MODBUS™ MICROGATEWAY

SPECIFICATIONS | Supersedes: NOTHING | Form 450.20-S19 (101)

The Modbus™ MicroGateway is an economical communications device that provides a reliable connection between YORK chillers that support a communication interface and a Modbus™ Remote Terminal Unit (RTU) network. It efficiently manages all the different communication protocols used by YORK micro panels, exposing the data in a consistent, organized and definable fashion.

Chillers may be controlled or monitored locally or remotely by any device that can process Modbus requests.

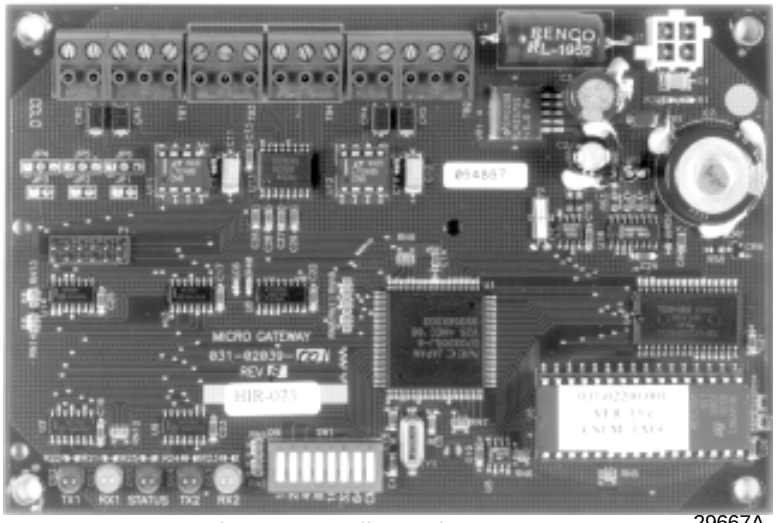

Figure 1. Modbus MicroGateway 29667A

Features and Benefits

- Seamless integration is offered between all standard York Talk communication protocols and a Modbus RTU network.
- Robust software design assures error-free data transfer.
- Plug-in ports simplify and ensure quick installation.
- DIP switches provide easy configuration and reduced setup time for most YORK chillers.
- Available as a stand-alone enclosure with power supply or as a card for installation within existing OptiView micro panels.
- UL 916 listed and certified to comply with the relevant *CE* EMC and safety directives.

The Modbus MicroGateway is available as either a card (shown in Figure 1) that may be fitted directly inside the OptiView micro panel or is supplied within an enclosure (shown in Figure 6) when used with other chiller micro panel types.

To simplify installation and setup, the Modbus MicroGateway comes preconfigured for operation with a series of typical chiller applications. The various setups are preloaded and can be chosen simply by selecting the correct DIP switches on the MicroGateway. In most applications, this “Quick Start” feature eliminates the need for the technician to connect a portable computer and program the variables, saving valuable setup time and costs.

When required, a computer can be connected to the Modbus MicroGateway and, using standard VT100 emulation and the YORK ISN “Feature-Section-Page” configuration style, special applications and non-standard chillers may be installed.

