Connect It! Remote IO

Easily integrate IO-Link into Ethernet-based fieldbuses

µPD78F806x Series

Use IO-Link
Universal · Smart · Easy

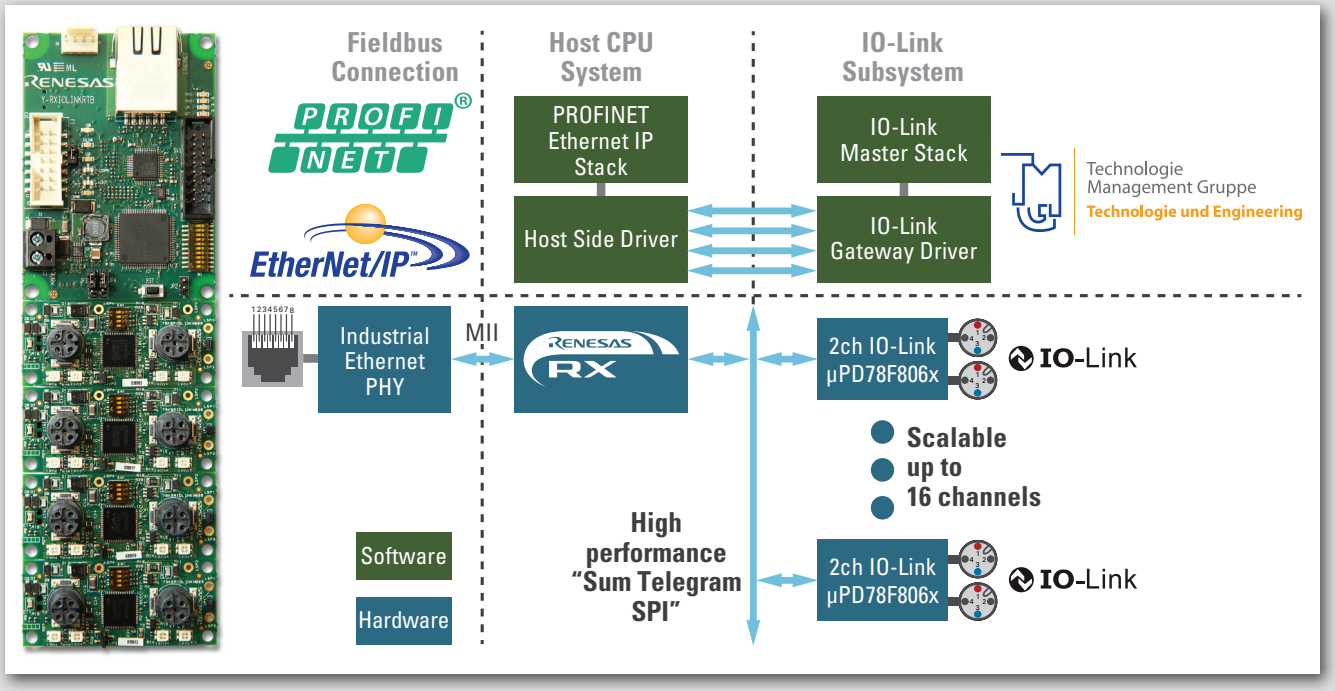
The Connect It! Remote IO ToolBox provides a modular development platform for fast remote I/Os module design and IO-Link integration into fieldbuses. All the technology blocks and pre-certified components to build up a high quality remote IO system are provided. The system is built with a selection of Renesas Electronics controllers. A 32-bit RX63N host CPU incorporating an Ethernet MAC enables easy Industrial fieldbuses implementation such as PROFINET RT and Ethernet IP. The low resources requirement of the included TMG TE evaluation stacks imply no external memory (RAM or ROM) is used in this solution.

