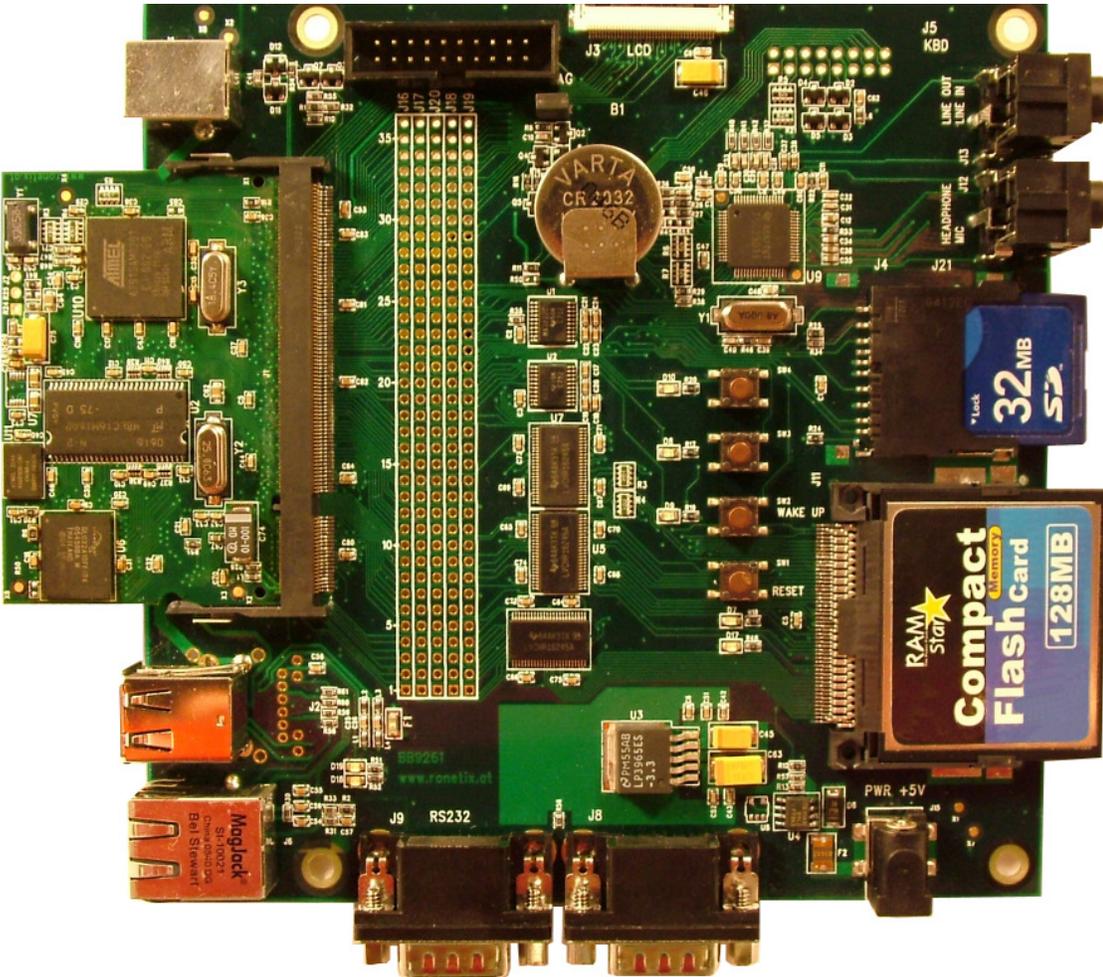


# EB9261 Evaluation Board

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## User Manual

Version 1.2



**RONETA**  
embedded development tools

November, 2008

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Ronetix GmbH  
Waidhausenstrasse 13/5  
1140 Vienna  
Austria  
Tel: +43-1-236 1101  
Fax: +43-1- 8174 955 3464  
Internet: [www.ronetix.at](http://www.ronetix.at)  
E-Mail [info@ronetix.at](mailto:info@ronetix.at)

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# 1 Overview

## 1.1 Scope

The EB9261 Development Kit enables real time code development and evaluation. It supports AT91SAM9261.

