» EZ3-VX3035 «

Getting Started

SD.DT.G05-0e - April 2012

Revision History

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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.

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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.

Table Of Contents

List Of Tables

List Of Figures

Chapter 1 - Equipment Presentation

1.1 Overview

EZ3-VX3035 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
- 3U Rackable Server
- Fedora 12 Linux Support

EZ3-VX3035 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, EZ3-VX3035 is compatible with many extensions.

1.2 Ordering Information

System type **EZ3-VX3035**

- **EZ3-VX3035-04-L** 3U VPX Intel® Core™ i7 Computer with 4GB DDR3 SDRAM Memory... Linux software version.
- **EZ3-VX3035-08-L** 3U VPX Intel® Core™ i7 Computer with 8GB DDR3 SDRAM Memory... Linux software version.

Also available with VxWorks and Windows. For more information contact Kontron.

Note To use additional SATA peripherals, the RTM (Rear Transition Module) is required. The ordering code for the RTM is PB-VX3-011

Non contractual photography

Figure 1: EZ3-VX3035 Overview

1.3 At a Glance

The information displayed below applies for:

a VX3035 board Order Code: **VX3035-SA24-00000** or VX3035-**SA28-00000**

a VX3035-RTM Order Code: **PV-VX3-011**

The EZ3-VX3035 system you have received may include a board, a RTM with a different order code. Please contact your Kontron representative for more information on this topic.

Processor

- Intel® Core™ i7-2655LE: 2.0 GHz, LV, 4 MB L3 cache

Memory

- 4 GB DDR3 SDRAM Memory for VX3035-**SA24-00000**
- 8 GB DDR3 SDRAM Memory for VX3035-**SA28-00000**

Storage

- Onboard mezzanine 32 GB SATA flash storage

Connectivity (VX3035 Front Panel only)

- One USB 2.0 ports
- One Ethernet 10/100/1000BASE-T channels
- One Serial Line
- One VGA

Software

- Depending on the system Order Code, Linux, VxWorks or Windows Operating System is pre-loaded on the SATA Flash storage at the factory.
  See Chapter 2 “Software” page 18 for details on your configuration.

Management

- VX3035 Front Panel Status LEDs: System LEDs

Chassis Form Factor

- 3U four−slot desktop chassis (Height: 191 mm − Width: 169.64 mm − Depth: 298.1 mm)

Warranty

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

1.4 Receipt of the Equipment

1.4.1 Checking the Packages

Inspecting the packages 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.

1.4.2 Unpacking

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

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.

1.4.3 Content

Depending on the system Order Code, the EZ3-VX3035 3U VPX Intel® Core i7 Computer is made of:

	EZ3-VX3035-04-L	EZ3-VX3035-08-L
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
Easy VX3035 Getting Started SD.DT.G05 (this document)	X	X
Easy VX3035 Quick Start SD.DT.F95	X	X

