kontron

» Easy VM6052/VM6054 «

Getting Started

SD.DT.G32-0e - July 2014

Revision History

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Environmental Protection Statement

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

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

Environmental protection is a high priority with Kontron.

Kontron follows the 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 product, 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.

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Chapter 1 - Equipment Presentation

1.1 Overview

Easy VM6052/VM6054 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 16 Linux Support

Easy VM6052/VM6054 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, Easy VM6052/VM6054 is compatible with many extensions.

Order Codes

- **EZ1-VM6052-00-L** 6U VME High Performance Core i7 Computer. Linux software version.
- **EZ1-VM6054-00-L** 6U VME High Performance Core i7 Computer. Linux software version.

Figure 1: Easy VM6052/VM6054 Overview

1.2 At a Glance

The information displayed below applies for a VM6052/VM6054 board:
Order Code: **VM6052/VM6054-2SA34-10110**

The Easy VM6052/VM6054 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 16, can also be used to get information related to the VM6052/VM6054 board. Example of **vpdtool** command output:

```
# vpdtool
VM6052/VM6054 detected
Board type   : VM6052/VM6054-2SA34-10110
EC Level     : 02003
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

- Intel® Core™ i7 3rd Gen - 3612QE (quad core 2.1 GHz) or 3517UE (dual core 2.2 GHz)

Memory

- 8 GB DDR3 SDRAM Memory

Storage

- 8 GB USB Flash

Connectivity

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

Rear Transition Module - PBV36-P0-VM6-00

> See “VM6052/VM6054 User's Guide - CA.DT.B16“, Chapter “VM6052/VM6054-RTM Characteristics”

Software

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

Management

> Chassis Front Panel Status LEDs: System LEDs
> SBC Front Panel Status LEDs: SBC LEDs

Chassis Form Factor

> 1U Rack Mount Chassis (Height: 44.2 mm (1U) - Width ≃ 444.6 mm - Deep ≃ 283 mm)

Warranty

> 2 years

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 packing and check its 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 an authorized technician.

> 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 Easy VM6052/VM6054 6U VME Core i7 Computer is made of:

	EZ1-VM6052-00-L EZ1-VM6054-00-L