## 1.2 Package contents

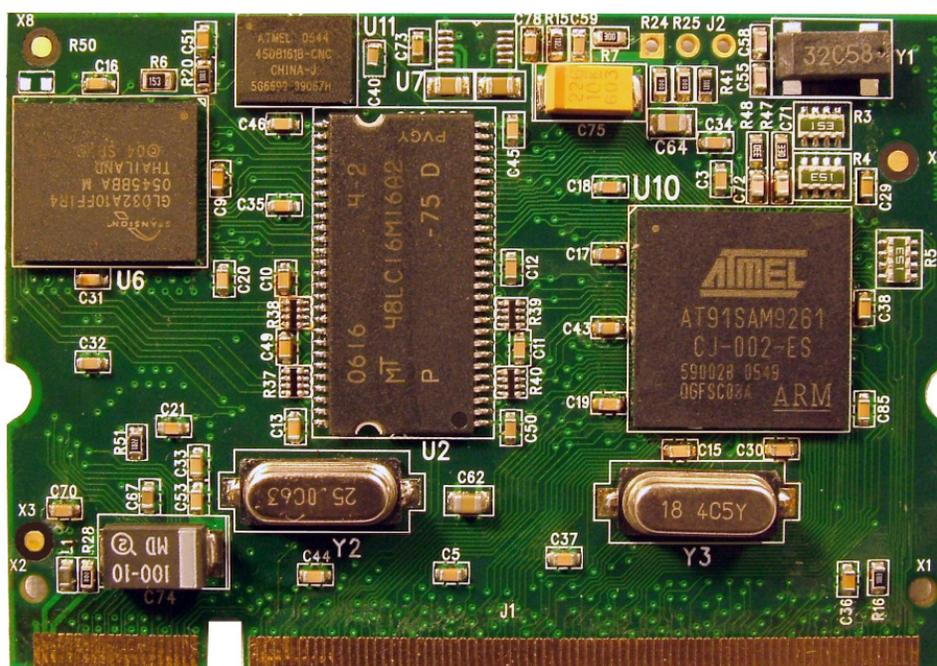
The Development Kit consists of:

- CPU Module PM9261
- Base Board BB9261
- Power Supply 5V/1A
- PEEDI – JTAG Emulator and Flash Programmer (optional)
- DVD including software, datasheets and documentation

A copy of the DVD can be found here: <http://download.ronetix.info>

# 2 The CPU Module PM9261

## 2.1 The PM9261



The PM9261 from Ronetix consists of an AT91SAM9261 together with several peripherals:

- ▶ ATMEL AT91SAM9261 Microcontroller in BGA217 package with:

- ARM926EJ-S™ ARM® Processor
- DSP Instruction Extensions
- ARM Jazelle® Technology for Java® Acceleration
- 16 Kbytes Data Cache, 16 Kbytes Instruction Cache, Write Buffer
- 210 MIPS at 190 MHz
- Bus Matrix – Five Masters and Five Slaves
- Embedded ICE (In-Circuit Emulation) with JTAG interface
- 160 Kbytes Internal RAM
- 3 USARTs
- 3 Synchronous Serial Controllers (SSC)
- Two Master/Slave SPI Interfaces
- One 3-Channel 16-bit Timer/Counter
- Programmable Watchdog Timer
- USB 2.0 Full Speed (12 Mbits/s) – Host Port
- USB 2.0 Full Speed (12 Mbits/s) – Device Port
- LCD Controller
- Real-time Clock with On-chip 32 kHz Oscillator
- 96 Programmable I/O Lines
- Advanced Power Management Controller
- ▶ 4 Mbyte 16-bit Flash
- ▶ 64 Mbyte 32-bit SDRAM
- ▶ 2 Gbit NAND Flash, 16-bit
- ▶ 16 Mbits SPI Serial DataFlash AT45DB161B
- ▶ 32 Kbytes SPI Serial EEPROM AT25256A
- ▶ Serial Number Chip DS2401
- ▶ SODIMM 200-pin connector
- ▶ Dimension 67,6 mm x 47.0 mm