Table 1: Delivery Content

. EZ3-VX3035

. Power Supply Cable

. CDDOC

. KIT-RJ12DB9

Figure 2: Delivery Content

1.5 System Identification

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

Figure 3: System Identification

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

1.6 Introducing Front and Rear Views

1.6.1 System Type EZ3-VX3035

Front View

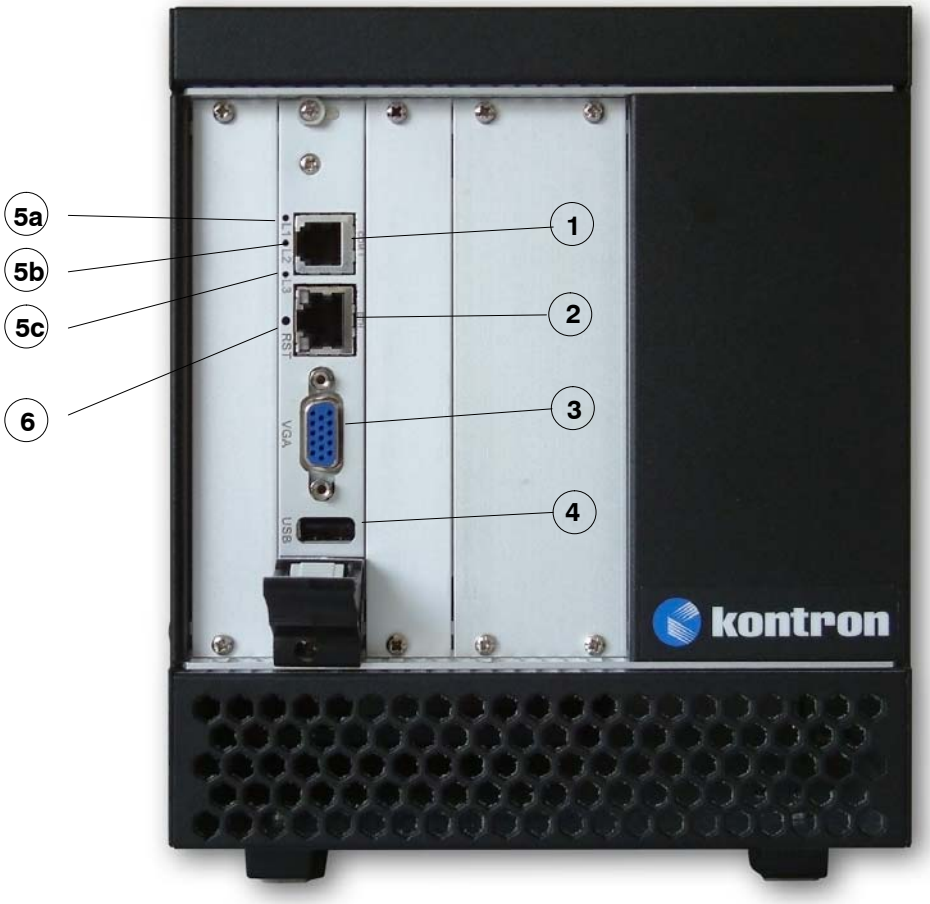


Figure 4: Front View

1. Serial Connector COM1
2. Gigabit Ethernet Connector
3. VGA
4. USB
5. LEDs
   - 5a L1 Permanent error/Internal power OK/ Reset state/
   - 5b L2 CPLD watchdog reset timer/Normal operation mode/Factory test mode
   - 5c L3 Thermal Alert / Ethernet ETH0 Status
6. Reset Button

RearView

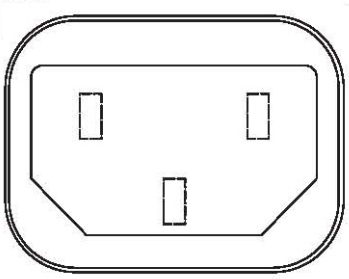
Figure 5: Rear View

1. Power Supply Connector
2. AC Switch

Power Supply Connector

AC connector:
IEC320 type female plug rated 3

Pin	J1
1	Line
2	Neutral
3	Earth



1.7 Associated Documentation

This product is based on the VX3035 board. Therefore, the following documentations are available on the Kontron web site or on the technical documentation CD-ROM .

Hardware

- VX3035 3U VPX Computing Node - User's Guide CA.DT.A95
- VX3035 - Hardware Release Notes CA.DT.A96
  (Date of availability May 2012)

Software

- VX3035 - AMI-BIOS User Reference Manual SD.DT.F97
  (Date of availability May 2012)
- Release Notes Fedora 14 on VX3030, VX3035, VX6060 and VM6050 . . . . . SD.DT.F82

Systems

- EZ3-VX3035 Quick Start SD.DT.F95

1.8 Plug and Play with EZ3-VX3035

1.8.1 Plug

To connect the EZ3-VX3035 3U VPX Intel x86 or 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)

