» EZ1-VM6250 «

Getting Started

SD.DT.F50-1e - July 2010

Revision History

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Rev.	Brief Description of Changes	Date of Issue
1e	Support EZ1-VM6250-00-L/V product	07-2010
0e	Initial Issue	10-2009

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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 - Equipment Presentation

1.1 Overview

EZ1-VM6250 is based on the best technologies from the embedded world and is ideally suited for systems evaluation.

- 5+ Years of Guaranteed Supply
- 10+ Years of Hardware and Software Support
- 19" 1U Rackable Server
- Fedora 9 Linux Support
- VxWorks 6.6 Support

EZ1-VM6250 is ready to use; its factory settings can get you to a shell prompt under Linux OS in a few seconds.

Thanks to its modular design based on standards, EZ1-VM6250 is compatible with many extensions.

Order Code

- **EZ1-VM6250-00-L** 6U VME High Performance PowerPC Computer. Linux software version.
- **EZ1-VM6250-00-L/V** 6U VME High Performance PowerPC Computer. Linux and VxWorks software versions.

Figure 1: EZ1-VM6250 Overview

1.2 At a Glance

The information displayed below applies for a VM6250 board:
Order Code: **VM6250-2SA4511110**

The EZ1-VM6250 system you have received may include a board with a different order code. Please contact your Kontron representative for more information on this topic.
The **vpdtool** command, under Linux Fedora 9, can also be used to get information related to the VM6250 board. Example of **vpdtool** command output:

```
# vpdtool
VM6250 detected
Board type   : VM6250-1SA24-10110
EC Level     : 23001
Serial Number: 1110011100073
Variant      : 2001344204430000
Keylist      : /PCB_C/SACLASS/P0PCIEON/SATAON/IOFPGAOFF/IBOMOFF/ETHFPR/NOXMC/864
0/MPX4:1/CORE2:1/DDR2_533/DDR2_1GB/NOPE7SERIAL/P0UHM/NV128K/1RANK/2ESST/REFSD2_1
00/REFCPU_33/1SLOT/H8OFF/HDDOFF/IPMIOFF/BC/BATON/ITIN/0V95/1G/
MAC address  : eth0: 0:0:de:50:c0:a4, eth1: 0:0:de:50:c0:a5, eth2: 0:0:de:50:c0:
a6, eth3: 0:0:de:50:c0:a7
#
```

Processor

- Up to 1.33 GHz Freescale Dual-Core MPC8641D with Altivec.

Memory

- 2 GB DDR2 SDRAM Memory
- 128K NVRAM

Storage

- 250 GB SATA HDD
- 4 GB USB Flash

Connectivity (Rack Rear Panel)

- Two USB 2.0 ports
  - 1x SBC Front Panel
  - 1x Rack Rear Panel (via the Rear Transition Module)
- Three Ethernet 10/100/1000Base-T channels
  - 2x SBC Front Panel
  - 1x Rack Rear Panel (via the Rear Transition Module)
- One Serial Line (SBC Front Panel)

Rear Transition Module - PBV36-P0-VM6-00

- See “VM6250 User's Guide - CA.DT.A65“, Chapter “VM6250-RTM Characteristics”

Software

- Software has been preloaded at the factory. See Chapter 2 “Software” for details on your configuration

Management

- Rack Front Panel Status LEDs: System LEDs
- Rack Rear Panel Status LEDs: SBC LEDs

Chassis Form Factor

- 1U Rack Mount Chassis (Height: 44.64 mm (1U) - Width: 443.5 mm - Deep: 254.3 mm)

Warranty

- 5+ years of Guaranted Supply
- 10+ years of Hardware and Software Support available

1.3 Receipt of the Equipment

1.3.1 Checking the Packages

Inspecting the packing cartons and verifying their condition is the responsability of the customer and should be carried out upon delivery.

> Inspect the cartons and check their condition:
  - no broken corners,
  - general state of the case (no rips or holes),
  - condition of the bands and the clips.

