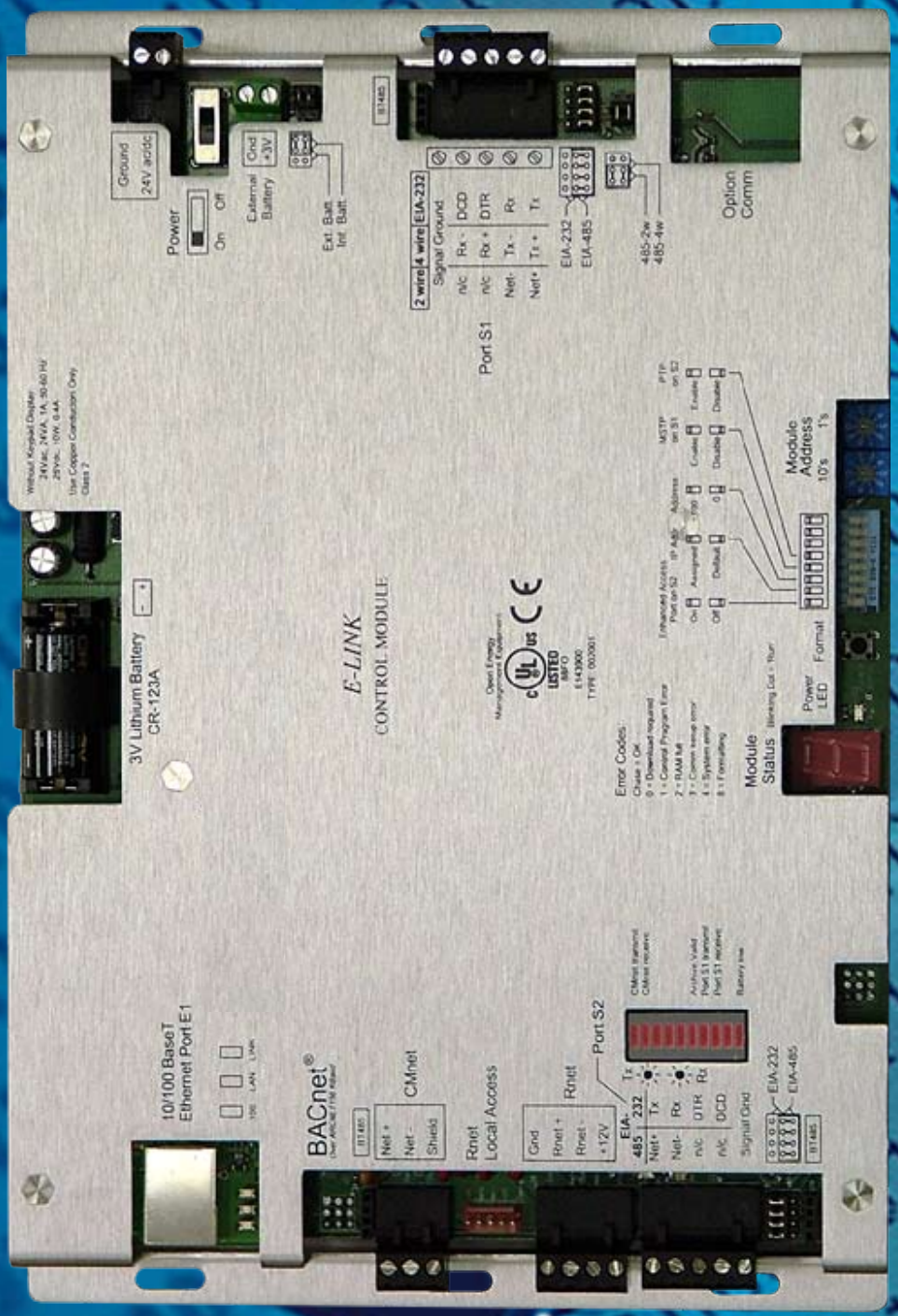
LUMISYS

BUILT FOR INTEGRATION

Installation Guide

Lumisys ELINK



1025 Cobb Place Blvd Suite 100 Kennesaw, GA 30144 • 800-241-9173 • www.lumisys1.com

ATTENTION

This section serves as a notice of the immediate or potential dangers involved when working with the equipment described throughout this manual. Any person involved in installation, maintenance, or service of the equipment should first carefully examine the equipment and read the instructions contained in this manual to ensure that personal and/or equipment injury is avoided.

The following safety messages are used throughout this manual to alert of immediate or potential danger to life or property:

Hint Indicates a tip or trick to help you.

Note Indicates an important note.

DANGER! Indicates an immediately hazardous situation which, if not avoided, will result in death or serious injury.

WARNING! Indicates a potentially hazardous situation which, if not avoided, can result in death or serious injury.

CAUTION: Indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.

CAUTION: Used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, can result in personal or property damage. Failure to comply with proper handling of the Lumisys products may void your warranty

In addition, this symbol may appear in the margin of specific portions of text as a safety reminder. Applicable instruction steps will be listed beneath the symbol.

Disclaimer

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designated to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Instructions contained in this user's guide should be performed only by qualified persons in accordance with local and national codes. Lumisys® Lighting and its affiliates assume no responsibility for any consequences related to the improper use of this manual.