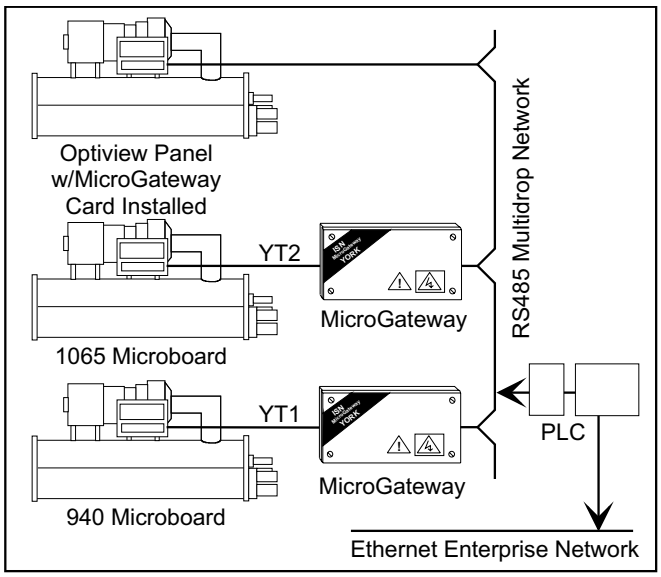

Figure 2. Modbus Network Controlled by a PLC

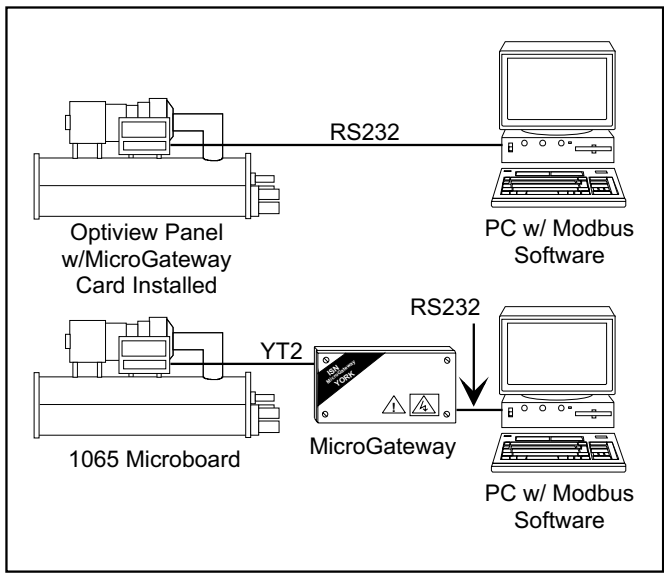

Figure 3. Direct Connection to a Chiller

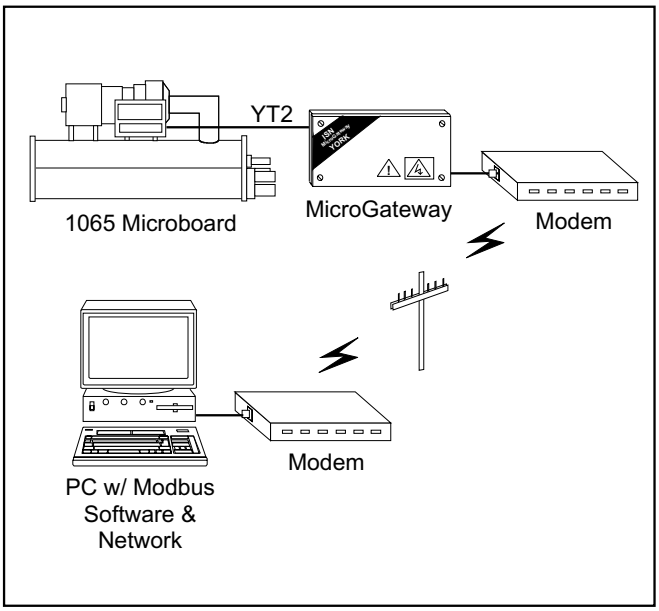

Figure 4. Remote Access of Chiller Data

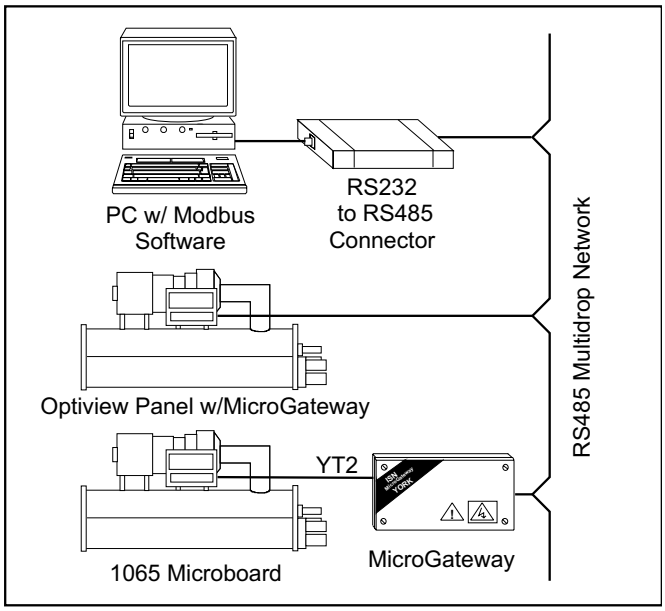

Figure 5. Modbus Network Controlled by a PC

Configurations of the Modbus MicroGateway

Figure 2 depicts a typical connection between several YORK chiller micro panels and a Modbus PLC Master controller. The Modbus MicroGateway interfaces to all the different types of microprocessor-based YORK micro panels, including the 776, 940, 1065, 1095 and the OptiView. For the OptiView micro panel, the MicroGateway board easily mounts within the micro panel itself, eliminating the need for an additional enclosure or power supply. Other chiller models may require an external enclosure and power supply.

Figure 3 shows a Modbus MicroGateway being interrogated by a PC running Modbus client software.

Figure 4 illustrates the remote access of data using a Modbus MicroGateway and a modem.

Figure 5 shows a network of Modbus devices connected to a PC that is running Modbus client software.

Modbus Support

The Modbus network is a local communications network that is widely used in many industrial applications. It is easy and economical to install requiring only a twisted, shielded pair cable daisy-chained between devices.

The Modbus MicroGateway supports any address between **0** and **200** (except **128**, which is reserved for a "Quick Start" feature). The physical length of the network, the number of nodes, etc., is governed only by the constraints imposed by the RS485 standard (4000 ft./1220 m, and 32 nodes).

Functionality

The Modbus MicroGateway provides the functionality of a SERVER. It translates Modbus commands into instructions that can be understood by the different types of YORK micro panels, as well as supplying chiller data back to the Modbus Master.

Network Protocol

The Modbus MicroGateway supports both RS485 and RS232 connections. It uses the RTU protocol and may operate at either **9600** or **19.2** kbaud. The default parity is **Even** but may be changed. Both signed and unsigned integers may be used.

