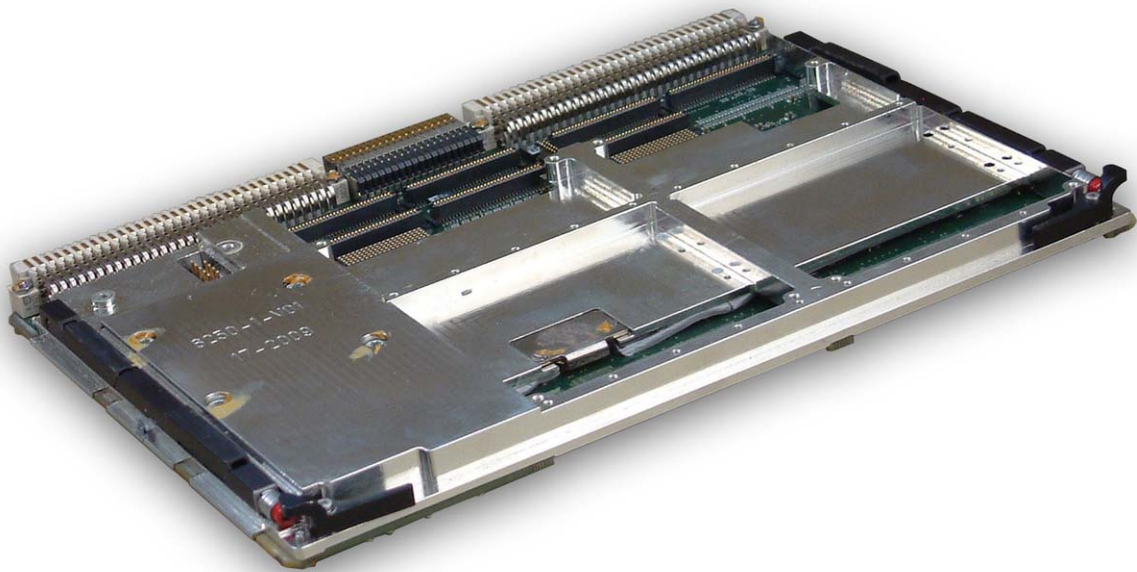


» VM6250/RC «



User's Guide Supplement

CA.DT.A75-1e - January 2012

Revision History

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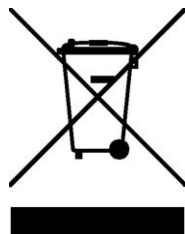
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Final disposition of this product after its service life must be accomplished in accordance with applicable country, state, or local laws or regulations.



Environmental protection is a high priority with Kontron.

Kontron follows the DEEE/WEEE directive.

You are encouraged to return our products for proper disposal.

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

- reduce waste arising from electrical and electronic equipment (EEE)
- make producers of EEE responsible for the environmental impact of their products, especially when 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

Conventions

This guide uses several types of notice: Note, Caution, ESD.



Note: this notice calls attention to important features or instructions.



Caution: this notice alert you to system damage, loss of data, or risk of personal injury.



ESD: This banner indicates an Electrostatic Sensitive Device.

All numbers are expressed in decimal, except addresses and memory or register data, which are expressed in hexadecimal. The prefix `0x` shows a hexadecimal number, following the `C` programming language convention.

The multipliers `k`, `M` and `G` have their conventional scientific and engineering meanings of $*10^3$, $*10^6$ and $*10^9$ respectively. The only exception to this is in the description of the size of memory areas, when `K`, `M` and `G` mean $*2^{10}$, $*2^{20}$ and $*2^{30}$ respectively.



When describing transfer rates, `k` `M` and `G` mean $*10^3$, $*10^6$ and $*10^9$ *not* $*2^{10}$ $*2^{20}$ and $*2^{30}$.

In PowerPC terminology, multiple bit fields are numbered from 0 to n, where 0 is the MSB and n is the LSB. PCI and CompactPCI terminology follows the more familiar convention that bit 0 is the LSB and n is the MSB.

Signal names ending with an asterisk (*) or a hash (#) denote active low signals; all other signals are active high.

Signal names follow the PICMG 2.0 R3.0 CompactPCI Specification and the PCI Local Bus 2.3 Specification.

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



Warning!

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



Caution, Electric Shock!

Before installing a not hot-swappable Kontron product into a system always ensure that your mains power is switched off. This applies also to the installation of piggybacks. Serious electrical shock hazards can exist during all installation, repair and maintenance operations with this product. Therefore, always unplug the power cable and any other cables which provide external voltages before performing work.

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 board 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 board.

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

In performing all necessary installation and application operations, please follow only 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 board, please re-pack it as nearly as possible in the manner in which it was delivered.

Special care is necessary when handling or unpacking the product. Please consult the special handling and unpacking instruction on the previous page of this manual.

