UNISON

DR and ER Series Installation Guide For DR system 2.0 LM Software 1.5

Contents

Introduction

Before you begin

This manual is designed to provide quick and easy installation instruction for the Unison Standard DR, ER and AX Racks. Before you begin the installation process, it is important that you check your order contents against the items listed on the packing slip(s). Contact ETC Customer Service at 1-800-688-4116 if there are any discrepancies.

Warning and notice conventions

Throughout this guide, these symbols are used to indicate warning, caution and points of interest.

Note

Calls your attention to important additional information.

Warning

Alerts you to dangers that could cause serious injury or death to you or those working with you.

Caution

Alerts you to dangers that could damage the equipment.

Important Notes

Warning: Risk of electrical shock.

This equipment should be installed and wired by a qualified electrician. Always follow applicable building and electrical codes when installing this equipment. If you are not sure if your installation complies with local or national codes, contact your local building inspector. Service by qualified personnel only.

Caution: Some electronic components are static sensitive. Do not open their static protection bags until you are ready to install them.

Tools Required

- Drill and assortment of drill bits, for drilling mounting holes
- #2 Philips screwdriver, for mounting option PCBs
- Small flathead screwdriver, for securing control connectors
- Flat screwdriver, for securing loads
- Allen wrench set, for securing feeds
- Ratchet and assorted sockets, for mounting rack to wall or floor
- Digital voltmeter, for testing
- Wire cutter, for cutting wire
- Wire stripper, for stripping load wires
- Assorted sizes of heat shrink tubing
- Hammer, for removing knock-outs
- Pencil, for marking locations
- Knife, for stripping wire
- Slip-joint pliers, for clamping insulation displacement connectors
- Conduit, conduit fittings
- Filler foam

Installation Guidelines

Unison Dimming Systems are comprised of a variety of system components, including dimming racks, consoles, fixtures, distribution and wall stations. It is important to understand the relationship between components prior to system installation.

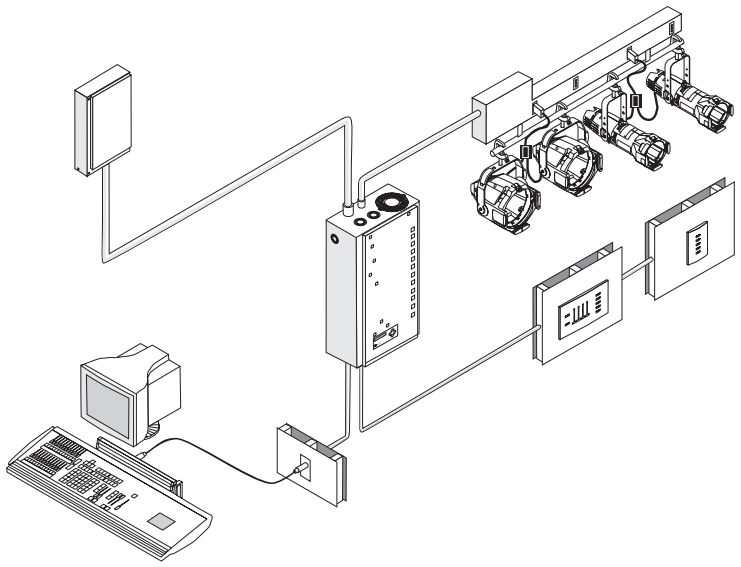


Figure 1: Unison system layout

Deciding where to mount the rack

Unison dimming, auxiliary and external processing racks are typically surface mounted on load bearing walls in an electrical closet or room with restricted access. See *Rack dimensions and weights* below. (DR12 racks are also available with a floor standing pedestal.)

Table 1: Rack dimensions and weights

Enclosure	Max. Weight	Dimensions
DR6	73 lbs	21.85" X 17" X 9.6"
AX6	40 lbs	21.85" X 13" X 9.6"
DR12	128 lbs	31.0" X 17" X 9.6"
AX12	75 lbs	31.0" X 13" X 9.6"
AX12X	75 lbs	31.0" X 13" X 9.6"
ER4	50 lbs	16.23" X 15.5" X 8.6

Maximum current draw of racks

Table 2: Rack phase types and maximum current draw

Enclosure	Phase Type	Max Current Draw
DR6	Single Three	200A 100A
AX6	Single Three	200A 100A
DR12	Single Three	400A 200A
AX12	Single Three	400A 200A
AX12X	Single Three	600A 400A
ER4	100 V, 120V, 230V, 277V	20A (with 2 repeaters)

Dimmer room specifications

- A main circuit breaker cabinet or other readily accessible input power disconnect device that meets the requirement of EN60950 clauses 1.7.2 and 2.6.2 of NEC.
- A clean, temperature-controlled environment
- Non-condensing humidity conditions
- 0-40 degrees C temperature, 32-104 degrees F temperature
- Restricted public access
- Possible sound proofing
- EMC environment 1
- Pollution degree 2
- Altitude ≤ 2000m (6,156 feet)
- Voltage tolerance ± 10%

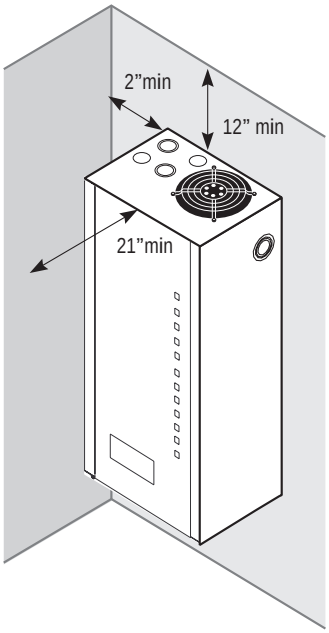


Figure 2: Unison rack clearances

Unison dimmer racks require 12 inches of top clearance for proper airflow through the cabinet. To allow the door to open to remove and install modules, install the rack with 21 inches of front clearance and 2 inches of clearance to the left and right of the rack.

Note: Store unsecured racks where they cannot fall over and use caution to keep racks stable during installation.

Wire routing

Unison dimming racks have wire knockouts at the top, sides and bottom. Line, load and control signal wiring can enter from the top, bottom or both sides of the rack. Signal and power wiring must be run in separate conduit. For wiring recommendations see *Table 3, “Unison Rack Wiring Guidelines,”* below.

Table 3: Unison Rack Wiring Guidelines

Knockout position	Wire size			
	>350 MCM FEED	<2/0 AWG FEED	LOAD WIRES	CONTROL WIRES
TOP	**preferred**	**preferred**	**acceptable**	**acceptable**
BOTTOM	**acceptable** 3-phase rack only	**acceptable** 3-phase rack only	**preferred**	**preferred**
LEFT SIDE	**not recommended**	**acceptable** bussing option only	**acceptable**	**acceptable**
RIGHT SIDE	**not recommended**	**acceptable** bussing option only	**acceptable** bussing option only	**acceptable** bussing option only

Caution: Do not route line (input feed) wires through the back of the panel. Doing so requires radius bends which puts undue stress on lugs.

Note: DR12 single phase applications require dual conductors per phase, neutral input feeds and single-phase strap kits. Installer must enlarge existing conduit knockouts.

Control wire specifications

The following table lists the common wire types used in a Unison installation and the and the maximum wire runs.

Table 4: Wiring maximums

	Link power (Belden 8471)	AUXVdc #14AWG and larger	DMX (Belden 9729)
Total length of control wire (without repeater)	1640’	1500’	1600’
Max. station to station	1200’	1200’	1600’
Max. repeater distance	1640’	1500’	N/A

Identifying Unison Components

Unison DR Series Dimming Racks

Unison Dimming Racks are available in DR6 - six module and DR12 - twelve module configurations. Racks are rated for specific input voltage: 100, 120, or 277 volts. Standard racks are supplied with 3-phase main lugs. Optional main breaker, cross-bussing and single phase straps are available (single phase 120V only).

Note: If you are installing a 230V rack, be certain you are using the *230V CE Installation Guide*. If you need the *230V CE Installation Guide*, call the factory.

DR6 & DR12 Dimming Rack

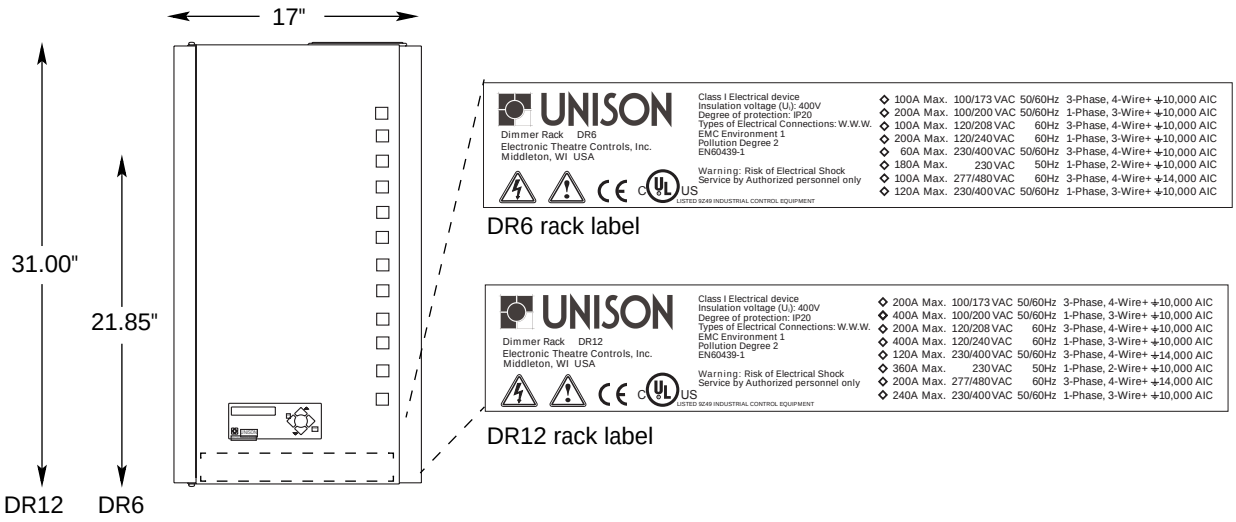


Figure 3: DR6 & DR12 Dimensions

ER Series External Processing Racks

The ER series racks are designed to provide Unison control for Unison, Sensor or other DMX512 dimming racks.

Figure 4: ER4 Dimensions

Unison AX Series Auxiliary Racks

Unison Auxiliary Racks are available in AX6, AX12 and AX12X configurations. Like the dimming racks, the AX series racks are rated for input voltage: 100, 120 or 277 volts. AX6 and AX12 racks provide main circuit breaker protection for DR6 and DR12 dimming racks. AX12X racks provide cross-bussing between (2) DR12 racks.

AX6MCB & AX12MCB Auxiliary Racks

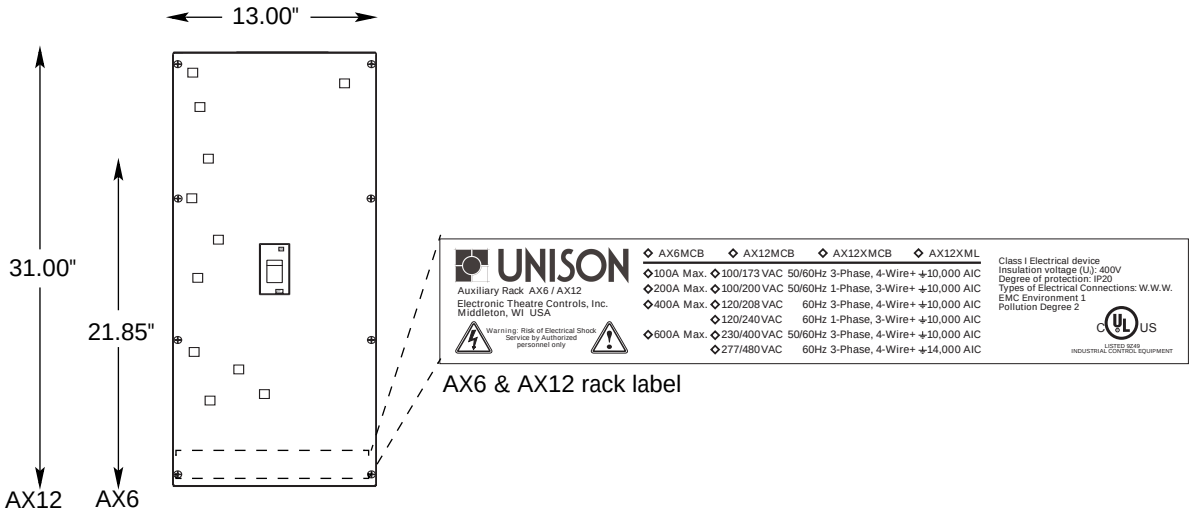


Figure 5: AX6 & AX12 Dimensions

AX12X Auxiliary Rack

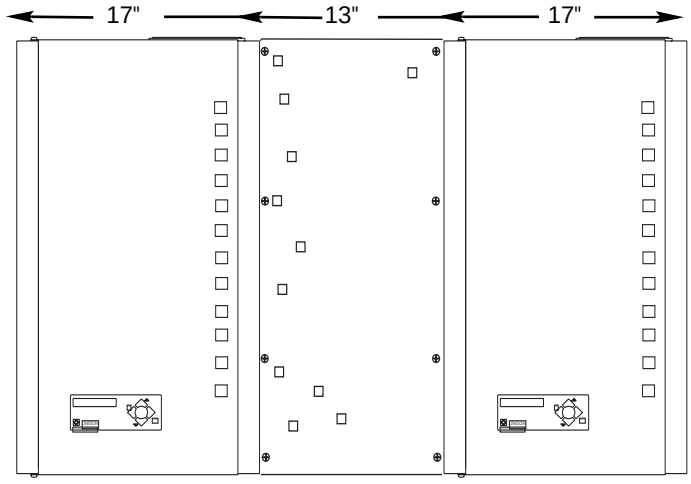


Figure 6: DR12 with AX12ML dimensions

Satellite Interface Stations

The satellite interface stations are a type of Unison control station that can be used in an application as a fader or switch contact station. Each allows eight custom key switches/lamps or eight potentiometers/lamps to be connected to the link power network.

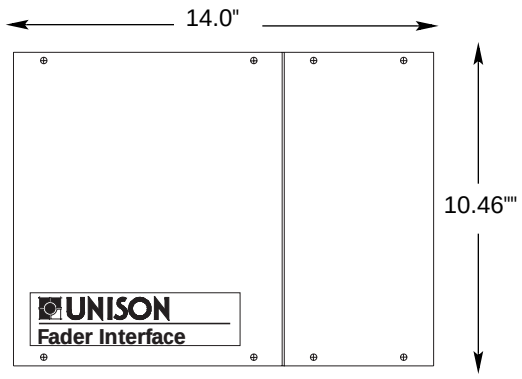


Figure 7: Satellite interface dimensions

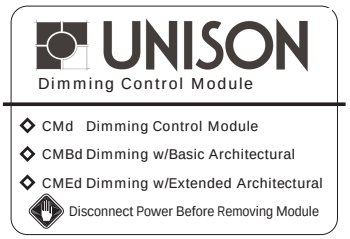
Control Modules

The control module is the processing center of the Unison Lighting Control system. Each module consists of the processors and power supplies required for your system.

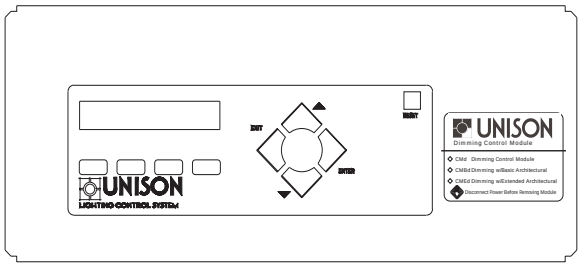
Two types of control modules are available; Dimming and Architectural. CMd, CMBd and CMEd modules are designed specifically for use in DR racks. CMB, CME and CMEi modules are designed for use in the ER4 rack. Modules are **NOT** interchangeable between DR and ER racks. When installing a CMBd and CMEd in systems with more than one rack, be sure to install the control module in the rack which is properly configured with an architectural option board. *See "To install an ARCH Architectural option board" on page 20.*

Note: Inspect the label on the control module front to ensure that you have the correct control module type.

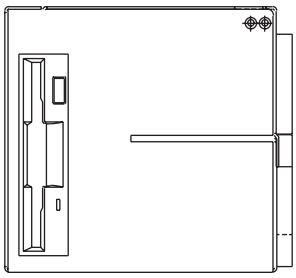
Control Module Details



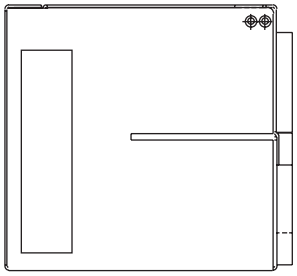
DR Module label



Dimming Rack Control module front view

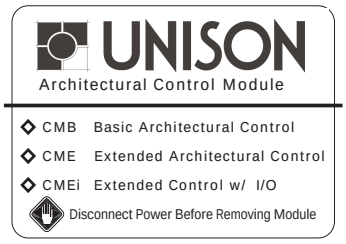


Side view DR control module with architectural processor

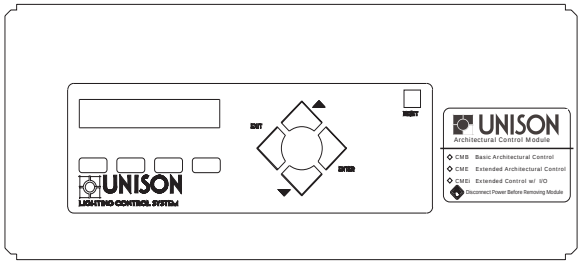


Side view DR control module without architectural processor

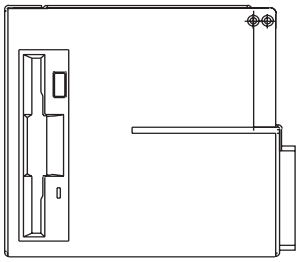
Figure 8: Dimming control module



ER4 Module label



ER4 Control Module front view



Side view external processing rack control module

Figure 9: ER4 Control Module

Dimming Rack Options

There are several options available to enhance the basic (DR) dimming racks.

Architectural Option Board (ARCH)

See page 20 for ARCH Option description.

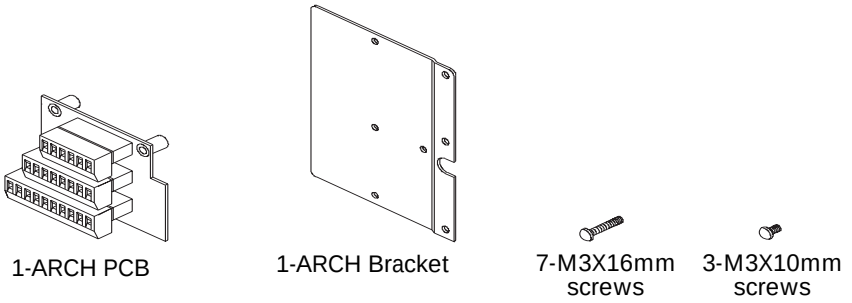


Figure 10: ARCH Kit, part number 7083A1014

Fluorescent Option Board (FLO)

See page 21 for FLO Option description.

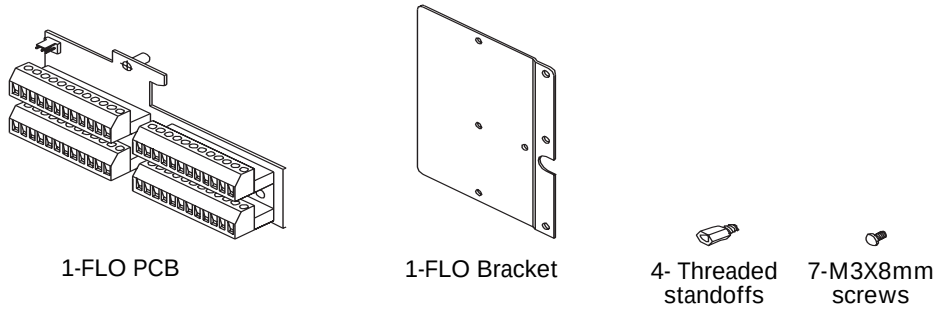


Figure 11: FLO Kit, part number 7083A1015

Bypass Option Board (BYP)

See page 22 for BYP Option description.