It supports the following Modbus Function codes:

- **01** Read Coil Status
- **02** Read Input Status
- **03** Read Holding Registers
- **04** Read Input Register
- **05** Force Single Coil
- **06** Preset Single Register
- **08** Diagnostics
- **15** Force Multiple coils
- **16** Preset Multiple Registers
- **17** Report Slave ID

All the chiller data has been pre-assigned* with Modbus registers that may be read or written to. The default analog points use registers in the range X01 to X53 while default digital points use registers X61 to X89 (X= 0, 1, 2 or 3, depending on chiller type).

** Using an advanced feature the Modbus register for any given point may changed from the default..*

The maximum message size that can be processed is limited to **256** bytes, allowing **800** coils and **100** registers to be read or set.

Additional registers are available to monitor diagnostic functions, such as the communications link between the chiller micro panels and MicroGateway, and the data overflow flag.

Diagnostics

Network integrity may be validated by using a ***Return Query Data*** command.

The STATUS LED on the board provides a visual indication of the configuration when using "Quick Start." It also displays the general status of the MicroGateway during normal operation.

Configuration Options

The Modbus MicroGateway may be configured by:

Quick Start – This provides a very simple method of setup using switches built into the Modbus MicroGateway. This technique allows for standard configurations to be easily and quickly set.

Computer – When more complex setups are required the MicroGateway can be configured using a VT100 terminal or a personal computer with a VT100 terminal emulator.

Built-In Applications

Scaling

The data in the Modbus MicroGateway may be scaled. A configuration parameter is used to determine, on a per point basis, how the value is processed. It may be processed without any modification, divided by 10 when received, or multiplied by 10 when sent.

Range

This advanced feature allows analog data points to be expressed in terms of another scale. It typically is used by systems that require analog points to be expressed as an ADC count.

