JOHNSON CONTROLS

E-Link Gateway Installation Instructions

Applications

The E-Link Gateway provides Johnson Controls® and York mechanical equipment, such as chillers and rooftop units, with Building Automation System (BAS) networking connectivity. It is designed with three active serial ports: Port 1 and Port 4 are used for BAS networking, Port 2 is reserved for connecting to the equipment, and Port 3 provides access for auxiliary monitoring and control.

To simplify the installation and setup, the E-Link Gateway comes pre-configured with a series of chiller and rooftop equipment profiles that you may choose by selecting the correct DIP switch settings.

There are several E-Link Gateway models available depending on the type of input voltage and equipment they are connected to. For chillers using the OptiView or Latitude Micro Panel, the E-Link Gateway consists of a single circuit board that is attached to four studs inside the Micro Panel, using the accessory mounting kit. The panel supplies 12 VDC input power, eliminating the need for an external power supply.

For other types of chillers, the E-Link Gateway is packaged in its own enclosure. In addition to the E-Link Gateway circuit board, a transformer is included inside the enclosure that converts a 120- or 240-volt input to 24 VAC power.

Installation

The E-Link Gateway comes as a circuit board that may either be installed directly into the equipment's enclosure or can be supplied already mounted within a line voltage capable enclosure. An accessory mounting kit is used to mount the E-Link Gateway in an OptiView or Latitude panel.

Table 1: E-Link Gateway Product Code Numbers

Description	Product Code Numbers
E-Link with Serial Outputs (BACnet® Master-Slave/Token-Passing [MS/TP], Modbus® Remote Terminal Unit [RTU] and N2)	YK-ELNK100-0
E-Link with LON as an Output	YK-ELNK101-0
E-Link with Serial Outputs in an Enclosure	YK-ELNKE00-0
E-Link with LON Output in an Enclosure	YK-ELNKE01-0
E-Link OptiView/Latitude Panel Installation Kit	YK-ELNKOLK-0

Wiring

Wire the product in a safe and neat manner, and always comply with the latest edition of any local, state, or country codes that may be applicable. Install the wiring in a way that does not cause a hazard and is protected against electrical and mechanical damage.

Power

The E-Link Gateway circuit board is powered from either a 12 VDC or a 24 VAC Class 2 power source. When used with an OptiView chiller, the Micro Panel supplies low-voltage power via a power harness supplied by the OptiView/Latitude installation kit. If the E-Link Gateway circuit board is installed in its own enclosure, a transformer is included in the enclosure. Line voltage may be supplied using an external power source or drawn from the input voltage terminal strip inside the equipment. Be sure the capacity of the power conductors supplying the equipment is rated for the additional power (VA) required by the E-Link gateway. Use a suitably sized wire to connect the line voltage feed to the E-Link Gateway that is one size larger than required for the amperage draw (maximum 400 mA). The line voltage power source should be dedicated, separately fused, and isolated (using a control transformer) from other equipment in the plant room that may generate electromagnetic interference.

Grounding

For the enclosure style, a ground wire must be connected directly to the enclosure supply power ground lug at the point of entry. A small label (Figure 1) identifies this grounding point. This ground wire should be connected through a continuous ground circuit to the incoming ground at the source transformer.

Figure 1: Grounding Label

Besides providing safety protection, the ground connection plays an extremely important part in the operation of the communication circuitry.

WARNING: Risk of Electric Shock. Ground the E-Link Gateway enclosure according to local, national, and regional regulations. Failure to ground the E-Link Gateway may result in electric shock and severe personal injury or death.

Protection of Communication Ports

When using RS-485 technology, it is possible that electrical disturbances, such as voltage spikes, can damage a circuit board. The E-Link Gateway includes tranzorbs on each RS-485 port to protect against damaging electrical spikes and stray voltage. The equipment panel should also be equipped with protection against electrical disturbances. Whereas OptiView Micro Panels are equipped with onboard tranzorbs, other equipment panels may require the addition of an external board. See the equipment documentation for details. Port 1 of the E-Link Gateway is also electrically isolated providing a means of mitigating common mode voltage induced problems.

High Noise Environments

Electrical equipment that employs high speed switching circuits (variable speed drives, solid state starters, and computing equipment) generates Electro-Magnetic Noise (EMI) and Radio Frequency Interference (RFI), which can generate transient voltage between ground points in the communication wiring. The RS-485 circuitry is designed to withstand some low transient voltage, but if this difference exceeds certain limits, it can permanently damage the RS-485 circuitry. To reduce transient voltage problems, follow good wiring practices:

- Ensure that the Micro Panel and the E-Link Gateway are powered from a source with true earth ground.
- Do not run communication cables in close proximity to or parallel with high-voltage power cables.

The likelihood of transient voltage is greatly reduced if the E-Link Gateway is close-coupled to the Micro Panel. Close-coupling requires that the E-Link Gateway and Micro Panel share the same line voltage power source and are physically close to one another. Typically the E-Link Gateway is mounted on the Micro Panel enclosure. This ensures a short communication cable, which is usually protected entirely within the two enclosures.

Types of Communication Ports

The E-Link Gateway uses three communication protocols to connect to other devices: RS-485 and FFT are used for multi-drop networking, whereas RS-232 is primarily used for point-to-point connectivity.

RS-485

The RS-485 standard uses three conductors to connect network nodes: two signal wires and a reference. The E-Link Gateway either uses a third wire for the reference or the building's infrastructure. The wiring method is dependent on the port being used: an electrically isolated Port 1 typically uses a third wire, whereas ports 2 and 3 normally use chassis or building ground for the reference.

Setup and Adjustments

There are a number of settings that a user may make on an E-Link Gateway or to the equipment to which it is being connected.

Network Termination

All End-of-Line (EOL) devices at either end of the RS-485 bus (that connect to only one set of RS-485 network wires) should be terminated. EOL termination provides biasing of the network and assists in returning the signal to a normal state in the event of voltage transients. If the E-Link Gateway happens to be the end-of-line device, terminate the network by setting the slider switch located above each of the E-Link Gateway's RS-485 ports to the ON position.

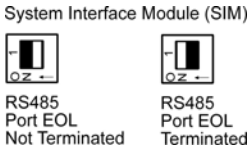


Figure 2: RS-485 EOL Switches

IMPORTANT: Ensure that the EOL switches are not set to the ON position for controllers that do not terminate the RS-485 network.

Media Access Control (MAC) Address

The E-Link Gateway's network hardware address is set on a single 8-way DIP switch. Switch 8, the T switch, is reserved to invoke Terminal mode on Port 3, leaving the remaining 7 switches for setting the actual address. Refer to the *E-Link Commissioning and Troubleshooting Guide Technical Bulletin (LIT-12011238)* for more details.

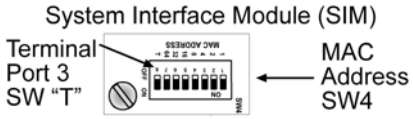


Figure 3: SIM DIP Switch

The network address is binary weighted, allowing you to set up to 127 unique network addresses.

APP Group A

The E-Link Gateway uses a 6-way DIP switch to select the desired equipment's profile. This switch is also binary weighted, allowing up to 63 unique selections.

APP Group B

The E-Link Gateway uses a 4-way DIP switch to select the desired output protocol. This switch is also binary weighted, allowing up to 15 unique selections.

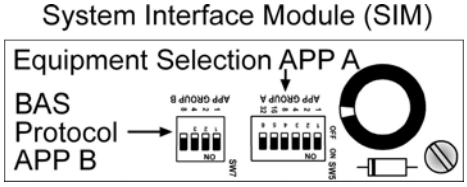


Figure 4: SIM Interface Module

Push Button

The E-Link Gateway uses a push button (Figure 5) as a means of activating any user selections on APP Group A and APP Group B switches.

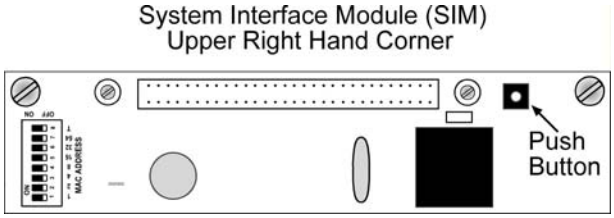


Figure 5: E-Link Gateway Push Button

Note: Refer to the *E-Link Commissioning and Troubleshooting Guide Technical Bulletin (LIT-12011238)* for more details on the functionality of the above switches.

Equipment Setup

Different pieces of equipment sometimes require a specific hardware configuration (jumper/switch settings) to enable communication with the E-Link Gateway. Refer to the equipment's installation literature for the proper configuration settings.