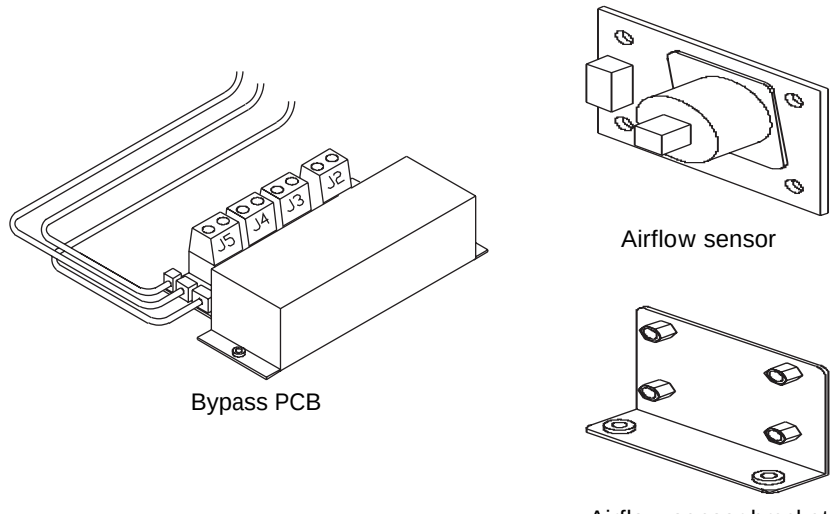
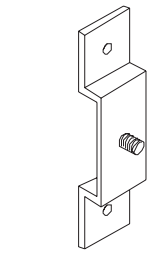
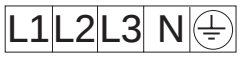


Figure 11: BYP Kit, part number 7083A1030

Single Phase (DR6/12)

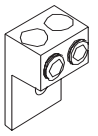


1- Phase Strap

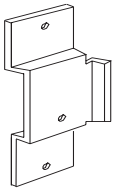


1-Set of lug labels

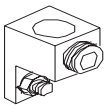
Figure 13: DR6 1PH Kit, part number 7083A1016



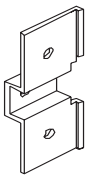
3-Ilsco AU-250 lug



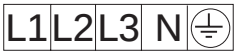
1-Phase Strap



1-Ilsco TA - 2/0 lug



1-Adapter bracket



1-Set of lug labels

5-16x18x3/4" bolts

Figure 14: DR12 1PH Kit, part number 7083A1017

Floor Stand Option

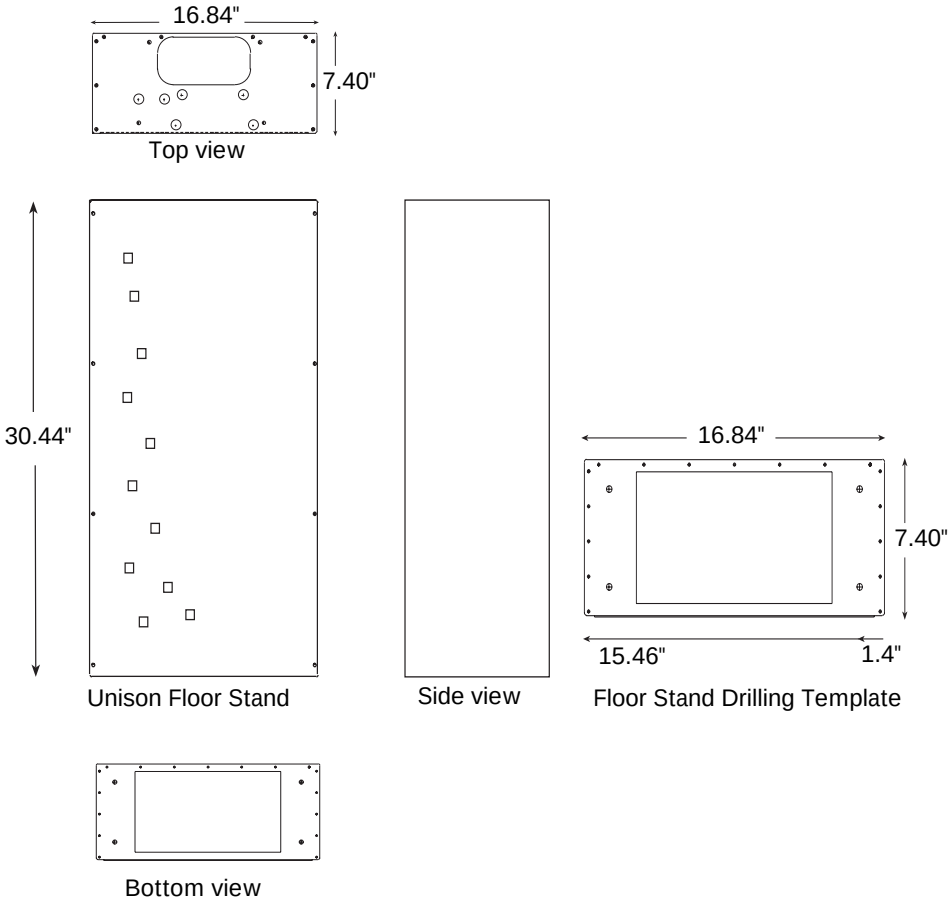


Figure 15: Floor Stand dimensions

Installing Unison Dimming (DR) and Auxiliary (AX) Racks

To Mount Unison DR and AX series racks

1. Assess weight and dimension requirements detailed in *"Installation Guidelines"* on page 7.
2. Assess wire and/or conduit entry requirements detailed in *"Wire routing"* on page 8.

Note: The AX rack should always be installed to the left of the dimming rack in main breaker applications and between two DR12 racks in cross-bussed applications.

3. Remove knockouts as required.
4. Drill holes in wall for mounting bolts. See below for drilling template measurements.
5. Secure enclosures to wall in accordance with local electrical codes.
6. If applicable , install the supplied 2" conduit bushings in knockouts between auxiliary and dimming racks.

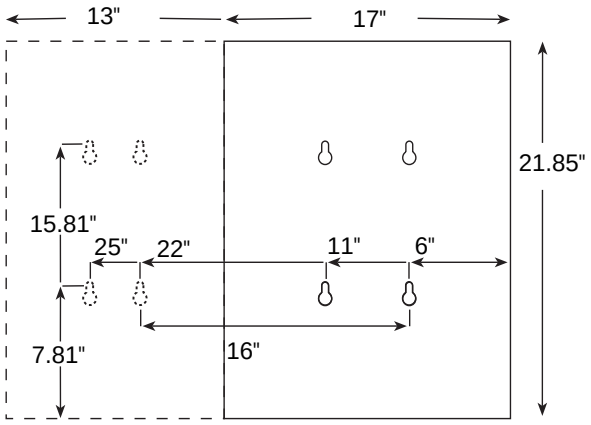


Figure 16: DR6 - AX6 Drilling Template

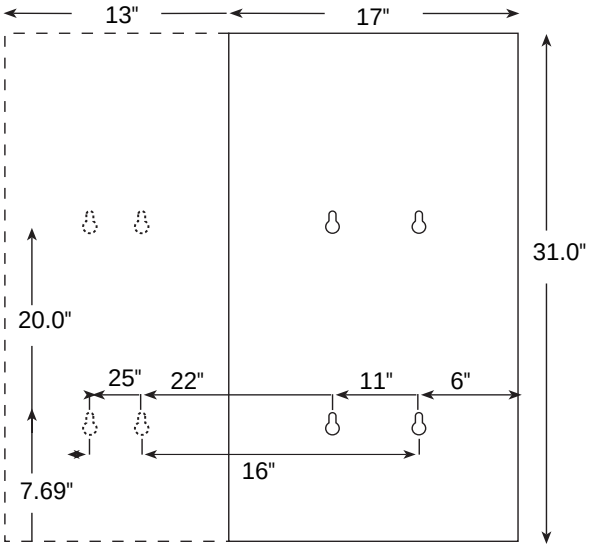


Figure 17: DR12 - AX12 Drilling Template

Installing Unison Dimming Rack Options

To install the 1PH Single-phase strap kit

The 1PH single-phase strap kit allows modification of standard 120V, three-phase dimming racks to single-phase. Installation is different for six module, twelve module and cross-bussed racks.

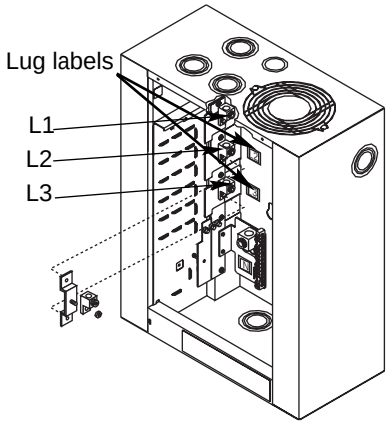


Figure 18: DR6 single-phase assembly

For DR6 racks

1. Remove and discard L3 lug and associated label.
2. Remove L2 lug.
3. Mount L2 lug on single phase strap assembly. See *Figure 18*.
4. Secure strap assembly in the L2/L3 position using existing hardware.

For DR12 racks

1. Remove and discard L1, L2, L3, ground and neutral lugs.
2. Remove L2 and L3 labels.
3. Mount adapter bracket assembly, supplied with ILSCO AU-250 lug, in the L1 position using existing hardware.
4. Mount single phase strap assembly, supplied with ILSCO AU-250 lug, in the L2/L3 position using existing hardware.
5. Attach new L2 label to strap assembly.
6. Mount ILSCO TA 2/0 lug in the ground position using existing hardware.
7. Mount ILSCO AU-250 lug in the neutral position using existing hardware.

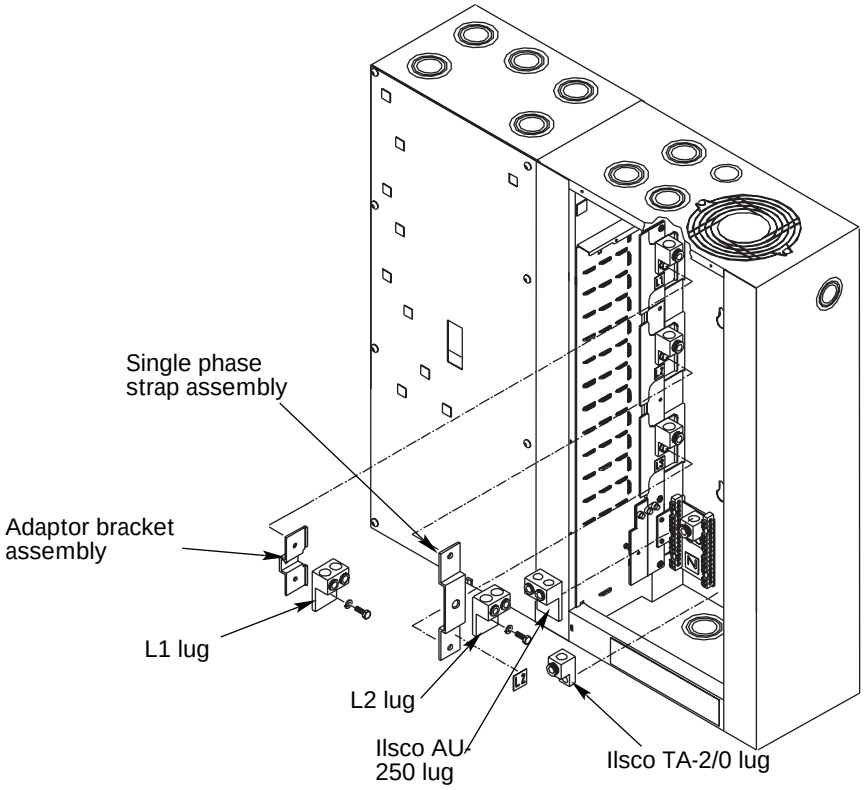


Figure 19: DR12 single-phase assembly

For cross-bussed DR12 racks

In cross-bussed applications, a DR12 rack is mounted on each side of the AX12X auxiliary rack. To phase balance, left and right side racks will strap alternate phases.

See adjacent page for detailed drawing.

Left rack modifications

1. Remove and discard L1, L2, L3, neutral and ground lugs.
2. Remove and discard L1, L2 and L3 labels.
3. Mount single phase strap assembly, supplied with ILSCO AU-250 lug in the L1/L2 position using existing hardware.
4. Attach new L1 label to single phase strap assembly.
5. Mount adapter bracket assembly, supplied with ILSCO AU-250 lug, in the L3 position using existing hardware.
6. Attach new L2 label adjacent to lug in the L3 position.
7. Mount ILSCO TA 2/0 lug in the ground position using existing hardware.
8. Mount ILSCO AU-250 lug in the neutral position using existing hardware.

Right rack modifications

1. Remove and discard L1, L2, L3, ground and neutral lugs.
2. Remove L2 and L3 labels.
3. Mount adapter bracket assembly, supplied with ILSCO AU-250 lug, in the L1 position using existing hardware.
4. Mount single phase strap assembly, supplied with ILSCO AU-250 lug, in the L2/L3 position using existing hardware.
5. Attach new L2 label to strap assembly.
6. Mount ILSCO TA 2/0 lug in the ground position using existing hardware.
7. Mount ILSCO AU-250 lug in the neutral position using existing hardware.

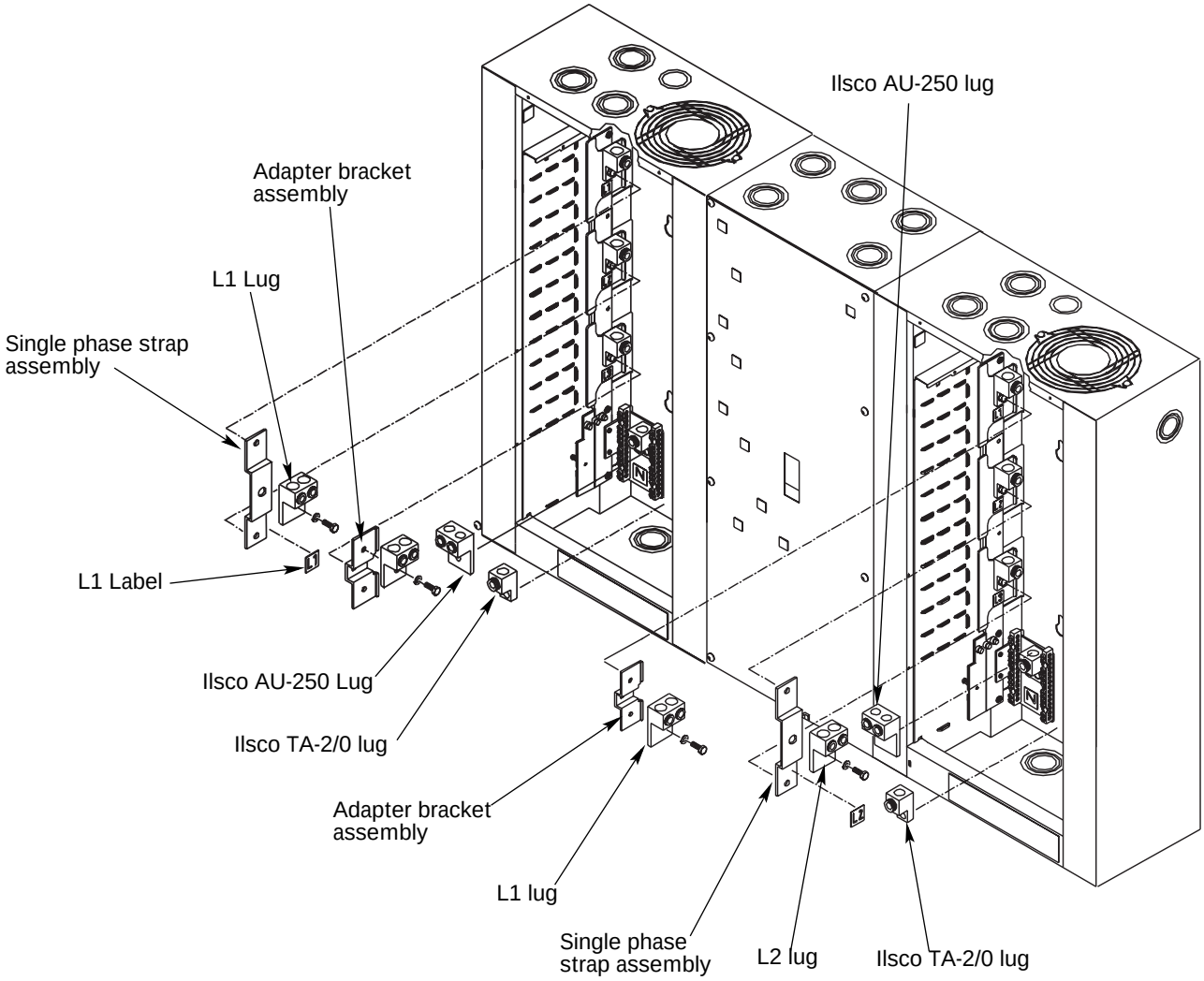


Figure 20: AX12X single phase strap installation

To install an ARCH Architectural option board

The ARCH architectural option board is required for terminating the Unison link power and AUX power control wiring. The ARCH board must be installed in a dimming rack with an architectural processor (CMBd or CMEd). Check the control module label to determine processor type.

1. Secure the mounting plate into the rack as shown in *Figure 21*.

2. Mount the ARCH option PCB onto the mounting plate with hardware provided.

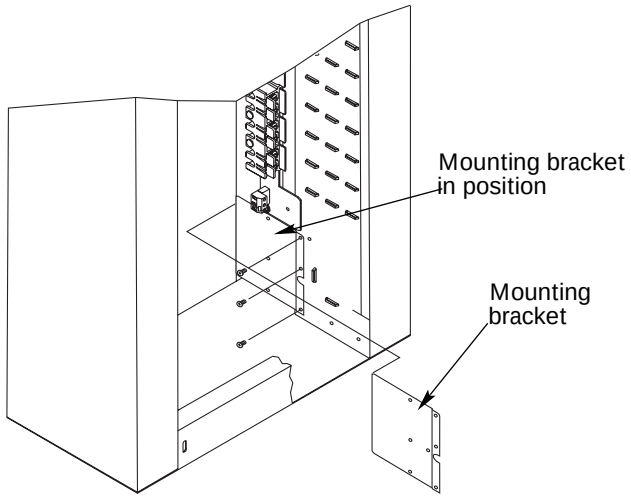


Figure 21: Installing the Mounting Bracket

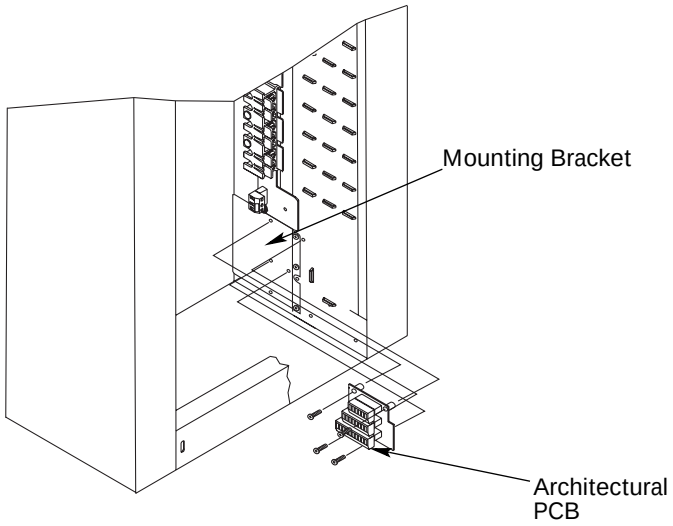


Figure 22: Mounting the ARCH option

To install the FLO Fluorescent option board

The FLO option board is required for termination of 4-wire fluorescent ballast (0-10Vdc) control wiring. The FLO option board may be installed in any Unison DR series dimming rack.

1. Secure the mounting plate into the rack. See *"Installing the Mounting Bracket"* on page 20.

2. Attach threaded standoffs to the rack as shown in *Figure 23*.

3. Mount the FLO option PCB onto the mounting plate. The FLO board will mount directly below the ARCH board on the mounting bracket when the ARCH board is installed.

