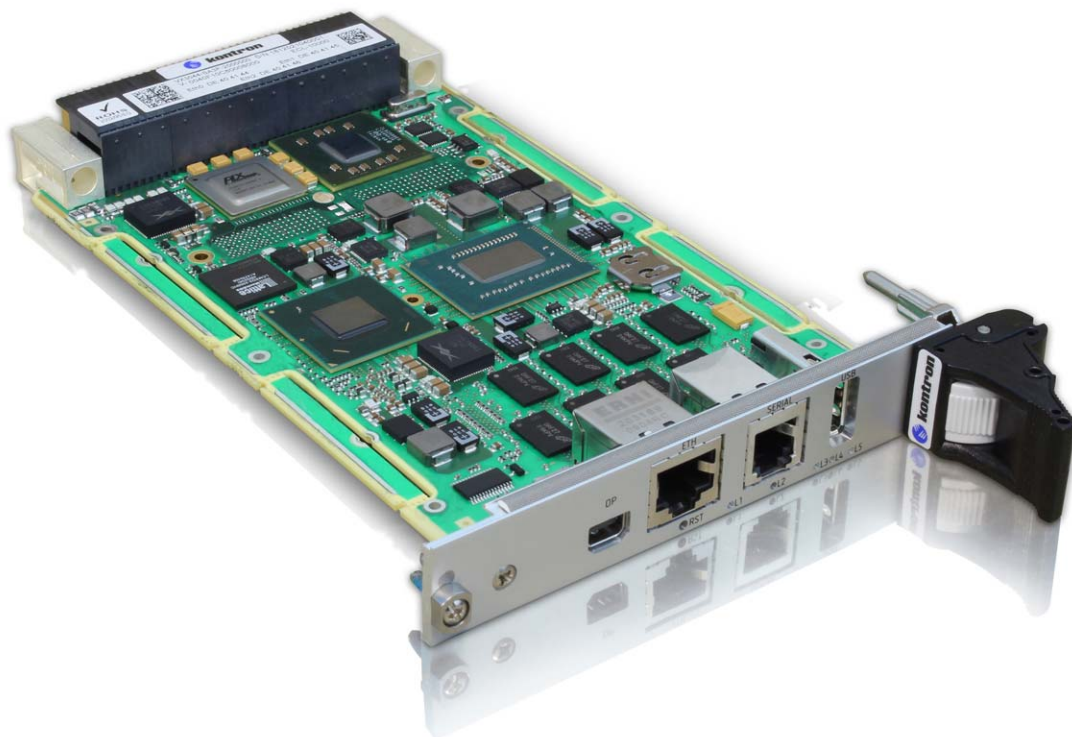


» VX304x «



## Release Notes for Windows 7 VX304x BSP

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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 - Scope

This document describes the VX304x Board Support Package (BSP) for Microsoft Windows 7 Professional 64 bits.

This document provides:

- ▶ A summary of BSP features.
- ▶ The list of the release package contents.
- ▶ The BSP installation procedures.
- ▶ The KEAPI services and test program for VX304x platform specificities.

## Chapter 2 - Glossary

|           |  |
|-----------|--|
| VX304x    | Short name for the VX3042 and VX3044 boards family.  |
| BSP       | Board Support Package.   |
| CPLD      | Complex Programmable Logic Device: on VX304x this logic allows to access many features such as GPIO, Watchdog, EEPROM, NVFRAM, Temperature sensors...  |
| F-RAM     | Ferro Electric RAM   |
| IDyyddd   | Identification code used for the BSP: yy is for year and ddd is for the day number into the year.  |
| KEAPI     | Kontron Embedded API: this includes a server that handles all the accesses to a platform features. A specified API is proposed to communicate with the KEAPI server. The server can be accessed locally or by the network. Any Kontron BSP will include KEAPI interface. |
| KEAPI-GUI | Kontron Embedded API Graphic User Interface: this is a tool that demonstrates how to connect to a KEAPI server and get/set many board platform features. It is delivered with the BSP.   |
| PBIT/POST | Power-On Built In Test or Power-On Self Test: on VX304x this is the complete test that can be executed at BIOS level (this is an optional product ordered with the board).   |
| VPD       | Vital Product Data: this is the board hardware information on hardware level, Serial Number, and hardware option.  |

## Chapter 3 - Windows 7 Installing

### 3.1 Windows 7 64-bit Version

For this BSP, the mandatory Windows version is Windows 7 64-bit professional:

OPK\_Win7\_Professional\_64-Bit\_SP1\_English\_X17-63355\_Installation\_DVD.zip (3.2 GB)

This OS must be activated by the user to be legally used.

### 3.2 Windows 7 64-bit Installation

Use a USB DVD-ROM to install Windows 7 on a SATA disk connected to the VX304x. Either the onboard SATA SSD Flash or a SATA disk connected to the VX304x rear connector can be used.

#### 3.2.1 Restore BIOS Default Parameters

Before Installing, we recommend to restore the default BIOS parameters:

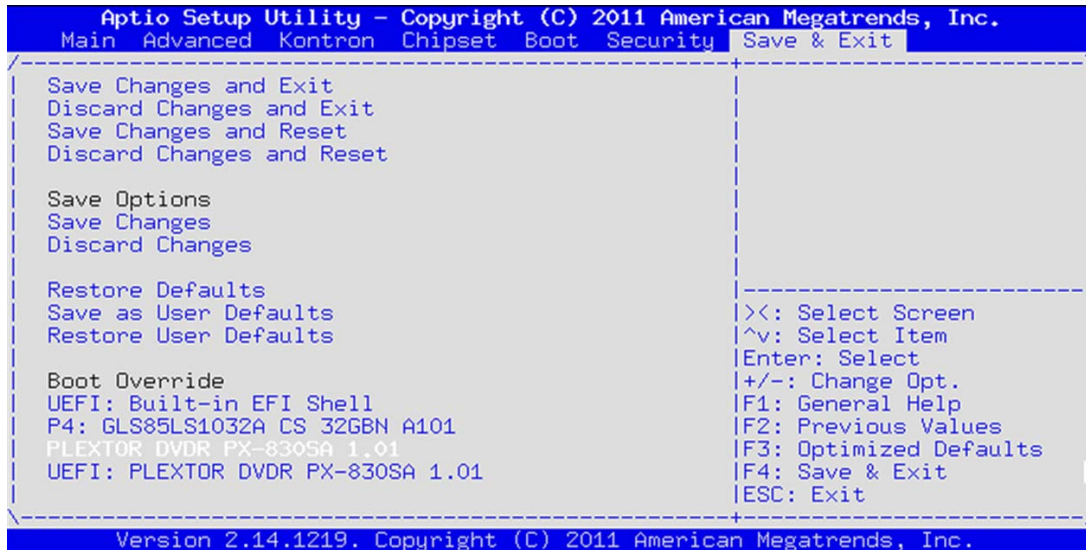
- ▶ Power on the VX304x and Enter BIOS SETUP with [F2] key,
- ▶ Select SAVE & Exit Tab Menu,
- ▶ Select Restore Defaults
- ▶ Then Save Changes and Reset.