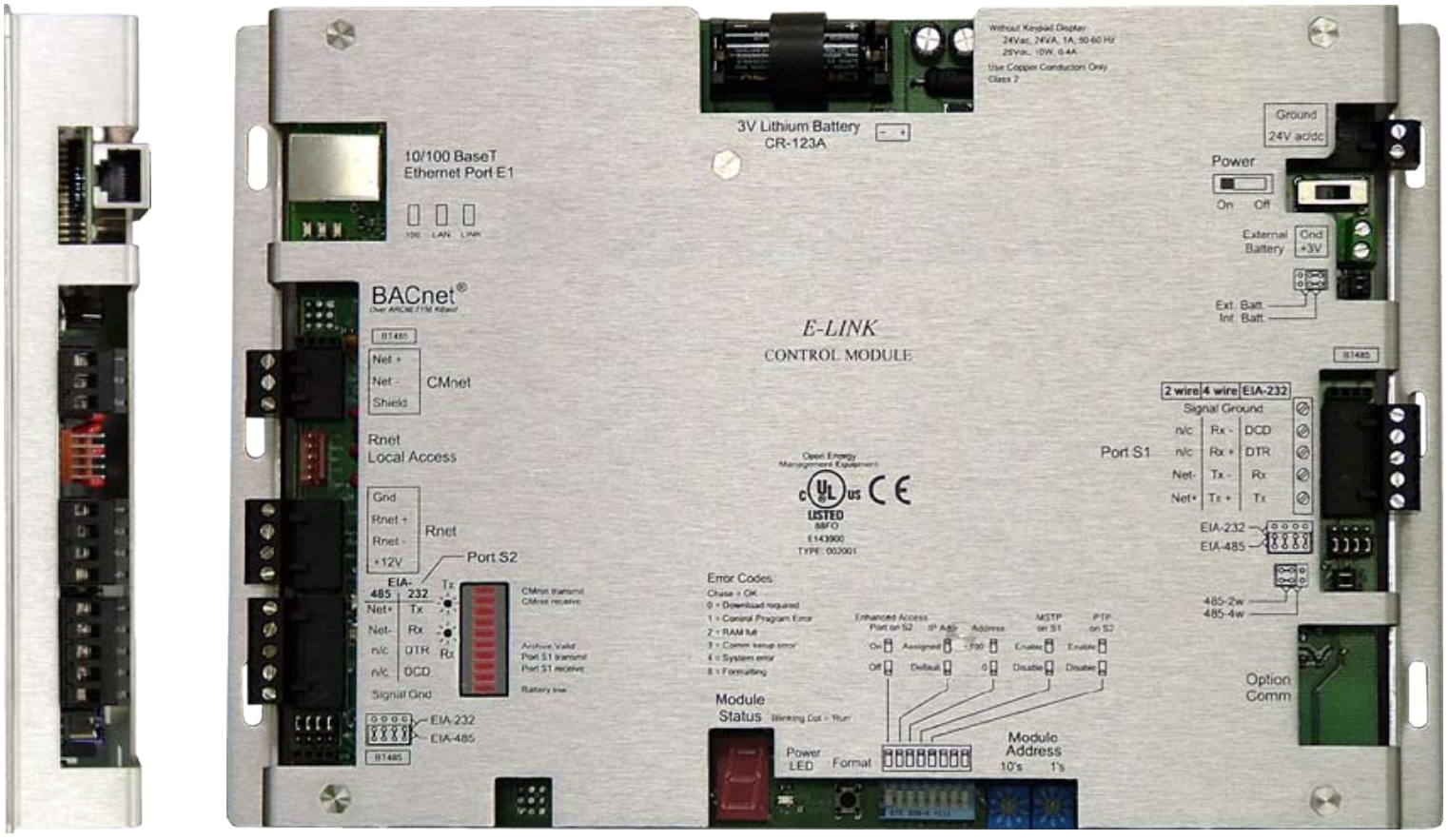
Table of Contents

ELINK Module for BACnet or Modbus

DATA SHEET | WEB PAGE

Parts List

ELINK	
Part #	Description
ELINK	Lumisys® ELINK MODULE FOR BACnet or Modbus, (Factory Programmed Only)



Overview

This document provides instructions on how to install the ELINK in two main steps: mounting and wiring.

The majority of the document is devoted to wiring the ELINK in the context of BACnet and Modbus networks and protocols. The intended audience for this installation guide is electrical contractors and other technicians, such BAS technicians certified to handle low voltage electronics and wiring. The ELINK module; though sophisticated in its operation, is simple to install because all programming and configuration of the ELINK is performed by Lumisys technicians before shipment.

The ELINK is a controller and protocol translator used to integrate devices on a Lumisys network with a BACnet or Modbus Building Automation System network. The ELINK enables the BAS to effectively monitor the status of and control any point on the Lumisys network.

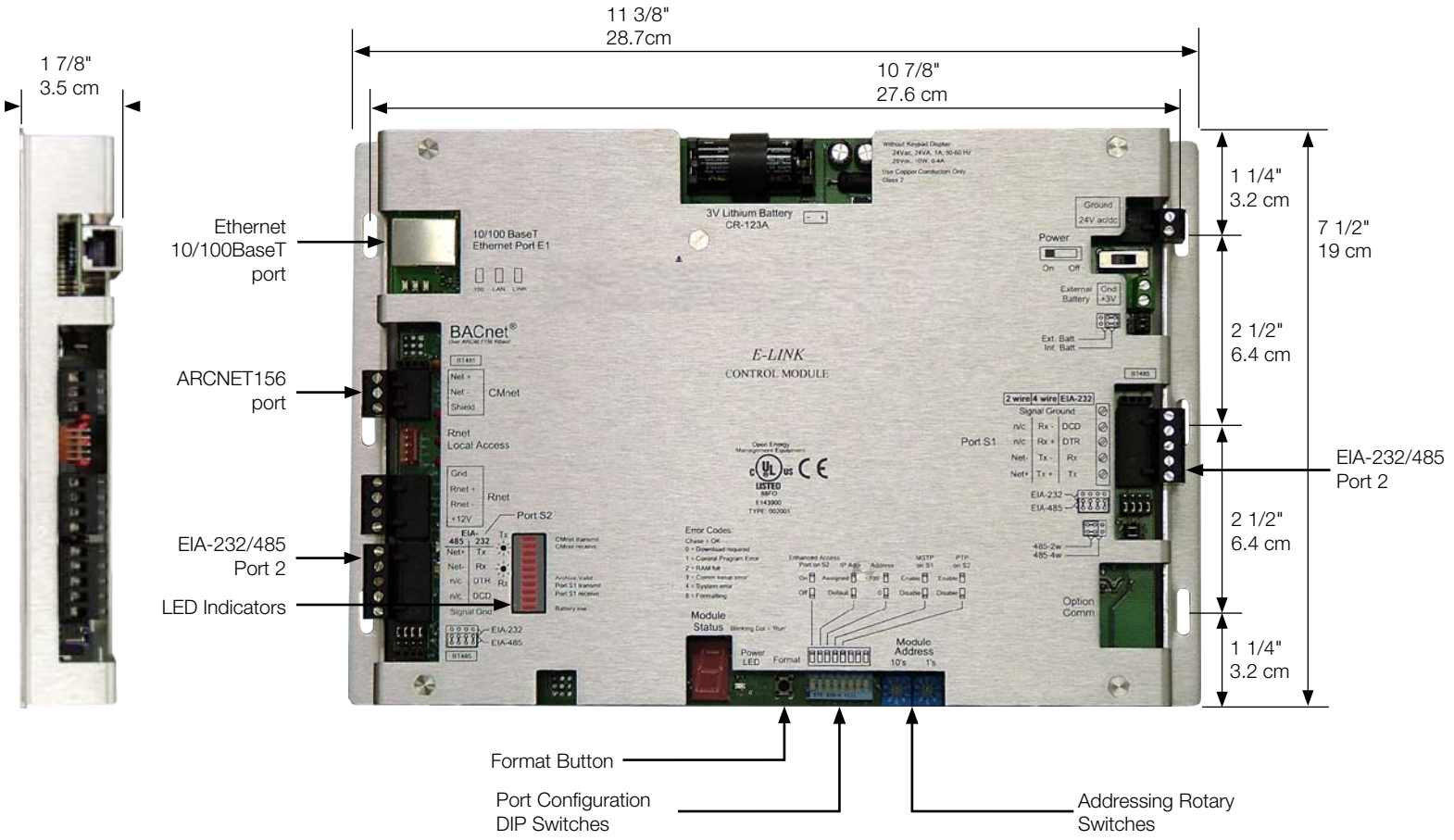
The Lumisys network includes devices that communicate through the Lumisys open protocol across the 2-wire RS-485 connection. The devices may include RCS1000 series, L26 series, L28 series, L35 series, and Qwik-Kit series conversion kits.

The ELINK supports the following BACnet protocols: BACnet IP, BACnet over Ethernet, BACnet over MS/TP, BACnet over PTP, and BACnet over ARCNET (156K).

The ELINK supports the following Modbus protocols: Modbus RTU and Modbus ASCII.

Physical Dimensions

Figure 1: ELINK Dimensions and Layout



Mounting

Screw the control module into an enclosed panel using the mounting holes provided. Be sure to leave about 2 inches (5 centimeters) on each side for wiring. Refer to Figure 1 above for mounting holes and dimensions.

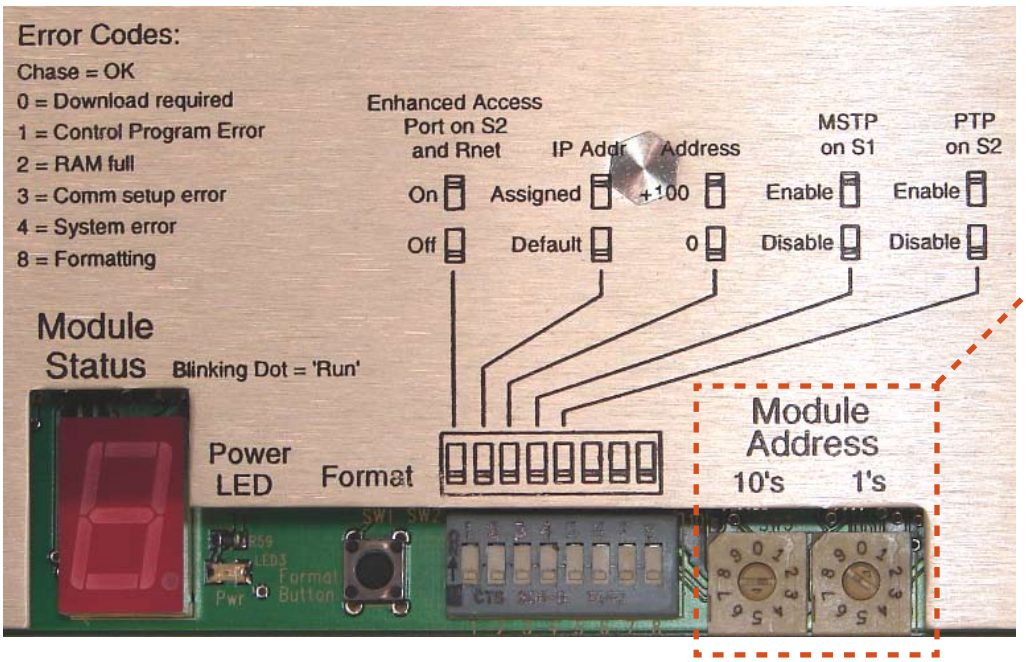
Wiring the ELINK

Addressing

Note: Addressing the ELINK as described here is necessary only if you have been requested to do so by Lumisys technical support for troubleshooting purposes.