> If you wish to report any damage in transit, you should make out a full report, and also note the damage on the packing list that accompanies the equipment. Ensure that the report and the packing list are signed by yourself and also by the transport agent, and send a copy of these documents to:
  - the transport company,
  - Kontron.

1.3.2 Unpacking

Unpacking the equipment must be carried out under the supervision of a technician approved by Kontron Modular Computers.

> Open the package and take out the items one by one.

Two people should assist in the unpacking of the system unit, as it may be heavy.

> Inspect each item and make a note of any possible defects (scratches, marks or blemishes, damaged cables, etc.). If necessary, make a report of any damage or defects.

> Check the equipment against the packing list and report any missing items.

It is recommended that you keep the package and the anti-shock protection. This will be required if you decide to move your system or rack to a different site.

1.3.3 Content

Depending on the order code, the EZ1-VM6250 6U VME PowerPC Computer is made of:

	EZ1-VM6250-00-L	EZ1-VM6250-00-L/V
One computer rack and associated boards	X	X
One power supply cable	X	X
One serial cable KIT-RJ12DB9	X	X
One documentation CD-ROM CDDOC	X	X
One USB bootable key VxWorks 6.6 USBKEY VxW 6.6	-	X
EZ1-VM6250 Getting Started SD.DT.F50 (this file)	X	X
EZ1-VM6250-00-L Quick Start SD.DT.F51	X	X

Table 1: Delivery Content

Figure 2: Delivery Content

1.4 System Identification

An identification label is available on the left side of the system.

Figure 3: System Identification

- Model: System Order Code
- Sn: Serial Number
- ECL: Engineering Change Level

1.5 Introducing Front and Rear Views

Front View

Figure 4: Front View

1. System LEDs
2. Reset Button
3. DC Switch

RearView

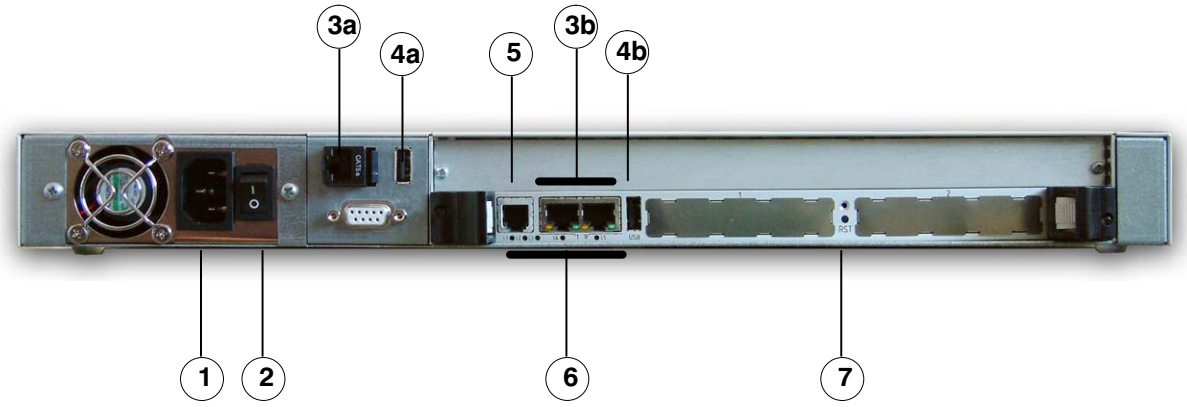


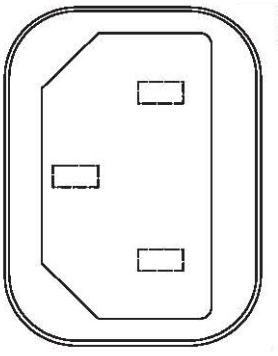
Figure 5: Rear View

1. Power Supply Connector
2. AC Switch
3. Ethernet Connectors
   - 3a from the RTM
   - 3b ETH0, ETH1 on the board front panel
4. USB Connectors
   - 4a from the RTM
   - 4b on the board front panel
5. Serial Connector
6. SBC LEDs
7. Abort/Reset Button and associated LED

Power Supply Connector

AC connector:
IEC320 type female plug rated 3

Pin	J1
1	Line
2	Neutral
3	Earth



1.6 Associated Documentation

This product is based on the same design as the VM6250 board. Therefore, the following documentations are available on the Kontron web site or on the technical documentation CD-ROM .

