CMB3U MTBF**

	GB		NS		ARW	AIC
	25°C	40°C	25°C	40°C	55°C	40°C
CMB-3U-SA-xx0	759 136h	523 603 h	160 358h	113 037h	31 873h	112 270h
PB-CMB3U-xx0	1 978 240h	1 529 447h	393 659h	304 074h	62 577h	478 166h

## 1.7 Related Publications

The following publications contain information relating to this product:

**Table 7: Related Publications**

PRODUCT	PUBLICATION
Standard	
ANSI/VITA 46.0	VPX Baseline Standard - ANSI/VITA 46.0-2007
PICMG 2.0 R3.0	Compact PCI Specification
Hardware	
CMB-3U-SA-xx0 Boards	CMB-3U Hardware Release Notes CA.DT.B12
PB-CMB3U-xx0 Boards	PB-CMB3U Hardware Release Notes CA.DT.B13

## 2 / Boards Identification

### 2.1 CMB-3U

The CMB-3U boards are identified by labels fitted to the bottom side and the top side of the board.

- A** "Board Order Code and Serial Number" labels
- B** "Board Ethernet Number" label
- C** "Board Variant and E.C. Level" label

Figure 3: CMB-3U Identification (Top View)

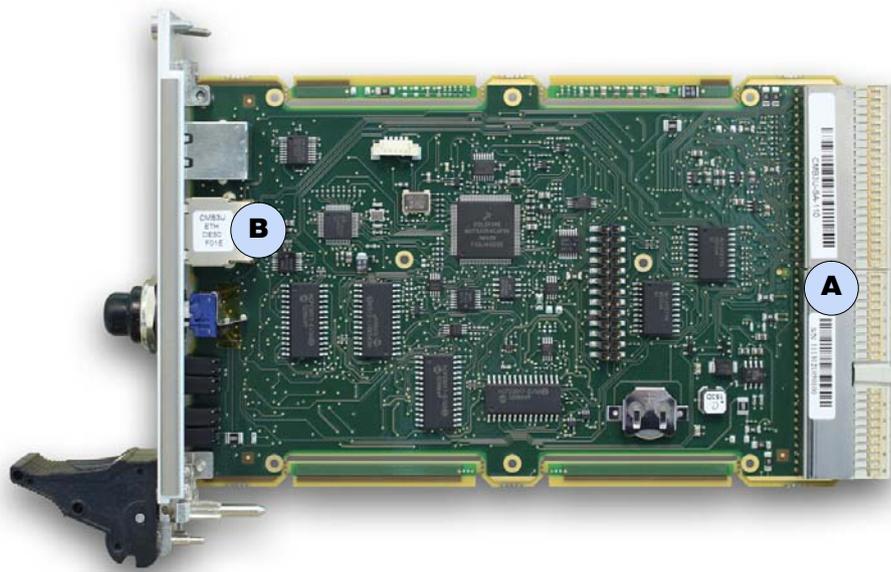
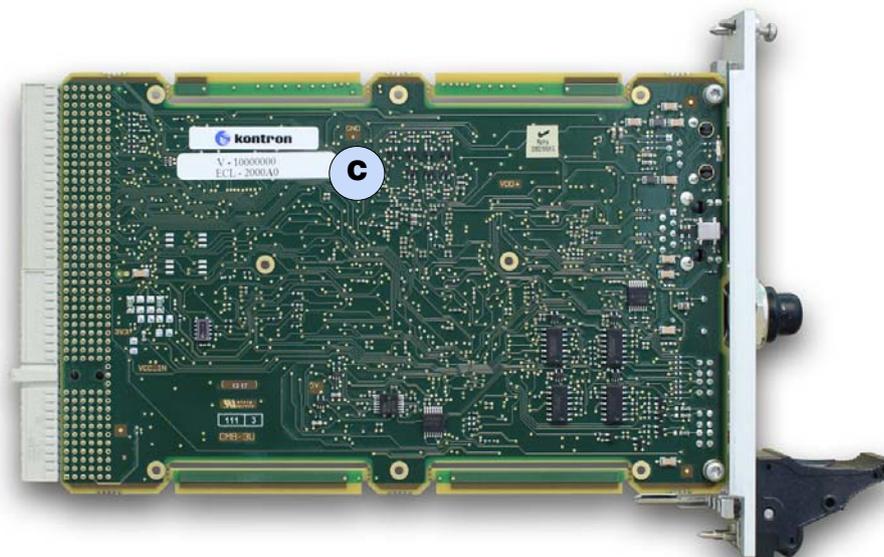


Figure 4: CMB-3U Identification (Bottom View)



## 2.2 PB-CMB3U

The PB-CMB3U Rear Transition Modules are identified by labels fitted to the bottom side and the top side of the board.

- A** "Board Order Code and Serial Number" labels
- B** "Board Variant and E.C. Level" label

Figure 5: PB-CMB3U Identification (Top View)



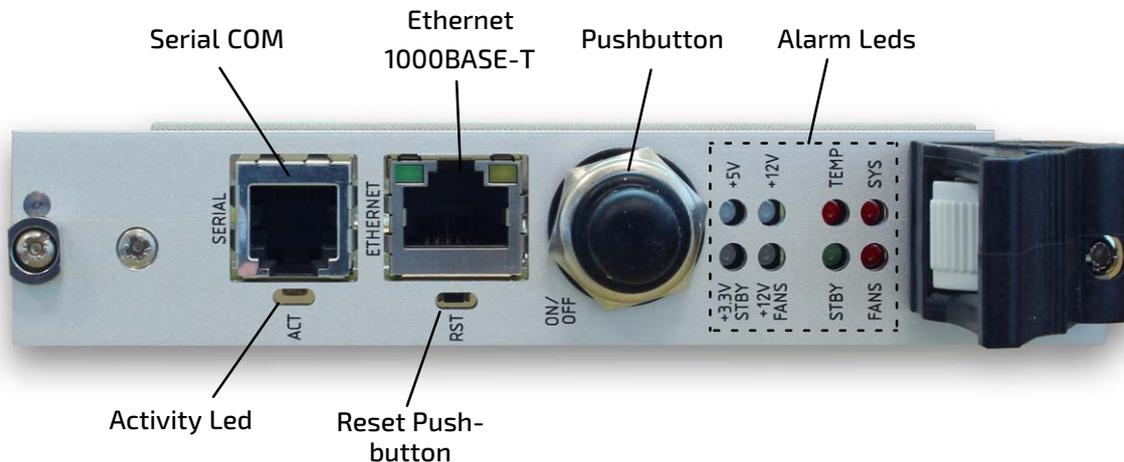
Figure 6: PB-CMB3U Identification (Bottom View)



## 2.3 CMB-3U I/O Interfaces

### 2.3.1 CMB-3U Front Panel Identification

Figure 7: Location of the Front Panel Connectors



### 2.3.2 Front Panel Technical Specifications

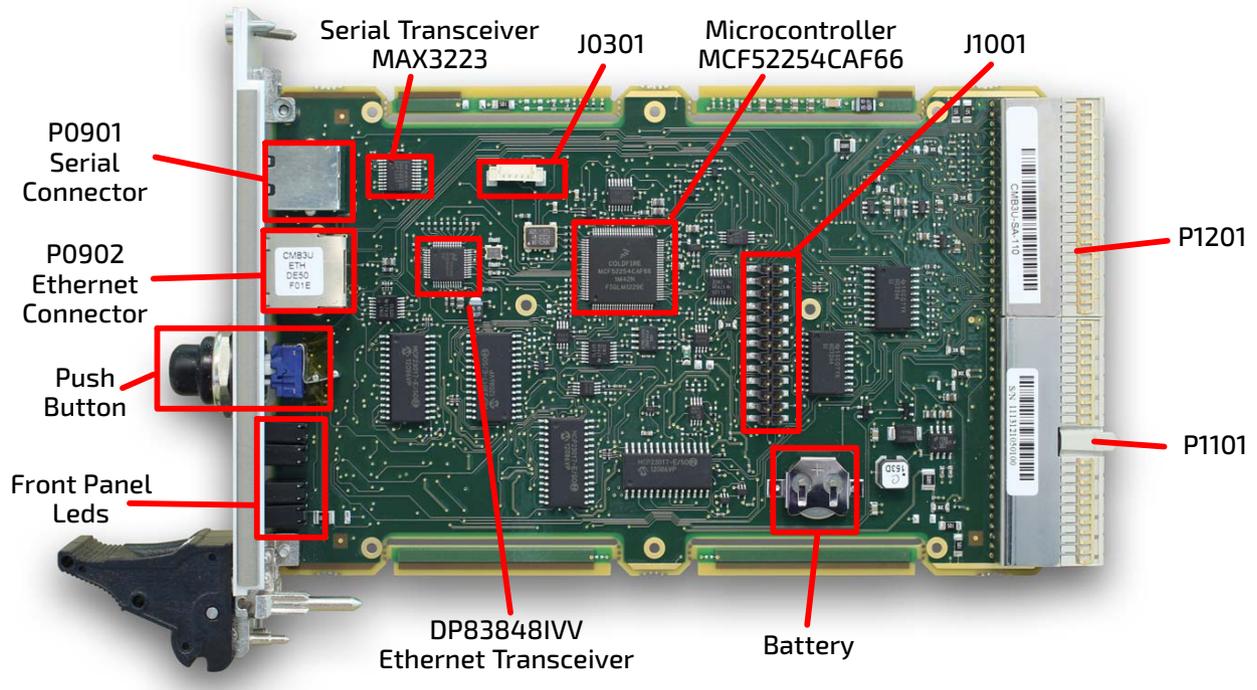
Table 8: Front Panel Connectors Technical Specifications

FRONT PANEL NAME	DESCRIPTION	COMMENTS
SERIAL	COM: serial port , EIA-232, RJ-11 connector	COM0 : standard RJ-11 connection COM1 : use KIT-2x-RJ12DB9 on this port.
ETHERNET	Ethernet interface implemented on RJ-45 connector	1000BASE-T
ON/OFF	Power ON/OFF pushbutton	Power on/off chassis. Can also generate soft reset (shutdown) by estimating pushing time.
RST	Reset pushbutton	Generate local reset for debug purpose.
ACT	Activity Led	CMB-3U Activity
+5V	+5V Alarm - Bicolor led	Backplane Power Refer to Table 10 - Alarm Description, page 19
+12V	+12V Alarm - Bicolor led	
+3.3V STBY	+3.3V Standby Alarm - Bicolor led	
+12V FANS	+12V Fans Alarm - Bicolor led	
TEMP	Temperature Alarm - Red led	
FAN	Fan Alarm - Red led	
SYS	System Alarm - Red led	
STBY	CMB Standby Power - Green led	

### 2.3.3 CMB-3U Component Layout

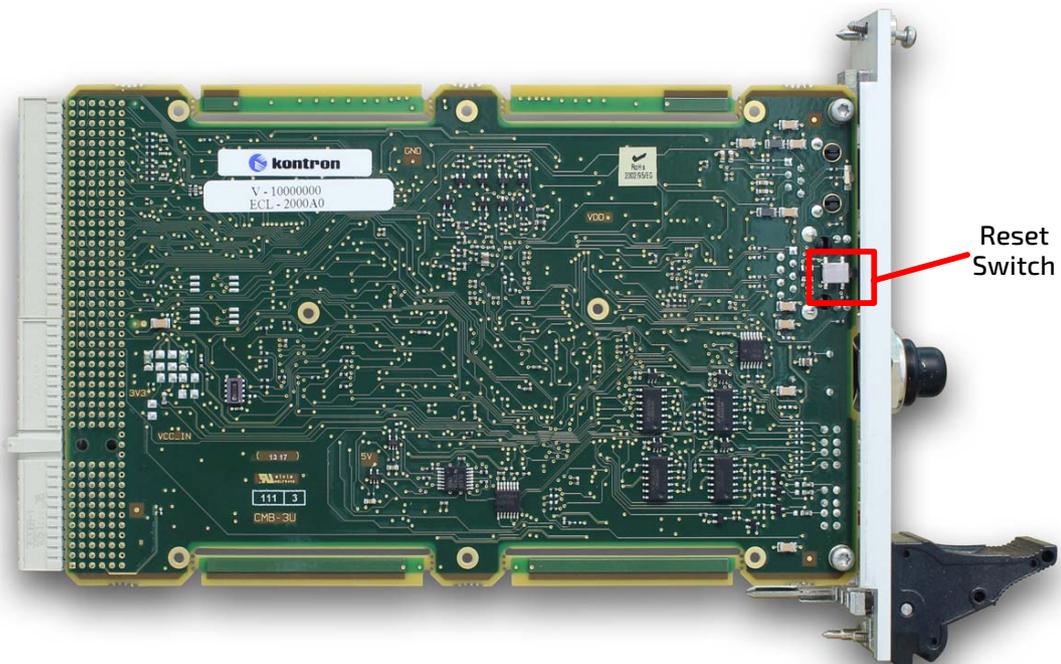
#### ► CMB-3U Top Side

Figure 8: Component Layout of the CMB-3U - Top Side



#### ► CMB-3U Bottom Side

Figure 9: Component Layout of the CMB-3U - Bottom Side



## ► CMB-3U Components Technical Specifications

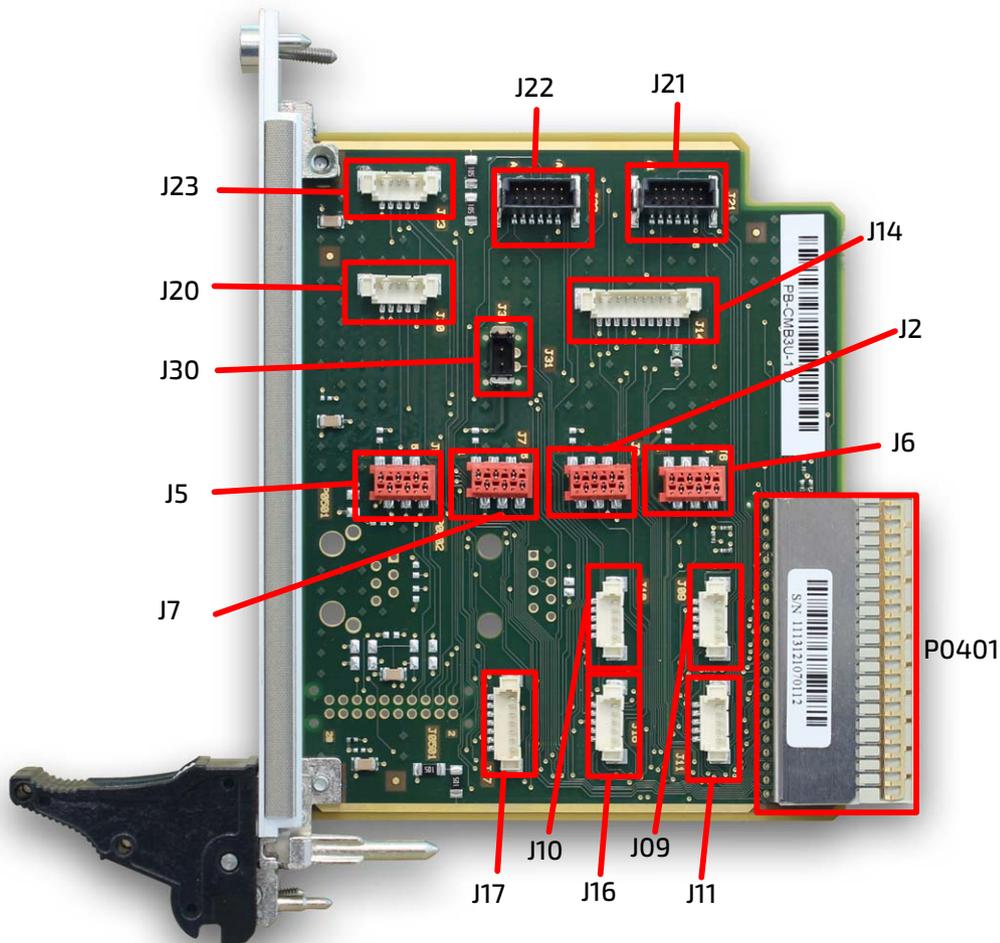
Table 9: CMB-3U Components Technical Specifications

ONBOARD INTERFACE		
J0301	53398-0571 Molex Connector	+5V Stby onboard power
J1001	TSM 113-01-L-DV-M Samtec Connector	BDM connector Programming/debug connector used with Cold Fire Multilink and USB Interface
MICROCONTROLLER		
Freescale MCF52254CAF66		32-bit microcontroller
ETHERNET CONTROLLER		
National Semiconductor DP83848IVV		Single port 10/100 Mb/s Ethernet Physical layer transceiver
SERIAL		
MAXIM MAX3223EAP+		RS232 Transceiver

## 2.4 PB-CMB3U I/O Interfaces

### 2.4.1 PB-CMB3U Component Layout - Top Side

Figure 10: Component Layout of the PB-CMB3U - Top Side



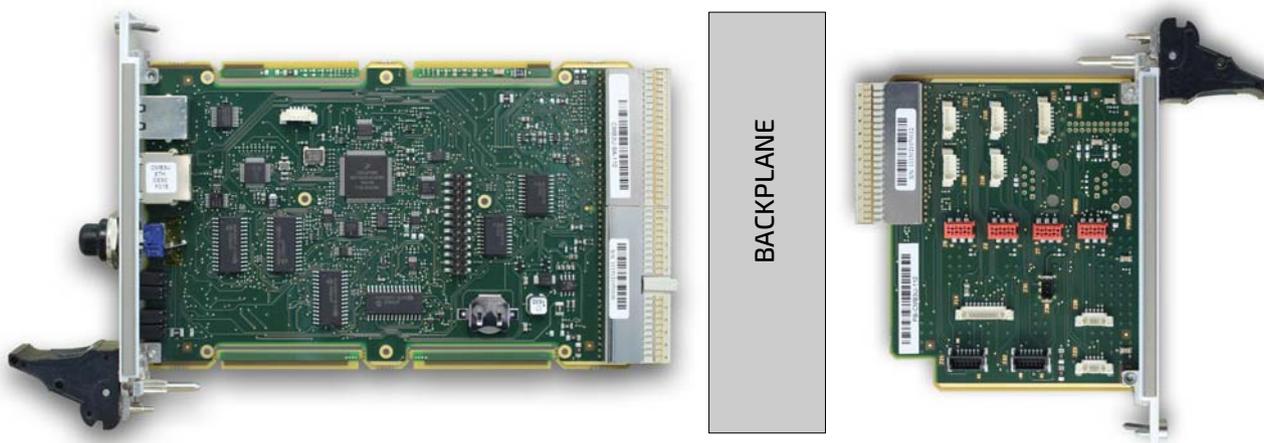
- |                     |                                         |
|---------------------|-----------------------------------------|
| ▶ J2 / J5 / J6 / J7 | Fans Connectors                         |
| ▶ P0401             | cPCI Connector                          |
| ▶ J21 / J22         | PSU and Backplane Monitoring Connectors |
| ▶ J30               | +12V Fan Connector                      |
| ▶ J14               | GPIO Connector                          |
| ▶ J09 / J10         | I2C Backplane Connectors                |
| ▶ J11               | I2C Temperature Sensor Connector        |
| ▶ J16               | VPX System Signal Connector             |
| ▶ J20 / J23         | Power Supply Standby Connectors         |
| ▶ J17               | Maskable Reset Signal Connector         |

## 2.4.2 PB-CMB3U Components Technical Specifications

Refer to Chapter 5 - Connectors, page 21.

## 3 / Installation

The CMB-3U and the PB-CMB3U have been designed for an easy installation. However, the following standard precautions, installation procedures, and general information must be observed to ensure proper installation and to preclude damage to the board, to other system components, and to preclude injury to personnel.



### 3.1 Safety Requirements

The following safety precautions must be observed when installing or operating the CMB-3U and the PB-CMB3U. Kontron assumes no responsibility for any damage resulting from failure to comply with these requirements.



These boards contain electrostatically sensitive devices. Please observe the necessary precautions to avoid damage to your boards:

Discharge your clothing before touching the assembly. Tools must be discharged before use.

- ▶ Do not touch components, connector pins or traces.
- ▶ We strongly recommend our customers to work in an environment equipped with anti-static workbenches with professional discharging equipments.

## 3.2 Initial Installation Procedure

The following procedures are applicable only for the initial installation of the CMB-3U and the PB-CMB3U in a system. Procedures for standard removal operations are found in their respective chapters.

To perform an initial installation of the CMB-3U and the PB-CMB3U in a system proceed as follows:

1. Ensure that the safety requirements indicated in Section 3.1 are observed.




---

Failure to comply with the instruction below may cause damage to the boards or result in improper system operation.

---

2. Ensure that the boards are properly configured for operation in accordance with application requirements before installing.




---

Care must be taken when applying the procedures below to ensure that neither the CMB-3U and the PB-CMB3U nor other boards in the system are physically damaged by the application of these procedures.

---

3. To install the CMB-3U and the PB-CMB3U perform the following:

- 3.1. Ensure that no power is applied to the system before proceeding.




---

When performing the next step, DO NOT push the board into the backplane connectors. Use the ejector handles to seat the board into the backplane connectors.

---

- 3.2. Carefully insert the board into the slot designated by the application requirements for the board until it makes contact with the backplane connectors.
- 3.3. Using the ejector handle, engage the board with the backplane. When the ejector handle is locked, the board is engaged.
- 3.4. Fasten the front panel retaining screws.
- 3.5. Connect all external interfacing cables to the board as required.
- 3.6. Ensure that the board and all required interfacing cables are properly secured.

The CMB-3U and the PB-CMB3U are now ready for operation. For operation of the CMB-3U, and the PB-CMB3U refer to appropriate specific software, application, and system documentation.

## 3.3 Standard Removal Procedure

To remove the boards, proceed as follows:

1. Ensure that the safety requirements indicated in Section 3.1 are observed.




---

Care must be taken when applying the procedures below to ensure that neither the CMB-3U and the PB-CMB3U nor other boards in the system are physically damaged by the application of these procedures.

---

2. Ensure that no power is applied to the system before proceeding.
3. Disconnect any interfacing cables that may be connected to the board.
4. Unscrew the front panel retaining screws.
5. Disengage the board from the backplane by first unlocking the board ejection handles and then by pressing the handles as required until the board is disengaged.
6. After disengaging the board from the backplane, pull the board out of the slot.
7. Dispose of the board as required.



## 4.2.2 Voltage Monitoring

The CMB-3U could continuously monitor following voltages outputs provided by the PSU:

- ▶ +5V
- ▶ +3.3V Stby
- ▶ +12V
- ▶ +12V Fans

If one of these voltages is out of the limits, the associated LED on the chassis front panel is set up in red state.

- ▶ STBY (+5V STDBY)

The CMB-3U should be powered from standby power so that all features are available even when the chassis is powered off.

Two 5V standby power inputs are available for redundancy, if needed.

If the voltage on one of these inputs is not OK, and the input is declared as used, the Stby LED will blink to report the error.

Voltage tolerance limits are software configurable and set up during the installation stage.

## 4.2.3 Temperature Monitoring

The CMB-3U continuously monitors the temperature inside the chassis via one local sensor on the CMB-3U, and up to eight sensors in the chassis.

When the temperature exceeds tolerance limits, the temperature red LED on the chassis front panel is activated.

Available temperature sensors and temperature limits are software configurable and set up during the installation stage

The CMB-3U can also be configured to power off the system if temperatures are out of limits. In this case the Sys red LED :

- ▶ is switched on when the temperature error occurs
- ▶ remains on even if the temperature becomes OK (latched status).
- ▶ is switched off at the next powered on requested if the temperature is OK

This can be managed by using one of the following commands :

```
system@CMB> set vpd system overtempoff on
system@CMB> set vpd system overtempoff off
system@CMB> set vpd system undertempoff on
system@CMB> set vpd system undertempoff off
```

A 5°C hysteresis applies to the temperature limits to prevent the temperature status from toggling continuously when temperature is at a limit. This prevents the "temp" LED from blinking.

If the CMB-3U was configured to power-off the system on temperature error, this also prevents the system from being immediately restarted by the operator while it is still too hot.

## 4.2.4 Fan Monitoring

The CMB-3U can monitor up to eight fans speed.

