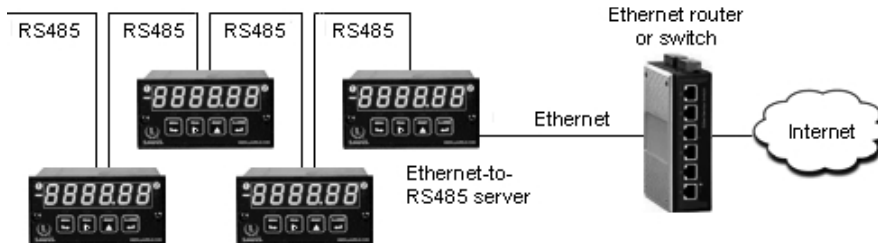# LAUREL
ELECTRONICS, INC.

Features

- **Connects a host meter to an Ethernet LAN while also acting as a server for up to 31 Laurel devices on an RS485 network.**
- **Includes an RJ45 jack for connection to the Ethernet and an RJ11 jack for connection to the RS485 bus.**
- **Suitable for all 1/8 DIN Laureate DPMs, counters, timers & remote displays.**
- **Complemented by free PC-resident Node Manager software and Node-resident web server software, both of which can discover Nodes and meters.**
- **Selectable baud rates to 19,200.**
- **Isolated from meter and power grounds.**

CE RoHS ETL c us LISTED 4006497 MADE IN CALIFORNIA

Description

Meters on an RS485 bus connected to the Internet via an Ethernet-to-RS485 device server board.

The Laureate Ethernet-to-RS485 Converter Board plugs into a host 1/8 DIN digital panel meter, counter or timer to provide a 10/100Base-T Ethernet interface via an industry-standard RJ45 jack. It also provides an RJ11 jack for interface to an RS485 bus, which can support up to 30 additional Laurel meters equipped with Laurel's RS485 interface board. That board features dual RJ11 connectors for RS485 daisy-chaining using commercial 6-wire RJ11 data cables with no need for a hub.

Discovery and setup of multiple Nodes on a LAN and multiple meters on an RS485 bus is easily achieved via PC-resident Node Manager software or Node-resident web server software.

Both methods automatically discover all Nodes on a LAN or WAN, plus any devices connected to each Server Node via an RS485 bus. They are used to configure each Node, such as setting communication parameters, naming the Node and associated devices, entering email addresses for alarm notification and data requests, selecting the Node's time zone for time-stamping of emails and streaming data, and upgrading firmware. Once configuration data has been stored in flash memory of all Nodes, the PC can be disconnected. Details are in our Ethernet Manual.

Data can be sent by Laurel Nodes in the form of real-time stream data upon request or in the form of emails. Emails can be sent in response to email requests from the host computer, periodically, or when devices encounter an alarm condition or go off-line.

On a Wide Area Network (WAN), such as the Internet, the host computer is outside of the LAN and therefore must know the public IP address of the LAN router to discover the Laurel Nodes.

Built-in DHCP server capability allows Laurel Nodes to constitute themselves into a network and to be connected directly to a host computer when no router or dedicated DHCP server is present, as illustrated below. When a Node fails to find a DHCP server that responds to its request for a private IP address, it assigns one. When several Nodes fail to receive a Private IP address, they mutually agree to make one of the Nodes a temporary DHCP server that assigns a Private IP address to each device on the network.
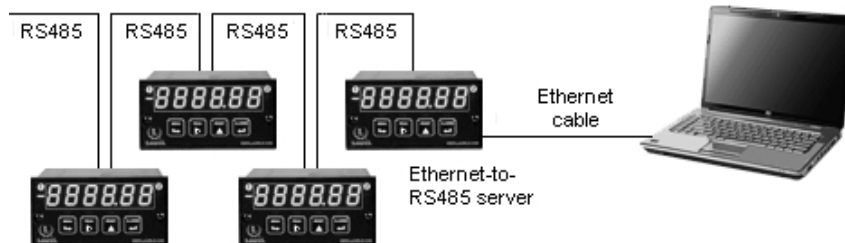
Easy connection of an RS485 bus with Laureate meters to a PC via an Ethernet cable.

The Modbus TCP protocol is fully supported. Conversion to Modbus TCP is provided transparently by Laurel Nodes so that an Ethernet application program can use the Modbus TCP protocol while the meters use the Modbus RTU or Modbus ASCII protocol. The Laurel ASCII protocol, which supports up to 31 digital addresses, can also be used if the only devices on the data line are Laureate meters.

Instruments from other manufacturers can be operated on the RS485 bus under control of our LTNET485 Ethernet-to-Serial Device Server if the host computer supplies commands and accepts responses suitable for these instruments.

The Ethernet-to-RS485 Converter Board can be ordered as an option for Laurel digital panel meters, counters and timers. It cannot be ordered as a stand-alone product.

Laurel's separate Ethernet board can be used as an alternative to the server board for connecting meters to a network. Each meter will then need to be connected to the network via an Ethernet router, switch or hub, and its own Ethernet cable.

Electrical Specifications

Ethernet Board Specifications	
Data rates	300, 600, 1200, 2400, 4800, 9600, 19200 bps
Devices per Ethernet line	1 Node plus up to 31 on RS485 bus
Ethernet connector	RJ45 jack
Ethernet cable	10/100Base-T
Ethernet compliance	IEEE 802.3
Devices per RS485 line	Up to 31 including the host meter
RS485 connector	RJ11 jack
RS485 compliance	EIA/TIA-485
Isolation	250V rms working, 2.3 kV rms per 1 min test
ESD Protection	15 kV per IEC 1000-4-2
EMI Immunity	10 V/m per IEC 1000-4-3
EFT Protection	2 kV per IEC 1000-4-4
Short Circuit Protection	Continuous

Protocol Specifications (implemented on the meter main board)

Modbus RTU	
Standards Compliance	Modbus over Serial Line Specification V1.0 (2002)
Data Formats (selectable)	1. No parity, 8 data bits, 2 stop bits
	2. Odd parity, 8 data bits, 1 stop bit
	3. Even parity, 8 data bits, 1 stop bit
Applicable Interface Boards	Ethernet, USB, RS232, RS485, RS485 Modbus
Conversion to Modbus TCP	Automatic
Modbus ASCII	
Standards Compliance	Modbus over Serial Line Specification V1.0 (2002)
Data Formats (selectable)	1. No parity, 7 data bits, 2 stop bits
	2. Odd parity, 7 data bits, 1 stop bit
	3. Even parity, 7 data bits, 1 stop bit
Applicable Interface Boards	Ethernet, USB, RS232, RS485, Modbus RS485
Conversion to Modbus TCP Main	Automatic
Laurel ASCII	
Data Format	No parity, 8 data bits, 1 stop bit
Protocol	Laurel Laurel ASCII
Applicable Interface Boards	Ethernet, USB, RS232, RS485, RS485 Modbus