» Hardware

- > VM6250 6U VME PowerPC SBC - User's Guide CA.DT.A65
- > VM6250/RC User's Guide Supplement CA.DT.A75
- > VM6250 - Hardware Release Notes CA.DT.A66

» Software

- > VM6250 - PBIT User's Guide SD.DT.F35
- > VM6250 - U-Boot User Manual SD.DT.F36
- > VM6250 - Release Notes Fedora 9 . . . . . SD.DT.F37
- > VM6250 - LTIB Release Notes SD.DT.F38
- > VM6250 - VxWorks B.S.P. User's Guide SD.DT.F44

1.7 Plug and Play with EZ1-VM6250

1.7.1 Plug

To connect the EZ1-VM6250 6U VME PowerPC Computer, you need to attach the following cables:

- the Power Supply Cable (available in the delivery kit)
- the Serial Cable KIT-RJ12DB9 (available in the delivery kit)

To boot the EZ1-VM6250-00-L/V system, you also need to attach the following device:

- the USB key (available in the delivery kit)

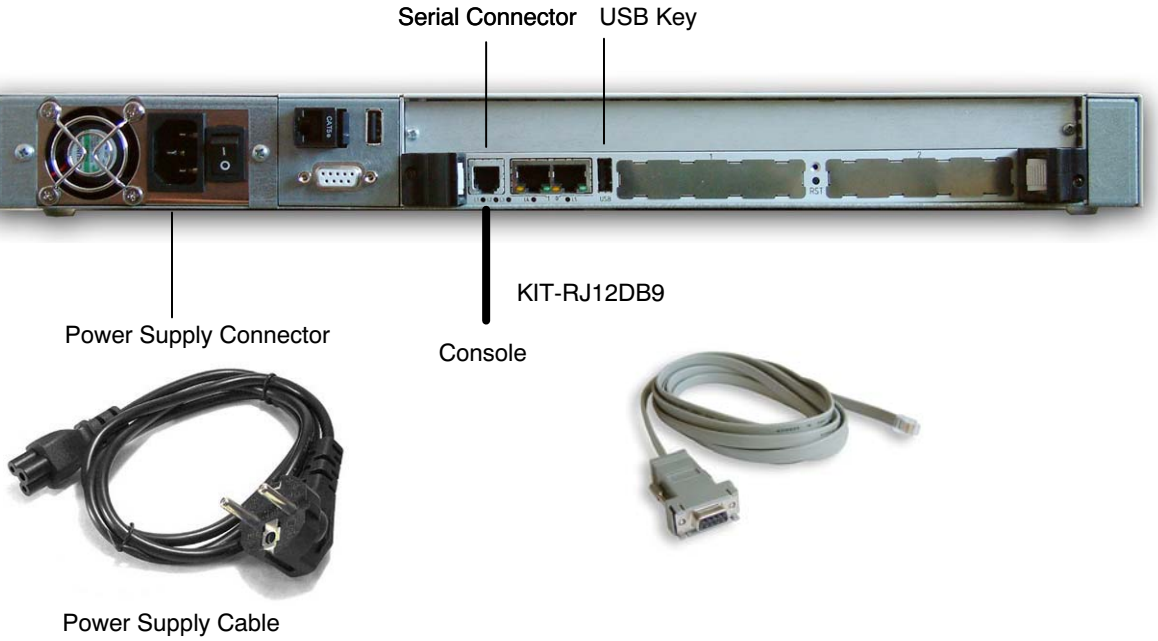


Figure 6: Connecting EZ1-VM6250

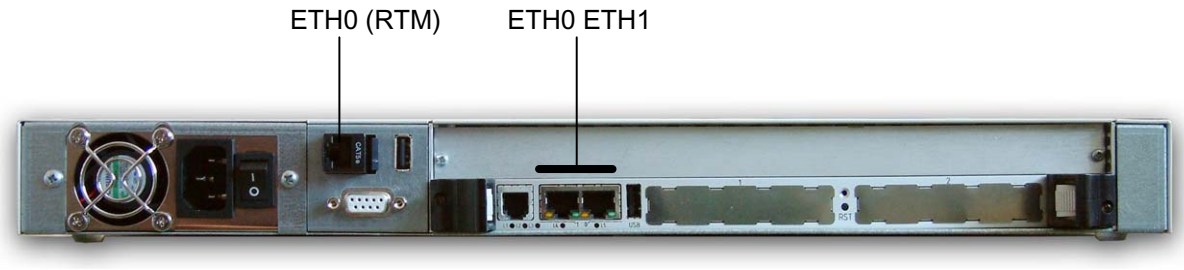


Figure 7: Hardware Name of Ethernet Ports

Linux Device Name	Hardware Name	Chassis Location
eth0	ETH0	Board front panel
eth1	ETH1	Board front panel
eth2	ETH0 (RTM)	Computer rear panel

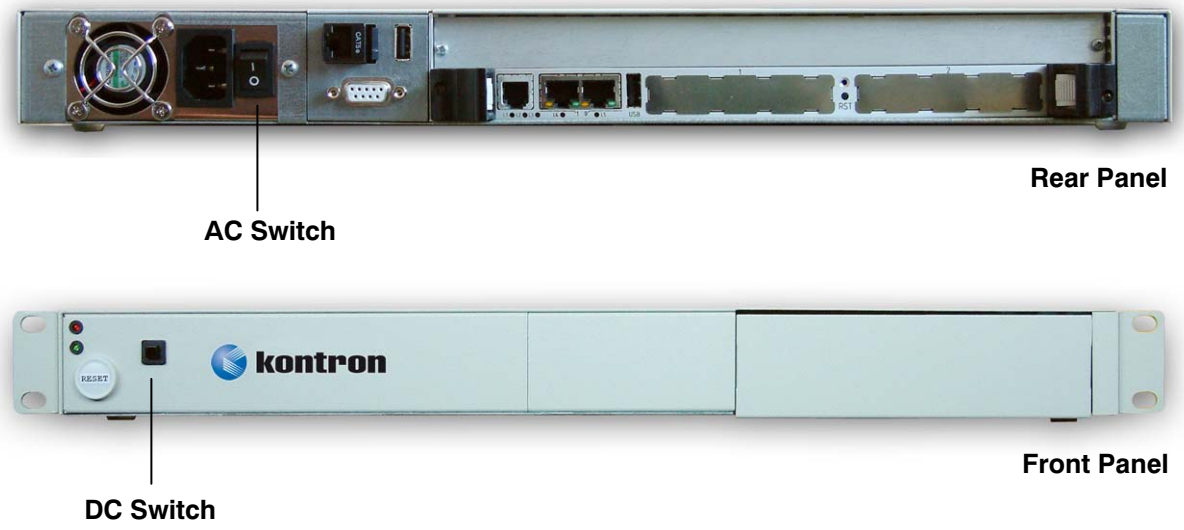
Table 2: Mapping Table: Linux Device Name / Hardware Name

VxWorks Device Name	Hardware Name	Chassis Location
motetsec0	ETH0	Board front panel

Table 3: Mapping Table: VxWorks Device Name / Hardware Name

ON/OFF Buttons

The ON/OFF buttons are located on the rear and front panels of the EZ1-VM6250 system.



To start the system

> Power on the main power supply module, AC Switch on the rear side of the system.

> Power on the secondary power supply modules, DC Switch on the front side of the system.

To stop the system

- Shutdown the OS.
- Power off the secondary power supply modules (DC Switch on the front side of the system).
- Power off the main power supply module (AC Switch on the rear side of the system).

Powering the system Off and On

DO NOT turn the power on while the power is cycling off. Wait a few seconds until the power has completely cycled off. Follow the same precaution for turning the power off.
Turning the power on or off before this cycle is complete can cause the voltage and temperature values programmed into the board monitoring system to be lost.
MAKE SURE YOU FOLLOW THESE SAFETY PRECAUTIONS.