Setting the Rotary Switch on Chiller Panels

Some Micro Panels use a rotary switch to set their York Talk II address, (York Talk address = Rotary Switch setting + 1). Since the E-Link Gateway uses a one-to-one relationship with the chiller panel, this switch is normally set to 0 (York Talk address 1); however, in a master/slave configuration, set the master Micro Panel rotary switch to 0 and the slave Micro Panel to 1. If the chiller Micro Panel is not equipped with a rotary switch, the York Talk address is software settable. In most cases, this is user configurable, but some models are fixed and cannot be changed (refer to the equipment documentation for specific details).

Figure 6: Chiller Rotary Switch

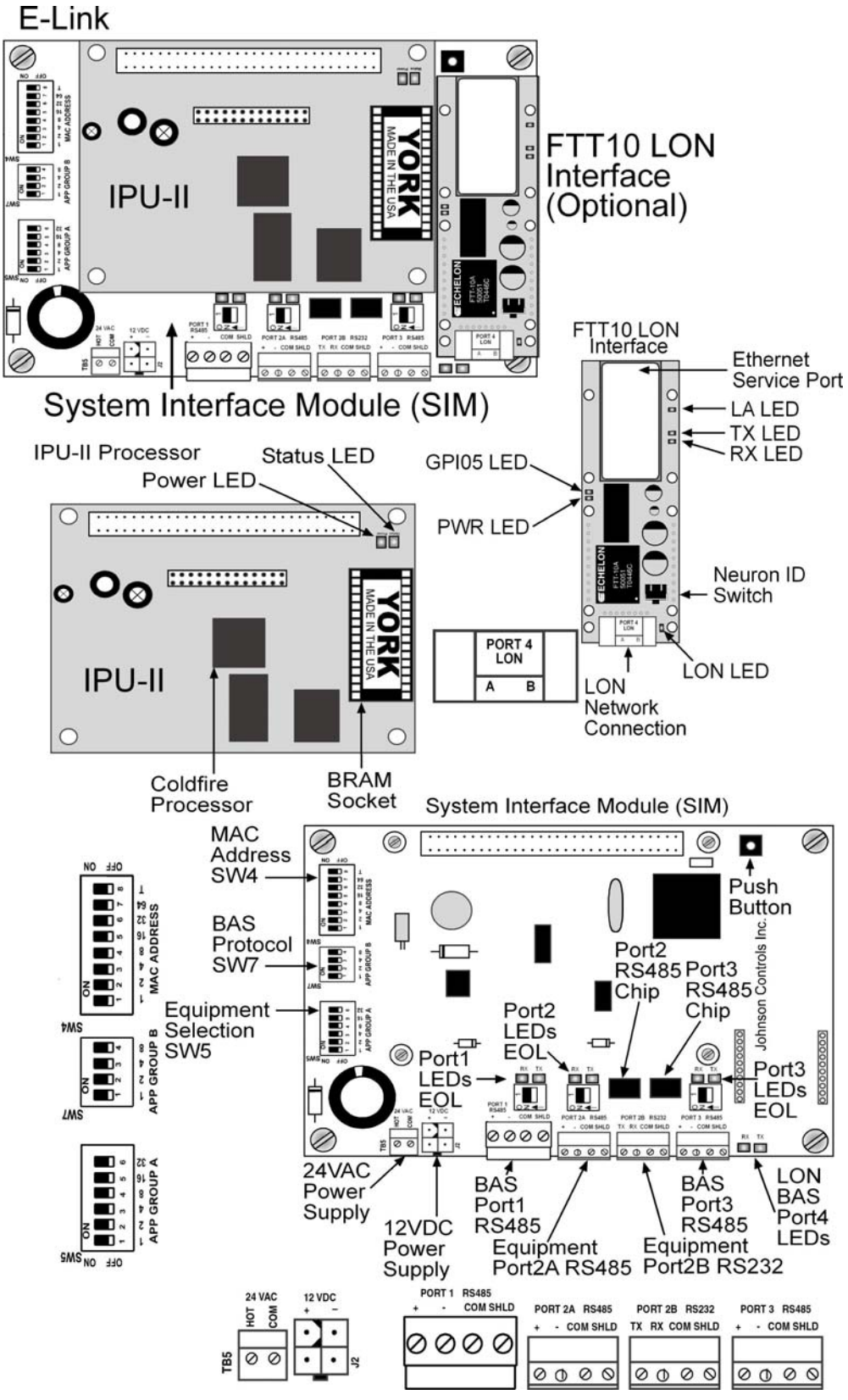


Figure 7: E-Link Gateway Component Identification

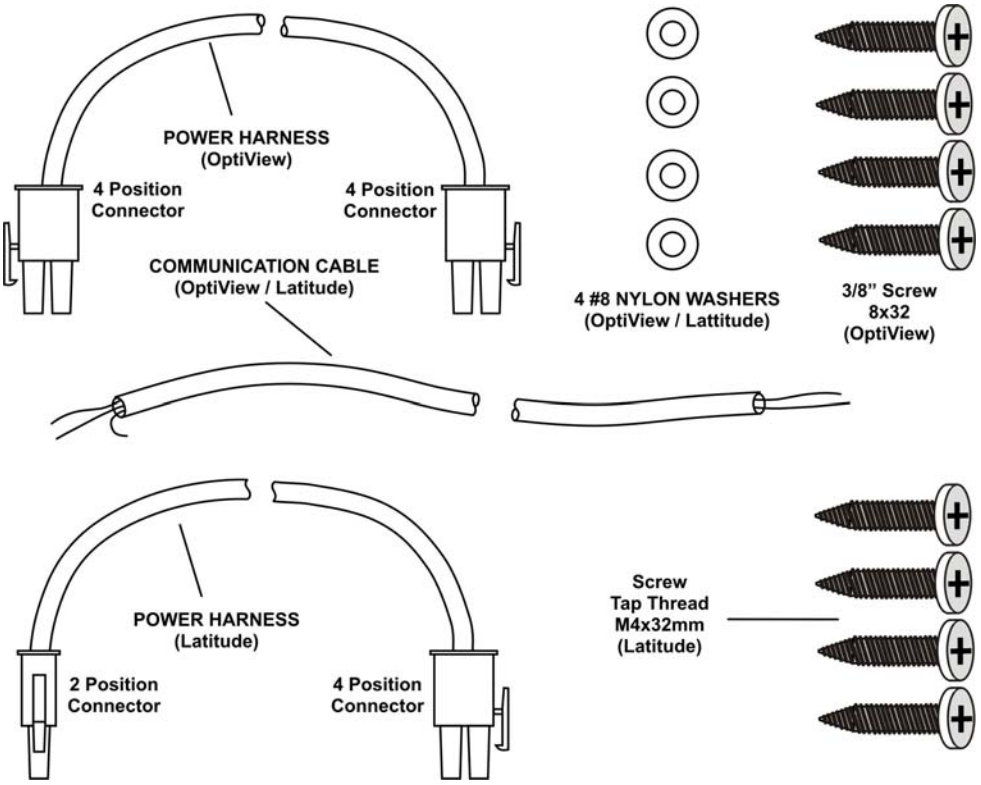


Figure 8: E-Link OptiView/Latitude Installation Kit YK-ELNKOLK-0 Contents

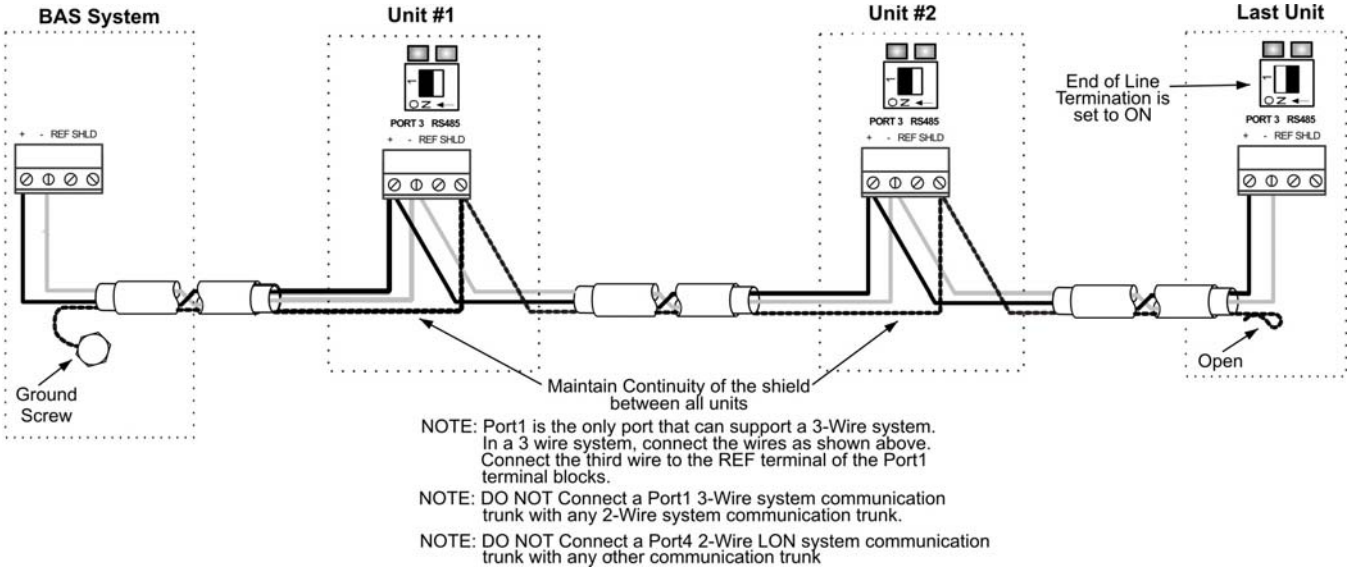


Figure 9: BAS Trunk Shield Wiring

Note: See Figure 15 and Figure 16 for additional information.