#### 3.2.2 Tested BIOS Version

| Item            | Description    |
|-----------------|----------------|
| Core version    | 4.6.5.3        |
| Project version | 1APTJ 0.18 x64 |
| Date            | 12/20/2012     |
| BIOS ID         | 12355          |

### 3.2.3 Installation Procedure

To proceed to the installation, enter in the BIOS SETUP using [F2] key and select the DVD-ROM as the boot device:



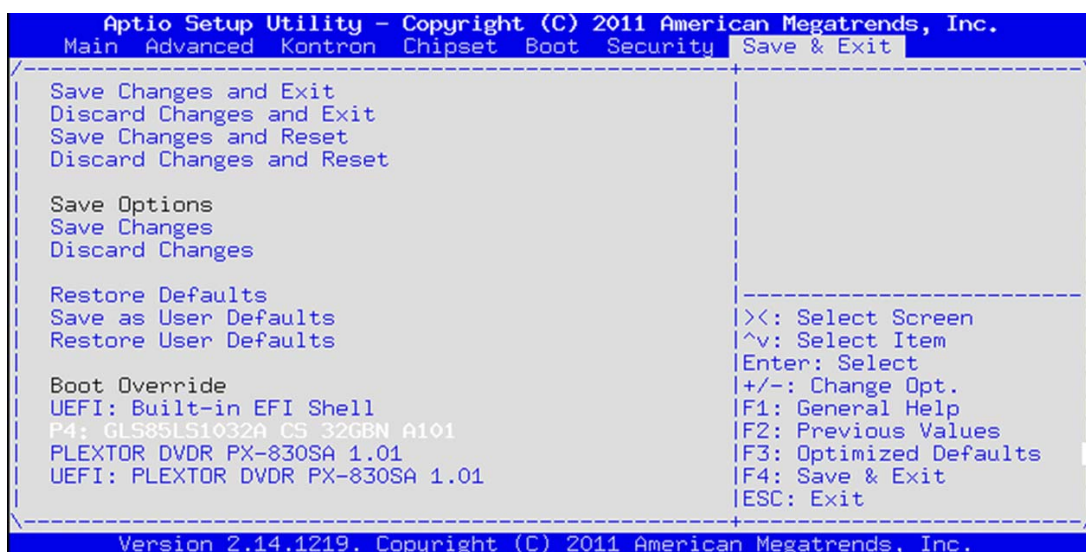
Windows 7 will start the installation.

1. Select your language (English by default), Time and Keyboard, click on Next
2. Click "Install Now".
3. After reading, accept license terms, click on Next.
4. Which type of Installation do you want? Select Custom (advanced), click on Next.
5. Where do you want to install Windows? Select your disk (Windows 7 recommends 17 GB minimal).
6. Wait for completion.

Then the board will reset. It is now necessary to boot on SATA disk on which Windows is being installed.

Do not remove the DVD-ROM drive disk.

1. Boot on SATA disk: Reset or power off-on the board and enter the SETUP to select the SATA disk to boot:



2. Windows is starting.... wait for completion installation

Then the board will reset again. Boot again on SATA disk on which Windows is being installed. Do not remove the DVD-ROM drive disk.

1. Boot on SATA disk. Reset or power off-on the board and enter the SETUP to select SATA disk to boot.
2. See message "SETUP is preparing your windows for first use" then wait for the next step.
3. Type a User name (i.e user) and a Computer Name (i.e PC-VX304x), click on Next.
4. Type a password (i.e Kontron), retype your password (i.e Kontron) and Type a password hint (i.e VX304x).
5. Enter Product Key, unselect "Automatically activate windows when I'm online", click on Next.
6. Click on "Use Recommended Setting"
7. Check time zone and check date is OK, click on Next
8. Then Windows 7 is started, keyboard can be selected by bottom left icon.

Modify SETUP to definitely boot on SATA device.

1. Enter SETUP pressing [F2] at power on
2. Select "Boot" Menu
3. Select "Hard Drive BSS priority" and set your disk first (use+ or – key)
4. Save and Exit

Windows 7 installation is ended.

Now the VX304x BSP drivers must be installed. See chapter 5 page 8 - VX304x BSP Installation.

Other recommended settings:

1. Adjust screen resolution to 1600x900 for example.
2. Add desktop icon setting (computer, control panel).
3. Adapt network configuration:

In Control Panel select -> Network and Internet -> Network and sharing centre -> Change adapter setting -> Select one of the 3 LAN -> TCP/IP V4 -> Properties (Here set LAN4 with IP manually and adjust DNS)