One computer Chassis and associated boards	X
One power supply cable	X
One serial cable KIT-RJ12DB9	X
Easy VM6052/VM6054 Getting Started SD.DT.G32 (this file)	X
Easy VM6052/VM6054-XXX Quick Start SD.DT.G33	X

Table 1: Easy VM6052/VM6054 Delivery Content

Easy VM6052/VM6054

. Power Supply Cable

. KIT-RJ12DB9

Figure 2: Easy VM6052/VM6054 Delivery Content

1.4 System Identification

An identification label is available on the top of the system.

Figure 3: Easy VM6052/VM6054 System Identification

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

1.5 Introducing Front and Rear Views

Front View

Figure 4: Easy VM6052/VM6054 Front View

1 Green LED: DC Power On
2 Yellow LED: System Failure
3 RJ-12 Serial Connector
4 RJ-45 Ethernet Connectors ETH0, ETH1
5 USB connector
6 VGA
7 Mini DisplayPorts
8 Status LEDs: L1 ... L5
9 Reset Button
10 Ethernet Status LEDs

RearView

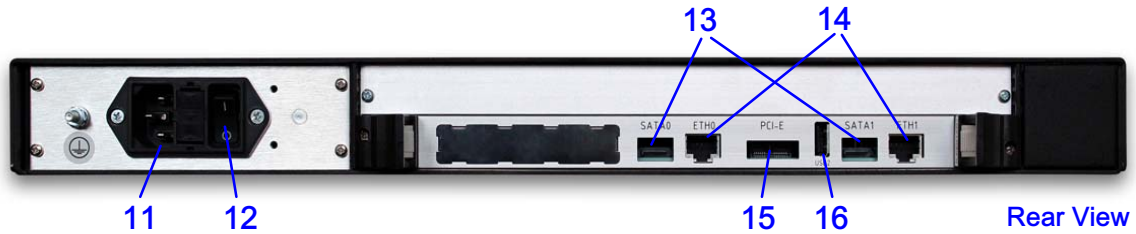


Figure 5: Easy VM6052/VM6054 Rear View

11 Power Supply Connector
12 AC Switch
13 SATA Connector
14 RJ45 Ethernet Connector ETH2, ETH3
15 PCI-X connector
16 USB Connector

Power Supply Connector

AC connector: IEC320 type female plug rated 3A

Pin	J1
1	Line
2	Neutral
3	Earth

1.6 Associated Documentation

This product is based on the same design as the VM6052/VM6054 boards. Therefore, the following documentations are available on the Kontron web site.

» Hardware

> VM6052/VM6054 6U VME SBC - User's Guide CA.DT.B16
> VM6052/VM6054 - Hardware Release Notes CA.DT.B17

» Software

> VM6052/VM6054 - PBIT User's Guide SD.DT.G35
> VM6052/VM6054 - AMI-BIOS User Reference Manual SD.DT.G34
> Release Notes Fedora 16 . . . . . SD.DT.G11

1.7 Plug and Play with Easy VM6052/VM6054

1.7.1 Plug

To connect the Easy VM6052/VM6054 6U VME Core i7 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)
- any monitor for graphical display (cables not provided)

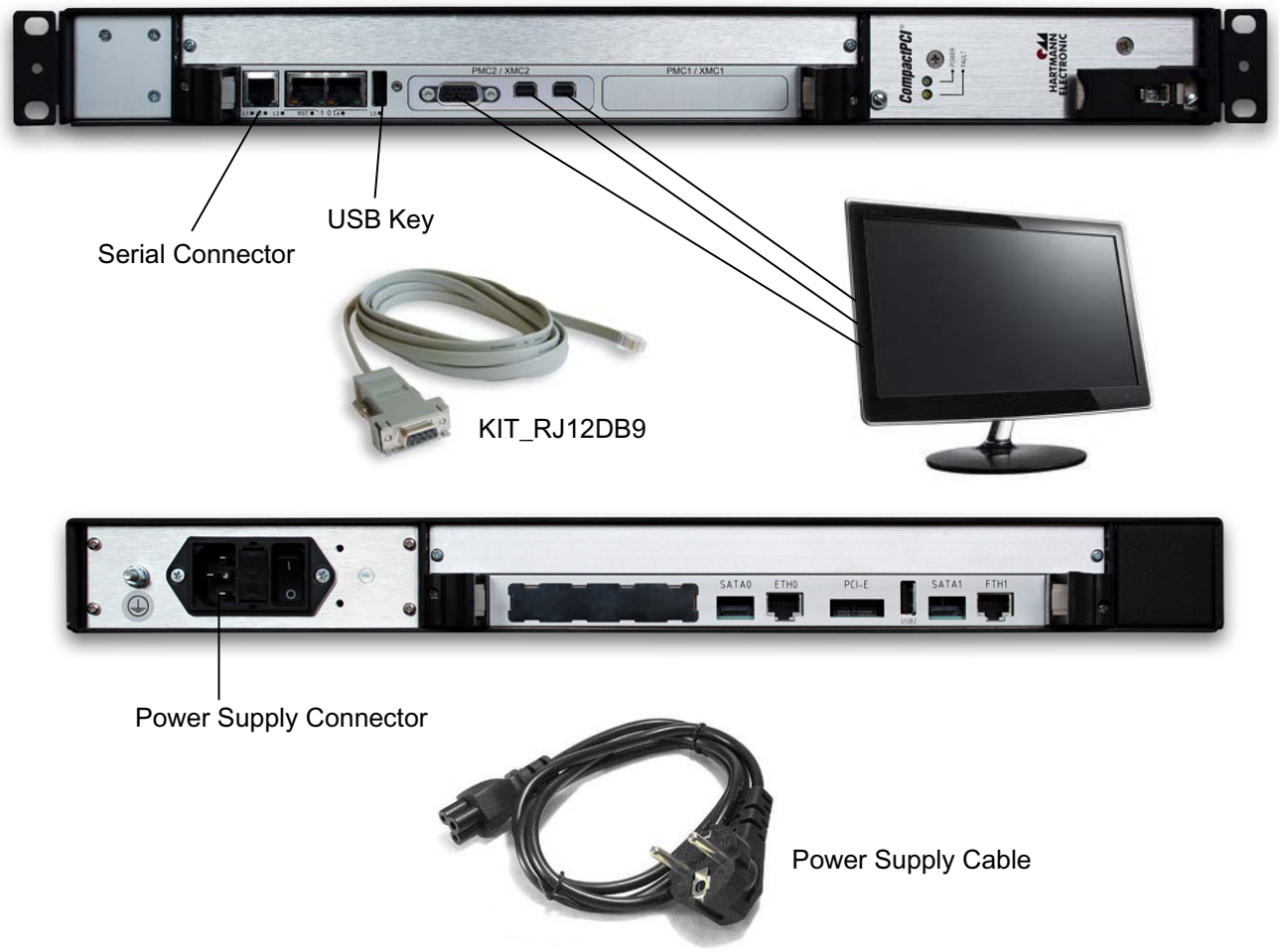


Figure 6: Connecting Easy VM6052/VM6054

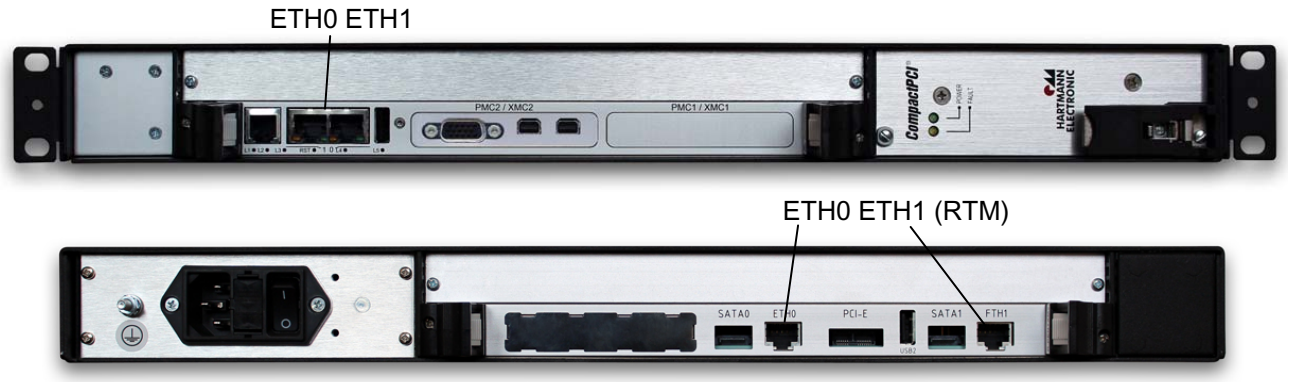


Figure 7: Hardware Name of Ethernet Ports

Linux Device Name	Hardware Name	Chassis Location
eth0	ETH0	Board front panel
eth1	ETH1	Board front panel
eth2	ETH0 (RTM)	Computer rear panel
eth3	ETH1 (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 is located on the rear panel of the Easy VM6052/VM6054 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 system 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 9.
> Power on the system
> Following screen appears:
  - AMI BIOS

