E-Link Gateway

Product Bulletin

Code No. LIT-12011237
Issued April 3, 2009
Supersedes December 11, 2007

The Johnson Controls® Equipment Link (E-Link) Gateway is an economical and versatile communications device that provides a connection between York equipment and open/standard protocols. It efficiently manages all of the communication protocols used by York equipment, exposing the data in a consistent, organized, and defined fashion. The E-Link Gateway is available as a card (Figure 1) that can be fitted directly inside an Optiview- or Latitude-based equipment control panel, or supplied within a line voltage-enabled enclosure. Configuring the required equipment profile and output protocol is achieved through a simple switch selection.

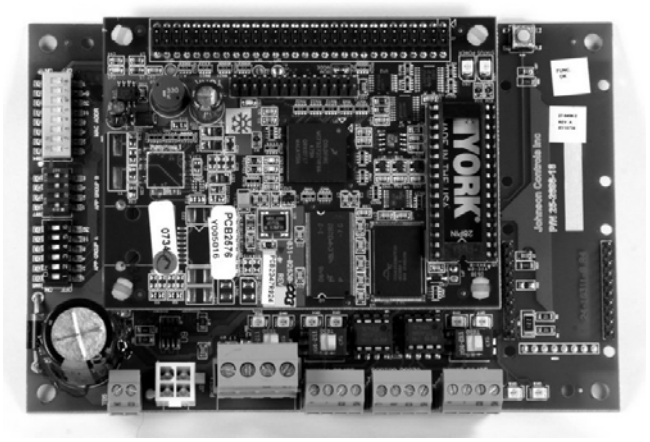

Figure 1: E-Link Gateway

Table 1: Features and Benefits

Features	Benefits
BACnet® Multidrop Serial Bus/Token Passing (MS/TP), LON, N2, and Modbus® Remote Terminal Unit (RTU) Outputs	Enable equipment connectivity to industry-standard open network protocols.
Switch-Selectable Quick Starts	Simplify the equipment connectivity commissioning and startup.
Removable Connectors	Simplify installation and accelerate future service.
LONMARK® Profile Compliant for York Optiview-Based Equipment	Supports the LONMARK 8040 profile, augmented with Johnson Controls manufacturer network variables.
Third Communications Port	Allows auxiliary monitoring, diagnostics, and control.

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Applications

The E-Link Gateway replaces the York MicroGateways. It consolidates the previously supported equipment profiles into a single application while enabling a user to easily select the desired output protocol without altering the firmware.

Table 2: Ordering Information

Part Number	Description
YK-ELNK100-0	E-Link Gateway with Serial Outputs (BACnet MS/TP, Modbus RTU, and N2)
YK-ELNK101-0	E-Link Gateway with LON Output
YK-ELNKE00-0	E-Link Gateway with Serial Outputs in an Enclosure
YK-ELNKE01-0	E-Link Gateway with LON Output in an Enclosure
YK-ELNKOLK-0	OptiView/Latitude Installation Kit
YK-ELNKSTK-0	IPU-II Panel Installation Kit (not available in Europe)

The E-Link Gateway is used to provide most Johnson Controls/York mechanical equipment, such as chillers and rooftop units, with Building Automation System (BAS) networking connectivity.

Configuration Method

To simplify the installation and setup, the E-Link Gateway comes pre-configured with a series of chiller and rooftop profiles, which can be selected using DIP switch settings.

The E-Link Gateway is commissioned using three switches. The Media Access Control (MAC) address switch is primarily used to select the device's network address and for invoking a troubleshooting mode. Application Switch A is used to select the desired equipment profile, whereas Application Switch B selects the required output protocol. A momentary push button activates the selected profile and output protocol.

Field Diagnostics

Initial field troubleshooting may be performed visually by observing the communication ports and status Light-Emitting Diodes (LEDs). Further diagnostics should be done with a terminal emulation program such as Microsoft® Windows® hyper terminal.

User Access

A user may gain access to the E-Link Gateway by logging on with an appropriate password, which allows the user to view and work with the application. For additional information, refer to the *E-Link Gateway Installation Instructions (Part No. 24-10404-9)*.

User Reports

Specific BACnet and Modbus parameters require field configuration to achieve optimum performance. User reports provide an efficient and convenient way to make these changes.

Field Commissioning

Two mechanisms allow a user to maintain and troubleshoot the E-Link Gateway in the field.

X-Modem

Updated firmware and/or databases can be restored to an E-Link Gateway using this standard data protocol.

Temporary Quick Start Setting

Two Quick Start Settings are reserved to allow users to make field modifications to the E-Link Gateway.

Port Functionality

The E-Link Gateway is designed with three active serial ports and supports concurrent access of equipment data on Ports 1 and 3 or 4 and 3.

Port 1

This RS-485 serial port is used to connect the E-Link Gateway to a BAS using one of the following BAS networking protocols:

- BACnet MS/TP
- N2
- Modbus RTU

Port 2

Port 2 is reserved for connecting to the equipment.