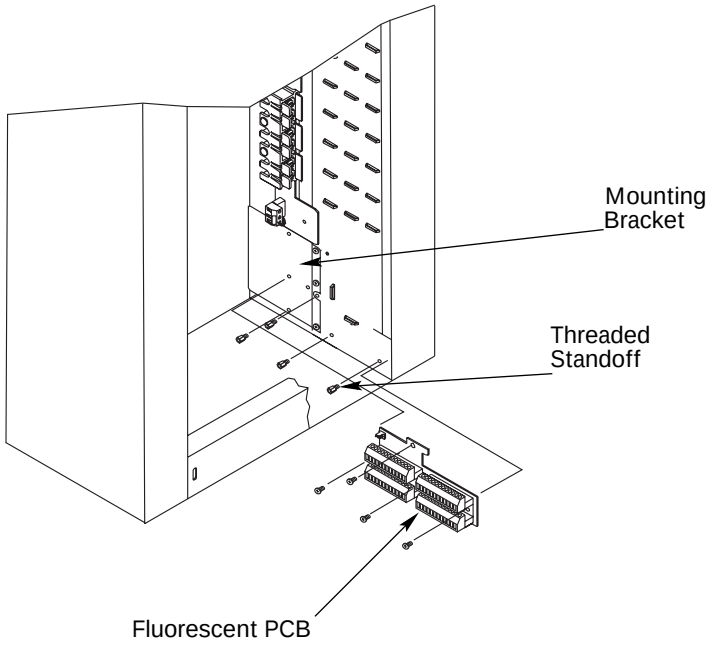


Figure 23: Mounting the FLO option

To Install the BYP Bypass option board

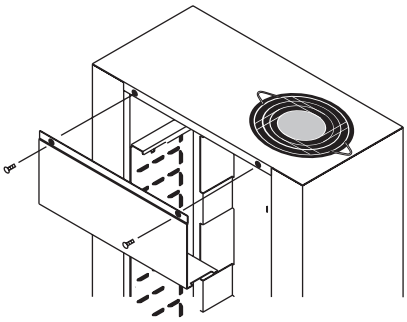


Figure 24: Removing the top access panel

The BYP option board is installed in a Unison DR series dimming rack which is fed with emergency power. The BYP monitors the presence of normal power in another rack (or another source of non-emergency power).

When the BYP senses the loss of normal power, it bypasses the control module in the rack in which it is installed and drives all loads in that rack to full. When the BYP senses that normal power has been restored, it will restore normal operation of the rack in which it is installed.

1. Remove top access panel. See *Figure 24*.
2. Mount Airflow sensor PCB on Airflow bracket with screws provided. See *Figure 25*.
3. Install airflow sensor bracket into the rack above the wire protection bracket (directly under fan) as shown in *Figure 26*.
4. Route the 3-pin airflow wire harness from Airflow sensor down the back of the rack. Connect to terminal J7 on the Bypass Option Board.
5. Connect the 2-pin dimmer cable assembly to terminal J8 on the Bypass Option Board. Connect free end to terminal J14 on the signal distribution PCB, just above the DMX input connector.
6. If FLO option board is installed, connect the 4-pin FLO cable to terminal J1 on the FLO Option Board. Connect free end to terminal J6 on the BYP Option Board.

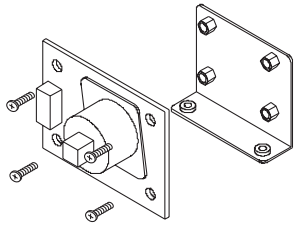


Figure 25: Airflow sensor and bracket installation

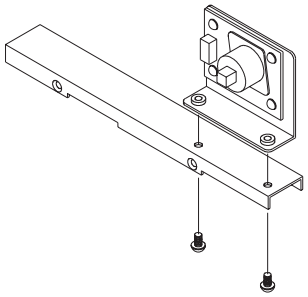


Figure 26: Installing the Airflow bracket on the wire protection bracket

120 volt systems

7. Connect the #14 AWG brown wire included in BYP kit to the right position of terminal J2. Connect the free end to the L1 phase bar. Remove the lug bolt, then reinstall the lug bolt through the ring terminal and the lug into the L1 phase bar.
8. Connect the provided #12 AWG white neutral wire onto the left position of terminal J2. Connect the free end to the neutral bus.
9. **For 3-phase racks**: Terminate the three **normal power** lines and neutral wires onto the terminals labeled J3 SENSE PWR-A, J4 SENSE PWR B, and J5 SENSE PWR-C. Connect free ends to an external reference of non-emergency power.

   ⇨ **Note**: Only one neutral needs to be pulled from the external reference, and can be jumpered between J3, J4 and J5

10. **For single-phase racks**: Terminate the two **normal power** lines and neutral wires onto the terminals labeled J3 SENSE PWR-A and J5 SENSE PWR-C. Connect free ends to an external reference of non-emergency power. Jumper J3 SENSE PWR-A and J4 SENSE PWR-B line terminals together.

277 volt systems

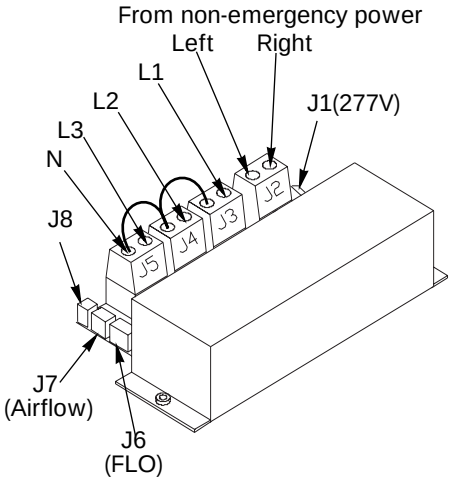


Figure 27: Bypass Option Kit

7. Connect the #14 AWG yellow wire included in the BYP kit to the right position of terminal J2. Connect free end to the 277 volt fuse block, L1 fuse F1. This should be done on the side opposite your line feed.
8. Connect the provided #12 AWG white neutral wire onto the left position of terminal J2. Connect free end to the neutral bus.
9. **For 3-phase racks**: Terminate the three **normal power** line and neutral wires onto the terminals labeled J3 SENSE PWR-A, J4 SENSE PWR B, and J5 SENSE PWR-C. Connect free ends to an external reference of non-emergency power.

   ⇨ **Note**: Only one neutral needs to be pulled from the external reference, and can be jumpered between J3, J4 and J5

10. Remove fuse F1 on the bypass option board and install included jumper at location J1. See *Figure 30* on page 23.

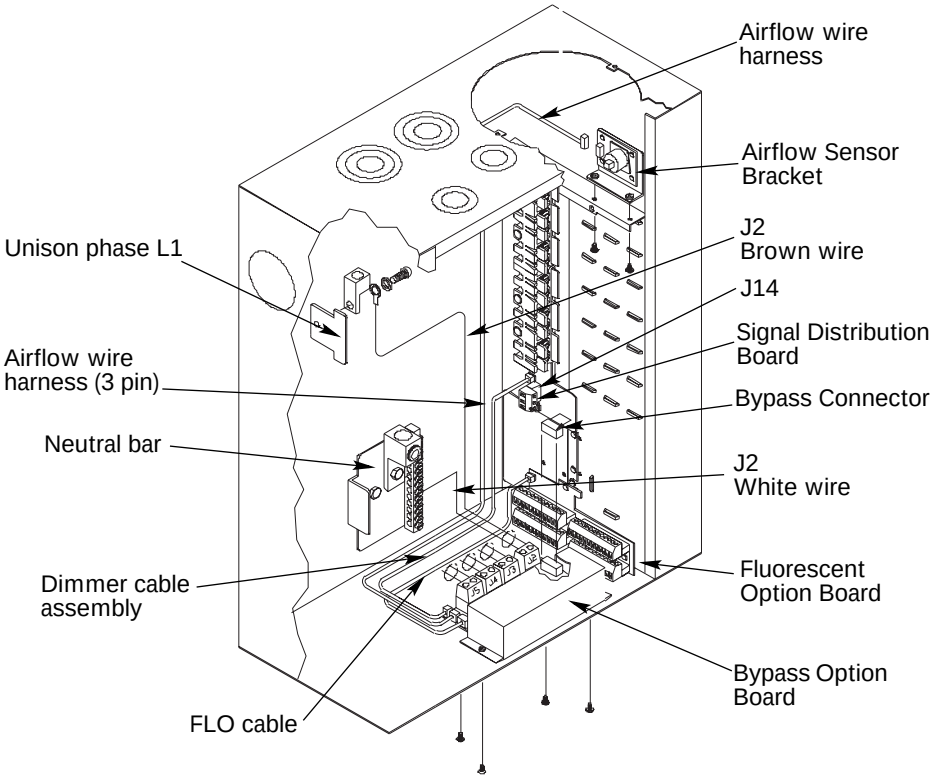


Figure 28: Mounting the 120 and 230V BYP option

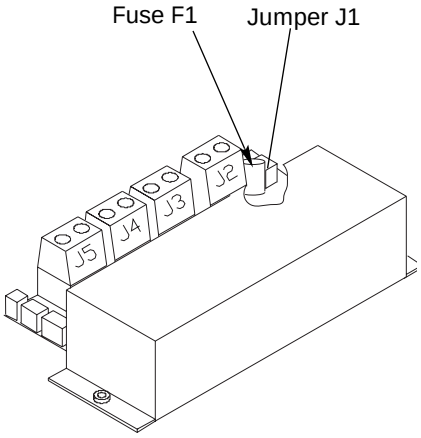


Figure 30: BYP option board fuse F1

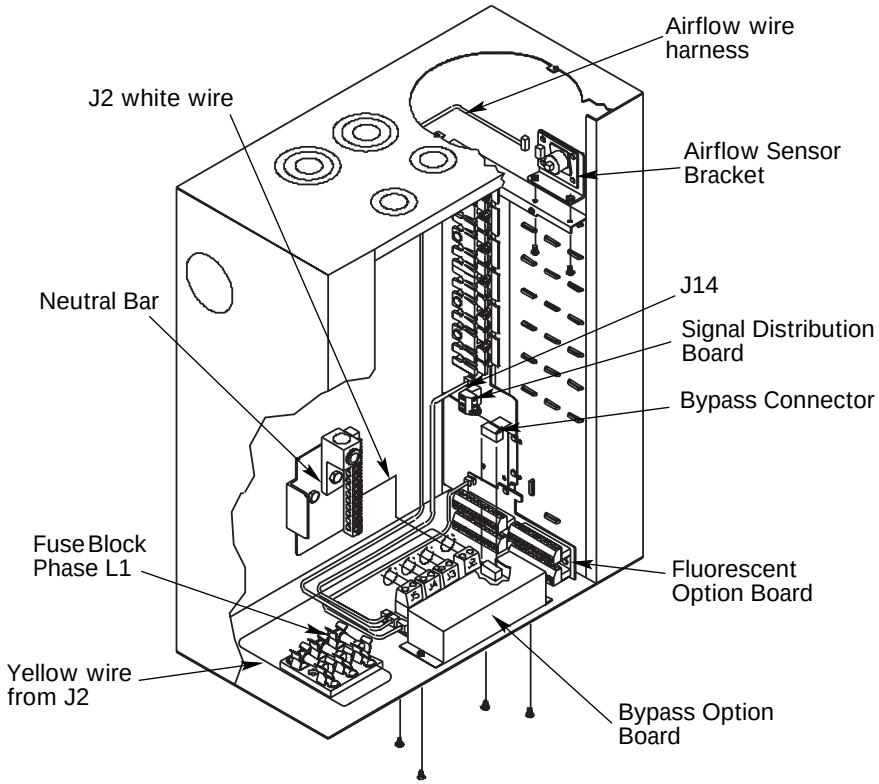


Figure 29: Mounting the 277V BYP option

Wiring Unison Dimming (DR) and Auxiliary (AX) Racks

The Unison dimming rack requires line, load and control wire terminations.

Warning: All rack terminations must be done with the power off.

To terminate line (input feed) wires in single DR rack applications

Line or "input feed" wires terminate in standard DR series racks on the three phase main lugs.

Caution: Cables and wires used with Unison dimming must be copper. Do not use wires containing aluminum or other metals.

1. Plan wire entry. Refer to *"Unison Rack Wiring Guidelines"* on page 8.
2. Install Conduit
   - Remove knockouts as required. Make sure the knockout centers are removed from the rack after they are broken loose. The top access panel can be removed for easier access to the top of the dimming rack.

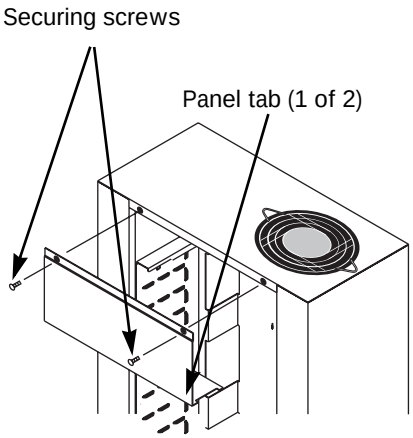


Figure 31: Removing the top access panel

Caution: The access panel is needed for proper cooling of the dimming rack. It MUST be in place during system operation. Always replace panel when rack wiring is complete.

To Remove Top Access Panel

1. Remove both panel securing screws with a #2 Phillips screwdriver.
2. Pull the panel straight down about one inch.
3. Tilt the panel slightly until the bottom tabs clear their slots.
4. Pull the panel straight out.

   - Install IP20 rated conduit fittings into the holes. The contractor must supply conduit and conduit fittings.

3. Connect phase, neutral and ground "input feed" wires on designated wire lugs. Lug bolts should be tightened to the values in table 4 below.

Note: Use a discrete neutral wire for each load. Common (ganged) neutral wiring is not recommended for phase-angle dimming systems.

Note: Phase lugs can rotate 10 degrees to make connections easier.

Note: Bottom feed applications require a large radius bend in cables. Neutral lug must be fed from top of lug. See *Figure 32*.

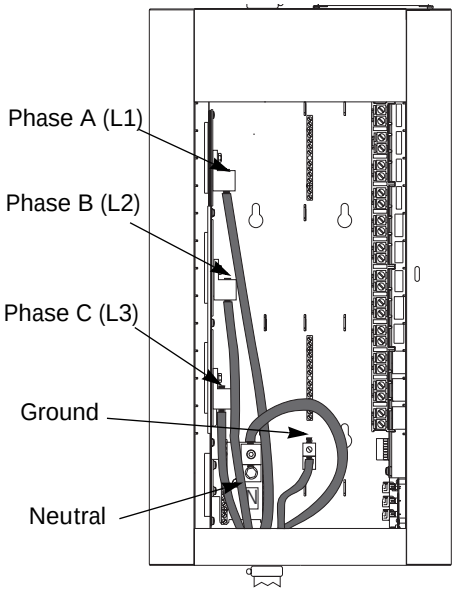


Figure 32: Bottom feed line (input feed) wires

Table 5: Torque values for ILSCO socket head screw connectors

Socket size across flats inches	Torque inch pounds	Torque foot pounds
Neutral - 1/4"	200 inch/lbs	16.7 foot/lbs
Phase - 5/16"	275 inch/lbs	22.9 foot/lbs
Ground - 3/8"	375 inch/lbs	31.3 foot/lbs

To terminate line (input feed) wires in AX rack applications.

Line wires in main breaker or cross-bussed rack applications terminate in the AX rack and feed through side conduit junctions to dimming rack phase bars. Wire used for AX and DR rack interconnection is provided by ETC. Your rack will be supplied with one or two sets of cables, depending on the model ordered. These cables will be pre-connected to the phase, neutral and ground lugs in the AX or AX12X rack.

Note: All AX series racks require bottom line wire entry.

1. Remove AX rack front cover.
2. Install conduit to the bottom of the AX rack. (Punch knockouts as required.)
3. Connect phase, neutral and ground wires on designated wire lugs.
4. Install ETC supplied conduit bushing between AX and DR rack.
5. Route ETC supplied interconnection wire through the conduit opening(s) to the DR rack.
6. Cut wire to desired length and attach each wire to its associated phase, neutral and/or ground lug. Tighten to the torque values listed on the ML/MCB label.
7. Tie wrap interconnection wires in back of DR rack to prevent wires from blocking the air flow of the fan.
8. Fill empty spaces of the conduit openings with UL or CE listed filler foam.
9. **Caution**: Air leaks can cause dimming racks to shut down due to insufficient airflow.

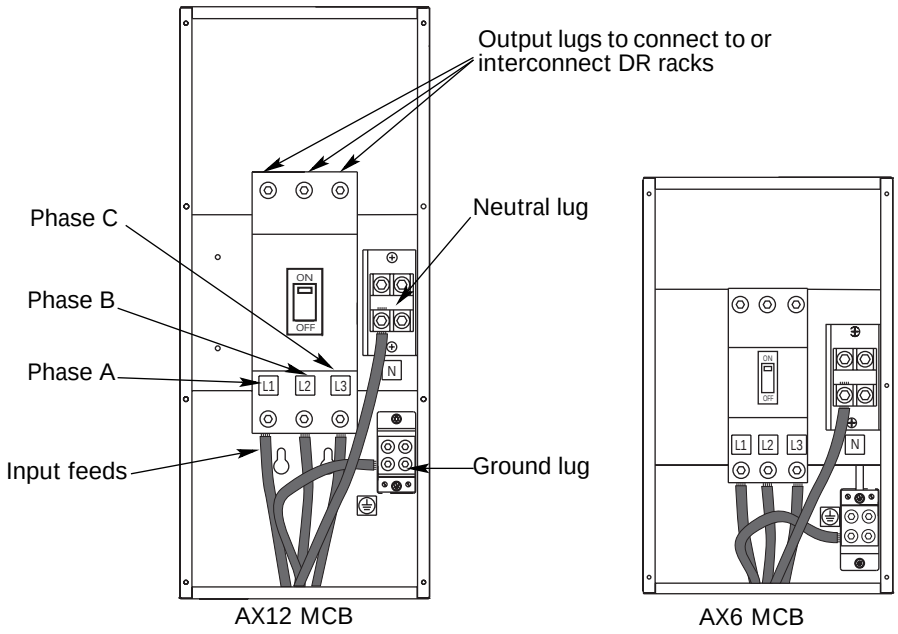


Figure 33: MCB Auxiliary racks

Table 6: Load wire sizes and torques

Connection	Cable Size	Torque	Torque
15-25 amp	18 - 10 AWG	35 inch/lbs	2.9 foot/lbs
	8 AWG	40 inch/lbs	3.3 foot/lbs
Load lugs	4 - 6 AWG	45 inch/lbs	3.8 foot/lbs
Neutral bus	14 - 6 AWG	25 inch/lbs	2 foot/lbs
Ground lugs	18 -8 AWG	75 inch/lbs	6.3 foot/lbs
	4 - 6 AWG	110 inch/lbs	9.2 foot/lbs
	2 -3 AWG	150 inch/lbs	12.5 foot/lbs

To terminate load wiring

Load wires can enter the rack from the top, bottom or left side of the rack without changing lug or connection block orientation. *See "Unison Rack Wiring Guidelines" on page 8.*

1. Separate load circuit wires into ground, neutral and hot wire bundles.
2. Pull bundles into DR rack per wire entry plan.
3. Connect neutral wires to the neutral terminal block.
4. Connect ground wires to the ground terminal block.

   Note: Ground connections must use all metal nuts and lock washers.
5. Connect each load wire to assigned dimmer lug by inserting wire between back of the lug and the pressure plate. See *Figure 34*.
6. Tighten the screws onto the plates using torque values shown in Table 6, "Load wire sizes and torques," on page 26.
7. Attach enclosed load circuit number label as shown in *Figure 35* below.

Use the enclosed self-adhesive circuit label to keep track of what each circuit is operating. See below for an example.