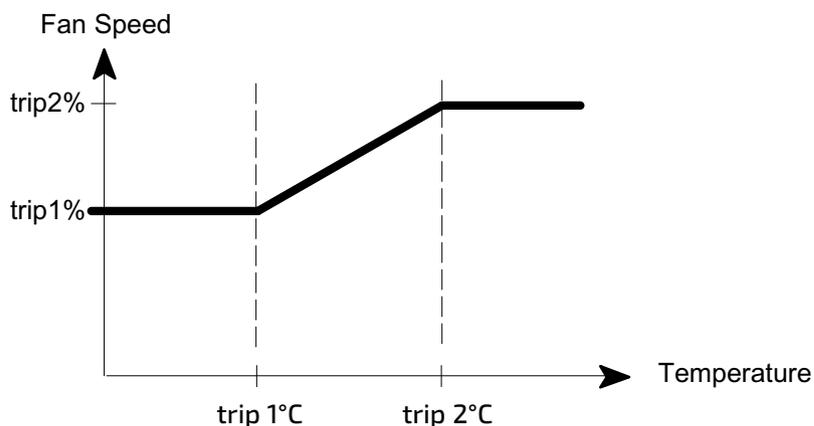
When a fan is not running or when its speed is lower than the lowest limit, the fan red LED on the chassis front panel is activated and all fans are configured to full speed.

Fan speed limits are software configurable and set up during the installation stage.

## 4.2.5 Fan Control

The chassis fans speed is controlled and correlated to the chassis temperature, according to two software configurable trip points `trip1` and `trip2`.

Each trip point defines a fan speed (in % of max) at a given temperature



The chassis temperature used for fans speed is computed as follows :

- ▶ max temperature of all chassis sensors if equipped
- ▶ the temperature of the CMB-3U sensor if no chassis sensor is equipped




---

Most fans are unable to operate safely at speeds below 50% of their maximum speed, so be aware of that when setting trip points.

---

## 4.2.6 Backplane Signals

VME signals `SYSRESET`, `ACFAIL`, `SYSFAIL` are controlled and monitored by the CMB-3U. `SYSFAIL` is monitored and drives the sys red LED.

VPX signals `SYSRESET`, `NVMRO`, `MRST1-MRST8` are controlled by the CMB-3U.

`SYSRESET` is driven active when the power supplies are off and is driven inactive 250 ms after the powersupplies have been switched on.

## 4.2.7 Startup Time

When standby power is applied to the CMB-3U (primary power supply is present), the CMB-3U software starts and is ready for monitoring in less than a second.

## 4.2.8 Self-Tests

When standby power is applied to the CMB-3U, Power-on Built-In-Tests (PBIT) are executed to check the CMB-3U components, configuration and environment.

The status is reported with the `stby` (standby) green LED :

- ▶ OFF: FAIL, the CMB-3U software failed to start
- ▶ BLINKING: the CMB-3U software has detected a software error, hardware error, or a standby power voltage out of limits
- ▶ ON: OK, system in standby mode or running

When the power supplies are enabled, a LEDs test sequence is performed: all LEDs except `stbby` are blinking during five seconds.

For power supply bicolor LEDs, the LEDs are blinking between red and green.

## 4.2.9 Alarms

The CMB-3U can generate alarms through the chassis front panel LEDs.

There are eight LEDs:

- ▶ Bicolor red/green for +3.3V stby
- ▶ Bicolor red/green for +5V
- ▶ Bicolor red/green for +12V
- ▶ Bicolor red/green for +12V Fans
- ▶ Green for standby
- ▶ Red for Temperature
- ▶ Red for fan failure
- ▶ Red for SYSFAIL

The LEDs behavior is described in following table:

**Table 10: Alarm Description**

FAILURE DESCRIPTION	DIAGNOSIS
Temp LED is blinking	The CMB-3U has detected some missing temperature sensors
Temp LED is ON (red) but the temperature is within limits	The CMB-3U has not detected any temperature sensor at start up
Temp LED is ON (red)	At least one temperature is out of limits
Fan LED is ON (red)	The CMB-3U has detected a fan failure
A power voltage LED is green	The voltage level of this power rail is correct
A power voltage LED is red	The voltage level of this power rail is not correct
A power voltage LED is blinking	The CMB-3U has detected a power-supply failure on this power rail (redundancy failure for example), but the voltage is OK.
A power voltage LED is off	No power on this rail.
Sys LED is ON (red)	VME SYSFAIL signal is currently active or an error condition occurred (power off due to temperature out of limits for example)
Sys LED is blinking	An error has been detected on the boards in the backplane
Stby LED is blinking	The CMB-3U software has detected a software error, hardware error, or a standby power voltage out of limits.

## 4.2.10 Serial Lines

The CMB-3U provides a serial line interface to control and monitor the chassis through a Command Line Interface (CMB shell). This interface can be used by an operator using a console or by a high level software running on another system.

Serial line interface characteristics are:

- ▶ Speed 115200 bauds
- ▶ 8-bit
- ▶ 1Stop bit
- ▶ No parity

Two simplified (TX,RX,GND) serial ports are available on the RJ-11 connector :

- ▶ the first one is protected by a password login and is to be connected to a console for maintenance by an operator. This can be done using a standard RJ-12 cable.
- ▶ the second one is without login and for optional in-chassis communication with other boards in the chassis. A special cable is needed to connect to the right pins of the RJ-11 connector.



The second serial line can be enabled or disabled by software configuration

## 4.2.11 Ethernet

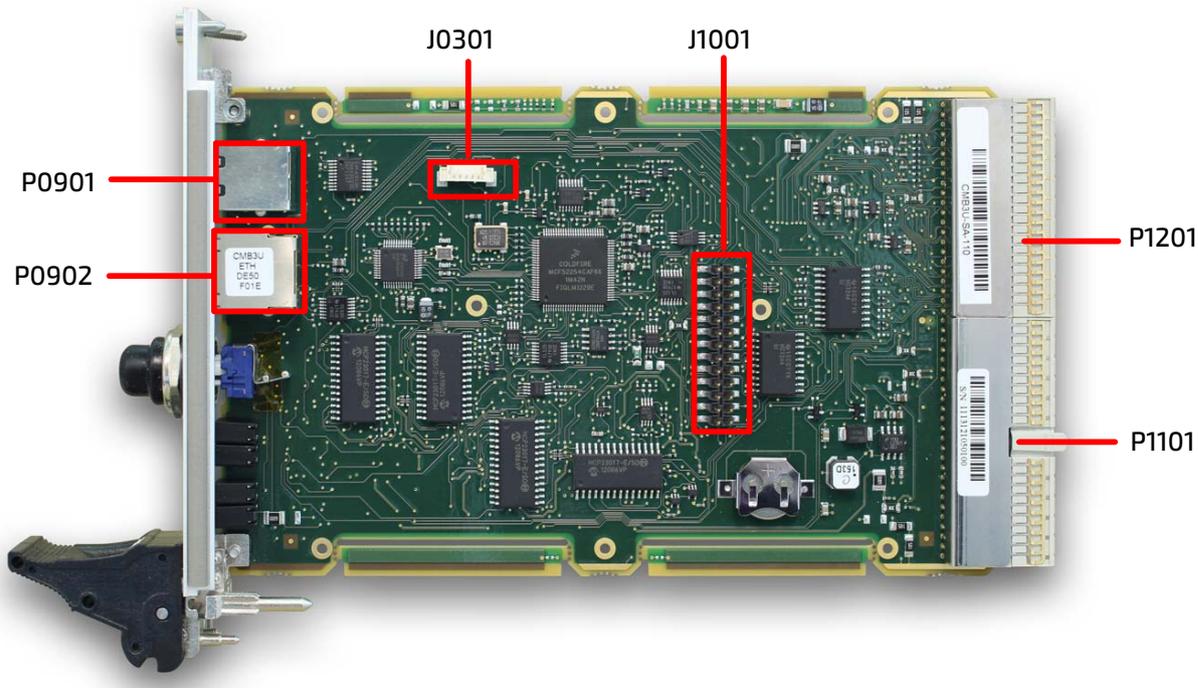
This interface provides a way to control and monitor the chassis:

- ▶ through Telnet using a Command Line Interface (CMB shell)
- ▶ through HTTP using a Web browser
- ▶ through SNMP using standard SNMP tools

## 5 / Connectors

### 5.1 CMB-3U Connectors

Figure 12: Connectors Location



- ▶ Refer to section 5.1.1 page 22 for J0301 - Power Supply Standby onboard Connector
- ▶ Refer to section 5.1.2 page 23 for J1001 - BDM Connector: Programming/Debug onboard Connector
- ▶ Refer to section 5.1.3 page 24 for P0901 - Serial Lines Connector
- ▶ Refer to section 5.1.4 page 24 for P0902 - Ethernet RJ-45 Connector
- ▶ Refer to section 5.1.5 page 25 for P1101 - CPCI J1 Connector
- ▶ Refer to section 5.1.6 page 26 for P1201 - CPCI J2 Connector

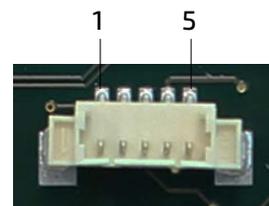
## 5.1.1 J0301 - Power Supply Standby onboard Connector

PSU1\_GLOB Global enable or inhibit for power pack #1

- ▶ Manufacturer: MOLEX
- ▶ Part No: 53398-0571
- ▶ Pin Assignment:

**Table 11: Pin Assignment of Power Supply Standby onboard Connector (J0301)**

PIN	LABEL	DESCRIPTION
1	PSU1_SPARE	Could be used for a fan or a thermal alarm from PSU1
2	PSU1_GLOB_EN_N	Driven to 0 to enable PSU1
3	ACFAIL1_IN_N	ACFAIL alarm from PSU1
4	PSU1_5V_STDBY_IN	+5V stdby from PSU1
5	GND	Ground



PSU1\_SPARE: 3V3 input with 10K pull-up to 3V3 internal standby power; NOT 5V tolerant

PSU1\_GLOB: open drain output, -50mA max, 5V tolerant

ACFAIL1\_IN\_N: 3V3 input with 10K pull-up to 3V3 internal standby power; NOT 5V tolerant. 0:OK, 1:FAIL, NC:FAIL.

PSU1\_5V\_STDBY\_IN: protected by a 1A fuse on CMB-3U

PSU1\_5V\_STDBY\_IN is redundant with PSU2\_5V\_STDBY\_IN to power the CMB-3U but they are not connected together on the CMB-3U (an ideal diode is used)

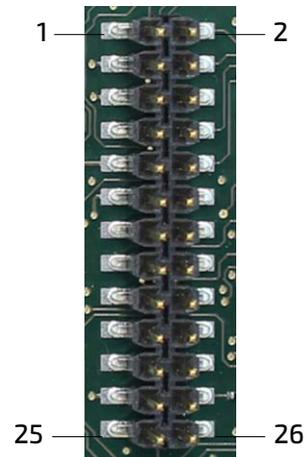
The CMB-3U can be configured by software (VPD rack) to use PSUn\_GLOB\_CTL# as global inhibit or global enable signals (inverted logic).

## 5.1.2 J1001 - BDM Connector: Programming/Debug onboard Connector

- ▶ Manufacturer: SAMTEC
- ▶ Part No: TSM-113-01-L-DV-M
- ▶ Pin Assignment:

Table 12: Pin Assignment of BDM Connector

PIN	LABEL	DESCRIPTION
1	N.C.	Not Connected
2	CPU_BKPT_B	
3	GND	Ground
4	CPU_DSCLK	
5	GND	Ground
6	N.C.	Not Connected
7	RESET_CMB	
8	CPU_DSI	
9	VDD	
10	CPU_DSO	
11	GND	Ground
12	N.C.	Not Connected
13	N.C.	Not Connected
14	N.C.	Not Connected
15	N.C.	Not Connected
16	N.C.	Not Connected
17	N.C.	Not Connected
18	N.C.	Not Connected
19	N.C.	Not Connected
20	GND	Ground
21	N.C.	Not Connected
22	N.C.	Not Connected
23	GND	Ground
24	CPU_PSTCLK	
25	N.C.	Not Connected
26	N.C.	Not Connected



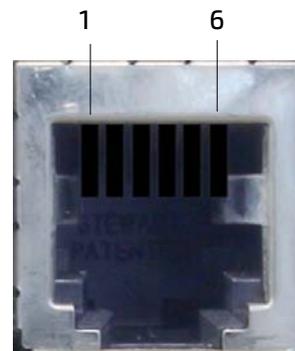
This interface is compatible with the P&E Micro USB-ML-CF Coldfire Multilink probe.

### 5.1.3 P0901 - Serial Lines Connector

- ▶ Manufacturer: BEL-STEWART
- ▶ Part No: SS-64665-A-PG4-BA
- ▶ Pin Assignment:

Table 13: Pin Assignment of Serial Lines Connector

PIN	LABEL	DESCRIPTION
1	CONN_COM2_TX	Transmit for EIA-232 Port 2
2	COM2_GND	Ground for EIA-232 Port 2
3	CONN_COM1_TX	Transmit for EIA-232 Port 1
4	CONN_COM1_RX	Receive for EIA-232 Port 1
5	COM1_GND	Ground for EIA-232 Port 1
6	CONN_COM2_RX	Receive for EIA-232 Port 2



COM1 signals are expected to be connected to a serial console (terminal) for maintenance.

COM2 signals are for chassis internal communication with another board

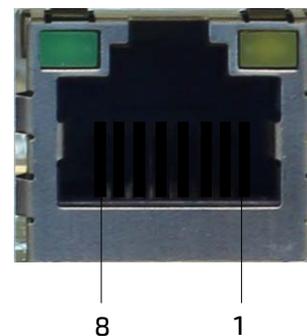
Both have a CMB shell prompt available; see below.

### 5.1.4 P0902 - Ethernet RJ-45 Connector

- ▶ Manufacturer: TYCO
- ▶ Part No: 5-6605758-1
- ▶ Pin Assignment:

Table 14: Pin Assignment of Ethernet RJ45 Connector

PIN	LABEL	DESCRIPTION
1	RJ45_RDP_CONN	Receive Positive
2	RJ45_RDN_CONN	Receive Negative
3	VDD_RJ45_CONN	VDD
4	VDD_RJ45_CONN	VDD
5	RJ45_TDP_CONN	Transmit Positive
6	RJ45_TDN_CONN	Transmit Negative
7	NC	Not Connected
8	GND	Ground
CASE 1&2	GND_Earth	
D1	+3.3V	VDD, anode of green led
D2	FEC_LINK_R	Cathode of green led
D3	+3.3V	VCC, anode of red led
D4	FEC_ACT_R	Cathode of red led



This connector provides a 10/100BASE-T interface

## 5.1.5 P1101 - CPCI J1 Connector

- ▶ Manufacturer: TYCO
- ▶ Part No: 5352068-1
- ▶ Pin Assignment:

	Z	A	B	C	D	E	F
1	NC	P5V_IN	NC	NC	P12V_IN	P5V_IN	GND
2	NC	NC	P5V_IN	NC	NC	NC	GND
3	NC	NC	NC	NC	P5V_IN	NC	GND
4	NC	NC	NC	NC	NC	NC	GND
5	NC	NC	NC	NC	GND	NC	GND
6	NC	NC	GND	P3V3_IN	NC	NC	GND
7	NC	NC	NC	NC	GND	NC	GND
8	NC	NC	GND	NC	NC	NC	GND
9	NC	NC	GND	NC	GND	NC	GND
10	NC	NC	GND	P3V3_IN	NC	NC	GND
11	NC	NC	NC	NC	GND	NC	GND
12							GND
13							GND
14							GND
15	NC	P3V3_IN	NC	NC	GND	NC	GND
16	NC	NC	GND	NC	NC	NC	GND
17	NC	P3V3_IN	NC	NC	GND	NC	GND
18	NC	NC	GND	P3V3_IN	NC	NC	GND
19	NC	P3V3_IN	NC	NC	GND	NC	GND
20	NC	NC	GND	NC	NC	NC	GND
21	NC	P3V3_IN	NC	NC	NC	NC	GND
22	NC	NC	GND	P3V3_IN	NC	NC	GND
23	NC	P3V3_IN	NC	NC	P5V_IN	NC	GND
24	NC	NC	P5V_IN	NC	NC	NC	GND
25	NC	P5V_IN	NC	NC	P3V3_IN	P5V_IN	GND




---

Z column only exists on Backplane Connector

---

## 5.1.6 P1201 - CPCI J2 Connector

- ▶ Manufacturer: TYCO
- ▶ Part No: 5352152-1
- ▶ Pin Assignment:

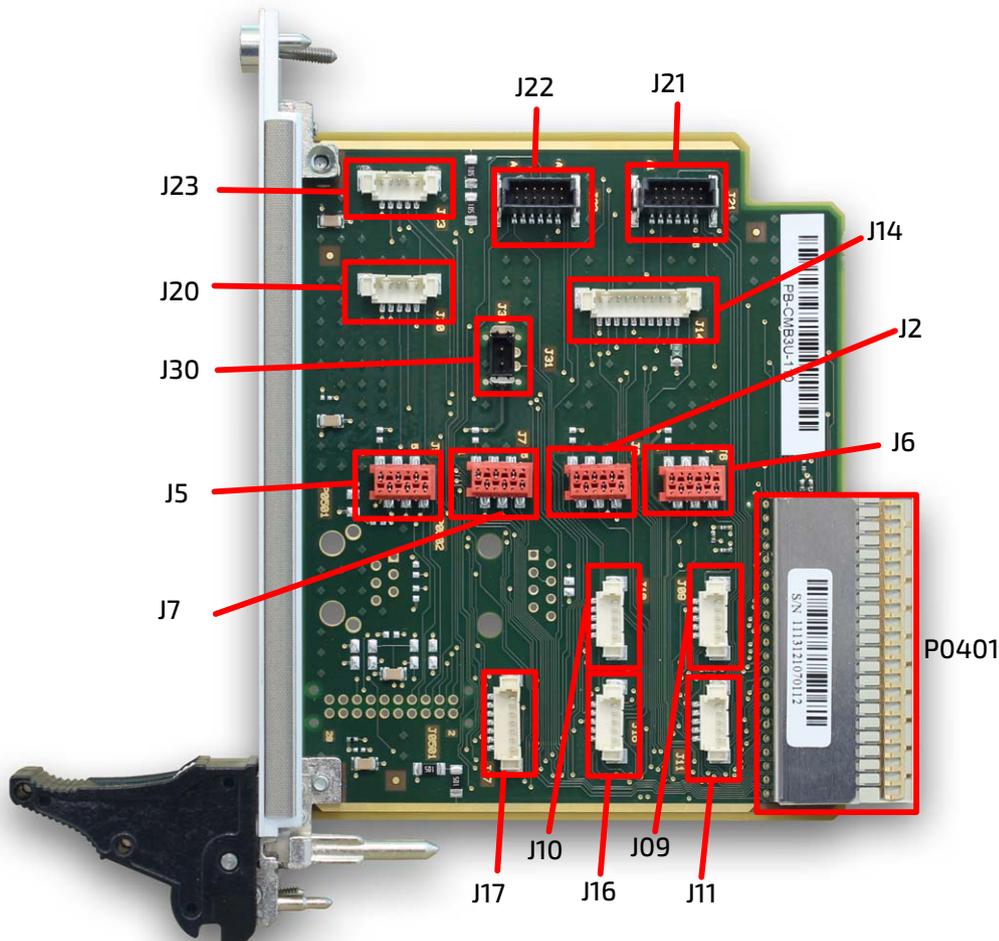
	Z	A	B	C	D	E	F
1	NC	GPIO_USR4	GPIO_USR5	VDD	GPIO_USR6	GPIO_USR7	GND
2	NC	RJ45_TDP_BP	RJ45_TDN_BP	NC	RJ45_RDP_BP	RJ45_RDN_BP	GND
3	NC	GPIO_USR0	GPIO_USR1	VDD_RJ45_BP_M	GPIO_USR2	GPIO_USR3	GND
4	NC	P3V3_G_CATHODE_BP	P3V3_G_ANODE_BP	VDD_RJ45_BP_M	P5V_G_ANODE_BP	P5V_G_CATHODE_BP	GND
5	NC	P12V_G_CATHODE_BP	P12V_G_ANODE_BP	LED_G_STBY_BP	P12V_FAN_G_CATHODE_BP	P12V_FAN_G_ANODE_BP	GND
6	NC	COM2_GND	FP_PB_IN_N	LED_R_SYSFAIL_B-P	RESET_CMB_R	COM1_GND	GND
7	NC	BP_COM2_TX	BP_COM2_RX	LED_R_FAN_BP	BP_COM1_TX	BP_COM1_RX	GND
8	NC	BP_MRST6_N	BP_MRST7_N	LED_R_TEMP_BP	BP_MRST8_N	BP_SPARE_R	GND
9	NC	BP_MRST1_N	BP_MRST2_N	BP_MRST3_N	BP_MRST4_N	BP_MRST5_N	GND
10	NC	BP_SYSFAIL_N	BP_NVMRO	I2C_RACK_PWR	RACK_I2C_SCL	RACK_I2C_SDA	GND
11	NC	BPR_I2C_SCL	BPR_I2C_SDA	IPMB_PWR	BP_I2C_SCL	BP_I2C_SDA	GND
12	NC	BP_ACFAIL_N	BP_SYSRESET_N	RST_BP_N	NC	VBAT_BP	GND
13	NC	PSU2_5V_STDBY_IN	ACFAIL2_IN_N	PSU2_GLOB_EN_N	PSU2_SPARE	BP_GDISC	GND
14	NC	PSU1_5V_STDBY_IN	ACFAIL1_IN_N	PSU1_GLOB_EN_N	PSU1_SPARE	BP_ALERT_N	GND
15	NC	PSU2_PWG_P12V_M3	PSU2_INH_P12V_M3	PSU2_PWG_RSVD	PSU2_INH_RSVD	NC	GND
16	NC	PSU2_PWG_P12V_M1	PSU2_INH_P12V_M1	PSU2_PWG_P12V_M2	PSU2_INH_P12V_M2	P12V_IN_FAN	GND
17	NC	PSU1_PWG_P5V_M1	PSU1_INH_P5V_M1	PSU1_PWG_P5V_M2	PSU1_INH_P5V_M2	P12V_IN_FAN	GND
18	NC	PSU1_PWG_P12V_M4	PSU1_INH_P12V_M4	PSU1_PWG_P3V3_M3	PSU1_INH_P3V3_M3	NC	GND
19	NC	FAN8_SENSE	NC	NC	NC	NC	GND
20	NC	FAN3_SENSE	FAN4_SENSE	FAN5_SENSE	FAN6_SENSE	FAN7_SENSE	GND
21	NC	FAN2_SENSE	FAN4_PWM	FAN3_PWM	FAN8_PWM	FAN7_PWM	GND
22	NC	FAN1_SENSE	FAN2_PWM	FAN1_PWM	FAN6_PWM	FAN5_PWM	GND



Z column only exists on Backplane Connector

## 5.2 PB-CMB3U Connectors

Figure 13: Component Layout of the PB-CMB3U - Top Side



- ▶ Refer to section 5.2.1 page 28 for J2, J5, J6, J7 - Fans Connectors (4-Wire Configuration)
- ▶ Refer to section 5.2.2 page 29 for J21 - PSU and Backplane Monitoring Connector
- ▶ Refer to section 5.2.3 page 30 for J22 - PSU Monitoring Connector
- ▶ Refer to section 5.2.4 page 30 for J09, J10 - Backplane I<sup>2</sup>C Connector
- ▶ Refer to section 5.2.5 page 31 for J20, J23 - Power Supply Standby Connector
- ▶ Refer to section 5.2.6 page 31 for J14 - GPIO Users Connector
- ▶ Refer to section 5.2.7 page 32 for J16 - VPX System Signal Connector
- ▶ Refer to section 5.2.8 page 32 for J17 - VPX Maskable Reset Signal Connector
- ▶ Refer to section 5.2.9 page 33 for J30 - P12V\_IN\_FAN Connector
- ▶ Refer to section 5.2.10 page 33 for J11B - Temperature Sencor I2C Connector
- ▶ Refer to section 5.2.11 page 34 for P0401 CPCI RJ2 Connector

## 5.2.1 J2, J5, J6, J7 - Fans Connectors (4-Wire Configuration)

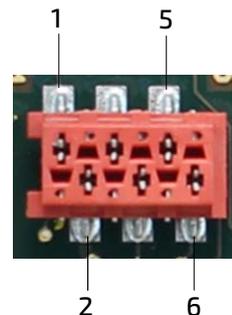
4-Wire configuration: +V, GND, SENSE, PWM

- ▶ Manufacturer: Tyco Micro-MaTch
- ▶ Part No: 0-188275-6
- ▶ Pin Assignment for one connector:

Table 15: Pin Assignment of Fans Connectors for 4-Wire Configuration

PIN	LABEL	DESCRIPTION
1	FANX&Y PWR	Not Connected (Optional P12V_IN_FAN)
2	FANX&Y GND	Connected to GND
3	FANX SENSE	Tachometer feedback
4	FANY SENSE	Tachometer feedback
5	FANX PWM	PWM
6	FANY PWM	PWM

CONNECTOR	X	Y
J2	5	6
J5	7	8
J6	1	2
J7	3	4



It is recommended to connect the fan power directly to the power supplies (+12V\_FAN). However, if PWR and GND are used, take care that the power delivered to all fans through PWR is protected by a global 3A fuse, and that each connector has an additional 1,5A fuse on PWR.