## Chapter 4 - VX304x BSP Contents

### 4.1 BSP Drivers and Applications

The WIN7\_x64\_BSP\_VX304x\_ID13065 directory contains the following items:

|                               | Item   | Version          | Description   |
|-------------------------------|--|------------------|---|
| <b>Graphics</b>               | Intel® Graphics Media Accelerator 4000           | 15.26.12.64.2761 | GMA driver for Windows Vista 64-bit, Windows 7 64-bit.<br>Folder: Drivers\Graphics      |
| <b>Network</b>                | Intel® Network Connections Software              | 17.3             | Network drivers' installation package for Windows 7 64-bit.<br>Folder: Drivers\Ethernet |
| <b>Chipset driver</b>         | Intel® 7 Series/C216 Chipset Family              | 9.3.0.1019       | Inf-files update for chipset devices.<br>Folder: Drivers\Chipset                        |
| <b>Kontron EAPI driver</b>    | KEAPI system driver                              | 1.0.10.0         | System Drivers for KEAPI.<br>Folder: Drivers\KEAPI                                      |
| <b>Kontron EAPI</b>           | KEAPI components                                 | 1.2.0.12         | GUI, shell tools, services and libraries for KEAPI.<br>Folder: Drivers\KEAPI            |
| <b>CPLD drivers</b>           | CPLD system drivers                              | 1.0.0.2          | CPLD and Watchdog drivers.<br>Folder: Drivers\CPLD                                      |
| <b>CPLD test applications</b> | Applications to demonstrate VX304x CPLD features | 1.0              | CPLD test applications.<br>Folder: Drivers\CPLD   |
| <b>Source code</b>            | CPLD test applications source code               | 1.0              | Source code for VX304x CPLD test applications.<br>Folder: Source                        |
| <b>USB driver</b>             | USB 3.0 Win7 driver                              | 1.0.5.235        | USB 3.0 driver for Windows 7<br>Folder: Drivers\USB 3.0                                 |

## 4.2 BSP Supported Features

| Onboard Hardware Support                             | Detail   |
|--|--|
| Intel® HD Graphics 4000                              | Mini Display Port on front panel   |
| Intel® 82579LM Gigabit Network Connections           |  |
| Intel® 82599 10 Gigabit Dual Port Network Connection |  |
| Two Serial ATA interfaces IDE mode, AHCI mode        | IDE mode, AHCI mode  |
| Two USB ports Front and rear                         | Front and rear   |
| Two Serial ports Front and rear                      | Front and rear   |
| Kontron Embedded API support                         | Accessible locally or remotely   |
| CPLD features support                                | Driver and example for Watchdog, LED, GPIO, Thermal sensors, NV-FRAM, Two EEPROM, Registers, RTC |
| PBIT or POST result analysis                         | Power On Self test result accessible in human readable form                                      |
| VPD (Vital Product Data) analysis                    | Serial number, Hardware Change level, Hardware option  |
| Voltage sensors access                               | Board voltage sensors on I2C   |
| SPD access   | Read Serial Presence Detect information for memory configuration                                 |

## 4.3 Features Not Supported

- ▶ KEAPI intruder detection
- ▶ KEAPI boot counter
- ▶ KEAPI fan control
- ▶ SMART battery
- ▶ KEAPI brightness control

## Chapter 5 - VX304x BSP Installation

Copy the BSP to a temporary directory into VX304x for example on:

Desktop/WIN7\_x64\_BSP\_VX304x\_ID13065.

### 5.1 Drivers Installation

Install the drivers for onboard devices:

1. Chipset inf updates: `infinst_auto1.exe` (Click SETUP file)
2. Intel Network adapters: `PROWinx64.exe` (Do not select SNMP)
3. KEAPI driver: `KEAPI_driver` (see section 5.2 for details)
4. CPLD, Watchdog drivers: `CPLD` (see section 5.3 for details)
5. Install KEAPI GUI: `Kontron_EAPI.msi` (see section 5.4 for details)
6. Copy CPLD utilities from "CPLD\Test applications.zip" to the place you like to have exe demonstrative files.
7. HD Graphic driver `Win7_64_152612.exe`. Install this driver optionally if you need graphic accelerator, dual screen or extended desktop.

### 5.2 KEAPI Driver Setup

1. Unpack `KEAPI_driver.zip` from BSP (`WIN7_x64_BSP_VX304x_ID13065\Drivers\KEAPI`) to temporary directory on HDD
2. Run Command Prompt utility as Administrator
3. Select directory with unpacked driver
4. Run `KEApiDrv.bat`
5. Check that KEApi System Driver device appeared in System device tree of Device manager

### 5.3 CPLD Drivers Setup

1. Unpack `Drivers.zip` from BSP (`WIN7_x64_BSP_VX304x_ID13065\Drivers\CPLD`) to temporary directory on HDD
2. Run Command Prompt utility as Administrator
3. Select directory with unpacked drive
4. Run `Install.bat`
5. Check that VX304x CPLD Driver and VX304x CPLD Watchdog Driver devices appeared in System device tree of Device manager

## 5.4 KEAPI Kontron.msi

Run KEAPI\_Kontron\_EAPI.msi. This will allow to run CPLDutils.exe files and will install the following in C:/Program Files (x86)/Kontron/KEAPI

- ▶ DOC (KEAPI doc),
- ▶ KEAPI (server),
- ▶ KEAPI-GUI,
- ▶ KEAPI-tools,
- ▶ Src: See following chapter on KEAPI for details on these directories.

## Chapter 6 - Services and Test Programs

### 6.1 CPLD Utilities

Utilities to test CPLD features are available in `Test applications.zip` archive from BSP (`WIN7_x64_BSP_VX304x_ID13065\Drivers\CPLD`). The following files can be found:

| Name                           | Description  |
|--------------------------------|--|
| <code>LedTest.exe</code>       | Program to demonstrate LED handling                          |
| <code>VpdInfo.exe</code>       | Access and display VPD information                           |
| <code>WdInit.exe</code>        | Set and get the CPLD watchdog mode (reset, interrupt, timer) |
| <code>Post.exe</code>          | Get and display PBIT & POST (executed under BIOS) result     |
| <code>Interrupt.exe</code>     | Test GPIO interrupt expecting for interrupt                  |
| <code>WdInterrupt.exe</code>   | Test watchdog interrupt expecting for interrupt              |
| <code>Registers.exe</code>     | Get and display CPLD registers values and information        |
| <code>InterruptInit.exe</code> | Initialize interrupt GPIO mode                               |
| <code>RTC.exe</code>           | Application to access external real time clock               |



Source code of these tools can be found in folder “`WIN7_x64_BSP_VX304x_ID13065\Sources\Test Applications`” of BSP