System Type EZ3-VX3035

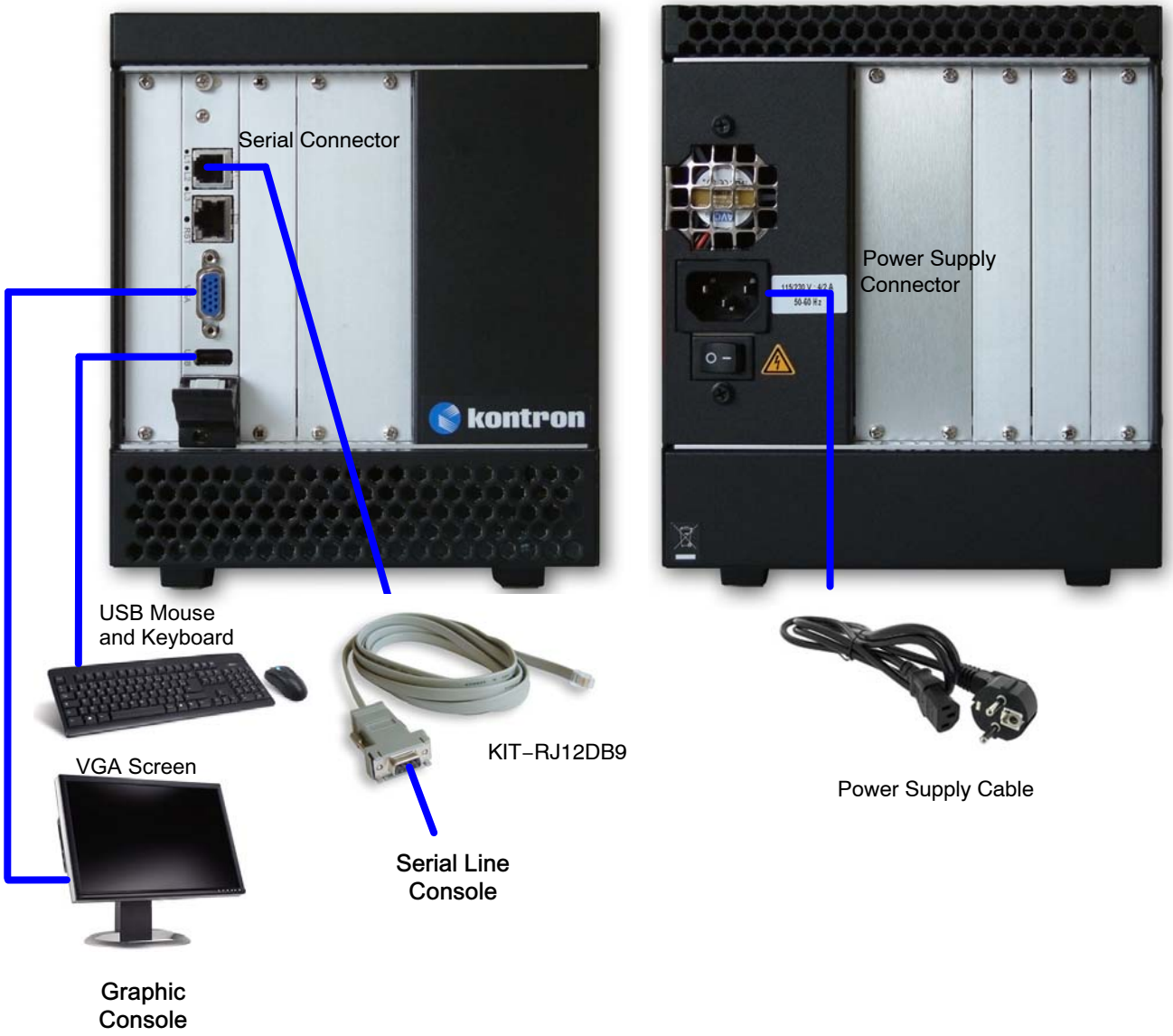


Figure 6: Connecting EZ3-VX3035

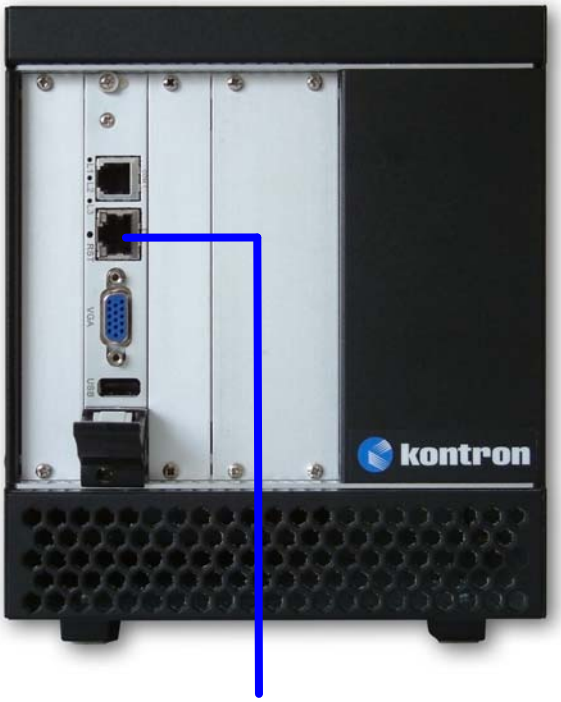


Figure 7: Hardware Name of Ethernet Ports

Linux Device Name	Hardware Name	Chassis Location
Eth0	ETH	Board front panel

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

ON/OFF Button

The ON/OFF button is located on the rear panel of the EZ3-VX3035 Getting Started system.