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Chapter 1 - Introduction

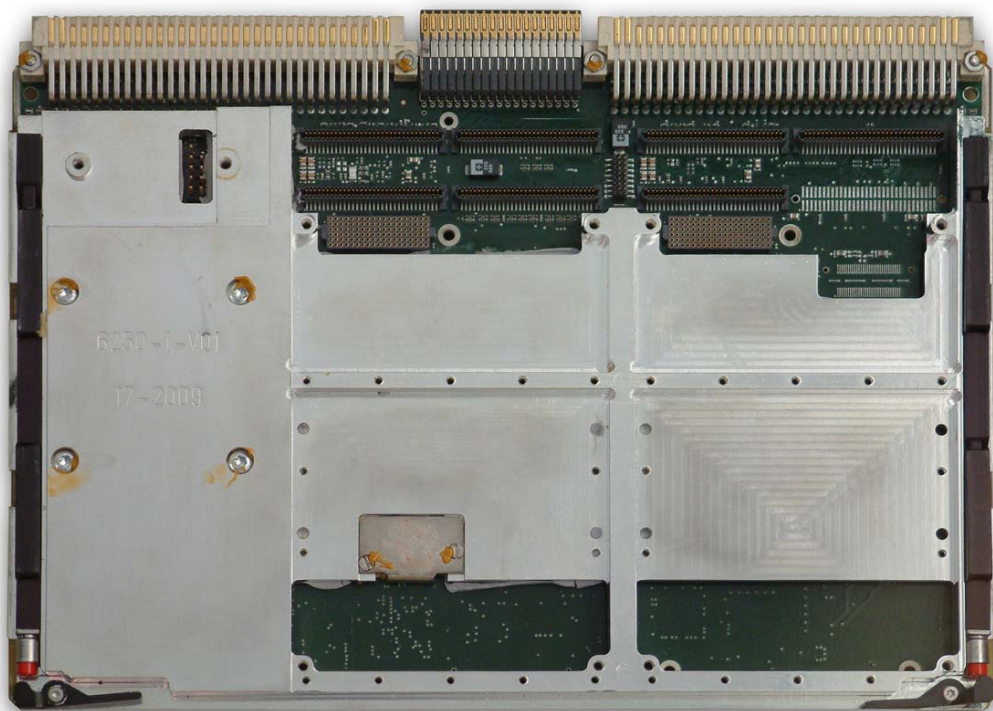


Functional changes that differ from previous version of the document are identified by a vertical bar in the margin.

The VM6250/RC boards uses "The Ruggedizer", a Kontron proven technology to meet the requirements for harsh environments. With an operational temperature range from -40° C up to +85° C (VITA 47 CC4) and its mechanical environmental performances, the VM6250/RC are designed for severe environmental applications with high levels of shock and vibration, small space envelope and restricted cooling such as required in military, marine, avionics, sheltered and industrial applications.

» Order Code

VM6250-1RC24-10110	Rugged Conduction-Cooled - RC Class Single Core MPC8640 @ 1GHz 1 GB DDR2-533 SDRAM 128 KB NoVRAM 2 PMC slots
VM6250-2RC25-11110	Rugged Conduction-Cooled - RC Class Dual Core MPC8640D @ 1 GHz 2 GB DDR2-533 SDRAM 128 KB NoVRAM 2 PMC/XMC slots
VM6250-1RC35-11110	Rugged Conduction-Cooled - RC Class Single Core MPC 8640 @ 1.25 GHz 2 GB DDR2-500 SDRAM 128k NVRAM 2 PMC/XMC slots
VM6250-2RC35-11110	Rugged Conduction-Cooled - RC Class Dual Core MPC 8640D @ 1.25 GHz 2 GB DDR2-500 SDRAM 128k NVRAM 2 PMC/XMC slots



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Figure 1: VM6250/RC - Overview

1.1 Objectives

This document describes the specificities of the VM6250/RC (Rugged Conduction-Cooled) boards compared to the VM6250/SA (Standard Air) boards. It focuses on the features which are specific to the rugged conduction-cooled version of the boards.

This document does not supersede the "VM6250 User's Guide" which contains important information for unpacking, identifying, configuring, installing and operating the VM6250 boards and which should be read first.

1.2 Related Documents

» Hardware Documentation

- > VM6250 Hardware Release Notes CA.DT.A66
- > VM6250 User's Guide CA.DT.A65
- > VM6250/RC Supplement User's Guide (this manual) CA.DT.A75



- The "User's Guide" manual reflects the most recent version of the Kontron products.
 - The "Hardware Release Notes" manual helps to keep track of various evolutions of the products.

» Firmware Documentation

- > U-Boot User Manual for VM6250 SD.DT.F36
- > VM6250 PBIT User's Guide SD.DT.F35

» Software Documentation

- > Release Notes Fedora9 on VM6250 SD.DT.F37
- > VxWorks B.S.P. User's Guide for VM6250 SD.DT.F44

Chapter 2 - Characteristics of the Board

2.1 VM6250/RC Specificities

The VM6250/RC boards have the same features as the VM6250/SA boards, except for the following items which are fully described in associated section below:

FUNCTION	SEE ALSO
Battery Installation	Section 2.2 page 5
Board Configuration	Section 2.3 page 6
Board Identification	Section 2.4 page 7
Environmental Specifications	Section 2.5 page 8
Mechanical Specifications	Section 2.6 page 9
MTBF	Section 2.7 page 10
Peripheral Connectivity	Section 2.8 page 11
PMC/XMC Installation	Section 2.9 page 12
USB Device Installation	Section 2.10 page 14

Table 1: VM6250/RC Specificities

2.2 Battery Installation

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer (Rayovac BR1225A).

Compared with the VM6250/SA boards, an additional cover is added on the battery in order to satisfy the shock and vibration constraints.