It is also recommended to connect the fan ground directly to the power supplies.

Also for the PWM signals:

- ▶ The PWM frequency is set to 20kHz.
- ▶ These signals are 3V3 push-pull outputs, internally limited to 5 mA.



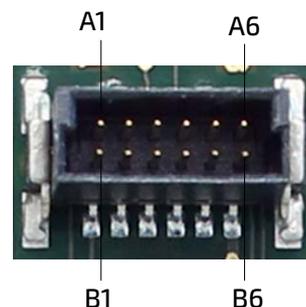
Do not connect PWM signals to a voltage below 0V or above 3V3.

## 5.2.2 J21 - PSU and Backplane Monitoring Connector

- ▶ Manufacturer: ERNI
- ▶ Part No: 2448 54
- ▶ Pin Assignment:

Table 16: Pin Assignment of PSU and Backplane Monitoring Connector

PIN	LABEL	DESCRIPTION
A1	PSU1_PWG_P5V_M1	PowerGood for PSU Module 1
A2	PSU1_INH_P5V_M1	Inhibit for Module 1
A3	PSU1_PWG_P5V_M2	PowerGood for PSU Module 2
A4	PSU1_INH_P5V_M2	Inhibit for Module 2
A5	PSU1_PWG_P3V3_M3	PowerGood for PSU Module 3
A6	PSU1_INH_P3V3_M3	Inhibit for Module 3
B1	PSU1_PWG_P12V_M4	PowerGood for PSU Module 4
B2	PSU1_INH_P12V_M4	Inhibit for Module 4
B3	NC	Not Connected
B4	NC	Not Connected
B5	NC	Not Connected
B6	GND	Electrical Ground



PSU1\_INH signals are for controlling individual power modules, while PSU<sub>n</sub>\_GLOB\_EN signals on J20/J23 are for driving the power pack(s) containing the modules (global control). Both can be used, or only PSU1\_INH or only PSU<sub>n</sub>\_GLOB\_EN, or none depending on requirements.

PSU1\_PWG signals are for monitoring the status of individual power modules. They can be used or not depending if the power modules have such a signal or if this monitoring is required or not.

PSU1\_PWG signals are 3V3 inputs with an internal 4K7 pull-up connected to a 3V3 internal standby power. 5V tolerant. 0:OK, 1:NOK, NC:NOK. Typical application is a power module driving these signals to GND when OK using an optocoupler.

PSU1\_INH signals are 5V push-pull outputs, +-20mA max. 1: ON. 0: OFF. Typical application is to drive a power module having an internal optocoupler (the optocoupler's LED is driven by the CMB-3U)

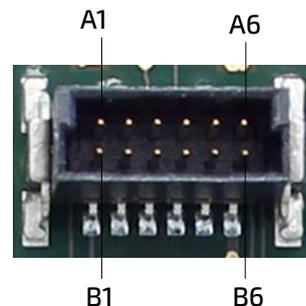
The CMB-3U can be configured by software (VPD rack):

- ▶ to use PSU1\_INH signals to enable (enableON = PSU ON) or inhibit (inhibitON = PSU OFF; inverted logic)
- ▶ to define for each power module: the power rail (3V3, 5V, 12V, or -12V) including redundancies between modules, the PSU1\_INH channel (if used), and the PSU1\_PWG channel (if used)

### 5.2.3 J22 - PSU Monitoring Connector

Table 17: Pin Assignment of PSU Monitoring Connector

PIN	LABEL	DESCRIPTION
A1	PSU2_PWG_P12V_M1	PowerGood for PSU Module 1
A2	PSU2_INH_P12V_M1	Inhibit for Module 1
A3	PSU2_PWG_P12V_M2	PowerGood for PSU Module 2
A4	PSU2_INH_P12V_M2	Inhibit for Module 2
A5	PSU2_PWG_P12V_M3	PowerGood for PSU Module 3
A6	PSU2_INH_P12V_M3	Inhibit for Module 3
B1	PSU2_PWG_RSVD	PowerGood for PSU Module 4 (RSVD)
B2	PSU2_INH_RSVD	Inhibit for Module 4 (RSVD)
B3	NC	Not Connected
B4	NC	Not Connected
B5	NC	Not Connected
B6	GND	Electrical Ground



See 5.2.2 for characteristics of PWGn and CTLn signals.

### 5.2.4 J09, J10 - Backplane I<sup>2</sup>C Connector

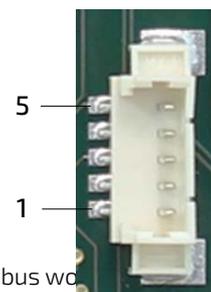
J09 is the backplane I2C bus having bus number 2 for CMB-3U shell commands.

J10 is the redundant backplane I2C bus having bus number 3 for CMB-3U shell commands.

- ▶ Manufacturer: MOLEX
- ▶ Part No: 53398-0571
- ▶ Pin Assignment:

Table 18: Pin Assignment of Backplane I2C Connector

PIN	J09 LABEL	J10 LABEL	DESCRIPTION
1	BSP_I2C_SCL	BPR_I2C_SCL	I <sup>2</sup> C Clock
2	GND	GND	Electrical Ground
3	BP_I2C_SDA	BPR_I2C_SDA	I <sup>2</sup> C Data
4	IPMB_PWR	IPMB_PWR	Power Supply
5	BP_ALERT_N	BP_GDISC	



IPMB\_PWR is supplied by the backplane and can be 3V3 or 5V. It should be a standby power so that this bus works in standby mode.

IPMB\_PWR is connected between J9 and J10 connectors.



An optional equipment on CMB-3U can provide 3V3 or 5V standby power on IPMB\_PWR if not done by the backplane.

An optional equipment on CMB-3U can provide 3V3 or 5V standby power on IPMB\_PWR if not done by the backplane.

BP\_ALERT\_N: 3V3 input with 10K pull-up to 3V3 internal standby power; NOT 5V tolerant.

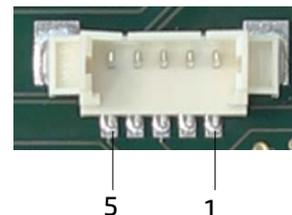
BP\_GDISC: 3V3 input / open drain output, with 10K pull-up to 3V3 internal standby power; NOT 5V tolerant.

## 5.2.5 J20, J23 - Power Supply Standby Connector

- ▶ Manufacturer: MOLEX
- ▶ Part No: 53398-0571
- ▶ Pin Assignment:

Table 19: Pin Assignment of Power Supply Standby Connector

PIN	J20 LABEL	J23 LABEL	DESCRIPTION
1	PSU1_SPARE	PSU2_SPARE	Could be used for a fan or a thermal alarm from PSU1/2
2	PSU1_GLOB_EN_N	PSU2_GLOB_EN_N	Driven to 0 to enable PSU 1/2
3	AC_FAIL1_IN_N	AC_FAIL2_IN_N	ACFAIL alarm from PSU 1/2
4	PSU1_5V_STDBY_IN	PSU2_5V_STDBY_IN	+5V Standby Power Supply from PSU 1/2
5	GND	GND	ElectricalGround

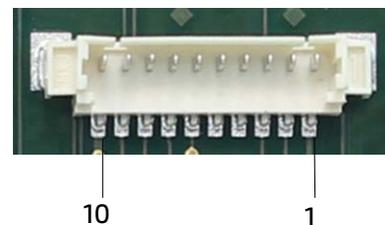


## 5.2.6 J14 - GPIO Users Connector

- ▶ Manufacturer: MOLEX
- ▶ Part No: 53398-1071
- ▶ Pin Assignment:

Table 20: Pin Assignment of GPIO Users Connector

PIN	LABEL	DESCRIPTION
1	VDD	
2	GPIO_USR0	General Purpose I/O 0
3	GPIO_USR1	General Purpose I/O 1
4	GPIO_USR2	General Purpose I/O 2
5	GPIO_USR3	General Purpose I/O 3
6	GPIO_USR4	General Purpose I/O 4
7	GPIO_USR5	General Purpose I/O 5
8	GPIO_USR6	General Purpose I/O 6
9	GPIO_USR7	General Purpose I/O 7
10	GND	Ground



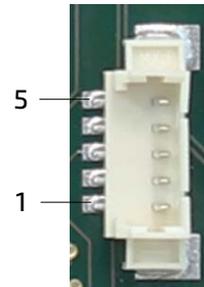
All signals are 3V3 general purpose input outputs (not 5V tolerant); +-10mA max for outputs.

## 5.2.7 J16 - VPX System Signal Connector

- ▶ Manufacturer: MOLEX
- ▶ Part No: 53398-0571
- ▶ Pin Assignment:

Table 21: Pin Assignment of VPX System Signal Connector

PIN	LABEL	DESCRIPTION
1	BP_SYSRESET_N	VPX SYSRESET
2	BP_NVRMO	VPX Non Volatile Memory Read-Only
3	GND	Electrical Ground
4	BP_MRST7_N	VPX Maskable Reset Slot 7
5	BP_MRST8_N	VPX Maskable Reset Slot 8



All signals are compliant with VPX standard.

BP\_SYSRESET\_N also used for VME is a 5V tolerant open drain output.

BP\_NVMRO is an open drain output, 5V tolerant. When high the non volatile devices on the equipments connected to the backplane are read-only.

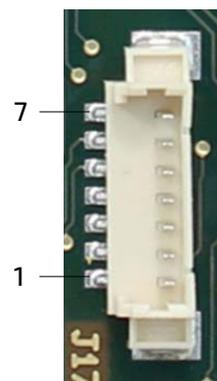
BP\_MRST\_N are open drain outputs, NOT 5V tolerant (max 3V3). Driven low to reset a device.

## 5.2.8 J17 - VPX Maskable Reset Signal Connector

- ▶ Manufacturer: MOLEX
- ▶ Part No: 53398-0771
- ▶ Pin Assignment:

Table 22: Pin Assignment of VPX Maskable Reset Signal Connector

PIN	LABEL	DESCRIPTION
1	BP_MRST1_N	VPX Maskable Reset Slot 1
2	BP_MRST2_N	VPX Maskable Reset Slot 2
3	BP_MRST3_N	VPX Maskable Reset Slot 3
4	GND	Electrical Ground
5	BP_MRST4_N	VPX Maskable Reset Slot 4
6	BP_MRST5_N	VPX Maskable Reset Slot 5
7	BP_MRST6_N	VPX Maskable Reset Slot 6



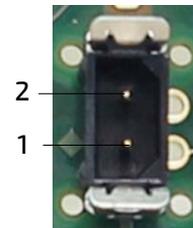
Characteristics of BP\_MRSTn\_N signals are the same than for J16.

## 5.2.9 J30 - P12V\_IN\_FAN Connector

- ▶ Manufacturer: HARWIN
- ▶ Part No: M80-8820242
- ▶ Pin Assignment:

Table 23: Pin Assignment of P12V\_IN\_FAN Connector

PIN	LABEL	DESCRIPTION
1	P12V_IN_FAN	+12V Power from PSU Module
2	GND	Electrical Ground

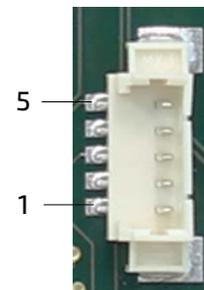


## 5.2.10 J11B - Temperature Sencor I<sup>2</sup>C Connector

- ▶ Manufacturer: MOLEX
- ▶ Part No: 53398-0571
- ▶ Pin Assignment:

Table 24: Pin Assignment of I<sup>2</sup>C Connector

PIN	LABEL	DESCRIPTION
1	RACK_I2C_SCL	I <sup>2</sup> C Clock
2	GND	Electrical Ground
3	RACK_I2C_SDA	I <sup>2</sup> C Data
4	I2C_RACK_PWR	5V Power Supply
5	GND_EARTH	Mechanical Ground



I2\_RACK\_PWR is protected by a 0.5A fuse on CMB-3U.

## 5.2.11 P0401 CPCI RJ2 Connector

- ▶ Manufacturer: TYCO
- ▶ Part No: 5352152-1
- ▶ Pin Assignment:

	Z	A	B	C	D	E	F
22	NC	GPIO_USR4	GPIO_USR5	VDD	GPIO_USR6	GPIO_USR7	GND
21	NC	RJ45_TDP_BP	RJ45_TDN_BP	NC	RJ45_RDP_BP	RJ45_RDN_BP	GND
20	NC	GPIO_USR0	GPIO_USR1	VDD_RJ45_BP	GPIO_USR2	GPIO_USR3	GND
19	NC	P3V3_G_CATHODE_BP	P3V3_G_ANODE_BP	VDD_RJ45_BP	P5V_G_ANODE_BP	P5V_G_CATHODE_BP	GND
18	NC	P12V_G_CATHODE_BP	P12V_G_ANODE_BP	LED_G_STBY_BP	P12V_FAN_G_CATHODE_BP	P12V_FAN_G_ANODE_BP	GND
17	NC	COM2_GND	FP_PB_IN_N	LED_R_SYSFAIL_BP	RESET_CMB_R	COM1_GND	GND
16	NC	BP_COM2_TX	BP_COM2_RX	LED_R_FAN_BP	BP_COM1_TX	BP_COM1_RX	GND
15	NC	BP_MRST6_N	BP_MRST7_N	LED_R_TEMP_BP	BP_MRST8_N	BP_SPARE_R	GND
14	NC	BP_MRST1_N	BP_MRST2_N	BP_MRST3_N	BP_MRST4_N	BP_MRST5_N	GND
13	NC	BP_SYSFAIL_N	BP_NVMRO	I2C_RACK_PWR	RACK_I2C_SCL	RACK_I2C_SDA	GND
12	NC	BPR_I2C_SCL	BPR_I2C_SDA	IPMB_PWR	BP_I2C_SCL	BP_I2C_SDA	GND
11	NC	BP_ACFAIL_N	BP_SYSRESET_N	RST_BP_N	NC	VBAT_BP	GND
10	NC	PSU2_5V_STDBY_IN	ACFAIL2_IN_N	PSU2_GLOB_EN_N	PSU2_SPARE	BP_GDISC	GND
9	NC	PSU1_5V_STDBY_IN	ACFAIL1_IN_N	PSU1_GLOB_EN_N	PSU1_SPARE	BP_ALERT_N	GND
8	NC	PSU2_PWG_P12V_M3	PSU2_INH_P12V_M3	PSU2_PWG_RSVD	PSU2_INH_RSVD	NC	GND
7	NC	PSU2_PWG_P12V_M1	PSU2_INH_P12V_M1	PSU2_PWG_P12V_M2	PSU2_INH_P12V_M2	P12V_IN_FAN	GND
6	NC	PSU1_PWG_P5V_M1	PSU1_INH_P5V_M1	PSU1_PWG_P5V_M2	PSU1_INH_P5V_M2	P12V_IN_FAN	GND
5	NC	PSU1_PWG_P12V_M4	PSU1_INH_P12V_M4	PSU1_PWG_P3V3_M3	PSU1_INH_P3V3_M3	NC	GND
4	NC	FAN8_SENSE	NC	NC	NC	NC	GND
3	NC	FAN3_SENSE	FAN4_SENSE	FAN5_SENSE	FAN6_SENSE	FAN7_SENSE	GND
2	NC	FAN2_SENSE	FAN4_PWM	FAN3_PWM	FAN8_PWM	FAN7_PWM	GND
1	NC	FAN1_SENSE	FAN2_PWM	FAN1_PWM	FAN6_PWM	FAN5_PWM	GND



Z column only exists on Backplane Connector

## 6 / Software

The software running on the CMB-3U board, called **Monitoring Software**, is made of a monitoring application running on a MQX RTOS (Real Time Operating System) from Freescale.

The monitoring application has been designed to be easily extended, by using several specialized threads reading/ changing the state of the system on some specific events.

The monitoring software is burnt to the CMB-3U processor flash memory during manufacturing process, and then supports on-the-field updates from the CMB-3U Shell.



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Information given in the following chapters are for software version 4.2. See previous versions of this document for older software versions, or check for the availability of a newer version of this document for newer software versions.

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## 7 / Command Line Interface

The CMB-3U provides a Command Line Interface (CLI), on serial line or Ethernet Telnet session

This CLI allows a front user interface inside or outside the chassis to control, monitor or debug the system through a shell called *CMB-3U shell*.

When a terminal is connected to the first serial line as console, the required setting for the terminal are: 115200 bauds, 8-bit, no parity, 1 stop bit.

When the CMB-3U is powered-on, some messages are displayed on the console. Press ENTER to get a login prompt:

```

=====
MONITORING SOFTWARE 3.0 (build: Jan 17 2012)
VPDs: LOADING ...
WARNING: VPD USER unavailable
CONF: LOADING ...
PASSWORDS: LOADING ...
MAIN TASK started
TEMPERATURE TASK started
5 sensors : CMB, VME slot #1, VME slot #2, VME s1LGB
Cot #3, VME slot #4
ED TASK started
LED BLINKING TASK started
FAN TACHO TAMBSK started
FAN PWM TASK started
PIO IN TASK started
GPIO OUT TASK started
GPIO USER TASK started
VOLTAGE TASK started
OARD TASK started
== ALL TASKS STARTED ==
Shell (build: Dec 12 2011)
Copyright (c) 2008 Freescale Semiconductor;
Copyright (c) 2010 Kontron Modular Computers;
NETWORK TASK started
NETWORK: MAC add
Username: ress is 00:00:de:40:41:25
NETWORK: IP method is : STATIC
NETWORK: IP address: 172.20.161.201
NETWORK: IP netmask: 255.255.255.0
NETWORK: IP gateway: 172.20.161.46
NETWORK: configuration done :
  IP address : 172.20.161.201
  IP mask    : 255.255.255.0
  IP gateway : 172.20.161.46
NETWORK: starting telnet server
NETWORK: starting HTTP server
SNMP TASK started
SNMP: starting SNMP server
SNMP: starting SNMP notifications

Username:
=====

```



As the monitoring software is multithreaded to maximize startup speed, some startup messages may be broken by some other messages. This is a normal behavior.

As the monitoring software is multithreaded to maximize startup speed, some startup messages may be broken by some other messages. This is a normal behavior.

There are several predefined and fixed usernames for login, each associated with a specific set of privileges. Each username is intended to be used by a specific kind of operator.

Some commands require more privileges than the others. If the current username does not have enough privileges, a *Permission denied* error is reported, and the list of users allowed to run the command is displayed. To change of username, logout (**exit**) and login again, or run the command **su** (switch user).

Each username has an associated password. It is recommended to set all passwords for safety reasons. The default password is an empty one (just type *<RETURN>* as password).

A user can change its own password and the password of less privileged users without knowing their current password.

User *guest* is the user having the less privileges. It is only allowed to run the commands that do not change the configuration: all **show** commands, some **set** commands (set password, set reset, set power on/off), and some other ones (ftp, netstat, ping, telnet).

Here is the table showing the privileges for each user

**Table 25: Usernames and Privileges**

COMMANDS	USERNAME:				
	CMB	RACK	SYSTEM	USER	GUEST
Change config	YES	YES	YES	YES	NO
Software update	YES	YES	YES	YES	NO
Change I/Os	YES	YES	YES	YES	NO
Change VPD user	YES	YES	YES	YES	NO
Change VPD system	YES	YES	YES	NO	NO
Change VPD rack	YES	YES	NO	NO	NO
Change VPD cmb	YES	NO	NO	NO	NO
Raw EEPROM read	YES	NO	NO	NO	NO
Raw EEPROM write	YES	NO	NO	NO	NO
Raw memory read	YES	NO	NO	NO	NO
Raw memory write	YES	NO	NO	NO	NO
Raw I2C local bus	YES	NO	NO	NO	NO
Raw I2C other bus	YES	YES	YES	YES	NO




---

User "cmb" should only be used by Kontron for manufacturing purposes.

---

Once logged, the shell gives access to many commands that are made of a top command plus additional sub-commands and optional parameters, according to a hierarchical command tree.

Using ? instead of a command/sub-command/parameter gives some help.

The top commands are:

```
cmb@CMB> ?
?  help  exit  sload  su  update  debug  set  show  ftp  ping
cmb@CMB>
```

When using the command line interface on the second serial port (if enabled):

- ▶ No login is required, the privileges are the same than for username "**user**"; and prompt is "**CMB>**". It is still possible to switch to another user using command "**su**", and run "**exit**" when done
- ▶ When using a push button as power button, as done on CMB-3U, the following message is sent on the serial port when a short push is detected while the system is on : "**POWER SWITCH: short push detected**"  
This message can be caught by the CPU to do a clean shutdown of the OS and set off a delayed power off by sending "**set power off <seconds>**" to the CMB-3U.
- ▶ As the CPU board can run commands on CMB-3U, it can also update the CMB-3U software.  
The new image can be downloaded to the CMB-3U through the serial line (command "**sload**"; takes around 5 minutes) or through Ethernet (command "**ftp**") if connected to CMB-3U.  
Then the new image can be burnt using command "**update**" (takes 5 seconds)

### ▶ Command Line Edition

- ▶ **ENTER**: validate edition
- ▶ **CTRL-C** or **ESCAPE+ESCAPE**: abort edition
- ▶ **BACKSPACE (BS or DEL)**: delete character on the left of cursor
- ▶ **CTRL-A**: move cursor to beginning of line
- ▶ **CTRL-E**: move cursor to the end of line
- ▶ **CTRL-B / ARROW-LEFT**: move cursor back one character
- ▶ **CTRL-F / ARROW-RIGHT**: move cursor forward one character
- ▶ **CTRL-P / ARROW-UP**: previous command in history
- ▶ **CTRL-N / ARROW-DOWN**: next command in history

History size is limited to 160 characters, including the command being edited.

The number of entries in history depends on the length of the last commands run.

### ▶ Main Top Commands

- ▶ **set**: to set parameters / configure. Some sub-commands require an additional argument (for example IP address). If this argument is incorrect or missing, some error and/or help is displayed
- ▶ **show**: to display values / configuration. For this command, only the first sub-command is required (for example: show volt); the other ones are optional and are used to select the information to be displayed (for example: show volt 3V3)
- ▶ **debug**: to provide some commands for debug
- ▶ **su**: to switch to another username

### ▶ Commands for updating the Software

- ▶ **ftp**: FTP client to download an image from network
- ▶ **sload**: to download an S-Record image over serial line
- ▶ **update**: to update software using the file downloaded

## ▶ Other Top Commands

- ▶ **? or help** to get help on available commands
- ▶ **exit:** to exit and restart the shell
- ▶ **ping:** for network debug

All numbers are processed by default as decimal numbers, except addresses, offsets, data bytes, and byte counts, processed as hexadecimal numbers.

If needed the values supplied may be prefixed to specify their base:

- ▶ **0x** hexa
- ▶ **%x** hexa
- ▶ **%d** decimal
- ▶ **%o** octal
- ▶ **%b** binary

For example:

- ▶ **0xA5A50123**
- ▶ **%d124**
- ▶ **%b100101101111**

## ▶ For I<sup>2</sup>C Commands

- ▶ **<logical busnum>** number describing the target I<sup>2</sup>C bus:  
 0: CMB-3U's local I<sup>2</sup>C bus (onboard devices)  
 1 chassis' I<sup>2</sup>C bus (where chassis' temperature sensors are)  
 2 backplane I<sup>2</sup>C bus  
 3 redundant backplane I<sup>2</sup>C bus
- ▶ **<I2C addr>** I<sup>2</sup>C address of the chip (in the range [0-0x7F])
- ▶ **<device offset>** offset of the register to reach in the device
- ▶ **<offset byte count>** number of I<sup>2</sup>C bytes required to send the offset to the device; 1 for most devices, except I<sup>2</sup>C EEPROM bigger than 256 bytes that require a 2 byte offset. 0 to not send any offset (in this case <device offset> is ignored)
- ▶ **<byte count>** number of bytes to read
- ▶ **<data> ...** data byte(s) to write (one or more bytes)

## ▶ Slotlist Parameter

Some commands require a **<slotlist>** parameter to select which VPX/VME slots will be processed.

This list can be a single slot number, a comma separated list of slot numbers (for ex: 2,5,9), a comma separated list of slot intervals (for ex: 1-3,6-7), or a combination of all that (for ex: 1,3-5,8)

Valid slots numbers are from 1 to 21.

For VX6070/VX6080/VX6090 boards, both sides (A and B) are processed for the slot number. To process only side A or side B, use a slot number with the following format :

**<slotnum>.0** (for side A) or **<slotnum>.1** (for side B)

## 8 / Configuration

The CMB-3U needs to be configured according to the chassis/system in which it will be used.

This is made through VPD (Vital Product Data), at sections **rack** and **system**.