#### 6.1.1 VPDinfo Result

Here is an example of `VPDinfo` command result. It gives the full board hardware manufacturing option.

```
C:\Users\user\Desktop\WIN7_x64_BSP_VX304x_R01.00\Drivers\CPLD\Test applications\
Test applications\VpdInfo>VpdInfo.exe
Board type   : VX3042-SA24-2010M00
EC Level    : 28002UD
Serial Number: 1812291120049
Variant     : 1001400401004800
MAC        : eth0: 00:00:de:52:4b:01, eth1: 00:00:de:52:4b:02, eth2: 00:00:de:
52:4b:00
Keylist     : /PCB_B/SACCLASS/PCISWON/10GON/IVBDCULV1G7/IBOMOFF/DDR3_STD_PWR/DBA
NK/SRANK/2GB_DDR3_1333/DDR3-1333/IRTC/XDPON/STDCCLK/P1SERIALOFF/STD_EARTH/BATOFF/
PECIPLD/TPMOFF/SSD32G/QM77/HDDOFF/PWRMAGOFF/DSNOFF/TMLVDSOFF/I2CSTD/1INCHES/1SLO
T/XMCOFF_FPIOON/P80ON/VS2OFF/P2ON/NODCLK/VX3042/NOPCISP_J16/NO1000BX_J16/XMCCONN
ON/ITIN/LF/LFCOMP/

Features    :
PCB B
SA Class
on board PCIe switch option available
Dual link 10Geth i82599
17W 1.7 GHz, Dual core Ultra Low Voltage, Core i7-3517UE
```

```
Normal BOM generation
Standard Power DDR3 (1.5V)
Dual bank memory configuration
Single memory rank number per bank
2GB DDR3-1333 device
DDR3-1333 dram speed
PCH internal RTC configuration
XDP port available
Standard clock option
No P1 Serial line redirection
Standard EARTH connection
Battery super cap not present
PECI device on cPLD local I2C bus
TPM option not available
32GB MLC on-board SSD option
QM77 Panther Point PCH
HDD carrier option not available on J16
Internal magnetic power option off
COM1 single mode front panel serial line
MLVDS terminations off
CPLD I2C equipment: one F-RAM, one EEPROM
1 inch VPX pitch
One VPX slot version for SA
No XMC slot, Front Panel IOs available
P80 debug option available on debug connector
VS2 PWR pins not used
VPX P2 connector present
No PCIe switch dual clocking mode
VX3042 board type
No PCIe spare link on J16
No 1000Base-BX spare link on J16
XMC Connectors J15 & J16 ON
PCB plating: Immersion Tin
Lead Free Process
All components Lead Free
```

### 6.1.2 PBIT/POST Results

The last PBIT result is accessible under Windows using the command `post.exe`. PBITs are not available by default. They will be available at the BIOS boot level if ordered.

```
C:\Users\user\Desktop\WIN7_x64_BSP_VX304x_R01.00\Drivers\CPLD\Test applications\
Test applications\Post>Post.exe
POSTs configured to run from command line:
    mem_data: PASSED
    mem_addr: PASSED
    mem_pattern1: PASSED
    mem_pattern2: PASSED
    mem_pattern3: PASSED
```

```
mem_pattern4: PASSED
  core_dmi: PASSED
  tpm: PASSED
pcie_vpx_sw: PASSED
  serial: PASSED
  rtc: PASSED
  sysflash: PASSED
  cp1d: PASSED
  fnvram: PASSED
  ether_loop0: PASSED
  ether_loop1: PASSED
  ether_loop2: PASSED
  hwmon: PASSED
sata0_controller: PASSED
sata1_controller: PASSED
  vpd: PASSED
  eeprom: PASSED
  xmc_check: PASSED
usb1_controller: PASSED
usb2_controller: PASSED
xHCI_controller: PASSED
  system: PASSED (FAILED ONCE)

PASSED : 27
FAILED : 0
NOT RUN : 0
TOTAL : 27
```

### 6.1.3 PLD Registers Information

The `Register.exe` command result is a long display of PLD registers' values and descriptions. The display will include information on:

- ▶ CPLD revision,
- ▶ Short PBIT Result,
- ▶ Serial Configuration (RS485 ...),
- ▶ PCI bus configuration,
- ▶ Non Volatile Memory write protection,
- ▶ VPX system controller information.

### 6.1.4 Watchdog Interrupt

The Watchdog mode and interrupt behavior can be configured with `WdInit.exe` and `wdInterrupt.exe`. See `watchdog.exe` command in KEAPI-Tools to start, trigger, stop watchdog. Example to set watchdog in interrupt mode and to display received interrupt: Display watchdog Mode

```
C:\Users\user\Desktop\WIN7_x64_BSP_VX304x_R01.00\Drivers\CPLD\Test applications\
Test applications\WdInit>WdInit.exe -c
Watchdog Timer Mode
```

Set watchdog mode to interrupt mode:

```
C:\Users\user\Desktop\WIN7_x64_BSP_VX304x_R01.00\Drivers\CPLD\Test applications\  
Test applications\WdInit>WdInit.exe -i
```

Check the mode:

```
C:\Users\user\Desktop\WIN7_x64_BSP_VX304x_R01.00\Drivers\CPLD\Test applications\  
Test applications\WdInit>WdInit.exe -c  
Watchdog Interrupt Mode
```

Start an interrupt handler to print received interrupt:

```
C:\Users\user\Desktop\WIN7_x64_BSP_VX304x_R01.00\Drivers\CPLD\Test applications\  
Test applications\WdInterrupt>WdInterrupt.exe  
Watchdog Interrupt  
Watchdog Interrupt  
Watchdog Interrupt  
^C  
C:\Users\user\Desktop\WIN7_x64_BSP_VX304x_R01.00\Drivers\CPLD\Test applications\  
Test applications\WdInterrupt>
```

## 6.2 KEAPI

The following items can be found in folder `c:/Program files (x86)/Kontron/KEAPI,:`

- ▶ KEAPI documentation (requires PDF reader tool),
- ▶ KEAPI server application,
- ▶ KEAPI-GUI application to access KEAPI server,
- ▶ KEAPI-tools to access basic platform feature from KEAPI server and
- ▶ Source code for KEAPI GUI and tools.