Network Topology

The E-Link Gateway has three serial communications ports and an optional LON port to connect equipment to a BAS system. Port 1 and Port 4 are designated as the BAS ports, with Port 1 used to support all RS-485 based communication protocols, and Port 4 used for LON connectivity with the addition of a LON ProtoCessor module.

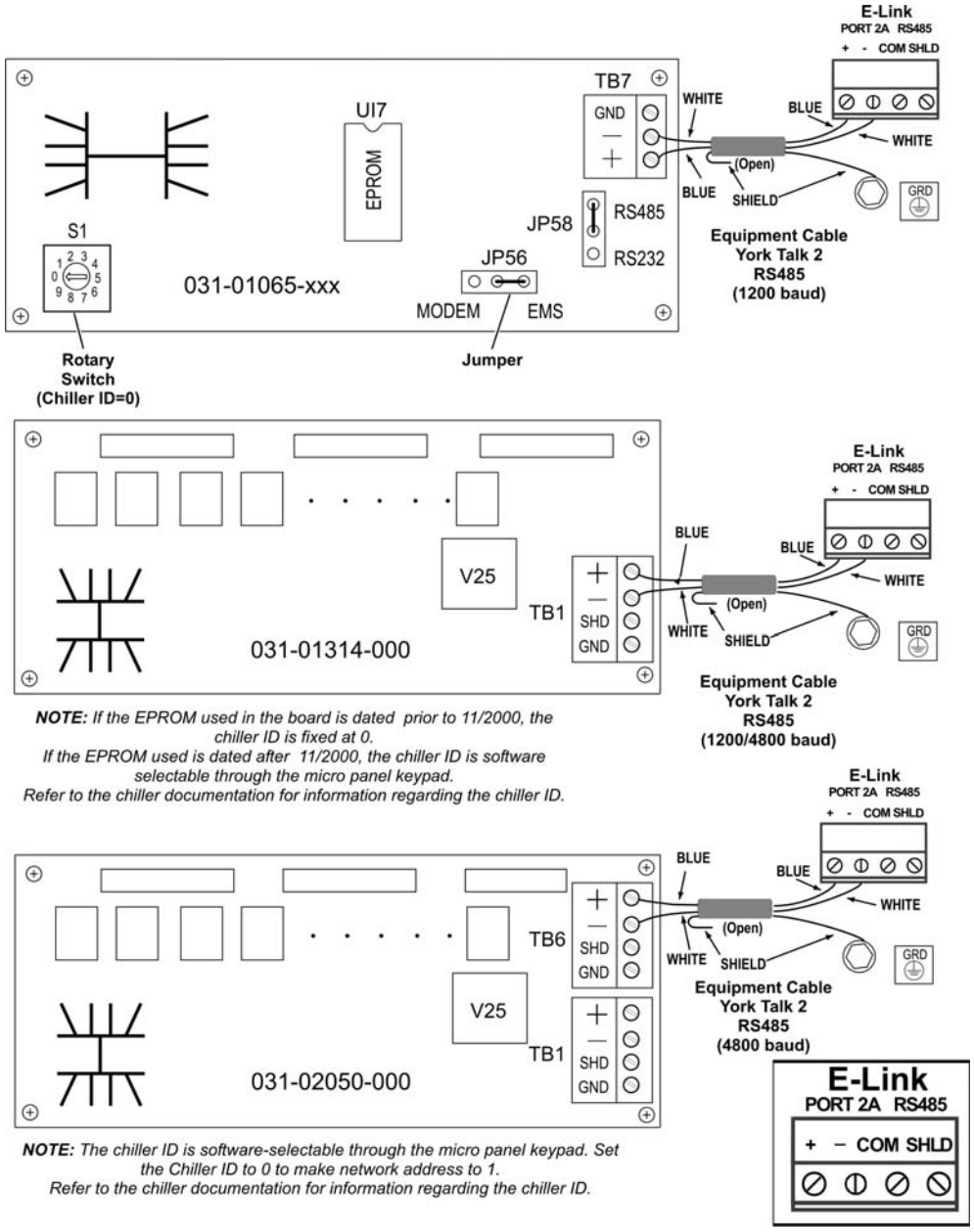


Figure 10: E-Link Gateway to York Talk II Equipment Connections