The **rack** VPDs contain all information related to the chassis:

- ▶ rack identification (part number, serial number, ...)
- ▶ power supplies (voltage, control/monitoring signals, ...)
- ▶ fans (fan count, characteristics, and location)
- ▶ sensors (sensor count, characteristics, and location)
- ▶ power switch (characteristics and connection to CMB-3U or power supplies)

The **system** VPDs contain all information related to the system environment:

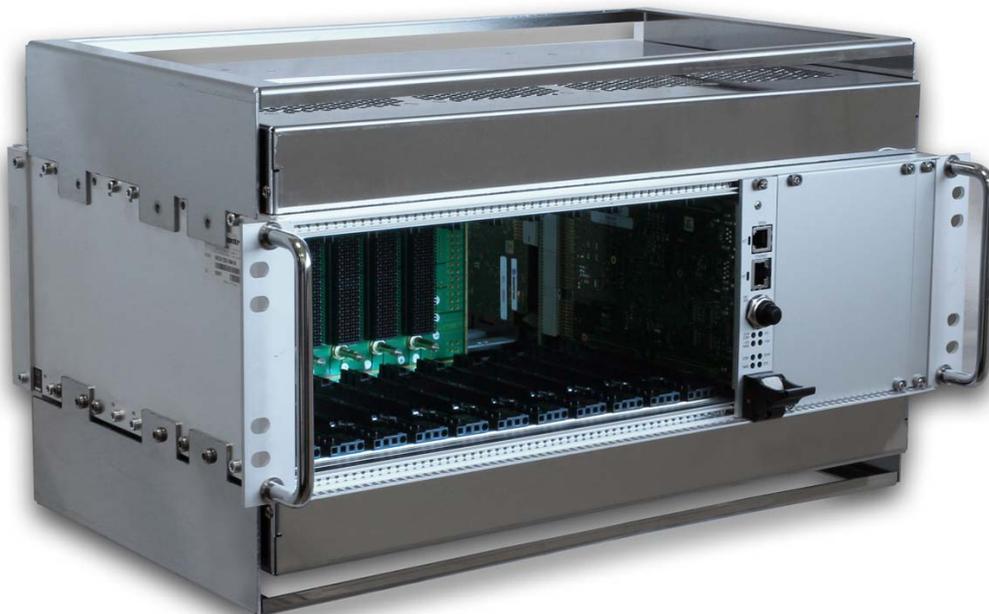
- ▶ system identification (part number, serial number, ...)
- ▶ the temperature, fan speed, and voltage limits

The **user** VPDs contain user specific data and do not contain any information for now. May probably be used in the future.

In order to keep the CMB-3U software small, the set of commands does not support individual definition/setting of sensors, fans, power supplies and limits, but let the operator select between several fixed and predefined configurations.

However a fine customization can be achieved by patching the VPDs as described in the Chapter 16 (Patching VPDs for Customization) of this document.

Figure 14: CMB-3U installed in Kontron SR3U 3U VPX Enclosure



## 8.1 Configuring the Chassis

Login as user **rack**.

To get the list of all supported chassis:

```
rack@CMB> set vpd rack ?
```

Then, set CMB-3U for the target chassis:

```
rack@CMB> set vpd rack <xxxx>
```

where **<xxxx>** is matching the target chassis. You should use **"cmb3u"** for CMB-3U.

Then, save the configuration and reset the system:

```
rack@CMB> set vpd rack save
rack@CMB> set reset
```

Now have a look to VPDs:

```
rack@CMB> show vpd rack
```

As the CMB-3U is equipped with a push button for power-on/off, you must have:

### Power button: Push-button connected to CMB

If your specific configuration has more sensors or fans than the ones displayed, you can patch VPDs (see Chapter 16) or set VPDs to define all possible sensors and fans:

```
rack@CMB> set vpd rack sensor-all
rack@CMB> set vpd rack fan-all-4w
rack@CMB> set vpd rack save
rack@CMB> set reset
```

At this step, if your specific configuration has less sensors or fans than the ones displayed, it is possible to make CMB-3U probe all fans and sensors and remove the ones that are not detected.




---

For a CMB driving 3 wire fans, use **"set vpd rack fan-all"** instead of the above **"set vpd rack fan-all-4w"**.

---

This can be useful for a reduced configuration, derived from a supported full configuration, where all fans or sensors are not equipped: select the full target chassis and run a probe.

This is done as follows:

For this, make sure the system is fully powered-on, and enter:

```
rack@CMB> set vpd rack sensor-probe-remove
rack@CMB> set vpd rack fan-probe-remove
rack@CMB> set vpd rack save
rack@CMB> set reset
```

## 8.2 Configuring the System

Login as user **system** or as a more privileged user (**rack**, or **cmb**).

To get a list of all supported systems:

```
system@CMB> set vpd system ?
```

Then, set CMB-3U for the target system:

```
system@CMB> set vpd system <xxxx>
```

where **<xxxx>** is matching the target system. You should use "limits-cmb3u" for CMB-3U.

Then, save the configuration and reset the CMB-3U:

```
system@CMB> set vpd system save
system@CMB> set reset
```

## 8.3 General Configuration

Login as user **user** or as a more privileged user (**system**, **rack**, or **cmb**).

These are basic settings suitable for the end-user. The current configuration settings is displayed by the command:

```
user@CMB> show conf
----- NETWORK config -----
IP method      : STATIC
IP static address: 172.20.161.201
IP static netmask: 255.255.255.0
IP static gateway: 172.20.161.46
Telnet server  : ENABLED
HTTP  server   : ENABLED
SNMP  server   : ENABLED
SNMP  notify   : V2 INFORM
Retry period   : 500 (mS)
Retry count    : 2
Target IP #1  : 172.20.144.71
Target IP #2  : 0.0.0.0
Target IP #3  : 0.0.0.0
----- MISC config -----
Shell on COM2 : DISABLED
----- BOARD config -----
Boot watchdog :
Slot list      : 1-4,7
Timeout (sec, 0=off) : 75
Max reset count : 2
Default NVMRO level : 0
Default GDISC level : 1
user@CMB>
```

### 8.3.1 IP Method

This is the way CMB-3U will get its address on the network.

To disable networking configuration using IP method:

```
user@CMB> set conf net ipmethod off
```

To enable network with DHCP:

```
user@CMB> set conf net ipmethod dhcp
```

To enable network with static IP address, and configure the required static IP parameters:

```
user@CMB> set conf net ipmethod static
user@CMB> set conf net ipaddr 192.168.0.1
user@CMB> set conf net netmask 255.255.255.0
user@CMB> set conf net gateway 192.168.0.10
```

### 8.3.2 Telnet Server

If enabled, the telnet server provides a CMB-3U shell access.

To enable the telnet server, enter:

```
user@CMB> set conf net telnet on
```

To disable the telnet server, enter:

```
user@CMB> set conf net telnet off
```

### 8.3.3 HTTP Server

If enabled, the HTTP server provides a Web-based interface to manage the system using a web browser.

To enable the HTTP server:

```
user@CMB> set conf net http on
```

To disable the HTTP server:

```
user@CMB> set conf net http off
```

### 8.3.4 SNMP Server

If enabled, the SNMP server provides an SNMP v1/v2c interface to manage the system using standard SNMP clients.

To enable the SNMP server:

```
user@CMB> set conf net snmp on
```

To disable the SNMP server:

```
user@CMB> set conf net snmp off
```

### 8.3.5 SNMP Notifications

If enabled, a notification is sent to notify important events.

The notification can be configured to be a V1 trap, V2 trap, or V2 inform

To disable notifications:

```
user@CMB> set conf net snmp notify method off
```

To enable V1 trap notifications:

```
user@CMB> set conf net snmp notify method v1trap
```

To enable V2 trap notifications:

```
user@CMB> set conf net snmp notify method v2trap
```

To enable V2 inform notifications:

```
user@CMB> set conf net snmp notify method v2inform
```

In addition the notifications can be retried by setting a retry count and a period (in milliseconds).

▶ Example:

```
user@CMB> set conf net snmp notify retries 3
user@CMB> set conf net snmp notify period 1000
```

Up to three targets to send notifications can be defined.

▶ Example for only one target (0.0.0.0 as target IP disables the target):

```
user@CMB> set conf net snmp notify ipaddr1 172.20.161.89
user@CMB> set conf net snmp notify ipaddr2 0.0.0.0
user@CMB> set conf net snmp notify ipaddr3 0.0.0.0
```




---

The SNMPB software (available at <http://sourceforge.net/projects/snmpb/> for Windows and Linux) is an SNMP MIB browser tool (with graphical interface) that can be used to play with SNMP and SNMP traps and more.

---

## 8.3.6 Board configuration

The configuration settings here are for the management of the board located in the backplane.

### 8.3.6.1 Boot watchdog

This watchdog is managed by the CMB-3U and provides a way to secure the boot and/or reboot of one or more boards.

▶ **Slot list:**

This is the default list of backplane's slots that are managed by the watchdog. The command is:

```
set conf board watchdog slotlist <slotlist>
```

▶ **Timeout:**

The default timeout in seconds before expiration of the watchdog. When set to 0, the watchdog is disabled for all boards. The command is:

```
set conf board watchdog timeout <value>
```

▶ **Max reset count:**

The number of resets that the watchdog will attempt to restart a board that fails to boot. When set to 0, no reset occurs but the watchdog timeout still occurs and this event is notified. The command is:

```
set conf board watchdog resetcount <value>
```

These default boot watchdog configuration settings are reloaded at each power-off of the system.

These settings can be temporarily changed while the system through command line, HTTP or SNMP.

### 8.3.6.2 VPX specific signals

- ▶ **Default NVMRO level:**

When set to 1, all Non Volatile Memory devices on the boards are set to Read Only. The command is:

```
set conf board nvmro <0|1>
```

- ▶ **Default GDISC level:**

Default level on GDiscrete signal. The command is:

```
set conf board nvmro <0|1>
```

These default levels are loaded when CMB-3U is powered on.

These levels can be temporarily changed through command line, HTTP or SNMP.

### 8.3.6.3 Power Profile

A power profile can be assigned at any time to each supported board using:

```
set board <slotlist> profile <none|bios|down|nominal|up>
```

- ▶ **none:** CMB does not set any profile for this board. The "requested power profile" register of the board is left unchanged and can be controlled by any other agent in the system (another board for example).
- ▶ **bios:** set profile to "according to board's BIOS settings"
- ▶ **down:** set profile to "forced down"
- ▶ **nominal:** set profile to "forced nominal"
- ▶ **up:** set profile to "forced up"

To save the current profiles for all boards and make them become the default ones:

```
set conf board profile define
```

To clear the default profiles (set default profile for all boards to none):

```
set conf board profile reset
```

### 8.3.7 Misc configuration

The command line interface (shell prompt) can also be enabled or disabled on COM2 using:

```
set conf misc com2shell <on|off>
```

### 8.3.8 Saving the Configuration

Changes are not automatically saved to EEPROM. To save the current configuration to the EEPROM, do a final check:

```
user@CMB> show conf
```

If OK, save the configuration to the EEPROM:

```
user@CMB> set conf save
```

Then, reset the CMB-3U by power-cycling or running the command:

```
user@CMB> set reset
```

### 8.3.9 Checking Current State

At any time, the state of the system can be displayed, including current IP parameters. This is useful when using DHCP to check the IP parameters assigned by the server:

```
user@CMB> show state
```




---

All users can use this command, as any other **show** commands.

---

## 8.4 Setting Passwords

Setting passwords is important to prevent unauthorized users from changing the configuration.

- ▶ If the password is left blank for user **guest**, everybody will be able to login and see the configuration settings, but also to reset or power on/off.
- ▶ If the password is left blank for user **user**, everybody will be able to change the general configuration parameters.
- ▶ If the password is also left blank for **rack** or **system**, everybody will be able to modify the related VPD data, which is dangerous.

So setting passwords for **rack** and **system** is mandatory at system integration for safety concerns.

### 8.4.1 Setting the password of the current user

```
rack@CMB> set password
New password for rack : *****
Retype new password for rack : *****
rack@CMB>
```

### 8.4.2 Setting the password of less privileged user

There's no need to provide the current password of a less privileged user when changing its password:

```
rack@CMB> set password system
New password for system : *****
Retype new password for system : *****
rack@CMB>
```

### 8.4.3 Setting the password of more privileged user

The current password of the user is required:

```
system@CMB> set password rack
rack's password: ****
New password for rack : ***
Retype new password for rack : ***
rack@CMB>
```

This also has the side effect to change the current username to this new user.



---

Setting/changing a password has an immediate effect (no need to save or reset)

---

## 9 / Operation




---

The output of the commands shown below may vary depending on your system configuration

---

### 9.1 System Standby

The CMB-3U is expected to be powered from a 5V "standby" power supply and then expected to start as soon as the system is connected to the mains. When the CMB-3U is starting, it performs some initializations and runs the PBIT (Power-on Built-In-Tests) and is ready for monitoring after less than half a second. The system remains powered-off (CPU boards in backplane not powered on).

Once the CMB-3U is started, *STBY* (standby) LED of the CMB-3U state is as follows:

- ▶ ON everything OK (CMB-3U started, PBIT OK)
- ▶ BLINKING BLINKING: the CMB-3U PBIT software has detected a software error, hardware error, or a standby power voltage out of limits (CMB-3U started but PBIT FAILED)
- ▶ OFF severe error (CMB-3U failed to start)

If a PSU1\_5V\_STDBY\_IN or PSU2\_5V\_STDBY\_IN power input is declared as "used", a limit is set on the VSB voltage (see VPD system), and the VSB voltage on the input is out of limits, the standby LED blinks.

However the system will continue to run normally as long as the CMB-3U remains powered by another source (the other standby power input or 5V).

All other LEDs should be OFF (power supplies LEDs, TEMP, FAN, and SYS) except +3V3 stby LED.

The state of the *STBY* LED is also shown by activity LED available on the front panel.

TEMP (temperature) LED is ON in case of temperature error.

SYS (SYSFAIL) LED should be off, except if the CMB-3U was configured to power off the system when the temperature is out of limits :

- ▶ it is switched on when the temperature error occurs,
- ▶ it remains on even if the temperature becomes OK (latched status),
- ▶ it is switched off at the next powered on requested if the temperature is OK.

If a console is connected to the first serial line (see Chapter 7 "Command Line Interface"), some CMB-3U shell commands can be run to get some detailed information (useful for debug).

For example, at any time, the LEDs state can be displayed:

```

guest@CMB> show led
----- LEDs -----
3V3SB: GREEN
5V   : OFF
12V  : OFF
12V-2: OFF
STBY : GREEN
TEMP : OFF
FAN  : OFF
SYS  : OFF
guest@CMB>

```

To display the PBIT/CBIT status:

```

guest@CMB> show bit
----- PBIT/CBIT report -----
Software          : OK
Configuration     : OK
I2C GPIO expander #1 : OK
I2C GPIO expander #2 : OK
I2C GPIO expander #3 : OK
I2C GPIO expander #4 : OK
I2C EEPROM        : OK
I2C Temp sensor #0 (CMB) : OK
I2C Temp sensor #1 (VPX slot #1) : OK
I2C Temp sensor #2 (VPX slot #2) : OK
I2C Temp sensor #3 (VPX slot #4) : OK
I2C Temp sensor #4 (VPX slot #5) : OK
I2C Temp sensor #5 (VPX slot #7) : OK
I2C Temp sensor #6 (VPX slot #9) : OK
I2C Temp sensor #7 (VPX slot #10) : OK
I2C Temp sensor #8 (VPX slot #12) : OK
guest@CMB>

```

To display the voltages

```

guest@CMB> show volt
----- VOLTAGES -----
3V3SB : 3292 mV (min: 3100, max: 3700)
5V    : 5127 mV (min: 4750, max: 5500)
12V   : 12055 mV (min: 11300, max: 13200)
12V-2 : 12073 mV (min: 11300, max: 13200)
VCMB1 : 5004 mV (min: 4750, max: 5500)
VCMB2 : 5014 mV (min: 4750, max: 5500)
guest@CMB>

```

## 9.2 System Power-On

To power-on the system, the CMB-3U is equipped with a power push-button. The system is powered-on if the push-button is pressed more than 200 ms, and is powered-off if pressed again more than 3 seconds. Support for a power-off interrupt when pressed more than 500 ms but less than 3 seconds is supported by:

- ▶ a message displayed on both serial lines: "POWER SWITCH: short push detected". This message can be caught by a CPU board to do a clean shutdown of the OS and set off a delayed power off by sending "set power off <seconds>" to the CMB-3U.
- ▶ an SNMP notification. As a reply, the CPU board can request an immediate or delayed power off through SNMP

In addition to the power button, the system can be powered-on /power-off using the **set power on / set power off** commands.

When a power-on is detected, the following sequence is performed:

- ▶ SYSRESET is unasserted after 200 ms.
- ▶ All LEDs except STDBY (remaining ON) are blinking: 0.5s ON (RED for power supplies LEDs), 0.5s OFF (GREEN for power supplies LEDs); all that during 5 seconds.
- ▶ During this time, all fans are started one-by-one or two-by-two (fans on the same PWM channel starts at the same time; four individual PWM channels are available for the 8 fans). They are running at full speed.

Here is the output of `show led` command during this sequence:

```

guest@CMB> show led
----- LEDs -----
3V3SB: BLINK RED/GREEN
5V   : BLINK RED/GREEN
12V  : BLINK RED/GREEN
12V-2: BLINK RED/GREEN
STBY : GREEN
TEMP : BLINK RED/OFF
FAN  : BLINK RED/OFF
SYS  : BLINK RED/OFF
guest@CMB>

```

If needed, some delays can be set between power packs and power modules at power-on, in units of 1mS. This defines a custom power sequencing. See section 16.2 "VPD Fields Reference" page 91 at "VPD RACK".

The default is all PSUs switched on at the same time.

### 9.3 System Running

Once the power-on sequence has been done, the CMB-3U works as follows:

- ▶ Fans are running at a temperature dependent speed, based on the maximum temperature of all sensors, and according to the fan trip points.
- ▶ STBY (standby) LED is ON, OFF or BLINKING as described above for system standby (should be ON if OK)
- ▶ FAN LED is switched ON if at least one fan runs at a speed out of limits (fan failure). In this case, all fans are switched to 100%
- ▶ TEMP (temperature) LED is switched ON in case of temperature error, and BLINKING in case of missing sensor.
- ▶ SYS (SYSFAIL) LED is switched ON if the SYSFAIL signal is active on the backplane. If the CMB-3U is configured to power off the system when the temperature is out of limits, it can also be ON for the reason listed above for system standby. This LED is blinking if an error is detected on the boards in the backplane.
- ▶ The four power supplies LEDs (+3V3 STBY, +5V, +12V, +12V FANS) are GREEN if voltages are OK. If a voltage is present but not within the limits, the related LED is RED. If the system has redundant power supplies with Power-Good signals connected to the CMB-3U and a power supply is in failure, the related voltage LED blinks RED/GREEN.

```

guest@CMB> show led
----- LEDs -----
3V3SB: GREEN
5V   : GREEN
12V  : GREEN
12V-2: GREEN
STBY : GREEN
TEMP : OFF
FAN  : OFF
SYS  : OFF
guest@CMB>

```

## 9.4 System power-off

When a power-off condition is detected, the following steps are done:

- ▶ SYSRESET is asserted.
- ▶ Power supplies are switched off by the CMB-3U through their enable and/or global enable signals, if managed by the CMB-3U.

If needed, some delays can be set between power packs and power modules at power-off, in units of 1mS. This defines a custom power sequencing. See section 16.2 "VPD Fields Reference" page 91 at "VPD RACK".

The default is all PSUs switched off at the same time.

## 10 / Board Management

The CMB-3U can monitor and control the boards located in the backplane through the backplane I2C bus.

This bus must be connected to the PB-CMB3U's backplane I2C bus interface (J09 connector).

The CMB-3U currently supports the following boards:

- ▶ VM6050
- ▶ VM6052/VM6054
- ▶ VX3030
- ▶ VX3035
- ▶ VX3040
- ▶ VX305x
- ▶ VX6060
- ▶ VX6070/VX6080
- ▶ VX6090

The boards detected are shown by the command "**show board**" as in the example below:

```

user@CMB> show board
----- BOARDS -----
Boards detected :
Slot 01: Board:VX3040 Power:ON LastRST:POWER-ON RunState:ON
        BootState:OS-RUNNING Reset:OFF
        BITstatus : OK
        PowerProfile : requested:NONE current:BIOS-SETUP
        Boot watchdog : OFF, STOPPED, Timeouts:0
Slot 02: Board:VX3040 Power:ON LastRST:POWER-ON RunState:ON
        BootState:OS-BOOT Reset:OFF
        BITstatus : OK
        PowerProfile : requested:NONE current:BIOS-SETUP
        Boot watchdog : OFF, STOPPED, Timeouts:0
Slot 03: Board:VX3040 Power:ON LastRST:POWER-ON RunState:ON
        BootState:OS-BOOT Reset:OFF
        BITstatus : OK
        PowerProfile : requested:NONE current:BIOS-SETUP
        Boot watchdog : OFF, STOPPED, Timeouts:0
Slot 04: Board:VX3040 Power:ON LastRST:POWER-ON RunState:ON
        BootState:OS-BOOT Reset:OFF
        BITstatus : OK
        PowerProfile : requested:NONE current:BIOS-SETUP
        Boot watchdog : OFF, STOPPED, Timeouts:0
Slot 05: Board:VX3040 Power:ON LastRST:POWER-ON RunState:ON
        BootState:OS-BOOT Reset:OFF
        BITstatus : OK
        PowerProfile : requested:NONE current:BIOS-SETUP
        Boot watchdog : OFF, STOPPED, Timeouts:0
Slot 06: Board:VX3040 Power:ON LastRST:POWER-ON RunState:ON
        BootState:OS-BOOT Reset:OFF
        BITstatus : OK
        PowerProfile : requested:NONE current:BIOS-SETUP
        Boot watchdog : OFF, STOPPED, Timeouts:0

Boot watchdog current settings :
Timeout (sec, 0=off) : 0
Max reset count      : 0
user@CMB>

```



If the backplane's I2C bus is not on standby power, the system must be switched on to be able to detect the boards.

For each board, we have:

- ▶ the backplane's slot number
- ▶ the board type
- ▶ the board's power state: ON or STANDBY. If the board is configured for that, it is possible to change this state from the CMB-3U.
- ▶ the last reset source
- ▶ the running state: ON or OFF. OFF if the board's PSUs are off or if the board is reset.
- ▶ the boot state: at which boot step the board is: "RESET", "BIOS-BOOT", "BIOS", "PBIT", "OS-BOOT", "OS-RUNNING", "COMPLETED", "SHUTDOWN", "REBOOT", "USER-SPECIFIC"
- ▶ the reset state: this is the reset as controlled by the CMB-3U; however another reset source may keep the board reset (see running state above).
- ▶ BIT status (Built In Tests status): OK, or FAILED with the reason among "POST", "RTC battery", "PECI/Temp Alert", "Onboard PSUs", "Backplane Under-Voltage", "Backplane Over-Voltage", "PECI Crit", "Therm Prot", "Therm Trip", "Catastrophic Error".
- ▶ power profile (requested and current one): only for boards supporting this feature

The modifiable settings can be changed from command line with the commands:

```
set board <slotlist> power <on|standby>
set board <slotlist> <reset|resetA|resetB|resetAB> <pulse|on|off>
set board <slotlist> profile <none|bios|down|nominal|up>
```

or though HTTP or SNMP.

The status of the boot watchdog managed by the CMB-3U is also displayed for each board:

- ▶ **ON** or **OFF**. This state can be changed from CMB-3U.
- ▶ The current state : **STOPPED** or **RUNNING**
- ▶ The number of timeouts that occurred since last power-on, board unreset, watchdog enable, or successful boot.

If value should always be 0 if no error occurs; any other value is reported as an error on the SYS LED (blinking)

Then some global boot watchdog settings are displayed (common for all boards):

- ▶ Timeout in seconds: when set to 0 the watchdog is disabled on all boards. This value can be changed from CMB-3U.
- ▶ Max reset count: the maximum number of resets attempted to restart the boards in case of watchdog expiration. When set to 0, no reset occurs but the timeout is reported. This value can be changed from CMB-3U.

The current boot watchdog settings are loaded from the default settings each time the system is powered-off.

The default settings are set by the command:

```
set conf board watchdog ...
```

The current settings can be temporarily changed with the command:

```
set board watchdog slotlist <list>
set board watchdog timeout <value>
set board watchdog resetcount <value>
```

or though HTTP or SNMP.

This makes possible to use dynamic boot watchdog settings managed by the backplane boards (once running) or any supervision agent.

