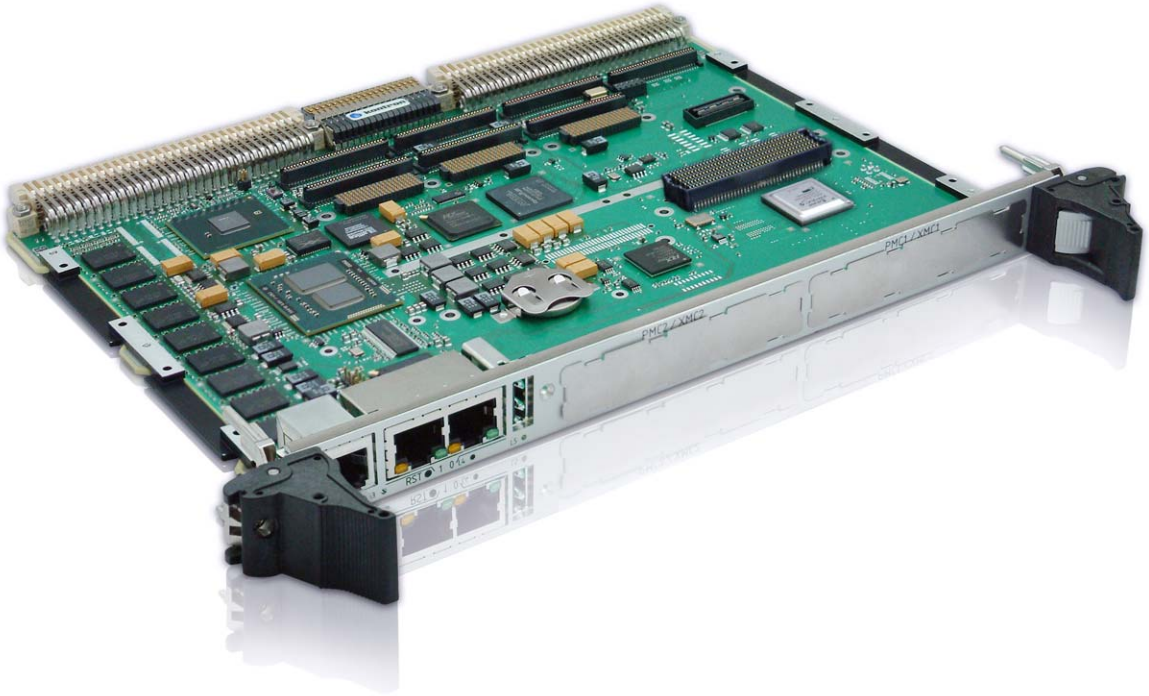
» VM6050 «



Release Note for WIN7 VM6050 BSP - ID 12152

SD.DT.G06-0e - June 2012

Revision History

Publication Title:	Windows 7 BSP for VM6050	
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0	Initial Version	06-2012

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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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Environmental protection is a high priority with Kontron.

Kontron follows the DEEE/WEEE directive.

You are encouraged to return our products for proper disposal.

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- reduce waste arising from electrical and electronic equipment (EEE)
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- 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 Figures

Chapter 1 - Scope

This document describes VM6050 Board Support Package (BSP) for Microsoft Windows 7 Professional 64 bits.
This document provides:

1. A summary of BSP features ;
2. The list of the release package contents ;
3. The BSP installation procedures ;
4. The KEAPI services and test program for VM6050 platform specificities.

Chapter 2 - Glossary

BSP	Board Support Package.
CPLD	Complex Programmable Logic Device. On VM6050 this logic allows to access many feature 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 VM6050 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 bits Version

For this BSP, the mandatory Windows version is Windows 7 64bits professional **OPK_Win7_Professional_64-Bit_SP1_English_X17-63355_Installation_DVD.zip (3.2GB)** available through the link:

http://msembedded.biz/fileadmin/download/Microsoft_OPK_hide_/Win7/SP1/OPK_Win7_Professional_64-Bit_SP1_English_X17-63355_Installation_DVD.zip

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

3.2 Windows 7 64 bits Installation

Use an USB DVDROM to install Windows 7 on a SATA disk connected to the VM6050. Either the on board SATA Flash or the on board SATA disk or the SATA disk connected to the VM6050 rear connector can be used.