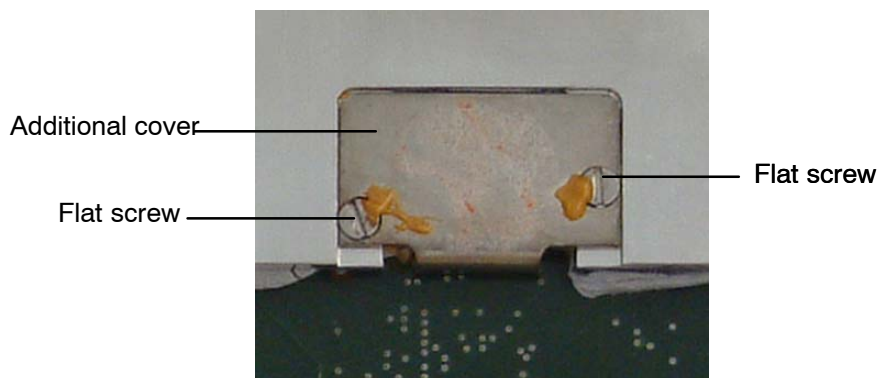
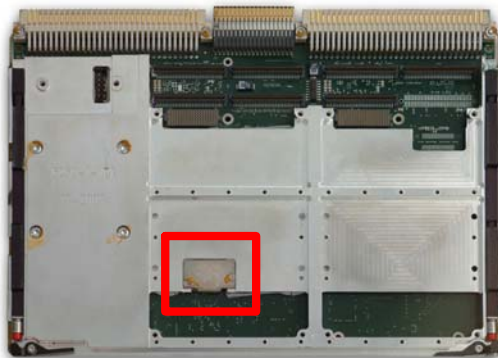
To replace the battery, proceed as follows:

- Turn off power and remove the board from the rack.
- Unscrew the two flat head screws (FX-M2x3) that maintain the cover in position, and remove the cover.
- Use a thin plastic tool to push the battery outside the safety cache. Push from the right or left top side of the safety cache.
- Remove the battery.
- Place the new battery in the socket.
- Make sure that you insert the battery the right way round. The plus pole must be on the top!
- Make sure the insulator under the cover is in good condition, otherwise contact your Kontron representative.
- Put back the cover and screw back the two flat head screws (FX-M2x3) applying a torque of 0.138 Nm (1.221 Lb-In).
- Secure the two screws with a drop of Loctite 222.



Care must be taken to ensure that the battery is correctly replaced.

The battery should be replaced only with an identical or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.



Thin plastic tool

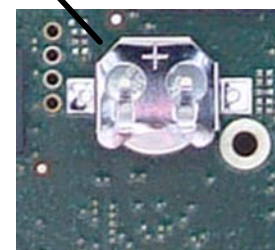


Figure 2: Battery Installation

2.3 Board Configuration

The four 4-bit DIP switches that are available on the VM6250/SA boards are not fitted in the VM6250/RC boards. A default configuration is used. Please contact Kontron, if a different default configuration is needed.

» DIP Switch SW1 Description - Default Configuration

DIP Switch SW1	Function	Description
1 .. 4	Reserved	Reserved

» DIP Switch SW2 Description - Default Configuration

DIP Switch SW2	Function	Description
1	Reserved	Reserved
2	Boot Flash Selection	OFF (1) Boot from Flash 0
3	Reserved	Reserved
4	Reserved	Reserved

» DIP Switch SW3 Description - Default Configuration

DIP Switch SW3	Function	Description
1 .. 4	Reserved	Reserved

» DIP Switch SW4 Description - Default Configuration

DIP Switch SW4	Function	Description
1	Boot Flash 0 WP#	ON (0) Boot Flash 0 Write Protected
2	Boot Flash 1 WP#	ON (0) Boot Flash 1 Write Protected
2 .. 4	Reserved	Reserved

» DIP Switch SW5 Description - Default Configuration

DIP Switch SW5	Function	Description
1 .. 4	Reserved	Reserved

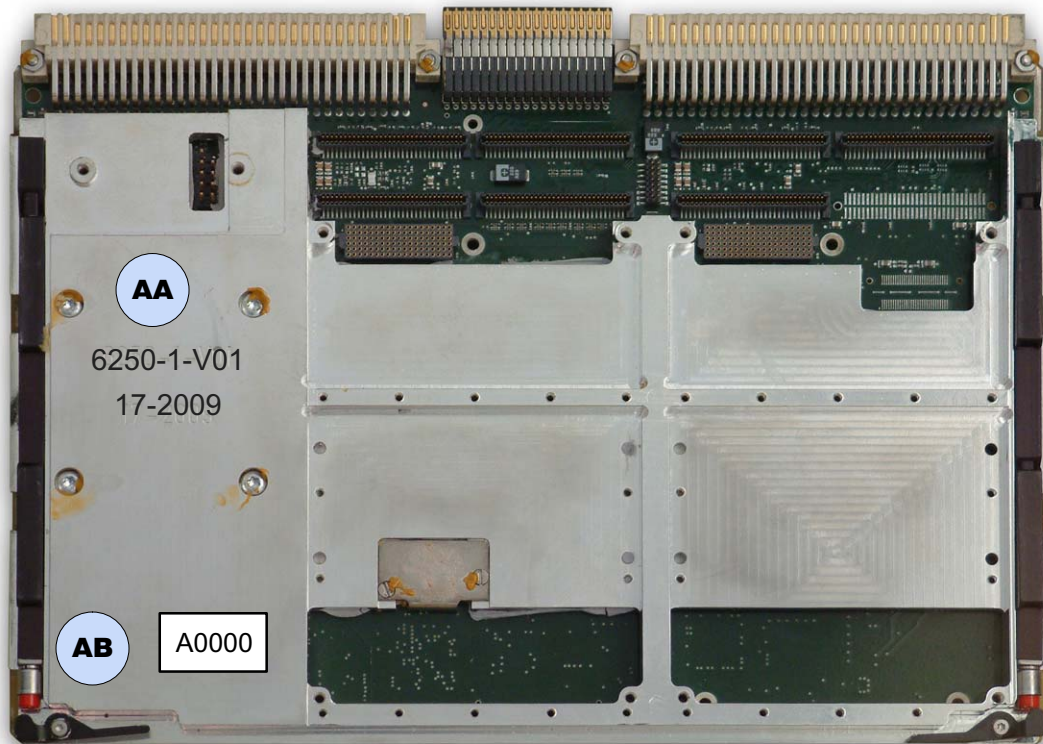
2.4 Board Identification

The VM6250/RC boards are identified by labels fitted to the bottom side. These labels are at the same location and have the same meaning (except the "Board Identification" label) as the VM6250/SA boards labels (refer to the "VM6250 User's Guide" for more information).