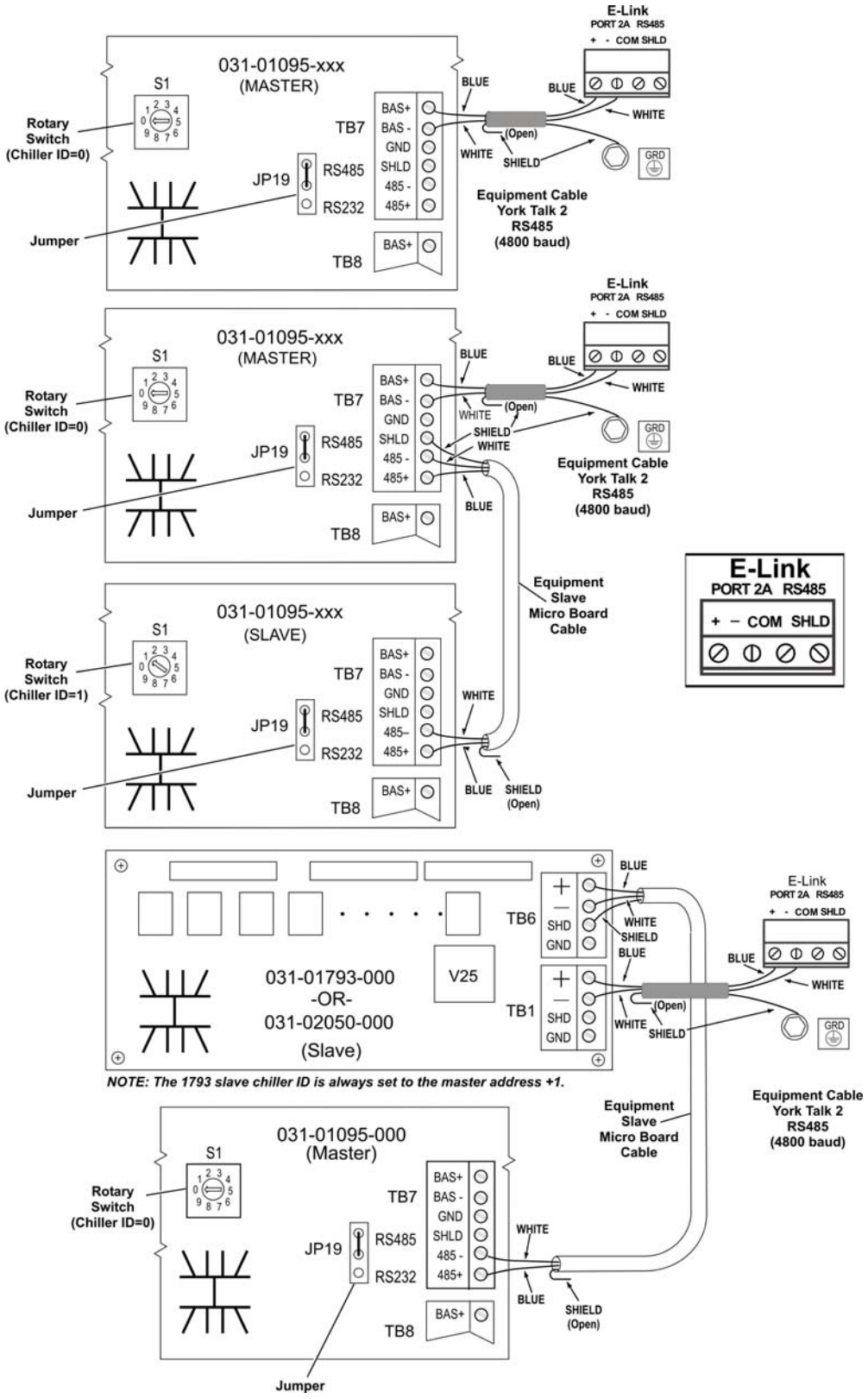
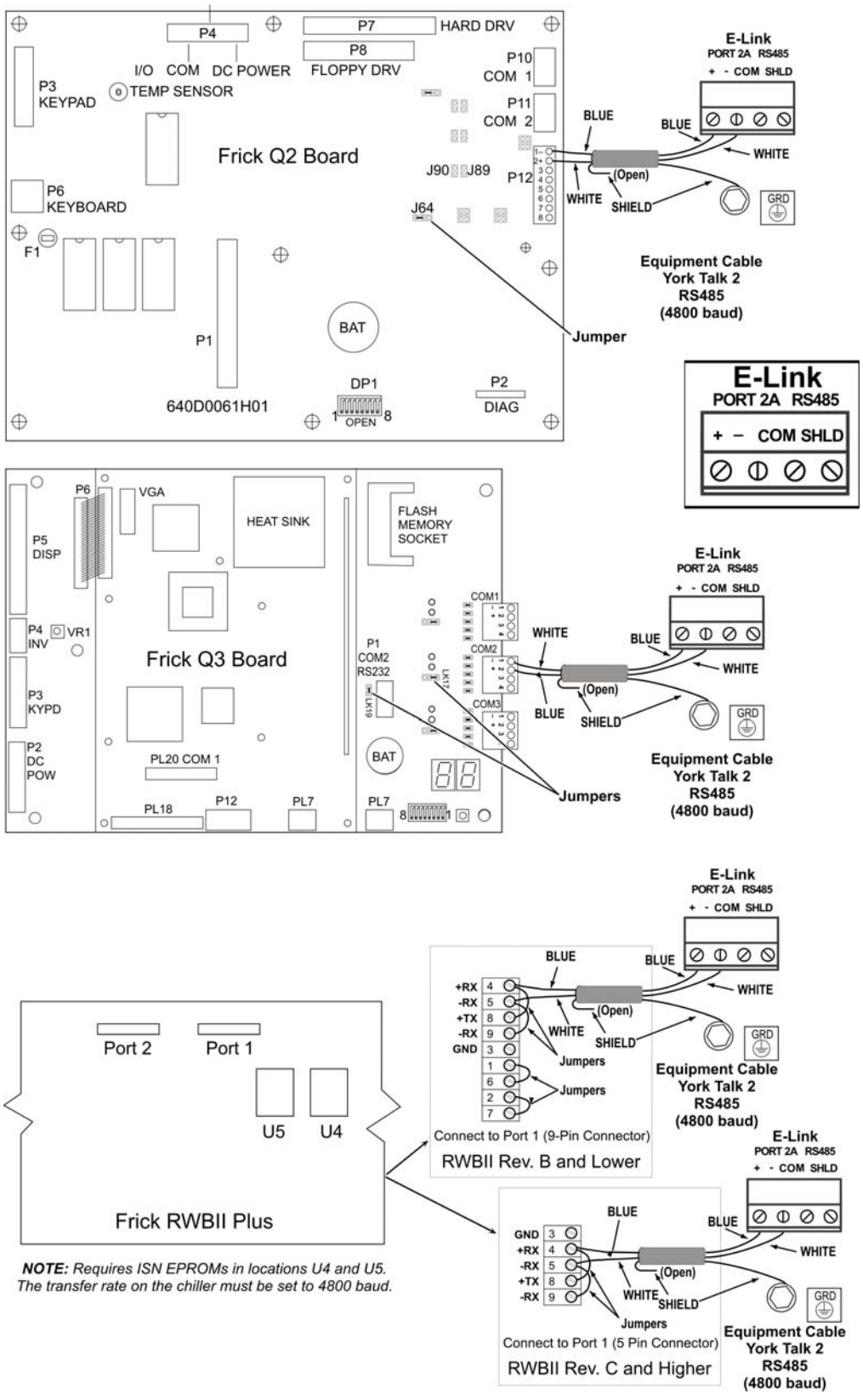


Figure 11: E-Link Gateway to York Talk II Equipment Connections (Continued)



NOTE: *Requires ISN EPROMs in locations U4 and U5.*
The transfer rate on the chiller must be set to 4800 baud.

Figure 12: E-Link Gateway to York Talk II Equipment Connections (Continued)

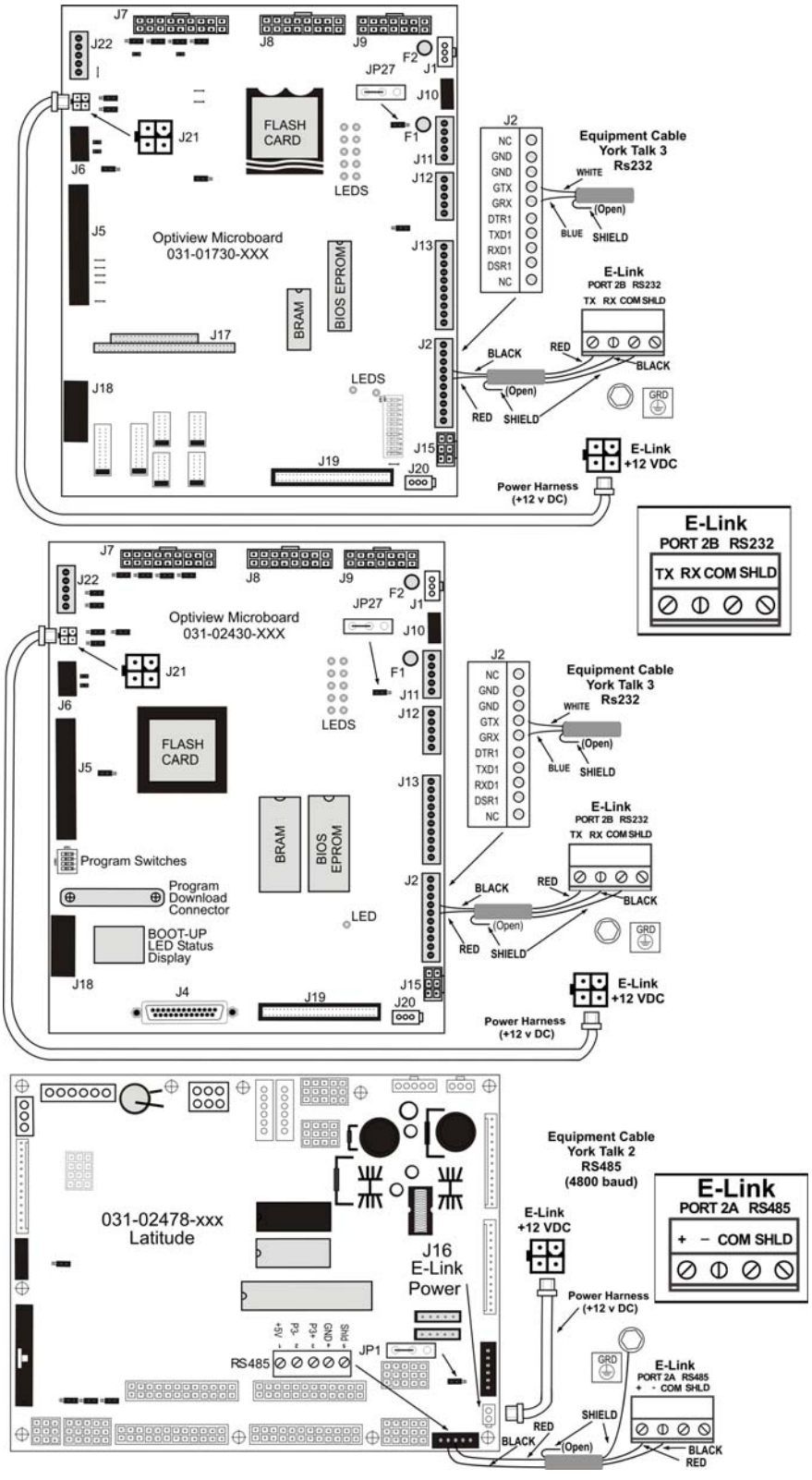


Figure 13: E-Link Gateway to OptiView and Latitude Equipment Connections (Continued)