Make sure the rack has been powered off using the ON/OFF button (on the rear panel of the rack) before unplugging the power supply cable.

1.7.2 Play

> Plug the system as described in section 1.7.1 “Plug” page 10.

> Power on the system

> Following screen appears:

- U-Boot

```
U-Boot 1.3.3 ID09201 for KONTRON VM6250 board

Freescale PowerPC
CPU:
    Core: E600 Core 0, Version: 0.2, (0x80040202)
    System: 8640D/8641D, Version: 2.1, (0x80900121)
    Clocks: CPU:1056 MHz, MPX: 528 MHz, DDR: 264 MHz, LBC:  66 MHz
    L2: Enabled
    Board: VM6250
    I2C:   ready
...
...
...
SATA:
    SATA0 : HD connected (1.5Gbit/s)
    SATA1 : No SATA Device Found
Hit any key to stop autoboot: 0
```

> EZ1-VM6250-00-L/V Specificities

- The EZ1-VM6250-00-L is featured with a Linux Operating System on SATA disk inside the chassis.
- The EZ1-VM6250-00-L/V is featured with a Linux Operating System on SATA disk inside the chassis and a USB key with a preloaded VxWorks 6.6 kernel allowing to boot the VxWorks Operating System.

So, the user will be able to choose between booting Linux through SATA disk or VxWorks through a USB key. To switch from a boot mode to another, the right boot settings under U-Boot must be properly set up:

To do it, under U-Boot when you see the message **Hit anykey to stop autoboot** , do it

- Then, to boot VxWorks from the USB Key (default mode):

```
VM6250 => setenv bootcmd 'run bootVXW'
VM6250 => saveenv
Saving Environment to EEPROM...
VM6250 => reset
```

- To boot Linux on SATA disk:

```
VM6250 => setenv bootcmd 'run bootdisk'
VM6250 => saveenv
Saving Environment to EEPROM...
VM6250 => reset
```

- The USB key can be plugged either on the board connector or on the chassis one (4.a or 4.b connectors, refer to Figure 5 page 8).

> EZ1-VM6250-00-L (Linux Fedora 9) Boot Screen

```
2470567 bytes read

3687442 bytes read
# Booting kernel from Legacy Image at 01000000 ...
    Image Name:   Linux-2.6.25-09135.vm6250.fc9.pp
    Created:      2009-05-15  21:06:37 UTC
    Image Type:   PowerPC Linux Kernel Image (gzip compressed)
    Data Size:    2470503 Bytes =  2.4 MB
    Load Address: 00000000
    Entry Point:  00000000
    Verifying Checksum ... OK
...
...
...
Fedora release 9 (Sulphur)
Kernel 2.6.25-09135.vm6250.fc9.ppc.smp on an ppc (/dev/ttyS0)

vm6250 login:
```

Log in as

- vm6250 login: **root**
  password: **kontron**

or

- vm6250 login: **demo**
  password: **demo**

> EZ1-VM6250-00-L/V (VxWorks 6.6) Boot Screen

```
 2242049 bytes read
## Ethernet MAC address not copied to NV RAM
Loading .text @ 0x00100000 (1726048 bytes)
Loading .sdata2 @ 0x002a5660 (512 bytes)
Loading .data @ 0x002a5860 (163824 bytes)
Loading .sdata @ 0x002cd850 (3248 bytes)
Clearing .sbss @ 0x002ce500 (2352 bytes)
Clearing .bss @ 0x002cee30 (465536 bytes)
## Using bootline (@ 0x4200):
## Starting vxWorks at 0x00100000 ...
Optimization PLX at bus:6 dev:0 func:0
Optimization PLX at bus:8 dev:0 func:0
PCIe unit:1 no link PEX_LTSSM_STAT:0x0
Attached IPv4 interface to motetsec unit 0
Bulk Class Driver Successfully Initialized

Adding 5562 symbols for standalone.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 ]]]]]]]]]]]]]]]]]]]]]]]]]]]       VxWorks 6.6
 ]]]]]]]]]]]]]]]]]]]]]]]]]]       KERNEL: WIND version 2.11
 ]]]]]]]]]]]]]]]]]]]]]]]]]       Copyright Wind River Systems, Inc., 1984-2007

 CPU: KOM VM6250 (Nice), PPC e600 (MPC8641D) (SMP[2]).  Processor #0.
 Memory Size: 0x40000000.  BSP version 2.0/10144.
 Created: Jun  3 2010, 17:36:05
 ED&R Policy Mode: Deployed
 WDB Comm Type: WDB_COMM_END
 WDB: Ready.

-> Instantiating /s0p0:1 as rawFs,  device = 0x20001
Instantiating /s0p0:2 as rawFs,  device = 0x30001

->
```