- The "Board Identification" label prefix of a VM6250/RC board is VM6250_xRC.

In addition, on VM6250/RC boards, the ruggedizer is identified by:

- the "Ruggedizer Identification" (printed on the ruggedizer). **AA**
- the "Engineering Change Level" (E.C. Level) of the ruggedizer. **AB**



non-contractual photography

Figure 3: VM6250/RC Identification

2.5 Environmental Specifications

Environmental Specifications	RC - Rugged Conduction-Cooled
Conformal Coating	Standard
Temperature	
Cooling Method	Conduction
Operating Single and dual core 1 GHz Single core 1.25 GHz Dual core 1.25 GHz	-40° to +85° C – VITA 47 – Class CC4 -40° to +85° C – VITA 47 – Class CC4 -40° to +71° C – VITA 47 – Class CC3
Storage	-45° to +100° C – VITA 47 Class C1/C2
Vibration Sine (Operating)	20 / 2000 Hz5g – VITA 47 Class V3
Random Vibration	VITA 47 – Class V3 The board withstands vibration as defined below for 1 hour per axis: 5 to 100 Hz PSD increasing at 3 dB/octave 100 to 1000 Hz PSD = 0.1 g2/Hz 1000 to 2000 Hz PSD decreasing at 6 dB/octave
Shock (Operating)	Half Sine 40 g / 20 ms
Altitude (Operating)	-1,640 to 60,000 ft
Relative Humidity	95% without condensation

Table 2: Environmental Specifications

2.6 Mechanical Specifications

The VM6250/RC boards are built on a multi-layer double Eurocard and conforms to the dimensions specified in the ANSI/VITA VME64 1-1994. The dimensions shown below are in millimeters, with inches (in parentheses) for general guidance only.

