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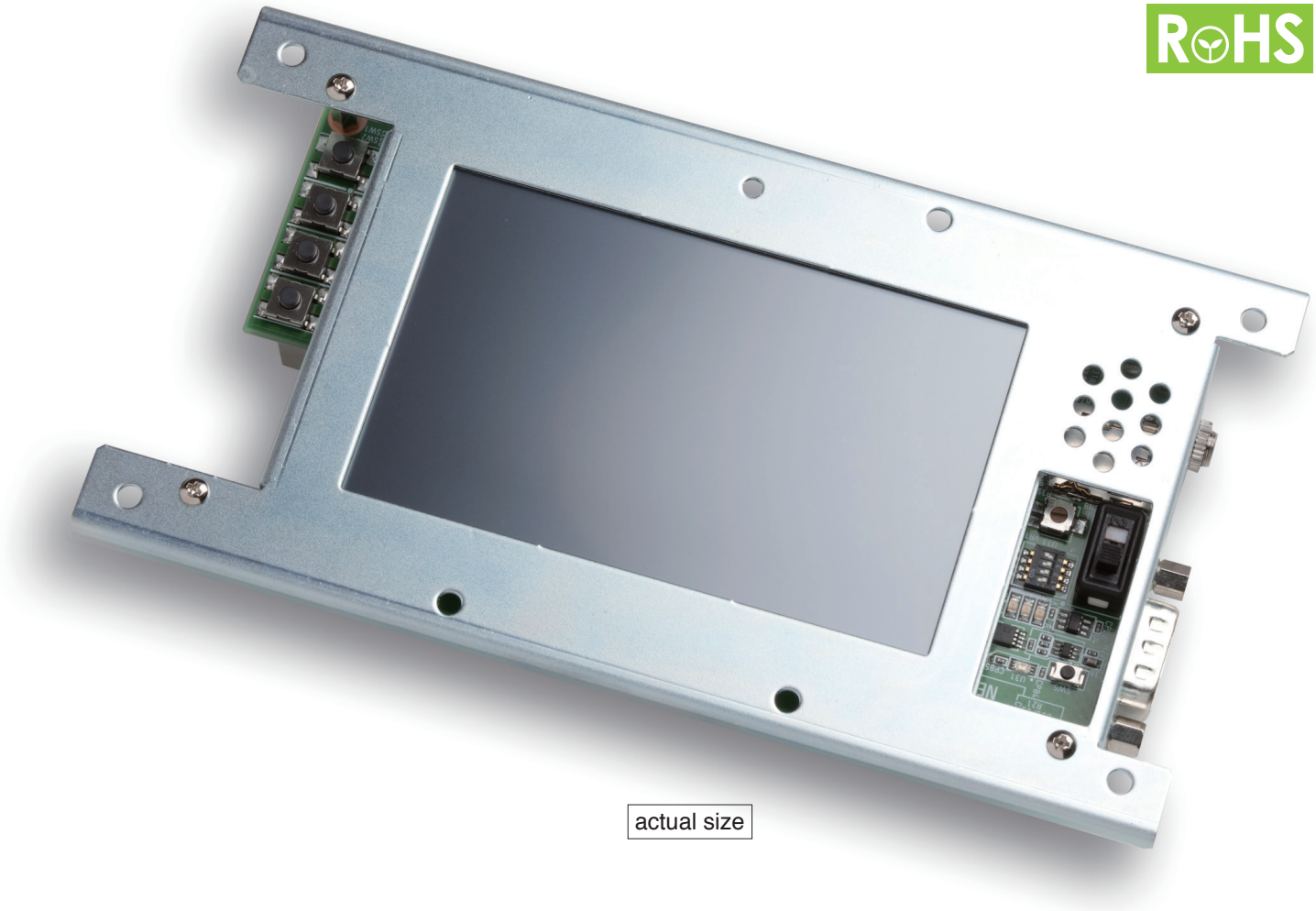
T-Kernel 2.0

T-Engine Reference Board with SDK for Embedded Systems

T-Kernel 2.0 Reference Kit

Supporting T-Kernel 2.0

RoHS



actual size

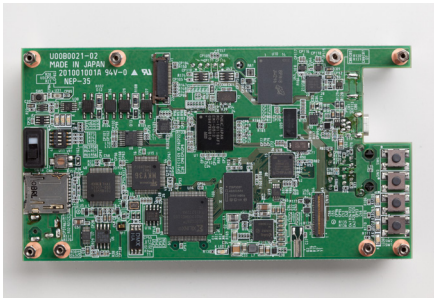
- Reference Board Certified by T-Engine Forum as Target Board for T-Kernel 2.0.
- Hardware and Software for Development of Embedded Devices are Provided as All-in-One Package.
  Including T-Kernel 2.0, Middleware (File, GUI), Development Environment (Eclipse).
- Powerful CPU (ARM11 Core 500MHz).
- Various I/O Interfaces such as WVGA-sized LCD with Touch Panel, LAN, USB 2.0, Serial, GPIO, microSD.