1.8 Health Management

» Chassis LED

Figure 8: Power On LED

- DC Power On: LED Green
- System Failure: LED Red

» Computer LEDs

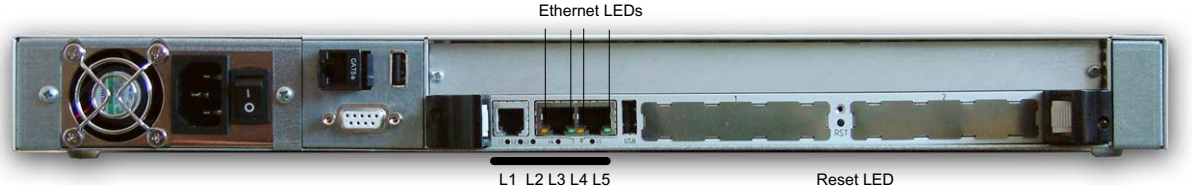

Figure 9: SBC LEDs

- Five status LEDs: L1 .. L5
- One reset LED
- Ethernet status LEDs

STATUS		ACT LED yellow	SPEED LED green
Ethernet link is not established		OFF	OFF
10/100 Mbps	Ethernet link establisehd	ON	OFF
	Ethernet Link Activity	BLINK	OFF
1000 Mbps	Ethernet link establisehd	ON	ON
	Ethernet Link Activity	BLINK	ON

Table 4: Ethernet LEDs Status Definition

Chassis Reset

Figure 10: Chassis Reset Button

> Available on the rack front panel.

SBC Reset

Figure 11: SBC Reset Switch

> Available on the rack rear panel, and on the board front panel.

Chapter 2 - Software

2.1 U-Boot Firmware

- U-Boot release >= **09201**
- Refer to U-Boot User Manual for VM6250 Documentation (SF.DT.F36)

2.2 Linux

- Fedora 9 release
- Kontron release >= **09135**
- Refer to Release Notes Fedora 9 on VM6250 Documentation (SF.DT.F37)

2.3 Linux Pre-Installed System Parameters

2.3.1 Root Account

Root account password is: kontron

Demo account password is: demo

2.3.2 Networking

Figure 12: Networking

EZ1-VM6250 has two ethernet ports configured, named **`eth0`** and **`eth1`**under Linux Fedora 9.

`eth0` (hardware name: ETH0) is configured as to request its IP address and parameters from a DHCP server at system boot. Use it if your network provides a DHCP service.
If you plugged the network cable only after boot, please use `ifup eth0` command to restart the configuration process with the server.

`eth1` (hardware name: ETH1) is configured with a private static IP of 192.168.0.1.

2.3.3 Disk Storage

Disk storage is organised with a small **`/boot`** partition and a large **`/`** partition spanning the rest of the disk.

2.3.4 Serial Line / Console Output

Figure 13: Serial Line / Console Output

EZ1-VM6250 front panel serial line is managed by Linux and a login prompt is offered on it . The speed of the serial line is set as to be the same as the U-Boot: 115200 bauds.

2.4 VxWorks

- VxWorks 6.6 release
- Kontron release >= 10158
- Refer to VxWorks 6.6 Release Notes on VM6250 Documentation (SF.DT.F44)

WIND RIVER

2.5 VxWorks Pre-Installed System Parameters

2.5.1 Networking

Figure 14: Networking

EZ1-VM6250 has one ethernet ports configured, named **motetsec0** under VxWorks 6.6.

motetsec0 (hardware name: ETH0) is configured with a private static IP of 192.54.144.163.

