

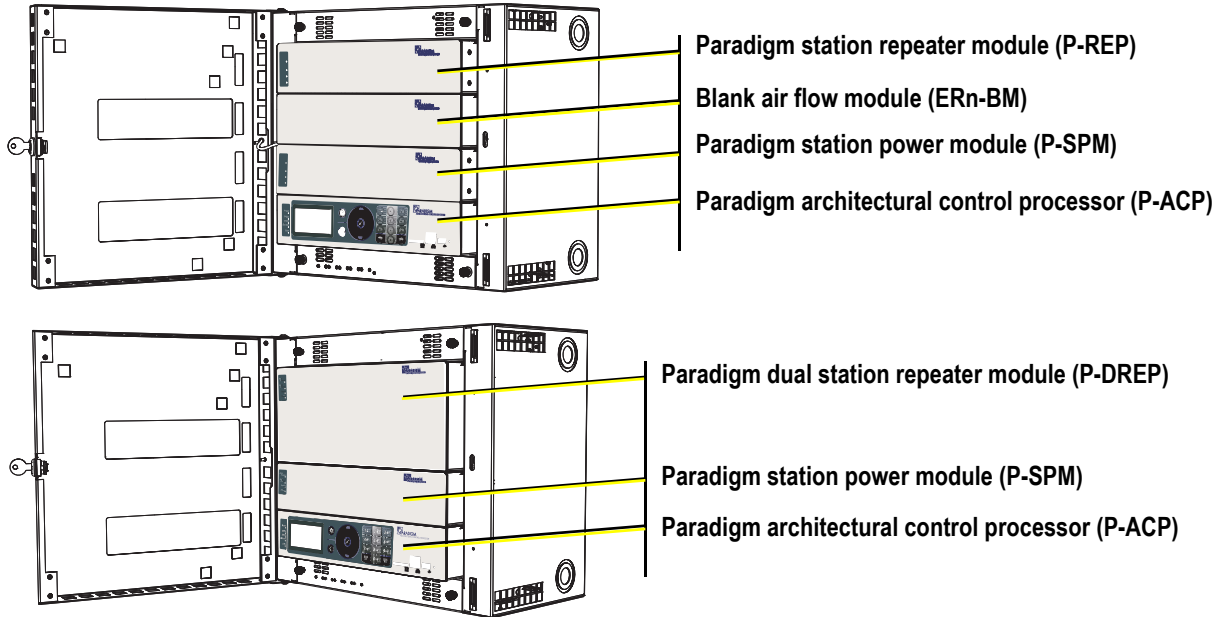
ETC® Setup Guide

Paradigm Repeater Module Installation



The Paradigm station repeater (P-REP) module extends the system station bus length by 1,640 feet (500m) and adds support for up to 30 additional stations.

The Paradigm dual station repeater (P-DREP) module extends the system station bus length 3,280 feet (1,000m) through two separate topology-free Echelon segments, supporting 1,640 feet (500m) of additional LinkPower station wire each, and adds support for up to 30 additional stations. Both repeater module types may only be utilized in the top module slots of the ERn4 rack enclosure.



The following table lists the recommended control wire types used in a typical Unison installation and the maximum wire runs allowed.

Purpose	Link Power (Belden 8471)		DMX (Belden 9729)		Ethernet (Cat5 /Belden 1583a)	
	Feet	Meter	Feet	Meter	Feet	Meter
Total length of control wire (without repeater module)	1640	500	1600	487	328	100
Maximum wire length (ERn to station)	1313	400	1600	487	N/A	N/A
Maximum repeater distance	1640	500	N/A	N/A	N/A	N/A



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Terminate LinkPower (LON[®]) Control Wiring



Note: *All low voltage control cables must run in separate conduit from power wires.*

Unison control stations communicate with the Paradigm architectural control processor using the LinkConnect station communication bus from the architectural control processor to the stations. LinkConnect is based on Echelon[®] LonWorks[®] with LinkPower bidirectional protocol, and uses one pair of wires (data+, data-).

Throughout this document, LinkConnect is referred to by the protocol it uses, LinkPower.

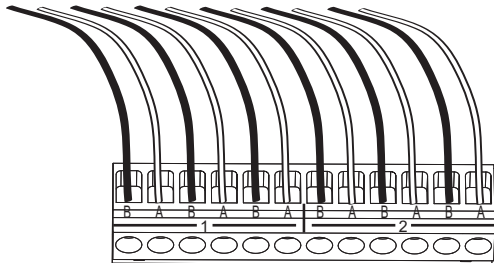
Termination is available for up to six home runs of LinkPower (LON) data runs utilizing Belden 8471 cable (or approved equal) plus one 14 AWG ESD drain wire when the data cable is not installed in grounded metal conduit. LinkPower wiring is topology-free and polarity independent, you can install your LinkPower data runs in any desired combination of bus, star, loop, and home run (up to six home run termination points available), or any combination of these. The total combined length of LinkPower wire run cannot exceed 1,640 feet (500m), with a maximum distance of 1,313 feet (400m) between any two (un-repeated) communicating devices. Without a repeater, no device may be more than 1,313 feet (400m) away from the architectural control processor.