```
Version 2.01.1204. Copyright (C) 2010 American Megatrends, Inc.
Press <DEL> or <F2> to enter setup. Press <F7> for BBS POPUP Menu.
```

> Easy VM6052/VM6054-00-L (Linux Fedora 16) Boot Screen

```
GNU GRUB  version 0.97  (626K lower / 3326560K upper memory)
Initializing cgroup subsys cpuset
Initializing cgroup subsys cpu
Linux version 2.6.35.6-11245.ki7.fc14.x86_64 (root@sls15.ariane.local) (gcc version 4.5.1
20100924 (Red Hat 4.5.1-4) (GCC) ) #1 SMP Fri Sep 2 18:46:11 CEST 2011
Command line: ro root=/dev/mapper/vg_vm6052-lv_root rd_LVM_LV=vg_vm6052/lv_root rd_NO_LUKS
rd_NO_MD rd_NO_DM LANG=en_US.UTF-8 SYSFONT=latarcyrheb-sun16 KEYTABLE=us con-
sole=ttyS0,115200 iommu=soft selinux=0 acpi_enforce_resources=lax
BIOS-provided physical RAM map:
...
...
...
                Welcome to Fedora
readahead: starting
Starting udev: udev[520]: starting version 161
microcode: CPU0 sig=0x20655, pf=0x10, revision=0x2
microcode: CPU1 sig=0x20655, pf=0x10, revision=0x2
microcode: CPU2 sig=0x20655, pf=0x10, revision=0x2
microcode: CPU3 sig=0x20655, pf=0x10, revision=0x2
microcode: Microcode Update Driver: v2.00 <tigran@aivazian.fsnet.co.uk>, Peter Oruba
shpchp: Standard Hot Plug PCI Controller Driver version: 0.4
i801_smbus 0000:00:1f.3: PCI INT C -> GSI 18 (level, low) -> IRQ 18
ACPI: resource 0000:00:1f.3 [io  0xe000-0xe01f] conflicts with ACPI region SMBI [irq
57344-57359 pref disabled]
ACPI: This conflict may cause random problems and system instability
ACPI: If an ACPI driver is available for this device, you should use it instead of the
native driver
ALMA INFO: almavme.c: $Revision: 1.114 $
ALMA INFO: 2ESST Mode enabled
ALMA INFO:  PCI to VME Bridge (Rev 43): Registers area at 0xffffc90016500000
[  OK  ]
Setting hostname VM6052:  [  OK  ]
Setting up Logical Volume Management:   1 logical volume(s) in volume group "vg_VM6052"
now active
[  OK  ]
```