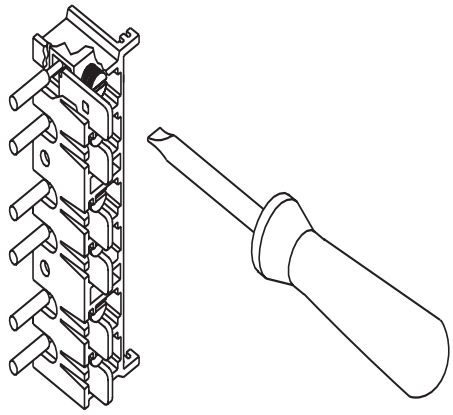


Figure 34: Terminating load lugs

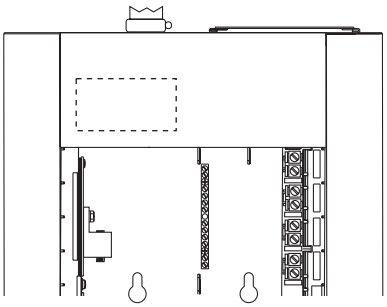


Figure 35: Rack circuit label placement

Table 7: Sample dimming rack circuit label

Lug Number	Circuit Number	DMX Address	Module Type	Circuit Description
1	1	1	D20F	General fluorescent lights
2	2			
3	3	2	D20F	Exterior lights
4	4			
5	5	3	D20	Reception
6	6	4	D20	Hallway
7	7		AFM	(Future Circuit)
8	8		AFM	(Future Circuit)
9	9	5	CC15	Exit lights
10	10	6	CC15	ER4 cabinet
11	11	7	D15	North
12	12	8	D15	South

To terminate DMX control wiring in single rack systems without the ARCH board installed

Note: Control cables must run in separate conduit from power wires. ETC recommends using Belden 9729 or equivalent.

1. Remove 6" of cable jacket from the end of the DMX512 cable.
2. Remove the exposed foil shielding from all wire pairs in the cable. Do not untwist pairs.
3. Cover all bare shield wires with 1/16" heat shrink. (There should be one for each twisted pair of wires in the cable).
4. Slide a 2.5" piece of 1/8" heat shrink over base of twisted pair and shield that will carry the DMX512 signal (usually a red and black pair).
5. Completely cover any unused twisted pairs, including their shield wire with a piece of 1/8" heat shrink. Extend the heat shrink 1.5" beyond the end of the wires.

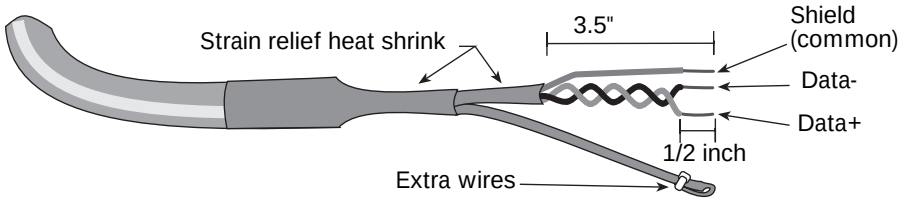


Figure 37: Preparing the DMX512 control cable

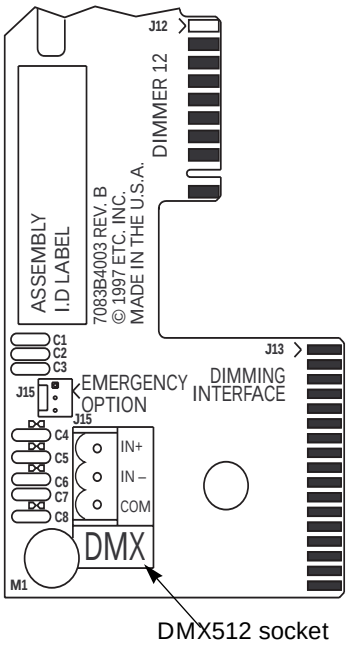


Figure 36: Signal distribution board

6. Bend back 1/2" of the heat shrink tip on the unused wire set and secure it with heat shrink or a wire tie.
7. Center 2.5" of 3/8" heat shrink over the end of the cable jacket and the bases of all wires in the cable.
8. Strip 1/4" of insulation or heat shrink from the ends of the Data+, Data- and common wires. The Data+ and Data- wires should remain twisted together.
9. Detach DMX connector from socket located on the signal distribution board, located on the right side of the rack. See *Figure 36*.
10. Insert the red DMX512 wire into the In+ wire termination on the DMX512-In connector. See *Figure 38*
11. Insert the black DMX512 wire into the In- termination on the DMX512-In connector.
12. Insert the shield wire into the COM wire termination on the DMX512-In connector.
13. Tighten the screws firmly onto each wire.
14. Insert connector into socket labeled DMX.

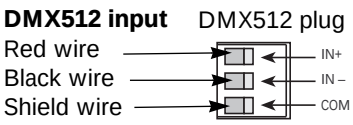


Figure 38: DMX512 connections

Note: Be certain the DMX connector is in the correct orientation to the socket. The connector will go in upside down if forced.

15. Verify that the DMX termination jumpers are installed on the back of the CMd control module as shown in *Figure 39*.

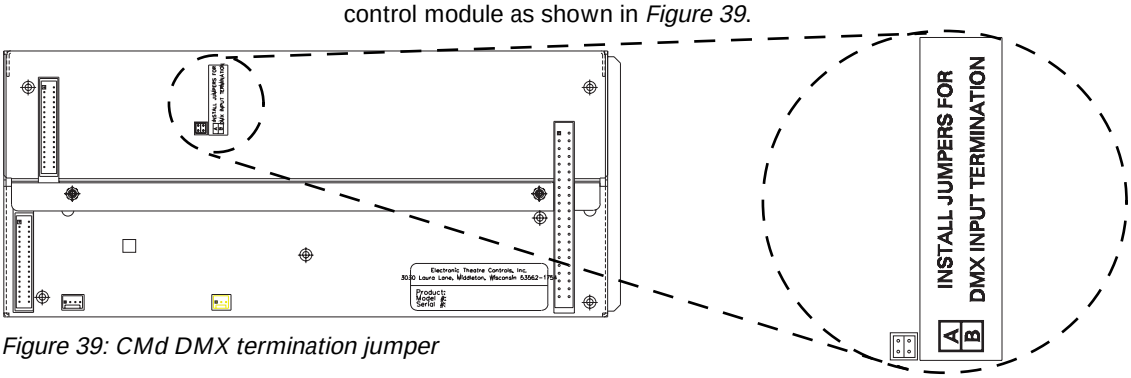


Figure 39: CMd DMX termination jumper

To Terminate DMX in cross-bussed or multiple-rack systems without the ARCH option board installed

Note: DMX must be wired in daisy-chain topology. Star, bus, or other wiring configurations will result in improper system operation. For further information on DMX wiring techniques, reference the United States Institute of Theatre Technology's 1990 DMX512 standard or Recommended Practice for DMX by Adam Bennette. Both are available from the USITT.

1. Follow steps 1 - 8 on page 28 for proper preparation of DMX cable.
2. Insert both the red DMX512-In wire and the white DMX interconnection (proplex) wire into the In + termination on the DMX512-In connector of the first rack (J15 Pin 3).
3. Insert both the black DMX512-In wire and the black DMX interconnection (proplex) wire into the In - termination on the DMX512-In connector of the first rack (J15 Pin 2).
4. Insert both the shield wire and the shield interconnection wire into the COM wire termination on the DMX512-In connector of the first rack (J15 - Pin 1).
5. Securely tighten all connector screws.
6. To interconnect subsequent racks, repeat this step until you come to the last rack. Terminate the last rack according to the directions on page 28.
7. Verify that DMX termination jumpers are installed only in the last CMd control module in the system (i.e., the end of line). Jumpers must be removed from all other control modules to avoid signal distortion and insure proper system operation. See *Figure 39* on page 28.

To terminate DMX in single racks with the ARCH option board installed

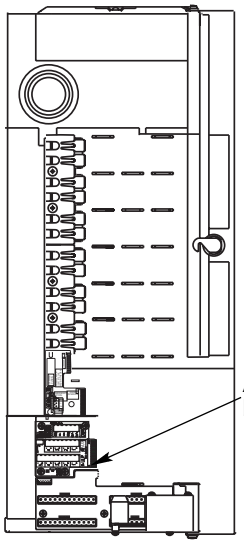


Figure 40: DR right side ARCH option board

1. Follow steps 1 - 8 on page 28 for proper preparation of DMX cable.
2. Detach DMX connector from the socket located on the Arch option board, located on the right side of the rack.
3. Insert the red DMX512 wire into the In+ wire termination on the DMX512-In connector.
4. Insert the black DMX512 wire into the In- termination on the DMX512-In connector.
5. Insert the shield wire into the COM wire termination on the DMX512-In connector.
6. Tighten the screws firmly onto each wire.
7. Insert connector into socket labeled DMX.

Note: Be certain the DMX connector is in the correct orientation to the socket. The connector will go in upside down if forced.

8. Verify that the DMX termination jumpers are installed on the back of the CMEd control module as shown in *Figure 39*.

To terminate DMX in cross-bussed DR racks with the ARCH option board

Note: The interconnection cable provided with the AX rack is not Belden 9729. It is a single pair (black/white) with shield cable. White is used for Data+, and black for Data-.

1. Follow steps 1 - 8 on page 28 for proper preparation of DMX cable. There will be no unused pairs.
2. Route your cable through the AX rack knockouts.
3. Insert the red DMX512 wire into the In+ wire termination on the DMX512-In connector.
4. Insert the black DMX512 wire into the In- termination on the DMX512-In connector.
5. Insert the shield wire into the COM wire termination on the DMX512-In connector.
6. Beginning with the dimming rack in which you have installed the ARCH option board, remove the DMX connector on the ARCH option board. Insert the white DMX512 wire into the OUT+ termination on the DMX connector.
7. Insert the black DMX512 wire into the OUT- termination on the DMX connector.
8. Insert the shield wire into the COM termination below the IN+.
9. Insert the connector back into the DMX socket on the ARCH option board.
10. In the rack that you are connecting to, remove the connector from the socket labeled DMX. Insert the white DMX512 wire into the IN+ on the DMX connector.
11. Insert the black DMX512 wire into the IN- termination.
12. Insert the shield wire into the COM termination.
13. Take care that all screws are tightened firmly onto each wire.
14. Insert the connector back into the DMX socket.

Note: Be certain the DMX connector is in the correct orientation to the socket. The connector will go in upside down if forced.

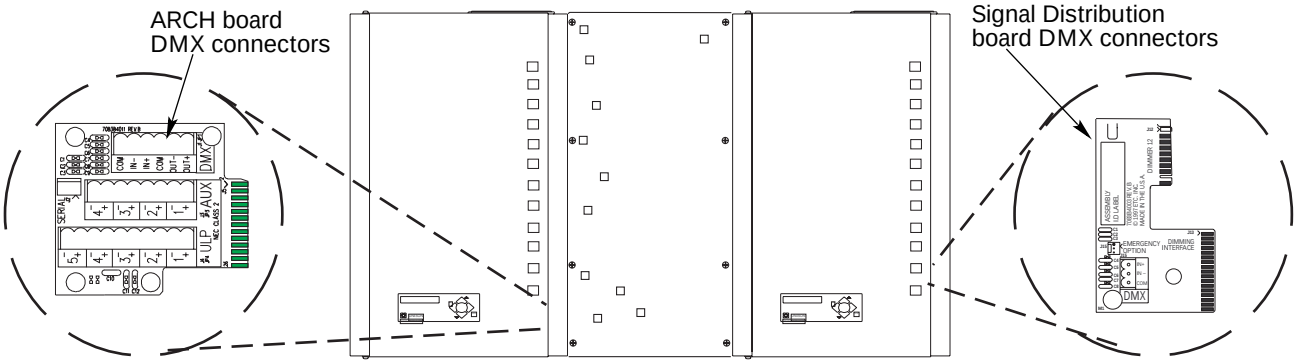


Figure 41: Interconnecting DMX512

To interconnect DMX between standard DR racks and racks with the ARCH option board

When the architectural processor controls dimmers in more than one DMX512 dimmer rack, the DMX512 output from the control module must be routed to the DMX512 inputs of the successive dimmer racks:

- If you are connecting Unison Dimming Racks use the above procedures.
- If you have ETC Sensor dimmer racks the authorized ETC Field Service technician will connect DMX512 before energizing your system.
- To connect a non-ETC rack, consult your rack installation documentation.

To terminate control wiring in DR series racks with ARCH option board

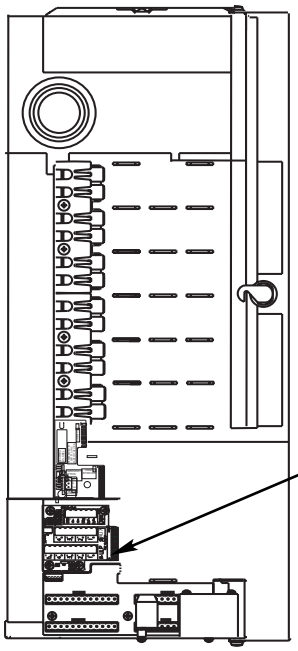


Figure 42: DR rack right side ARCH board

Dimming racks with an architectural processor and the ARCH architectural option board installed support DMX512 In, DMX512 Out, Link power and AUX control power. All connections are located on the ARCH (architectural) option board. Each group of terminations uses a plug-in connector which removes for easy wiring. Check the control module for processor type. Use these instructions for CMBd and CMEd modules. See *"To terminate DMX control wiring in single rack systems without the ARCH board installed"* on page 28 for control wire termination of a rack with a CMd.

Terminating link power control wiring

Unison stations communicate with the architectural processor using Echelon® Link power network wiring. Link power wiring is topology free and polarity independent. You can connect up to five pairs of Link power wires to the ARCH option board ULP connector.

1. Pull Link power control wiring into rack (1) Belden 8471 and (1)#14AWG.
2. Strip 1/4" of insulation from the ends of a link power wire pair.
3. Detach the ULP connector from the ARCH board.
4. Insert each white Link power wire into a + terminal on the connector.
5. Insert each black Link power wire into a - terminal on the connector.
6. Tighten the screws firmly onto each wire.
7. Insert the connector into the socket labeled ULP.
8. The #14 AWG ground wire can terminate in one of three ways.
   - Daisy-chained between stations using Scotch Locks (3M® #314 insulation displacement connector).
   - Grounded to the conduit
   - If grounded metal conduit is not installed, connect the #14 green wire to the ground terminal inside of the dimming rack and the green/yellow striped wire connected to the station using a Scotch Lock. *See "To wire Unison wall stations" on page 44.*

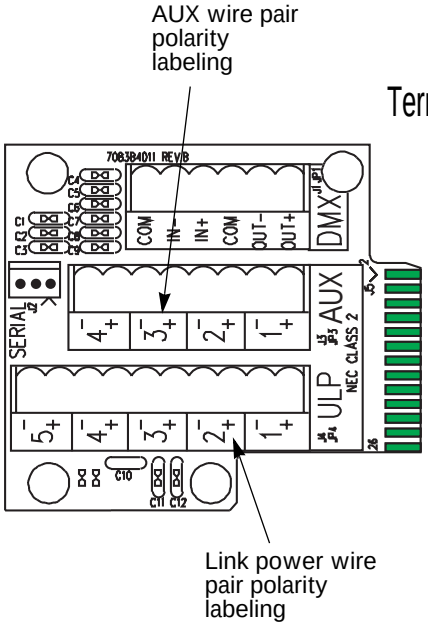


Figure 43: Link power and AUX control power plug sockets

Terminating AUX power wiring

Unison LCD, PC and portable station connector stations require an additional pair of AUX power wires for proper operation. You can connect up to four pairs of AUX power wires to the ARCH architectural option board AUX connector.

1. Pull AUX control power wiring into rack. (2)#16 AWG red/black pair.
2. Strip 1/4" of insulation from the ends of a AUX power wire pair.
3. Detach the AUX connector from the ARCH board.
4. Insert the red AUX power wire into + terminal on the connector.
5. Insert the black AUX power wire in to - terminal on the connector.
6. Tighten the screws firmly onto each wire.
7. Insert the connector into the socket labeled AUX.

To terminate electronic fluorescent control wiring

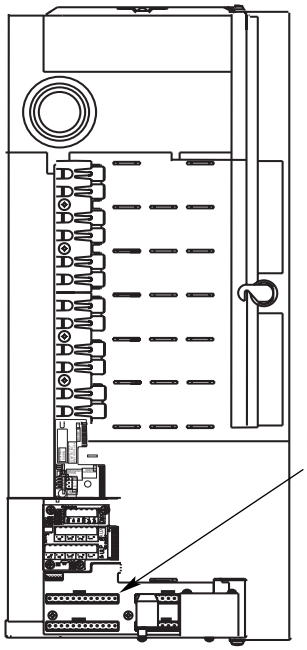


Figure 44: DR rack right side FLO board

4 wire: 4-wire ballasts require D15 or D20 modules

4-wire electronic ballasts are controlled by 0-10Vdc . The FLO fluorescent option board is required for 0-10Vdc termination. The FLO board is comprised of 24 individual 0-10Vdc connections, each rated to operate a maximum of 75 - 1, 2 or 3 lamp fluorescent ballasts. To control 4-wire fluorescent ballasts, the power circuit in the dimming rack must be configured as a D15 or D20 module with a 4-wire Flr load type. It is important to note the circuit number of each 4-wire fluorescent load, as ballast 0-10Vdc control wiring will terminate on the associated FLO board terminal.

Example: If circuit 1 is configured as a D20 with a 4-wire load type, ballast wiring would terminate in FLO board terminal 1.

1. Pull fluorescent ballast control wiring pairs into the dimmer cabinet per wire entry plan.
2. Strip 1/4" of insulation from the end of each wire.
3. Terminate the violet control wire of the first pair into the + terminal associated to the power circuit.
4. Terminate the gray control wire of the first pair into the - terminal associated to the power circuit.
5. Repeat steps 3 and 4 for each control wiring pair(s).

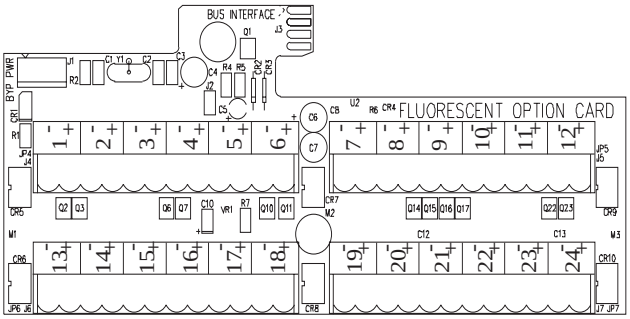


Figure 45: Fluorescent Option board layout

3 wire: 3-wire ballasts require D15F or D20F modules

Note: Even though two lugs are used, the configuration refers only to the top (odd) number.

1. Pull fluorescent ballast control wiring into the dimmer cabinet per wire entry plan.
2. Strip 1/4" of insulation from the end of each wire.
3. Terminate the black switched hot wire to the top terminal in its assigned dimmer lug pair.
4. Terminate the orange dimmed hot wire to the bottom terminal in its assigned dimmer lug pair.
5. Terminate the white wire to the neutral terminal block inside the dimming rack.
6. Repeat steps 3 - 5 for each ballast.

2 wire: 2-wire ballasts require D15 or D20 modules

1. Pull fluorescent ballast power wiring into the dimmer cabinet per wire entry plan.
2. Strip 1/4" of insulation from the end of each wire.
3. Terminate the neutral wire to the neutral terminal block inside the dimming rack.
4. Terminate the load wire to the assigned dimmer lug by inserting wire between the back of the lug and the pressure plate. See *"To terminate load wiring"* on page 27.
5. Repeat steps 3 and 4 for each fluorescent wiring pair(s).

Installing Unison external processing racks

This section details the installation of the Unison ER series external processing racks.

The external processing rack is designed to provide Unison architectural control processing to Unison, Sensor or any DMX512 dimming racks. To install your Unison external processing rack you must first assess the space, clearance and power issues.

ER racks must be mounted on a load-bearing wall or in a 19" equipment rack. Your rack should be installed in a well ventilated area with at least 12 inches of clearance below, 2 inches on each side and 15 inches in front of rack.

To install an ER series Unison rack

1. Assess support and clearance requirements. See *"Installation Guidelines"* on page 7 and *"Identifying Unison Components"* on page 9.