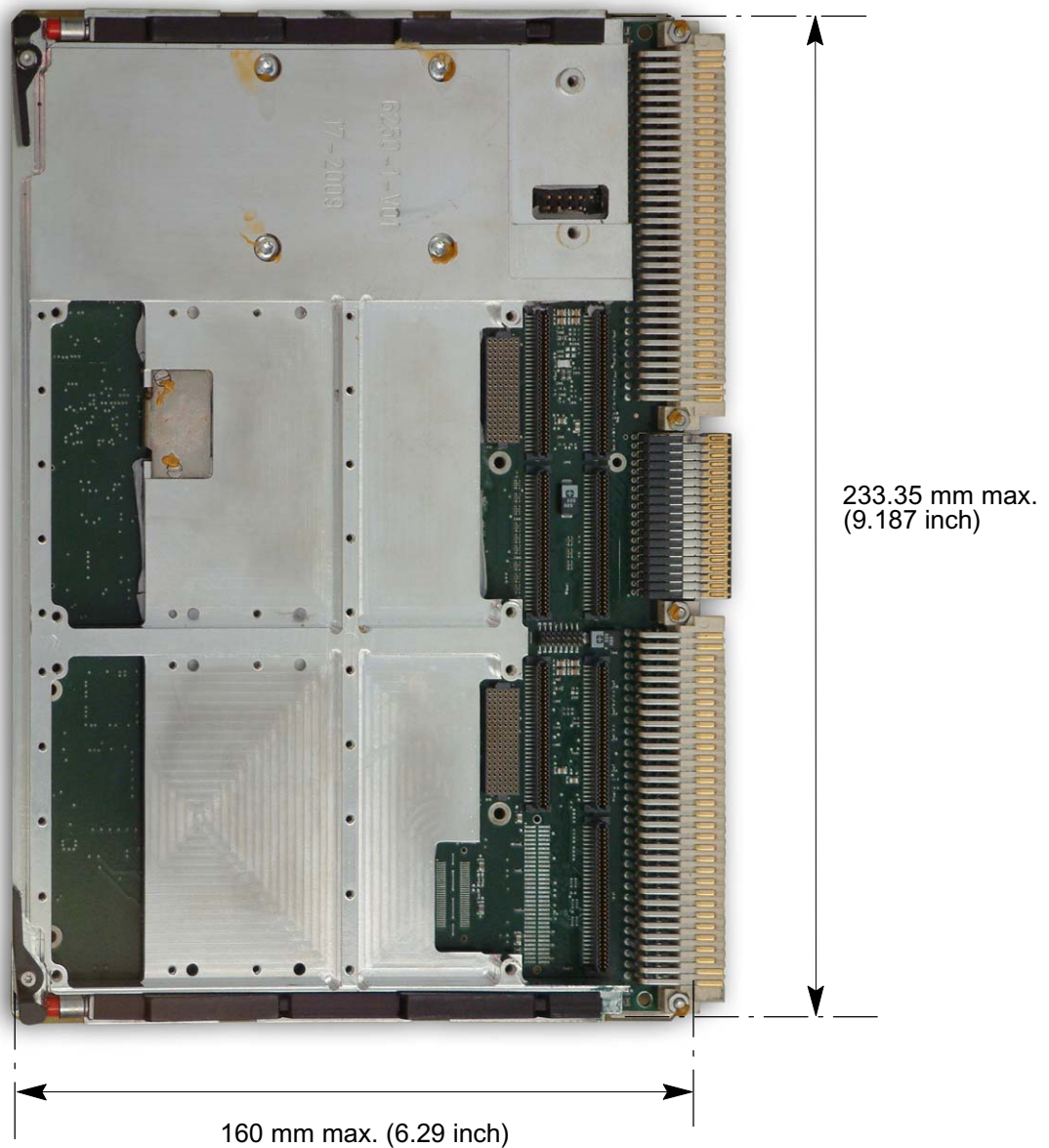


Figure 4: VME Dimensions

- Length: 233.35 mm max.
- Depth: 160 mm max.
- Height: 1 VME slot compatible
- Weight: 700 g (approximately)

2.7 MTBF Data

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

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

	GB (Hours)		AIC (Hours)	NS (Hours)		ARW (Hours)
	25°C	40°C	40°C	25°C	40°C	55°C
	VM6250/RC Order Code: VM6250-2RC2411110	329 216	241 625	48 204	63 832	53 360

Table 3: MTBF Data

2.8 Peripheral Connectivity

The VM6250/RC board features the same connectors as the VM6250/SA except that:

- the front panel connectors are absent (serial lines COM1/COM2 are always routed to P2 on the rugged conduction-cooled board),
- the P4 and P6 onboard connectors are not fitted on the VM6250/RC board.

For detailed information about the connectors located on the VM6250, refer to the "VM6250 Boards - User's Guide" .

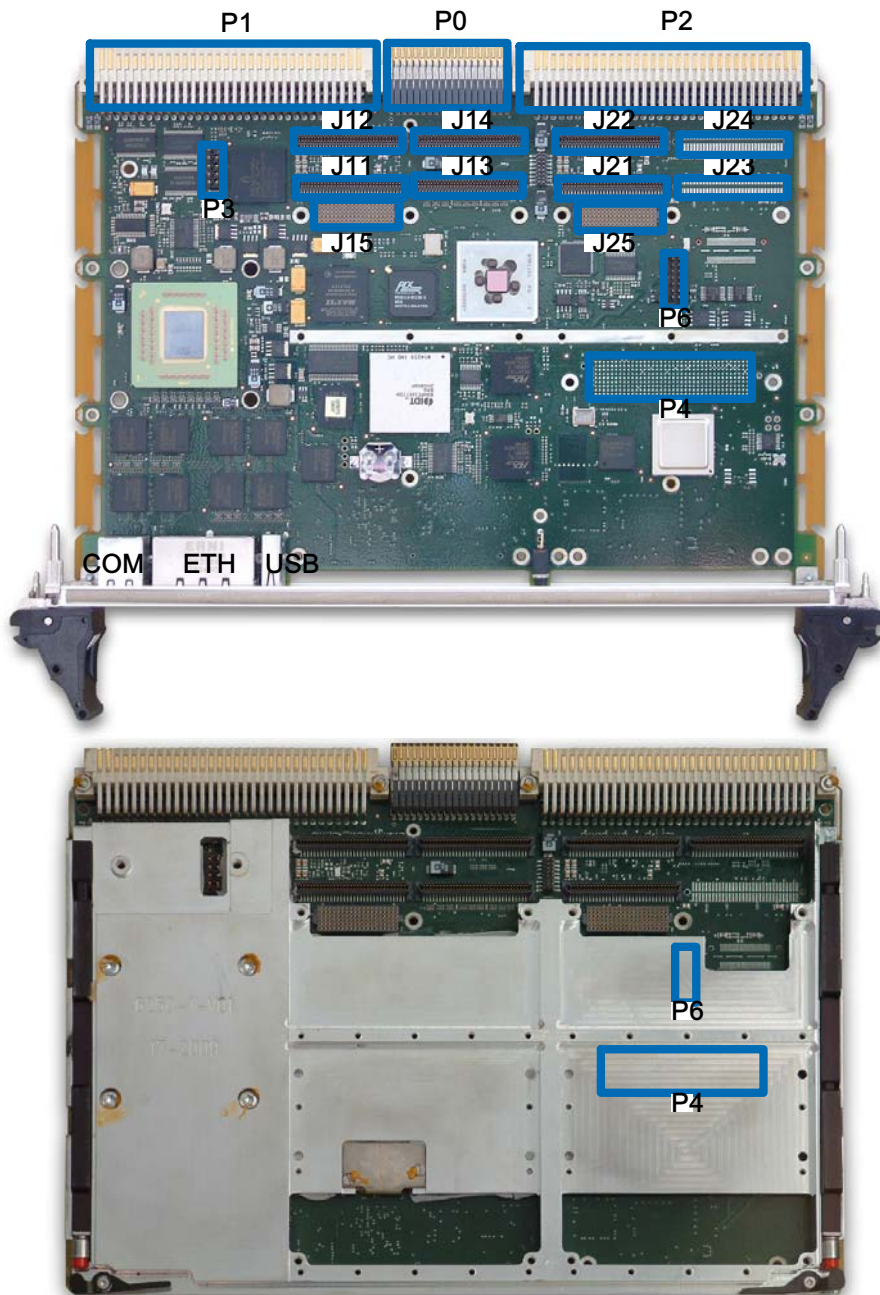


Figure 5: Peripheral Connectivity

2.9 PMC/XMC Installation

» Standard Anchorage Points

Install the XMC/PMC (for example XMC-ETH2-RC) to the VM6250/RC according to the following steps.