To start the system

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

To stop the system

- Shutdown the OS.
- 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.

1.8.2 Play

> Plug the system as described in section 1.8.1 “Plug” page 10.

> Power on the system

> The following screens appear:

- AMI BIOS EFI

```
      Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
          BIOS Date: 04/13/2012 15:01:42 Ver: 0ABUC0010

          Press <DEL> or <F2> to enter setup. Press <F7> for BBS POPUP Menu.
```

- Linux Fedora 14 (Order Code: **EZ3-VX3035-04-L / EZ3-VX3035-08-L**)
  The following boot process will be displayed on serial console only.

```
     GNU GRUB  version 0.97  (621K lower / 523264K upper memory)

      ****************************************************************************
      * Fedora (2.6.35.6-11245.ki7.fc14.x86_64)                                  *
      * Fedora (2.6.35.6-11245.ki7.fc14.x86_64) - bootchart                      *
      *                                                                          *
      *                                                                          *
      *                                                                          *
      *                                                                          *
      *                                                                          *
      *                                                                          *
      *                                                                          *
      *                                                                          *
      *                                                                          *
      *                                                                          *
      ****************************************************************************
         Use the * and * keys to select which entry is highlighted.
         Press enter to boot the selected OS, ´e´ to edit the
         commands before booting, or ´c´ for a command-line.
```

```
root (hd0,0)
 Filesystem type is ext2fs, partition type 0x83
kernel /vmlinuz-2.6.35.6-11245.ki7.fc14.x86_64 ro root=/dev/mapper/vg_vx3035-lv
_root rd_LVM_LV=vg_vx3035/lv_root rd_NO_LUKS rd_NO_MD rd_NO_DM LANG=en_US.UTF-8
 SYSFONT= KEYTABLE=fr-latin9 nomodeset rhgb quiet iommu=soft vmalloc=512MB seli
nux=0 acpi_enforce_resources=lax console=ttyS0,115200
   [Linux-bzImage, setup=0x3200, size=0x398de0]
initrd /initramfs-2.6.35.6-11245.ki7.fc14.x86_64.img
               Welcome to Fedora
Starting udev: [  OK  ]
Setting hostname vx3035:  [  OK  ]
Setting up Logical Volume Management: 1 logical volume(s) in volume group "vg_vx3035"
now active
Checking filesystems
Checking all file systems.o select which entry is highlighted.
[/sbin/fsck.ext4 (1) -- /] fsck.ext4 -a /dev/mapper/vg_vx3035-lv_root

/dev/mapper/vg_vx3035-lv_root:    clean,    164018/1716960    files,    1927923/6864896    blocks
[/sbin/fsck.ext2 (1) -- /boot] fsck.ext2 -a /dev/sda1
/dev/sda1: clean, 36/128016 files, 64374/512000 blocks (check in 4 mounts)
[  OK  ]
Remounting root filesystem in read-write mode:  [  OK  ]
Mounting local filesystems:  [  OK  ]
Enabling local filesystem quotas:  [  OK  ]
Enabling /etc/fstab swaps:  [  OK  ]
Entering non-interactive startup
Starting monitoring for VG vg_vx3035:   1 logical volume(s) in volume group "vg_vx3035" monitored
[  OK  ]
Bringing up loopback interface:  [  OK  ]
Bringing up interface eth0:
Determining IP information for eth0... done.
[  OK  ]
...
Starting lm_sensors: loading module cpld_i2c i2c_i801 lm73 ads7830 [  OK  ]
Retrigger failed udev events[  OK  ]
Starting PC/SC smart card daemon (pcscd): [  OK  ]
Starting NFS services:  [  OK  ]
Starting NFS quotas: [  OK  ]
Starting NFS daemon: [  OK  ]
Starting NFS mountd: [  OK  ]
ipsec_setup: Starting Openswan IPsec U2.6.29/K2.6.35.6-11245.ki7.fc14.x86_64...
Starting sshd: [  OK  ]
Starting xinetd: [  OK  ]
Starting ntpd: [  OK  ]
Starting abrt daemon: [  OK  ]
Starting console mouse services: [  OK  ]
Starting crond: [  OK  ]
Enabling monthly Smolt checkin: [  OK  ]
[  OK  ] atd: [  OK  ]

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

vx3035 login:
```