Standard LON interoperability requires that there should be a maximum of only one repeater between any two LON devices. This means that only one repeater module, whether a Paradigm station repeater module (P-REP) or a Paradigm dual station repeater module (P-DREP), may be used per Paradigm architectural control processor (P-ACP). Each individual topology-free TP/FT-10 LonWorks network can have no more than 62 LON stations with a repeater option and Paradigm architectural control processor (a maximum of 64 total devices).



Note: *When utilizing a Paradigm station repeater module (P-REP) or Paradigm dual station repeater module (P-DREP), terminate the repeated LON segment(s) and auxiliary power wiring to the top right I/O board in the ERn4 rack enclosure.*

- Step 1: Pull Belden 8471 (or an equal type) control wiring into the ERn4 rack through the conduit opening previously prepared.
- Step 2: Strip 3/16" (4.8mm) of insulation from the ends of each wire pair.
- Step 3: Remove the LinkPower connector (labeled LON) from the top right I/O board.

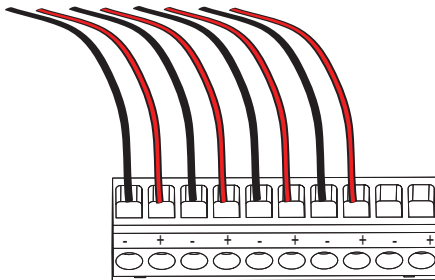


Notice the LinkPower/LON connector is labeled to indicate that the connector is split between two LON segments, allowing three station wire home runs per segment. This is effective only when a Paradigm dual station repeater module (P-DREP) is used. With the standard Paradigm station repeater module (P-REP) all six station home runs connect to the single LON segment control.

- Step 4: Loosen the terminal screws for as many wire pairs you are terminating. If utilizing a Paradigm dual station repeater module, keep in mind that the connector is split into two LON segments. Be sure to terminate each wire pair to the correct LON segment.
- Step 5: Insert each white (typical) wire from the pairs into a “A” terminal on the connector and tighten the screw firmly to secure the wire into the terminal.
- Step 6: Insert each black (typical) wire from the pairs into a “B” terminal on the connector and tighten the screw firmly to secure the wire into the terminal.
- Step 7: The 14 AWG ground wire can terminate to the ground bus located inside the ERn rack (back panel right side) and the other end to the green/yellow striped wire connected at the architectural control station using a Scotchlok connector.
- If grounded metal conduit is installed a ground wire may not be required for termination. Reference the related [station installation manual](#) for details.
- Step 8: Replace the connector on the top right I/O board.

Terminate Auxiliary Power

Auxiliary power is required when you are installing powered Unison architectural control stations. ETC recommends using two 16 AWG stranded wires for 24 Vdc auxiliary power to the control station(s). Auxiliary power is topology-free. Maximum auxiliary voltage runs are dependant by the wire gauge and the distribution of auxiliary load determined by installation. The auxiliary supply is capable is of 36W (1.5A at 24Vdc).



The auxiliary power connector (labeled Aux Power) provides termination for up to 20 wires in the ten position pluggable connector. Each terminal allows up to two 16 AWG wire and provides 24 Vdc power to Unison control stations when used with the Paradigm ACP.



Note:

When utilizing a Paradigm Station Repeater Module (P-REP) or Paradigm Dual Station Repeater Module (P-DREP) in an ERn4 rack, terminate the affected LON segment(s) and auxiliary power wiring to the top right I/O board.

- Step 1: Pull auxiliary control power wiring (typically 16 AWG red / black wire pair) into the ERn4 rack through the conduit opening previously prepared.
- Step 2: Strip 3/16” (4.8mm) of insulation from the ends of each wire pair.
- Step 3: Remove the auxiliary power connector from the right I/O board.
- Step 4: Loosen the terminal screws for as many auxiliary wire pairs as you are terminating.
- Step 5: Insert the black (typical) auxiliary power wire from the pair into a “-” terminal on the connector and tighten the screw to secure the wire into the terminal.
- Step 6: Insert the red (typical) auxiliary power wire from the pair into a “+” terminal on the connectors and tighten the screw to secure the wire into the terminal.
- Step 7: Repeat steps 5 and 6 for each auxiliary power wire pair in the rack.
- Step 8: Replace the connector on the right I/O board.

Status Indicators

When power is applied to the host rack, the Paradigm repeater module LEDs located on the front panel illuminate, indicating the status of the auxiliary power, LinkPower control network, and connected stations.

The Aux Power and LinkPower LEDs indicate in green when the Paradigm station power module is connected properly and auxiliary power and LinkPower are present. When there is an unbalance in LinkPower the fault indicators illuminate. This condition typically means that the station wiring is at fault, however it could mean a connected device is having an issue. A technician should inspect the system wire and terminations first, then proceed to disconnecting devices to pinpoint the fault and correct it. The power supply will update the fault indicators automatically when the fault condition is cleared.

- If the NET A line has a fault (is shorted or has leakage to ground), the Fault + LED lights.
- If the NET B line has a fault (is shorted or has leakage to ground), the Fault - LED lights.
- If neither fault LED is illuminated the data connections are properly installed and the stations are receiving the data and power required for operation.