## 2.2 Electrostatic Warning

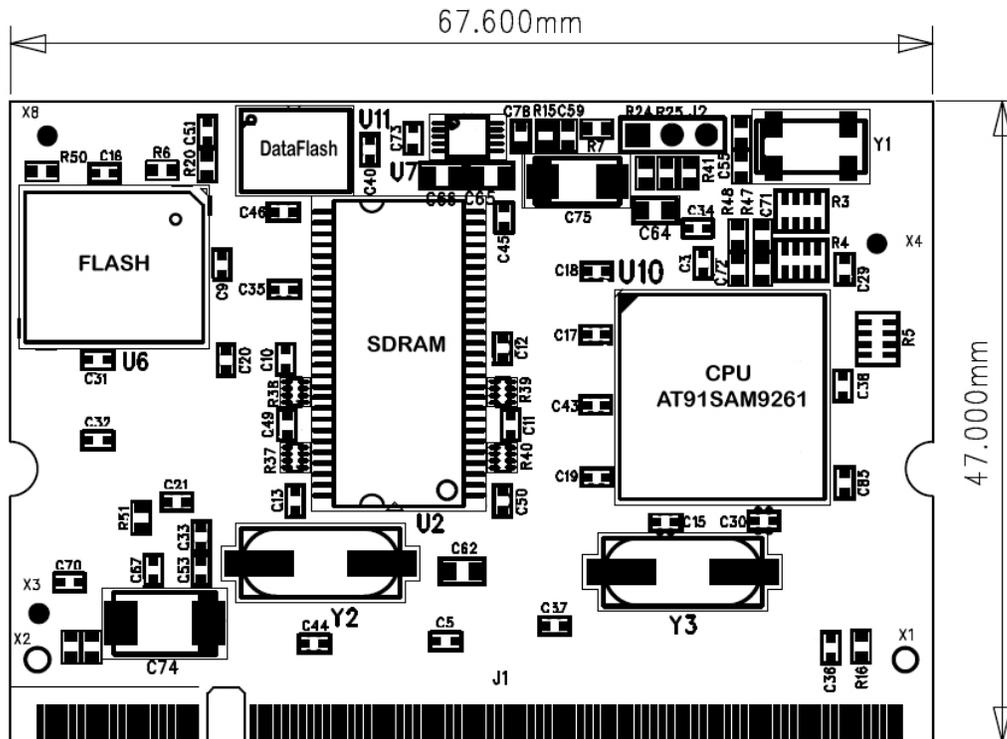
The PM9261 Module is shipped in protective anti-static packaging. The board must not be subjected to high electrostatic potentials. A grounding strap or similar protective device should be worn when handling the board. Avoid touching the component pins or any other metallic element.