- Log in as:

  - VX3035 login: **root**
    password: **kontron**

  or

  - VX3035 login: **guest**
    password: **guest**

1.9 Health Management

» LEDs

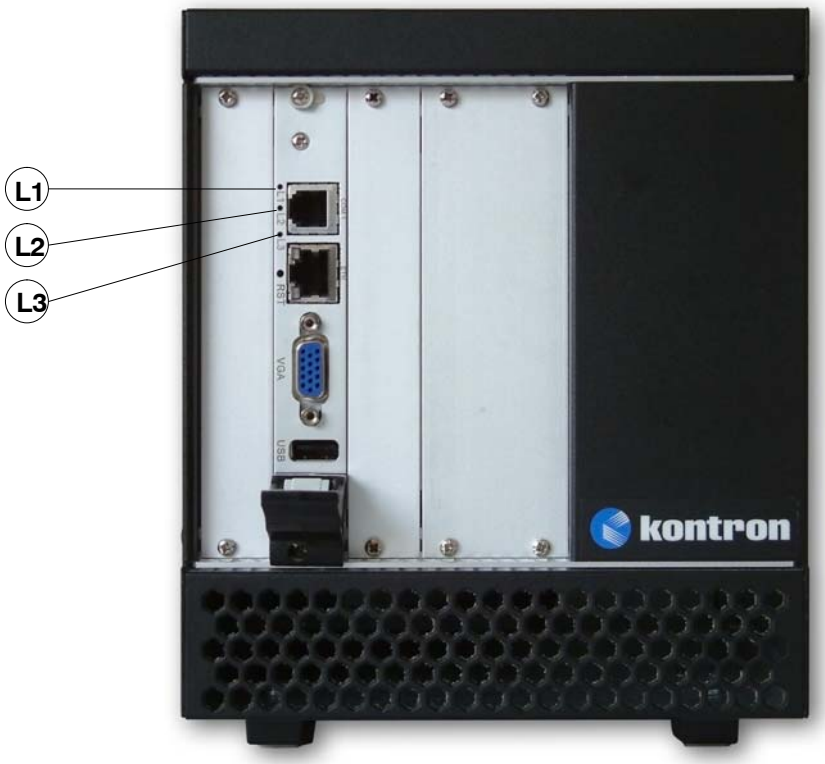


Figure 8: SBC LEDs

▸ L1	red	Permanent error on subsystem
	green	Internal power OK for subsystem
	orange	Reset state on subsystem
	off	Blinking during CPLD I2C, SMI or COM
▸ L2	red	CPLD watchdog reset timer has expired
	green	Normal operation mode
	orange	Factory test mode
	off	Blinking during SATA activity in subsystem
▸ L3	red	Processor hot, may trigger processor performance limitations
	green	Ethernet ETH connector valid on front panel
	orange	Ethernet ETH link directed to backplane
	off	Blinking during ETH link activity in subsystem

During the system operation, LEDs should display:

- L1: Green,
- L2: Green,
- L3: Green.

With L2 blinking to black during SATA activity, same for L3 during ETH activity.

Reset

Figure 9: SBC Reset Switch

Chapter 2 - Software

2.1 AMI-BIOS Firmware

- AMI-BIOS release >= 12104
- Refer to “VX3035 - AMI-BIOS User Manual” Documentation (SF.DT.F97) for detailed description of AMI-BIOS Firmware.

2.1.1 Recovery

- Refer to Chapter “Update AMI-BIOS Firmware” of the “VX3035 - AMI-BIOS User Manual” for more information on this topic.

2.2 Linux

- Fedora 14 release
- Kontron release >= 11334
- Refer to Release Notes Fedora 14 on VX3030, VX3035, VX6060 and VM6050 on Documentation (SD.DT.F82 not yet available) for detailed description.
- Refer to section 2.3 “Linux Pre-Installed System Parameters” page 19 for detailed description of the Linux system configuration.