### 6.2.1 Doc

In «Program files <x86>/Kontron/KEAPI/Doc»:

| Name  | Description                                  |
|---|--|
| KEAPIGUI_and_tools_user_guide_v1.0_21_04_2011.pdf | Guide for KEAPI-GUI and shell tool           |
| KEAPI_spec_v1.21_26_04_2011.pdf                   | KEAPI interface specification                |
| Kontron_EAPI_installation_guide_v1.0.pdf          | Installation guide for KEAPI driver & server |

### 6.2.2 KEAPI

In «Program files <x86>/Kontron/KEAPI/KEAPI»: KEAPI server

| Name            | Description                      |
|-----------------|----------------------------------|
| KeapiServer.exe | KEAPI server (local and network) |

### 6.2.3 KEAPI-GUI

In «Program files <x86>/Kontron/KEAPI/KEAPI-GUI»

| Name          | Description  |
|---------------|--|
| Keapi-GUI.exe | KEAPI graphical Interface to access KEAPI server (local or by network) |

When launched, KEAPI starts an application that allows to control some of the VX304x specificities (GPIO, Watchdog ...). KEAPI allows to control board locally or even by network.

Here are some examples of the KEAPIGUI interface:

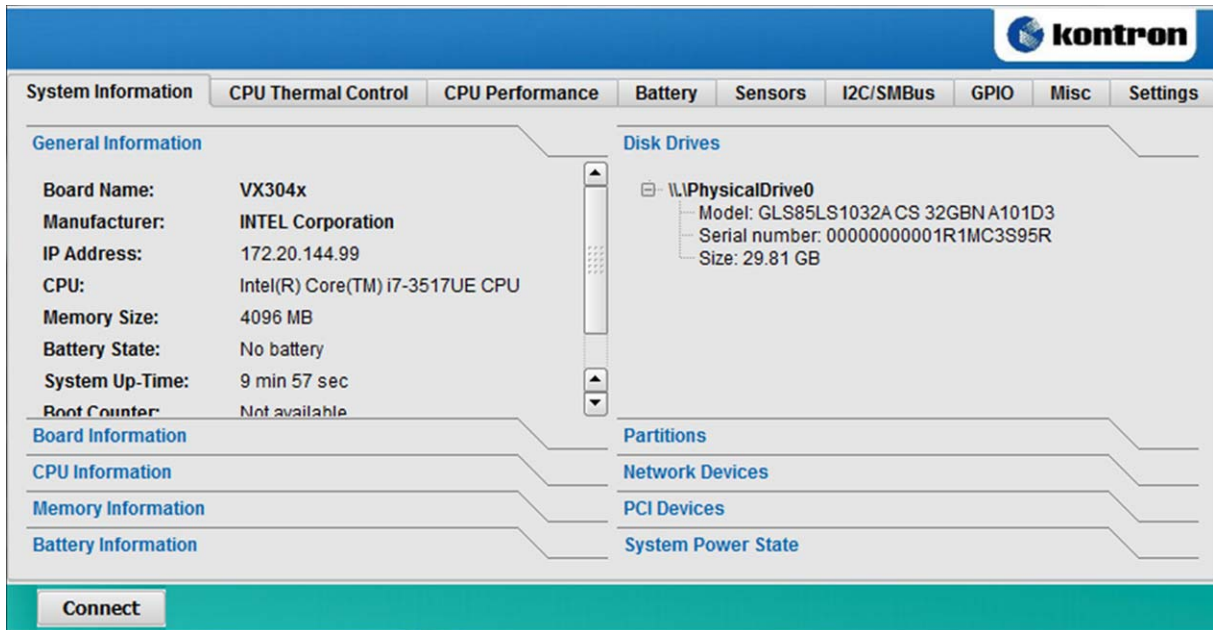


Figure 1: System Information KEAPI-GUI menu

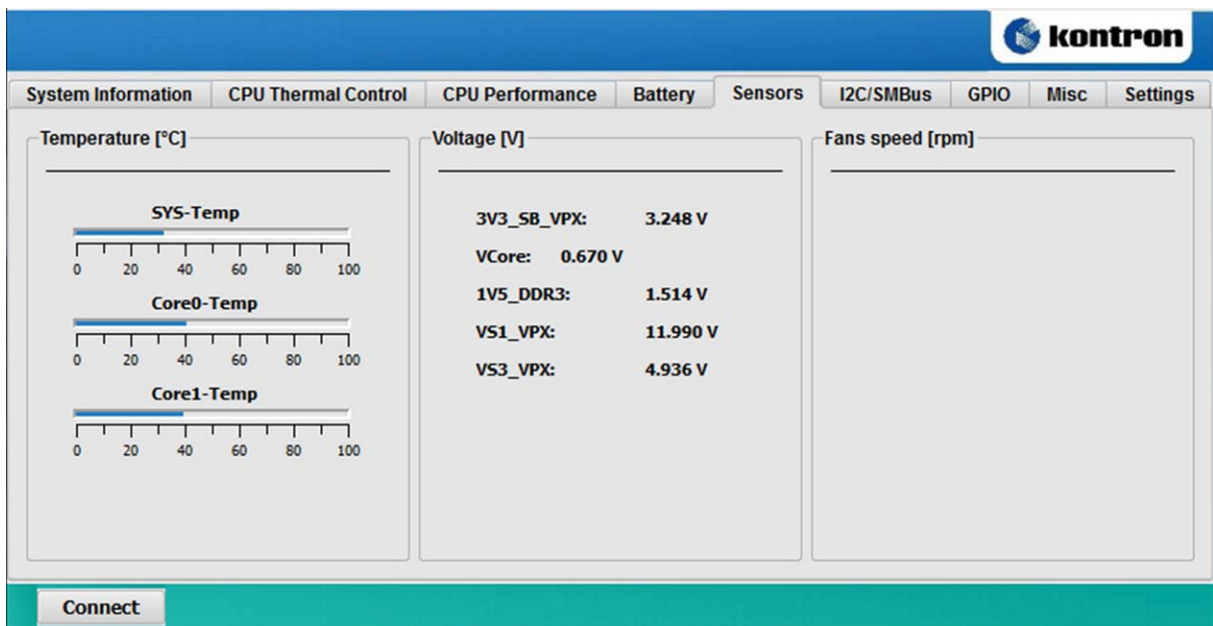


Figure 2: KEAPI-GUI Sensors Menu

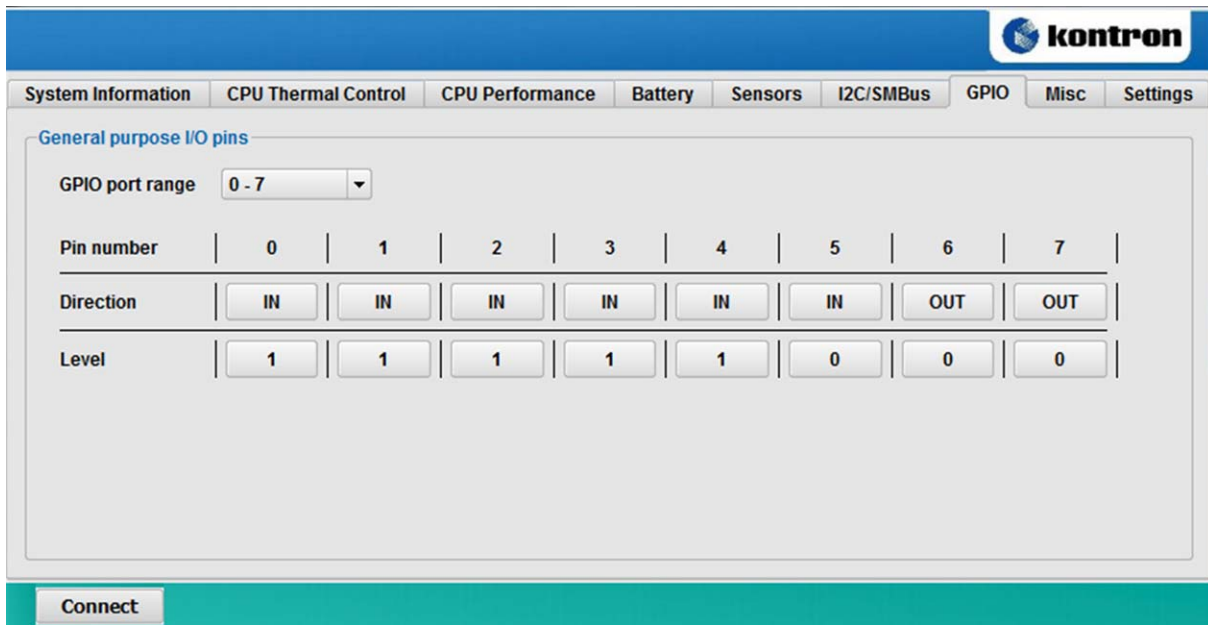


Figure 3: KEAPI-GUI GPIO Control Menu

### 6.2.4 KEAPI-tools

In «Program files (x86)/Kontron/KEAPI/KEAPI-tools»

All the tools included into this folder invoke KEAPI server (local or by network) to access VX304x platform features.

The precondition to run these tools is:

1. Firewall should be turned off on the target.
2. Kontron EAPI server service should be started on the target.

| Name        | Description  |
|-------------|--|
| battery.exe | Get battery count & state                            |
| cpu.exe     | Get CPU information, frequency & performance         |
| disk.exe    | Get Disk count, list , partition information         |
| display.exe | Get display count and set/get back light value       |
| eprom.exe   | Get storage device count, size and read/write device |
| fan.exe     | Get/set fan characteristic (N/A for VX304x)          |
| general.exe | Get general platform information                     |
| gpio.exe    | Get GPIO count and get/set GPIO direction and level  |
