Kontron Linux BSP for MSM-LP
R01.00
1. Revision history

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Author</th>
<th>Description</th>
</tr>
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<tr>
<td>1.0</td>
<td>11/05/2012</td>
<td>Andrey Rusalin</td>
<td>Release notes for R01.00</td>
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3. Introduction

This document describes Linux Board Support Package (BSP) for Kontron MSM-LP board. It provides:
- a summary of BSP features;
- build and installation notes;
- listing of the release package contents.

4. Supported features

- Intel® D425 / D525 (1.8GHz) processor;
- Intel 82801HM IO-Controller;
- Intel High Definition Audio;
- Intel GMA3150;
- USB 2.0 (EHCI/OHCI);
- 2xUART, 2xRS232;
- 8xGPIO/4xADC/2xPWM;
- PCI, PCleXpress;
- SATA, PATA;
- Ethernet Intel Corporation 82567V-3 Gigabit Network;
- Ethernet Intel Corporation 82574L Gigabit Network;
- ACPI, Watchdog, SMBus, I2C;
- Kontron KEAPI support.

5. Unsupported features

Please see chapter “8. Known issues”

6. BSP Components

<table>
<thead>
<tr>
<th>File name in delivery</th>
<th>Description</th>
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<tbody>
<tr>
<td>Kontron_Linux_MSM_LP_LiveCD_R01.00.iso*</td>
<td>LiveCD image for Kontron Linux BSP with md5sum</td>
</tr>
<tr>
<td>README.txt</td>
<td>Installation instructions in raw text format</td>
</tr>
<tr>
<td>installation_tools.zip</td>
<td>Utilities to make a bootable USB flash from ISO image on Linux and Windows hosts</td>
</tr>
<tr>
<td>Kontron_Linux_BSP_RPMs_MSM_LP_R01.00.zip</td>
<td>Binary packages that were used for ISO creation</td>
</tr>
<tr>
<td>keapi_docs.zip</td>
<td>KEAPI User's Guide and software specification</td>
</tr>
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</table>

BSP source code is provided under GPL license, please request ext-kgscl@dev.rtsoft.ru for it.
7. Installation and set up procedures

The Kontron Linux distribution is LiveCD image, which can be burned to CDROM and then used as a boot media. It is then possible to evaluate functionality, and install it to Hard Drive or other persistent storage. There are two ways to deploy the BSP image:

− Write CDROM with appropriate OS software;
− Create bootable USB stick with supplied utility.

7.1. Writing ISO image to CD

In Windows OS, it is recommended to use the appropriate software that is able to write ISO9660 image to CD.

In Linux host operating system, issue "cdrecord" command to burn BSP image to CD or DVD media:

# cdrecord Kontron_Linux_MSM_LP_LiveCD_R01.00.iso

Then attach CDROM to MSM-LP, set up BIOS to boot from CD, insert prepared CD media into MSM-LP CDROM, and exit saving BIOS settings.

7.2. Writing ISO image to USB flash/disk

7.2.1 On Linux host

1. Extract livecd-iso-to-disk script from installation_tools.zip archive (e.g. unzip -x installation_tools.zip. Script will be extracted to the installation_tools directory);
2. Install USB disk of capacity more than 1G into MSM-LP USB slot;
3. Make sure syslinux-4.0.2 or greater is installed (Updated syslinux for Ubuntu can be downloaded from https://launchpad.net/);
4. Write ISO onto disk with the command:
   
   # ./livecd-iso-to-disk --noverify --format --reset-mbr Kontron_Linux_MSM_LP_LiveCD_R01.00.iso /dev/[your device]

7.2.2 On Windows host

1. Extract liveusb-creator-3.10.0-setup.exe from installation_tools.zip archive;
2. Install LiveUSB Creator(liveusb-creator-3.10.0-setup.exe) on the host;
3. Install USB disk of capacity more than 1G into host USB slot;
4. Format the USB disk:
   - run Control Panel->Administrative Tools->Computer Management:
- in Storage->Disk Management window right click on the USB stick device and choose "Format...":

- format disk( File system: FAT; Allocation unit size: Default):

5. Run LiveUSB Creator: in the field "Use existing Live CD" specify Kontron_Linux_MSK_LP_LiveCD_R01.00.iso; in the field "Target Device" specify previously formatted USB disk; click on the button "Create LiveUSB":

