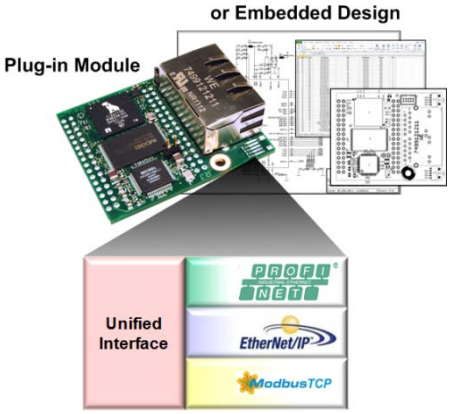
RapID™ Platform - PROFINET Network Interface

2-Port, Class B Connectivity Solution

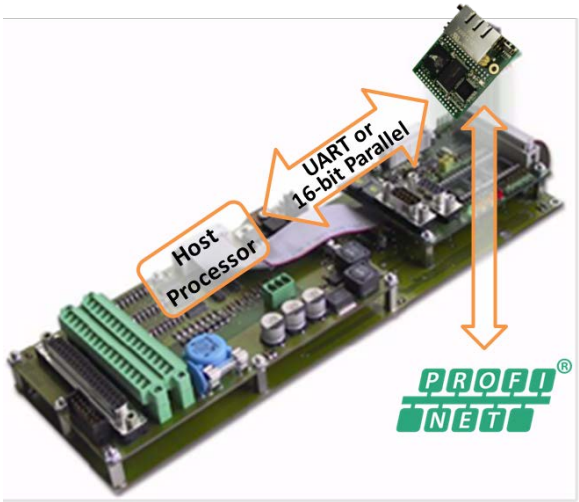
The *RapID Platform Network Interface* is a pre-tested module that manages the industrial protocol and network traffic with a single host processor interface



The interface contains everything needed including the communications controller, protocol stacks, Flash, RAM, and PHYs. All PROFINET capabilities are encapsulated on this small form factor device, and can be integrated into any type of automation equipment from complex control to a simple sensor or actuator. For applications where space is limited, the module's design can be embedded directly into the field device. The *RapID Platform Network Interface* connects to a "Host" processor via a UART or 16-bit Parallel Interface. At the software layer the Host connects to a "Unified Interface" so other protocols can be used without changing the host software. PROFINET communication is Class B certified and passes Net Load Class III. This means your field device incorporating a *RapID Platform Network Interface* will operate problem-free with any PROFINET controller and will never disconnect from the network.

Easy Hardware and Software Integration

The *Network Interface* can be integrated into a design as either a module or an embedded design. As a module, the *Network Interface* plugs into a board using standard 2.54 mm pitch through-hole pins. When designing-in the module, hardware integration is as easy as connecting Power/Ground/Reset and interfacing the Host to the UART or 16-bit Parallel interface. The Ethernet physical interface is ready to plug into the network. Software for the module is provided as firmware that is resident on the flash.



As an embedded design, the *Network Interface* hardware design can be integrated directly using the schematics provided. Also provided are the Bill of Materials and example layouts to minimize the hardware design effort. Software for the embedded design is provided as firmware that is downloaded to the flash. Whether using the *Network Interface* as a module or an embedded design, no software development is required and there are no license fees or royalties.

Software integration with a Host is also easy. Messages passed between the Host and *Network Interface* follow a "Unified Interface" definition. A simple to use, Innovasic supplied, PC-based tool configures the *Network Interface*, so the Host only passes parameters between it and the *Network Interface*. From this tool, it is also easy to specify how parameters will be passed to the PROFINET controller using the GSDML file. Since the Host is only passing parameters, the Host software does not have to change if PROFINET network parameters change or if another Industrial Ethernet protocol is used. There is also a "sockets" interface that supports direct Ethernet communication. Example C-code is provided to minimize the software effort for the Host / Network Interface communication.

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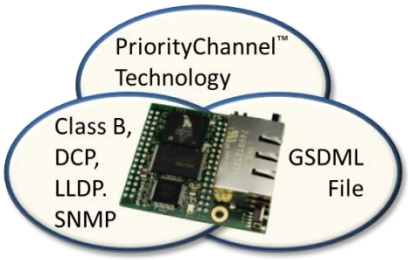
Easy, Reliable Network Integration



The RapID Platform Network Interface supports PROFINET Class B communication with PriorityChannel™ technology. PriorityChannel™ is a revolutionary technology that eliminates the effects of network traffic and ensures reliable, real-time network performance to Net Load Class III. It gives your device a significant competitive advantage, extremely low jitter, and a reliable connection that will not disconnect even with >95% network loading.

Class B support includes the Discovery Control Protocol (DCP) which is required for all PROFINET devices and provides basic device configuration facilities, and the Link Layer Discovery Protocol (LLDP) so controllers can identify the devices attached to the network and the overall topology. Also included is the Simple Network Management Protocol (SNMP) along with the required Management Information Bases (MIBs) to support network configuration and diagnostics. The two protocols work together so devices can be easily added or removed from the network. To tie all of this together with a PROFINET Controller, a GSDML file describes a device's capabilities. The example GSDML file provided can be tailored to describe the exact features of the final field device product.

Easy Evaluation, Fast Product Development

The Evaluation Kit available for the *RapID Platform Network Interface* provides a quick assessment for interfacing a Host to the module. An application example is provided in order to demonstrate end-to-end, Host-to-Network Interface-to-Controller communication. Simply connect the Host development board to the *Network Interface* evaluation board via the UART or 16-bit Parallel interface. Once Host-side communication is established, PROFINET communication can be evaluated using a PLC or Controller simulator. The communication path between Host and PROFINET controller can be completely verified before integrating the module into the actual field device hardware.



RapID-NIEK V0004



RapID-NI V2002 (UART)
RapID-NI V2102 (Parallel)

RapID Platform – PROFINET Network Interface	
Parameter	**Details**
Host Processor	Any CPU or DSP
Host Processor Interfaces	UART (115.2 kBaud) 16-bit Parallel (up to 12.5 Mbps)
Network Interface	Data Transport: IEEE 802.3
	Data Rate: 10/100 Mbps
	Ports: 2
Environmental Conditions	-40C to +85C
Power Supply	Voltage: 3.3 VDC
	Power consumption: 1.3W
TCP/IP	ICMP, IGMP, ARP, SNTP, BSD 4.4A socket, DNS, BOOTP, DHCP, TELNET, FTP, TFTP, HTTP (server & client), CGI, SNMP
PROFINET	Cyclic Input Data: 1440 bytes Cyclic Output Data: 1440 bytes
	Cycle time: 1 ms (min.)
	Alarm Types: Process, Diagnostic, Return of Sub Module
	DCP, LLDP, VLAN Priority
Compliance	RoHS, CE, PI