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

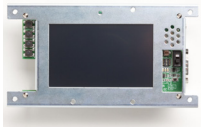
Features of "T-Kernel 2.0 Reference Kit"

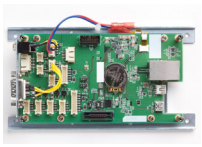
- This kit is the high-performance and high-functioning embedded board with "T-Kernel 2.0", the next generation real-time OS for embedded systems. This kit also includes various middleware and device drivers for T-Kernel, development environment, technical documents. The hardware and software for the development of embedded devices are provided as all-in-one package.
- T-Kernel 2.0 provided by T-Engine forum as an open source software runs on the board with no change.
- The hardware features various I/O devices(*1) such as WVGA-sized (800×480 dots) LCD with Touch Panel, LAN, USB 2.0, UART(Serial), GPIO, microSD card, eMMC, sound, HLS(High-speed Link System), chip LED, PUSH switch, illuminance sensor, temperature sensor and camera(optional product).
- You can easily develop various GUI based applications, because the kit includes "PMC T-Kernel Extension" for File Management and Process Management, TCP/IP for network communications, GUI middleware "PMC T-Shell" and Visual language "Micro Script". As an optional, GUI libraries of "Qt" are available, too(*2).
- This kit is suitable for the customers, not only in Japan, but worldwide, since English versions of software and documents are also attached to the kit.

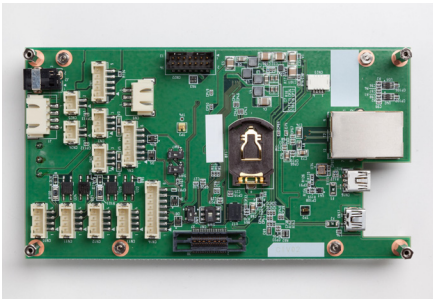
(*1) Regarding some I/O devices such as Sound, device drivers are not included.
(*2) As for the release date of "Qt", please contact our sales division.



Upper side of CPU board







Back side of CPU board

Applications

* Evaluation or Development of T-Kernel 2.0.
* A device control terminal or an information display terminal at factory.
* A controlling device or a control terminal for equipment instruments at house or building.
* POP terminal at shops or production sites.
* A ticket vending machine or a control terminal for e-money payment.
* Teaching materials for practical training of embedded programming including RTOS, hardware control, GUI.

Product Specification

Hardware

●CPU board

CPU	Renesas Electronics EMMA Mobile1-D (ARM11 Core,500MHz)
Flash ROM	32MB (NOR Flash)
RAM	64MB (CPU built-in)
eMMC	4GB, It can be used for the secondary storage.
JTAG-ICE I/F	for Kyoto Microcomputer Co., Ltd.'s PARTNER-Jet
Power supply	DC +5V, AC adapter
CPU board Dimensions	137mm×75mm (not including protrusions)
Metallic frame Dimensions	161mm×87mm (not including protrusions)
RoHS	Compliant
I/O Interfaces	
microSD slot	1 slot
LAN	10/100BASE-T, RJ-45 connector
USB-OTG(*3)	supporting USB 2,0, mini-AB connector
USB-UART(*4)	mini-B connector
Serial(*5)(*6)×2	RS-232 or CMOS level shift
Insulated I/O(*6)×4 bits	insulated GPIO by photo coupler
Sound(*6)	Microphone-in, Speaker-out
HLS(*6)	High-speed Link System
Others	Chip LED×4, PUSH Switch×4, illuminance sensor, temperature sensor, camera module (optional)

(*3) You need USB cable with USB mini-A connector for connecting USB devices such as mouse, keyboard, USB mass storage. The attached device driver supports functions for USB-Host, not supporting functions as USB-Function.
(*4) This can be used for debugging console by connecting USB of PC for development.
(*5) One piece of DSUB 9-pin connector (for Serial) is attached.
(*6) Box-type substrate connectors on CPU board are used.

●LCD board

LCD	4-inch, TFT color, 800×480 dots
Touch panel	Resistance film

Software

Target-side Software	
T-Monitor	PMC T-Monitor
T-Kernel	PMC T-Kernel 2.0
T-Kernel Extension	PMC T-Kernel Extension (process management, file management, etc)
Device drivers	microSD, LAN, USB 2.0 (for Host), Serial, RTC, KB/PD, Screen(LCD), Touch panel, USB-HID class, USB mass storage class, etc.
Applications	PMC T-Shell (GUI middleware), Micro Script (Visual language), development tools including CLI, utilities, etc.
Host(Windows)-side Software(*7)	
SDK	Eclipse for PMC T-Kernel - GNU C/C++ compiler (designed for T-Kernel) - GDB (source-level debugger) - ANSI C Library, T-Kernel Library, sample sources, etc.

(*7) We have confirmed that the above host-side software run on Windows XP SP3, Windows Vista(only 32-bit version) and Windows 7(32-bit/64-bit version). GNU development environment with no GUI runs on Linux. We have checked the operation on Ubuntu 8.04.

Reference Books and Related Information

- T-Kernel Standard Handbook, Ken Sakamura (Ed.), **3800yen**.
  * English documents are included as PDF files on CD-ROM.
- T-Kernel Kumikomi Programing Kyokasho (A Practical Guide to T-Kernel Embedded Programing), Ken Sakamura (Ed.), **4200yen**.
- Jissen TRON Kumikomi Programming(A Practical Guide to T-Kernel Embedded Programming for beginners), Ken Sakamura(Ed.), **3200yen**.
- TRONWARE Vol.1-129 (TRON bimonthly magazine, scheduled to be continued), **1200yen** (ordinary issue).

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

- T-Kernel Kumikomi Programing Kyokasho(E-book for iPad), Ken Sakamura(Ed.).
- Jissen TRON Kumikomi Programming(E-book for iPad), Ken Sakamura(Ed.).

* The above e-books are available at App Store. These e-books are written in Japanese.

T-Engine Forum **http://www.t-engine.org/**
Personal Media Corporation (T-Engine Solution Website) **http://www.t-engine4u.com/en/**
PMC International Retail Site **http://www.personal-media.co.jp/retail/**

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