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www.t-engine4u.com

µT-Engine/M32104 Development Kit

An Open Development Platform for Embedded Systems

T-Engine®

The CPU Board of the µT-Engine/M32104 Development kit (in full-scale)

If you have any questions, please feel free to contact us.
E-mail: te-sales@personal-media.co.jp

Hardware Specification of µT-Engine/M32104 Development Kit

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CPU Board	
CPU	Renesas Technology M32104 (M32R, internal clock 216MHz)
Flash Memory	4 MB
SDRAM	16 MB
Input/Output I/F	Compact Flash (CF) card, serial, eTRON chip I/F, MultiMedia card (MMC), LED (2), expansion bus I/F
Others	RTC
Power Supply	AC adapter
Dimensions	60 x 85 mm (excluding protrusions)
Expansion LAN Board	
LAN	SMSC LAN controller (LAN91C111) 100BASE-TX/10BASE-T
Connectors	SDI connector (connects SDI debugger) LAN RJ-45 connector AR board connector Parallel interface (8-bit port I/O)
Dimensions	60 x 85 mm (excluding protrusions)
AR Board	* AR : Artificial Retina.
Resolution	160 x 144 x 3 (RGB)
Others	Lens (integrated package)
	Built-in circuits for CDS, AGC, gamma and color tone corrections
	Built-in functions for gain and black level adjustments
Dimensions	40 x 35 mm (excluding protrusions)
Power Supply Board	
Dimensions	45 x 35 mm (excluding protrusions)

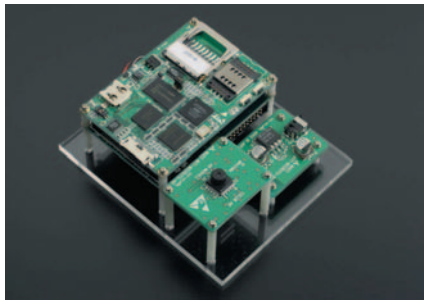

photo1: µT-Engine/M32104 Development Kit

photo2: Extension LAN Board

PRODUCT SPECIFICATION

Supplied Software

For T-Engine target board

- PMC T-Monitor
- PMC T-Kernel
  T-Kernel/OS, T-Kernel/SM, T-Kernel/DS
- Device drivers
  Clock (RTC), console (serial), system disk (CF card)
  * The source code for the above device drivers are provided.
- Sample applications: source code included

Note:

- The device driver for the expansion LAN board is currently being developed and will be released soon.
- Customers are allowed to execute the above software on µT-Engine/M32104 Development Kit only. If the above software are executed on another hardware (or embedded in a final product), a separate license is required. Please contact us for further information.
- Among the above software, T-Kernel will be release as the open source software by the T-Engine Forum. More detailed information and license agreement will be supplied on inquiry to the T-Engine Forum.

For development machine

- GNU development environment with source code
  GNU based development environment running on PC-based Linux
  (including gdb source debugger)

System Requirements for GNU Development Environment

- PC/AT compatible Linux
  • Confirmed package: RedHat Linux 7.1 / 7.3 / 8.0 /9.0, Red Hat Professional Workstation.

Optionals

µT-Engine/M32104 Extension Universal Board

Dedicated Connectors for Extension Bus of T-Engine/µT-Engine

T-Engine/µT-Engine Universal Board.

T-Engine/µT-Engine Universal Board is a set of 4 different universal boards. They are convenient to make your own extension boards. By mounting peripheral LSIs on the boards, you can efficiently develop software or hardware of systems applying the LSIs.

T-Engine/µT-Engine FPGA Extension Board.

T-Engine/µT-Engine FPGA Extension Board can be connected T-Engine/µT-Engine board via extension bus. Interface and user circuits can be implemented on the FPGA embedded in this board. These circuits are integrated into one whole system with SOPC Builder development software by Altera Corporation, which makes reusable design easy.
Following 4 components are also included with this board: Quartus II WebEdition, which is FPGA design tool by Altera, Nios II development environment including Nios II processor core evalution version, FPGA cofiguration, and a download cable connecting Nios II IDE and hardware.

Documentation

The following documentation are being supplied in electronic files:

- Development Kit User's Manual
- Library Manual
- Device Driver Manual
- GNU Development Environment Manual
- T-Monitor Specification
- T-Kernel Specification
- T-Monitor/T-Kernel Implementation Specification
- Hardware User's Manual (circuit diagrams provided)

* Some documents are provieded in Japanese. Please contact us for more information.

Main Package Details

- Hardware
  µT-Engine specified CPU board with M32104 T-Engine Forum reference number : m301.
  Expansion LAN board.
  Artificial retina (AR) board.
  Power supply board.
  AC adapter.
  RS232C (serial) cable.
  Acrylic board for µT-engine/M32104.
- CD-ROM
  T-Kernel and other software and various documentation.
- Others
  Packing list, Software License Agreement, etc.

Reference Books and Related Information

- T-Kernel Standard Handbook, Ken Sakamura (Ed.), 3800yen.
  * English documents are included as PDF files on CD-ROM.
- T-Engine, T-Engine2, T-Engine3 (TRONWARE extra edition), 1600yen (each).
- TRONWARE Vol.1-96 (TRON bimonthly magazine, scheduled to be continued),1200yen (ordinary issue).
- µITRON 4.0 Standard Guidebook, Ken Sakamura (Ed.), 3200yen.

* The above books are published by Personal Media Corporation in Japanese. Tax is not included.

- T-Engine Forum http://www.t-engine.org/
- TRON Project http://www.tron.org/
- Personal Media Corporation (T-Engine Solution Website) http://www.t-engine4u.com/

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- For details and price, please contact us.
- TRON is an abbreviation of "The Real-time Operating System Nucleus".
- eTRON is an abbreviation of "entity and economy TRON".
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