2.5.2 Serial Line / Console Output

Figure 15: Serial Line / Console Output

EZ1-VM6250 front panel serial line is managed by VxWorks and a login prompt is offered on it . The speed of the serial line is set as to be the same as the U-Boot: 115200 bauds.

Chapter 3 - Technical Specifications

3.1 System Unit Technical Data

Dimensions

- H x W x D: 44.64 x 443.5 x 254.3 mm (1.75 x 17.46 x 10.01 in)

Weight

- 5.5 kg (approximate)

Power Supply

- 250 W ATX power supply
- Input range of 100 to 240 VAC (50-60 Hz)
- 4 voltages: 3.3 V / 14 A, 5 V / 20 A, 12 V / 16 A, -12 V / 0.8 A

Ambient Temperature

- Operating
  10°C to +35°C (50°F to 95°F) at sea level.
- Non-operating
  -20°C to +65°C (-4°F to 149°F).

Humidity

- 30 to 80%, non-condensing.

EMC, fulfils requirements for:

- Transient Emissions: EN 55022
- Interference Resistance: EN 55024

Safety

> Test voltages according to EN 60950

Input - Output:	4,3 kVDC
Input - PE:	2,2 kVDC
Output - PE:	0,7 kVDC
Output - Output:	0,7 kVDC

Electromagnetic Shielding

> Shielding attenuation
typ. 40 dB at 1 GHz if shielded front panels are used.

Appendix A - Technical Recommendations

Recommendation
Avoid connecting your rack on the same circuit as any electrical equipment that does not have a noise suppressor, and can produce transient phenomena.
It is preferable to install a separate power line directly from the main electrical network.
All the system components (peripheral rack, printer, etc.) must be connected directly to the main electrical network.

Power Supply
Check the correct input voltage prior applying power to the unit. Refer to Chapter 3 “Technical Specifications", section “Power Supply".

Electrical safety
To prevent electrical accidents that could damage your equipment and threaten user safety, adhere to the regulations and standards recommended in the IEC publication 364 (International Electronic Commission) and the French standard NFC 15-100.

Electrical Damage
Avoid connecting cables to the front panel application connectors while functioning. Voltage discharge may damage the inserted boards I/O devices or the power supply.

Fire safety
Fire estinguishers, type CO2, should be installed in the work area, close to the rack.

User Safety
All fans are externally protected with proper finger guard grids. User should avoid touching any fan part with his fingers.

DO NOT turn the power on while the power is cycling off. Wait a few seconds until the power has completely cycled off. Follow the same precaution for turning the power off.
Turning the power on or off before this cycle is complete can cause the voltage and temperature values programmed into the board monitoring system to be lost.
MAKE SURE YOU FOLLOW THESE SAFETY PRECAUTIONS.

Make sure the rack has been powered off using the ON/OFF button (on the rear panel of the rack) before unplugging the power supply cable.

It is strongly recommended to use an antistatic wrist strap and a conductive foam pad when you install or upgrade your system to prevent the accumulation of electrostatic charges.

Avoid touching areas of integrated circuitry; static discharge can damage circuits.

Appendix B - List of Abbreviations

AC	Alternating Current
BSP	Board Support Package
DC	Direct Current
EMC	Electro-Magnetic Compatibility
ESD	Electrostatic Sensitive Device
LED	Light Emitting Diode
MTBF	Mean Time Between Failures
OS	Operating System
PMC	PCI Mezzanine Card
RTM	Rear Transition Module
SBC	Single Board Computer
SDRAM	Synchronous DRAM. A type of dynamic RAM memory chip.
U	The U is a standard unit of height measurement (e.g. 1U). One U is 4.445 centimetres (1.75 inches).
USB	Universal Serial Bus.
WEEE	Waste Electrical and Electronics Equipment
XMC	Express Mezzanine Card (VITA)

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