PEEDI

Powerful Embedded Ethernet Debug Interface

PEEDI is a JTAG/BDM Emulator for ARM7, ARM9, ARM11, Cortex-M3, Cortex-A8, XScale, PowerPC, ColdFire, Blackfin, MIPS32 and AVR32 based MCUs. PEEDI provides the services needed to perform all debugging

Key Features:

► **Device support:**

- **ARM7TDMI**, ARM710T, ARM720T, ARM740T, AT91SAM7, LPC2000, MAC7100, TMS470, STR7, STR9

- **ARM9TDMI**, ARM920T, ARM922T, ARM926EJS, ARM940T, ARM9E, ARM946E, ARM966ES

- **ARM11: ARM1136, ARM1156, ARM1176**

- **Cortex-M3: STM32, LM3S**

- **Cortex-A8: OMAP3**

- **XSCALE**, PXA250, PXA255, PXA270, PXA320, IXP420, IXP421, IXP422, IXP425, IXP460, IXP465

- **PowerPC – MPC5200,** MPC5510, MPC5553, MPC5554, MPC5565, MPC5566, MPC5567

- **PowerQUICC II Pro – MPC83XX**

- **ColdFire –** MCF52XX, MCF53XX, MCF54XX

- **Blackfin** – BF5xx

- **MIPS32 – PIC32, ADM5120**

- **AVR32 – AVR32AP7000, AVR32UC3**

► **Multi Core support – up to 4 Cores/Targets**

► **Built-in debugger support:**

  ♦ **open source: gdb, insight, ddd, Kdbg, Eclipse IDE**

  ♦ **commercial: ARM ADS, RealView, MULTI, IAR IDE, eCosPro**

► **Linux Kernel** debugging also when MMU is enabled

► **uClinux support –** enables debugging of uClinux kernel and applications.

► Access to all CP15 registers - physical or interpreted mode

► Low cost: The combination of free compiler (gcc), free debugger (gdb, insight) and PEEDI.

► **Target Reset control and remote reset detection**

► **Hardware and Software Breakpoints**

► **Blackfin** virtual memory support **-** enables a linear programming and access to a device that is bigger than the visible external asynchronous memory space

Technical specification:

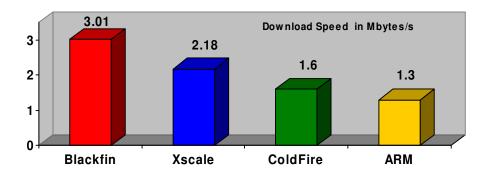|	
JTAG/BDM Clock:	5kHz – 33MHz
	Adaptive Clocking
Download speed	up to 3Mbytes/s*
Target Voltage:	Autosense 1.2V-5V
Ethernet:	10/100BaseT
LEDs:	Power, Target Power, Ethernet Status, JTAG/BDM Status, 7 Segment led
Power Supply:	5V / 1A
	6.9V overvoltage shutdown reverse polarity protection
Small robust aluminium case:	
Dimensions:	115x105x34mm
Weight:	270 gram
I/O ports:	I/O Header 2x10
	RJ45
	RS232
	Power Jack 2.1mm
Buttons:	Two on front panel
	One on back panel - Reset

* Raw download speed, not file or debugger transfer

► **Built in FLASH programmer:**

- ◆ Download images from TFTP, FTP, HTTP server or MMC/SD card
- ◆ Telnet command line interface
- ◆ Front panel interface: 2 buttons and 7-segment LED
- ◆ Can be used as **standalone FLASH programmer** without host - the file images are stored on MMC/SD card and controlled via front panel interface
- ◆ Up to 15 file images can be selected on the front panel
- ◆ Support of various chip vendors: AMD, Intel, Atmel, Toshiba, SST, SGS and others. The built-in FLASH chip database contains information of more than 900 chips as well as Atmel AT91SAM7, Philips LPC2000, Freescale MAC7100, iMX31, TI TMS470, ST STR7, STR9 and Cotex-M3. Support for MPC5553, MPC5354, MPC5565, MPC5566 and MPC5567, MCF52XX, MCF53XX, MCF54XX.
- ◆ Programming of Atmel **AT45DB SPI DataFlash** devices connected to an AT91 MCU – enables the easy use of AT45DB SPI DataFlash as boot device
- ◆ Programming of **NAND and OneNAND Flash** devices - MCU independent
- ◆ NAND FLASH **JFFS2** support
- ◆ auto FLASH program after target power detect
- ◆ multi FLASH support – up to 4 devices per core
- ◆ built-in speaker
- ◆ ideal for small and mid-range manufacturing

► **Built-in telnet server for FLASH programming and debug services**
► **Automatic processor initialization on power-up and Reset**
► **RS232 serial interface for setup**
► **Capability to route the RS232 of the PEEDI to a TCP/IP port**
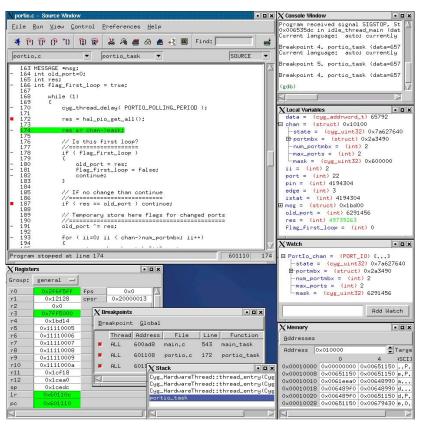► **Warranty: Hardware 2 Years; Software 1 Year**

Raw Download Speed:

PEEDI has a built-in command to measure the raw download speed, i.e. downloading to target RAM without the overhead of loading a file from server or waiting for a debugger to send data. The tests are made using 33MHz JTAG clock and 22MHz BDM clock.