The IO-Link subsystem is implemented on the µPD78F806x series, the world first integrated dual IO-Link Master controller in the industry. The solution' scalability grants the designer complete control over the number IO-Link ports to realize up to 16 IO-Link ports applications. Ports number are managed just by stacking or un-stacking IO-Link master modules to the Host controller system. The IO-Link Master module runs a Smart IO-Link master stack firmware integrating a SPI host driver with high efficiency protocol support, as well as IO-Link specification v1.1 compliant features, including parameter server, EMC functionality, and more. The Connect It! Remote IO Tool Box includes an IO-Link Slave node in the Box for evaluation purposes. Connection to the fieldbus network via a RJ45 connector is realised by an industrial Ethernet PHY supporting MII or RMII interface configuration, hardware support for PTP as defined in IEEE1588 v2, assures the IEEE802.3.

Applications

- Modular Remote I/O
- IO-Link Gateway

Application Example



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Key Benefits

- Scalable 32bit Uplink host controller
- Extended Industrial Ethernet PHY family
- Single-chip IO-Link Master solution
- Advanced SPI sum protocol for scalability
- Mapping from IO-Link to Industrial Ethernet
- Fieldbus independent com. to Engineering tool
- Firmware update via SPI
- Pre certified Hardware

Key Features

- Fully standard compliant with IEEE 802.3/802.3u for 100BASE-TX, 100BASE-FX and 10BASE-T
- MDI interface: 10BASE-T and 100BASE-TX to UTP cable via magnetics
- Integrated PMD sub-layer featuring adaptive equalization and baseline wander correction
- IEEE 802.3u auto-negotiation and parallel detection
- Full and half duplex operation
- Supports automatic polarity detection and correction
- Supports automatic MDI/MDI-X crossover
- Supports IEEE1588 v1 and v2
- IO-Link Subsystem: µPD78F806x
  - » 16-bit low voltage CPU core
  - » Built-in 2 channels IO-Link Master ports
    - IO-Link supply switch supporting external PMOS transistors
    - Wake-up generation support
    - Digital inputs configurable for IO-Link or IEC61131-2 compatible interface
    - SPI interface for configuration, programming and diagnostic functions
    - Over-current & short-circuit protection at output stages with configurable thresholds
    - Over temperature protection
    - Port communication Status LEDs
    - x2 Digital I/Os IEC 61131-2 Type 1
  - » x2 Master Modules
- Host CPU System: RX63N R5F563NEDDFP
  - » 332-bit RX CPU core
    - Max. operating frequency: 100 MHz
  - » Low-power design and architecture
    - Operation from a single 2.7 to 3.6V supply
  - » ROM/RAM/ E2Data Flash Capacities
    - 2 Mbytes/128 Kbytes/32 Kbytes
  - » Communications interfaces
    - o Host/function or OTG controller (1 channel) with full-speed USB 2.0 transfer
    - SCI, I²C, RSPI, CAN
    - Ethernet MAC
  - » DMA
    - DMAC: Four channels
    - Dedicated DMAC for the Ethernet controller: Single channel
- Power supply voltage
  - » V_{DD} = 2.7 to 3.45 V;
  - » V_{DDH} = 8 to 36 V
- Software package
  - » Profinet IO Device Stack
    - Conformance Class B
    - Message Box based interface According to PROFINET specification 2.2 (2.3 in preparation)
    - RTOS and TCP/IP stack used for reference design:
    - Code Size: less than 256 Kbyte
    - RAM: less than 100 Kbyte
  - » SiP IO-Link V1.1 compliant Master stack
    - TMG IO-Link Master stack library,
    - Host library interface source code
    - Running demo project including BSP for RX63N host microcontroller
- Operating ambient temperature
  - » TA = −40 to +85°C

Ordering Information

Order Number	Board Size
Y-RXIOLINKRTB	Host CPU System = 75 x 54 mm
	IO-Link Master module = 24 x 54 mm

For further information on Connect It! Remote IO ToolBox visit our European website at www.renesas.eu/io-link

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www.renesas.eu

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