1. Check that the standoffs are attached to the XMC/PMC. Align the standoffs and the holes at the front, the middle and the rear of the PMC with the matching holes on the VM6250/RC board.
2. Lower the XMC/PMC component side down, fitting the mezzanine board connectors into their mating connectors on the VM6250/RC. Press them together so that the friction from the pins holds the mezzanine board in place.
3. Screw the XMC/PMC in place using mounting screws (5+2 at the front of the board, 5 in the middle of the board and 2 at the rear of the board). Tighten with a torque of 0.383 N.m. (3.389 Lb-In). Figure 6 shows the location of the standard anchorage points on an VM6250/RC board.

The PMC Installation Fastenings Kit is delivered with the VM6250/RC board. For each PMC location, it includes:

- ▶ 4x VIS-CZX-M2.5X6-INOX For the PMC assembly on the board **red** marks below
- ▶ 10x VIS-CZX-M2X6-INOX For PMC assembly on the board **blue** marks below

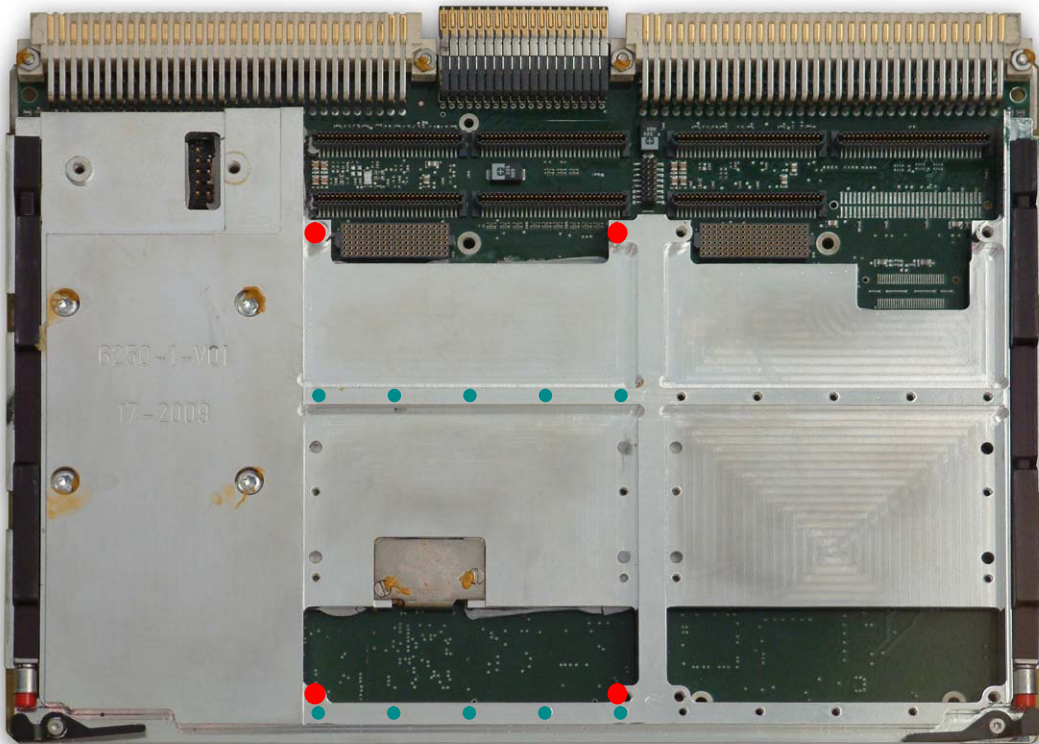


Figure 6: Standard Anchorage Points on VM6250/RC Board

» Fastenings Kit

An optional secondary thermal interface ribs should be used to get the specified module thermal performance.

Order Code: KIT-RIBPMC1V01-1

- ▶ 2x RIB-PMC-1-V01 Two additional ribs
- ▶ 4x VIS-CZX-M2X5-INOX For the ribs assembly on the board black marks below
- ▶ 10x VIS-CZX-M2.5X6-INOX For the PMC assembly on the ribs (6x)
For the PMC assembly on the board (4x) red marks below
- ▶ 10x VIS-CZX-M2X6-INOX For PMC assembly on the board blue marks below