## 2.3 Layout

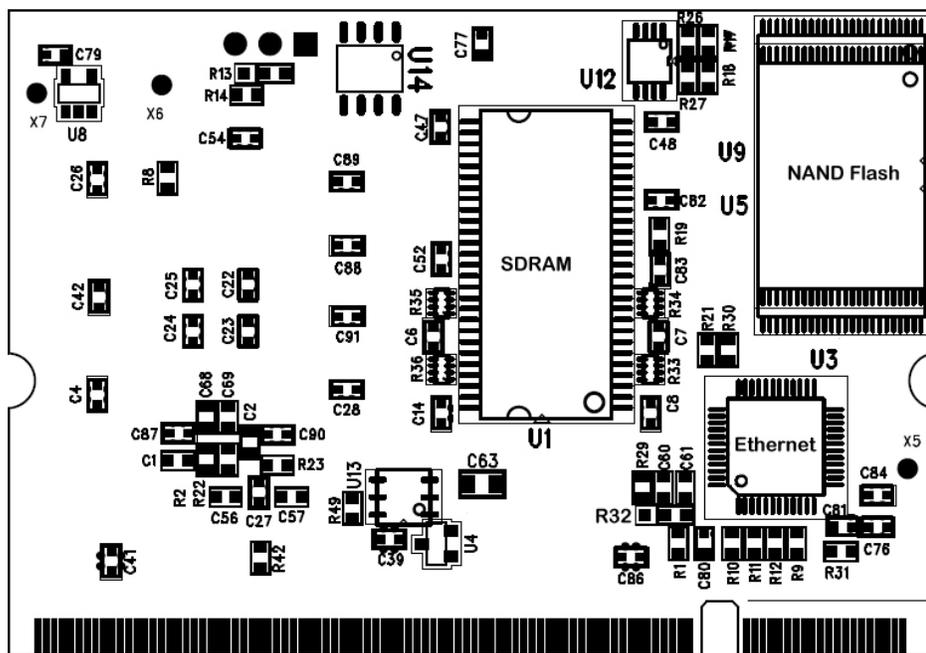
The board layout diagram (Figure 2-1 and Figure 2-2) shows an approximate floorplan of the board. It was designed to provide the smallest board dimensions. The board has 4 signal layers and 2 power planes. The mechanical drawing of the CPU module is available on the DVD or here:

[http://download.ronetix.info/boards/doc/PM9261/v1.2/bb9261\\_v1.2\\_assembly.pdf](http://download.ronetix.info/boards/doc/PM9261/v1.2/bb9261_v1.2_assembly.pdf)

**Figure 2-1 – Top View**



**Figure 2-2 – Bottom View**



## 2.4 Circuit Description

The schematic of the CPU module can be found on the DVD or here:

[http://download.ronetix.info/boards/doc/PM9261/v1.2/bb9261\\_v1.2\\_sch.pdf](http://download.ronetix.info/boards/doc/PM9261/v1.2/bb9261_v1.2_sch.pdf)

### 2.4.1 AT91SAM9261

The footprint is for a 217-pin BGA package.

The pull-down resistor R42 enables to choose between the standard ICE debug mode and the JTAG boundary scan mode of operation.

The R42 is assembled by default – ICE debug mode.

### 2.4.2 200-pin SODIMM Connector

The 200-pin SODIMM connector makes the most CPU pins, Vcc 3.3V and Ground available to the user.

The recommended SODIMM200 2.5V connector is:

FCI 59354-052FSLF

The description of the SODIM200 signals is available on the DVD or:

[http://download.ronetix.info/boards/doc/PM9263/SODIMM200\\_PM9261\\_PM9263.xls](http://download.ronetix.info/boards/doc/PM9263/SODIMM200_PM9261_PM9263.xls)

### 2.4.3 Memories

The PM9261 has on board:

- 4 Mbyte, 16-bit Parallel Flash (boot capable)
- 64 Mbyte, 32-bit SDRAM
- 2 Gbit, 8 or 16-bit NAND Flash (boot capable)
- 32 Mbit, serial SPI DataFlash (boot capable)

- 32 Kbytes serial SPI Serial EEPROM AT25256A (optional)

The AT91SAM9261 CPU can boot in 2 different ways:

- If BMS = 0 (J22 closed) - direct from the parallel Flash
- If BMS = 1 (J22 open) – then the internal 32 KB ROM boot loader of AT91SAM9261 allows the CPU to boot from the DataFlash or the NAND Flash

The JTAG Emulator and Flash Programmer PEEDI from Ronetix support the flash programming of all these memories: FLASH, DataFlash and NAND Flash.