The boot watchdog uses the boot state information read from the boards. This information is updated by the board's BIOS and should also be updated by the OS. It is located in the "boot status" field of the I2C\_BOARD\_STATUS register (see board's documentation)

The value written in this field gives the current state of the board :

```

0x00 : RESET      : default hardware value
0x01 : BIOS-BOOT  : written by BIOS
0x02 : BIOS       : written by BIOS
0x03 : PBIT       : written by BIOS
0x04 : OS-BOOT    : written by BIOS
0x05 : OS-RUNNING : to be written by OS at the end of boot
0x06 : COMPLETED : to be written by the final application when running
0x07 : SHUTDOWN   : to be written by OS when issuing a halt/shutdown
0x08 : REBOOT     : to be written by OS when rebooting
0x09 - 0x0B : Reserved
0x0C - 0x0F : Customer defined

```

The watchdog is started when at state **RESET**, **BIOS-BOOT**, **BIOS**, **PBIT**, **OS-BOOT**, **OS-RUNNING**, or **REBOOT**

It is stopped when at state **COMPLETED**.




---

To prevent watchdog expiration, make sure to set **COMPLETED** when the board is running

**REBOOT** starts the watchdog to protect from an hanging reboot.

**SHUTDOWN** does not start the watchdog as the board is halted.

---

## 11 / CMB-3U Shell Commands

### 11.1 Command Tree

```

set
  board
    <slotlist>
      power
        on
        standby
        ?
      reset|resetA|resetB|resetAB
        on
        off
        pulse
        ?
      profile
        none
        bios
        down
        nominal
        up
        ?
      ?
  watchdog
    slotlist <slotlist>
    slotlist reset
    timeout <value in seconds>
    resetcount <value>
    ?
  ?
conf
  reset
  save
  board
    watchdog
      slotlist <slotlist>
      slotlist reset
      timeout <value in seconds>
      resetcount <value>
      ?
      nvmro 0|1
      gdisc 0|1
    profile
      define
      reset
      ?
    ?
  misc
    com2shell
      on
      off
      ?
    ?
  net
    ipmethod
      off
      static

```

```

    dhcp
    ?
    ipaddr <valueIP>
    netmask <valueIP>
    gateway <valueIP>
    telnet
        off
        on
    ?
    http
        off
        on
        ?
    snmp
        on
        off
        notify
            method
                off
                v1trap
                v2trap
                v2inform
                ?
            period [<period in mS>]
            retries [<count>]
            ipaddr1 [<valueIP> | 0.0.0.0]
            ipaddr2 [<valueIP> | 0.0.0.0]
            ipaddr3 [<valueIP> | 0.0.0.0]
    ?
    ?
    ?
?
fan
    <fanum>
    speed <value%>
    duty <value%>
    auto
    ?
    all
    speed <value%>
    duty <value%>
    auto
    ?
    ?
gpio
    <gpionum>
    in
    out <level>
    off
    it
        on
        off
        ?
    ?
    all
    in
    out <level>
    it
        on
        off

```

```

    ?
  ?
  ?
io
  <output signal name> <level>
  ?
mon
  on
  off
  ?
password
  [<username>]
  ?
power
  on [<delay in seconds>]
  off [<delay in seconds>]
  ?
reset
vpd
  cmb
    reset
    save
    pcb-proto
    pcb
      proto
      a
      a-3u
      b
      b-3u
      ?
    partnum <string>
    serialnum <string>
    variant <string>
    eclevel <string>
    macaddr <addr>
    racki2cstdby
      on
      off
      ?
    ?
  rack
    reset
    save
    galileo-2u
    galileo-2u-4w
    galileo-8u
    galileo-8u-4w
    m7
    m7-6u
    r2u
    r2u-4w
    r4u
    r4u-4w
    r8u
    r8u-4w
    rtop
    rtop-4w
    r3u
    cmb3u
    fan-all

```

```

fan-all-4w
fan-probe-remove
sensor-all
sensor-probe-remove
partnum <string>
serialnum <string>
eclevel <string>
?
system
reset
save
limits-galileo
limits-m7
limits-r2u
limits-r4u
limits-r8u
limits-rtop
limits-r3u
limits-cmb3u
overtempoff
    on
    off
    fanon
    ?
undertempoff
    on
    off
    ?
partnum <string>
serialnum <string>
eclevel <string>
?
user
reset
save
?
?
?
show
bit
board
conf
    [misc]
    [net]
    [?]
fan
gpio
io
    [in]
    [out]
    [?]
led
psu
state
temp
volt
    [3v3]
    [5v]
    [12v]
    [-12v]

```

```

    [5vsb]
    vpd
    [cmb]
    [rack]
    [system]
    [user]
    [?]
?
debug
dump
    eeprom <offset> <byte count>
    global-data
    mem <addr> <byte count>
    ?
fill
    eeprom <offset> <byte count> <pattern byte>
    mem <addr> <byte count> <pattern byte>
    ?
info
read
    i2c <logical busnum> <I2C addr> <device offset> <offset byte count> <byte count>
    uint8
    uint16
    uint32
    ?
test
    i2c [<iterations>]
    ?
write
    i2c <logical busnum> <I2C addr> <device offset> <offset byte count> <data> ...
    uint8
    uint16
    uint32
    ?
?
?
help
    [<command>]
?
exit
sload
su
update
ftp [<hostIP>]
ping <hostIP>

```




---

Disabling the monitoring with `set mon off` command may be required to be able to manually change fans speed or change the state of some output signals; otherwise the monitoring may set them back to their previous state.

---




---

The command

```
set vpd rack galileo-generic
```

is obsolete but still accepted. Run these two commands instead :

```
set vpd rack fan-all
set vpd rack sensor-all
```

---



The same command but for 4 wire fans :

```
set vpd rack galileo-generic-4w
```

is obsolete but still accepted. Run these two commands instead :

```
set vpd rack fan-all-4w
set vpd rack sensor-all
```

## 11.2 Examples of Command Output

```
user@CMB> ?
?      help      exit      sload    su        update   debug    set
show   ftp          ping
user@CMB> show ?
Usage: show <command> [<parameter> ...]
Commands:
  bit           = show PBIT/CBIT status
  board         = show boards into backplane
  conf          = show configuration
  fan           = show fans speed and limits
  gpio          = show GPIO "user" state
  io            = show I/Os state
  led           = show LEDs state
  psu           = show PSUs state
  state         = show state of the system
  temp          = show temperatures and limits
  version       = show monitoring software version
  volt          = show voltages and limits
  vpd           = show VPDs

For a command, use ? as parameter for help on parameters
user@CMB> show bit
----- PBIT/CBIT report -----
Software           : OK
Configuration      : OK
I2C GPIO expander #1 : OK
I2C GPIO expander #2 : OK
I2C GPIO expander #3 : OK
I2C GPIO expander #4 : OK
I2C EEPROM         : OK
I2C Temp sensor #0 (CMB) : OK
I2C Temp sensor #1 (VPX slot #1) : OK
I2C Temp sensor #2 (VPX slot #2) : OK
I2C Temp sensor #3 (VPX slot #4) : OK
I2C Temp sensor #4 (VPX slot #5) : OK
I2C Temp sensor #5 (VPX slot #7) : OK
I2C Temp sensor #6 (VPX slot #9) : OK
I2C Temp sensor #7 (VPX slot #10) : OK
I2C Temp sensor #8 (VPX slot #12) : OK
user@CMB>
user@CMB> show board
----- BOARDS -----
Boards detected :
Slot 01.0: Board:VX6090 Power:ON LastRST:POWER-ON RunState:ON
          BootState:RESET Reset:OFF
          BITstatus : OK
          PowerProfile : requested:NONE current:BIOS-SETUP
          Boot watchdog : OFF, STOPPED, Timeouts:0
```

```

Slot 01.1: Board:VX6090 Power:ON LastRST:POWER-ON RunState:ON
           BootState:RESET Reset:OFF
           BITstatus : OK
           PowerProfile : requested:NONE current:BIOS-SETUP
           Boot watchdog : OFF, STOPPED, Timeouts:0
Slot 03.0: Board:VX6090 Power:ON LastRST:POWER-ON RunState:ON
           BootState:RESET Reset:OFF
           BITstatus : FAILED (POST)
           PowerProfile : requested:NONE current:BIOS-SETUP
           Boot watchdog : OFF, STOPPED, Timeouts:0
Slot 03.1: Board:VX6090 Power:ON LastRST:POWER-ON RunState:ON
           BootState:RESET Reset:OFF
           BITstatus : FAILED (POST)
           PowerProfile : requested:NONE current:BIOS-SETUP
           Boot watchdog : OFF, STOPPED, Timeouts:0

```

```

user@CMB>
user@CMB> show conf
----- NETWORK config -----
IP method      : STATIC
IP static address: 192.168.10.128
IP static netmask: 255.255.255.0
IP static gateway: 0.0.0.0
Telnet server  : ENABLED
HTTP  server   : ENABLED
SNMP  server   : ENABLED
SNMP  notify   : V2 TRAP
Retry period   : 3000 (mS)
Retry count    : 1
Target IP #1   : 192.168.10.30
Target IP #2   : 0.0.0.0
Target IP #3   : 0.0.0.0
----- MISC config -----
Shell on COM2  : DISABLED
----- BOARD config -----
Boot watchdog :
Slot list      :
Timeout (sec, 0=off) : 0
Max reset count : 0
Default NVMRO level : 0
Default GDISC level : 0
Power profile per slot :
user@CMB>
user@CMB>
user@CMB> show fan

```

```

----- FANS -----
FAN #0 : Top Left      : 2626 RPM (min:1440, max:----) AUTO SPEED 50% (pwm 50%)
FAN #1 : Top Middle   : 2524 RPM (min:1440, max:----) AUTO SPEED 50% (pwm 50%)
FAN #2 : Top Right    : 2636 RPM (min:1440, max:----) AUTO SPEED (= fan #0)
FAN #3 : Bottom Left  : 2717 RPM (min:1440, max:----) AUTO SPEED 50% (pwm 50%)
FAN #4 : Bottom Middle: 2474 RPM (min:1440, max:----) AUTO SPEED 50% (pwm 50%)
FAN #5 : Bottom Right : 2687 RPM (min:1440, max:----) AUTO SPEED (= fan #3)
user@CMB>
user@CMB>
user@CMB> show gpio
----- GPIOs -----
GPIO #0 : off
GPIO #1 : off
GPIO #2 : off
GPIO #3 : off
GPIO #4 : off
GPIO #5 : off
GPIO #6 : off
GPIO #7 : off
user@CMB>
user@CMB> show io
----- INPUTS -----
psu_mon[0]      = 0
psu_mon[1]      = 0
psu_mon[2]      = 0
psu_mon[3]      = 0
psu_mon[4]      = 0
psu_mon[5]      = 0
psu_mon[6]      = 0
psu_mon[7]      = 1
sysreset_      = 1
acfail_        = 1
sysfail_       = 1
bp_alert_      = 1
cmb_therm_alert_ = 1
fp_pb_         = 0
psu1_spare     = 1
psu2_spare     = 1
bp_nvme       = 0
bp_gdisc      = 0
psu_acfail1_in = 0
psu_acfail2_in = 0
psu_acfail    = 0
----- OUTPUTS -----
psu_ctl[0]      = 0
psu_ctl[1]      = 0
psu_ctl[2]      = 0
psu_ctl[3]      = 0
psu_ctl[4]      = 0
psu_ctl[5]      = 0
psu_ctl[6]      = 0
psu_ctl[7]      = 0
ctl_sysreset_   = 1
ctl_acfail_     = 1

```

```

ctl_mrst1_      = 1
ctl_mrst2_      = 1
ctl_mrst3_      = 1
ctl_mrst4_      = 1
ctl_mrst5_      = 1
ctl_mrst6_      = 1
ctl_mrst7_      = 1
ctl_mrst8_      = 1
ctl_nvrmro_     = 0
ctl_gdisc       = 0
ctl_bp_spare    = 1
ctl_glben1_     = 0
ctl_glben2_     = 0
ctl_sysfail_    = 1
led1_ctl_       = 1
led2_ctl_       = 0
user@CMB>
user@CMB>
user@CMB> show led
----- LEDs -----
3V3SB: GREEN
5V   : GREEN
12V  : GREEN
STBY : GREEN
TEMP : OFF
FAN  : OFF
SYS  : OFF
user@CMB>
user@CMB> show psu
----- PSUs -----
PSU 12V #1 : 12V : ON
PSU 12V #2 : 12V : ON
PSU 12V #3 : 12V : ON
PSU 5V  #1 : 5V  : ON
PSU 5V  #2 : 5V  : ON
PSU 3V3 AUX : 3V3SB : ON
PSU 12V FAN : 12V-2 : ON
user@CMB>
user@CMB> show state
----- STATE -----
Power state : POWER ON
Machine state : UNDEFINED
Monitor state : ON
Network state :
  IP method : STATIC
  IP address: 192.168.10.128
  IP netmask: 255.255.255.0
  IP gateway: 0.0.0.0
user@CMB>
user@CMB> show temp
----- TEMPERATURES -----
SENSOR #0 : CMB : 37 C (min:---, max: 70)
SENSOR #1 : VPX slot #1 : 29 C (min:---, max: 70)
SENSOR #2 : VPX slot #2 : 29 C (min:---, max: 70)

```

```

SENSOR #3 : VPX slot #4 : 29 C (min:---, max: 70)
SENSOR #4 : VPX slot #5 : 26 C (min:---, max: 70)
SENSOR #5 : VPX slot #7 : 26 C (min:---, max: 70)
SENSOR #6 : VPX slot #9 : 27 C (min:---, max: 70)
SENSOR #7 : VPX slot #10 : 26 C (min:---, max: 70)
SENSOR #8 : VPX slot #12 : 26 C (min:---, max: 70)
user@CMB>
user@CMB> show version
MONITORING SOFTWARE 0.0 (Mar 12 2014)
user@CMB>
user@CMB> show volt
----- VOLTAGES -----
3V3SB : 3311 mV (min: 3100, max: 3700)
5V    : 4980 mV (min: 4750, max: 5500)
12V   : 12026 mV (min: 11300, max: 13200)
VCMB1 : 4959 mV (min: 4750, max: 5500)
VCMB2 : 4982 mV (min: 4750, max: 5500)
user@CMB>
user@CMB>
user@CMB>
user@CMB>
user@CMB> show vpd
----- VPDs CMB -----
Part number   : CMB-F3W-00
Serial number  : 1112181030066
Variant       : 12000000
EC Level      : 2001
PCB Level     : B
MAC address   : 00:00:de:50:f0:40
Temperature sensor(s) : 1
  CMB : bus=0, addr=48
Rack I2C bus on standby power : no
----- VPDs RACK -----
Part number   :
Serial number  :
EC Level      :
Fan(s) : 6
  Top Left    : port 2, max 4800 RPM, min 50%, PWM@min 50%
               tacho (2 pulses per revolution), pwm wire
  Top Middle  : port 3, max 4800 RPM, min 50%, PWM@min 50%
               tacho (2 pulses per revolution), pwm wire
  Top Right   : port 6, max 4800 RPM, min 50%, PWM@min 50%
               tacho (2 pulses per revolution), pwm wire
  Bottom Left : port 0, max 4800 RPM, min 50%, PWM@min 50%
               tacho (2 pulses per revolution), pwm wire
  Bottom Middle : port 1, max 4800 RPM, min 50%, PWM@min 50%
               tacho (2 pulses per revolution), pwm wire
  Bottom Right : port 4, max 4800 RPM, min 50%, PWM@min 50%
               tacho (2 pulses per revolution), pwm wire
Temperature sensor(s) : 8
VPX slot #1 : bus=1, addr=48
VPX slot #2 : bus=1, addr=49
VPX slot #4 : bus=1, addr=4a
VPX slot #5 : bus=1, addr=4b

```

```

VPX slot #7 : bus=1, addr=4c
VPX slot #9 : bus=1, addr=4d
VPX slot #10 : bus=1, addr=4e
VPX slot #12 : bus=1, addr=4f
Power supplies (PSUs) : 7
PSU 12V #1 : 12V rail, MON[4], CTL[4], GLOBCTL[1], CTL=INHIBIT, GLOBCTL=ENABLE
PSU 12V #2 : 12V rail, MON[5], CTL[5], GLOBCTL[1], CTL=INHIBIT, GLOBCTL=ENABLE
PSU 12V #3 : 12V rail, MON[6], CTL[6], GLOBCTL[1], CTL=INHIBIT, GLOBCTL=ENABLE
PSU 5V #1 : 5V rail, MON[0], CTL[0], GLOBCTL[0], CTL=INHIBIT, GLOBCTL=ENABLE
PSU 5V #2 : 5V rail, MON[1], CTL[1], GLOBCTL[0], CTL=INHIBIT, GLOBCTL=ENABLE
PSU 3V3 AUX : 3V3SB rail, MON[2], CTL[2], GLOBCTL[0], STANDBY, CTL=INHIBIT, GLOBCTL=ENABLE
PSU 12V FAN : 12V-2 rail, MON[3], CTL[3], GLOBCTL[0], STANDBY, CTL=INHIBIT, GLOBCTL=ENABLE
PSU GLOBCTL delay on/off (mS) : 0:0/0 1:0/0
PSU CTL delay on/off (mS) : 0:0/0 1:0/0 2:0/0 3:0/0 4:0/0 5:0/0 6:0/0
Acfail used : ACFAIL1_IN ACFAIL2_IN
Voltages monitored : VCMB1 VCMB2 3V3SB 5V 12V
Power button : Switch connected to CMB
----- VPDs SYSTEM -----
Part number : StarVX-Demo
Serial number : 00012
EC Level :
Temperature limits :
Sensor #0 : CMB : min:---C, max: 70C
Sensor #1 : VPX slot #1 : min:---C, max: 70C
Sensor #2 : VPX slot #2 : min:---C, max: 70C
Sensor #3 : VPX slot #4 : min:---C, max: 70C
Sensor #4 : VPX slot #5 : min:---C, max: 70C
Sensor #5 : VPX slot #7 : min:---C, max: 70C
Sensor #6 : VPX slot #9 : min:---C, max: 70C
Sensor #7 : VPX slot #10 : min:---C, max: 70C
Sensor #8 : VPX slot #12 : min:---C, max: 70C
Power-off if temperature above high limits : no
Power-off if temperature under low limits : no
Fan RPM limits :
Fan #0 : Top Left : min: 30%, max:---%
Fan #1 : Top Middle : min: 30%, max:---%
Fan #2 : Top Right : min: 30%, max:---%
Fan #3 : Bottom Left : min: 30%, max:---%
Fan #4 : Bottom Middle : min: 30%, max:---%
Fan #5 : Bottom Right : min: 30%, max:---%
Fan trip points :
50% @ 35C
100% @ 65C
Voltage limits (mV) :
3V3SB : min: 3100mV, max: 3700mV
5V : min: 4750mV, max: 5500mV
12V : min: 11300mV, max: 13200mV
VCMB : min: 4750mV, max: 5500mV
----- VPDs USER -----
user@CMB>

```

## 11.3 Controlling Backplane Signals

If connected to the backplane, the NVMRO is controlled by the CMB-3U.

Its default level at power-on can be configured (see above in this document), but its level can also be changed at any time with:

```
set io ctl_nvmmro 1
```

or

```
set io ctl_nvmmro 0
```



No jumper should be set on the backplane to force NVMRO to 0, as it is already controlled by the CMB-3U.

The same commands are also available for GDISC:

```
set io ctl_gdisc 1
```

or

```
set io ctl_gdisc 0
```

The CMB-3U also controls eight maskable reset that can be used to reset up to eight boards through their maskable reset input (muxed with GPIO2 on Kontron boards):

```
set io ctl_mrst1_0
```

or

```
set io ctl_mrst1_1
```



A board reset can also be done through the backplane I2C interface with "**set board <slot> reset on|off|pulse**".

The SYSRESET can also be controlled. To assert it:

```
set io ctl_sysreset_0
```

then depending on the configuration, the CMB-3U may unassert it automatically (with a "**PSU ACFAIL inactive**" on the console) or leave it asserted.

To unassert it if needed:

```
set io ctl_sysreset_1
```

If the CMB unasserts it automatically and that the SYSRESET should be kept asserted for a longer period, it is also necessary to temporarily disable the monitoring:

```
set mon off
set io ctl_sysreset_0
```

then re-enable it:

```
set io ctl_sysreset_1
set mon on
```

Disabling the monitoring disables all automatic actions made by the CMB-3U, leaving all I/Os unchanged and settable as needed by the user.

Do not forget to re-enable it otherwise even switching the chassis off becomes impossible.

## 12 / HTTP Interface

This interface provides a way to read and modify the system state.

If no password is set for user "**guest**", the web server is accessible without authentication for reading and to power on/off the system (equivalent to CMB-3U shell login as "guest" without password). If not, login as user "**guest**" (or more privileged) with the associated password is required.

If no password is set for user "**user**", it is also possible to change the I/Os, reset the boards, ... without any authentication (equivalent to CMB-3U shell login as "user" without password). If not, login as user "**user**" (or more privileged) with the associated password is required..

Here are some screenshots using a well known web browser.



The partnum and serialnum information in VPD "system" (if set) is displayed on the main Web page to identify the system, as show on the screenshot below.

SYSTEM STATE - Mozilla Firefox

File Edit View History Bookmarks Tools Help

SYSTEM STATE

cmb/state.cgi

Sensors Boards I/O Status LOGOUT

SYSTEM : StarVX-Demo 00012

### Power

ON  OFF

### LEDs

+3V3SB	GREEN
+5V	GREEN
+12V	GREEN
STBY	GREEN
TEMP	OFF
FAN	OFF
SYS	OFF

SENSORS - Mozilla Firefox
x

File Edit View History Bookmarks Tools Help

SENSORS
+

← cmb/sensors.cgi

Google

### VOLTAGES

Power rail	mV	Low Limit	High Limit
+3V3SB	3304	3100	3700
+5V	4974	4750	5500
+12V	12018	11300	13200
VCMB1	4952	4750	5500
VCMB2	4980	4750	5500

### PSUs

PSU	Power rail	State
PSU 12V #1	12V	ON
PSU 12V #2	12V	ON
PSU 12V #3	12V	ON
PSU 5V #1	5V	ON
PSU 5V #2	5V	ON
PSU 3V3 AUX	3V3SB	ON
PSU 12V FAN	12V-2	ON

### TEMPERATURES

Sensor	°C	Low Limit	High Limit
CMB	38	---	70
VPX slot #1	29	---	70
VPX slot #2	30	---	70
VPX slot #4	29	---	70
VPX slot #5	26	---	70
VPX slot #7	27	---	70
VPX slot #9	26	---	70
VPX slot #10	26	---	70
VPX slot #12	27	---	70

### FANS

Fan	RPM	Low Limit	High Limit	Mode	%
Top Left	2627	1440	---	AUTO SPEED	50
Top Middle	2522	1440	---	AUTO SPEED	50
Top Right	2635	1440	---	AUTO SPEED	= Top Left
Bottom Left	2716	1440	---	AUTO SPEED	50
Bottom Middle	2476	1440	---	AUTO SPEED	50
Bottom Right	2682	1440	---	AUTO SPEED	= Bottom Left

BACK RELOAD

Fichier Édition Affichage Historique Marque-pages Outils Aide

BOARDS

cmb/boards.cgi

## Boards

Slot	Board Type	State
1	VX3040	Power: on <input checked="" type="radio"/> standby <input type="radio"/> LastRST:POWER-ON PSU:ON BootState:OS-RUNNING Reset: on <input type="radio"/> off <input checked="" type="radio"/> BITstatus : <b>OK</b> PowerProfile requested : none <input checked="" type="radio"/> bios-setup <input type="radio"/> down <input type="radio"/> nominal <input type="radio"/> up <input type="radio"/> PowerProfile current : BIOS-SETUP
2	VX3040	Power: on <input checked="" type="radio"/> standby <input type="radio"/> LastRST:POWER-ON PSU:ON BootState:OS-RUNNING Reset: on <input type="radio"/> off <input checked="" type="radio"/> BITstatus : <b>OK</b> PowerProfile requested : none <input checked="" type="radio"/> bios-setup <input type="radio"/> down <input type="radio"/> nominal <input type="radio"/> up <input type="radio"/> PowerProfile current : BIOS-SETUP
3	VX3040	Power: on <input checked="" type="radio"/> standby <input type="radio"/> LastRST:POWER-ON PSU:ON BootState:OS-RUNNING Reset: on <input type="radio"/> off <input checked="" type="radio"/> BITstatus : <b>OK</b> PowerProfile requested : none <input checked="" type="radio"/> bios-setup <input type="radio"/> down <input type="radio"/> nominal <input type="radio"/> up <input type="radio"/> PowerProfile current : BIOS-SETUP
4	VX3040	Power: on <input checked="" type="radio"/> standby <input type="radio"/> LastRST:POWER-ON PSU:ON BootState:OS-RUNNING Reset: on <input type="radio"/> off <input checked="" type="radio"/> BITstatus : <b>OK</b> PowerProfile requested : none <input checked="" type="radio"/> bios-setup <input type="radio"/> down <input type="radio"/> nominal <input type="radio"/> up <input type="radio"/> PowerProfile current : BIOS-SETUP
5	VX3040	Power: on <input checked="" type="radio"/> standby <input type="radio"/> LastRST:POWER-ON PSU:ON BootState:OS-RUNNING Reset: on <input type="radio"/> off <input checked="" type="radio"/> BITstatus : <b>OK</b> PowerProfile requested : none <input checked="" type="radio"/> bios-setup <input type="radio"/> down <input type="radio"/> nominal <input type="radio"/> up <input type="radio"/> PowerProfile current : BIOS-SETUP
6	VX3040	Power: on <input checked="" type="radio"/> standby <input type="radio"/> LastRST:POWER-ON PSU:ON BootState:OS-RUNNING Reset: on <input type="radio"/> off <input checked="" type="radio"/> BITstatus : <b>OK</b> PowerProfile requested : none <input checked="" type="radio"/> bios-setup <input type="radio"/> down <input type="radio"/> nominal <input type="radio"/> up <input type="radio"/> PowerProfile current : BIOS-SETUP