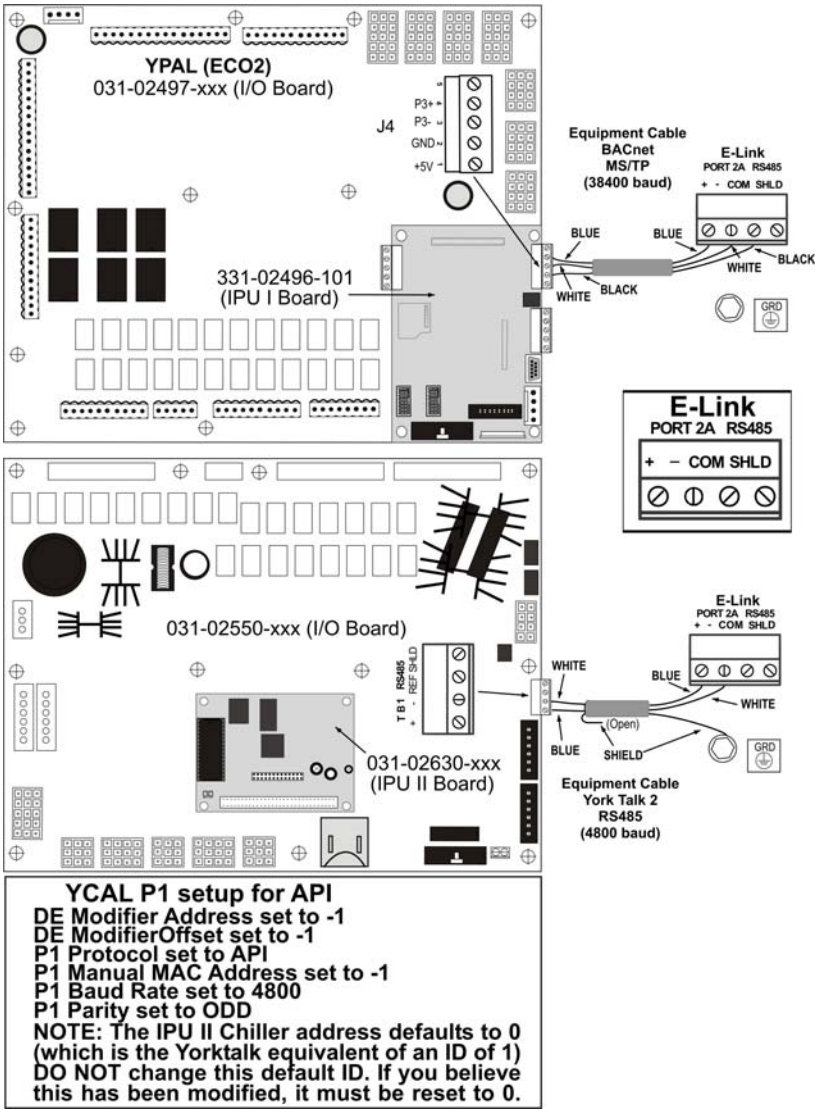


Figure 14: E-Link Gateway to YPAL (ECO2) and YCAL Equipment Connections

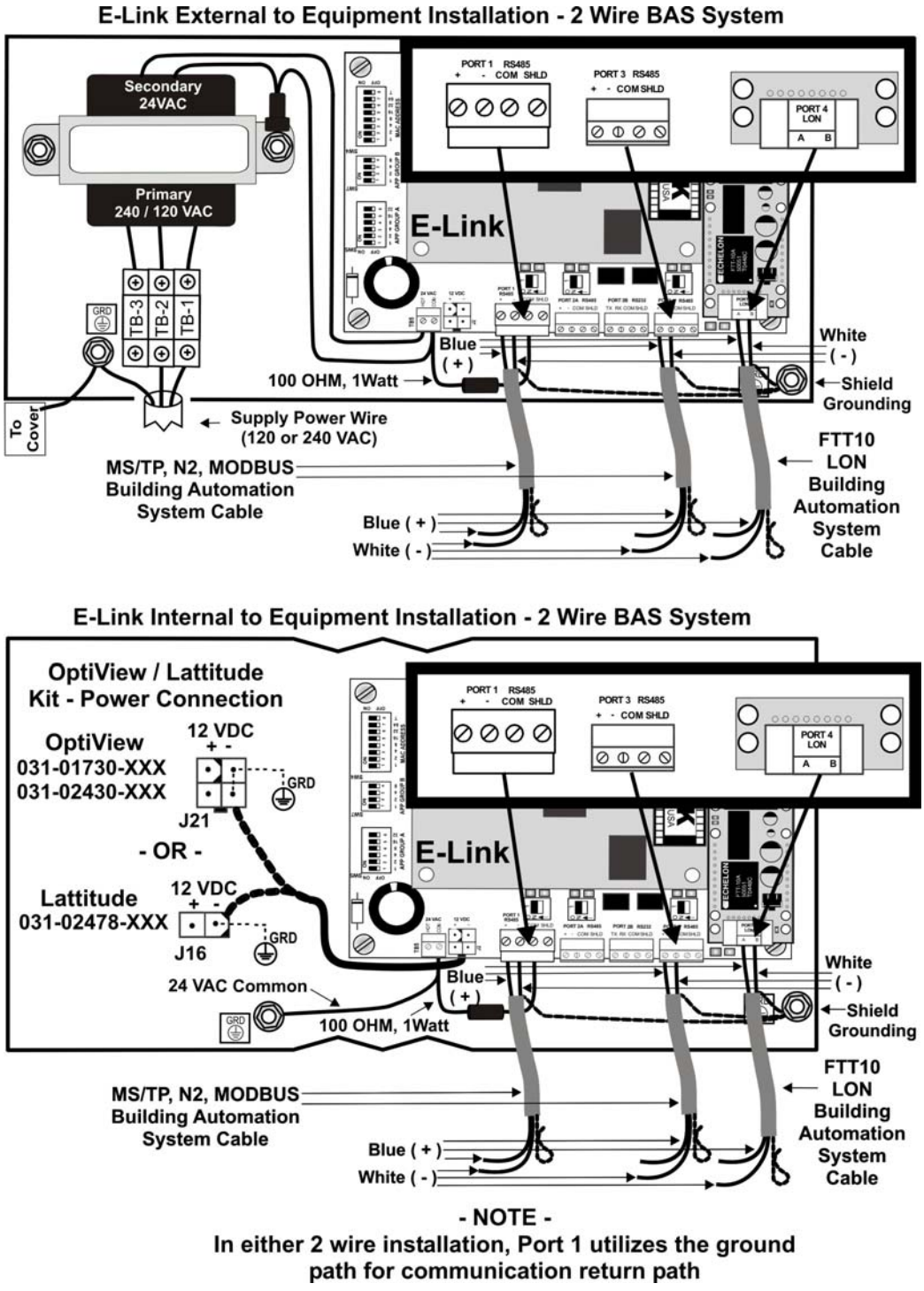


Figure 15: E-Link Gateway Communication Port Connections to a BAS System

Note: Only connect a ground strap between the panel's ground path and the E-Link's common path if this connection has not been made elsewhere in the configuration.