For more information visit <http://www.ronetix.at/peedi.html>

## 2.4.4 Serial Number Chip DS2401

The DS2401 1-Wire® Silicon Serial Number has a unique 48-bit serial number, an 8-bit CRC, and an 8-bit Family Code. It is connected to PA7 of the AT91SAM9261 and allows the module to have a unique serial number. It can be used also for the MAC address of the Ethernet controller.

## 2.4.5 Crystal Quartzes

The board has three crystals: a 32.768 kHz connected to the RTC low-power oscillator of the AT91SAM9261, an 18.4320 MHz connected to the main oscillator and a 25 MHz for the Ethernet Controller.

The AT91SAM9261 Master Clock can be derived from the 32.768 kHz crystal quartz or the 18.4320 MHz crystal quartz depending on the programming of the APMC registers.

## 2.4.6 Power

PM9261 requires only 3.3V power supply. Pin 200 of the SODIMM200 connector is connected to +5V on the base board, but for custom designs this is not necessary – pin 200 can be connected to +3.3V.

The power consumption of PM9263 with all peripherals is 110mA/3.3V.

## 2.4.7 Ethernet Controller

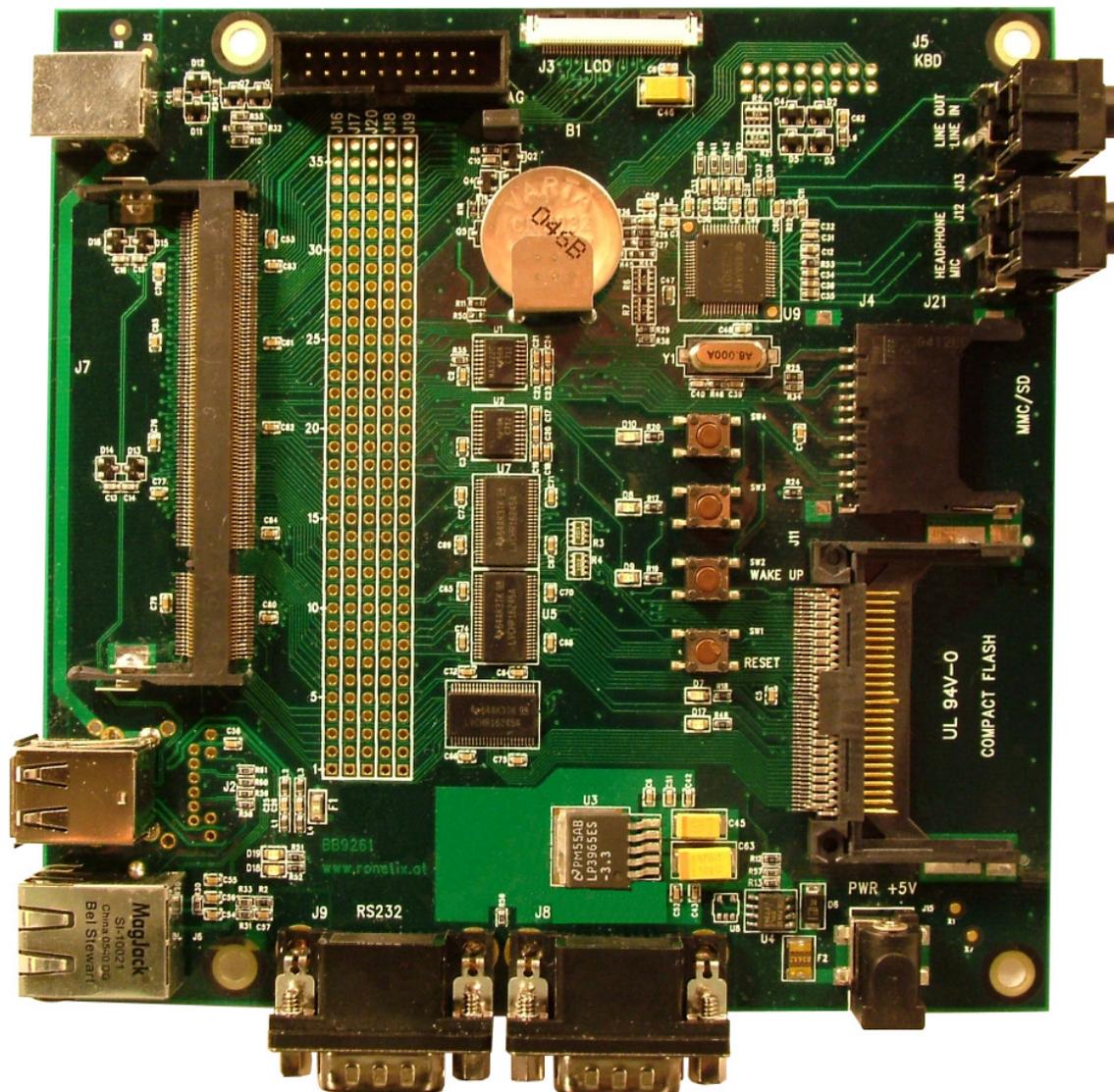
The PM9261 has on board a DM9000A Fast Ethernet Controller with 10/100M PHY and 16 Kbytes SRAM.

