R-IN32M3-EC

Multi-Protocol Industrial Ethernet IC

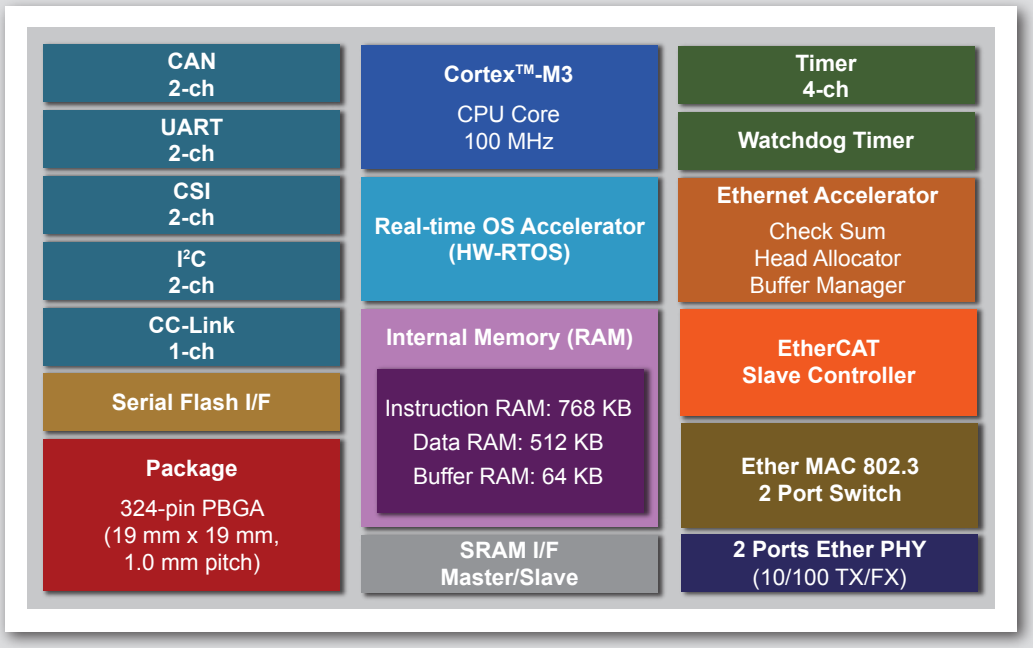
The R-IN32M3-EC is an Industrial Ethernet Communication Controller, which incorporates the R-IN32 Engine, an EtherCAT Slave Controller, a 2-port switch with Ethernet PHYs, internal RAM, fieldbus interfaces and an extensive set of peripherals. The R-IN32 Engine consists of a 32-bit ARM® Cortex™-M3 RISC CPU, a Hardware Real-Time OS Accelerator (HW-RTOS) and a hardware accelerator for speeding up network packet processing.

State of the art high-speed real time processing with outstanding low power dissipation is provided by the R-IN32M3-EC. The HW-RTOS allows for cutting edge speedy task changes and interrupt responses. In addition, comprehensive OS hardware support accelerates system calls drastically. The hardware system timer implementation offers an unmatched timer precision and determinism.

Industrial protocols like EtherCAT, PROFINET RT, EtherNet/IP, FL-net are easily implemented on the same device, reducing the implementation efforts to a minimum. Our rich partner network provides easy access to a variety of industrial Ethernet and Fieldbus controller software, allowing you to focus on the implemenation of your application. Hence, the R-IN32M3-EC is a true one-stop-get-it-all device, meeting fast time to market requirements where multiple industrial protocols are needed.

EtherCAT®
PROFINET®
EtherNet/IP™
Modbus
CANopen®
DeviceNet™
PROFIBUS®

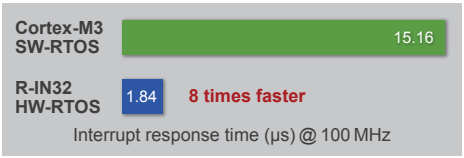
Block Diagram



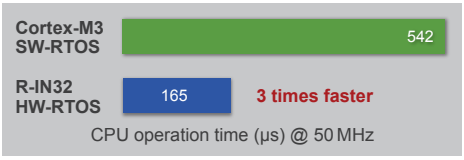
Benefits

Benefits of the real-time OS Accelerator

- Speedy interrupt response times

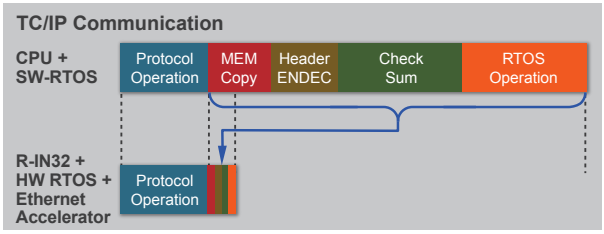


- Fastest task switching



Benefits of The Ethernet Accelerator

- Drastic reduction of overhead processing



Product Features

- High-performance ARM Cortex M3 CPU core
  - » 100 MHz max. clock frequency
  - » 768 KByte instruction memory
  - » 512 KByte data memory
  - » 64 KByte buffer memory
- Integrated interrupt controller
- EtherCAT slave controller
- Hardware Real-Time OS Accelerator
- Ethernet Accelerator
- Integrated 2-port Ethernet Switch with cut-through technology for fastest Ethernet packet processing
- IEEE1588 V2 (PTP) and Device Level Ring (DLR) support
- 2 integrated 10/100 Industrial Ethernet PHYs
- Serial Flash Interface
- 16/32-bit SRAM interface
- Multi-channel real-time DMA controller
- 2 I²Cs interfaces
- 2 UART interfaces
- 2 CSI interfaces
- 2 CAN interfaces
- 1 CC-Link interface
- Support for a wide range of industrial Ethernet protocols including but not limited to PROFINET RT, EtherNet/IP, Modbus TCP, EtherCAT and FL-net
- All clocks generated (via PLL) with 25 MHz crystal oscillator
- 4 Timers
- Watchdog timers
- Boundary scan support
- Compact 324-pin BGA package, 19 mm x 19 mm, 1 mm ball pitch
- Power supply: 1.0 V (Core), 3.3 V (IO)
- Temperature range T_A -40°C to +85°C

Ordering Information

Part Number	Package/Type
MC-10287BF1-HN4-M1-A	PBGA 324, 19 x 19 mm, 1.0 mm ball pitch
Y-SK-RIN32M3-EC	Starter Kit
YCONNECT-IT-RIN	Connect it! – Ethernet R-IN Solution Kit

Documentation

Extensive documentation and example software can be found at www.renesas.eu/r-in

Renesas Electronics Europe
www.renesas.eu

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