The ELINK module only reads the address when the control module is first turned on. A change of address on rotary switches will not be read until the module is restarted. The control module has two rotary switches for addressing. One switch corresponds to the tens digit and the other corresponds to the ones digit. For example, if the control module's address is three, set the Tens switch to zero and the Ones switch to three, as shown in Figure 2.

Figure 2: Setting the ELINK Control Module's Address



Network communications

Lumisys Network

The Lumisys ELINK communicates with the Lumisys panels using a 2-wire twisted pair EIA-485 connection on port S2 or S1 of the ELINK. Port S2 should be used to connect Lumisys network unless you are communicating to the ELINK via BACnet over PTP (discussed below) Ports S2 and S1 have communications jumpers that must be set for 2-wire EIA-485 mode when connecting the Lumisys network wires to either of these ports. Refer to Table 1 and Figure 1 for port and jumper locations on the Lumisys ELINK.

Once the Lumisys ELINK is connected to the first Lumisys panel, additional Lumisys panels may be connected in ser es using a daisy chain topology. Refer to Lumisys's "LP Controller User Guide" for details on addressing the Lumisys panels.

BACnet over MS/TP

The ELINK can connect the BACnet devices communicating by MS/TP only through port S1. MS/TP requires 2-wire EIA-485. Refer to "EIA-485 (2 wire) Wiring" for wiring instructions. Port S1 jumpers must be set to EIA-485 mode, and 2-wire mode.

Wiring the ELINK

Baud Rates on Ports S1 and S2

The ELINK can connect to Lumisys panels through the S1 or S2 port at 9600 bps. It can connect to BACnet devices through the S1 port at 9600 bps, 19.2 kbps, 38.4 kbps, or 76.8 kbps, communicating by MS/TP (DIP switch 4), or Modbus. It can connect to BACnet devices at through the S2 port at 9600bps, 19.2 kbps, or 38.4 kbps, communicating by PTP or Modbus. Communication Baud rates for S1 and S2 ports are factory set using the setup menu. Refer to Figure 3 below for DIP switch settings.

Note Baud Rate can be changed in the field with an IP-Cable.

BACnet IP and BACnet over Ethernet

The ELINK can connect to an Ethernet network by using a LAN 10base-T cable to connect to the 10/100 BaseT Ethernet port. The 10/100BaseT Ethernet port automatically detects whether the connection speed is 10 or 100 mbps. For BACnet IP and BACnet over Ethernet communications use Port E1.

Note IP Address change cable can be used to change IP Address in the field.
Factory default IP address is 192.168.168.51

Figure 3: DIP Switch Settings

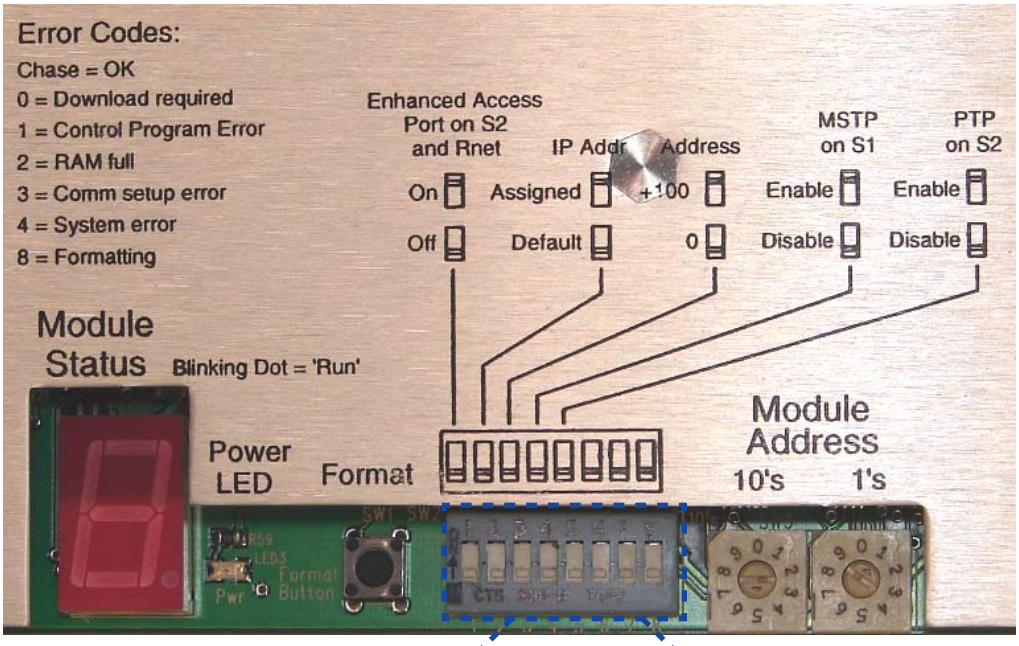
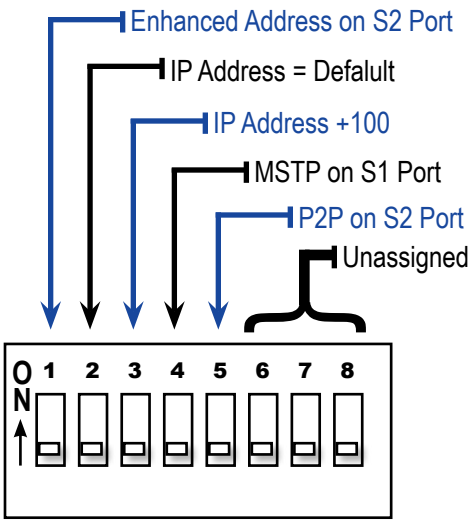


Figure 2: Setting the ELINK Control Module's Address



Wiring the ELINK

Network Topologies

When connecting wires to the ELINK be sure to follow these general steps:
1. Make sure the control module's power is off before wiring it to the network.
2. Check the network communication wiring for shorts and grounds.

The following diagrams show network topologies for each of the BACnet protocols and Modbus. Use these diagrams in conjunction with Table 1 to wire the ELINK.

