We offer the software development services for embedded systems and applications. Please contact us for further customized services.

RTOS Porting, Kernel Tuning & Customization

Real-Time OS (μITRON RTOS, embedded Linux, OSE, Sciopta, Windows Embedded Compact etc.) is ported to the hardware platform based on the processor architectures such as ARM, SuperH, H8, PowerPC, MIPS etc., matching platform top capabilities for full performance. We also provide OS Kernel tuning, porting to new toolset and customization services.

Middleware Stack Development
(Development, Customization, Porting, Tuning)

Various Middleware Stack modules such as TCP/IP, PPP, HTTP, GUI, USB, File-System, etc. are required to interface a user application with underlying RTOS and hardware resources. We provide services for development and porting of the software or hardware middleware stack on to Target platform running with or without RTOS.

Application Development
(Development, Customization, Migration)

We offer the design and development services to help building or migration of custom applications and utility programs for embedded systems. PC based DLL, MFC, EXE or GUI application development is also possible.

Firmware / Device Drivers / BSP Development, Customization and Tuning

The Target hardware includes various IO and memory device controllers dedicated for specialized use. In most of the cases the RTOS and application modules do not support direct interface to these hardware peripheral controllers. Specially built device driver program is required to build RTOS specific hardware independent functional interface for optimal access to the peripheral controller device. Each peripheral controller has different internal hardware processing and has unique interface requirements. Although the generic device driver programs offered by chip manufacturers are easy to interface, the throughput performance is inefficient.

We provide development services to design and build a target specific firmware/BSP or a dedicated device driver, matching the full hardware features of standard IO/MEM controller or custom built peripheral controller. We also help customer to Upgrade and Port the older version of device driver program on to the revised hardware.
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Work History

Processor (8/16/32-bit)
Target Hardware Platform
- LCD/VGA
- Storage Disk
- Processor / CPU
  - ARM7, ARM9, ARM9E, Intel Xscale, ARM11, Cortex-M0/M3/M4,
    Cortex-A8/A9, AT91 CPU Family, SH2, SH2A, SH3, SH3A, SH4A,
    H8, H8S, H8SX, M16C/60 Series, PowerPC, PowerPC e500v2, e600,
    MIPS24K, ARC 600, ARC 700, IPFlex etc.

② IO/MEM Device Drivers
- CPU Cache, MMU I/F
- CPU Bus/Memory Controller
- PLL/Clock Controller
- DMA Controller
- Interrupt Controller
- Timer, Counter Controller
- Real-Time Clock (RTC) Controller
- RS232, RS485 Serial Controller
- I2C, SPI, ESP1 Bus I/F
- EEPROM I/F
- Flash (NOR, NAND, Serial, Custom) Controller
- ADC, DAC
- POMCIA Controller
- PCI, CompactPCI Bus I/F
- LAN Controller (10/100/1G)
- Wireless LAN Controller
- CF Card, SD Card I/F
- LCD, VGA Controller
- Touch screen I/F
- ARCCNET Controller
- USB Controller (Function)
- CAN Controller
- Custom FPGA Device
  etc.

③ OS Kernel I/F
  RTOS Kernel Porting
  RTOS Kernel Tuning
- μITRON Kernel ported to Cortex-A8, ARC 600, ARC 700, IPFlex DAP processor.
- μITRON Kernel corresponding to work with MetaWare, IPFlex FW II development
  environment. Tuning of TOPPERS JSP/FDMP/ASP Kernel etc.

④ RTOS Porting
- μITRON RTOS:
  - NORTI, NORTI Version4
  - TOPPERS/JSP/FP/FDMP/ASP/Pro
  - μC/Standard, μC/Compact
  - M3T-MR30 (M16C Series RTOS)
  - ENEA OSE RTOS, SCIOPTA
  - Embedded Linux, WindRiver Linux,
    Windows Embedded Compact 7 (WEC7) OS etc.

⑤ Stack Porting
- NORTI Middlewares (TCP/IP, PPP, HTTP, SMTP, SNMP, FileSystem),
  SD File System (TED),
  Datalight Reliance Nitro File System,
  TOPPERS/TINET TCP/IP Stack,
  μC3 RTOS TCP/IP Stack (μNET3),
  OSENETv4, IPNET/LINX, SCIOPTA IPS,
  Linux Middleware modules etc.

⑥ Custom Development
- μITRON RTOS debug library plug-in developed for KEIL-MDK and EW C-SPY Debugger
- Firmware and HTTP server application development for HD-PLC system
- Development of RTOS Performance Test program and Demo application
- Development of C++ Compiler I/F for μITRON RTOS. RTOS objects can be defined as
  C++ class type interface
- Development of Bootloader and Monitor program (support for boot from SD Card)
- Development of Inter-Processor communication protocol and software bridge drivers
  for dual processor embedded platform running with Linux and μITRON RTOS
- Development of PAYPASS and EMVCO specification verification test program (target
  program + Windows EXE program) for non-contact type IC card R/W device
- Stack porting and demo program development for USB 2.0 device class driver
- Demonstration program for message passing using CAN/LIN protocol
- PCI bus I/F Driver and application development for Windows XP (32-bit)
  etc.

※ TRON is the abbreviation of “The Real-time Operating system Nucleus”. μTRONis the abbreviation of “Micro Industrial TRON”.
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