| i2c.exe     | Perform I2C read/write operation                     |
| memory.exe  | Get memory information                               |
| netdev.exe  | Get network device count and list                    |
| pcidev.exe  | Get PCI device count and list                        |
| smbus.exe   | Get Smbus count and read/write Smbus bytes           |

| Name         | Description   |
|--------------|---|
| temp.exe     | Get temperature sensors count list and value<br>Get CPU temperature value |
| voltage.exe  | Get voltage sensors count list and value                                  |
| watchdog.exe | Enable/trigger and disable watchdog (CPLD watchdog on VX304x)             |

### 6.2.4.1 CPU

In particular the CPU command allows to get/set the CPU frequency

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>cpu.exe

Usage: Cpu <function name> [<parameters>] [<ip address>]

- Board IP address
- Function name. Possibilities:
* GetCpuFreq
* GetCpuInfo
* GetCpuPerformance
* SetCpuPerformance <performance type> <performance percentage>
** Percentage 0 -100 is applied under Windows    ** Performance types 0 - 3
are applied under Linux    ** 0 - CPU_PERFORMANCE_HIGH
** 1 - CPU_PERFORMANCE_POWER_SAVE
** 2 - CPU_PERFORMANCE_ON_DEMAND
** 3 - CPU_PERFORMANCE_CONSERVATIVE

Example:
- Local: Cpu GetCpuInfo
- Remote: Cpu GetCpuInfo 192.168.1.123
```

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>cpu.exe GetCpuFreq
Minimal frequency: 800 MHz
Return value: 0x0000
Maximal frequency: 2200 MHz
Return value: 0x0000
Current frequency: 2200 MHz
Return value: 0x0000
```

### 6.2.4.2 EEPROMs (and F-RAM)

EEPROM command allows reading or writing EEPROMs or F-RAM on I2C bus. The user should use only <number>

- ▶ 0 for EEPROM VPD (32KB),
- ▶ 1 for EEPROM (32 KB) free for using,
- ▶ 2 for F-RAM (128KB) free for using.
- ▶ 3 for SPD EEPROM (256 Bytes)

Example:

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>eeprom.exe

Usage: Eeprom <function name> [<parameters>] [<ip address>]

- Board IP address
- Function name. Possibilities:
* GetStorageCount
* GetStorageSize <storage_number>
* StorageRead <storage_number> <offset> <data_length>
* StorageWrite <storage_number> <offset> <data>

Example:
- Local: Eeprom GetStorageSize 0
- Remote: Eeprom StorageWrite 0 0 Hello 192.168.1.123