3.2.1 Restore BIOS Default Parameters

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

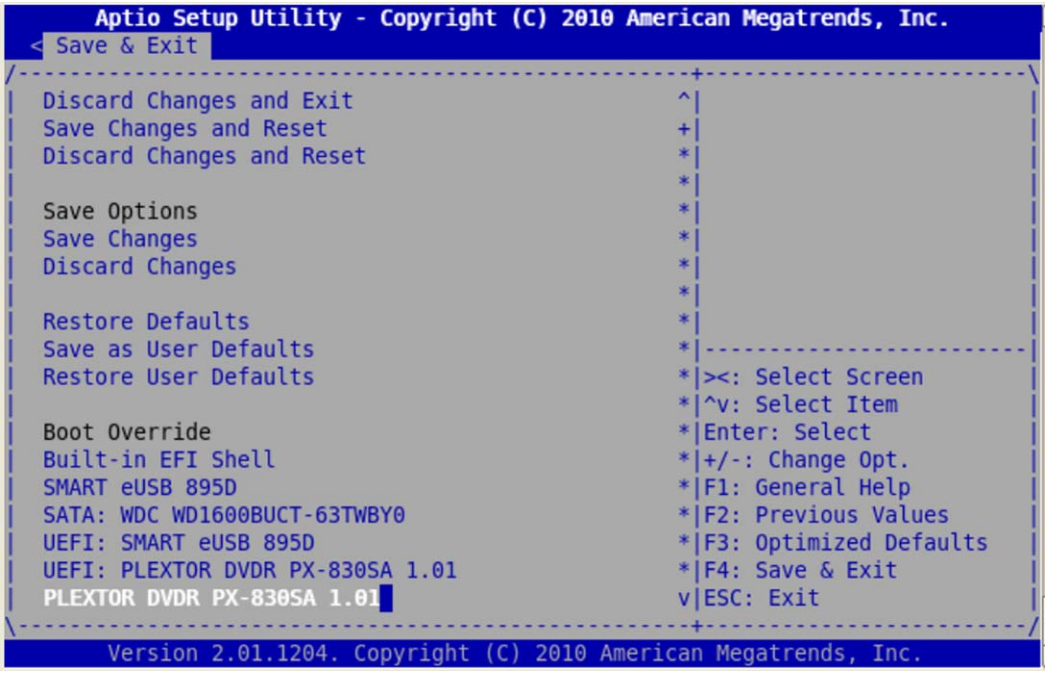
- Power on the VM6050 and Enter BIOS SETUP with [F2] key,
- Select SAVE & Exit Menu,
- Select Restore Default
- Then Save and Reset.

3.2.2 Tested BIOS Version

Signal Name	Description
Core version	4.6.3.5
Project version	0ABPZ 0.20 x64
Date	02/13/2012
BIOS ID	12044