To boot the Kontron Linux distribution, insert it into MSM-LP USB slot, enable booting from USB in BIOS, save settings and reset the board.
7.3. Installation of the Linux BSP prototype to persistent storage

It is possible to install the live image to persistent storage (USB stick, SATA or PATA hard drive). To do this, the following requirements should be met:
- make sure that the correct time is set in the BIOS. Otherwise installation may fail;
- if automatic partitioning will be used during installation ("Use All Space", "Replace Existing Linux System", "Shrink Current System" or "Use Free Space" options in Generic Installer menu), make sure that there is at least 16GB of free space on the storage;
- to install the BSP on a storage with size less than 16GB, you have to manually create a partition layout ("Create Custom Layout" option in Generic Installer menu), with root partition (/) size of at least 5GB. For more information about disks partitioning please refer to:

In order to install Kontron Linux, proceed with the following steps:
- Boot the BSP image either from LiveCD or bootable USB stick;
- Log into the system with "Automatic login";
- Configure display by executing: Activities->Applications->System Tool->System Settings->Displays (by default, a clone mode with 800x600 resolution is used).
- Run "Install to Hard Drive" by clicking on Activities->Applications->System Tools ->Install to Hard Drive;
- Install BSP following on-screen instructions.
For full details, please refer to:

8. Known issues

- Low network performance:
  - Intel 82574: TCP bandwidth is about 700 Mb/sec; UDP bandwidth is about 800 Mb/sec and percentage of datagram losses is about 1.6%.
  - Intel 82567: UDP bandwidth is about 790 Mb/sec and percentage of datagram losses is about 1.7%.
- PATA:
  - Target hangs after power up if SATA and PATA hard drives are connected at the same time and the compatible mode is set in BIOS. This issue is not reproduced on development version of BIOS (MSMLP 1.01)
- LVDS:
  - LVDS channel is active all the time (regardless of the BIOS settings). So the clone mode with 800x600 resolution is used to prevent GUI malfunction (it's activated by /etc/X11/xorg.conf);
  - Only the "GMBus-Inverted" method of backlight control is functional.
- ACPI:
  - The cpufreq driver supports only the userspace, performance and powersave governors for MSM-LP CPU
- KEAPI:
  - KEApiGetIntruderStatus, KEApiResetIntruderStatus, KEApiGetFanSpeed, KEApiGetFanList, KEApiGetFanMode, KEApiSetFanModeThermalCruise, KEApiSetFanModeManual, KEApiGetCpuFanSpeed, KEApiGetSystemFanSpeed, KEApiSetSystemFanSpeed, EApiBoardGetValue_keapiGetCpuFanSpeed,
EApiBoardGetValue_KEApiGetSystemFanSpeed, KEApiGetVoltageSensorList, KEApiGetVoltageSensorValue, EApiBoardGetValue_VoltageVCore, 
EApiBoardGetValue_Voltage2V5, EApiBoardGetValue_Voltage3V3, 
EApiBoardGetValue_VoltageVBAT, EApiBoardGetValue_Voltage5V, 
EapiBoardGetValue_Voltage5VSB, EApiBoardGetValue_Voltage12V, 
KEApiGetBatteryInfo, KEApiGetBatteryState, KEApiGetChipsetTemp and 
EApiBoardGetValue_KEApiGetChipsetTemp - intruder status, fan speed control, 
voltage sensors, MARS batteries and chipset temperature sensor are not supported;

- KEApiGetSetCpuPerformance - the cpufreq driver supports only the userspace, 
  performance and powersave governors for MSM-LP CPU;
- KEApiGetBatteryCount - returns error as ACPI_PROCFS_POWER is disabled in 
  the kernel by default, so the directory /proc/acpi/batteries is missing;
- KEApiGetMemoryInfo - the field “Manufacturer” is undefined.

Unittested features:
- Compatibility with WR Linux;
- SPDIF input/output;
- PCI, PCIe;
- KEApiSmbusQuickCommand, KEApiSmbusWriteWord, 
  KEApiSmbusReadWord, KEApiSmbusWriteBlock, KEApiSmbusReadBlock and 
  KEApiI2cWrite - are not supported by available sensors/EEPROMs.

9. Changelog

R01.00: Initial release.