C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>eeprom.exe GetStorageSize 0
Storage size: 32768
Return value: 0x0000

C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>eeprom.exe GetStorageSize 2
Storage size: 131072
Return value: 0x0000

C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>eeprom.exe StorageRead 0 0 100
KONTRON COMPUTERS SA      VX3042-SA24-2010M00      28002UD 1812291120049
      1001
Data was read. Return value: 0x0000
```

### 6.2.4.3 GPIO

The GPIO command allows controlling GPIO direction and level.

GPIO man example:

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>gpio.exe

Usage: Gpio <function name> [<parameters>] [<ip address>]

- Board IP address
- Function name. Possibilities:
* GpioGetCount
* GpioGetDirectionCaps <pin_number>
* GpioGetDirection <pin_number>
* GpioSetDirection <pin_number> <direction>
** direction:
- 0 - IN
- 1 - OUT
* GpioGetLevel <pin_number>
* GpioSetLevel <pin_number> <level>
** level:
- 0 - low
- 1 - high
```

```
Example:  
- Local: Gpio GpioSetDirection 2 1  
- Remote: Gpio GpioSetDirection 2 1 192.168.1.123
```

### » Get the number of GPIOs:

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>gpio.exe GpioGetCount  
GPIO count = 6  
Return value: 0x0000
```

### » Get GPIO 3 direction capabilities:

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>gpio.exe GpioGetDirectionCaps 3  
GPIO number: 3  
Is input: 1  
Is output = 1  
Return value: 0x0000
```

### » Get GPIO 3 direction (it is in):

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>gpio.exe GpioGetDirection 3  
GPIO pin number: 3  
Direction: 0  
Return value: 0x0000
```

### » Get GPIO 3 level

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>gpio.exe GpioGetLevel 3  
GPIO number: 3  
Level = 1  
Return value: 0x0000
```

### » Set GPIO 3 direction OUT:

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>gpio.exe GpioSetDirection 3 1  
Pin number: 3  
Direction: 1  
Return value: 0x0000
```

### » Get GPIO 3 low level

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>gpio.exe GpioSetLevel 3 0  
GPIO number: 3  
Level = 0  
Return value: 0x00000000
```

#### 6.2.4.4 Temp

The temp.exe command permits to get the value of various temperature sensors on the board.

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>temp.exe
```

```
Usage: Temp <function name> [<parameters>] [<ip address>]
```

- Board IP address
- Function name. Possibilities:
  - \* GetTempSensorCount
  - \* GetTempSensorList
  - \* GetTempSensorValue <temp\_sensor\_number>
  - \* GetCpuTemp
  - \* GetChipsetTemp
  - \* GetSystemTemp

Example:

- Local: Temp GetTempSensorValue 0
- Remote: Temp GetTempSensorValue 0 192.168.1.123

Sensors list is:

- ▶ 0 SYS-Temp 0 is the Nuvoton sensors onto the board (I2C bus)
- ▶ 1 CPU Core 0
- ▶ 2 CPU Core 1

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>temp.exe GetTempSensorList
```

```
Sensor number:0
```

```
Sensor name: SYS-Temp
```

```
Sensor value: 31000
```

```
Sensor number:1
```

```
Sensor name: Core0-Temp
```

```
Sensor value: 38000
```

```
Sensor number:2
```

```
Sensor name: Core1-Temp
```

```
Sensor value: 40000
```

```
Return value: 0x0000
```

### 6.2.4.5 Voltage

The voltage command reads the value of the 5 voltage sensors present on the board.

Voltage man page example:

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>voltage.exe

Usage: Voltage <function name> [<parameters>] [<ip address>]

- Board IP address
- Function name. Possibilities:
* GetVoltageSensorCount
* GetVoltageSensorList
* GetVoltageSensorValue <volt_sensor_number>

Example:
- Local: Voltage GetVoltageSensorCount
- Remote: Voltage GetVoltageSensorCount 192.168.1.123
```

Example: get sensors list and values

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>voltage.exe GetVoltageSensorList
Sensor number: 0
Sensor name: 3V3_SB_VPX
Sensor value 3252

Sensor number: 1
Sensor name: VCore
Sensor value 730

Sensor number: 2
Sensor name: 1V5_DDR3
Sensor value 1514

Sensor number: 3
Sensor name: VS1_VPX
Sensor value 11990

Sensor number: 4
Sensor name: VS3_VPX
Sensor value 4944

Return value: 0x0000
```

### 6.2.4.6 Watchdog

The watchdog command allows starting, triggering and stopping the CPLD watchdog.

Watchdog man example:

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>watchdog

Usage: Watchdog <function name> [<parameters>] [<ip address>]

- Board IP address
- Function name. Possibilities:
* WatchdogEnable <timeout_in_ms>
* WatchdogTrigger
* WatchdogDisable

Example:
- Local: Watchdog WatchdogEnable 50000
- Remote: Watchdog WatchdogEnable 50000 192.168.1.123
```

Example to enable a 10s watchdog, to trigger and stop watchdog (watchdog mode must be set using wdInit.exe in CPLDutils tools).

```
C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>watchdog.exe WatchdogEnable 10000
Timeout: 10000
Return value: 0x0000

C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>watchdog.exe WatchdogTrigger
Watchdog triggered.
Return value: 0x00000000