3.2.3 Installation Procedure

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



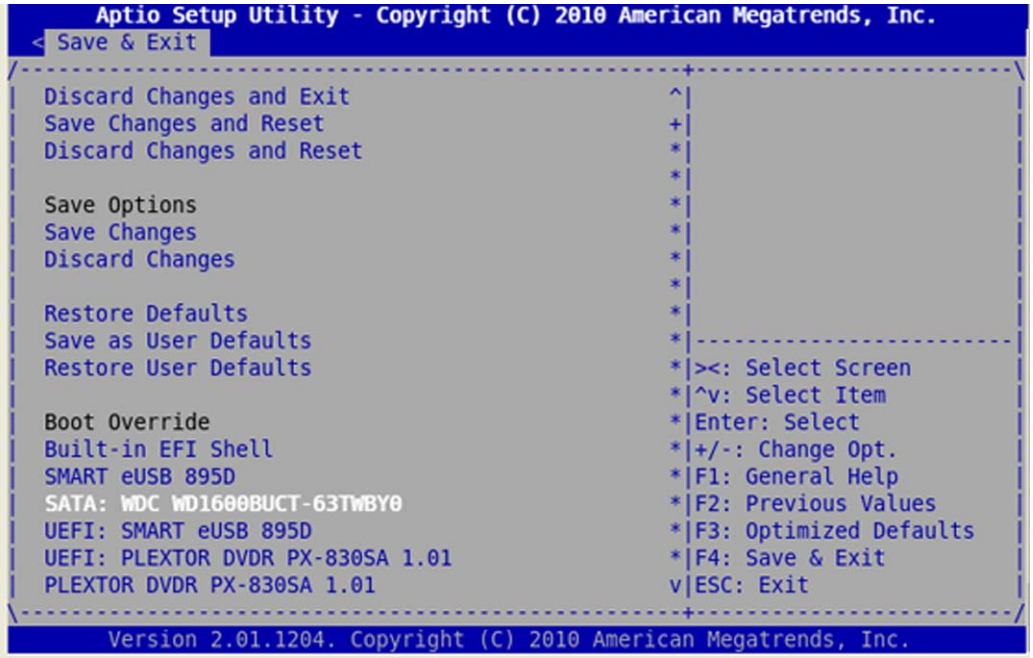
Windows 7 will start its installation.

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 DVDROM drive disk.

1. Boot on SATA disk. Reset or power off-on board and enter SETUP to select 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 DVDROM drive disk.

1. Boot on SATA disk. Reset or power off-on board and enter 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 VM6050), click on next
4. Type a password (i.e Kontron), retype your password (i.e Kontron) and Type a password hint (i.e VM6050)
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 Next
8. Then windows 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 ended.

Now VM6050 BSP drivers must be installed. See BSP installation chapter 5 p 9.

Other recommended setting:

1. Adjust screen resolution to 1280x1024 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 4 LAN -> TCP/IP V4 -> Properties (Here set LAN4 with IP manually and adjust DNS)

Chapter 4 - VM6050 BSP Contents

4.1 BSP Drivers and Applications

The WIN7_BSP_VM6050_IDyyddd.zip file contains the following items:

Network	Version	Description
Intel(R) Network Connections Software	11.11.35.0	Network drivers' installation package for Windows 7 64-bit. Folder: Ethernet
Chipset driver	**Version**	**Description**
Intel(R) QM57	9.2.0.1030	Inf-files update for chipset devices. Folder: Chipset
Kontron EAPI driver	**Version**	**Description**
KEAPI system driver	1.0.7.1	GUI, shell tools, services and libraries for KEAPI. Folder: KEAPI
Kontron EAPI	**Version**	**Description**
EAPI components	1.2.0.10	CPLD and Watchdog drivers. Folder: CPLD
CPLD drivers	**Version**	**Description**
CPLD system drivers	1.0.0.0	CPLD and Watchdog drivers. Folder: CPLD
Source code	**Version**	**Description**
CPLD test applications	1.0	Source code for VM6050 CPLD test applications. Folder: Src
Graphics	**Version**	**Description**
Intel(R) Graphics Media Accelerator	8.15.10.2361	GMA driver for Windows Vista 64-bit, Windows 7 64-bit. Folder: Graphics

4.2 BSP Supported Features

Onboard Hardware Support	Details
VGA, DP Screen HDMI	
Four Intel® 82580 Gigabit backplane Ethernet	2 Ethernet on front and 2 Ethernet on rear
Two Serial ATA interfaces	IDE
Mezzanine On board SATA Flash	IDE
On Board HDD SATA disk	IDE
Three USB ports and one USB Flash mezzanine port	1 front, 1 on board, 2 rear