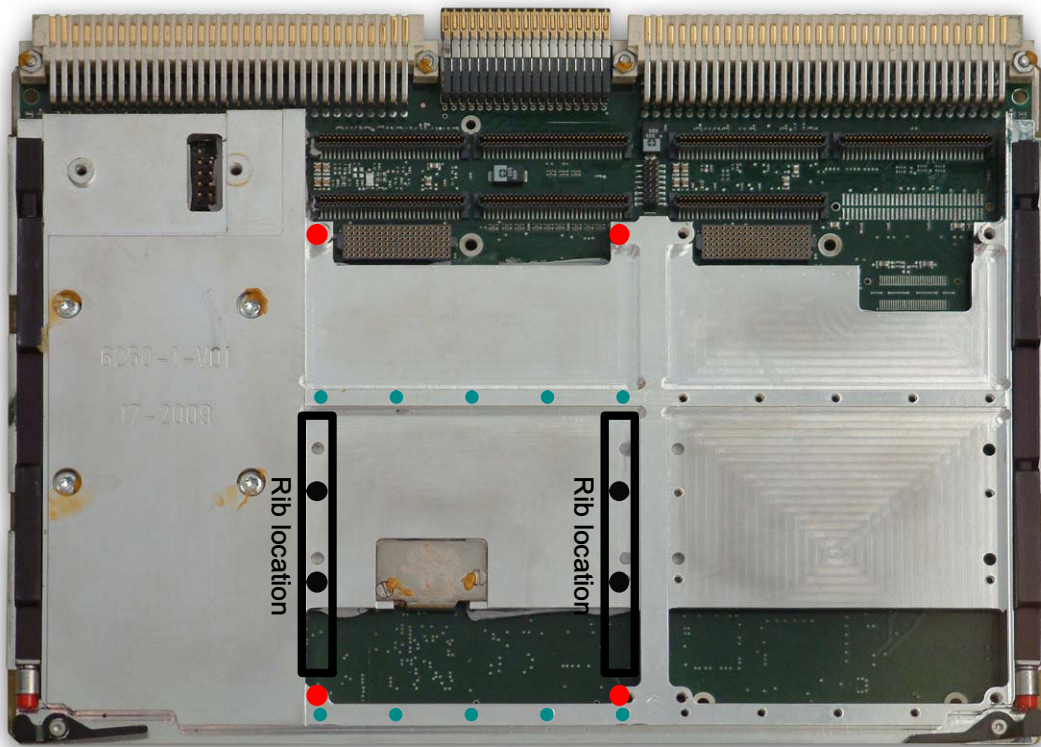


Figure 7: Usage of Fastenings Kit Ribs on VM6250/RC Board

2.10 USB Device Installation

The fastenings kit is delivered with the board, it includes:

- ▶ 2x screws CZX-M2.5X5
- ▶ 1x washer poly M3 P3 side

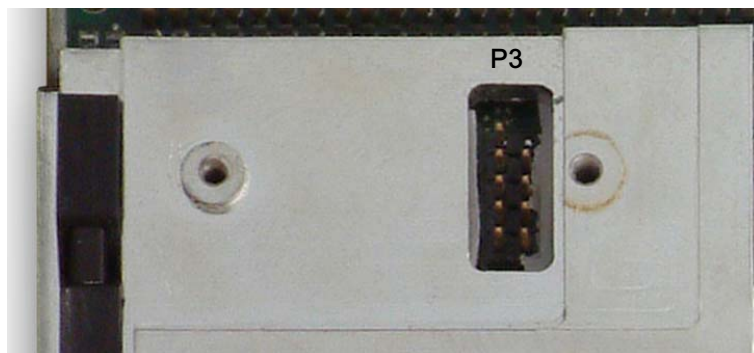
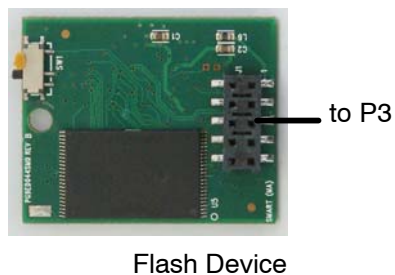
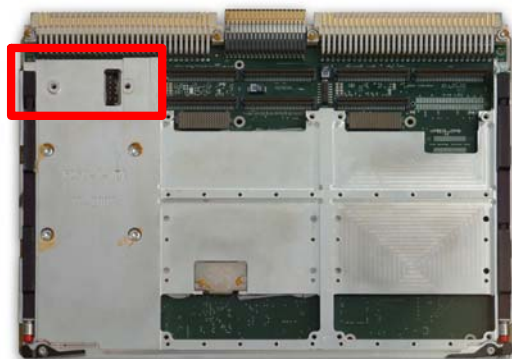
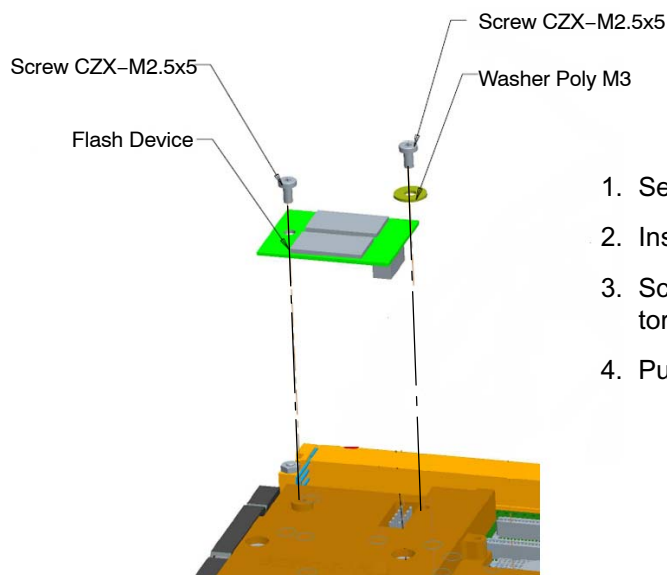


Figure 8: USB Device Location



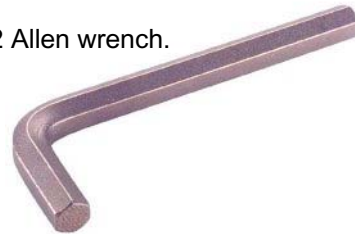
1. Set up the flash device using the P3 connector.
2. Install the washer poly M3.
3. Screw the two screws CZX-M2.5x5 using a torque of 0.279 N.m. (2.469 Lb-In).
4. Put a drop of Loctite 222 on each screw head.