2.2.1 Linux System Recovery

- Refer to Chapter 5 “Installation” of the “VX3035 - Release Notes Fedora 14 on VX3030, VX3035, VX6060 and VM6050” for more information on this topic.

2.3 Linux Pre-Installed System Parameters

2.3.1 Account Password

Root account password is: kontron

Guest account password is: guest

2.3.2 Disk Storage

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

2.3.3 Networking

Figure 10: Linux Pre-Installed System Parameters: Networking

EZ3-VX3035 has one ethernet port configured, named **eth0** under Linux Fedora 14.

Eth0 (hardware name: ETH) is configured with a private static IP of 192.168.1.1.

2.3.4 Serial Line / Console Output

Figure 11: Linux Pre-Installed System Parameters: Serial Line / Console Output

EZ3-VX3035 front panel serial line is managed by Linux and a login prompt is offered on it.

Characteristics of the serial line:

- Baudrate: 115200
- Parity: None
- Data Bits: 8
- Stop Bits: 1
- Flow Control: None

2.3.5 Linux Pre-Installed Benchmarks

Several benchmarks are provided with the system. They can permit you to evaluate the current performance of the board. All the benchmarks provided are located under **/usr/share/VX3035_benchmark** directory.

Lmbench

lmbench is an old fashion benchmark which consists of a suite of simple, portable benchmarks. It is interesting for results of memory bandwidth or latency.

To see the last **lmbench** result, change directory to **/usr/share/vx3035_benchmark/lmbench** and run the make see command.

```
[root@vx3035 lmbench]# make see
cd results && make summary percent 2>/dev/null | more
make[1]: Entering directory '/usr/share/vx3035_benchmark/lmbench/results'

                L M B E N C H  3 . 0   S U M M A R Y
                ------------------------------------
                (Alpha software, do not distribute)

Basic system parameters
--------------------------------------------------------------------------------
Host                 OS Description              Mhz  tlb  cache  mem   scal
                                                     pages line   par   load
                                                           bytes
--------- ------------- ----------------------- ---- ----- ------ ------ ----
pentxm2   Linux 2.6.9-3                  boards 1331    65   128 3.4100    1
pentxm4   Linux 2.6.9-4                  boards 1665    65   128 3.6200    1

Processor, Processes - times in microseconds - smaller is better
--------------------------------------------------------------------------------
Host                 OS  Mhz null null      open slct sig  sig  fork exec sh
                             call  I/O stat clos TCP  inst hndl proc proc proc
--------- ------------- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ----
pentxm2   Linux 2.6.9-3 1331 0.37 0.73 2.85 3.92 19.6 0.96 2.93 189. 673. 1979
pentxm4   Linux 2.6.9-4 1665 0.28 0.44 3.13 4.03 15.7 0.76 2.33 184. 634. 1761
vx3030    Linux 2.6.32. 2794 0.13 0.23 1.51 2.48 3.93 0.33 1.38 103. 379. 1677
vx3030.1. Linux 2.6.32. 1195 0.24 0.41 2.80 4.40 6.81 0.75 3.16 193. 712. 3104
vx6060-64 Linux 2.6.32. 2793 0.13 0.19 1.16 2.20 2.92 0.21 1.22 95.5 361. 1366
vx6060    Linux 2.6.31. 2758 0.14 0.29 1.85 3.01 3.21 0.34 1.42 218. 880. 3312
vx6060_x6 Linux 2.6.32. 2749 0.12 0.22 1.28 2.38 3.15 0.22 1.34 180. 704. 2836
vx3035    Linux 2.6.35. 2200 0.09 0.17 1.14 1.79 2.82 0.23 1.37 114. 347. 1659
vx3035    Linux 2.6.35. 2200 0.10 0.17 1.14 1.80 2.81 0.24 1.37 113. 346. 1640
......
......
```

To rerun a benchmark with the same configuration, change directory to **/usr/share/VX3035_benchmark/lmbench** and run the command:

```
make rerun
```

To run a benchmark with a new configuration, change directory to **/usr/share/VX3035_benchmark/lmbench** and run the command:

```
make result
```