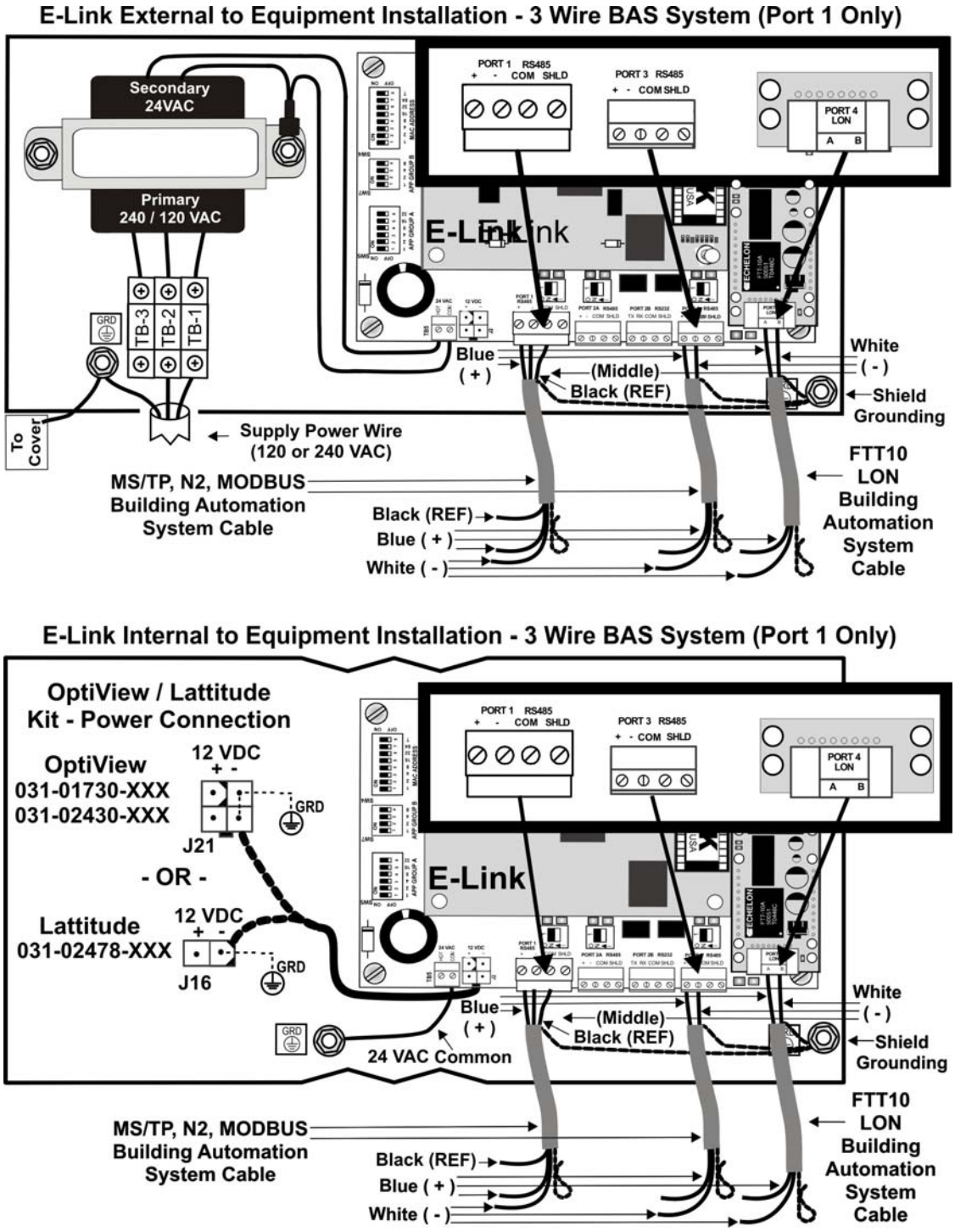


Figure 16: E-Link Gateway Communication Port Connections to a BAS System (Continued)

Note: Only connect a ground strap between the panel's ground path and the E-Link's common path if this connection has not been made elsewhere in the configuration.

Mounting

WARNING: Risk of Electric Shock.
Disconnect each of multiple power supplies before making electrical connections. More than one disconnect may be required to completely de-energize equipment. Contact with components carrying hazardous voltage can cause electric shock and may result in severe personal injury or death.

OptiView Panel Installation

1. Attach the E-Link Gateway board to the studs in the upper left corner of the OptiView enclosure using the four screws and washers provided in the OptiView/Latitude installation kit.
2. Connect the communications cable (included with the kit) from Port 2B on the E-Link Gateway to J2 on the OptiView Micro Panel. Ensure that wires are connected according to Table 3.
3. Check for stray wire strands, which could cause short circuits, and ensure all components are secure.
4. Connect the BAS network to Port 1, if the protocols are transported by RS-485, or Port 4 if the BAS network is LON.

Note: For RS485 2-wire operation, connect a 100 ohm 1 W resistor between the REF and the E-Link Gateway's TB5 COM (see Figure 15).

5. Ensure jumper J27 is set for RS232 (see Figure 13).
6. Connect the power harness (included with the kit) from J2 on the E-Link Gateway to J21 on the OptiView Micro Panel (see Figure 13).

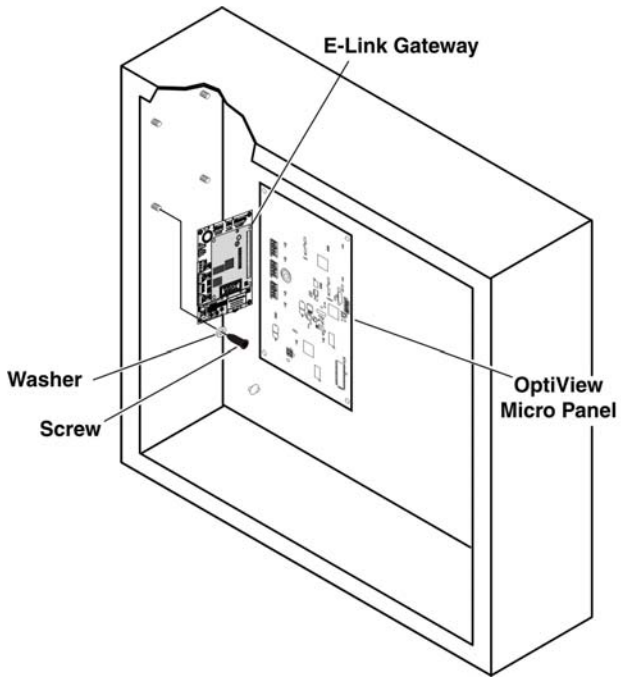


Figure 17: OptiView Micro Panel Connected to E-Link Gateway

The E-Link Gateway is now ready to be configured using Quick Start; see the *Commissioning a Standard Application* section.

Table 2: OptiView Wiring – E-Link Port 2B

E-Link Port 2B	OptiView Port	Wire Color
RX	GTX	White
TX	GRX	Blue
REF	N/A	Shield/Drain

Table 3: BAS Wiring – E-Link Port 1

E-Link Port 1	BAS	Wire Color
+	+	White
-	-	Blue
REF	REF	Black

Other Chiller Panel Installation

For non OptiView applications, the E-Link Gateway includes an optional enclosure. It does not include communication cables due to the variety of types and lengths that may be required.

IMPORTANT: Never install the E-Link Gateway outside the confines of a building unless within another enclosure rated IP 65/NEMA 4x or higher.

The E-Link Gateway can be mounted as a stand-alone enclosure on either the outside surface of the chiller Micro Panel (close coupled) or on a smooth surface within close proximity of the chiller panel enclosure.

For mounting on a Micro Panel, the line voltage power is supplied by a power source in the Micro Panel.

IMPORTANT: Make sure that the cover is securely fastened to the enclosure and the internal ground wire is attached before placing the gateway in operation. This helps to minimize RFI interference from being generated and picked up.

Mounting on a Micro Panel

WARNING: Risk of Electric Shock. Disconnect each of multiple power supplies before making electrical connections. More than one disconnect may be required to completely de-energize equipment. Contact with components carrying hazardous voltage can cause electric shock and may result in severe personal injury or death.

IMPORTANT: When attaching the E-Link Gateway to a Micro Panel, ensure the E-Link Gateway does not impede access to other components.

To mount the E-Link Gateway on a Micro Panel:

1. Disconnect power to the chiller Micro Panel.
2. Make sure the E-Link Gateway enclosure fits properly and that no obstructions, such as internal boards, switches, or external conduit, prevent mounting or servicing of the panel. See Figure 18 for examples of good mounting locations.
3. Locate and remove the two plastic caps in the bottom of the E-Link Gateway enclosure.
4. Mark an appropriate place on the enclosure for a matching set of knock out holes. Mark and drill or punch two holes in the Micro Panel.
5. Using two bulkhead pipe couplers, attach the E-Link Gateway enclosure to the Micro Panel.
6. Complete the wiring by applying power as described in the *Applying Power* section.

IMPORTANT: Be careful not to damage the E-Link Gateway or Micro Panel's circuit boards during the installation. Protect all circuit boards from metal chips, which may cause short circuits if left on the boards at startup.

Note: Use of bulkhead pipe couplers provides sufficient clearance to allow removal of the E-Link Gateway cover.

Wall Mounting

To mount the E-Link Gateway on a wall:

IMPORTANT: When wall mounting, make sure there is no interference with other components in the near vicinity. Use appropriate conduit to connect the power and communications wiring.

1. Check for proper clearances for the necessary electrical and communications cable runs.
2. Ensure that power and communications wiring is in compliance with all local, national, and regional codes and customer requirements.
3. Select a suitable location and mark the anchor points. Ensure that the enclosure is level. See Figure 19 for an example.
4. Drill the appropriate holes in accordance with the type of wall anchor being used.
5. Install the enclosure on the wall. Be careful not to damage the circuit cards during installation.
6. Check that the mounting is secure and the wiring connections are correct and tight. Check that no loose wire strands or other metal objects that could cause a short circuit are on the circuit board.
7. Complete the wiring as described in the *Applying Power* section.