EIA-485 (2-wire) Wiring

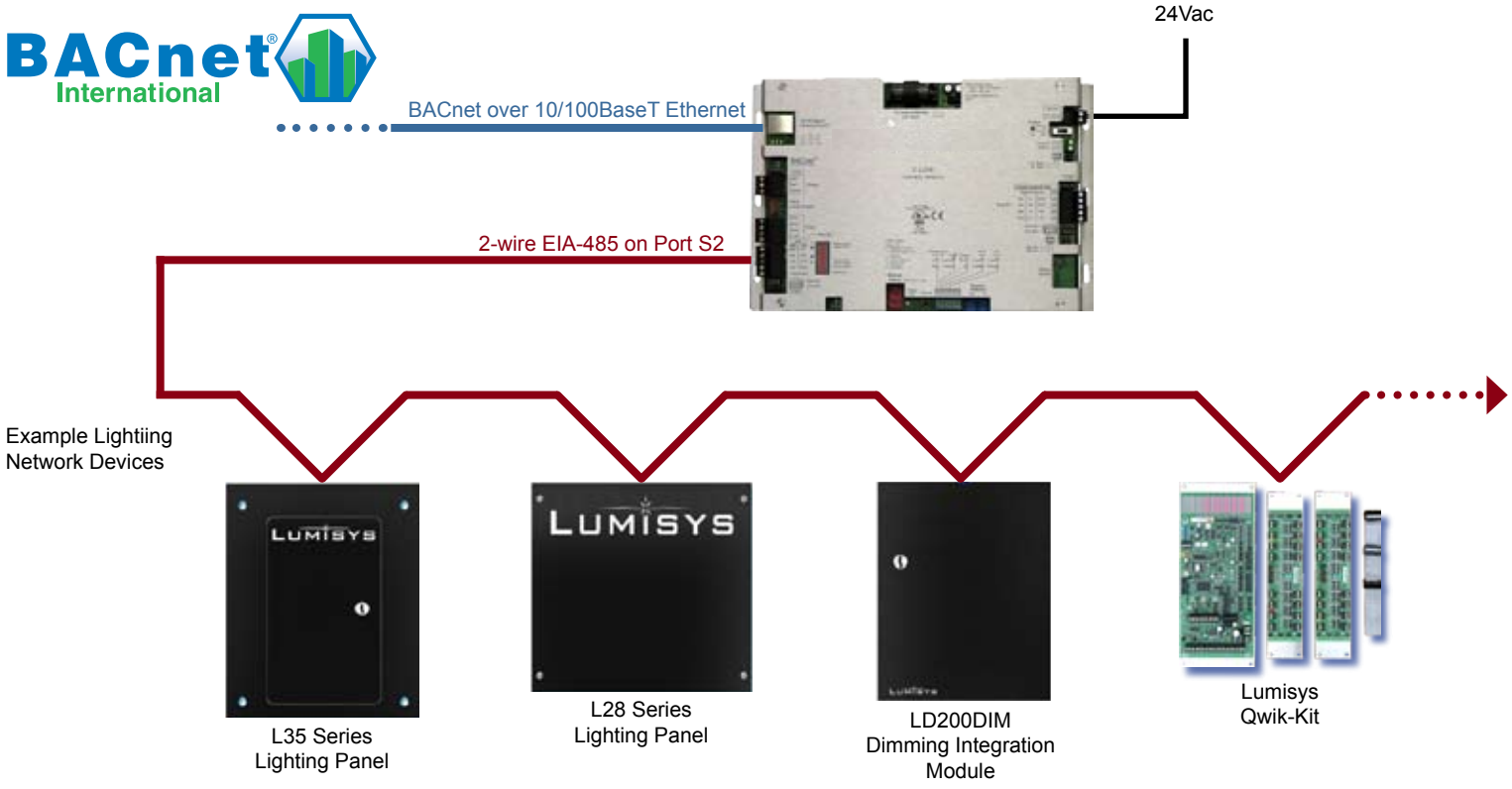
When connecting the ELINK module to a device that speaks 2-wire EIA-485, the recommended cabling to use is shielded, 18-24AWG twisted pair.

The distance from the ELINK to the first EIA-485 device depends on the communications baud rate; on average, the distance should not exceed 3,000 feet (914.4 meters) at 9600 baud. Keep in mind the repeaters are often required:

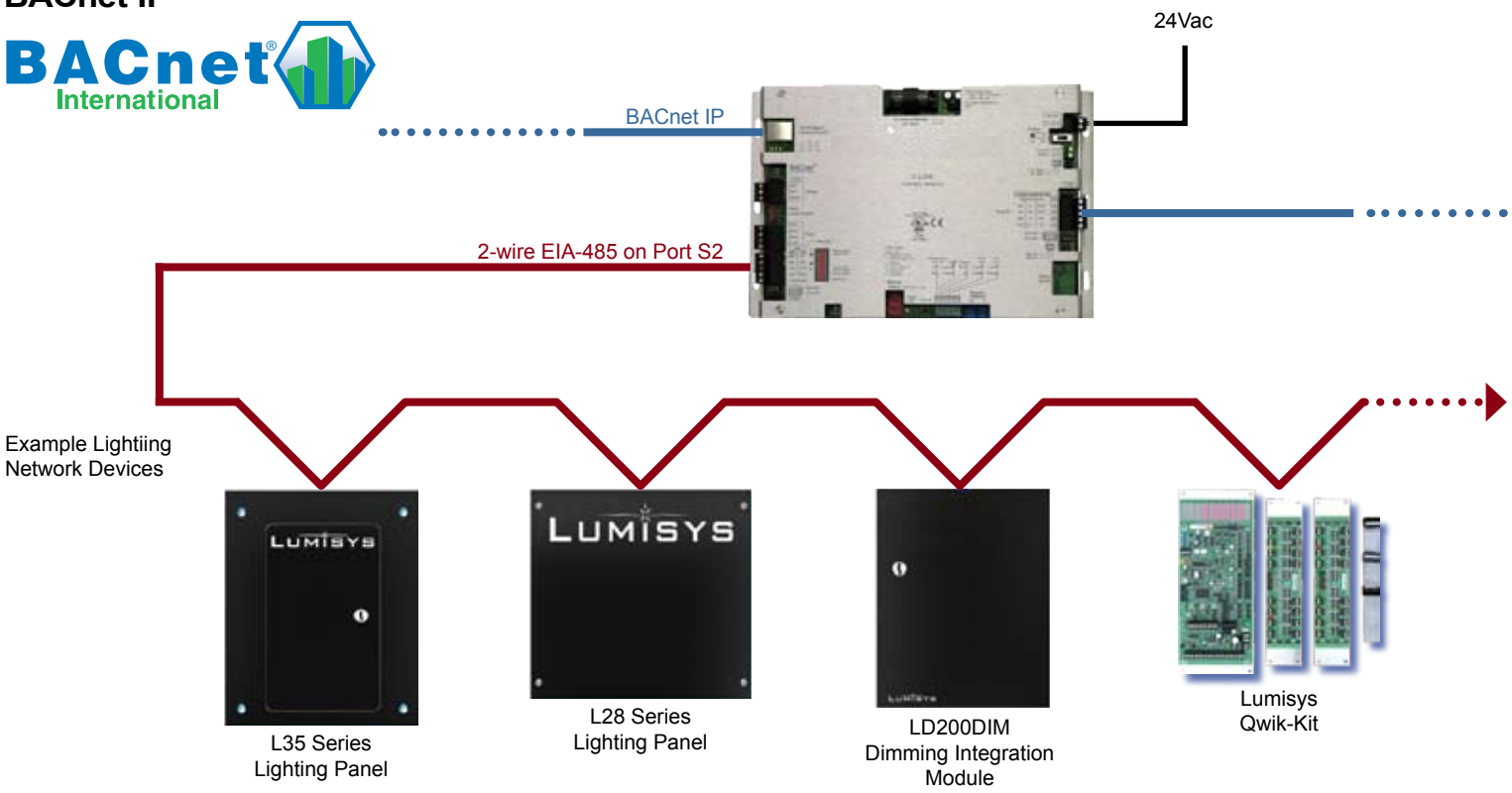
- after connecting 32 EIA-485 devices
- when using long runs of wire

For EIA-485 (2-wire) configurations on Port S2 note that the Port S2 configuration jumper must be set to EIA-485. For EIA-485 (2-wire) configurations on Port S1, note that the Port S1 configuration jumpers must be set to EIA-485 and EIA-485 2-wire. See Figure 10a for 2-wire EIA-485 wiring using Port S2. Figure 10b shows 2-wire EIA-485 on Port S1.