> mem_bandwidth

Mem_bandwidth is an home-made benchmark to evaluate the maximum bandwidth to DRAM. The benchmark is written with SSE instructions.

```
[root@vx3035 mem_bandwidth]# ./mem_bandwidth
Prefetch offset=0 mode=_MM_HINT_NTA
Standard read throughput= 8093MB/s
Optimized read throughput= 13456MB/s
Standard write throughput= 8102MB/s
Optimized write throughput= 14410MB/s
Standard memcpy throughput= 7295MB/s
Standard bcopy throughput= 5354MB/s
Optimized copy throughput= 7630MB/s
```

> fft_ipp_x86

fft_ipp_x86 benchmark uses the fft primitives of the Intel IPP library to evaluate the CPU gflops performance.

```
[root@vx3035 fft_ipp_x86]# ./benchfftipp 0
Average time - gflops for FFT 64 points : 61 ns - 31.5 gflops
Average time - gflops for FFT 128 points : 163 ns - 27.5 gflops
Average time - gflops for FFT 256 points : 349 ns - 29.3 gflops
Average time - gflops for FFT 512 points : 803 ns - 28.7 gflops
Average time - gflops for FFT 1024 points : 1719 ns - 29.8 gflops
Average time - gflops for FFT 2048 points : 4759 ns - 23.7 gflops
Average time - gflops for FFT 4096 points : 11218 ns - 21.9 gflops
Average time - gflops for FFT 8192 points : 24201 ns - 22.0 gflops
```

> dhrystone

Dhrystone is an old fashion benchmark which evaluates the CPU number of instructions per second capability. The results is given in number of dhrystones per second. Just divide by 1757 to get the DMIPS result.

```
[root@vx3035 dhrystone]# ./dhry1

Dhrystone Benchmark, Version 2.1 (Language: C)

Program compiled with 'register' attribute

Please give the number of runs through the benchmark: 50000000

Execution starts, 50000000 runs through Dhrystone
Execution ends
...
...
Microseconds for one run through Dhrystone:    0.1
Dhrystones per Second:                      16666667.0
```

> Bootchart

Bootchart is a tool for performance analysis and visualization of the GNU/Linux boot process. Resource utilization and process information are collected during the boot process and can later be displayed in a PNG, SVG or EPS-encoded chart.

Choose during the boot process the kernel, tagged bootchart and wait for the linux prompt. Verify that **/var/log/bootchart.tgz** was created and contains the log files and render the chart by running "**bootchart**" command.

Chapter 3 - Technical Specifications

3.1 Rack

Dimensions

- H x W x D: 191 x 169.64 x 298.1 mm (2.45 x 6.62 x 11.63 in)

Weight

- 5.0 kg (approximate)

Power Supply

- 200W ATX industrial-power supply
- Input range from 90 to 264 VAC (47-63 Hz)
- Voltages: +3.3V / 14A
  +5V / 23A
  +12V / 12A

Ambient Temperature

- Operating: 0°C to +50°C (32°F to 122°F) at sea level
- Non-operating: -20°C to +80°C (-4°F to 176°F)

Humidity

- 20 to 80%, non-condensing.

EMC

- CE

Safety

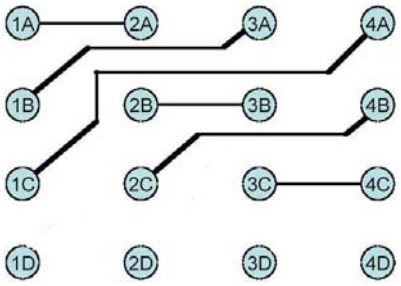
- TUV EN 60950 / UL 60950

3.2 VPX Backplane

Key Figures

- Compliant to VITA 46.0 baseline specification
- Supports VITA 46.4 Full mesh x1 PCI Express
- Supports VITA 46.10 with RTM connectors
- 3U, 4 slots, Full Mesh configuration
- M4 screws and ATX 24 poles connector for powerentry
- PCB size TBD mm x 120.7 mm x 5.4 mm
- 4 HP from slot to slot (20.32 mm)
- System Management Interface on the backplane (I^2C1, I^2C2)
- Flexible keying and alignment mechanism
- with JTAG connector on first slot
- with geographical address pin
- Reference clock
- Non-Volatile Memory Read Only signal set by Jumper X5. Vbat extrnal or connected to 3.3 AUX.
- System Reset
- P1 Reserved Signals
- Operating temperature:
  -40°C
  +85°C
- Storage temperature:
  -55°C
  +85°C
- Flammability rating:
  UL94-V0