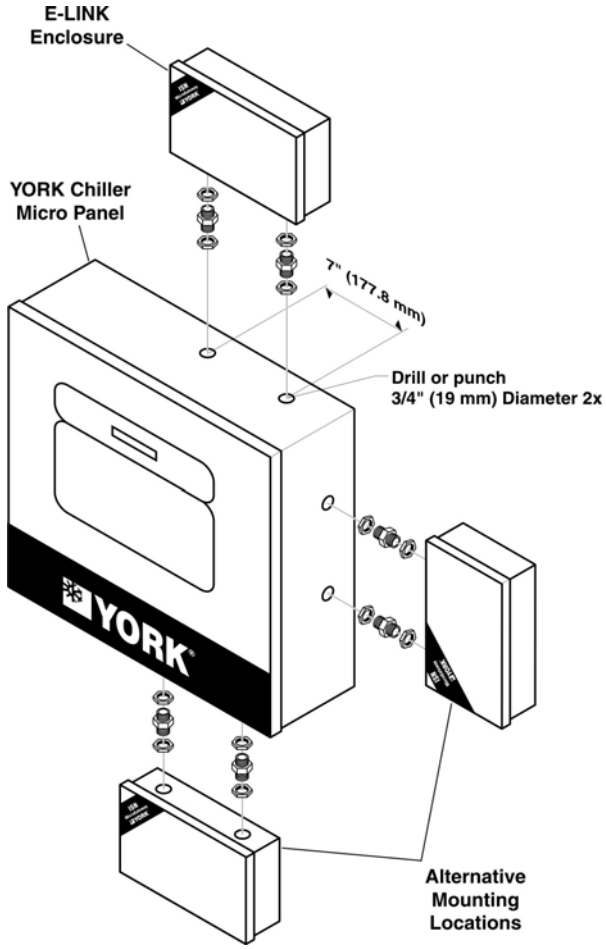


Figure 18: Mounting on the Equipment

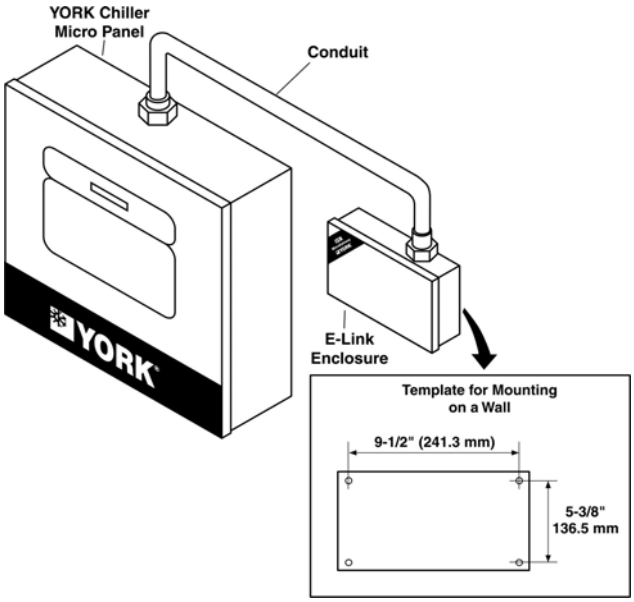


Figure 19: Wall Mounting

Applying Power

When using an enclosure type of E-Link Gateway, power can be supplied from either a separate power supply or from the main terminal strip in the chiller panel. Locate the power source within 0.9 m (3 ft) of the E-Link Gateway, and protect it with a suitable fuse or circuit breaker. Ensure the power is from a dedicated source and not controlled by a programmed switch.

If the enclosure is mounted on a wall, the wiring from the power source to the E-Link Gateway must always run in a suitable conduit. To obtain the best EMI and EMC performance, ensure that the conduit is bonded to the metal of both enclosures. Scraping the paint around the knockouts usually helps provide a better electrical connection between the joining parts.

1. Disconnect power to the chiller Micro Panel and follow standard lock out procedures to prevent electrocution and inadvertent activation.
2. Connect a 16-18 AWG wire from a reliable ground reference to the E-Link Gateway's incoming power ground lug. Do not remove the existing wire that connects the ground lug to the power circuit.
3. On 120 VAC applications, connect the Hot wire to TB2 and the Neutral wire to TB1. Connect the ground wire to a ground lug. On 240 VAC applications, connect the Hot wire to TB3 and the Neutral wire to TB1. Connect the ground wire to a ground lug.

IMPORTANT: Use copper conductors only. Make all wiring connections in accordance with local, national, and regional regulations. Do not exceed the E-Link Gateway's electrical ratings.

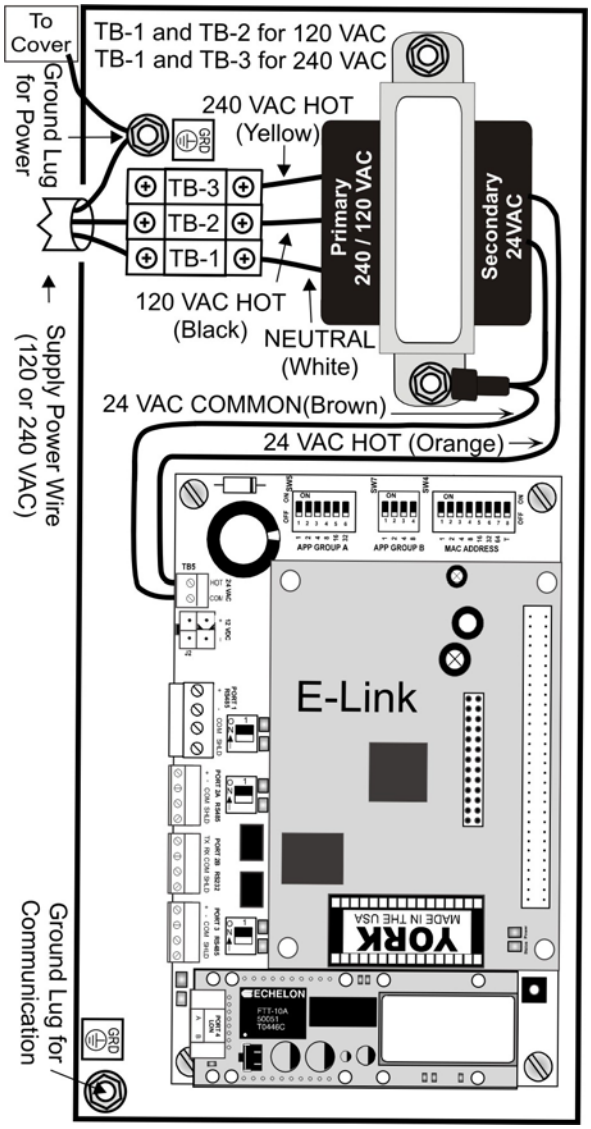


Figure 20: Power Connection Shown as 120 VAC

Commissioning a Standard Application

Once the E-Link gateway has been mechanically and electrically installed (that is, it has been located in its enclosure, wired, and terminated appropriately), it may then be Quick Commissioned.

1. Apply power and verify that the red power Light-Emitting Diode (LED) on the IPU-II board is on. Make sure the T switch is set OFF and then set the required MAC address. This should be done in concert with the system integrator to ensure that a unique address is used. If any nonstandard setup is required, refer to the *E-Link Commissioning and Troubleshooting Guide (LIT-12011238)* for more details.

Table 4: Allowable MAC Addresses

Protocol	Max Allowable Switch Settable MAC Addresses
BACnet MS/TP	1 – 127
N2	1 – 127
Modbus RTU	1 – 127

2. Based on the equipment to be integrated (see Table 7) and the required BAS output protocol (see Table 8) select the appropriate settings on GROUP A and GROUP B switches. For equipment points lists, refer to the Johnson Controls Portal (Products & Services > Delivery > Product/Service Field Support > Equipment Integration > York Equipment Data Maps).
3. Press the momentary push button shown in Figure 5. The Status LED flashes quickly. After the E-Link Gateway reinitializes, the commissioning is complete.
4. Check the E-Link Gateway's LEDs. First, check the STATUS LED; if the E-Link Gateway has no errors, it flashes continuously (1/2 second on, 1/2 second off). If it is not, see Table 6 for possible reasons.

Table 5: LED Status Indication

Flash Rate	Status LED Indication
LED Off	No database configuration is loaded.
1 Flash	Terminal mode has been invoked (Switch T is on).
2 Flashes	An equipment to E-Link communications error has occurred.
3 Flashes	A Quick Start has a configuration error.
LED On	No errors with custom/field modified application
Flashing Continuously	No errors with factory standard application

For all chillers that use the York Talk protocols, check that the Port 2 communication LEDS, Red (TX) and Green (RX) are flashing; this indicates that the chiller panel is being polled and is responding. (See Figure 7 for the location of Port 2 communications LEDs.)