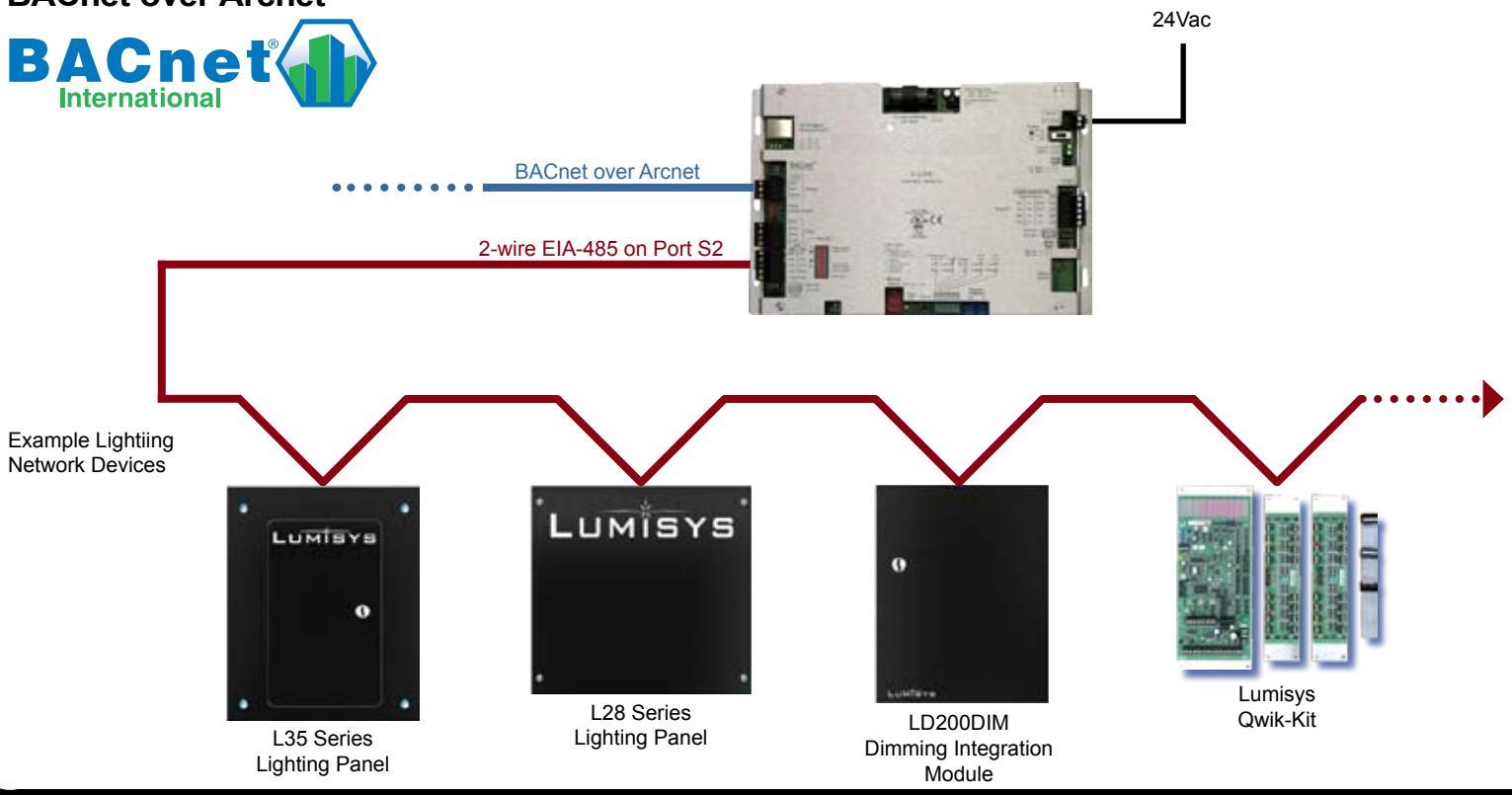
BACnet over Ethernet



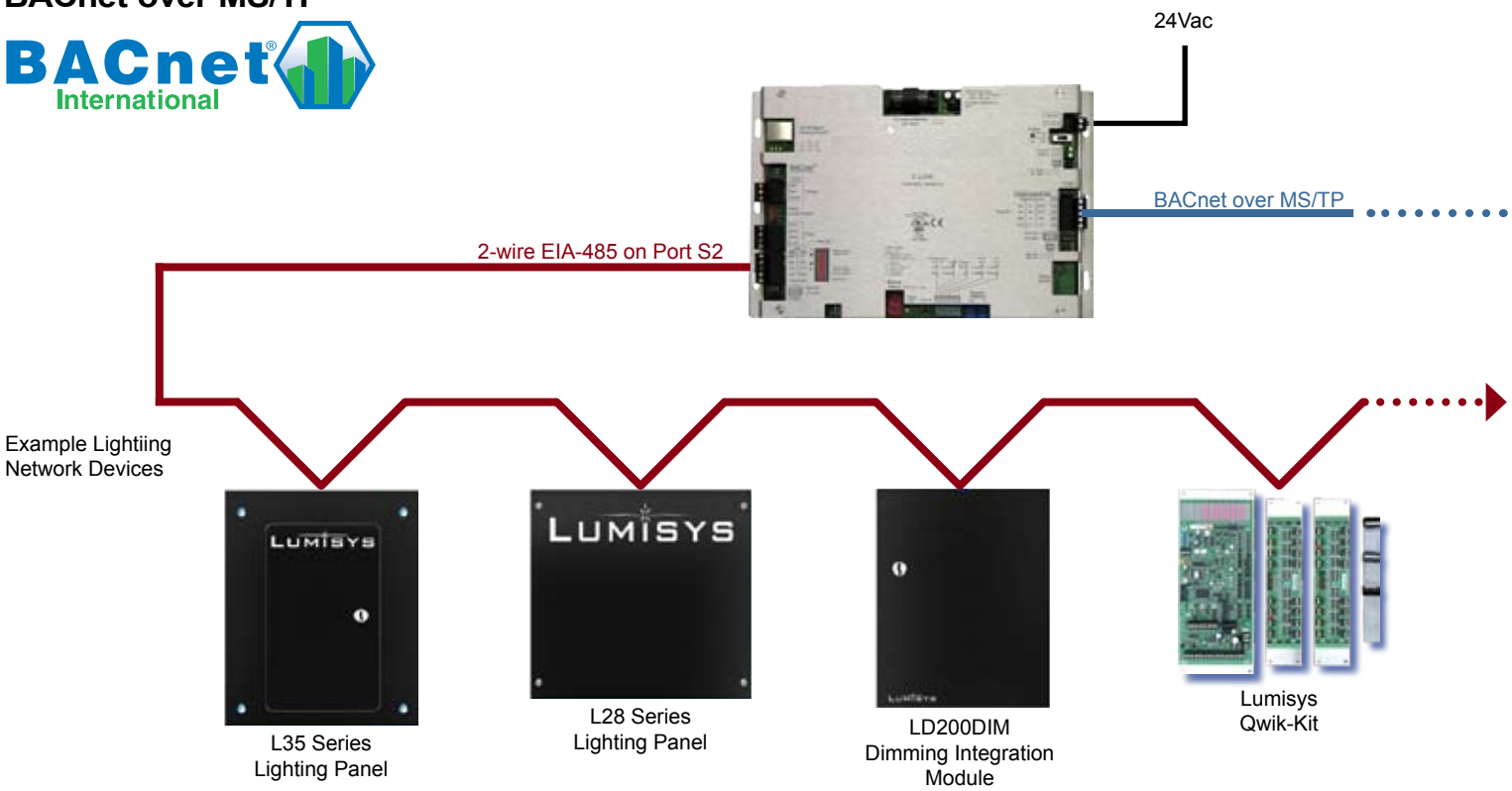
BACnet IP



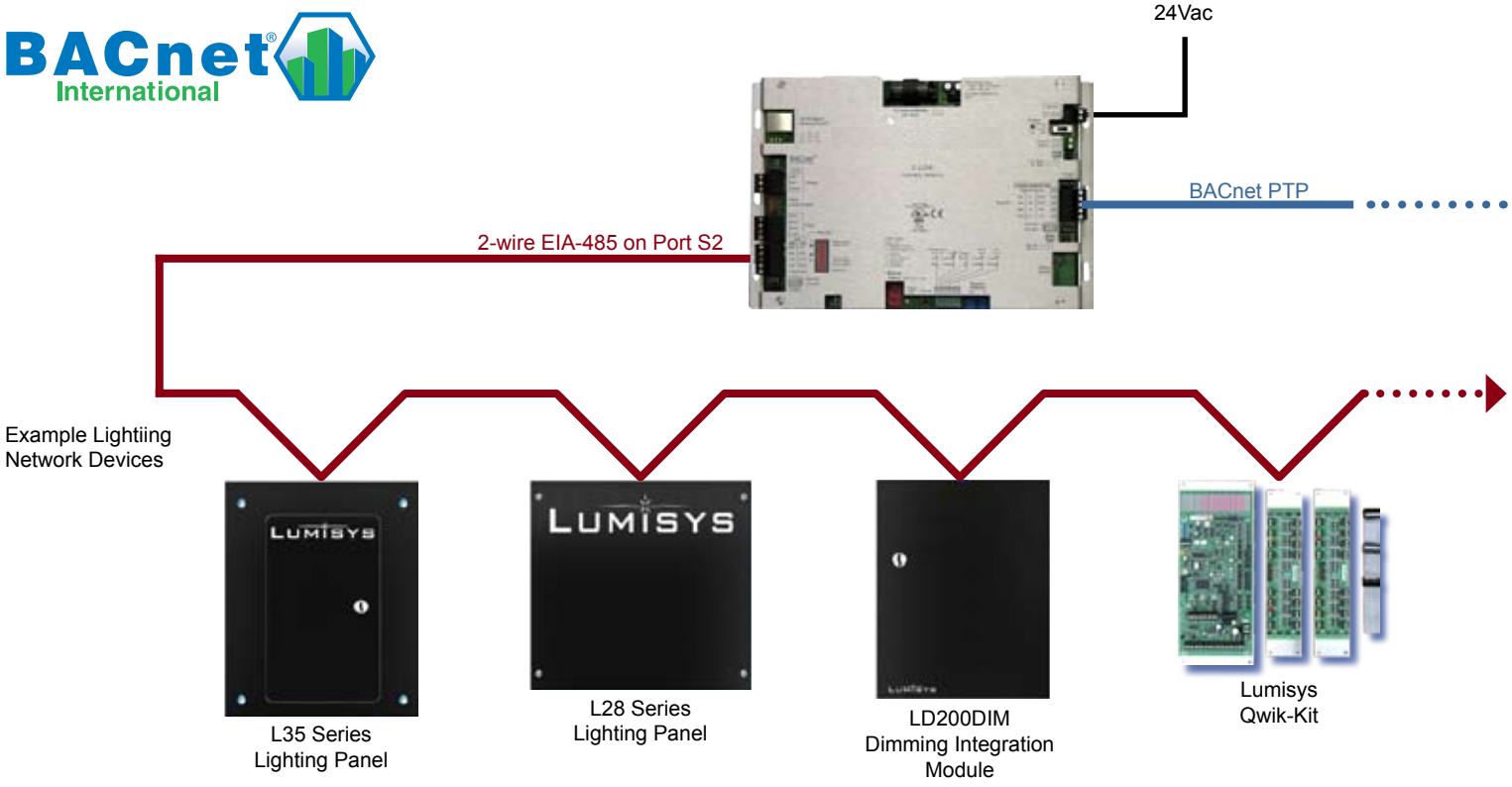
BACnet over Arcnet



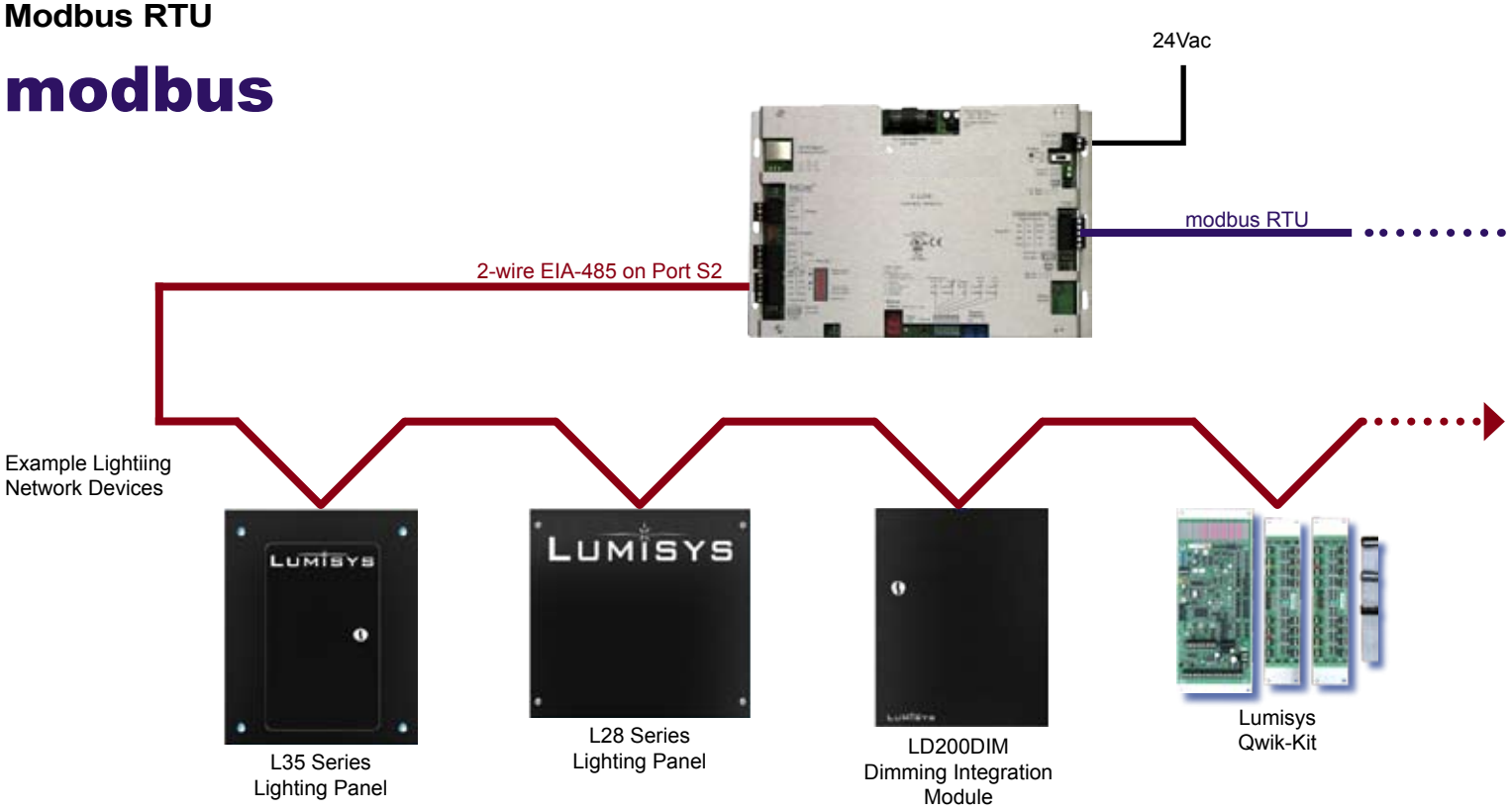
BACnet over MS/TP



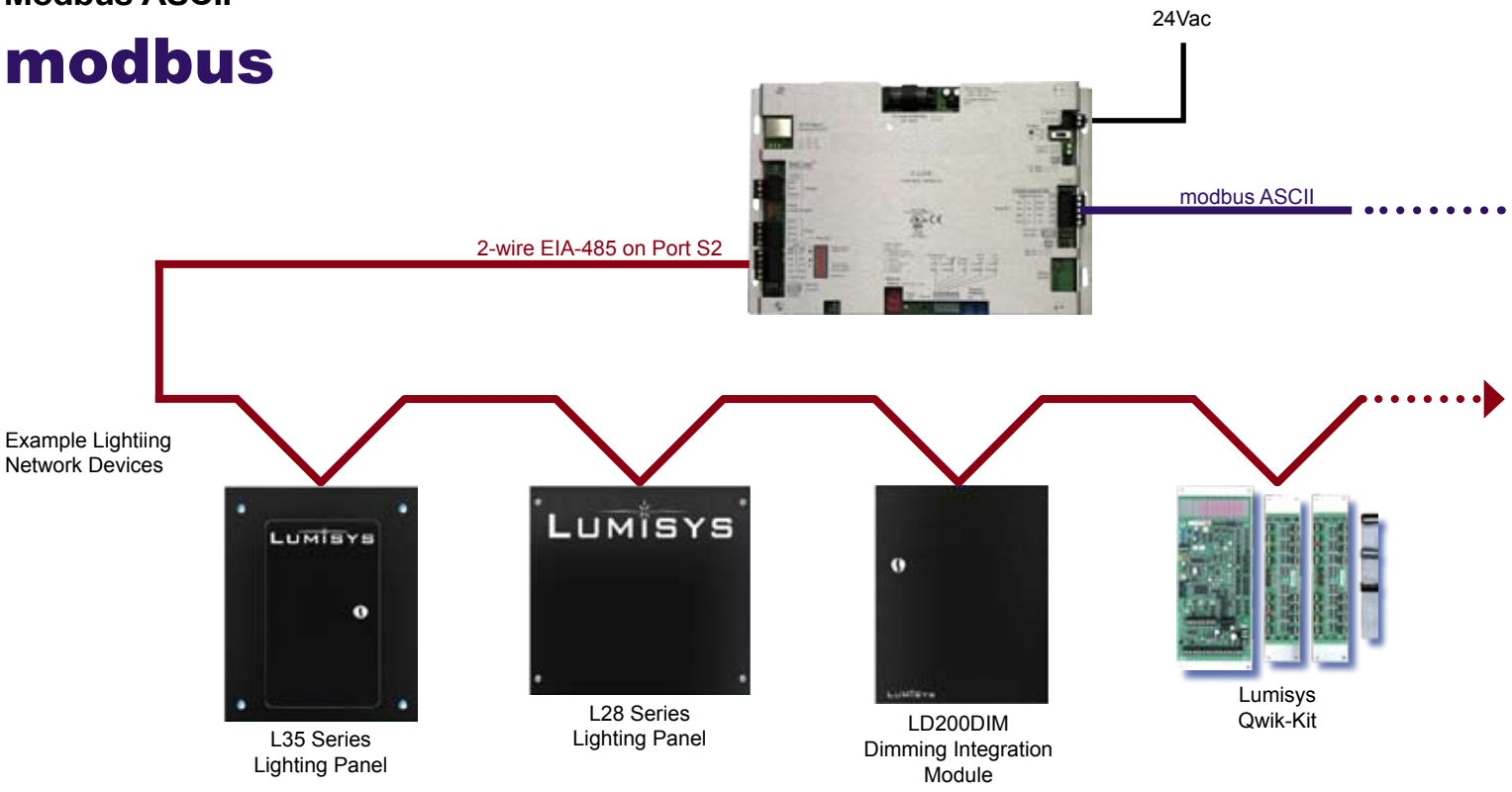
BACnet PTP



Modbus RTU



Modbus ASCII



Caution

The control module is a Class 2 device (less than 30 Vac, 100 Va maximum). Take appropriate isolation measures when mounting the control module in a control panel where non-Class 2 devices (for example, 120 Vac) or wiring are present. The control module's operating range is 21.6 Vac to 26.4 Vac. If voltage measured at the control module's power input terminals is outside this range, the control module may not work properly.

1. Make sure that the control module's address is set and the power switch is off.
2. Make sure the 24 Vac power source is off.
3. Pull the terminal plug from the control module's power terminals labeled Gnd and 24 Vac.
4. Connect the transformer to the terminal plug.
5. Apply power to the transformer.
6. Make sure that 24 Vac is present at the terminal plug.
7. Insert the terminal plug into the control module's power terminals labeled Gnd and 24 Vac.
8. Turn on the control module's power switch.