Topology: Full Mesh x1



Current Capability

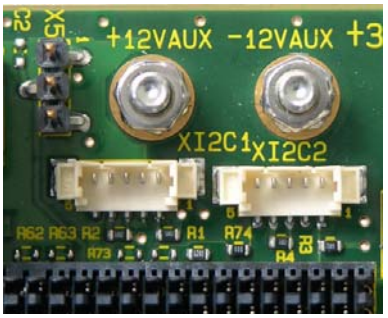
(By using ATX connector, see values in brackets)

- +12V 40A (10A)
- +3.3V 80A (20A)
- +5V 80A (25A)
- -12V_AUX 5A
- +12V_AUX 5A
- +3.3V_AUX 5A

System Management IPMB (I2C1, I2C2 connector)

There are 2 connectors (5 poles) for system management I2C1, I2C2

I2C1	Signal	I2C2	Signal
1	SCL1	1	SCL2
2	GND	2	GND
3	SDA1	3	SDA2
4	+3.3V_AUX	4	+3.3V_AUX
5		5	



VBAT (X5 connector)

Normally a battery voltage with approximately 3Vis available at Pin VBAT of connector VPX-J1. The voltage is externally accessible with connector X5. The battery should be connected to pin1 and 2 or internally using 3.3V_AUX by closing a Jumper between pin 2 and 3.

X5	Signal
1	GND
2	VBAT
3	+3.3V_AUX

NVMRO (BR1 jumper)

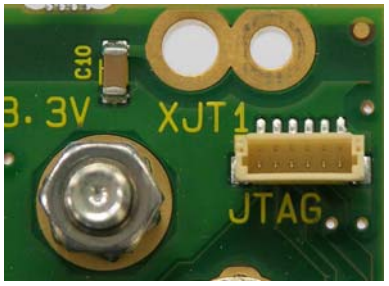
If Jumper BR1 is closed NVRMO is set to memory writable

BR1	Signal
1	NVMRO
2	GND

JTAG (connector XJT1)

For test and programming a JTAG connector (6-poles) is implemented (XJT1)

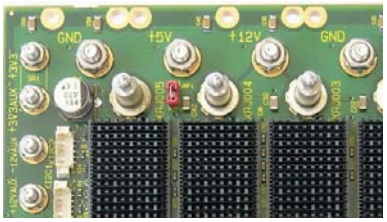
XJT1	Signal
1	GND
2	TCK
3	TMS
4	TRST–
5	TDI
6	TDO



Power Connection (X1 or M4 screw)

The main operating voltages and GND are supplied with M4 screw terminals or through X1 connector (fits to ATX connector without locking mechanism). The auxiliary operating voltages are supplied via M3 screw terminals. Optimal daughter board supply and trouble-free operation are ensured by the arrangement of the feed modules on the backplane.

X1	Signal	Signal	X1
1	+3.3V	+3.3V	13
2	+3.3V	–12V	14
3	GND	GND	15
4	+5V	PS_ON	16
5	GND	GND	17
6	+5V	GND	18
7	GND	GND	19
8	PWR_OK	Res	20
9	+5VSB	+5V	21
10	+12V	+5V	22
11	+12V	+5V	23
12	+3.3V	GND	24



If Jumper X6 is closed, ATX power supply starts automatically.

Chapter 4 - System Revision Guide

4.1 How to Use the System Revision Guide Table

1. Find the E.C. Level associated to your system as described in the Chapter 1.5 “System Identification" page 6.
2. Find the column associated to this E.C. Level in the table.
3. Check for a specific item in the table lines:
   3.1. A x (cross) in the E.C. Level column indicates that this item applies to this E.C. Level.
   3.2. No x (cross) in the E.C. Level column indicates that this item does not apply to this E.C. Level.

Each item is fully described in section 4.3 “Item Detailed Description" page 27.

4.2 Revision Guide Table

Item	Description	E.C. Level					
		00000					
1	Initial system E.C. Level	X					

4.3 Item Detailed Description

Each item applies only to a specific group of E.C. Levels.
Refer to the table available in section 4.2 “Revision Guide” page 27 to find the specific E.C. Levels associated to a specific item.

Item # 1 Initial system E.C. Level

Tested with Board revision ECL10000, BIOS ID11342 and system software ID11334.

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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