Onboard Hardware Support	Details
Two Serial ports	COM1 on front and COM1/COM2 on rear
2 PMC sites	One 64 bits and one 32 bits slot
2 XMC sites	
Kontron EAPI support	Accessible locally or by network
CPLD feature support	Driver for internal logic to control: 1 Watchdog (reset, timer or interrupt mode), 3 board leds, 6 GPIO (with interrupts), 3 Thermal sensors, 1 F-RAM, 2 EEPROMs, Internal Logic Registers access
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	8 Board voltage sensors on SMbus

4.3 Features Not Supported

1. AHCI Sata disk (not validated)
2. VME device (ALMA chip)
3. Intel HD graphic driver Intel HD Graphic if not used in Maximum Performance. To use this driver the property "Power at Maximum Performance" must be selected

Chapter 5 - VM6050 BSP Installation

Copy the BSP to a temporary directory into VM6050 for example on **Desktop/VM6050_BSP_IDyyddd**

5.1 Drivers Installation

Install the drivers for onboard devices:

1. Chipset inf updates: **infinst_autol.zip** (Click SETUP file)
2. Intel Network adapters: **PROWinx64.exe** (Do not select SNMP)
3. KEAPI driver: KEAPI_drive (see 5.2 for details)
4. CPLD, Watchdog drivers: CPLD (see 5.3 for details)
5. Install KEAPI GUI: Kontron_EAPI.msi (see 5.4 for details)
6. Copy CPLD utilities from CPLDUtils to the place to like to have exe demonstrative files.
7. HD Graphic driver **Win7Vista_64_15221.exe.** Install this driver optionally if you need graphic accelerator, dual screen or extended desktop. In this case select Power at "Maximum Performance" as explained in Chapter 7 p 25 Known Issues

5.2 KEAPI Driver Setup

1. Run Command Prompt utility as **Administrator**
2. Select directory where KEAPI_driver is located (**Desktop/VM6050_BSP_IDyyddd/KEAPI**)
3. Run **KEApiDrv.bat**
4. Check that KEApi System Driver device appeared in System device tree of **Device Manager**.

5.3 CPLD Drivers Setup

1. Run Command Prompt utility as **Administrator**
2. Select directory where CPLD is located **(Desktop/VM6050_BSP_IDyyddd/CPLD/CPLD)**
3. Run **Install.bat**
4. Check that **VM6050 CPLD Driver** and VM6050 **CPLD Watchdog Driver** devices appear 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.

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 **CPLD\CPLDUtils** directory from BSP. These tools are not included into KEAPI standardized interface. This is why they are in a separate directory. Other VM6050 BSP exe files can also be found into **KEAPI-Tools** directory (see below).The following CPLDutils files can be found:

Name	Description
LedTest.exe	Program to demonstrate LED handling
VpdInfo.exe	Access and Display VPD information
WdInit.exe	Set and Get the CPLD watchdog mode (reset, interrupt, timer). See also KEAPI-tools for watchdog control
Post.exe	Test GPIO interrupt expecting for interrupt (see also KEAPI-tools for GPIO control)
WdInterrupt.exe	Test watchdog interrupt expecting for interrupt (see also KEAPI-tools for watchdog control)
Registers.exe	Get and display CPLD registers values and information
InterruptInit.exe	Initialize interrupt GPIO mode (see also KEAPI-tools for GPIO control)

Source code of these tools can be found in folder **Src** 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\CPLDUtils>VpdInfo.exe
Board type   : VM6050-SA-0010000
EC Level     : 02000
Serial Number: 1811271020019
Variant      : 1000004180850000
Keylist      : /PCB_B/SACLASS/P2GPIOOFF/BHQUAD/IOFPGAOFF/IBOMOFF/PCIEMUXGEN2/NOJ
TAGPCH/XMC/COREI7LVKO/PWRMAGOFF/BATON/STD_EARTH/IRTC/XDPON/STDCLK/CK505REFOSC/XM
CPWR12VOFF/2GB_DDR3_1333/POPWRMAGOFF/POUHM/SATAHDD/2RANK/VME/PXMC/1SLOT/FP422ON/
FL/P80OFF/ITIN/I2CSTD/P5VOFF/NOFPIO/PMCON/JTAGON/