Change

## Boot Watchdog

Slot	Enable	Current state	Timeout count
1	on <input type="radio"/> off <input checked="" type="radio"/>	STOPPED	0
2	on <input type="radio"/> off <input checked="" type="radio"/>	STOPPED	0
3	on <input type="radio"/> off <input checked="" type="radio"/>	STOPPED	0
4	on <input type="radio"/> off <input checked="" type="radio"/>	STOPPED	0
5	on <input type="radio"/> off <input checked="" type="radio"/>	STOPPED	0
6	on <input type="radio"/> off <input checked="" type="radio"/>	STOPPED	0

Timeout (seconds)

Max reset count

Change

[BACK](#) [RELOAD](#)

I/Os - Mozilla Firefox

File Edit View History Bookmarks Tools Help

I/Os

cmb/io.cgi

Google

### I/O inputs

sysreset_	1
acfail_	1
sysfail_	1
nvmmro	0
gdisc	0

### I/O outputs

sysreset_	0	<input type="radio"/>	1	<input checked="" type="radio"/>
acfail_	0	<input type="radio"/>	1	<input checked="" type="radio"/>
sysfail_	0	<input type="radio"/>	1	<input checked="" type="radio"/>
nvmmro	0	<input checked="" type="radio"/>	1	<input type="radio"/>
gdisc	0	<input checked="" type="radio"/>	1	<input type="radio"/>
mrst1_	0	<input type="radio"/>	1	<input checked="" type="radio"/>
mrst2_	0	<input type="radio"/>	1	<input checked="" type="radio"/>
mrst3_	0	<input type="radio"/>	1	<input checked="" type="radio"/>
mrst4_	0	<input type="radio"/>	1	<input checked="" type="radio"/>
mrst5_	0	<input type="radio"/>	1	<input checked="" type="radio"/>
mrst6_	0	<input type="radio"/>	1	<input checked="" type="radio"/>
mrst7_	0	<input type="radio"/>	1	<input checked="" type="radio"/>
mrst8_	0	<input type="radio"/>	1	<input checked="" type="radio"/>

### GPIOs

Name	Level	Config	IT config	IT count
GPIO0	-	out@0 <input type="radio"/> out@1 <input type="radio"/> in <input type="radio"/> off <input checked="" type="radio"/>	---	---
GPIO1	-	out@0 <input type="radio"/> out@1 <input type="radio"/> in <input type="radio"/> off <input checked="" type="radio"/>	---	---
GPIO2	-	out@0 <input type="radio"/> out@1 <input type="radio"/> in <input type="radio"/> off <input checked="" type="radio"/>	---	---
GPIO3	-	out@0 <input type="radio"/> out@1 <input type="radio"/> in <input type="radio"/> off <input checked="" type="radio"/>	---	---
GPIO4	-	out@0 <input type="radio"/> out@1 <input type="radio"/> in <input type="radio"/> off <input checked="" type="radio"/>	---	---
GPIO5	-	out@0 <input type="radio"/> out@1 <input type="radio"/> in <input type="radio"/> off <input checked="" type="radio"/>	---	---
GPIO6	-	out@0 <input type="radio"/> out@1 <input type="radio"/> in <input type="radio"/> off <input checked="" type="radio"/>	---	---
GPIO7	-	out@0 <input type="radio"/> out@1 <input type="radio"/> in <input type="radio"/> off <input checked="" type="radio"/>	---	---

STATUS - Mozilla Firefox

File Edit View History Bookmarks Tools Help

STATUS

cmb/status.cgi

Google

### CMB Built-in Tests (BIT)

Software	OK
Configuration	OK
I2C GPIO expander #1	OK
I2C GPIO expander #2	OK
I2C GPIO expander #3	OK
I2C GPIO expander #4	OK
I2C EEPROM	OK
I2C Temp sensor #0 (CMB)	OK
I2C Temp sensor #1 (VPX slot #1)	OK
I2C Temp sensor #2 (VPX slot #2)	OK
I2C Temp sensor #3 (VPX slot #4)	OK
I2C Temp sensor #4 (VPX slot #5)	OK
I2C Temp sensor #5 (VPX slot #7)	OK
I2C Temp sensor #6 (VPX slot #9)	OK
I2C Temp sensor #7 (VPX slot #10)	OK
I2C Temp sensor #8 (VPX slot #12)	OK

### CMB Network

IP method	STATIC
IP address	192.168.10.128
IP netmask	255.255.255.0
IP gateway	0.0.0.0
TELNET server	ENABLED
HTTP server	ENABLED
SNMP server	ENABLED
SNMP notifications	V2 TRAP
retries	1
period (mS)	3000
target IP	192.168.10.30
target IP	0.0.0.0
target IP	0.0.0.0

CMB software 0.0 (Mar 12 2014)

[BACK](#)
[RELOAD](#)

The CMB-3U Web interface is designed around several CGI scripts, with the modified settings passed to the CGI using the POST method. However the CGI also support the GET method (data in URL).

It is also possible to use a text based command line HTTP client, for example to power on/off using the GET method :

With **wget** :

- ▶ power on:

```
wget -O /dev/null --http-user='user' --http-passwd='userpassword' gblgtest1
'http://cmbhostname/setpower.cgi?power=on'
```

- ▶ power off:

```
wget -O /dev/null --http-user='user' --http-passwd='userpassword' gblgtest1
'http://cmbhostname/setpower.cgi?power=off'
```

Or with **CURL**:

```
curl --user 'user:userpassword' 'http://cmbhostname/setpower.cgi?power=on'
curl --user 'user:userpassword' 'http://cmbhostname/setpower.cgi?power=off'
```

Valid variables/values to change settings are:

```
power=on|off
sysreset=0|1
acfail=0|1
sysfail=0|1
nvmro=0|1
gdisc=0|1
mrst1=0|1
mrst2=0|1
mrst3=0|1
mrst4=0|1
mrst5=0|1
mrst6=0|1
mrst7=0|1
mrst8=0|1
gpio_<num>=out0|out1|in|off
gpioit_<num>=on|off
wdgtimeout=<value>
wdgresets=<value>
bwdgena_<loc>=on|off
power_<loc>=on|standby
reset_<loc>=on|off
resetA_<loc>=on|off
resetB_<loc>=on|off
profile_<loc>=none|bios|down|nominal|up
```

Where **<num>** is GPIO number from 0 to 7.

Where **<loc>** is **<slotnum>** for all boards, and VX6070/VX6080/VX6090 side A.

**loc** is **<slotnum>\_1** for VX6070/VX6080/VX6090 side B.

**<slotnum>\_0** is equivalent to **<slotnum>**

**<slotnum>** is VPX or VME physical slot number from 1 to 21



---

For maximum interoperability, all Web pages produced by the CMB have been successfully checked with the W3C validation service (<http://validator.w3.org/>) as valid "HTML 4.01 Transitional" and "CSS level 3"



## 13 / SNMP Interface

This interface provides a way to read and modify the system state.

Supported protocols are:

- ▶ SNMP: v1 and v2c
- ▶ SNMP notifications: v1 trap, v2 trap, and v2 inform

Supported communities are:

- ▶ Public
- ▶ Private

No password is supported.

MIB entries for CMB-3U are located under `SNMPv2-SMI::enterprises.20885.101` (OID = 1.3.6.1.4.1.20885.101) Where 20885 stands for "komSA" (Kontron Modular Computers SA), and 101 for "cmb"

A MIB file for CMB-3U (CMB-MIB.txt) can be downloaded from the Kontron's website at:

<http://www.kontron.com/products/systems-and-platforms/vpx-systems-and-platforms/vpx-accessories/cmb.html>

This file describes all SNMP data specific to CMB-3U and then makes easier to work with SNMP by giving a name and a meaning to each data entry rather than just displaying a numerical OID

You can add this file to the list of MIB files loaded by your SNMP command line or GUI tools. This file can be loaded by default, or explicitly.

When using this file you can directly specify the OIDs as:

```
CMB-MIB::cmb...
```

instead of

```
SNMPv2-SMI::enterprises.20885.101...
```

and use symbolic names instead of numbers for sub OIDs.

Here are some examples using some command line tools on a Linux system (available in `net-snmp-utils` package):

To get LED +5V state:

```
snmpget -v 2c -c public cmbhostname SNMPv2-SMI::enterprises.20885.101.1.2.0
```

Can also be written as:

```
snmpget -m +/pathtomib/CMB-MIB.txt -v 2c -c public cmbhostname CMB-MIB::cmb.1.2.0
```

And also as:

```
snmpget -m +/pathtomib/CMB-MIB.txt -v 2c -c public cmbhostname CMB-MIB::cmb.led.ledP5V.0
```

To set power on:

```
snmpset -m +/pathtomib/CMB-MIB.txt -v 2c -c public cmbhostname CMB-MIB::powerState.0 s on
```

To set power off:

```
snmpset -m +/pathtomib/CMB-MIB.txt -v 2c -c public cmbhostname CMB-MIB::powerState.0 s off
```

- To get the state of the reset controlled by the CMB for the board at slot 1, all the following commands are equivalent:

```
snmpget -m +/pathtomib/CMB-MIB.txt -v 2c -c public cmbhostname CMB-MIB::boardReset.1
snmpget -m +/pathtomib/CMB-MIB.txt -v 2c -c public cmbhostname
CMB-MIB::boardEntry.boardReset.1
snmpget -m +/pathtomib/CMB-MIB.txt -v 2c -c public cmbhostname
CMB-MIB::boardTable.boardEntry.boardReset.1
snmpget -m +/pathtomib/CMB-MIB.txt -v 2c -c public cmbhostname
CMB-MIB::boards.boardTable.boardEntry.boardReset.1
snmpget -m +/pathtomib/CMB-MIB.txt -v 2c -c public cmbhostname
CMB-MIB::cmb.boards.boardTable.boardEntry.boardReset.1
snmpget -m +/pathtomib/CMB-MIB.txt -v 2c -c public cmbhostname
CMB-MIB::enterprises.komSA.cmb.boards.boardTable.boardEntry.boardReset.1
snmpget -m +/pathtomib/CMB-MIB.txt -v 2c -c public cmbhostname
SNMPv2-SMI::enterprises.komSA.cmb.boards.boardTable.boardEntry.boardReset.1
```

To list all boards and their status:

```
snmptable -m +/pathtomib/CMB-MIB.txt -v 2c -c public -Cb cmbhostname
CMB-MIB::cmb.boards.boardTable
```

All temperature sensors in the chassis:

```
snmptable -m +/pathtomib/CMB-MIB.txt -v 2c -c public -Cb cmbhostname
CMB-MIB::temperatureTable
```

All fans:

```
snmptable -m +/pathtomib/CMB-MIB.txt -v 2c -c public -Cb cmbhostname CMB-MIB::fanTable
```

All voltages:

```
snmptable -m +/pathtomib/CMB-MIB.txt -v 2c -c public -Cb cmbhostname CMB-MIB::voltageTable
```

All PSUs:

```
snmptable -m +/pathtomib/CMB-MIB.txt -v 2c -c public -Cb cmbhostname CMB-MIB::psuTable
```

All GPIOs:

```
snmptable -m +/pathtomib/CMB-MIB.txt -v 2c -c public -Cb cmbhostname CMB-MIB::gpioTable
```

To get all data:

```
$ snmpwalk -m +/pathtomib/CMB-MIB.txt -v 2c -c public cmbhostname CMB-MIB::cmb
```



With the commands above, a value or threshold reported at 2147483647 (= 0x7FFFFFFF) means "undefined" or "disabled". Also a gpioInValue at 2 means the GPIO is "disabled".

If enabled, a notification is sent to notify important events. Up to three target IP addresses can be specified as destination.

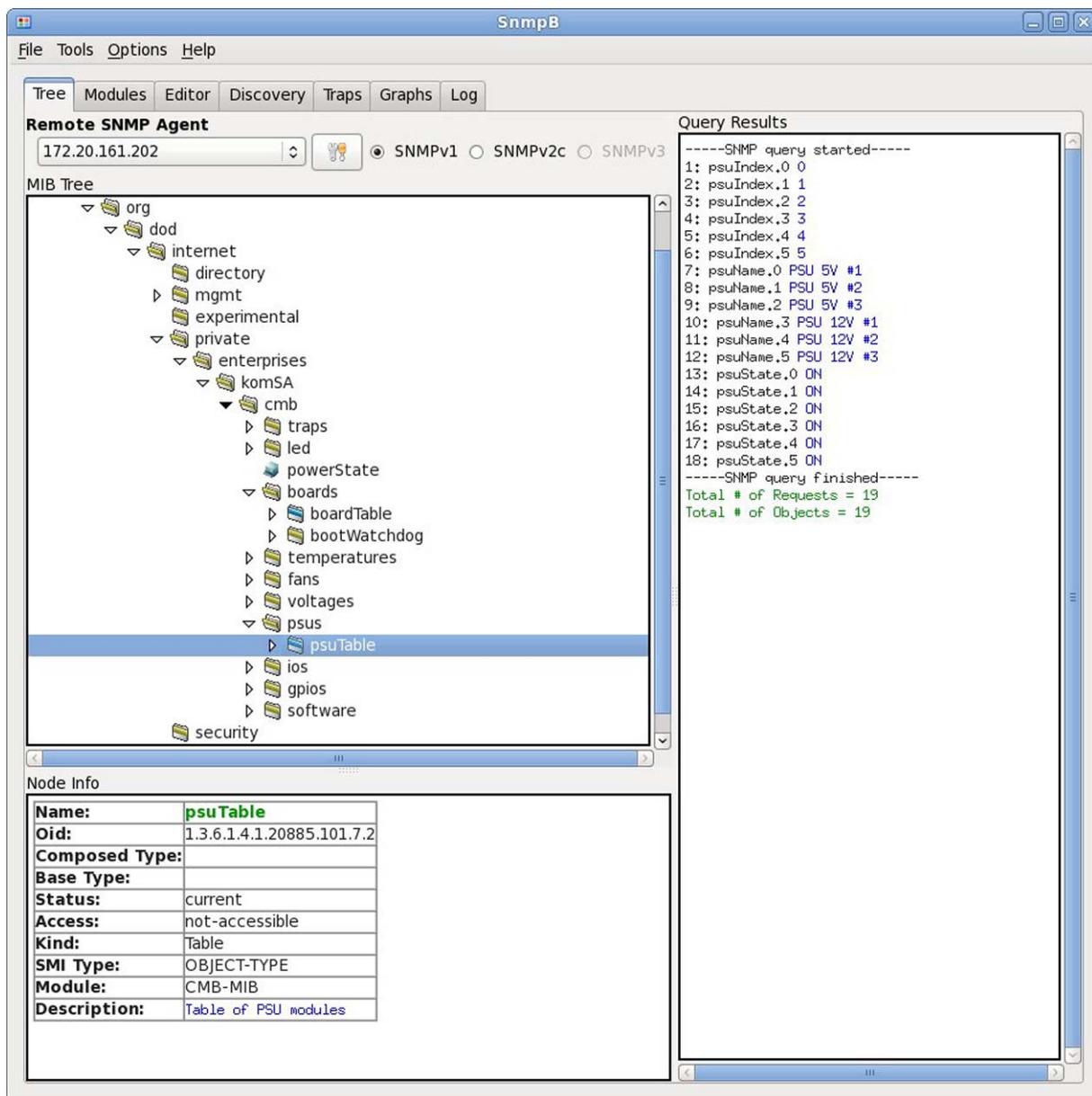
There is a difference between trap and inform

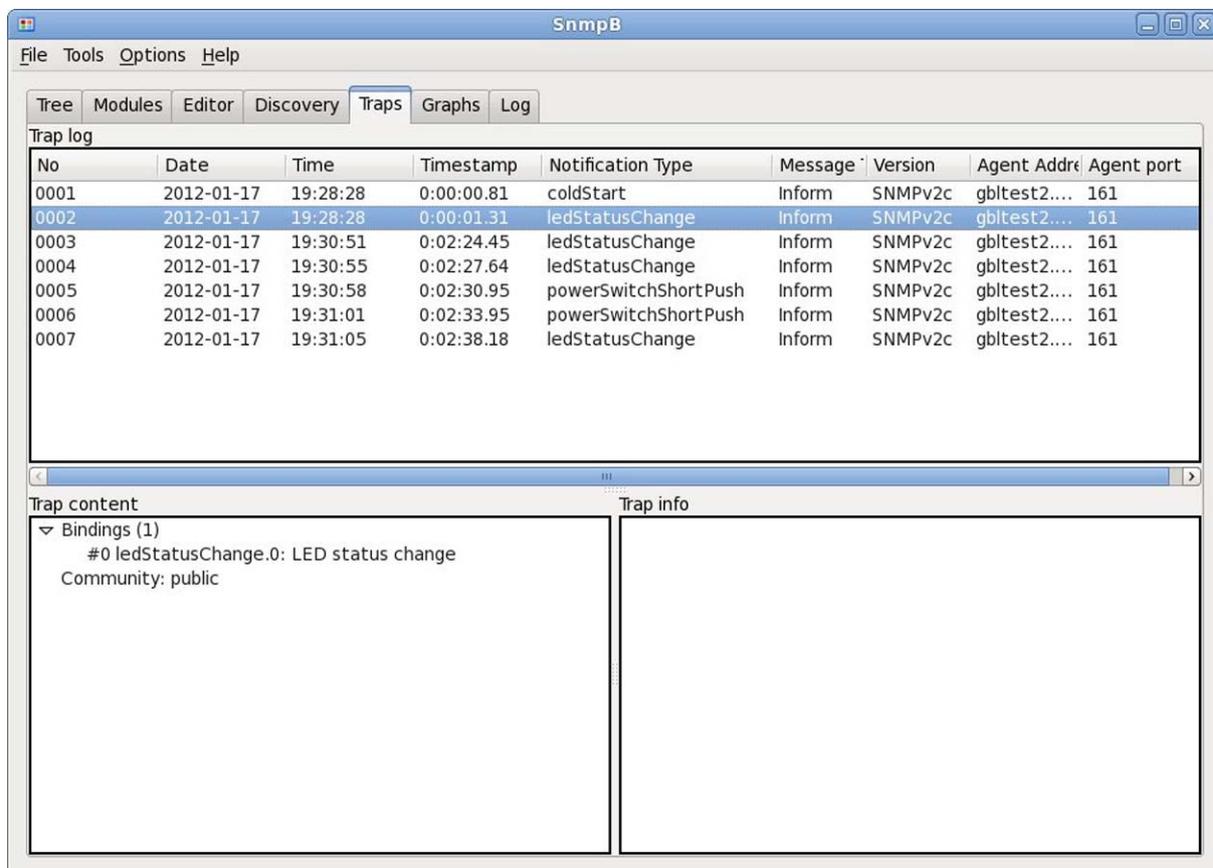
- ▶ V1 traps and V2 traps are not acknowledged by the target agent, so they are always resent as many times as defined by the "retries" parameter in the CMB-3U configuration.
- ▶ V2 inform are acknowledged, so they are resent until acknowledged or until "retries" count is reached.

The CMB-3U manages the retries separately for each notification and each target agent to make sure each target receives all the notifications.

The SNMPB software (available at <http://sourceforge.net/projects/snmpb/> for Windows and Linux) is an SNMP MIB browser tool (with graphical interface) that can be used to play with SNMP and SNMP traps and more.

Here are some screenshots of this tool displaying CMB MIB data and notifications.





Here is the structure of the MIB in a simplified format (not a real MIB file):

```

komSA                               enterprises.20885
cmb                                 komSA.101

traps                                cmb.0
  ledStatusChange                    traps.1          DisplayString  read-only     mandatory
  powerSwitchShortPush                traps.2          DisplayString  read-only     mandatory

led                                   cmb.1
  ledP3V3                             led.1            DisplayString  read-only     mandatory
  ledP5V                               led.2            DisplayString  read-only     mandatory
  ledP12V                              led.3            DisplayString  read-only     mandatory
  ledN12V                              led.4            DisplayString  read-only     mandatory
  ledSTBY                              led.5            DisplayString  read-only     mandatory
  ledTEMP                              led.6            DisplayString  read-only     mandatory
  ledFAN                               led.7            DisplayString  read-only     mandatory
  ledSYS                               led.8            DisplayString  read-only     mandatory

powerState                           cmb.2            DisplayString  read-write    mandatory

boards                                cmb.3
  boardTable                          boards.2         SEQUENCE      not-accessible mandatory
    boardEntry                        boardTable.1    SEQUENCE      not-accessible mandatory
      boardSlot                       boardEntry.1    INTEGER       read-only     mandatory
      boardType                       boardEntry.2    DisplayString  read-only     mandatory
      boardPowerState                 boardEntry.3    DisplayString  read-write    mandatory
      boardLastReset                  boardEntry.4    DisplayString  read-only     mandatory
      boardBootStatus                 boardEntry.5    DisplayString  read-only     mandatory
      boardBootStatusA                boardEntry.6    DisplayString  read-only     mandatory
      boardBootStatusB                boardEntry.7    DisplayString  read-only     mandatory
      boardReset                      boardEntry.8    DisplayString  read-write    mandatory
  