## 2.4.8 Temperature range

PM9261 is available in two temperature ranges:

- Standard temperature range 0° +70°C
- Industrial temperature range -40° +85°C

### 3 Base Board BB9261



The BB9261 is equipped with:

- SODIMM 200 pin for reception of PM9261
- One USB device port
- Two USB Host ports
- One RJ45 10/100M Ethernet
- JTAG debug interface, 20-pin
- One 3.5" ¼ VGA TFT LCD + Touch Screen – 40 pin
- Two RS232
- Four Audio connectors: Line In, Line Out, Headphone, Microphone
- One MMC/SD card

- One Compact Flash connector.
- Expansion connectors
- One reset push-button
- One wakeup push-button
- Two user input push-buttons
- Three general purpose LEDs
- Two power LEDs: one for 5V and one for 3.3V
- One Lithium Coin Battery
- DC power connector 2.1mm by 5.5mm. The central pin is positive polarity.

The board dimension is 145 mm by 145 mm

### 3.1 Revisions

There are two revisions of the BB9261: v1.1 and v1.2.

The differences between both versions are:

- The CompactFlash connector on v1.1 is not soldered because of a hardware design mistake. On v1.2 the CompactFlash connector is soldered.
- Added 3.3K pull-up to PA1 (MMC: CMD/SI)
- Added MMC Write Protect: PB5
- Added MMC Card Detect: PA21

### 3.2 Jumpers

Jumper	Description
J14	Forces power on. To use the software shutdown control, J20 must be opened and the battery backup J23 must be closed. default: close
J22	Boot mode select: open – the CPU boots from the internal ROM close – the CPU boots from the NOR Flash default: close
J23	Connect/Disconnect the 3.0V battery backup. default: open

### 3.3 Electrostatic Warning

The BB9261 Module is shipped in protective anti-static packaging. The board must not be subjected to high electrostatic potentials. A grounding strap or similar protective device should be worn when handling the board. Avoid touching the component pins or any other metallic element.

### 3.4 Requirements

The BB9261 requires DC power supply 5V / 1A. The DC power connector is 2.1mm by 5.5mm; the central pin is positive polarity.

The board has reverse voltage protection.

For more information please see the board schematics on the DVD.

## 4 Getting started

The EB9261 is delivered with a DVD containing all necessary and step-by-step procedure for working with the GNU development tools.

Please refer to this DVD, or to the Ronetix web site, for the most up-to-date information:

<http://download.ronetix.info>

### 4.1 Getting started with Linux

To get started with U-BOOT and Linux, please read the U-BOOT and Linux Kernel readme from the DVD or from here:

<http://download.ronetix.info/boards>

### 4.2 Getting started with a standalone example under Windows

To get started with a standalone example under Windows, please read the “Software Installation Guide” from the DVD or from here:

<http://download.ronetix.info/boards>