Port 2A

This RS-485 port is used to connect the E-Link Gateway to equipment that uses the York Talk II protocol or BACnet MS/TP protocol.

Port 2B

This RS-232 port is used to connect the E-Link Gateway to equipment using the York Talk III protocol.

Port 3

This RS-485 port is used to monitor the E-Link Gateway using one of the following BAS networking protocols:

- BACnet MS/TP
- N2
- Modbus RTU

Port 4

This TTL port is used to provide a LON based BAS connection.

Data Mapping

The E-Link Gateway's internal data is expressed in terms of standard BACnet objects of type Analog Value (AV), Binary Value (BV), and Multistate Value (MV). Each object supports a collection of required and optional properties used in varying degrees by the different protocols.

Integration

To fully integrate the E-Link Gateway into a BAS system, the mapped output objects (AV, BV, and MV) along with their associated equipment definitions need to be known. This detailed information is provided in the York Equipment Point Maps that are available from your local Johnson Controls representative.

Modbus

The E-Link Gateway supports the following Modbus function codes:

- 1 – Read Coil Status
- 2 – Read Input Status
- 3 – Read Holding Registers
- 4 – Read Input Register
- 5 – Force Single Coil
- 6 – Preset Single Register
- 15 – Force Multiple Coils
- 16 – Force Multiple Registers

The E-Link Gateway can process a maximum message size of 256 bytes, which allows 800 coils and 100 registers to be read or set. The E-Link's Modbus data is scaled on a per-point basis and can be processed without any modification. It can be divided by 10 when received or multiplied by 10 when transmitted. Certain data can be scaled differently by making an appropriate selection in the User Reports.

The Modbus data link layer can be configured using Quick Starts to support two baud rates (9600 or 19200), two parities (N or E), and one or two stop bits.

BACnet Protocol

Obtain a full description of the BACnet services and capabilities, which are provided in the Protocol Implementation Conformance Standard (PICS)/BACnet Interoperability Building Blocks (BIBBS) document, from your local Johnson Controls representative. The BACnet data link layer is configured using Quick Starts to support auto baud, 38,400, and 76,800.

N2

The E-Link Gateway supports the N2 open protocol and operates at 9600 baud. From a programming perspective, the E-Link is considered a Vendor Device (VND). The data is presented using Analog Data Input (ADI), Analog Data Float (ADF), and Binary Data (BD) objects.

It supports the following N2 commands:

- Synch Time
- Poll without/with ACK Message
- Read Internal Parameter
- Override Internal Parameter
- Override Release Parameter
- Identity Device Type

The N2 data link layer is configured using Quick Starts to support 9600 baud.

N2 Data Integrity

The communication's link between the E-Link Gateway and the equipment is monitored, and if it is compromised, the data is marked as unreliable.

Technical Specifications

E-Link Gateway

Power Requirements	**Input Voltage**	24 VAC at 50/60 Hz (±15%) 12 VDC (-2%/50%)
	Power Consumption	Nominally 12 VA
Ambient Operating Conditions		-40 to 185°F (-40 to 85°C) 0 to 95% RH noncondensing
Ambient Storage Conditions		-40 to 194°F (-40 to 90°C) 0 to 95% RH noncondensing
Technology	**Processor**	MCF 5272 Coldfire® processor @ 66 MHz
	Memory	4 M Flash 8 M SDRAM
	Operating System	eCos
Communications	**Port 1**	2.5 KV isolated BAS networking port (RS-485 – BACnet MS/TP, N2, Modbus RTU)
	Port 2A	Equipment port (RS-485 – York Talk II or BACnet MS/TP)
	Port 2B	Equipment port (RS-232 – York Talk III; York Talk II not supported)
	Port 3	Monitoring port (RS-485 – BACnet MS/TP, N2, Modbus RTU)
	Port 4	BAS networking port (TTL interface – LON)
User Functions	**Communication Status**	Each communication port has a TX and RX status LED (Transmitting – Red = On, Receiving – Green = On)
	Status LED	Flashing LED indicates various error codes.
	MAC Address	7-way switch sets network address between 1 and 127
	App Switch Group A	6-way switch used to configure the required equipment profile
	App Switch Group B	4-way switch used to configure the required output protocol
	EOL Switch	Each RS-485 port has an End-of-Line (EOL) network that is switch-selectable.
	Activation Push Button	Used to activate the selections chosen on App Switch Group A and B.
Shipping Weight	**Circuit Board**	8 oz (226 g)
	Metal Enclosure and Transformer	4.5 lb (2 kg)
Agency Listing		UL 916/FCC Part 15 Conducted and Radiated CE (Satisfying all relevant EMC directives) and LVD 2006/95/EC (General European Safety Directive): EN 60204-1 (Industrial Component Type), EN 1050-1 (General Risk Assessment), EN 12100-1 (Basic Safety Category A), EN 12100-2 (Basic Safety Category B)

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

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Published in U.S.A. www.johnsoncontrols.com