```

boardResetA	boardEntry.9	DisplayString	read-write	mandatory	
boardResetB	boardEntry.10	DisplayString	read-write	mandatory	
boardBitStatus	boardEntry.11	DisplayString	read-only	mandatory	
boardBitStatusExt	boardEntry.12	DisplayString	read-only	mandatory	
boardPowerReq	boardEntry.13	DisplayString	read-write	mandatory	
boardPowerCur	boardEntry.14	DisplayString	read-only	mandatory	
boardPowerState_1	boardEntry.103	DisplayString	read-write	mandatory	
boardLastReset_1	boardEntry.104	DisplayString	read-only	mandatory	
boardBootStatus_1	boardEntry.105	DisplayString	read-only	mandatory	
boardReset_1	boardEntry.108	DisplayString	read-write	mandatory	
boardBitStatus_1	boardEntry.111	DisplayString	read-only	mandatory	
boardBitStatusExt_1	boardEntry.112	DisplayString	read-only	mandatory	
boardPowerReq_1	boardEntry.113	DisplayString	read-write	mandatory	
boardPowerCur_1	boardEntry.114	DisplayString	read-only	mandatory	
bootWatchdog	boards.3				
bootWdgTimeout	bootWatchdog.1	INTEGER	read-write	mandatory	
bootWdgResetCount	bootWatchdog.2	INTEGER	read-write	mandatory	
bootWdgboardTable	bootWatchdog.3	SEQUENCE	not-accessible	mandatory	
bWdgboardEntry	bWdgboardTable.1	SEQUENCE	not-accessible	mandatory	bWdgSlot
bWdgSlot	bWdgboardEntry.1	INTEGER	read-only	mandatory	
bWdgEnable	bWdgboardEntry.2	DisplayString	read-write	mandatory	
bWdgState	bWdgboardEntry.3	DisplayString	read-only	mandatory	
bWdgTmoCount	bWdgboardEntry.4	INTEGER	read-only	mandatory	
bWdgEnable_1	bWdgboardEntry.102	DisplayString	read-write	mandatory	
bWdgState_1	bWdgboardEntry.103	DisplayString	read-only	mandatory	
bWdgTmoCount_1	bWdgboardEntry.104	INTEGER	read-only	mandatory	
temperatures	cmb.4				
temperatureTable	temperatures.2	SEQUENCE	not-accessible	mandatory	
temperatureEntry	temperatureTable.1	SEQUENCE	not-accessible	mandatory	temperatureIndex
temperatureIndex	temperatureEntry.1	INTEGER	read-only	mandatory	
temperatureName	temperatureEntry.2	DisplayString	read-only	mandatory	
temperatureValue	temperatureEntry.3	INTEGER	read-only	mandatory	
temperatureMin	temperatureEntry.4	INTEGER	read-only	mandatory	
temperatureMax	temperatureEntry.5	INTEGER	read-only	mandatory	
temperatureStatus	temperatureEntry.6	DisplayString	read-only	mandatory	
temperatureBitStatus	temperatureEntry.7	DisplayString	read-only	mandatory	
fans	cmb.5				
fanTable	fans.2	SEQUENCE	not-accessible	mandatory	
fanEntry	fanTable.1	SEQUENCE	not-accessible	mandatory	fanIndex
fanIndex	fanEntry.1	INTEGER	read-only	mandatory	
fanName	fanEntry.2	DisplayString	read-only	mandatory	
fanPercent	fanEntry.3	INTEGER	read-only	mandatory	
fanRPM	fanEntry.4	INTEGER	read-only	mandatory	
fanMin	fanEntry.5	INTEGER	read-only	mandatory	
fanMax	fanEntry.6	INTEGER	read-only	mandatory	
fanStatus	fanEntry.7	DisplayString	read-only	mandatory	
fanBitStatus	fanEntry.8	DisplayString	read-only	mandatory	
voltages	cmb.6				
voltageTable	voltages.2	SEQUENCE	not-accessible	mandatory	
voltageEntry	voltageTable.1	SEQUENCE	not-accessible	mandatory	voltageIndex
voltageIndex	voltageEntry.1	INTEGER	read-only	mandatory	
voltageName	voltageEntry.2	DisplayString	read-only	mandatory	
voltageValue	voltageEntry.3	INTEGER	read-only	mandatory	
voltageMin	voltageEntry.4	INTEGER	read-only	mandatory	
voltageMax	voltageEntry.5	INTEGER	read-only	mandatory	
voltageStatus	voltageEntry.6	DisplayString	read-only	mandatory	
voltageBitStatus	voltageEntry.7	DisplayString	read-only	mandatory	

psus	cmb.7				
psuTable	psus.2	SEQUENCE	not-accessible	mandatory	
psuEntry	psuTable.1	SEQUENCE	not-accessible	mandatory	psuIndex
psuIndex	psuEntry.1	INTEGER	read-only	mandatory	
psuName	psuEntry.2	DisplayString	read-only	mandatory	
psuState	psuEntry.3	DisplayString	read-only	mandatory	
psuBitStatus	psuEntry.4	DisplayString	read-only	mandatory	
ios	cmb.8				
inputs	ios.1				
inSysreset	inputs.1	INTEGER	read-only	mandatory	
inAcfail	inputs.2	INTEGER	read-only	mandatory	
inSysfail	inputs.3	INTEGER	read-only	mandatory	
inNvmro	inputs.4	INTEGER	read-only	mandatory	
inGdisc	inputs.5	INTEGER	read-only	mandatory	
outputs	ios.2				
outSysreset	outputs.1	INTEGER	read-write	mandatory	
outAcfail	outputs.2	INTEGER	read-write	mandatory	
outSysfail	outputs.3	INTEGER	read-write	mandatory	
outNvmro	outputs.4	INTEGER	read-write	mandatory	
outGdisc	outputs.5	INTEGER	read-write	mandatory	
outMrst1	outputs.6	INTEGER	read-write	mandatory	
outMrst2	outputs.7	INTEGER	read-write	mandatory	
outMrst3	outputs.8	INTEGER	read-write	mandatory	
outMrst4	outputs.9	INTEGER	read-write	mandatory	
outMrst5	outputs.10	INTEGER	read-write	mandatory	
outMrst6	outputs.11	INTEGER	read-write	mandatory	
outMrst7	outputs.12	INTEGER	read-write	mandatory	
outMrst8	outputs.13	INTEGER	read-write	mandatory	
gpios	cmb.9				
gpioTable	gpios.2	SEQUENCE	not-accessible	mandatory	
gpioEntry	gpioTable.1	SEQUENCE	not-accessible	mandatory	gpioIndex
gpioIndex	gpioEntry.1	INTEGER	read-only	mandatory	
gpioName	gpioEntry.2	DisplayString	read-only	mandatory	
gpioDir	gpioEntry.3	DisplayString	read-write	mandatory	
gpioInValue	gpioEntry.4	INTEGER	read-only	mandatory	
gpioOutValue	gpioEntry.5	INTEGER	read-write	mandatory	
gpioIt	gpioEntry.6	DisplayString	read-write	mandatory	
gpioItCount	gpioEntry.7	INTEGER	read-only	mandatory	
software	cmb.10				
softwareCmb	software.1				
sfwCmbVersion	softwareCmb.1	DisplayString	read-only	mandatory	
sfwCmbDate	softwareCmb.2	DisplayString	read-only	mandatory	

## 14 / Update Software

This chapter describes how to update the software running on CMB-3U from the CMB-3U shell (command line).

### 14.1 Update through Serial Line

The first serial line of CMB-3U (console port) is connected to a PC, and a S-Record image *intflash.Vx.x.elf.S19* is sent to CMB-3U as update image.

The `sload` command is used to do the S-Record transfer to CMB-3U, and `update` command is used to update from the image downloaded:

The "sload" command is allowed to all users; but the "update" command is not allowed to "guest" (allowed to `cmb`, `rack`, `system`, `user`)




---

Do not remove power on CMB-3U while running "update" (takes nearly 5 seconds); this would corrupt the software and make CMB-3U non functional.

---

On the PC side, when running the "sload" command on CMB-3U, the following procedure must be followed:

#### ▶ With a PC running Linux

- ▶ At the message "Please send S-Record", send the file:

```
$ cat intflash.Vx.x.elf.S19 > /dev/ttyS0
```

A "." is displayed by CMB-3U for each S-Record line processed. The transfer takes several minutes. If no "." is displayed, this means that something is going wrong.

#### ▶ With a PC running Windows

- ▶ At the message "Please send S-Record", without typing any character in the window, go to main menu and select "Transfer" / "Send a text file", then select the *intflash.Vx.x.elf.S19* file to send and valid.
- ▶ A "." is displayed by CMB-3U for each S-Record line processed. The transfer takes several minutes. If no "." is displayed, this means that something is going wrong.




---

Another way to proceed, instead of using "Transfer" / "Send a text file", is to open *intflash.Vx.x.elf.S19* in NotePad, then "Edit" / "Select all", then "Edit" / "Copy"; then in hyperterminal window: "Edit" / "Copy to host".

---

```

=====
MONITORING SOFTWARE 0.0 (build: Jan 18 2012)
VPDs: LOADING ...
WARNING: VPD USER unavailable
CONF: LOADING ...
PASSWORDS: LOADING ...
MAIN TASK started
TEMPERATURE TASK started
1 sensors : CMB
LED TASK started
LED BLINKING TAGB
CMBNSK started
FAN TACHO TASK started
FAN PWM TASK started
PIO IN TASK star Sted
GPIO OUT TASK started
GPIO USER TASK started
VOLTAGE TASK started
OARD TASK started
== ALL TASKS STARTED ==
hell (build: Dec 12 2011)
Copyright (c) 2008 Freescale Semiconductor;
Copyright (c) 2010 Kontron Modular Computers;
ETWORK TASK
Username: started
NETWORK: MAC address is 00:11:22:33:44:56
NETWORK: IP method is : STATIC
NETWORK: IP address: 172.20.144.95
NETWORK: IP netmask: 255.255.255.0
NETWORK: IP gateway: 172.20.144.46
NETWORK: configuration done :
  IP address : 172.20.144.95
  IP mask    : 255.255.255.0
  IP gateway : 172.20.144.46
NETWORK: starting telnet server
NETWORK: starting HTTP server
SNMP TASK started
SNMP: starting SNMP server
SNMP: starting SNMP notifications

```

```

Username: user
user's password:

```

```

user@CMB> sload
S-Record download from console
Buffer: SPI flash detected
Buffer: erasing ... DONE
System monitoring disabled during transfer
Please send S-Record

```

```

.....
.....
.....
////
.....
.....
.....Transfer done

```

```
Buffer: checking sum ... OK
Buffer : now contains 288080 bytes
user@CMB>
      user@CMB>
user@CMB> update
Checking sum of buffer ... OK
Checking if image in buffer is OK for this board ... OK
UPDATING, please be patient and DO NOT RESET
.....
.....
```

```
=====
MONITORING SOFTWARE 3.0 (build: Jan 19 2012)
VPDs: LOADING ...
WARNING: VPD USER unavailable
CONF: LOADING ...
PASSWORDS: LOADING ...
MAIN TASK started
TEMPERATURE TASK started
1 sensors : CMB
LED TASK started
LED BLINKING TAGB
CMBNSK started
FAN TACHO TASK started
FAN PWM TASK started
PIO IN TASK star Sted
GPIO OUT TASK started
GPIO USER TASK started
VOLTAGE TASK started
OARD TASK started
== ALL TASKS STARTED ==
hell (build: Dec 12 2011)
Copyright (c) 2008 Freescale Semiconductor;
Copyright (c) 2010 Kontron Modular Computers;
ETWORK TASK
Username: started
NETWORK: MAC address is 00:11:22:33:44:56
NETWORK: IP method is : STATIC
NETWORK: IP address: 172.20.144.95
NETWORK: IP netmask: 255.255.255.0
NETWORK: IP gateway: 172.20.144.46
NETWORK: configuration done :
  IP address : 172.20.144.95
  IP mask    : 255.255.255.0
  IP gateway : 172.20.144.46
NETWORK: starting telnet server
NETWORK: starting HTTP server
SNMP TASK started
SNMP: starting SNMP server
SNMP: starting SNMP notifications
```

```
Username:
```

## 14.2 Update through Ethernet using ftp

An S-Record image intflash.Vx.x.elf.S19 is downloaded on CMB-3U as update image.

```

=====
MONITORING SOFTWARE 0.0 (build: Jan 18 2012)
VPDs: LOADING ...
WARNING: VPD USER unavailable
CONF: LOADING ...
PASSWORDS: LOADING ...
MAIN TASK started
TEMPERATURE TASK started
1 sensors : CMB
LED TASK started
LED BLINKING TAGB
CMBNSK started
FAN TACHO TASK started
FAN PWM TASK started
PIO IN TASK star Sted
GPIO OUT TASK started
GPIO USER TASK started
VOLTAGE TASK started
OARD TASK started
== ALL TASKS STARTED ==
hell (build: Dec 12 2011)
Copyright (c) 2008 Freescale Semiconductor;
Copyright (c) 2010 Kontron Modular Computers;
ETWORK TASK
Username: started
NETWORK: MAC address is 00:11:22:33:44:56
NETWORK: IP method is : STATIC
NETWORK: IP address: 172.20.144.95
NETWORK: IP netmask: 255.255.255.0
NETWORK: IP gateway: 172.20.144.46
NETWORK: configuration done :
  IP address : 172.20.144.95
  IP mask    : 255.255.255.0
  IP gateway : 172.20.144.46
NETWORK: starting telnet server
NETWORK: starting HTTP server
SNMP TASK started
SNMP: starting SNMP server
SNMP: starting SNMP notifications

Username: user
user's password:

user@CMB> ftp 172.20.144.71

RTCS v3.02.00 FTP client
Connecting to: [172.20.144.71]
220 (vsFTPd 2.2.2)
ftp []> user guest

```

```

331 Please specify the password.
Password: guest
230 Login successful.
ftp []> cd /tftpboot
250 Directory successfully changed.
ftp []> get intflash.V3.0.elf.S19 buffer:
Buffer: SPI flash detected
Buffer: erasing ... DONE
200 PORT command successful. Consider using PASV.
150 Opening BINARY mode data connection for intflash.V3.0.elf.S19 (636908 bytes).
Buffer: SRECORD format detected.
226 Transfer complete.
Buffer: checking sum ... OK
Buffer : now contains 288080 bytes
ftp []> bye
221 Goodbye.
FTP terminated
user@CMB>
user@CMB> update
Checking sum of buffer ... OK
Checking if image in buffer is OK for this board ... OK
UPDATING, please be patient and DO NOT RESET
.....
=====
MONITORING SOFTWARE 3.0 (build: Jan 19 2012)
VPDs: LOADING ...
WARNING: VPD USER unavailable
CONF: LOADING ...
PASSWORDS: LOADING ...
MAIN TASK started
TEMPERATURE TASK started
1 sensors : CMB
LED TASK started
LED BLINKING TAGB
CMBNSK started
FAN TACHO TASK started
FAN PWM TASK started
PIO IN TASK star Sted
GPIO OUT TASK started
GPIO USER TASK started
VOLTAGE TASK started
OARD TASK started
== ALL TASKS STARTED ==
hell (build: Dec 12 2011)
Copyright (c) 2008 Freescale Semiconductor;
Copyright (c) 2010 Kontron Modular Computers;
ETWORK TASK
Username: started
NETWORK: MAC address is 00:11:22:33:44:56
NETWORK: IP method is : STATIC
NETWORK: IP address: 172.20.144.95
NETWORK: IP netmask: 255.255.255.0
NETWORK: IP gateway: 172.20.144.46
NETWORK: configuration done :
  IP address : 172.20.144.95
  IP mask    : 255.255.255.0
  IP gateway : 172.20.144.46

```

```
NETWORK: starting telnet server  
NETWORK: starting HTTP server  
SNMP TASK started  
SNMP: starting SNMP server  
SNMP: starting SNMP notifications
```

Username:

## 15 / Software Changelog

This chapter describes the changes between Monitoring Software versions.




---

For CMB boards at EClevel 2000 (does NOT apply to CMB-3U): Latest versions can be used, but programming must be done using a USB BDM probe, and then future updates must be done the same way. It's impossible to do it live from CMB shell (for code size reason and lack of external SPI flash). On these boards the last version that can be live updated is 2.3 (unofficial) or lower.

---

### 15.1 4.2 compared to 4.1

- ▶ Support for 4 wire fans (8412N/2GHP) with the following new "**set vpd rack xxx**" commands:
  - ▶ galileo-2u-4w, galileo-8u-4w
  - ▶ r2u-4w, r4u-4w, r8u-4w
  - ▶ rtop-4w
  - ▶ fan-all-4w
  - ▶ galileo-generic-4w (= sensor-all + fan-all-4w)
- ▶ Support for M7 6U chassis with new command "**set vpd rack m7-6u**".
- ▶ MISC:
  - ▶ Only switch fans to forced **100%** or **auto** on fan status change, not at every event to let user change fan speed with "**set fan speed ...**".
  - ▶ Fixed fan speed that can not be changed by "**set fan speed ...**" with 4 wire fans.
  - ▶ Fixed (unused) `LIBBOARD_CMD_GET_POWER_REQ` not returning data.

### 15.2 4.1 compared to 4.0

- ▶ Added support for VX305x and VX6090
- ▶ MISC:
  - ▶ Renamed "**PSU:ON/OFF**" to "**RunState:ON/OFF**" in "**show board**" and HTTP "boards" page, because info was not coherent with the actual meaning of the cPLD register 0x72 bit 4.
  - ▶ fixed too many (wrong) I2C errors during concurrent accesses on the backplane I2C bus .

### 15.3 4.0 compared to 3.3

- ▶ MISC:
  - ▶ Added support for VX6070/VX6080/VM6052/VM6054
  - ▶ For VX6070/VX6080: added side option to slot numbers (not for VX6060): **<slot>[.<side>]**. (so **<slot>.0** and **<slot>.1**).
  - ▶ STARVX: added support for boards PowerProfile and bitStatus reporting .
  - ▶ Shell prompt (through serial line or telnet): support for command line edition:
    - ENTER**: validate edition
    - CTRL-C** or **ESCAPE+ESCAPE**: abort edition
    - BACKSPACE (BS or DEL)**: delete character on the left of cursor
    - CTRL-A**: move cursor to beginning of line

- CTRL-E**: move cursor to the end of line
- CTRL-B / ARROW-LEFT**: move cursor back one character
- CTRL-F / ARROW-RIGHT**: move cursor forward one character
- CTRL-P / ARROW-UP**: older history entry
- CTRL-N / ARROW-DOWN**: newer history entry
- ▶ Support for SPI flash AT25SF041 as replacement of AT25DF041A (EOL)
- ▶ FIXES:
  - ▶ fixed "**set board all ...**" not working due to error for slots where no board is present.
  - ▶ set board slotlist ...: no more check presence of boards when using intervals in slotlist, but still check for single slot values.
  - ▶ fixed potential transfer aborted issue with "**sload**" command, and updated messages.
  - ▶ fixed HTTP pages for W3C compliance for HTML and CSS.
- ▶ ENHANCEMENTS
  - ▶ PSUs: added support for custom delays at power on and off between PSU modules and PSU packs (power sequencing).
  - ▶ Enhanced support for multimaster I2C on backplane buses (retry timeout, ...).
  - ▶ Changed names P5VSB and 5VSB to VCMB to avoid confusion with backplane standby power, and for configurations where CMB is powered from a 3V3 standby source instead of a 5V one.
  - ▶ Changed boards PSU status from NOK/OK to OFF/ON.
  - ▶ Added new commands to reset boot watchdog:
    - set board watchdog slotlist reset**
    - set conf board watchdog slotlist reset**
  - ▶ GPIO "**user**": added "**off**" state (default) when unused. Min pulse width on input GPIO for IT count is now 30mS instead of 150mS.
- ▶ STATUS REPORTING:
  - ▶ Added bitStatus for Voltages, PSUs, temperatures, fans.
  - ▶ Added bitstatus report for each board with SYS LED blinking red in case of error.
  - ▶ Report bitStatus for current power profile compared to requested one.
  - ▶ HTTP server and SHELL: added colors to report bitStatus and LEDs state.
- ▶ SNMP: new MIB file (updated because of changes above).

## 15.4 3.3 compared to 3.2

- ▶ Support for CMB3U (support for 12V-2, PCB A-3U/B-3U).
- ▶ R3U (VPD "rack"):
  - ▶ no more run PSU module for fans at standby (automatically started if "**set fan ...**" is run).
  - ▶ fixed 5V starting 250mS before 12V at power-on (bugzilla xxxx).
- ▶ R2U (VPD "rack"): fixed 3rd fan port number: must be on port 3 (as for galileo-2u), not 2.
- ▶ VPD rack: added flags **PSU\_CTL\_INFO\_FAN\_POWER**, and **PSU\_GLOB\_CTL\_INFO\_STANDBY\_ON**.
- ▶ VPD system: added flag **MONITORING\_OPTIONS\_OVERTEMP\_FAN\_ON** + command "**set vpd system overtempoff fanon**".
- ▶ Default **Gdisc level** is 1 (undriven) when no VPD or after "**set conf reset**" (this is safer).
- ▶ Shell prompt is now supporting **DEL** in addition to **BS** (backspace) for serial consoles sending **DEL** when **backspace** is pressed (no more needed to type **CTRL-H** as workaround). See MQX34\_changelog.txt.

- ▶ R3U VPD rack:
  - ▶ Declare "PSU 12V FAN" module as "fan power" but no more as "standby" to prevent it from running at standby but have it set ON if "set fan ..." is used at standby  
To return to previous config:
 

```
rack@CMB> debug write uint8 vpd@2c0 3
```
  - ▶ Keep global control ON at standby for 12V PSUs to have them starting at the same time than 5V PSUs (workaround for PSU internal delay on global control).  
To return to previous config:
 

```
rack@CMB> debug write uint8 vpd@231 0
```
- ▶ CMB3U VPD rack:
  - ▶ keep global control ON at standby for 12V PSUs to have them starting at the same time than 5V PSUs (workaround for PSU internal delay on global control). Same as for R3U.




---

To disable standby on these racks (all PSU packs and modules OFF at standby):

```
rack@CMB> debug write uint8 vpd@231 0
rack@CMB> debug write uint8 vpd@2a8 1
rack@CMB> debug write uint8 vpd@2c0 5
```

---

## 15.5 3.2 compared to 3.1

- ▶ Support for R3U (VPDs + PSU management).
- ▶ Support for standby power modules.
- ▶ Support for 3V3SB (standby) connected to 3V3 input of CMB for monitoring.
- ▶ Support for 12VFAN (12V #2) on CMB-3U (replacing -12V managed by CMB).
- ▶ Support for VX3040 boards on backplane I2C.
- ▶ Fix:
  - ▶ For 4 wire fans: no more check fan speed in the 10s following a power-on (may not start immediately and then lead to a temporary fan error on LED "fan").
- ▶ Misc:
  - ▶ SNMP: only report voltages actually monitored by the CMB, not all possible (according to VPDs)
  - ▶ Blink standby LED when a standby PSU is not OK
  - ▶ Renamed MASKABLE-RESET to LOCAL-RESET for the boards reported reset source

## 15.6 3.1 compared to 3.0

- ▶ For 3 wire fans: added an offset between each PWM channel to reduce noise due to fans on +12V/-12V.  
This was needed for Hotlines #34533 and #31720 (Galileo R2U chassis / ULS).

## 15.7 3.0 compared to 2.2

- ▶ Management of boards through backplane I2C (from shell, HTTP, SNMP)
  - ▶ New commands:
    - ▶ **show board ...**

- ▶ **set board ...**
- ▶ **set conf board ...**
- ▶ Boot watchdog to secure board boot/reboot .
- ▶ Support for default NVMRO and GDISC level setting.
- ▶ HTTP:
  - ▶ Changed/fixed permissions on Web server
    - ▶ Free access to view and power on/off if "guest" password is empty
    - ▶ Free access to modify I/Os if "user" password is empty
  - ▶ added a "back" and "reload" button to each page
- ▶ SNMP and HTTP: added read/write to more system parameters: boards, I/Os, GPIOs, ...
- ▶ SYSRESET: fixed 200mS delay after PSU startup that was reduced to 0 due to PSU startup time.
- ▶ Support for RTOP VPX 3U (VPDs).

## 15.8 2.2 compared to 2.1

- ▶ New I2C driver with timeout management for more robust I2C buses (internal and backplane), avoiding dead CMB due to hanging I2C .

## 15.9 2.1 compared to 2.0

- ▶ Workaround for hanged I2C temp. sensors at power on/off on CMB-FxW-00 (sensors not on standby).

## 15.10 2.0 compared to 1.5

- ▶ Support for CMB EC level x2001 (SPI flash for update buffer): now 512KB of code is possible instead of 256KB.
- ▶ SNMP support: LEDs, Power on/off, LED and "power button short push" notifications
- ▶ VPDs:
  - ▶ Support for VPDs for R2U, R4U, and R8U
  - ▶ Added "set vpd rack fan-all" and "set vpd rack sensor-all"; and removed "set vpd rack galileo-generic"
  - ▶ Fixed VPDs for galileo racks.
- ▶ Fixed HTTP server priority leading to potential crash of system
- ▶ Fixed HTTP and SNMP server init error handling
- ▶ Removed "GPIO IN interrupt" messages
- ▶ Added "set conf misc com2shell on/off" to enable/disable shell on second serial port
- ▶ Software update: added some checksum verifications and update retry.

## 16 / Patching VPDs for Customization

To perform some specific customization (or do some debug), VPD can be patched.

The procedure is to use debug write command to patch VPD in memory as many times as required, then verify the result with show vpd, and at the end save changes with set vpd xxx save, and reset.

No change is saved to memory until set vpd xxx save is run, so if an error was made when patching and changes have not yet been saved, just reset the board to return to previous VPD.

If already saved, reprogram VPDs as for a new board (at least the altered sections of VPDs, not all VPDs), or revert each change one-by-one by doing some other patches.

Be careful when patching VPDs to use the required command according to the VPD field width :

- ▶ 1 byte field: uint8
- ▶ 2 byte field: uint16
- ▶ 4 byte field: uint32
- ▶ other fields: several uint8/16/32 or "debug fill mem <addr> <count> <pattern byte>"

The field width is listed below for each VPD field.

The address to patch is specified as <vpd section>@<offset in section>.

Valid VPD sections are :

- ▶ vpd: for CMB
- ▶ vpdr: for rack
- ▶ vpd: for system
- ▶ vpdu: for user

The offset to use according to the VPD field is listed below.

The valid values to patch for each field are also listed below.

Patching VPDs must be done as a username having the privilege to modify the target VPD section.




---

The CMB-3U section of VPDs is only set / modified during the CMB-3U's manufacturing process and is not intended to be modified in other circumstances. Information about this section that is given below is just for information.