C:\Program Files (x86)\Kontron\KEAPI\KEAPI-tools>watchdog.exe WatchdogDisable
Watchdog disabled.
Return value: 0x00000000
```

### 6.2.5 Src

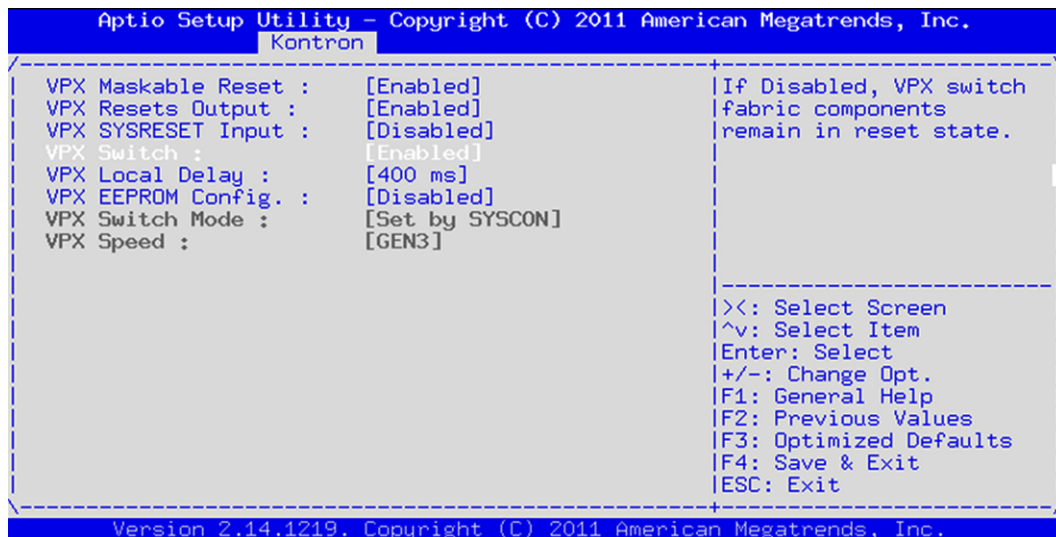
In «Program files (x86)/Kontron/KEAPI/src»

- ▶ Include folder : includes files for KEAPI services library  
keapi.h, keapi\_types.h, PicmgWrapper.h
- ▶ KEAPI-GUI folder : source code for KEAPI GUI  
connectiondlg.cpp, connectiondlg.h, kstation.cpp, kstation.h, main.cpp, ui\_connectiondlg.h, ui\_kstation.h ...  
etc
- ▶ KEAPI-tools folder : source code for KEAPI tools  
Battery.c, Cpu.c, Disk.c, Display.c, Eeprom.c, Fan.c, General.c, Gpio.c, I2c.c, Makefile, Memory.c,  
Netdev.c, Pcddev.c, Smbus.c, Temp.c, Voltage.c, Watchdog.c

## Chapter 7 - Known Issues

1. Driver for Base System Device (VEN\_10B5& DEV\_ 87D0) not found (four devices).

**Workaround:** If not needed, the VPX switch can be disabled in BIOS settings. It will allow to avoid these warnings under the Windows 7 Device Manager tool.



2. Driver for other PCI Bridge Device (VEN\_10B5& DEV\_ 87B0) not found.

**Workaround:** same as 1.

3. Driver for PCI Simple Communications Controller (VEN\_8086& DEV\_ 3B64) not found.

4. Communication port (COM2) cannot start (Code 10).

5. EEPROM KEAPI tool only accesses the first 512 Kbits of the 1 Mbit F-RAM. The 1 Mbit F-RAM is not seen as a contiguous 1 Mbit memory but as two 512 kbit memories.

**Workaround:** Use i2c raw commands to access to the second half F-RAM part.

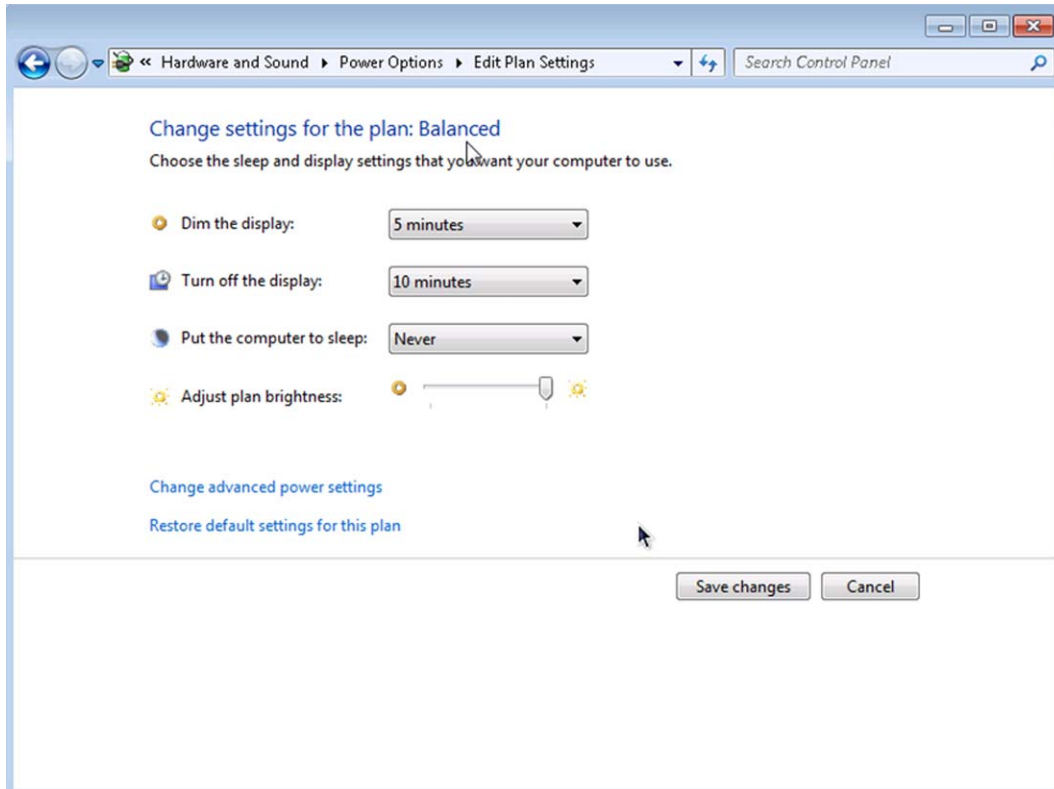
6. The date does not remain after power off if it has been changed under Windows OS.

**Workaround:** To change permanently the date, use the BIOS settings.

7. System restarts during wake up after sleep mode.

**Workaround:** To prevent the system entering the sleep mode, the following settings have to be made:

- ▶ Open the control panel and go to the Power Options: **Control Panel \ Hardware and Sound \ Power Options**
- ▶ Change Plan Settings : **“Put the computer to sleep”** shall be set to **“Never”**



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