2. Drill holes for mounting bolts.

3. Secure the rack to the wall with the mounting bolts.

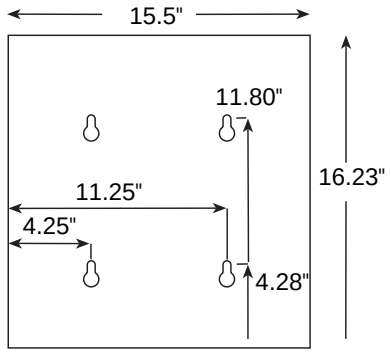


Figure 46: ER4 Drilling template

Wiring Unison External Processing Racks (ER)

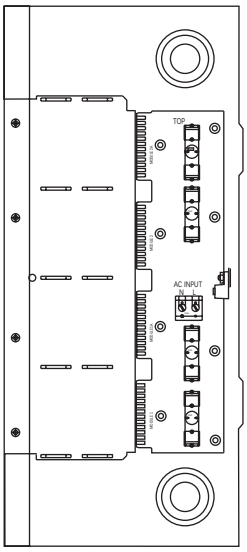


Figure 47: ER4 left side power distribution board (277V shown)

The Unison external processing rack requires line and control wire terminations. The rack has wire conduit knockouts on all four sides and back of the rack to provide wire access. Line (input feed) and control wires can enter through any of them. The ER4 rack requires a single phase, 20 amp input feed.

All rack terminations must be done with the power off.

Cables and wires used with Unison dimming must be copper. Do not use wire containing aluminum or other metals.

To terminate line (input feed) wires in ER series racks

The line (input feed) terminations for the ER rack are centered on the power distribution PCB on the left side of the ER rack. The ground lug is on the back of the rack next to the AC connection.

1. **Plan wire entry**. See *"Identifying Unison Components"* on page 9 for dimensions and clearances.

Caution: Do not run power and control wiring in the same conduit.

2. **Install conduit**.

- ▼ Remove knockouts as required. Make sure the knockout centers are removed from the rack after they are broken loose.
- ▼ Install IP20 rated conduit fittings into the holes. The contractor must supply conduit and conduit fittings.

Note: Always install conduit fittings into the knockout holes. Never pull wires through unprotected holes in the rack cabinet.

3. **Connect line (input feed) wires as detailed in *Figure 48* for top and bottom entry**.

- ▼ Connect the ground wire to the ground lug.
- ▼ Connect the neutral wire to the N screw terminal.
- ▼ Connect the line (input feed) wire to the L terminal.

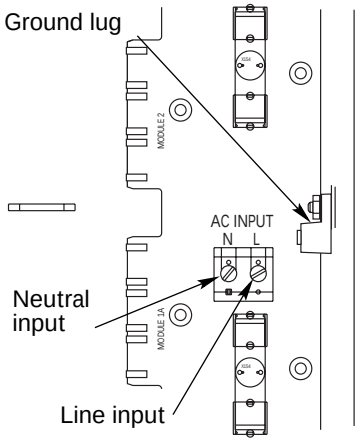


Figure 48: AC connections

To terminate control wiring in ER series racks

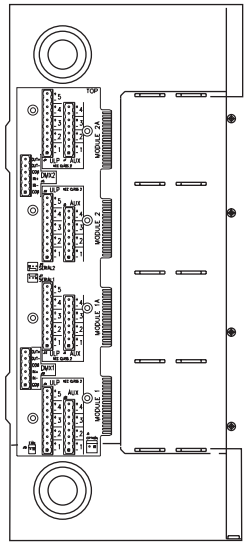


Figure 49: ER4 right side signal distribution board

The Unison external processing rack supports DMX512 In, DMX512 Out, link power and AUX control power wire terminations. All control connections are located on the main signal distribution board. Each connection uses a plug-in connector which can be removed for easy wiring.

Terminating link power control wiring

Unison stations communicate with the architectural processor using Echelon® link power network wiring. Link power wiring is topology free and polarity independent. You can connect up to five pairs of link power wires to the ER4 signal distribution ULP connector.

Note: Use connections adjacent to the slot where the module is going to "live". e.g., If you CME will be installed in the bottom of the ER4 rack, the module control should be connected to the terminal blocks associated with "Module 1".

1. Strip 1/4" of insulation from the ends of a link power wire pair. (1)Belden 8471 and (1)#14AWG.
2. Detach the ULP connector from signal distribution board.
3. Insert each white link power wire into a + terminal on the connector.
4. Insert each black link power wire into associated - terminal on the connector.
5. Tighten the screws firmly onto each wire.
6. Insert the connector into the socket labeled ULP.

Note: Connectors are numbered with number 1 starting at the bottom.

7. The #14 AWG ground wire can terminate in one of three ways.
   - Daisy-chained between stations using Scotch Locks (3M® #314 insulation displacement connector).
   - Grounded to the conduit
   - If grounded metal conduit is not installed, connect the #14 green wire to the ground terminal inside of the dimming rack and the green/yellow striped wire connected to the station using a Scotch Lock. *See "To wire Unison wall stations" on page 44.*

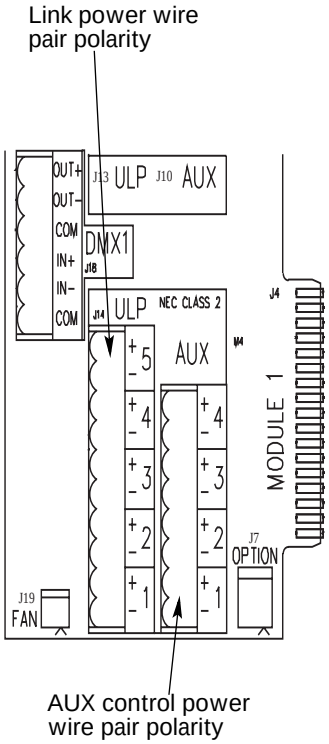


Figure 50: ER4 control wire terminations

Terminating AUX control power wiring

Unison LCD, PC and portable station connector stations require an additional AUX power wire for operation. You can connect up to four pairs of AUX power wires to the ER4 signal distribution AUX connector.

Note: Use connections adjacent to the slot where the module is going to "live". e.g., If your CME will be installed in the bottom of the ER4 rack, the AUX and ULP should be connected to the terminal blocks associated with "Module 1".

1. Strip 1/4" of insulation from the ends of the AUX power wire pair. (2)#16AWG red/ black pair.
2. Detach the AUX connector from signal distribution board.
3. Insert the red AUX power wire into a + terminal on the connector.
4. Insert the black AUX power wire into the associated - terminal on the connector.
5. Tighten the screws firmly onto each wire.
6. Insert the connector into the socket labeled AUX.

Note: Connectors are bottom justified. Use position number one.

Note: Connectors can be plugged in upside down if forced. Verify correct orientation.

To terminate DMX512 control wiring in ER series racks

DMX512 wiring is terminated on the DMX connector located on the signal distribution board. See *"To terminate DMX control wiring in single rack systems without the ARCH board installed"* on page 28 for heat shrink diameters.

Note: Control cables must run in separate conduit from line and load power wires.

1. Remove 6" of cable jacket from the end of the DMX512 cable. (Belden 9729)
2. Remove the exposed foil shielding from all wire pairs in the cable. Do not untwist pairs.
3. Cover all bare shield wires with heat shrink. You should have one piece of heat shrink for each twisted pair of wires in the cable.
4. Slide a 2.5" piece of heat shrink over base of twisted pair and shield that will carry the DMX512 signal (a red and black pair).
5. Completely cover any unused twisted pairs, including their shield wire with a piece of heat shrink. Extend the heat shrink 1.5" beyond the end of the wires.

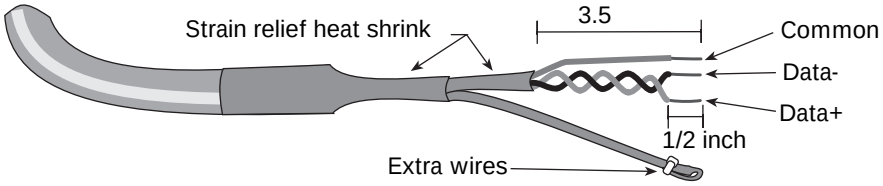


Figure 51: Preparing the DMX512 control cable

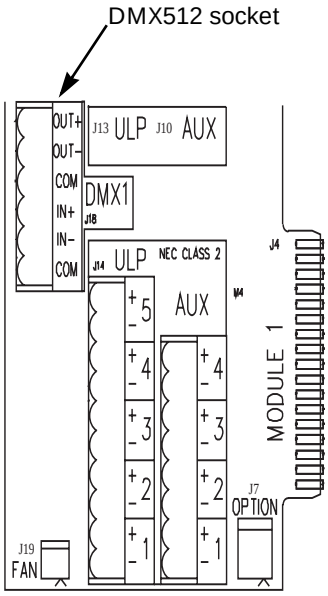


Figure 52: DMX wiring connections

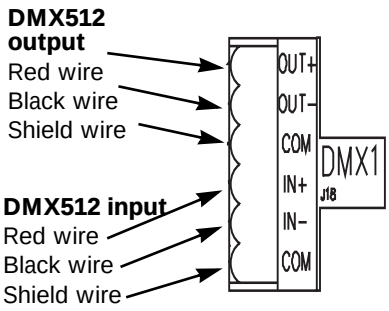


Figure 53: DMX connector wiring

6. Center 2.5" of heat shrink over the end of the cable jacket and the bases of all wires in the cable.
7. Bend back 1/2" of the heat shrink tip on each unused wire set and secure it with heat shrink or a wire tie.
8. Strip 1/4" of insulation or heat shrink from the ends of the Data+, Data- and common wires. The Data+ and Data- wires should remain twisted together.

For DMX Output (to other equipment)

- Insert red DMX512 wire into the OUT+ termination on the DMX connector.
- Insert the black DMX512 wire into the OUT- termination on the DMX connector.
- Insert the shield wire into the COM termination below the OUT-.

For DMX Input (from a control source)

- Insert red DMX512 wire into the IN+ termination on the DMX connector.
- Insert the black DMX512 wire into the IN- termination on the DMX connector.
- Insert the shield wire into the COM termination below the IN-.

9. Tighten the securing screw firmly onto each wire.
10. Insert the plug into the socket labeled DMX.

To interconnect DMX512 between ER and DR series racks

When the architectural processor controls dimmers in more than one rack, the DMX512 output from the control module must be routed to the DMX512 inputs of the associated dimming racks.

- If you are connecting Unison Dimming Racks, use the procedures detailed in *"To Terminate DMX in cross-bussed or multiple-rack systems without the ARCH option board installed"* on page 29.
- If you have ETC Sensor dimming racks the authorized ETC Field Service technician will connect DMX512 output before energizing your system.
- If you have a non-ETC rack, consult your rack installation documentation.

To network wire multiple ER series racks

Multiple ER series racks may be networked via UTP or fiber optic network wiring. Due to the complex nature of network systems, all network installations must be terminated by an ETC authorized field service technician. Contact ETC to schedule commissioning.

To install a Repeater module

The Unison Repeater module is installed in the ER4 in either of the two slots above a CME or CMEi. The repeater module provides power for five additional LCDs (or other stations requiring AUX power) on the AUX power line and repeats the link power for up to 32 stations.

In order to route data to the Repeater module, four (4) jumpers must be installed on the signal distribution board found on the right, inside the ER4.

1. On jumper connector labeled **J5**, install jumpers into positions **A**, **C**, **E** and **F**.
2. Terminate the station's link power on the ULP connector as described on page 32.
3. Terminate the LCD's AUX wiring on the AUX connector.

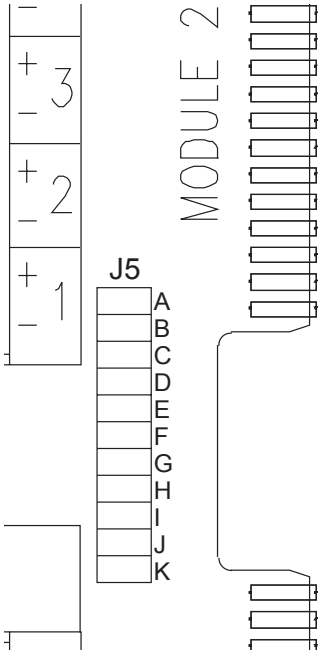


Figure 54: Jumper socket

Note: There can be at most one repeater module between any station and the processor.

ER4 for Auxiliary (AUX) power only

If the Repeater module is being used only as a AUX power booster, the jumpers do not need to be installed.

ER4 with Repeater modules only

If you are using an ER4 with only repeaters installed, you need to land the incoming link power on the connector labeled **Option**, located at the bottom of the signal distro board.

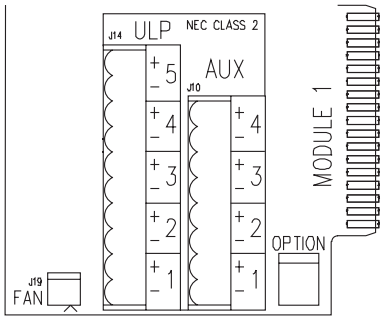


Figure 55: Option socket

Wiring Unison Serial Access Protocol

The Unison Serial Access Protocol (USAP) provides data for other vendors wishing to interface with an Unison System. The USAP is a "polled" system, meaning that it accepts commands from a transmitter and provides status when queried.

Note: ETC will not provide any programming. Manufacturers wishing to poll the Unison system must write the necessary commands.

Note: The maximum run distance for a Unison debug cable is 32 feet.

To terminate USAP in a DR rack

1. Pull a Unison debug cable (7080B7007) into the rack.

Note: The Unison debug cable may arrive with the MaxConn connector already connected. If not, use the following steps to terminate the wires.

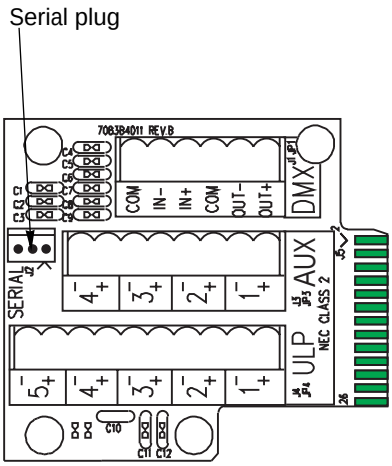


Figure 56: Serial plug on the ARCH board

2. Using a 3-pin MaxConn connector(J6132), insert the Tx wire into pin 1.
3. Insert the Rx wire into pin 2.
4. Insert the Ground wire into pin 3.
5. Lightly crimp the connector so the wires do not fall out. You must use the MaxConn specific crimper or you will damage the connector.
6. Snap the connector cover (J6130) in place.
7. Place the connector in the Serial plug on the ARCH option board in the rack. See *Figure 56*.

Note: If you are using the ETC debug cable with the connector already attached, insert the connector upside down in the Serial plug.

To terminate USAP in a ER4 rack

1. Pull a Unison debug cable (7080B7007) into the rack.

Note: The Unison debug cable may arrive with the MaxConn connector already connected. If not, use the following steps to terminate the wires.

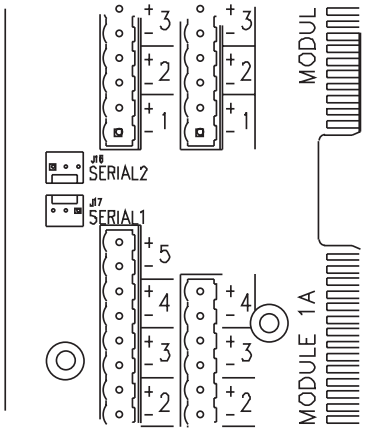


Figure 57: Serial plugs on the ER4 signal distribution board

2. Using a 3-pin MaxConn connector(J6132), insert the Tx wire into pin 1.
3. Insert the Rx wire into pin 2.
4. Insert the Ground wire into pin 3.
5. Lightly crimp the connector so the wires do not fall out. You must use the MaxConn specific crimper or you will damage the connector.
6. Snap the connector cover (J6130) in place.
7. Place the connector in the bottom Serial plug (Serial 1) on the signal distribution board. See *Figure 57*.

   When bringing in two cables, the second connector will plug into Serial 2.

Installing Wall stations

This section details the installation of Unison preset, fader, LCD, connector and infrared wall stations.

To install ETC supplied backboxes

The following stations require backboxes provided by ETC: LCD stations, half gang stations and surface mounted stations. All others are provided by the contractor.

- Install flush mount backbox even with finished wall surface. Failure to do so will make attaching wall station faceplates impossible.

Note: Some backboxes supplied by ETC must be installed with one side up. These backboxes are identified with "UP" arrows.

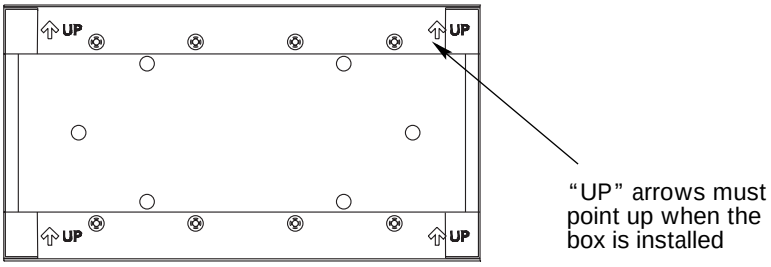
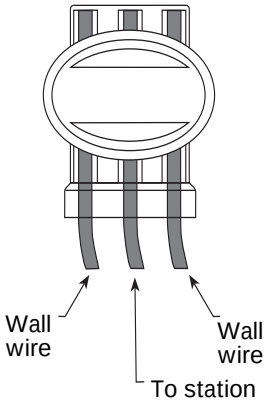


Figure 58: Orientation of supplied backboxes for installation

To wire Unison wall stations

Bus or daisy chain connections (the wall wiring connects to other stations down the line)



Star or home run connections (the wall wiring connects the station directly to the processor, or the station is at the far end of the control network)

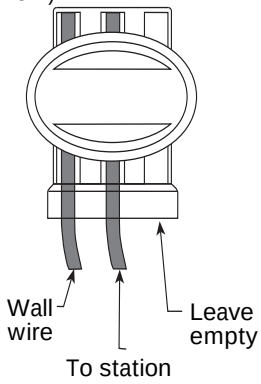


Figure 59: Inserting wires into connector

All Unison control stations require (1) Belden #8471 link power, and (1) #14 ESD ground wire. Stations splice into link power network wiring using 3M® #314U Insulation Displacement connectors. Each station is supplied with a link power plug-in flying lead.

In addition the LCD, PC connector, portable connector stations and satellite boards require AUX control power wiring. These stations are also supplied with (2)#16 AWG red/black AUX control power wire plug-in flying leads.

1. Insert the white link power wire(s) from the wall and white flying lead into a connector until each wire end touches the back wall of the connector.
2. Clamp the connector completely closed with large slip joint pliers.
3. Insert the black link power wire(s) from the wall and black flying lead into a connector until each wire end touches the back wall of the connector.
4. Clamp the connector completely closed with large slip joint pliers.
5. Where applicable, insert the red AUX control power wire(s) from the wall and red flying lead into a connector until each wire end touches the back wall of the connector.
6. Clamp the connector completely closed with large slip joint pliers.
7. Where applicable, insert the black AUX control power wire(s) from the wall and black flying lead into a connector until each wire end touches the back wall of the connector.
8. Clamp the connector completely closed with large slip joint pliers.
9. If the network is not installed in a grounded metal conduit, a #14 ESD ground is provided by a single green wire. Match green wire to the green wire with the yellow stripe connected to the station with the ring crimp connector.
10. Insert the green and striped green wire into a connector until each wire touches the back wall of the connector.
11. Clamp connector completely closed with large slip joint pliers.

Note: If your installation substituted wiring with a different color scheme, make sure you know the wire signal assignments before connecting the station connectors.

Note: To protect against corrosion in high-moisture environments, 3M® #314 Insulation Displacement connectors may be substituted.

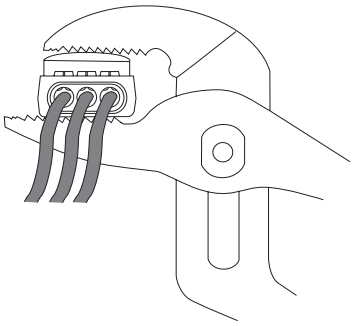


Figure 60: Clamping 3M® connector

Installing satellite interface stations

A satellite board enclosure is typically installed in the same location as the Unison racks, yet any secured location will do.