---

### 16.1 Examples of VPD Patch

Patch of pwr-button-mngt to use a push button:

```
CMB> debug write uint8 vpdr@30C 2
CMB> show vpd rack
CMB> set vpd rack save
CMB> set reset
```

Patch of sensor1-limit-low to -3C:

```
CMB> debug write uint32 vpd@6C FFFFFFFD
CMB> show vpd system
CMB> set vpd system save
CMB> set reset
```

## 16.2 VPD Fields Reference

For each field, the following information is listed below :

- ▶ Offset
- ▶ width (in bytes)
- ▶ name of field
- ▶ comment

### VPD CMB

```

000 4 magic          "VPDC"
004 4 size
008 4 sum
00C 1 version       1
00D 3 unused

010 20 partnum      31 characters max + null
030 20 serialnm     31 characters max + null
050 20 variant      31 characters max + null
070 10 eclvl        15 characters max + null
080 6 mac-address

088 1 nb-cmb-temp-sensors 0-2
089 3 unused

08C 4 cmb-sensor0-bus 0
090 1 cmb-sensor0-addr i2c-addr
091 1 cmb-sensor0-type 0
092 2 unused
094 10 cmb-sensor0-name

0A4 4 cmb-sensor1-bus 0
0A8 1 cmb-sensor1-addr i2c-addr
0A9 1 cmb-sensor1-type 0
0AA 2 unused
0AC 10 cmb-sensor1-name

0BC 1 pcb-level     0=A,1=B,...FF=invalid
0BD 1 cmb-options   mask : i2c_rack_on_standby=1

```

### VPD RACK

```

000 4 magic          "VPDR"
004 4 size
008 4 sum
00C 1 version       1
00D 3 unused

010 20 partnum      31 characters max + null
030 20 serialnm     31 characters max + null
050 10 eclvl        15 characters max + null

060 1 nb-rack-temp-sensors 0-10
061 3 unused

```

```

064 4 rack-sensor0-bus 1
068 1 rack-sensor0-addr i2c-addr
069 1 rack-sensor0-type 0
06A 2 unused
06C 10 rack-sensor0-name

07C 4 rack-sensor1-bus 1
080 1 rack-sensor1-addr i2c-addr
081 1 rack-sensor1-type 0
082 2 unused
084 10 rack-sensor1-name

094 4 rack-sensor2-bus 1
098 1 rack-sensor2-addr i2c-addr
099 1 rack-sensor2-type 0
09A 2 unused
09C 10 rack-sensor2-name

0AC 4 rack-sensor3-bus 1
0B0 1 rack-sensor3-addr i2c-addr
0B1 1 rack-sensor3-type 0
0B2 2 unused
0B4 10 rack-sensor3-name

0C4 4 rack-sensor4-bus 1
0C8 1 rack-sensor4-addr i2c-addr
0C9 1 rack-sensor4-type 0
0CA 2 unused
0CC 10 rack-sensor4-name

0DC 4 rack-sensor5-bus 1
0E0 1 rack-sensor5-addr i2c-addr
0E1 1 rack-sensor5-type 0
0E2 2 unused
0E4 10 rack-sensor5-name

0F4 4 rack-sensor6-bus 1
0F8 1 rack-sensor6-addr i2c-addr
0F9 1 rack-sensor6-type 0
0FA 2 unused
0FC 10 rack-sensor6-name

10C 4 rack-sensor7-bus 1
110 1 rack-sensor7-addr i2c-addr
111 1 rack-sensor7-type 0
112 2 unused
114 10 rack-sensor7-name

124 4 rack-sensor8-bus 1
128 1 rack-sensor8-addr i2c-addr
129 1 rack-sensor8-type 0
12A 2 unused
12C 10 rack-sensor8-name

13C 4 rack-sensor9-bus 1
140 1 rack-sensor9-addr i2c-addr
141 1 rack-sensor9-type 0
142 2 unused
144 10 rack-sensor9-name

```

```

154 1  nb-rack-fans          0-7
155 3  unused

158 1  rack-fan0-portnum      0-7 : physical fan port
159 1  rack-fan0-features    mask : 1=tacho; 2=separatePWMwire, 4=noPWMfromCMB
15A 1  rack-fan0-tacho-pulses-per-revolution  how many pulses on tacho output per revolution
15B 1  unused
15C 2  rack-fan0-rpm-max    0-65535 : maximum speed in RPM
15E 1  rack-fan0-rpm-min-percent  0-100 : minimum operation speed
15F 1  rack-fan0-duty-at-rpm-min  0-100 : duty cycle required to run at minimum speed
160 10 rack-fan0-name

170 1  rack-fan1-portnum      0-7 : physical fan port
171 1  rack-fan1-features    mask : 1=tacho; 2=separatePWMwire, 4=noPWMfromCMB
172 1  rack-fan1-tacho-pulses-per-revolution  how many pulses on tacho output per revolution
173 1  unused
174 2  rack-fan1-rpm-max    0-65535 : maximum speed in RPM
176 1  rack-fan1-rpm-min-percent  0-100 : minimum operation speed
177 1  rack-fan1-duty-at-rpm-min  0-100 : duty cycle required to run at minimum speed
178 10 rack-fan1-name

188 1  rack-fan2-portnum      0-7 : physical fan port
189 1  rack-fan2-features    mask : 1=tacho; 2=separatePWMwire, 4=noPWMfromCMB
18A 1  rack-fan2-tacho-pulses-per-revolution  how many pulses on tacho output per revolution
18B 1  unused
18C 2  rack-fan2-rpm-max    0-65535 : maximum speed in RPM
18E 1  rack-fan2-rpm-min-percent  0-100 : minimum operation speed
18F 1  rack-fan2-duty-at-rpm-min  0-100 : duty cycle required to run at minimum speed
190 10 rack-fan2-name

1A0 1  rack-fan3-portnum      0-7 : physical fan port
1A1 1  rack-fan3-features    mask : 1=tacho; 2=separatePWMwire, 4=noPWMfromCMB
1A2 1  rack-fan3-tacho-pulses-per-revolution  how many pulses on tacho output per revolution
1A3 1  unused
1A4 2  rack-fan3-rpm-max    0-65535 : maximum speed in RPM
1A6 1  rack-fan3-rpm-min-percent  0-100 : minimum operation speed
1A7 1  rack-fan3-duty-at-rpm-min  0-100 : duty cycle required to run at minimum speed
1A8 10 rack-fan3-name

1B8 1  rack-fan4-portnum      0-7 : physical fan port
1B9 1  rack-fan4-features    mask : 1=tacho; 2=separatePWMwire, 4=noPWMfromCMB
1BA 1  rack-fan4-tacho-pulses-per-revolution  how many pulses on tacho output per revolution
1BB 1  unused
1BC 2  rack-fan4-rpm-max    0-65535 : maximum speed in RPM
1BE 1  rack-fan4-rpm-min-percent  0-100 : minimum operation speed
1BF 1  rack-fan4-duty-at-rpm-min  0-100 : duty cycle required to run at minimum speed
1C0 10 rack-fan4-name
1D0 1  rack-fan5-portnum      0-7 : physical fan port
1D1 1  rack-fan5-features    mask : 1=tacho; 2=separatePWMwire, 4=noPWMfromCMB
1D2 1  rack-fan5-tacho-pulses-per-revolution  how many pulses on tacho output per revolution
1D3 1  unused
1D4 2  rack-fan5-rpm-max    0-65535 : maximum speed in RPM
1D6 1  rack-fan5-rpm-min-percent  0-100 : minimum operation speed
1D7 1  rack-fan5-duty-at-rpm-min  0-100 : duty cycle required to run at minimum speed
1D8 10 rack-fan5-name

```

```

1E8 1 rack-fan6-portnum      0-7 : physical fan port
1E9 1 rack-fan6-features    mask : 1=tacho; 2=separatePWMwire, 4=noPWMfromCMB
1EA 1 rack-fan6-tacho-pulses-per-revolution  how many pulses on tacho output per revolution
1EB 1 unused
1EC 2 rack-fan6-rpm-max      0-65535 : maximum speed in RPM
1EE 1 rack-fan6-rpm-min-percent 0-100 : minimum operation speed
1EF 1 rack-fan6-duty-at-rpm-min 0-100 : duty cycle required to run at minimum speed
1F0 10 rack-fan6-name

200 1 rack-fan7-portnum      0-7 : physical fan port
201 1 rack-fan7-features    mask : 1=tacho; 2=separatePWMwire, 4=noPWMfromCMB
202 1 rack-fan7-tacho-pulses-per-revolution  how many pulses on tacho output per revolution
203 1 unused
204 2 rack-fan7-rpm-max      0-65535 : maximum speed in RPM
206 1 rack-fan7-rpm-min-percent 0-100 : minimum operation speed
207 1 rack-fan7-duty-at-rpm-min 0-100 : duty cycle required to run at minimum speed
208 10 rack-fan7-name

218 1 rack-nb-psus         0-10
219 1 rack-psu-acfail-info 0=noacfail; 1=acfail_in(PCB A); 2=acfail1_in; 4=acfail2_in 6=acfail1+2_in
21A 1 rack-psu-info        mask : 0=undefined, 0x01=12V#2_on_-12V, 0x02=VSB1, 0x04=VSB2,
0x08=3V3SB_on_3V3, 0x10=3V3, 0x20=5V, 0x40=12V, 0x80=-12V
Note : the field above lists all voltages available in the rack that are monitored by CMB

21B 1 unused

21C 10 rack-psu0-name
22C 1 rack-psu0-voltage-rail 0=3V3; 1=5V; 2=12V; 3=-12V, 6=3V3SB, 7=12V#2
22D 1 rack-psu0-mon-channel 0-7; FF=none
22E 1 rack-psu0-ctl-channel 0-7; FF=none
22F 1 rack-psu0-glob-ctl-channel 0-1; FF=none
230 1 rack-psu0-ctl-info    mask : 1=ctl_is_inhibit, 2=on_at_standby, 4=fan_power
231 1 rack-psu0-glob-ctl-info mask : 1=glob_ctl_is_inhibit, 2=on_at_standby
232 2 unused

234 10 rack-psu1-name
244 1 rack-psu1-voltage-rail 0=3V3; 1=5V; 2=12V; 3=-12V, 6=3V3SB, 7=12V#2
245 1 rack-psu1-mon-channel 0-7; FF=none
246 1 rack-psu1-ctl-channel 0-7; FF=none
247 1 rack-psu1-glob-ctl-channel 0-1; FF=none
248 1 rack-psu1-ctl-info    mask : 1=ctl_is_inhibit, 2=on_at_standby, 4=fan_power
249 1 rack-psu1-glob-ctl-info mask : 1=glob_ctl_is_inhibit, 2=on_at_standby
24A 2 unused

24C 10 rack-psu2-name
25C 1 rack-psu2-voltage-rail 0=3V3; 1=5V; 2=12V; 3=-12V, 6=3V3SB, 7=12V#2
25D 1 rack-psu2-mon-channel 0-7; FF=none
25E 1 rack-psu2-ctl-channel 0-7; FF=none
25F 1 rack-psu2-glob-ctl-channel 0-1; FF=none
260 1 rack-psu2-ctl-info    mask : 1=ctl_is_inhibit, 2=on_at_standby, 4=fan_power
261 1 rack-psu2-glob-ctl-info mask : 1=glob_ctl_is_inhibit, 2=on_at_standby
262 2 unused

```

```

264 10 rack-psu3-name
274 1 rack-psu3-voltage-rail 0=3V3; 1=5V; 2=12V; 3=-12V, 6=3V3SB, 7=12V#2
275 1 rack-psu3-mon-channel 0-7; FF=none
276 1 rack-psu3-ctl-channel 0-7; FF=none
277 1 rack-psu3-glob-ctl-channel 0-1; FF=none
278 1 rack-psu3-ctl-info mask : 1=ctl_is_inhibit, 2=on_at_standby, 4=fan_power
279 1 rack-psu3-glob-ctl-info mask : 1=glob_ctl_is_inhibit, 2=on_at_standby
27A 2 unused

27C 10 rack-psu4-name
28C 1 rack-psu4-voltage-rail 0=3V3; 1=5V; 2=12V; 3=-12V, 6=3V3SB, 7=12V#2
28D 1 rack-psu4-mon-channel 0-7; FF=none
28E 1 rack-psu4-ctl-channel 0-7; FF=none
28F 1 rack-psu4-glob-ctl-channel 0-1; FF=none
290 1 rack-psu4-ctl-info mask : 1=ctl_is_inhibit, 2=on_at_standby, 4=fan_power
291 1 rack-psu4-glob-ctl-info mask : 1=glob_ctl_is_inhibit, 2=on_at_standby
292 2 unused

294 10 rack-psu5-name
2A4 1 rack-psu5-voltage-rail 0=3V3; 1=5V; 2=12V; 3=-12V, 6=3V3SB, 7=12V#2
2A5 1 rack-psu5-mon-channel 0-7; FF=none
2A6 1 rack-psu5-ctl-channel 0-7; FF=none
2A7 1 rack-psu5-glob-ctl-channel 0-1; FF=none
2A8 1 rack-psu5-ctl-info mask : 1=ctl_is_inhibit, 2=on_at_standby, 4=fan_power
2A9 1 rack-psu5-glob-ctl-info mask : 1=glob_ctl_is_inhibit, 2=on_at_standby
2AA 2 unused

2AC 10 rack-psu6-name
2BC 1 rack-psu6-voltage-rail 0=3V3; 1=5V; 2=12V; 3=-12V, 6=3V3SB, 7=12V#2
2BD 1 rack-psu6-mon-channel 0-7; FF=none
2BE 1 rack-psu6-ctl-channel 0-7; FF=none
2BF 1 rack-psu6-glob-ctl-channel 0-1; FF=none
2C0 1 rack-psu6-ctl-info mask : 1=ctl_is_inhibit, 2=on_at_standby, 4=fan_power
2C1 1 rack-psu6-glob-ctl-info mask : 1=glob_ctl_is_inhibit, 2=on_at_standby
2C2 2 unused

2C4 10 rack-psu7-name
2D4 1 rack-psu7-voltage-rail 0=3V3; 1=5V; 2=12V; 3=-12V, 6=3V3SB, 7=12V#2
2D5 1 rack-psu7-mon-channel 0-7; FF=none
2D6 1 rack-psu7-ctl-channel 0-7; FF=none
2D7 1 rack-psu7-glob-ctl-channel 0-1; FF=none
2D8 1 rack-psu7-ctl-info mask : 1=ctl_is_inhibit, 2=on_at_standby, 4=fan_power
2D9 1 rack-psu7-glob-ctl-info mask : 1=glob_ctl_is_inhibit, 2=on_at_standby
2DA 2 unused

2DC 10 rack-psu8-name
2EC 1 rack-psu8-voltage-rail 0=3V3; 1=5V; 2=12V; 3=-12V, 6=3V3SB, 7=12V#2
2ED 1 rack-psu8-mon-channel 0-7; FF=none
2EE 1 rack-psu8-ctl-channel 0-7; FF=none
2EF 1 rack-psu8-glob-ctl-channel 0-1; FF=none
2F0 1 rack-psu8-ctl-info mask : 1=ctl_is_inhibit, 2=on_at_standby, 4=fan_power
2F1 1 rack-psu8-glob-ctl-info mask : 1=glob_ctl_is_inhibit, 2=on_at_standby
2F2 2 unused

2F4 10 rack-psu9-name
304 1 rack-psu9-voltage-rail 0=3V3; 1=5V; 2=12V; 3=-12V, 6=3V3SB, 7=12V#2
305 1 rack-psu9-mon-channel 0-7; FF=none
306 1 rack-psu9-ctl-channel 0-7; FF=none
307 1 rack-psu9-glob-ctl-channel 0-1; FF=none
308 1 rack-psu9-ctl-info mask : 1=ctl_is_inhibit, 2=on_at_standby, 4=fan_power
309 1 rack-psu9-glob-ctl-info mask : 1=glob_ctl_is_inhibit, 2=on_at_standby
30A 2 unused

```

```
30C 1 pwr-button-mngt          0=switch_to_psu; 1=switch_to_cmb; 2=push_button_to_cmb
```

Individual delays for PSU modules (ctl) and PSU packs (glob\_ctl), at power on and off (in milliseconds; default = 0; from the beginning of the power on or off sequence) :

```
310 2 glob-ctl0-on
312 2 glob-ctl0-off
314 2 glob-ctl1-on
316 2 glob-ctl1-off
318 2 ctl0-on
31A 2 ctl0-off
31C 2 ctl1-on
31E 2 ctl1-off
320 2 ctl2-on
322 2 ctl2-off
324 2 ctl3-on
326 2 ctl3-off
328 2 ctl4-on
32A 2 ctl4-off
32C 2 ctl5-on
32E 2 ctl5-off
330 2 ctl6-on
332 2 ctl6-off
334 2 ctl7-on
336 2 ctl7-off
```

#### VPD SYSTEM

```
000 4 magic          "VPDS"
004 4 size
008 4 sum
00C 1 version        1
00D 3 unused

010 20 partnum       31 characters max + null
030 20 serialnm      31 characters max + null
050 10 eclvl         15 characters max + null

060 4 sensor0-limit-high signed 32bit value for limit; 7FFFFFFF=nolimit
064 4 sensor0-limit-low
068 4 sensor1-limit-high
06C 4 sensor1-limit-low
070 4 sensor2-limit-high
074 4 sensor2-limit-low
078 4 sensor3-limit-high
07C 4 sensor3-limit-low
080 4 sensor4-limit-high
084 4 sensor4-limit-low
088 4 sensor5-limit-high
08C 4 sensor5-limit-low
090 4 sensor6-limit-high
094 4 sensor6-limit-low
098 4 sensor7-limit-high
09C 4 sensor7-limit-low
0A0 4 sensor8-limit-high
0A4 4 sensor8-limit-low
0A8 4 sensor9-limit-high
0AC 4 sensor9-limit-low
0B0 4 sensor10-limit-high
0B4 4 sensor10-limit-low
0B8 4 sensor11-limit-high
0BC 4 sensor11-limit-low
```

```

0C0 4 fan0-limit-high
0C4 4 fan0-limit-low
0C8 4 fan1-limit-high
0CC 4 fan1-limit-low
0D0 4 fan2-limit-high
0D4 4 fan2-limit-low
0D8 4 fan3-limit-high
0DC 4 fan3-limit-low
0E0 4 fan4-limit-high
0E4 4 fan4-limit-low
0E8 4 fan5-limit-high
0EC 4 fan5-limit-low
0F0 4 fan6-limit-high
0F4 4 fan6-limit-low
0F8 4 fan7-limit-high
0FC 4 fan7-limit-low
100 4 p3v3-limit-high
104 4 p3v3-limit-low
108 4 p5v-limit-high
10C 4 p5v-limit-low
110 4 p12v-limit-high
114 4 p12v-limit-low
118 4 n12v-limit-high
11C 4 n12v-limit-low
120 4 p5vsb-limit-high
124 4 p5vsb-limit-low
128 1 system-monitoring-options mask : 1=overtemp_power_off, 2=undertemp_power_off, 4=overtemp_fan_on
12C 1 fan-trip-point-low-temp signed value between -128 and 127
12D 1 fan-trip-point-low-speed % of full speed between 0 and 100
12E 1 fan-trip-point-high-temp signed value between -128 and 127
12F 1 fan-trip-point-high-speed % of full speed between 0 and 100

```

#### VPD USER

```

000 4 magic          "VPDU"
004 4 size
008 4 sum
00C 1 version        1
00D 3 unused

```

## 17 / Known Limitations

### 17.1 Using Interrupts on User GPIOs

These user GPIOs are available to provide general input and output for user application purpose.

These signals are managed by an I2C GPIO expander so they are not designed to be able to generate (as output) or to detect (as input) fast level transitions, and the monitoring software is also not designed for that.

#### ▶ With CMB Monitoring Software < 4.0:

When configured as input, the level reported for a GPIO through HTTP and SNMP interfaces is not updated unless interrupt is enabled on this GPIO.

In addition, when configured as input with interrupt enabled, the following limitations apply :

- ▶ The interrupt count for a GPIO may be lower than expected (interrupt lost) if the signal is a pulse with a period lower than 150 msec.
- ▶ The interrupt count for a GPIO may also be lower than expected (interrupt lost) if the signal is a pulse of less than 150 msec and another GPIO interrupt occurs within 150 msec before.

#### ▶ With CMB Monitoring Software $\geq$ 4.0:

When configured as input with interrupt enabled, the following limitations apply:

- ▶ The interrupt count for a GPIO may be lower than expected (interrupt lost) if the signal is a pulse with a period lower than 30 msec.
- ▶ the interrupt count for a GPIO may also be lower than expected (interrupt lost) if the signal is a pulse of less than 30 msec and another GPIO interrupt occurs within 30 msec before.



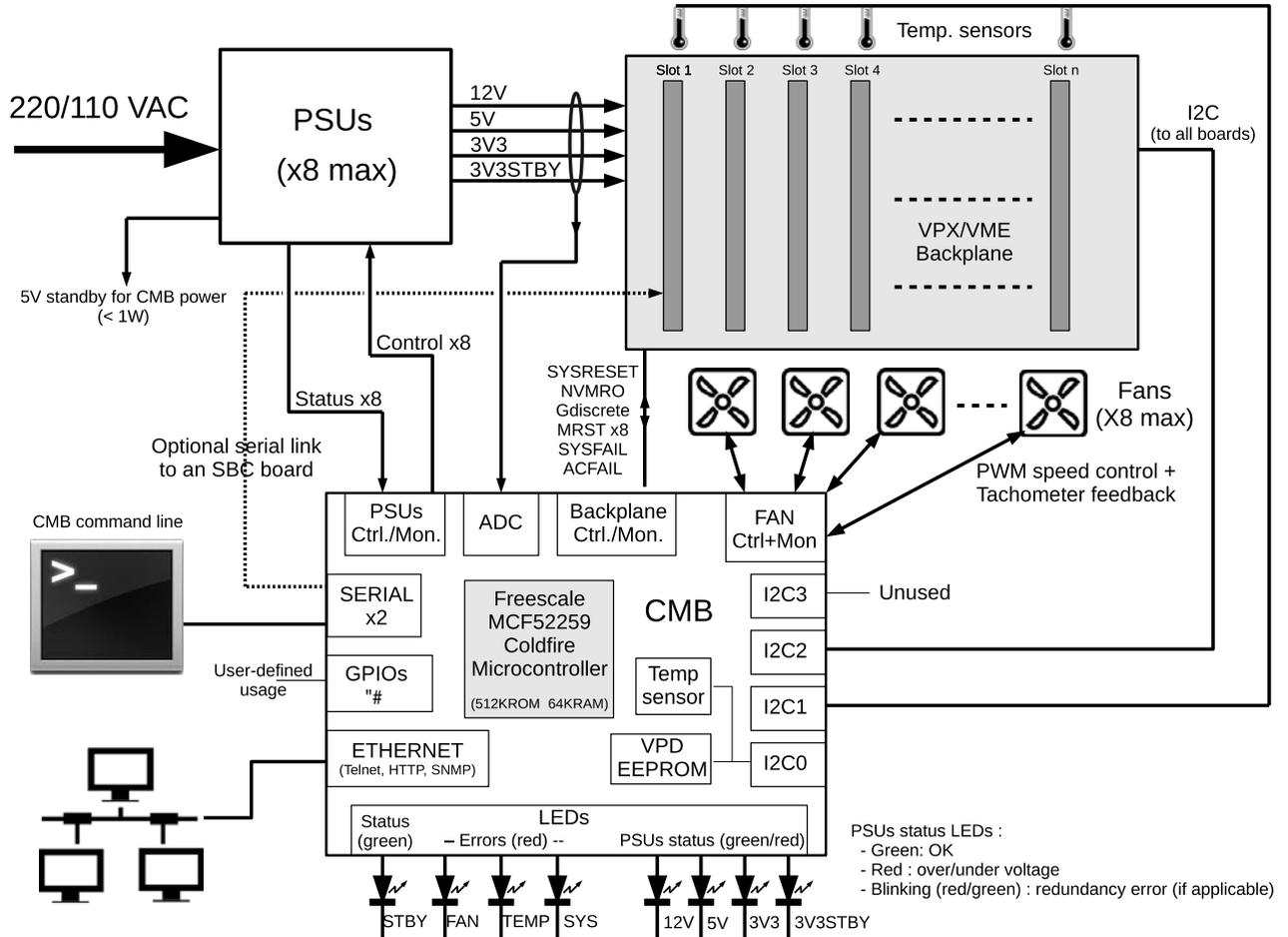

---

When enabled, an interrupt occurs at each level change (2 interrupts per signal period).

---

## 18 / Overview of a CMB-3U in a Chassis

The synoptic below is an example showing how a CMB-3U interacts with the components of the chassis.





## About Kontron

Kontron, a global leader in embedded computing technology and trusted advisor in IoT, works closely with its customers, allowing them to focus on their core competencies by offering a complete and integrated portfolio of hardware, software and services designed to help them make the most of their applications.

With a significant percentage of employees in research and development, Kontron creates many of the standards that drive the world's embedded computing platforms; bringing to life numerous technologies and applications that touch millions of lives. The result is an accelerated time-to-market, reduced total-cost-of-ownership, product longevity and the best possible overall application with leading-edge, highest reliability embedded technology

Kontron is a listed company. Its shares are traded in the Prime Standard segment of the Frankfurt Stock Exchange and on other exchanges under the symbol "KBC".

For more information, please visit: [www.kontron.com](http://www.kontron.com)



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