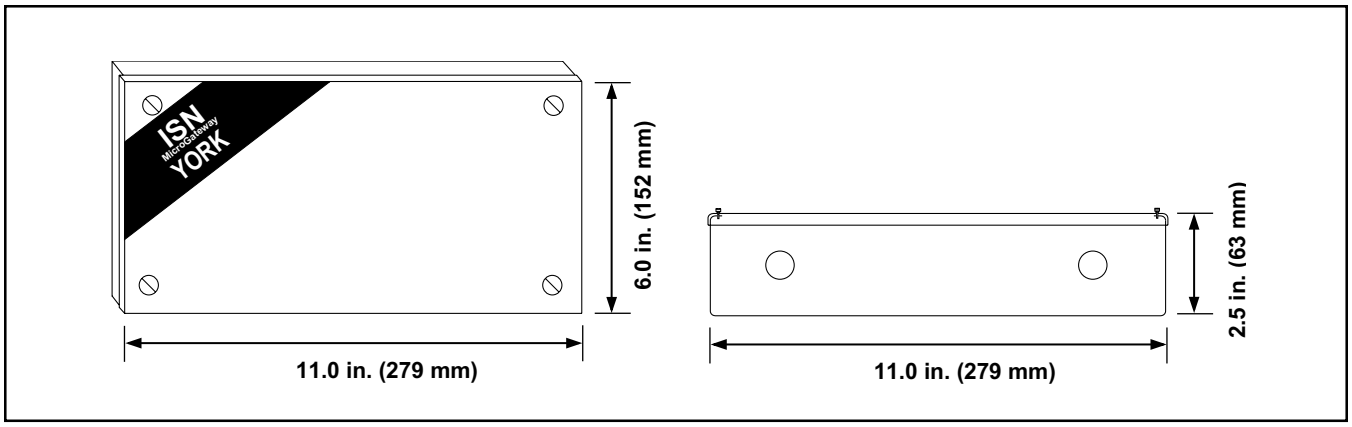

Figure 6. Dimensions

SPECIFICATIONS

		Board Only	Board w/Enclosure & Power Supply
General	Primary Power Source	12 VDC, (-2/+25%)	110/220 VAC, (±15%)
	Frequency	N/A	60/50 Hz (±10%)
	Power Consumption	Nominally 4 VA	Nominally 12 VA
	Operating Environment	32 to 122° F (0 to 50° C) 0 to 95% RH non-Condensing	32 to 122° F (0 to 50° C) 0 to 95% RH non-Condensing
	Size (H x W x D)	4 x 6 in. (101 X 152 mm)	6 x 11 x 2.5 in. (152 X 279 X 63 mm)
	Weight	4 oz. (113 grams)	4.5 lb. (2 kg)
Electrical	Processor	NEC V25 Operating at 8 MHz	
	Memory PROM	256 kbytes of CMOS OTP	
	Memory RAM	128 kbytes of capacitor-backed CMOS SRAM (design supports 256 kbytes)	
	E^2	1,000 bytes of useful storage	
	Real Time Clock	RTC Accuracy ±30 seconds per year	
	Back-up	SRAM data and RTC maintained for 72 hrs. Capacitor Enable/Disable jumper	
Installation	Port 1 Selections	RS485/RS232 (York Talk (1,2, & 3)	
	Port 2 Selections	RS485/RS232 (Modbus RTU and Terminal Configuration)	
User Functions	Port 1	Communication status LEDS (TX = Red LED and RX = Green LED)	
	Port 2	Communication status LEDS (TX = Red LED and RX = Green LED)	
	System Status	Flashing Red LED; Error codes reported by different flash rates	
	Node Selection	Via DIP Switch – Nodes 1-200 (Terminal Mode selected by setting DIP=255)	
	Network Cabling	A three-core cable with shield and drain wire should be used for both RS232 and RS485 connections	
Agency	UL 916/FCC Part 15 Conducted and Radiated CE (Satisfying all the relevant EMC directives) and IEC950/EN60950 (Safety directive)		

Ordering Information

Modbus MicroGateway OptiView kit: 371-03609-002
Modbus MicroGateway in an enclosure 110VAC: 371-02592-102
Modbus MicroGateway in an enclosure 220VAC: 371-02592-202

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Supersedes: None