To install a satellite board enclosure

1. Drill keyhole and secondary holes for mounting bolts.
2. Place keyhole bolts in wall and secure rack.
3. Fasten rack to wall with secondary mounting bolts.

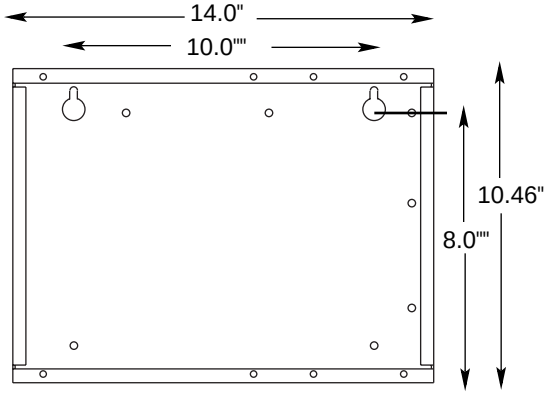


Figure 61: Satellite enclosure drilling template

To terminate satellite station wiring

1. Remove knockouts, and pull switch or fader load wires (#16-18AWG) into the enclosure.
2. Terminate control wires onto the terminal block, labeled TS1, as indicated in *Figure 63* and *Figure 62*. Be sure to tighten screws firmly onto each wire.
3. Connect one side of switch/potentiometer 1-8 to input 1-8 on the other side of the switch/potentiometer to common.
4. Connect the corresponding indicator to LP 1-8 and the other side to common.

Caution: Faders connect between PT 1-8 and +5V. Using other voltages will damage the board.

Note: The final control termination between the terminal block (TS1) and the satellite circuit has been factory wired.

5. Insert the white link power wire(s) from the wall and flying lead into a connector until each wire end touches the back wall of the connector.
6. Clamp the connector completely closed with large slip joint pliers.
7. Insert the black link power wire(s) from the wall and flying lead into a connector until each wire end touches the back wall of the connector.
8. Clamp the connector completely closed with large slip joint pliers.
9. Where applicable, insert the red AUX control power wire(s) from the wall and flying lead into a connector until each wire end touches the back wall of the connector.
10. Clamp the connector completely closed with large slip joint pliers.
11. Where applicable, insert the black AUX control power wire(s) from the wall and flying lead into a connector until each wire end touches the back wall of the connector.
12. Clamp the connector completely closed with large slip joint pliers.
13. If the network is not installed in a grounded metal conduit, a #14 ESD ground is provided by a single green wire. Match green wire to the green wire with the yellow strip connected to the station with the ring crimp connector.
14. Insert the green and striped green wire into a connector until each wire touches the back wall of the connector.
15. Clamp connector completely closed with large slip joint pliers.

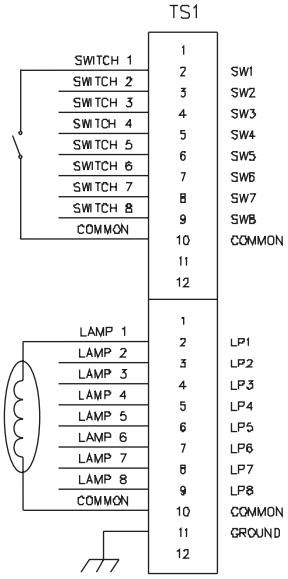


Figure 62: Wiring switches

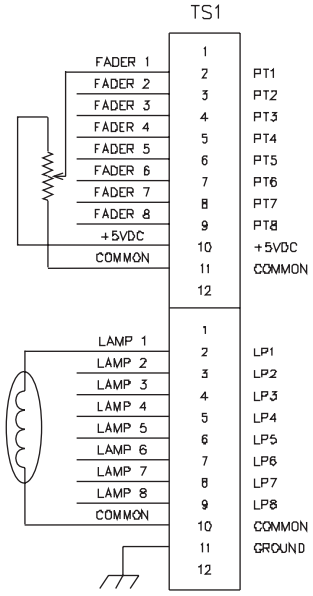


Figure 63: Wiring faders

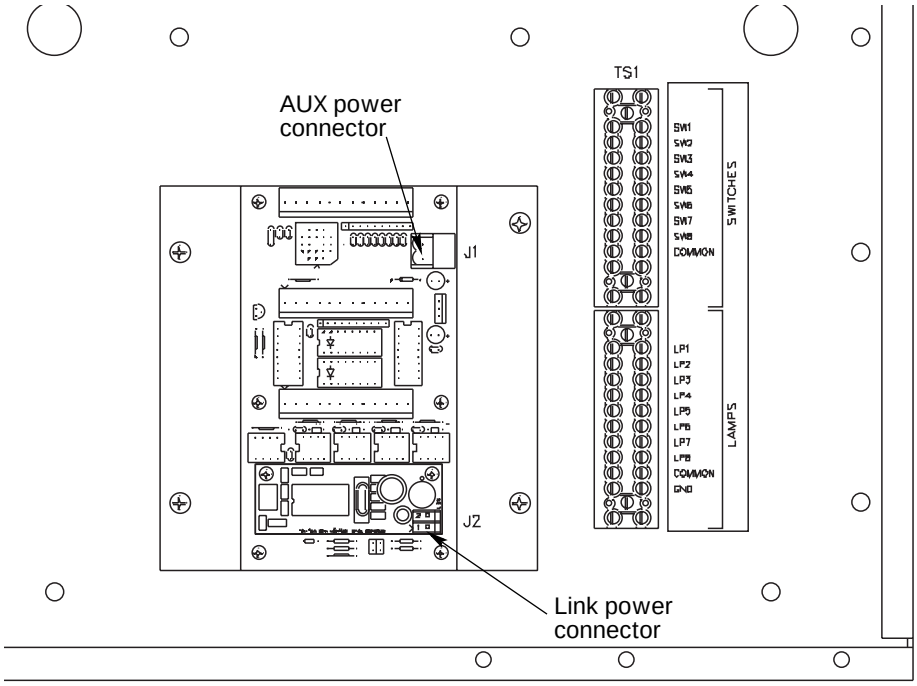


Figure 64: Satellite interface unit

Completing Wall Station Installation

To install Unison stations into backboxes

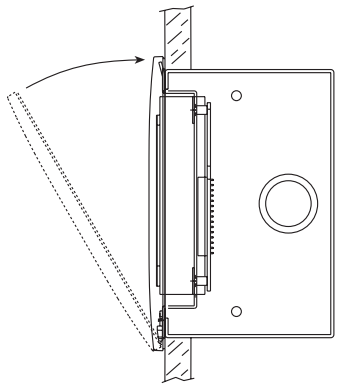


Figure 65: Side view of seating the bottom tabs

1. Insert the link power connector into the socket on the back of the control station.
2. If the station uses AUX supplemental power, insert the AUX plug into the socket on the back of the control station.
3. Remove the top layer of the ID sticker and attach it to a copy of the Wall Station ID chart. See *"Appendix C: Wall Station ID Chart"* on page 73. The bottom layer remains in the control station.

Note: During manufacture, each control station is given a unique 12-character ID. When a station sends control signals over the link power network, it includes this ID number to identify where the signals are coming from. This ID is required for binding control stations to the architectural processor. *See "To bind control stations to the architectural processor" on page 58.*

4. Coil the wires neatly into the back box.
5. Insert station brackets into the backbox. To correctly orient the station, make sure the link power connectors are on top.

Note: The front of the station must be flush to the wall surface for the faceplate to attach properly.

To attach station faceplate and fader knobs

1. Align faceplate horizontally to the station.
2. Hook bottom inside edge of faceplate on wire clip(s).
3. Push faceplate upward and swing top edge over station hooks.

Note: Buttons are part of the faceplate assembly and should not be removed for installation.

4. Hold faceplate close to wall and push down slightly to final position.
5. Install fader cap(s) if necessary, flat side up.

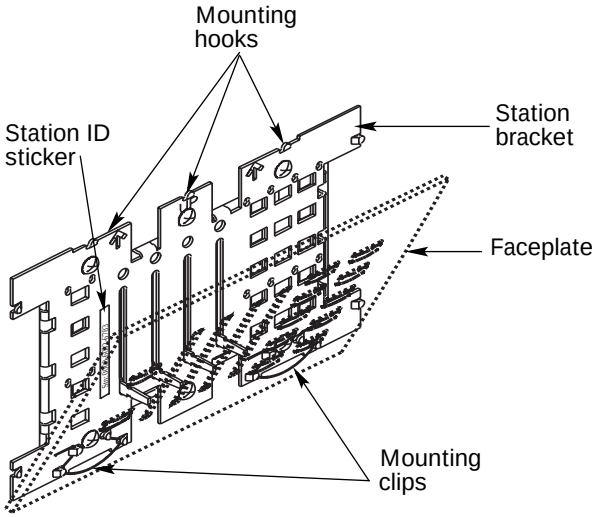


Figure 66: Attaching station faceplates

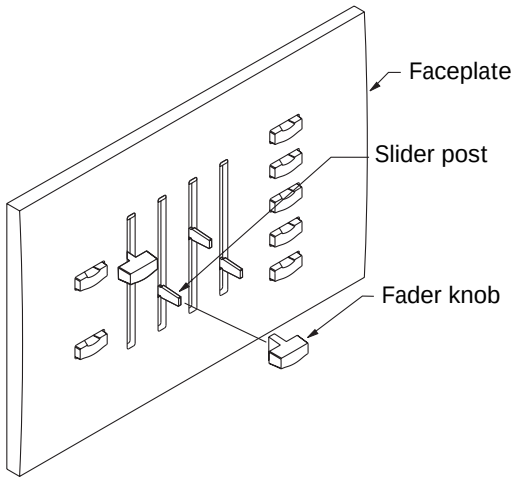


Figure 67: Attaching fader knobs

To test the control network installation

After you have installed all the control stations in a control network, but before you connect that network to the Unison Dimmer Rack or Unison External Processing Rack, check for shorts and cross-connections with a digital voltmeter (DVM).

You should perform DVM testing of link power or AUX power control wiring at the Unison Dimmer Rack or Unison External Processing Rack.

Warning: Only a qualified electrical technician should perform the following procedures.

1. Check resistance between each pair of link power + and – wires. Your reading should be higher than 10Ω and lower than 10 MΩ.

2. Check resistance between each link power wire and ground for shorts. If resistance is below 10 MΩ, you should check for damaged network wiring.

3. Check resistance between each pair of AUX power and AUX common wires. Your reading should be higher than 3Ω and lower than 10 MΩ.

4. Check resistance between each AUX control wire and ground for shorts. If resistance is below 10 MΩ, you should check for damaged AUX wiring.

Completing the Installation

Before applying power to the DR and ER systems

1. Clean up the inside of the dimming rack(s).

- ▼ Ensure that rack power is off.
- ▼ Check the inside of the rack for wire pieces, conduit centers or other debris.
- ▼ Check for loose connections, bare wires and damaged insulation.
- ▼ Use filler foam to seal any air leaks in the rack cabinet. Check conduit access panels and gaps inside partially filled wiring conduit.

Caution: Air leaks can cause dimming racks to shut down due to insufficient airflow.

2. Use a digital voltmeter (DVM) to check for shorts between the AC power, neutral and ground lugs.

Readings

Phase to Phase - Resistance should be 10MΩ or higher.

Phase to Ground - Resistance should be 10MΩ or higher.

Neutral to Ground - Resistance should be very close to 0Ω.

Phase to Neutral - Resistance should be 10MΩ or higher.

- ▼ Use the DVM to check for shorts between load power, neutral and ground wires. If the circuit is open between power and neutral check your load connections.

Warning: Line voltages may be on the phase bus bars during this procedure. You must be a qualified electrician familiar with the hazards of working with electricity. Use extreme caution performing this procedure.

3. Install dimmers into dimming rack (does not apply to ER racks)

- ▼ Firmly press individual dimming modules into place.
- ▼ Verify modules are seated firmly in the rack.

Warning: Unison dimming racks are rated for 15 and 20 amp dimmers only.

4. Install rack control module (CMd, CMBd, CMEd)

Note: The control module is installed in the bottom slot of DR series racks.

- ▼ Firmly press control module into position.

Warning: Never operate the Unison rack without modules installed. Failure to do so exposes dangerously high voltages and may result in rack overheating.

To apply power to the system

1. Set all dimmer module circuit breaker switches to the Off (right) position.
2. Apply system power at the main circuit breaker panel.

To verify system operation

▼ Check Control module indications

When power is applied to the system, the control module LCD will display "Booting", then "System OK". In the event of an error condition the control module beacon located in the center of the Unison logo will flash and error messages will be displayed. *See "Appendix B: Error Message Chart" on page 71.*

▼ Check load routing

To confirm that lighting loads are connected to the correct dimmer lug, energize one dimmer module at a time and confirm it is connected to its assigned light load.

1. Use the Test submenu in the dimmer menu to set a level for the first circuit you want to test. See *"To set dimmer levels in the Test submenu"* on page 54.

2. Check the assigned light load to see if it lights.

3. Repeat steps 1 – 2 for the other dimmer modules.

4. When finished, restore DMX and exit the Test submenu.

System configuration
Unison rack dimming software version 2.0

To access configuration menus

1. Press the concealed menu activate button for three seconds. Menu screen will appear. See *Figure 68* for concealed button.
2. Press [up arrow] or [down arrow] to scroll through bracketed options.
3. Press [Enter] to move bracket placement to the right.
4. Press [Exit] to move bracket placement left.

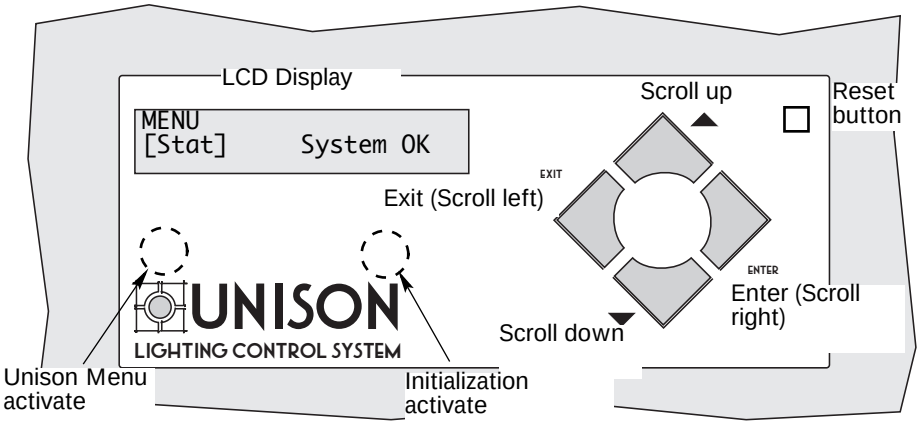


Figure 68: Control module interface for the Dimmer Menu

To reset a Control Module

When the rack door is open, a Reset button is available in the top right corner. Pressing it restarts the Control Module using saved settings. Resetting will temporarily interrupt all Control Module processing. Lights will flash momentarily or may go out while system boots.

To initialize a dimming rack

Initialization refers to the programming of rack voltage, size and DMX start address. The first time you access menus on a Unison dimming rack, you must initialize the dimming system processor.

1. Complete Rack Configuration Chart (Appendix D) on page 75.
2. Press the concealed "Initialization activate" button for three seconds. The [**Stat**] menu will be displayed.
3. Use [▲] or [▼] to scroll to the [**Rack**} menu.

```
Menu   Control  Rack
[Rack] Unknown   ER4
```

4. Press [Enter] to move the brackets underneath Control and use [▲] or [▼] to select the appropriate dimming rack or external processing rack control module.
5. If you have selected a dimming rack, move the brackets underneath **Rack** and use [▲] or [▼] to select either **DR6** or **DR12**.

```
Menu      Volt
Rack[    100-120     ]
```

6. Press [Enter] to move the brackets underneath **Volt** and use [▲] or [▼] to select the voltage that matches your feed, either **100-120, 120 Delta or 277 VAC**.
7. Press [Enter] to move the brackets underneath **Start** and use [▲], or [▼] to enter a DMX512 starting address for your rack between **001** and **512**.

```
Menu Start
Rack [ 001 ]
```

DMX start address - the DMX512 channel number (between 1 and 512) applied to the first dimmer in the rack. Succeeding DMX channel numbers are automatically applied to the remaining dimmers.

Continued on next page...

```
Menu Sequencing
Rack [ Straight ]
```

8. Press [Enter] to move the brackets underneath **Sequencing**. Select either **Straight** or **Balanced**.

   Straight or Balanced refers to how the DMX addresses will be distributed to the dimmers. Straight indicates that the distribution will be sequential starting at one. Balanced indicates that sequential loads will be distributed evenly over the three phases in the rack.

Note: Single-phase racks cannot be phase balanced, as the racks are not split evenly.

```
Update Rack?     [Yes]
```

9. Press [Enter] then [Exit]. The display changes to **Update Rack?** Use [▲] or [▼] to select Yes. Press [Enter] again to save changes and leave the **Rack** menu.

To detail dimming circuits

The Unison dimming processor is designed to control (dim) multiple lighting circuits. Control of each circuit is based on installed module type, connected load type, DMX address and circuit mode.

1. Access configuration menu (press the Unison Menu activation button.)

```
Menu     Ckt
[Cnfg]   001
```

2. Scroll to [**Cnfg**] with [▲] or [▼] and press [Enter]. The brackets move to the circuit number.

Note: Circuit numbers start with "1" for the first dimmer in the top slot of the rack. A rack can have one or two dimmer circuits per module. Dimmer load wire lugs are also labeled by circuit number.

```
Menu     Circuit
Cnfg     [001]
```

3. Select the desired circuit number with [▲] or [▼] and press [Enter]. The display changes to **Module Type**.

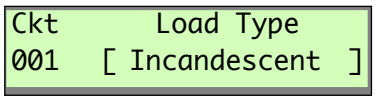
```
Ckt      Module
001    [ D15/D20  ]
```

4. Select the correct module type with [▲] or [▼] and press [Enter]. The display changes to **Load Type**.

Table 8: Dimmer modules and load types

Module Type	Description	Compatible loads
100-120 Volt Rack		
AFM	Required in empty dimmer slots	None
D15 and D20 D15E and D20E D15G and D20G	Standard 15 or 20 amp dimmer 500µs rise time 300µs rise time	Incandescent, 2- and 4-wire fluorescent, Low voltage, Neon, Cold cathode (CC), Non-Dim
R15 and R20	15 and 20 amp mechanically held relay	Any switched load
D15F and D20F	15 and 20 amp fluorescent dimmer	3 wire fluorescent dimmer ballasts
CC 15 and CC 20	Direct connection from line lug to load lugs protected by a 15 or 20 amp circuit breaker	Non-dim loads like color changer power supplies
277 Volt Rack		
AR15 and AR20	15 and 20 amp mechanically held relay	Any switched load
AD15 and AD20	15 and 20 amp dimmer 200µs rise time	Incandescent, 2- and 4-wire fluorescent, Low voltage, Neon, Cold cathode (CC), Non-Dim
AD15F and AD20F	15 and 20 amp fluorescent dimmer	3 wire fluorescent dimmer ballasts

Note: "CC" (constant current) module types do not indicate Cold Cathode.

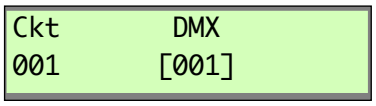


5. Select the desired load type with [▲] or [▼] and press [Enter]. The display changes to **DMX**. The number displayed refers to the DMX channel.

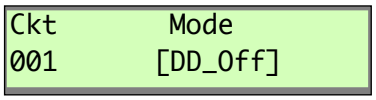
Note: When the Airflow module is selected the display goes directly to the **Save Changes?** screen. The display returns to the **Ckt** screen where you can begin detailing another circuit.

Table 9: Load type setting options

Load type	Setting options
Non-dim	DMX512 channel
Fluorescent (2, 3, 4 wire)	DMX512 channel, Ballast Type
Incandescent	DMX512 channel, DD (Dimmer Doubling) settings
Low Volt	DMX512 channel
Neon, CC (Cold Cathode)	DMX512 channel, Ballast Type

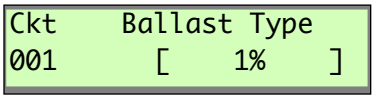


6. Select the desired DMX512 address with [▲] or [▼] and press [Enter]. The brackets move to **Mode**.



Note: It is important to note the circuit to DMX channel assignments. Select the **DD** mode with [▲] or[▼] and press [Enter]

Caution: Dimmer doubling is only available in 120V systems using Source Four fixtures with 77V lamps.