When the control module turns on, the Run LED begins blinking. The alphanumeric display shows a chase pattern if the control module is running with no errors.

You can verify that the ELINK control module is communicating on the CMnet by making sure the CMnet transmit and receive LEDs are active.

Figure 10b: 2-wire EIA-485 wiring on Port S1

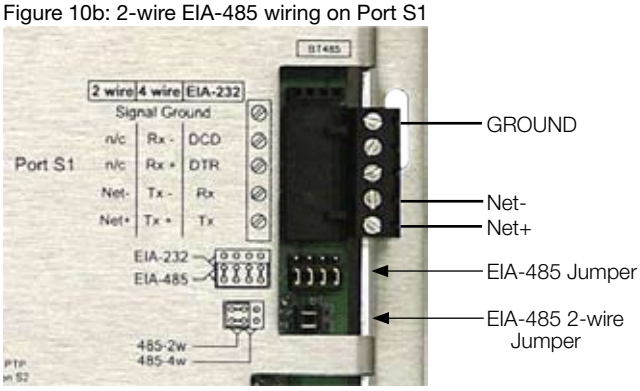
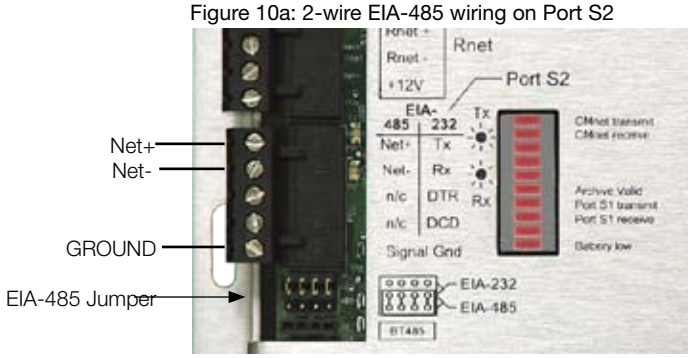


Figure 10a: 2-wire EIA-485 wiring on Port S2

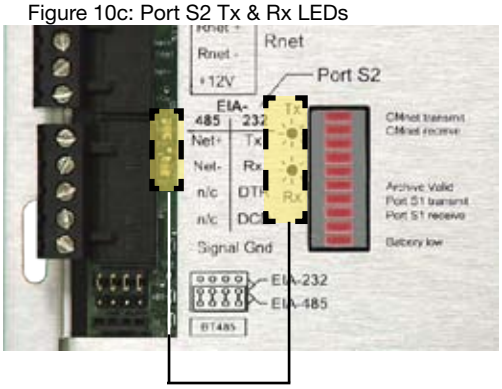


Trouble Shooting

LEDs

The ELINK control module has several status LED indicators to assist with troubleshooting. The control module status LED displays alphanumeric numbers that are described on the control module. The Ethernet port LEDs display the link, status, and speed. The other LEDs indicate the following states:

Figure 10c: Port S2 Tx & Rx LEDs



Tx & Rx Light (LED)

Power - lights when power is being supplied to the control module.
CMnet receive - lights when the control module receives data from the CMnet.
CMnet transmit - lights when the control module transmits data over the CMnet.
Archive Valid - lights when backup is valid.
Port S1 transmit - lights when the control module transmits data from Port S1.
Port S1 receive - lights when the control module receives data in to Port S1.
Battery low - lights when the battery is low.

Protection

The ELINK control module is protected by internal solid state Polyswitches on the incoming power and network connections. These Polyswitches are not replaceable and will reset themselves if the condition that caused the fault returns to normal.

Power protection - metal oxide varistor, solid state fuses, and capacitors.
Network protection - sold state fuses, transient voltage suppressors, 50 V isolation.
Analog Input protection - metal oxide varistor, series resistor, solid state overvoltage protection, capacitor.
Analog Output protection - metal oxide varistor, series resistor.
Relay Output protection - metal oxide varistor, relay isolation.

The following two sections are for WebCTRL users only.

Production Date

To determine when a control module was manufactured, check the module status report for the control module in WebCTRL. Refer to WebCTRL Help for more information about the module status report.

A sticker on the back of the control module also shows the date the control module was manufactured. The first three characters on the sticker indicate the type of control module. The next two characters show the year and month of manufacture.