```
Checking filesystems
Checking all file systems.
[/sbin/fsck.ext4 (1) -- /] fsck.ext4 -a /dev/mapper/vg_VM6052-lv_root
/dev/mapper/vg_VM6052-lv_root: clean, 149617/458752 files, 1139129/1835008 blocks
[/sbin/fsck.ext2 (1) -- /boot] fsck.ext2 -a /dev/sda1
/dev/sda1: clean, 40/128016 files, 63175/512000 blocks
[  OK  ]
...
...
...
Starting sshd: [  OK  ]
Starting xinetd: [  OK  ]
Starting abrt daemon: [  OK  ]
Starting console mouse services: [  OK  ]
Starting crond: [  OK  ]
Starting atd: [  OK  ][  OK  ]
Starting VM6052setup[  OK  ]

Fedora release 14 (Laughlin)
Kernel 2.6.35.6-11245.ki7.fc14.x86_64 on an x86_64 (/dev/ttyS0)

VM6052 login:
```

Root Account

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

Guest Account

- login: **guest**
- password: **guest**

1.8 Health Management

» Chassis LED

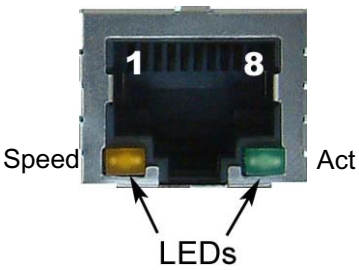
Figure 8: Power On LED

> DC Power On: Green LED
> System Failure: Yellow LED

» Computer LEDs

Figure 9: SBC LEDs

> Five status LEDs: L1 .. L5
> Ethernet status LEDs



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

Table 4: Ethernet LEDs Status Definition

SBC Reset

Figure 10: SBC Reset Switch

> Available on the board front panel.

Chapter 2 - Software

2.1 Linux

> Fedora 16 release
> Kontron release >= xxx
> Refer to Release Notes Fedora 16 Documentation (SF.DT.G11)

2.2 Linux Pre-Installed System Parameters

2.2.1 Networking

Figure 11: Networking

Easy VM6052/VM6054 has two configured Ethernet ports named `eth0` and `eth1` under Linux Fedora 16.

`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 192.168.1.1.

2.2.2 Disk Storage

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

2.2.3 Serial Line / Console Output

Figure 12: Serial Line / Console Output

Easy VM6052/VM6054 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 BIOS: 115200 bauds.

2.2.4 PowerOn Built In Test

The PowerOn Built In Test (PBIT) software comes pre−installed in the system Flash, along with the EFI BIOS firmware on the VM6052/VM6054 boards.

PBIT is a product that can be activated on any Easy VM6052/VM6054. Please contact Kontron support for more information.

2.2.5 Pre-installed Software

Linux BSP

Easy VM6052/VM6054 system is delivered with a configured Fedora 16 Linux included the VM6052/VM6054 BSP. RPM packages and sources are available under `/usr/share/vm605x_bsp/` folder.

OpenSource Benchmark

Some benchmarks are also provided with the system in order to run or rerun them. It can help you to get the current performances of the system.

All benchmarks are located under `/usr/share/vm605x_benchmark` folder.

Chapter 3 - Technical Specifications

3.1 System Unit Technical Data

Dimensions

> H x W x D: 44.2 x 444.6 x 283 mm (1.74 x 17.50 x 11.14 inches)

Weight

> 5.0 kg

Power Supply

Output:

> 250 W power supply
> Input range from 90 to 264 VAC (47-63 Hz)
> 4 voltages: 3.3V / 33A, 5V / 33A, 12V / 5.5A, -12V / 1A

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

> 5 to 80%, non-condensing.

EMC, fulfils requirements for:

> Transient Emissions: EN 61000-6-3
> Interference Resistance: EN 61000-6-1
> Test Voltage: EN 60950-1

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 system 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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