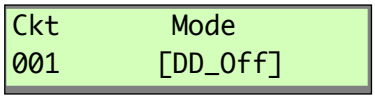


7. If a 2-, 3-, 4-wire fluorescent or Neon/CC is selected in load type the display will move to **Ballast Type**. Use [▲] or [▼] to scroll to the correct type (1, 5, 10, 15 or 20%).

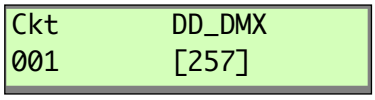
8. Use [▲] or [▼] to scroll to [**Yes**] to record your changes or scroll to [**No**] to discard changes and press [Enter]. The display returns to the circuit number step of the [**Cnfg**] menu. Use [▲] or [▼] to begin configuring another dimmer circuit. Or press [Exit] to leave the Configuration submenu.

To enter Dimmer Doubling (DD) settings

Dimmer Doubling (DD) can only be used in 120V systems using D15, D20, D15E, and D20E modules. This feature is used for applications where ETC Dimmer Doubling and Source 4 equipment is used. If you have not purchased Dimmer Doublers, this feature must be turned off.



1. Select either [**DD_On**] or [**DD_Off**] with [▲] or [▼] to enable or disable Dimmer Doubling and press [Enter]. If you select [DD_On] the display changes to [**DD_DMX**]. If you select [**DD_Off**], **Save Changes?** displays.

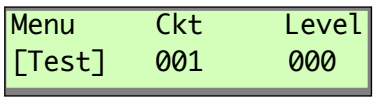


2. Select the desired DMX512 address with [▲] or [▼] and press [Enter]. Use the default address number (the **DMX** address plus 256) unless a different address is specified. The display changes to [**Save Changes?**].

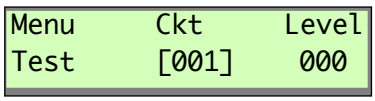
To set dimmer levels in the Test submenu

You can use the Test submenu to set dimmer levels to test your dimmer circuit wiring or lighting load operation. Test also allows you to view DMX level being received by the dimming processor.

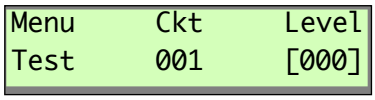
1. Access the configuration menu (press the Unison Menu activation button.)
2. Scroll to [**Test**] with [▲] or [▼] and press [Enter]. The brackets move to **Ckt**. The DMX input value for the circuit is displayed between and range of 0 and 255.



3. Use [▲] or [▼] to scroll to the desired circuit number and press [Enter]. The brackets move to **Level**. ***This shuts off all DMX to the rack***. ***DMX levels are held at last look and DMX level changes have no effect***.

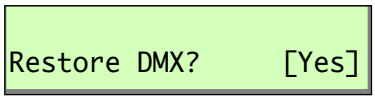


4. Use [▲] or [▼] to scroll to the circuit output level. Circuit output will continuously match the levels as they scroll. Press [Exit] to set levels on another circuit or [Enter] to go to **Restore DMX?**. (Restoring DMX will cancel all test levels.)



Note: Circuit levels will remain at their test setting when you press [Exit]. You can set levels for all the dimmer circuits by repeating steps 2 and 3.

5. Use [▲] or [▼] to scroll to [**Yes**] to clear the test settings and restore DMX or [**No**] to temporarily keep the look and press [Enter].

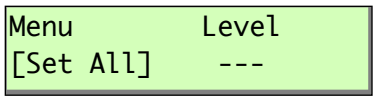


Note: If you keep the test settings, DMX512 input is disabled until you return to the **Test menu** and restore DMX.

To set dimmer levels in the Set All submenu

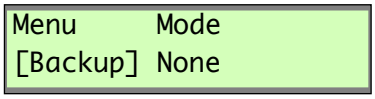
The [**Set All]** submenu is an additional test menu. It allows you to change all of the levels in the dimmer rack.

1. Access the configuration menu (press the Unison Menu activation button.)
2. Scroll to [**Set All**] with [▲] or [▼] and press [Enter].
3. Use [▲] or [▼] to change the level of all dimmers.
4. Press [Enter], and use [▲] or [▼] to scroll to [Yes] to clear the [Set All] and restore DMX. Or [No] to temporarily keep the look and press [Enter].



To set the Backup look

In the event of console failure, the backup look enables you to activate a single preset at the CMd or CMEd.



1. Access the configuration menu.
2. Scroll to [**Backup**] with [▲] or [▼] and press [Enter]. The brackets move to **Mode**.

3. Scroll to [**Record**] with [▲] or [▼] and press [Enter]. The system will record current levels.

Note: Any "Test" or "Set All" levels will be recorded if DMX is not active.

4. Use [▲] or [▼] to select if programmed backup look should play at boot-up of system processor. Select [**Yes**] or [**No**] and press [Enter].

5. Scroll to [Yes] to save changes and press [Enter].

Note: playing the backup look will disable DMX or test levels to the dimming rack.

Turning Over Installation Materials

After finishing and saving the system configuration, if there is no architectural configuration, deliver the *Configuration User Manual* and any other system information to the site manager.

Note: ***Installation manuals should not be left on site with the user.***

Configuring the Architectural Processor Application and Light Manager software version 1.5

You configure the architectural processor for your system using the Unison Architectural menu. This menu lets you load the provided configuration, enter the Unison local control settings and other information used by the control processor.

Each Unison control system has one architectural processor.

- If your system has an External Processing Rack, its control module will contain the architectural processor.
- If your system does not have a processing rack, the architectural processor is in the control module of one of your Unison Dimmer Racks.

Note: You can tell which dimming rack control module contains the architectural processor by looking at the label on the right side of the faceplate. CMBd, CMEd and CMEi control modules contain an architectural processor. CMd modules do not.

From the dimming rack

- Access the Unison menu and scroll to [ARCH] with [▲] or [▼] and press [Enter]. The Unison menu will be displayed.

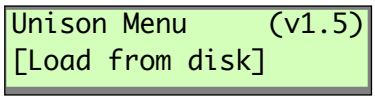
From the external processing rack

- Access the Unison menu by holding the concealed button for three seconds.

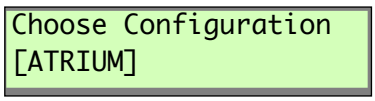
To load a Unison Light Manager configuration into the control processor

The Light Manager configuration provides system parameters such as number of rooms, number of zones in each room, number of presets and type and placement of stations.

1. Open the rack door and find the 3.5" disk drive slot on the right side of the Control Module.
2. Insert the disk containing the configuration into the drive.
3. Access the Unison menu and scroll to **[Load from Disk]** with [▲] or [▼] and press [Enter].



4. Scroll to the desired configuration name with [▲] or [▼] and press [Enter].

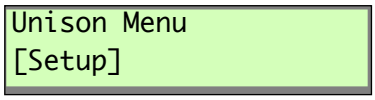


Note: Reading a configuration will overwrite the configuration currently in the processor. Save to disk before reading in a new configuration if you are unsure.

5. **Loaded** displays when the configuration is loaded from the 3.5" floppy disk. Press [Enter] to return to the **Unison** menu.

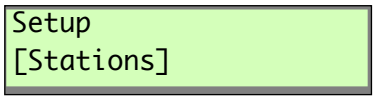
To bind control stations to the architectural processor

Before the architectural processor can identify signals from the wall stations, it has to link each control station to its ID number. This process is called "binding". Systems with a single station of a particular type (preset, fader, LCD) will automatically bind with the associated ID number.

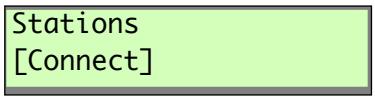


1. Access the Unison Menu, scroll to **[Setup]** with [▲] or [▼] and press [Enter].

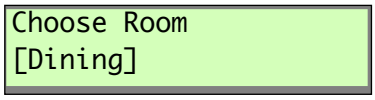
Note: Refer to the Control Station ID Chart to find the station ID number of the control you wish to bind.



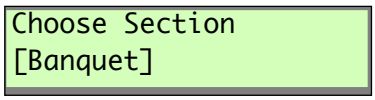
2. From the **Setup** display scroll to **[Stations]** with [▲] or [▼] and press [Enter].



3. From the **Stations** display, scroll to **[Connect]** with [▲] or [▼] and press [Enter].

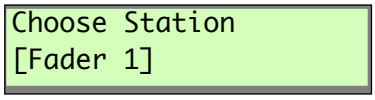


4. The **Choose Room** display shows a list of rooms with unbound control stations. Scroll to the desired room with [▲] or [▼] and press [Enter].

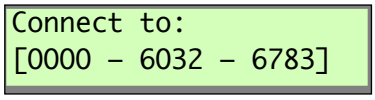


5. The **Choose Section** display shows the sections available in divided rooms. Scroll to the desired section with [▲] or [▼] and press [Enter].

Note: If the selected room is not divided, this display is skipped.

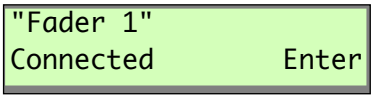


6. The **Choose Station** display scrolls the names of unbound control stations in the section. Scroll to the desired control station with [▲] or [▼] and press [Enter].



7. When a control station name is selected, the **Connect to** display shows a list of the station IDs available on the network for that type of station. Scroll to the correct ID with [▲] or [▼] and press [Enter].

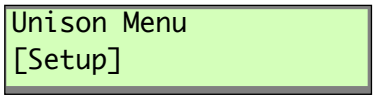
Note: When you are in the **Connect to** menu, pressing a control button on the station you choose in Step 6 will display the ID number of that station. You can use this feature to bind stations if you lose your Control Station ID Chart.



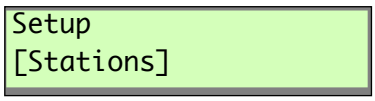
8. The LCD will display [Connected] when the station is bound. The control station is now ready. Press [Enter] to show the next room or section with unbound control stations. Press [Exit] to leave the **Connect** menu.

To unbind control stations (optional)

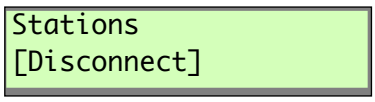
When you need to remove or change a station, follow this procedure to unbind a control station from the architectural processor.



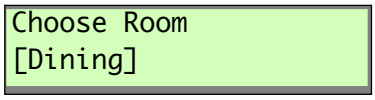
1. Access the Unison Menu, scroll to **[Setup]** with [▲] or [▼] and press [Enter].



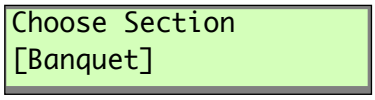
2. Scroll to **[Stations]** with [▲] or [▼] and press [Enter].



3. Scroll to **[Disconnect]** with [▲] or [▼] and press [Enter].

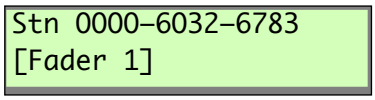


4. In the **Choose Room** display [▲] or [▼] scrolls the names of rooms with bound control stations. Press [Enter] to select the desired room.

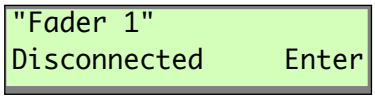


5. In the **Choose Section** display [▲] or [▼] scrolls the names of sections with bound control stations. Press [Enter] to select the desired section.

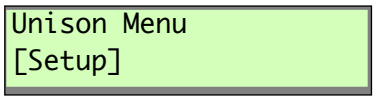
Note: The Choose Section display is skipped for undivided rooms.



6. After you select the section, the display shows a scrolling list of linked stations in that location. Scroll to the desired station with [▲] or [▼] and press [Enter].



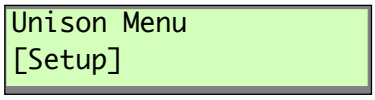
7. The message "**Disconnected"** displays when the control station has been unbound. Press [Enter] to move to the next section or room with bound control stations. If there are no remaining bound control stations in the configuration, the display reverts to the Stations Connect menu.



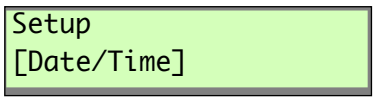
8. Press [Exit] to move back through the **Stations** submenu until you return to the **Unison** menu.

To enter the Date and Time local control settings

Follow this procedure to set the date and time in the astronomical time clock in the architectural processor.

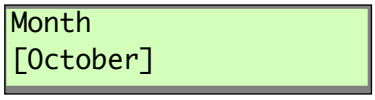


1. Access the Unison Menu, scroll to **[Setup]** with [▲] or [▼] and press [Enter].



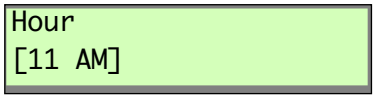
2. Scroll to **[Date/Time]** with [▲] or [▼] and press [Enter].

3. The **Year** display scrolls dates from **[1995]** to **[2099]** with [▲] or [▼]. Press [Enter] to select the correct year.

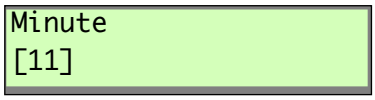


4. The **Month** display scrolls all 12 months with [▲] or [▼]. Press [Enter] to select the correct month.

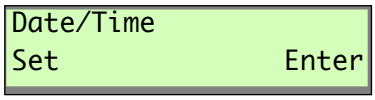
5. The **Date** display scrolls days from 1 to 31 with [▲] or [▼]. Press [Enter] to select the correct date.



6. The **Hour** display scrolls 24 hours in a 12 hour AM/PM format with [▲] or [▼]. Press [Enter] to select the correct hour.



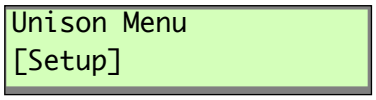
7. The **Minute** display scrolls from 00 to 59 minutes with [▲] or [▼]. Press [Enter] to select the correct minute.



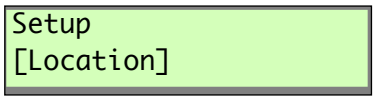
8. **Date/Time Set** appears when the Date/Time menu is complete. Press [Enter] to return the display to the **Unison** menu.

To enter your location settings

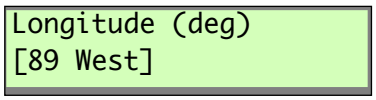
The Location menu allows you to enter the installation latitude, longitude, elevation, and time zone into the Unison astronomical time clock. For latitude, longitude and time zone information for many North American cities see *"Appendix G: U.S. Time Zone and Location Map"* on page 81, or consult the reference section of your local library.



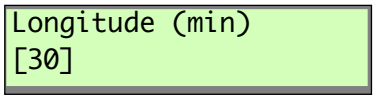
1. Access the Unison Menu, scroll to **[Setup]** with [▲] or [▼] and press [Enter].



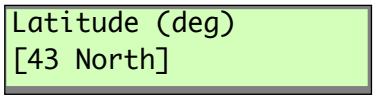
2. Scroll to **[Location]** with [▲] or [▼] and press [Enter].



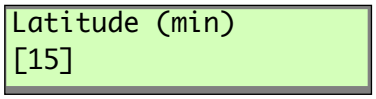
3. The **Longitude (deg)** display scrolls from 0 to 179 degrees East and West with [▲] or [▼]. Press [Enter] to select the correct value.



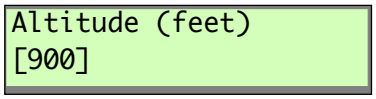
4. The **Longitude (min)** display scrolls from 0 to 59 minutes of longitude with [▲] or [▼]. Press [Enter] to select the correct value.



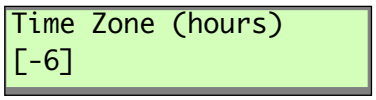
5. The **Latitude (deg)** display scrolls from 0 to 89 degrees North and South with [▲] or [▼]. Press [Enter] to select the correct value.



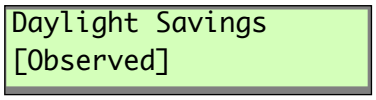
6. The **Latitude (min)** display scrolls from 0 to 59 minutes of latitude with [▲] or [▼]. Press [Enter] to select the correct value.



7. The **Altitude display** scrolls elevation values in increments of 100 feet (28.5m) with [▲] or [▼]. Press [Enter] to select the correct value.



8. The **Time Zone** display scrolls from 1 to 12 hours before (+) or after (–) Greenwich Mean Time. Scroll to the correct Time Zone with [▲] or [▼] and press [Enter].



9. The **Daylight Savings** display scrolls from [**Observed**] to [**Not Observed**] with [▲] or [▼]. Press [Enter] to select the desired daylight savings setting.

10. **Location Set** displays when the Set Location menu is complete. Press [Enter] to return to the **Unison** menu.

Working in the Setup menu

All of the following Setup menu options will allow you to access, change or set information about your Unison system. See *"Appendix E: Architectural Menu Flow Chart"* on page 77, for help on maneuvering through the menus.

```
Setup
[Stations]
```

▼ Stations

Use this menu to connect (bind) or disconnect stations to the Unison processor. See page 58.

```
Setup
[Zones]
```

▼ Zones

Use this menu to change a zone's level, add a dimmer, remove a dimmer, or change the DMX input mode.

```
Setup
[Presets]
```

▼ Presets

This option will let you activate, deactivate, record and change the fade time of a Preset.

```
Setup
[Walls]
```

▼ Walls

Use this menu to open or close a wall.

```
Setup
[Load Net Backup]
```

▼ Load net backup

Loads configurations over the network in special Master Controller applications.

```
Setup
[Date/Time]
```

▼ Date/Time

Allows you to display or change timeclock information about the system. *See "To enter the Date and Time local control settings" on page 60.*

```
Setup
[Location]
```

▼ Location

Allows you to display or change astronomical timeclock information about the system. *See "To enter your location settings" on page 61.*

```
Setup
[Format disk]
```

▼ Format disk

See page 64 for more information.

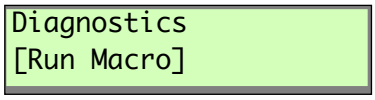
```
Setup
[Information]
```

▼ Information

This menu option gives you detailed information about your configuration, including: numbers of stations and connectors, numbers of rooms and sections, numbers of zones and dimmers, presets and their levels, and processor addresses.

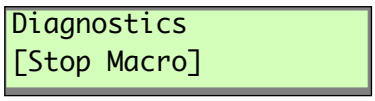
Working in the Diagnostics menu

As with the Setup menu, the Diagnostics menu will allow you to access advanced information about your configuration.



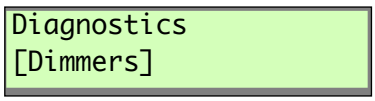
▼ Run Macro

Runs a selected Macro.



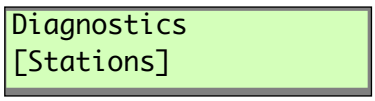
▼ Stop Macro

Stops a selected Macro.



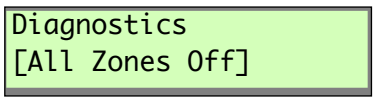
▼ Dimmers

This menu option gives you the specific DMX level information for the selected dimmer.



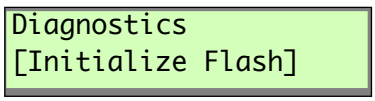
▼ Stations

Use this menu to find out which stations are connected to the network, including their unique station ID number.



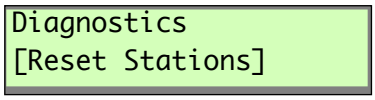
▼ All Zones Off

Turns off all zones that are currently on.



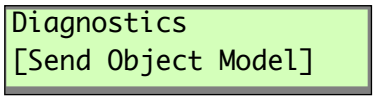
▼ Initialize Flash

Clears and resets the current flash memory.



▼ Reset Stations

By selecting this option you will be performing a power-only reset on the AUX and link power lines.



▼ Send Object Model

Used in networked systems to send information about controls and wall stations.

To format floppy disk (optional)

The write-enable tab must be in the "Write" position to format a disk

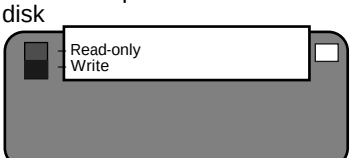


Figure 69: Write tab position

If you have an unformated double-sided, high-density disk, you can format it in the Control Module's disk drive.