Formatting the Control Module

Since formatting the control module erases all memory, you need to use WebCTRL to transfer memory back to the control module after it is formatted. Do not format the module if you do not have WebCTRL software.

Note Since the control module is automatically formatted when you transfer memory, you should only manually format the control module if communication was not established after the memory transfer.

1. Press and hold the Format button, then turn on the control module's power.
2. Continue to hold down the Format button until 8 is displayed, then 0.
3. Release the Format button.
4. Transfer memory to the control module. Refer to WebCTRL Help for more information.

Terms and Conditions of Sale

AGREEMENT OF SALE: Acceptance by Lumisys, (hereinafter "Seller") of any order, placed for the goods described on the Acknowledgment, Invoice or Sales Contract hereof shall be subject to Seller's Standard Terms and Conditions of Sale and is conditioned upon the Buyer's acceptance of these Standard Terms and Conditions of sale as stated on this Sales Contract.

TERMS OF CONTRACT: Any terms or conditions of the Buyer's order which are inconsistent with these Standard Terms and Conditions shall not be binding on the Seller and shall not be considered applicable to the sale or shipment of goods covered by this Acknowledgment, Invoice, or Sales Contract. PRICES: Prices are subject to change to the extent permissible under applicable federal law. Sales contracts which call for delivery in the future will be billed at prices in effect at the time of shipment. Shipping weights shown are approximate and subject to change without notice. Seller shall notify buyer of any significant changes in weight.

SHIPMENT AND PAYMENTS: All prices are F.O.B. Seller's plant in Kennesaw, Georgia. No freight is allowed on any shipments. Shipments and deliveries hereunder shall at all times be subject to the approval of Seller's Credit Department. Seller may, at any time, require payment in advance or satisfactory security or guarantee that invoices will be promptly paid when due. If Buyer fails to comply with any terms of payment, Seller, in addition to its rights and remedies but not in limitation thereof, reserves the right to withhold further deliveries or terminate this Agreement, and any unpaid amount thereon shall become due immediately. Terms of payment shall be as set forth on the face hereof. Unless approved by Seller, all overseas shipments shall require prepayment by wire transfer or an irrevocable letter of credit from Buyer.

FORCE MAJEURE: Delays or defaults in delivery by Seller of the goods covered by this Sales Contract shall be excused as Force Majeure so far as the same is caused by fire, strikes, accident, war, natural disasters, acts of God, terrorism, explosions, death, vandalism, armed robbery, theft, breakage of machinery, governmental regulation, or any other events which were unavoidable or caused by events which are beyond the reasonable control of Seller. In no event shall Seller be liable for any consequential, special, or contingent damages on account of any default or delay in delivery from any Force Majeure event. If any Force Majeure event occurs which may affect Buyer's goods, Seller shall give prompt oral and written notice of its Force Majeure declaration to Buyer within 7 days or as soon as is practicable.

NON-CANCELLATION: Orders are not subject to suspension, reduction, or cancellation, except on terms that will indemnify Seller against loss. SPECIFICATIONS: Seller relies on specifications and other data furnished by the Buyer, architect, contractors, and/or consulting engineer in all phases of the work covered by this Acknowledgment, Invoice or Sales Contract. Seller shall be responsible to check quantities only. Alterations, changes in specifications, approval of samples, and/or changes in delivery shall not be binding upon Seller unless approved by Seller in advance. In the event Buyer asks Seller to perform design or engineering work for any and all phases of the work covered by this Acknowledgment, Invoice or Sales Contract, Seller shall not be responsible for any damages claimed by the Buyer as a result of alleged errors or defects in such design or engineering work except for gross negligence on the part of Seller.

WARRANTY AND LIMITATION OF LIABILITY: Seller warrants that the goods supplied by it have been manufactured in accordance with its standard manufacturing practices, are non-defective and conform to the contract or catalog description for such goods. Except as stated herein, Seller makes no express warranty with respect to goods supplied by it and Seller makes no implied warranties of suitability or fitness for any particular purpose. Unauthorized or unapproved modifications or alterations of such goods without the express written approval of Seller shall void all warranties and indemnities granted herein. To satisfy its indemnity and warranty obligations, Seller will, at its sole option, credit, repair or replace, any goods supplied by it which its examination shall disclose to its satisfaction are defective in workmanship or material, and are returned to it within two years from the date of shipment. Any claim not made within this period shall be conclusively deemed waived by Buyer. Seller shall not be liable for any consequential, special, incidental, punitive or contingent damage or expense arising directly or indirectly from any defect in its goods or from the use of any defective goods or otherwise arising out of this Contract or any purchase order. The remedies set forth herein shall constitute the exclusive remedies available to Buyer for Seller's indemnity and warranties and are in lieu of all other remedies that would otherwise be available to Buyer.

Warranty and technical support on Lumisys products are only available after payment has been received in full.

RETURNS: Material returned for credit is subject to a 10% restocking charge. Freight or other costs incurred in restocking will be added. Returns resulting from errors by the Seller will not be subject to the charge. Returned materials shall be received in condition for resale as new equipment to qualify for credit. Returned materials must be returned to the Seller within 30 days of receipt and shall only be accepted with prior authorization.

SELLER RESERVES THE RIGHT TO SUBSTITUTE MATERIALS USED IN CONSTRUCTION OR EQUIPMENT SOLD PROVIDED SAID SUBSTITUTION DOES NOT MODIFY THE OPERATIONAL CHARACTERISTICS OF THE EQUIPMENT SOLD.

THESE TERMS OF SALE MAY BE MODIFIED WITHOUT NOTICE. THE TERMS OF SALE IN EFFECT AT THE TIME OF SALE SHALL APPLY. THE SELLER AS REFERRED TO IN THE TERMS OF SALE IS Lumisys.

CLAIMS: Claims for shortages of goods or for mistakes or errors in billing must be presented within forty-five (45) days from the date of goods; and must state the packing slip number and container number applicable to the claim. Any claim not so presented shall be conclusively deemed waived.

TAXES: Any federal, state, local or government tax or charge on the sale, shipment, or installation of the goods covered by the Acknowledgment, Invoice or Sales Contract, shall be added to the price and paid by Buyer or, in lieu thereof, the Buyer shall furnish Seller with tax-exemption certificates acceptable to the taxing authority. Buyer agrees to reimburse and save Seller harmless from all such state and local taxes, including interest and penalties thereon, which may at any time be payable to any governmental unit with respect to the sale of any goods covered by this Acknowledgment, Invoice or Sales Contract.

CREDIT BALANCE: Any credit memos granted to Buyer from Seller arising out of returned goods or other circumstances, which are not subsequently requested or applied to the purchase of other goods from Seller within twelve months from the date credit was granted, shall become the property of Seller.

APPLICABLE LAW: All questions arising out of this Acknowledgment, Invoice or Sales Contract, which shall be deemed a Georgia contract, shall be governed by the laws of the State of Georgia. Venue for any disputes arising out of this agreement shall be in Georgia. All disputes arising out of this agreement shall be resolved in the following fashion: the parties shall first engage in good-faith negotiation. If the parties are unable to settle their claims through good-faith negotiation, the parties shall attempt to resolve their dispute through mediation by an agreed upon mediator. Lastly, if mediation fails, the parties shall be subject to binding arbitration by an agreed upon arbitrator who is a member of the American Arbitration Association. The prevailing party in any arbitration or other legal action arising out of this agreement, and/or these terms and conditions of sale, shall be entitled to indemnification of all its attorneys' fees, litigation expenses, and costs from the losing party.

EXCLUSIVE TERMS: This Acknowledgment, Invoice or Sales Contract, which includes these Standard Terms and Conditions, shall constitute the final and binding contract between the parties and shall take precedence over any other terms and conditions from the Buyer. Any changes or deviations from this Acknowledgement, Invoice or Sales Contract must be in writing and mutually agreed to by Buyer and Seller.

LIMITATION FOR SUITS: Any controversy or claim arising out of, or relating to, this Acknowledgment, Invoice or Sales Contract, or the breach thereof, must be commenced within two (2) years