PEEDI debugging is completely non-intrusive and requires no target system resources. Together with gdb and insight source level debugger, PEEDI provides powerful control over the embedded target platform.

► **Insight** is a graphical user interface to GDB, the GNU Debugger. It provides:

► Run/stop of target application

► Single-step, function step into, step-over

► Display/modification of processor registers

► Read/write access to target memory

► Support for all on-chip hardware breakpoints

► Unlimited software breakpoints

► Display of program code in source, assembly or mixed mode
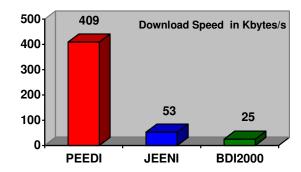
► Full variable expression handling

Insight is being released under the terms of the GNU General Public License (GPL) and can be downloaded from http://sources.redhat.com

RONETIX provides pre-built GNU cross toolchains for Linux and Windows with Cygwin and a detailed install guide.

Download Speed with GNU gdb:
By default, GDB normally downloads program code and data in small chunks which causes the program download to be slow. PEEDI supports large download packet size (up to 16 kbytes) which improves the download speed.

► Target CPU ARM7TDMI running at 32MHz (EB55800 with AT91M55800A)

► SRAM 16-bit access, 0WS

► arm-elf-gdb v6.3.50 running on Linux RedHat 9.0, Athlon XP 1.6 GHz

► Ethernet: 100 Mbits/s

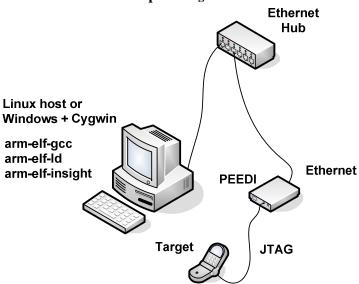*PEEDI: JTAG Clock 33MHz, 35cm JTAG cable, gdb download-write-size 16KB*
JEENI: rev 2.2
BDI2000: JTAG Clock 16MHz , Firmware v1.09,Logic v1.04

Development Environment:

A simple configuration:

Ethernet
Hub

Linux host or
Windows + Cygwin

arm-elf-gcc
arm-elf-ld
arm-elf-insight

PEEDI   Ethernet

Target   JTAG

A typical standalone development configuration consists of a target board with ARM processor, PEEDI and PC with GNU ARM toolchain. The PC can run Linux or Windows OS.
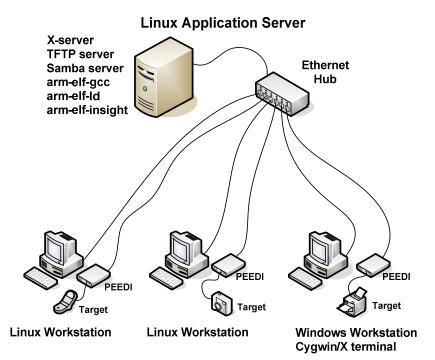
The native OS for the gnu tools is Linux, but Windows + Cygwin can be used as well. Cygwin is a free Linux-like environment for Windows. It works on all Windows 32-bit OS versions since Windows 95 except Windows CE.

Another development configuration (RONETIX recommended) consists of a Linux Server with installed gnu toolchain, X11 Server and Samba (optional, for Windows shares). The GNU tools run on the Linux Server, the workstations need only an X-terminal.

For workstations Linux or Windows PC can be used. A Linux PC needs nothing additional. The Windows PC needs an X-terminal to connect to the X-server. For X-terminal the open source Cygwin/X or some commercial product (for example X-Win32) can be used.

► This configuration has the following advantages:
► the toolchain is installed only on one PC
► to update the toolchain you need to do this only once for the server
► the workstations have nothing additional installed – it's very easy to add additional workstations to the workgroup
► all project source codes can be stored on the Linux Server – it's easy to make backups. The Windows PC can access the source codes via Samba shares. Other way to access is via CVS (Concurrent Versions System).

An example of multiple programmer development:

Linux Application Server

X-server
TFTP server
Samba server
arm-elf-gcc
arm-elf-ld
arm-elf-insight

Ethernet
Hub

PEEDI   PEEDI   PEEDI

Target   Target   Target

Linux Workstation   **Linux Workstation**   **Windows Workstation Cygwin/X terminal**

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