Features     :
PCB B
SA Class
No GPIOs 7 & 8 on P2
Quad link NH82580
No I/O FPGA
Normal BOM generation
PCIe mux GEN2
PCH JTAG is not available on XDP connector
XMCA and XMCB equipped
Low Voltage 620LE Core-i7 2GHz KO
Front magnetic power option off
Battery present
Standard EARTH connection
PCH internal RTC configuration
XDP port available
Standard clock option
CK505 oscillator source configuration
5V XMC power rail
2GB DDR3-1333 device
PO magnetic power option off
PO type is UHM
SATA equipped for VM6250 HDD carrier
Both rank equipped
vme 2esst available
PMC P64s, XMC X8d+X12d IOs available
1 VME slot version for SA
Front panel RS-422 option on
Use of SnPb component only
P80 debug option not available on debug connector
PCB plating: Immersion Tin
CPLD I2C equipment: one F-RAM, one EEPROM
No P5V only
No front IO option
PMC connector fitted on board
JTAG connector fitted on board
```

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.

```
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
         serial               PASSED
            rtc               PASSED
       sysflash               PASSED
           cpld               PASSED
   temp_sensors               PASSED
    temperature               PASSED
         fnvram               PASSED
    ether_loop0               PASSED
    ether_loop1               PASSED
    ether_loop2               PASSED
    ether_loop3               PASSED
        voltage               PASSED
 sata_controler               PASSED
            vpd               PASSED
         eeprom               PASSED
      vme_check               PASSED
 pmcA_xmc_check               PASSED
 pmcB_xmc_check               PASSED
usb1_controller               PASSED
usb2_controller               PASSED
         system               FAILED

PASSED  : 26
FAILED  : 1
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,
- PMC presence,
- Non Volatile Memory write protection,
- VME 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\CPLDUtils>WdInit.exe -c
Watchdog Timer Mode
```

Set watchdog mode to interrupt mode

```
C:\Users\user\CPLDUtils>WdInit.exe -i
```

Check the mode

```
C:\Users\user\CPLDUtils>WdInit.exe -c
Watchdog Interrupt Mode
```

Start an interrupt handler to print received interrupt