Figure 9: USB Device Installation

Chapter 3 - Inserting and Removing the Board

» Inserting the Board

1. Insert the board into the backplane of the rack.
2. Screw both hexagonal socket drive 3/32 across flats with a 3/32 Allen wrench.



Conduct the installation using a torque spanner with a the recommended torque of 0.682 N.m. (6.03 Lb-In).

» Removing the Board

1. Unscrew both hexagonal socket drive 3/32 across flats with a 3/32 Allen wrench.
2. Remove the board from the backplane of the rack.

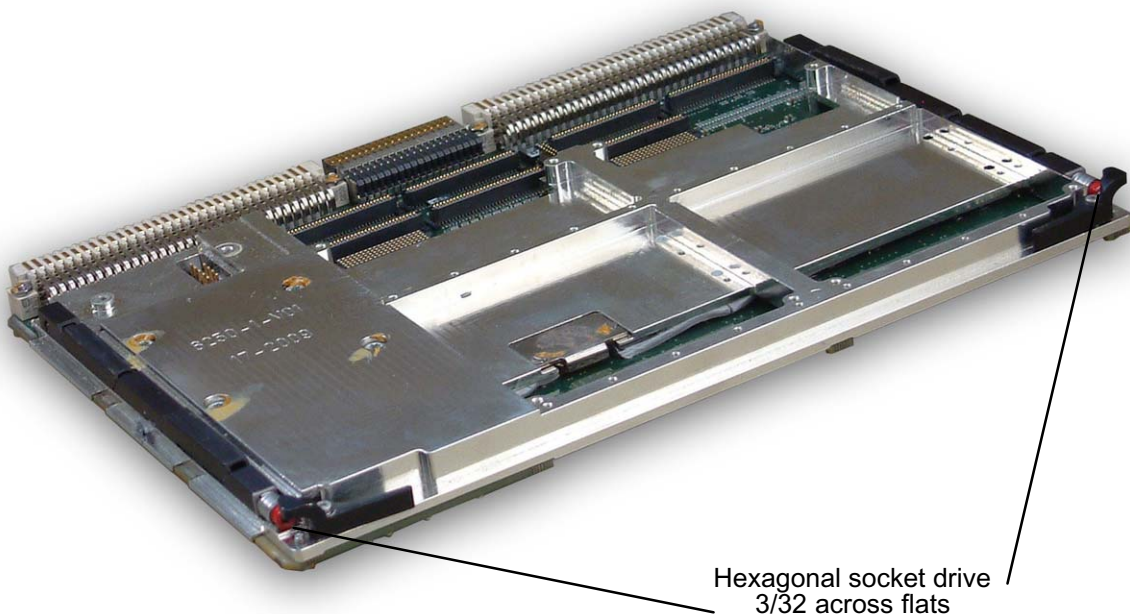


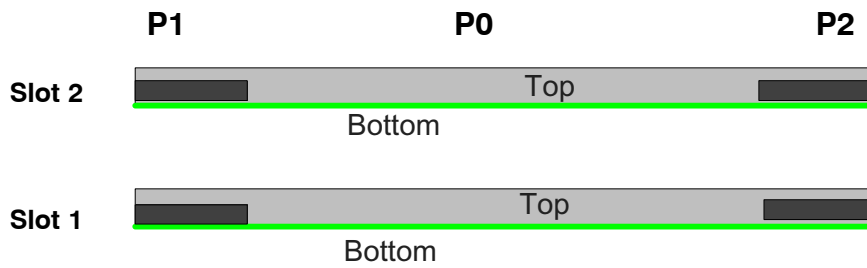
Figure 10: Inserting the Board



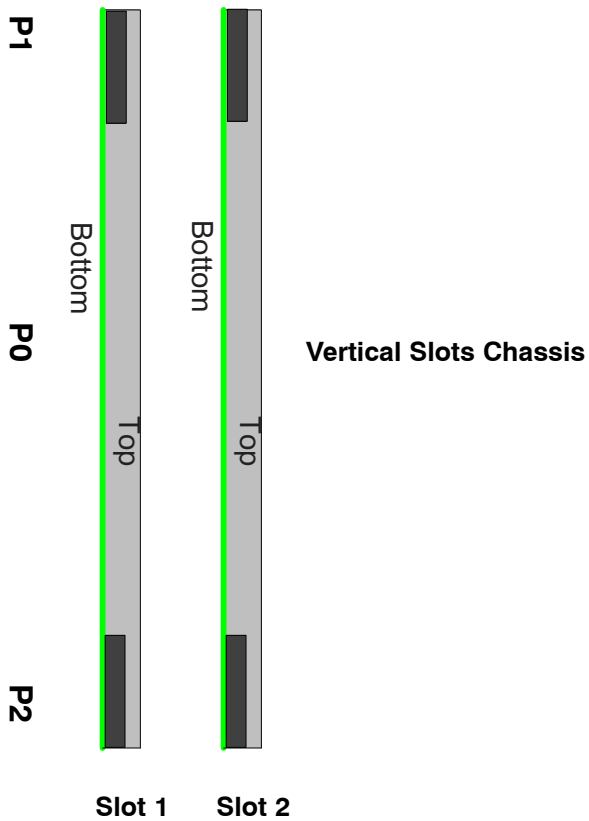
Do not touch the ruggedizer while removing the board from a rack because it can get very hot. Do not place the board on any surface or in any form of storage container until the board and its heatsink have cooled down to room temperature.



Depending on the chassis type (horizontal slots or vertical slots), make sure to insert the board correctly, as shown below:



Horizontal Slots Chassis



Vertical Slots Chassis

Figure 11: Slots Orientation

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