Table 6: Equipment Quick Start Selections

	APP GROUP A SWITCH					Equipment Profiles Quick Starts	
Switch Settings	**16**	**8**	**4**	**2**	**1**	**Functionality**	
1 [1]	0	0	0	0	1	YK with SSS Imperial	(York Talk-III)
2	0	0	0	1	0	YK with VSD Imperial	(York Talk-III)
3 [1]	0	0	0	1	1	YT with SSS Imperial	(York Talk-III)
4	0	0	1	0	0	YT with VSD Imperial	(York Talk-III)
5 [1]	0	0	1	0	1	YS / YR with SSS Imperial	(York Talk-III)
6 [1]	0	0	1	1	0	YK with SSS Metric	(York Talk-III)
7	0	0	1	1	1	YK with VSD Metric	(York Talk-III)
8 [1]	0	1	0	0	0	YT with SSS Metric	(York Talk-III)
9	0	1	0	0	1	YT with VSD Metric	(York Talk-III)
10 [1]	0	1	0	1	0	YS / YR with SSS Metric	(York Talk-III)
11	0	1	0	1	1	York Talk II, 1200, 1 Section	(York Talk-II)
12	0	1	1	0	0	York Talk II, 4800, 1 Section	(York Talk-II)
13	0	1	1	0	1	York Talk II, 4800, 2 Sections	(York Talk-II)
14	0	1	1	1	0	YD Imperial	(York Talk-III)
15	0	1	1	1	1	YD Metric	(York Talk-III)
16	1	0	0	0	0	ECO2	(BACnet MS/TP via an IPU-I)
17 to 62						Reserved for future use	
63	1	1	1	1	1	Reserved for Field adjustments	

1. A Quick Start that references a Solid State Starter (SSS) is also applicable to a mechanical starter.

Table 7: BAS Output Protocol Quick Start Selections

	APP GROUP B SWITCH with T Switch				Output Protocol Quick Starts		
Switch Settings	**8**	**4**	**2**	**1**	**Port 1**	**Port 3**	**Port 4**
0 [1]	0	0	0	0	MS/TP, AUTO, N, 8, 1	Modbus, 19200, N, 8, 1	Terminal
1 [2,5]	0	0	0	1	MS/TP, AUTO, N, 8, 1	Modbus, 19200, N, 8, 1	Terminal
2 [2,5]	0	0	1	0	MS/TP, AUTO, N, 8, 1	Modbus, 19200, N, 8, 2	Terminal
3 [2,5]	0	0	1	1	MS/TP, AUTO, N, 8, 1	N2, 9600, N, 8, 1	Terminal
4 [2,5]	0	1	0	0	N2, 9600, N, 8, 1	MS/TP, 38400, N, 8, 1	Terminal
5 [2,5]	0	1	0	1	Modbus, 19200, N, 8, 1	MS/TP, 38400, N, 8, 1	Terminal
6 [2,5]	0	1	1	0	Modbus, 19200, N, 8, 2	MS/TP, 38400, N, 8, 1	Terminal
7 [2,5]	0	1	1	1	Modbus, 9600, E, 8, 1	MS/TP, 38400, N, 8, 1	Terminal
8 [2,5]	1	0	0	0	Modbus, 9600, N, 8, 1	MS/TP, 38400, N, 8, 1	Terminal
9 [3, 5, 6]	1	0	0	1	N2, 9600, N, 8, 1	Modbus, 19200, N, 8, 2	LON ~ Conversion
10 [4, 5, 7]	1	0	1	0	N2, 9600, N, 8, 1	Modbus, 19200, N, 8, 2	LON ~ Pass through
11 [3, 5]	1	0	1	1	Modbus, 19200, N, 8, 2	N2, 9600, N, 8, 1	LON ~ Conversion
12 [4, 5]	1	1	0	0	Modbus, 19200, N, 8, 2	N2, 9600, N, 8, 1	LON ~ Pass through
13 [2, 5]	1	1	0	1	Modbus, 9600, E, 8, 1	Modbus, 19200, N, 8, 2	Terminal
14 [2, 5]	1	1	1	0	MS/TP, 38400, N, 8, 1	N2, 9600, N, 8, 1	Terminal
15 [6]	1	1	1	1	Reserved	Reserved	Terminal

1. Switch setting 0 used with User Report 1 permanently stores the changes to Port 1 baud rate into flash.
2. The Terminal setting on Port 4 is restricted for Factory use only.
3. Use Quick Start 9 and 11 if the equipment is sending data to the E-Link Gateway in Imperial units and the E-Link Gateway is required to convert these values into metric. When supporting a LONMARK® profile, supply the data to the FFT10 LON Interface in metric.
4. Use Quick Start 10 and 12 if the equipment is already sending data to the E-Link Gateway in metric units, and no conversion is required by the E-Link Gateway, so it operates in pass through mode.
5. Setting Switch T = ON, on the MAC address forces TERMINAL mode on Port 3, @ 57600 baud, N,8,1. This is only needed to debug the E-Link Gateway's operation.
6. Quick Starts 15 on APP GROUP B and 63 on APP GROUP A are reserved for field adjustments.
7. Quick Starts 9 and 10 are selected when connecting the E-Link Gateway to an ECO2 unit.

Technical Specifications

Power Requirements	**External to Equipment (Inside Enclosure):** 120/240 VAC Primary 50/60 Hz, 24 VAC Secondary Transformer (+10%/-15%), 400 mA, Nominal 12 VA **Internal to Equipment E-Link Gateway Board Assembly:** 24 VAC (+/- 15%), 50/60 Hz, 400 mA, Nominal 12 VA, 12 VDC (+50%/-2%), 400 mA, Nominal 12 VA
Addressing	Addressing is selectable by the MAC Address Switch – 8 Position Dip Switch using Switches 1 through 7 • BACnet MS/TP valid addressing 1 to 127 • Modbus RTU valid addressing 1 to 127 • N2 valid addressing 1 to 127
Installation Environment	Indoor, Dry
Ambient Operating Conditions	Temperature : -40 to 85°C; (-40 to 185°F) Humidity : 0% to 95% noncondensing
Continued on next page . . .	

Ambient Storage Conditions (continued)	Temperature :-40 to 90°C (-40 to 194°F) Humidity : 0 to 95% RH, noncondensing
Power	**External to Equipment (Inside Enclosure):** One 3-Position Terminal Block for 120 / 240 VAC Supply Power **Internal to Equipment E-Link Gateway Board Assembly:** Removable Terminal Plug for 24 VAC Supply Power and Removable Terminal Plug for 12 VDC Supply Power
Communication Wiring Terminations	Equipment Protocol is selectable by the APP Switch Group A – 6 Position Dip Switch Port 2a: RS485 Equipment Port supporting BACnet MS/TP and York Talk II Protocols with available EOL Termination Switch Port 2b: RS232 Equipment Port supporting York Talk 3 Protocol BAS Protocol is selectable by the App Switch Group B – 4 Position Dip Switch Port 1 : RS485 BAS Port supporting BACnet MS/TP, Modbus RTU, N2 Protocols with available EOL Termination Switch Port 3 : RS485 BAS Port supporting BACnet MS/TP, Modbus RTU, N2 Protocols with available EOL Termination Switch; when selected by switch 8 of the MAC Address Dip Switch, Terminal Communications Port 4 : RS485 BAS Port supporting the LON FTT10 Protocol
Wiring	**Network Cable:** 24 AWG (3 cores plus shield) **Power Cable:** 18 AWG copper wire rated for 10 amperes per core at 250 VAC
Materials	**External to Equipment** Metal Enclosure with removable lid, E-Link Gateway Board Assembly, Power Transformer **Internal to Equipment E-Link Board Assembly** E-Link Gateway Board Assembly,
Mounting	**External to Equipment** - Screw Mount Enclosure **Internal to Equipment** - E-Link Optiview/Latitude installation kit
Dimensions	**External to Equipment** 241.3 x 136.5 x 63 mm (9.5 x 5.375 x 2.5 in.) **Internal to Equipment** 102 x 152 x 25.4 mm (4 x 6 x 1 in.)
Shipping Weight	**External to Equipment** 2 kg (4.5 lb) **Internal to Equipment** 227 g (8 oz)
Agency Listing	UL 916/FCC Part 15 Conducted and Radiated CE (Satisfying all relevant EMC directives) and IEC950/EN60950 (Safety directive)

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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