```
C:\Users\user\Desktop\CPLDUtils>InterruptInit.exe
Usage: InterruptInit -g <GPIO number> [parameter]
Parameters:
    -i <on|off>                 Enable/Disable input GPIO interrupt
    -p <fall|rise>              Falling/Rising interrupt polarity
    -m <edge|level>             Edge/Level sensitive interrupt mode
    -t <on|off>                 Enable/Disable toggle interrupt mode
```

6.2 KEAPI

In folder **c:/"Program files x64"/Kontron/KEAPI**, the following items can be found (if Kontron_EAPI.msi have been run):

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

6.2.1 Doc

In « **Program files/Kontron/KEAPI/doc** » :

Name	Description
KEAPI-GUI_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/Kontron/KEAPI/KEAPI » : KEAPI server

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

6.2.3 KEAPI-GUI

In Program files/Kontron/KEAPI/KEAPI-GUI

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

When launched, KEAPI starts an application that allows you to control some of the VM6050 specificities (GPIO, Watchdog ....). KEAPI allows to control board locally or even by network. Here is some example of the KEAPI-GUI interface:

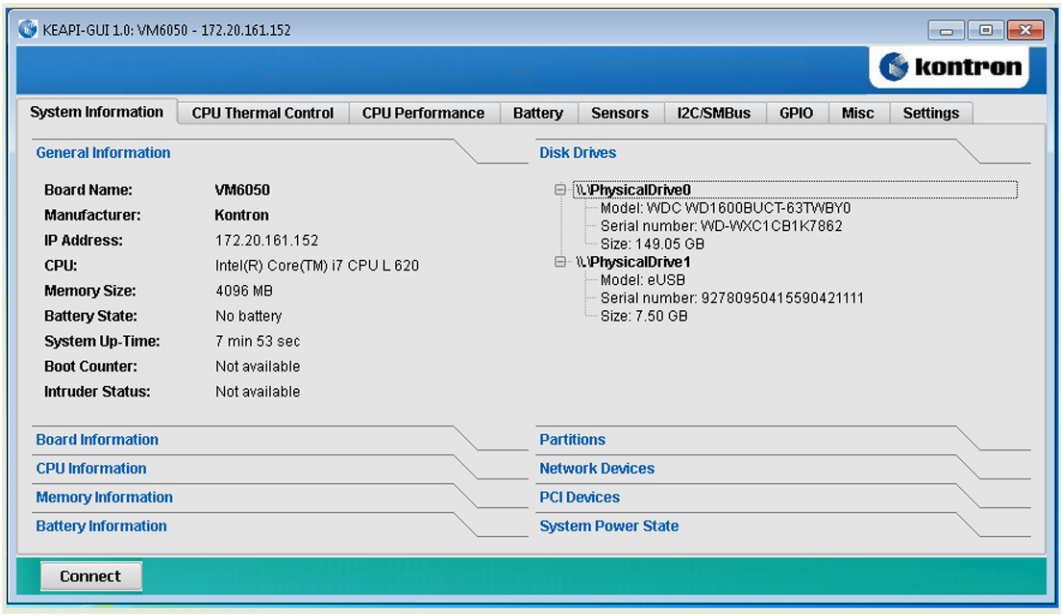


Figure 1: System Information KEAPI-GUI menu

