

R-IN32M3-CL

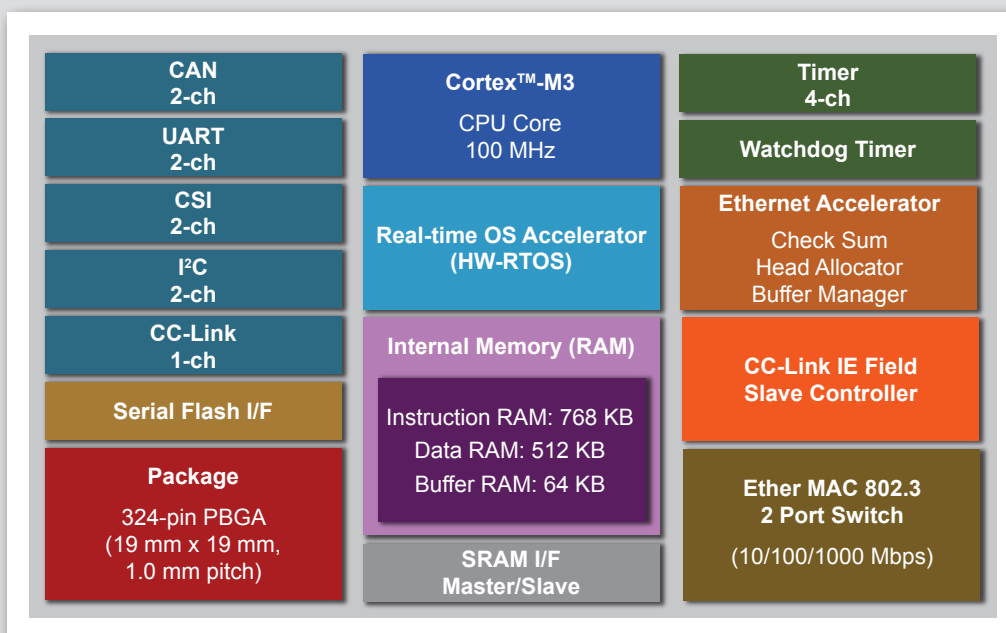
Multi-Protocol Industrial Ethernet IC

The R-IN32M3-CL is an Industrial Ethernet Communication Controller, which incorporates the R-IN32 Engine, a CC-Link IE Field Slave Controller, a 2-port switch, 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-CL. 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 Ethernet protocols like CC-Link IE Field, 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 implementation of your application. Hence, the R-IN32M3-CL is a true one-stop-get-it-all device, meeting fast time to market requirements where multiple industrial protocols are needed.

Block Diagram



Benefits

Benefits of the real-time OS Accelerator	Benefits of The Ethernet Accelerator
<ul style="list-style-type: none"> Speedy interrupt response times <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"> <p>Cortex-M3 SW-RTOS 15.16</p> <p>R-IN32 HW-RTOS 1.84 8 times faster</p> <p style="font-size: small;">Interrupt response time (µs) @ 100 MHz</p> </div> <ul style="list-style-type: none"> Fastest task switching <div style="border: 1px solid #ccc; padding: 5px;"> <p>Cortex-M3 SW-RTOS 542</p> <p>R-IN32 HW-RTOS 165 3 times faster</p> <p style="font-size: small;">CPU operation time (µs) @ 50 MHz</p> </div>	<ul style="list-style-type: none"> Drastic reduction of overhead processing <div style="border: 1px solid #ccc; padding: 5px;"> <p style="text-align: center; font-weight: bold; font-size: small;">TC/IP Communication</p> </div>

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
- Hardware Real-time OS Accelerator
- Ethernet Accelerator
- CC-Link IE Field controller
- Integrated 2-port Gigabit Ethernet Switch with cut-through technology for fastest Ethernet packet processing
- IEEE1588 V2 (PTP) and Device Level Ring (DLR) support
- Serial Flash Interface
- 16/32-bit SRAM interface
- Multi-channel real-time DMA controller
- 2 I²C 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, CC-Link IE Field and FL-net
- All clocks generated (via PLL) with 25 MHz crystal oscillator
- 4 Timers
- Watchdog timer
- 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
UPD60510BF1-HN4-M1-A	PBGA 324, 19 x 19 mm, 1.0 mm ball pitch
Y-SK-RIN32M3-CL	Starter Kit

Documentation

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

Before purchasing or using any Renesas Electronics products listed herein, please refer to the latest product manual and/or data sheet in advance.