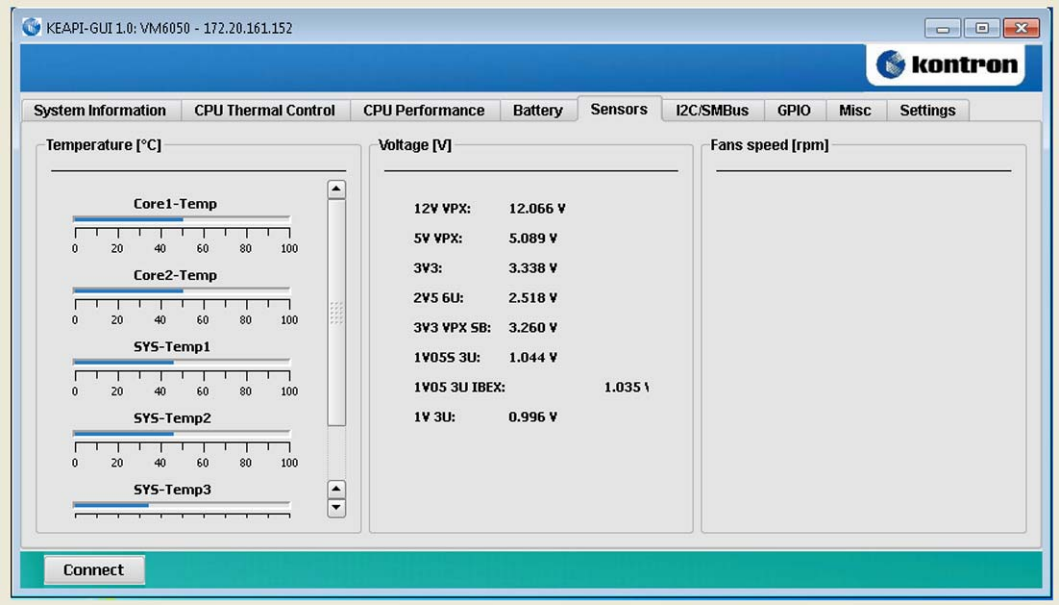


Figure 2: KEAPI-GUI Sensors Menu

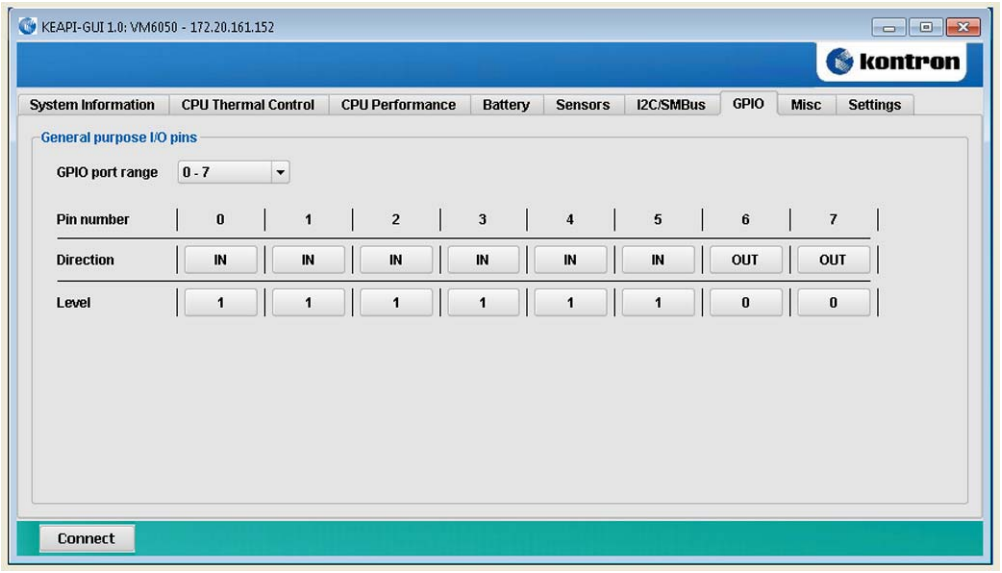


Figure 3: KEAPI-GUI GPIO Control Menu

6.2.4 KEAPI-tools

In **Program files/Kontron/KEAPI/KEAPI-tools**

All the tools included into this folder invokes KEAPI server (local or by network) to access VM6050 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. Not supported for VM6050.
cpu.exe	Get CPU info &Freq & Performance Note: Intel (R) Speed Step and Enhanced C-states should be disabled in BIOS to use this feature
disk.exe	Get Disk count, list, Partition information
display.exe	Get display count and set/get back light value. Not Supported for VM6050
eeprom.exe	Get storage device count, size and Read Write device
fan.exe	Get/Set Fan characteristic (N/A for VM6050)
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 to access EEPROMs or F-RAM
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
temp.exe	Get temperature sensors count list and value Get CPU temperature value
voltage.exe	Get Voltage sensors count list and value
watchdog.exe	Enable/Trigger and disable watchdog (CPLD watchdog on VM6050)

6.2.4.1 CPU

In particular cpu command allows to get/set the CPU Freq

```
C:\Users\user \Kontron\KEAPI-tools>cpu
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:\Users\user \Kontron\KEAPI-tools>cpu GetCpuFreq
Minimal frequency: 1200 MHz
Return value: 0x0000
Maximal frequency: 2001 MHz
Return value: 0x0000
Current frequency: 2001 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 (64Kb) free for using.

Example

```
C:\Users\user \Kontron\KEAPI-tools>eeprom
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:\Users\user \Kontron\KEAPI-tools>eeprom GetStorageSize 0
Storage size: 32768
Return value: 0x0000

C:\Users\user \Kontron\KEAPI-tools>eeprom GetStorageSize 2

Storage size: 65536
Return value: 0x0000

C:\Users\user \Kontron\KEAPI-tools>eeprom StorageRead 0 0 100
KONTRON COMPUTERS SA    PROTO-VM6050-LOT1-B             02000   1811271020019
                1000
Data was read. Return value: 0x0000
```

6.2.4.3 GPIO

The GPIO command allows controlling GPIO direction and level.

Example GPIO man

```
C:\Users\user \Kontron\KEAPI-tools>gpio

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 GPIO 3 direction (it is out)

```
C:\Users\user \Kontron\KEAPI-tools>gpio GpioGetDirection 3
GPIO pin number: 3
Direction: 1
Return value: 0x0000
```

> Get GPIO 3 level

```
C:\Users\user \Kontron\KEAPI-tools>gpio GpioGetLevel 3
GPIO number: 3
Level = 1
Return value: 0x0000
```

> Get GPIO 3 low level

```
C:\Users\user \Kontron\KEAPI-tools>gpio 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:\Users\user \Kontron\KEAPI-tools>temp
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 CPU Core 0
- 1 CPU Core 1
- 2 SYS-Temp 0 is the first LM73 sensors onto the board (I2C bus)
- 3 SYS-Temp 1 is the second LM73 sensors onto the board (I2C bus)
- 4 SYS-Temp 2 is the third LM73 sensors onto the board (I2C bus)

```
C:\Users\user \Kontron\KEAPI-tools>temp GetTempSensorList
Sensor number:0
Sensor name: Core1-Temp
Sensor value: 51000

Sensor number:1
Sensor name: Core2-Temp
Sensor value: 51000

Sensor number:2
Sensor name: SYS-Temp1
Sensor value: 46000

Sensor number:3
Sensor name: SYS-Temp2
Sensor value: 44000

Sensor number:4
Sensor name: SYS-Temp3
Sensor value: 32000

Return value: 0x0000
```

6.2.4.5 Voltage

The voltage command reads the value of the 8 voltage sensors present on the board.

Example voltage man page

```
C:\Users\user \Kontron\KEAPI-tools>voltage
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:\Users\user\Kontron\KEAPI-tools>voltage GetVoltageSensorList
Sensor number: 0
Sensor name: 12V
Sensor value 12066

Sensor number: 1
Sensor name: 5V
Sensor value 5057

Sensor number: 2
Sensor name: 3V3
Sensor value 3320

Sensor number: 3
Sensor name: 2V5 6U
Sensor value 2498

Sensor number: 4

Sensor name: 3V3 SB
Sensor value 3260

Sensor number: 5
Sensor name: 1VO5S 3U
Sensor value 1044

Sensor number: 6
Sensor name: 1VO5 3U IBEX
Sensor value 1044

Sensor number: 7
Sensor name: 1V 3U
Sensor value 996
Return value: 0x0000
```

6.2.4.6 Watchdog

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

Example watchdog man

```
C:\Users\user\Kontron\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 10 s watchdog, to trigger and stop watchdog (watchdog mode must be set using wdInit.exe in CPLDutils tools).

```
C:\Users\user\Kontron\KEAPI-tools>watchdog.exe WatchdogEnable 10000
Timeout: 10000
Return value: 0x0000

C:\Users\user\Kontron\KEAPI-tools>watchdog.exe WatchdogTrigger
Watchdog triggered.
Return value: 0x00000000

C:\Users\user\Kontron\KEAPI-tools>watchdog.exe WatchdogDisable
Watchdog disabled.
Return value: 0x00000000
```

6.2.5 Src

In « Program files/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, Pcidev.c, Smbus.c, Temp.c, Voltage.c, Watchdog.c

Chapter 7 - Known Issues

1. GPIO interrupt on level mode is not supported
2. HD Intel graphic driver: to support **Win7Vista_64_anyversion.exe** onto VM6050 it is necessary to select the Power "Maximum Performance" as shown in the following picture:

To select this option "Right Click on Desktop as for changing the screen resolution ...". After this right click then-select Properties, then Power and then "Maximum Performance". If you boot without this option then the platform will hang. To solve this issue then Press F8 before Windows Starts. Into the Windows starting optional boot option select Enable VGA mode then boot. After that you can enable the graphical option: "Power at Maximum Performance" and reboot. This will solve the issue.

Chapter 8 - Log

N/A

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