1. Insert the disk into the disk drive on the right side of the control module. The write-protect tab must be closed. See *Figure 69*.

```
Unison Menu
[Setup]
```

2. Access the Unison Menu, scroll to **[Setup]** with [▲] or [▼] and press [Enter].

```
Setup
[Format disk]
```

3. Scroll to **[Format Disk]** with [▲] or [▼] and press [Enter].
   Formatting disk... displays while the Control Module is formatting the disk. Formatting may take a few moments.

```
Formatting
disk...
```

▼ **"Disk Formatted"** displays if formatting is successful. The disk is ready to record a configuration.

```
Formatting failed!
er:05            Enter
```

▼ **Formatting failed!** displays if there is a problem formatting the 3.5" floppy disk. You should check the write-enable tab or use another disk.

To save the installed configuration

When you finish binding wall stations you should record your installed Unison configuration to another 1.44 MB IBM DS HD formatted 3.5" floppy disk (not your original configuration disk.) Saving the installed configuration records binding and location information entered while binding stations and setting up the system.

```
Unison Menu
[Save to disk]
```

1. To use the **Save to disk** submenu, insert a correctly formatted disk (see Preparing a 3.5" floppy disk, above), access the Unison menu, scroll to [**Save to disk**] with [▲] or [▼] and press [Enter].

```
Choose Save Name
[UNISON-1]
```

2. The **Choose Save Name** display scrolls the nine name options used by the Control Module processor for saved configurations. Names begin with **Unison** and are numbered from 1 to 9. Scroll to the desired name with [▲] or [▼] and press [Enter].

```
Saved
"UNISON-1"       Enter
```

3. **Saved** displays when the configuration is saved to the 3.5" floppy disk. Press [Enter] to return to the **Unison** menu.

Turning over installation materials

You have finished the normal steps of a Unison installation after finishing the system configuration and saving the installed configuration.

1. Deliver both the original and the installed copy of the Unison system configuration to your customer.
2. Deliver the User manual and any other system or order documentation to the site supervisor.
3. Forward a copy of the final configuration via disk or email to the factory (**lightmanager@etcconnect.com**). Should the need arise, this will ensure that you receive the best possible technical service.
4. Please include all relevant job information. Including, the job number, contact person on site with their name and phone number.

Maintaining Your Unison System

Cleaning dimming rack air filters

Clean the filter on your dimmer cabinet every six months, more often if your system operates in a dusty environment.

Caution: Phase voltages inside the rack can be deadly. Do not remove rack modules . Only qualified technicians should expose the inside of the dimming cabinet. The Unison dimmer rack carries only an IP00 protection rating when control or dimmer modules are removed.

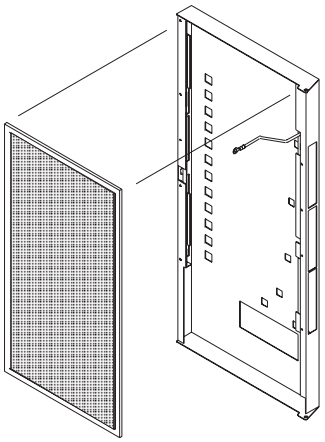


Figure 70: Removing a Unison DR or ER air filter

1. Open the dimmer rack door. The filter is mounted on the inside of the door, held in on the bottom by a metal clip.
2. Slide the filter up about 1/2 inch until the filter base clears the top edge of the lip. Pull the base out far enough to clear the retaining lip and slide the filter down and out.
3. Vacuum or blow dust out of the filter.

Note: You can wash the filter under clear tap water, but it must be completely dry before you reinstall it. Do not use soap or other chemicals to clean the filter.

4. Slide the top of the filter back into the slot at the top of the door until the base clears the metal retaining lip on the bottom of the door.

Note: When you clean the air filter, you should also check the dimmer air vents for dust. See "*Vacuuming Dimming Racks*" below.

5. Let the filter drop back into place and close the door.

Vacuuming Dimming racks

You should inspect your dimming rack when you clean the air filter and vacuum the front of the dimmer modules if necessary.

1. Open the door and look at the modules' air vents. If dust is thick enough to hide the paint color, vacuum the front of the modules.
2. Leave the modules inside the rack. Most dust collects on the dimmer choke vents and grills of the dimmer module.
3. Use a narrow vacuum cleaner nozzle to vacuum dimmer module air vents. Do not push debris into the modules.
4. Close the door.

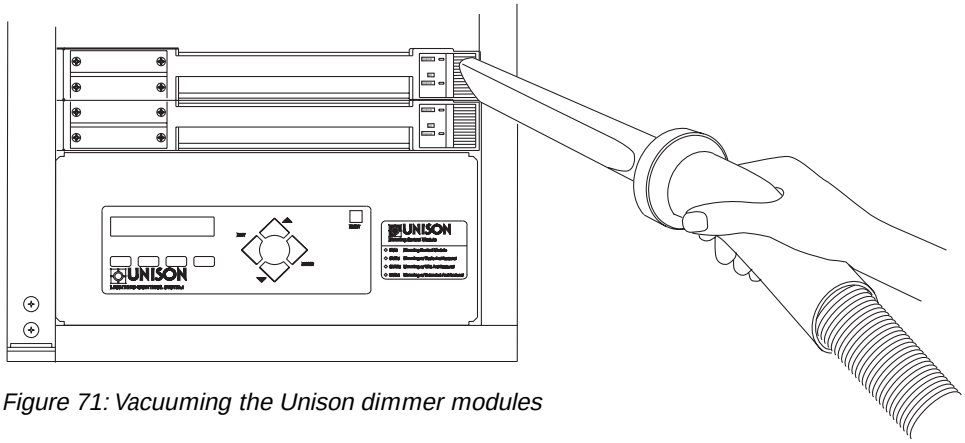


Figure 71: Vacuuming the Unison dimmer modules

Appendix A: Frequently Asked Questions

Can the length of the link power network be increased?

Yes. For the length of the network to be increased beyond the specified 500 meters, use a repeater which will increase the length by 500 meters for each repeater. The network **CANNOT** be topology independent. One end of the network is the link power/ AUX control power supply, while the other end is a network termination block at the last station in the network.

Please contact ETC if you are working in a networked system.

What voltage is required for the LCD station to operate?

The voltage at the LCD should be at least 9.5Vdc. If the voltage is too low the LCD will go into a power cycling mode. The cycle is created when the backlight circuit draws more current during the power-up stage, causing the voltage to drop to 5Vdc and reset the unit. The unloaded output voltage of the AUX control power supply is set at 24Vdc at the factory. The maximum output voltage is about 14Vdc. The unloaded output voltage of the 24V AUX control power supply is set at 24 Vdc. This is the maximum output voltage as well.

Can I measure the voltages on the link power network to check for faults?

Yes, with a digital volt meter (DVM). Set the DVM to read DC volts and measure the voltage across the link power terminals, it should read plus or minus 40.5Vdc +/- 1Vdc. The polarity is not important. Also measure the voltage from each link power terminal to an earth ground connection. The voltage should read either plus or minus 20.25Vdc +/- 1Vdc. One terminal will be 20.25 referenced to earth ground and the other will be -20.25Vdc referenced to earth ground. Abnormal readings will warrant an investigation to find the fault.

I am installing a CMEd/CMBd in a DR12 rack. I've already installed and wired my ARCH option board and am now running a DMX-In signal to the rack. There are (2) DMX-Input locations, to which do I wire?

You can wire to either of the two connections, the 6-pin connector on the ARCH option board or the 3-pin connector on the signal distribution PCB. Once the module is installed they are electrically connected together.

Can any control module be hot-swapped?

No, the inrush current that charges the input capacitors is enough that it can arc across the card edge connectors. This can damage the connectors and create high resistance hot-spots on the connectors. Turn off the power feed breaker to the rack when changing control modules.

I have a multi-rack DR12 system and a CMEd/CMBd control module driving a series of wall stations. None of the wall stations seem to be getting power, what's wrong?

If the wall stations are wired to a properly installed architectural option PCB in one of the racks, it is likely that the control module installed in that rack does not contain an architectural processor. The CMEd/CMBd must be located in the same rack to which the wall stations are wired.

I have a DR12 and regardless of what I do only modules 1,2,3,6,9 and 10 do anything.

The control module is configured for a 6 module rack. To fix the problem enter the **Rack** initialization menu and under the field [Rack] select [DR12]. Remember, the menu is entered by holding the hidden key located just above the second 'N' in UNISON on the membrane overlay. See page 51 for rack initialization instructions.

I have one or two loads that seem to cycle periodically. When they are off, they're off for about 2 minutes, then it comes back on. What's wrong?

It is likely that you have an over-temperature problem due to the accumulation of dust in the air filter. The Unison series will attempt to restart the over-temperature module after approximately 2 minutes. Overtemp conditions are detected on a by-module basis. Thus, all circuits that are controlled by the module will be shut down in over temp.

Can the stations be reset without resetting the control module?

Yes, from the [**Diagnostics**] section of the Architectural menu. Scroll through the menu until the [**Reset Stations**] selection appears and hit [Enter]. This will reset the AUX control power and the link power supplies, which will reset all the stations on the network.

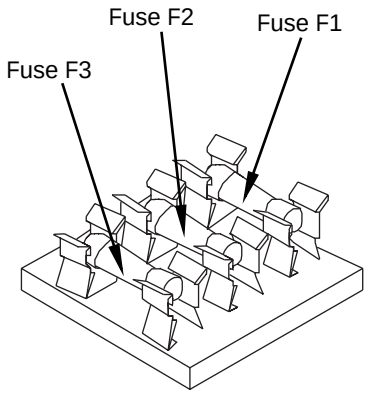


Figure 72: 277V fuse block

My control module/stations/fan won't work. What's wrong? (277V only)

Most likely you have blown fuse F1 and it should be replaced. Fuses are located at the bottom of the rack on the left side of the enclosure. See *Figure 72* for location of fuses.

I can't access my [ARCH] menu. I've got a dimmer rack with a CMBd/CMEd control module.

If a functioning architectural processor is installed, first enter the [RACK] menu. Scroll to [VOLT] (or any other field), scroll up once, scroll down once (the field should be unchanged). Exit the [RACK] menu, answering [YES] to "Save Changes". Reset the control module. You should now be able to access the architectural processor if it exists.

This only occurs in dimming control modules with Architectural processing. Upon initial power-up the interface processor waits approximately 45 seconds for the Architectural processor to initialize. If the architectural processor does not come on-line in that period, it is assumed that the architectural processor does not exist and that information is written to non-volatile memory. Without an architectural processor, boot time is reduced from 45 seconds to 10 seconds as the interface processor simply ignores the architectural processor. The above procedure forces the interface processor to re-recognize the architectural processor it if exists.

I'm getting a "Zero Crossing" error on my control module. What does that mean? (277V only)

Either fuse F2 or F3 needs to be checked and/or replaced. Fuse F2 is for phase C, and F3 for phase B. See *Figure 72* for location of fuses.

I have plugged in my control processor and all the zones have come to full.

Go into the Unison setup menu and scroll to the [**DIAGNOSTIC**] menu. From there scroll to "all zones off ". This will take all levels to zero and you can finish installing the system.

I am trying to communicate with the Unison PC interface, but cannot get a connection.

Make sure that when you attach to the processor that Light Manager is not running. Make the serial connection first, then start Light Manager and try to get a connection. Also check *File/Setup PC Interface* for the correct COM port. Reboot if necessary.

I have a portable station that will not work when I plug it into any of the portable connectors.

When you first install a Unison system with portable stations you must first bind the portable station to each of the portable connectors. After that the portable station will know where it is connected and will work automatically.

I have a Preset station and when I try to play a preset all the LEDs chase.

If the station LEDs chase, it means the station is not "bound" to the processor. Follow the steps on page 58 to manually bind the station.

How do I bind stations?

See "To bind control stations to the architectural processor" on page 58.

How many stations can I connect/What are the differences between processors?

- CMB - Basic architectural processor
  - 128 dimmers
  - 8 rooms
  - 1200 recordable levels
  - 16 stations (5 LCD)
- CME - Extended architectural processor
  - 512 dimmers
  - 64 rooms
  - 10000 recordable levels
  - 128 stations (5 LCD)
- CMEi - Extended architectural processor with network connections
  - 512 dimmers
  - 64 rooms
  - 10000 recordable levels
  - 128 stations (5 LCD)

My LCD screen looks all scrambled

Bitmap files for fonts and graphics have become corrupted. Try reloading your configuration. If you still have problems, contact ETC Technical Services.

I try to bind stations, and all I get is "------" at the processor.

Either the station is already bound or is not being recognized by the processor. Check the link power connection.

Does it matter what I call my configuration?

No, provided it has a ".cfg" suffix.

I want to test my loads but don't have any stations connected. What can I do?

You may set dimmer levels at the processor using the [**Test**] menu. *See "To set dimmer levels in the Test submenu" on page 54.*

How do I play/stop a Backup look?

You need to go into the Unison menu, and under [**Backup**] select [Play] or [Stop]. *See "To set the Backup look" on page 55.*

I set my Backup look to play at boot and now it won't stop.

You need to go into the Unison menu, and under [**Backup**] select [**Stop**] and "Play At Boot" [**No**]. *See "To set the Backup look" on page 55.*

How do I clear the memory in the processor?

You will need to go into the [**Arch**] menu, select [**Diagnostics**], scroll to [**Initialize Flash**] and press [**Enter**]. Insure that the configuration is saved to disk, then reset the processor.

How do I upgrade my processor to a newer version of code?

Contact ETC Technical Services.

My processor will not read disks.

There might be a problem with the floppy drive. Call ETC Technical Services.

How long should the processor say "Booting"?

Depending on the size of the configuration and number of stations, the processor can display this message for a minute or more.

I want the "Take Control" functionality like DAS, how can I do that?

Call ETC Technical Services for more information.

I plugged in my PC to the Interface station. How do I "talk" to the processor?

See the *Unison Light Manager Manual, To configure a PC for live control*, page 44 for details.

I want to record looks that I have set on my console to presets, how does that work?

In the *Unison Light Manager Manual*, see *Modifying Zone Properties*, page 21.

How do I program a Contact Interface station into my configuration?

In the *Unison Light Manual Manual*, see *Fader/Switch contact satellite station*s, page 44.

Appendix B: Error Message Chart

Upon starting and during operation of your system, the control module will display messages to indicate system status.

DISPLAY MESSAGES	STATUS	SUGGESTED SOLUTION
System OK	System operating correctly	
Backup Active	Backup look playing	Turn backup look off
Test DMX Off	Test menu active	Restore DMX in test menu
Errors Exist	1 or more circuits have specific errors	Scroll through error list

If errors exist, use the right arrow button to scroll through the list of circuits and associated errors. Multiple errors can be seen by pressing [▲] or [▼].

Possible error types possible include:

DISPLAY MESSAGES	STATUS	SUGGESTED SOLUTIONS
SSP_ERR	Indicates I^2C error	Cycle power - Call factory
No DMX	DMX is not being received	Hook up DMX or turn on console
DMX ERR	Bad DMX packets being received	Verify DMX wiring and termination
No Zero	One of the phases has failed to detect zero crossing. System is likely inoperable.	Call factory
Over Temp	One or more of the dimming modules has been shut off due to sensing of over-temp.	Make sure fan is running - Check rack filter - Check module input vents - Replace module.
Voltage Low	Rack is receiving insufficient voltage for initialized parameters.	Verify input voltage
Voltage High	Rack is receiving excess voltage for initialized parameters.	Verify input voltage
Arch Failure	The control module has been configured as a CME/CMEd orCMB/CMBd and communication with the architectural processor cannot be established.	The control module must be configured as a dimming module in the [Rack] menu, or call ETC.
Bypass Active	A power failure in the normal power feed was sensed. Dimmers have been driven to full, bypassing all control.	Restore normal power.
CPU 01 - 06 Fail	A dimming processor in a -d module has failed.	Call ETC

ETC contact information

- Technical Service phone: **800-775-4382**
- Technical Service fax: **800-836-1736**
- System and Light Manager questions may be directed to: **lightmanager@etcconnect.com** or **service@etcconnect.com**

  In the event of an emergency, for faster service please call the factory.

Appendix C: Wall Station ID Chart

Use the following chart to identify and track wall station ID numbers.

Job Name:_____

Date:_____

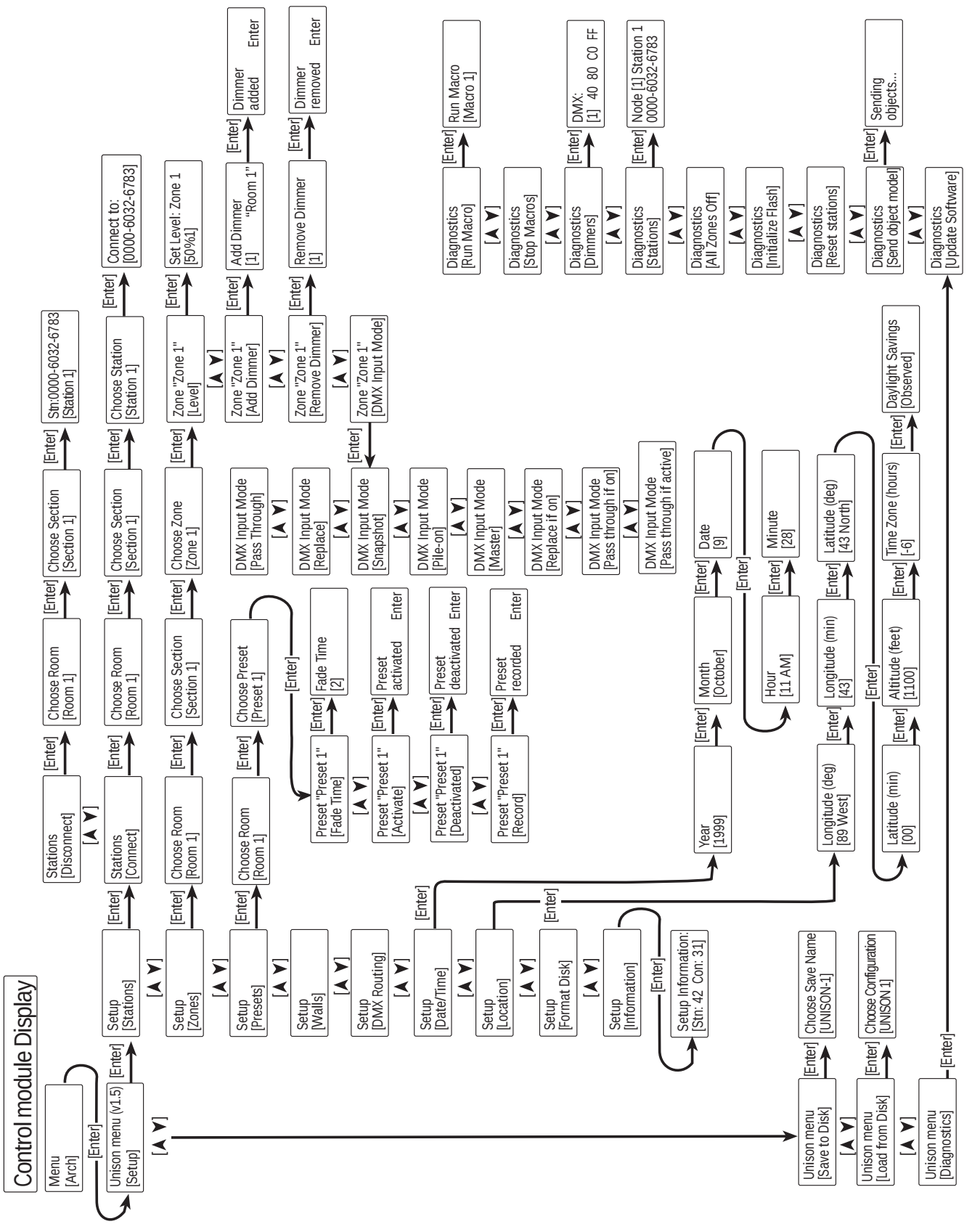
Room	Wall Station Type	ID tag

Appendix D: Rack Configuration Chart

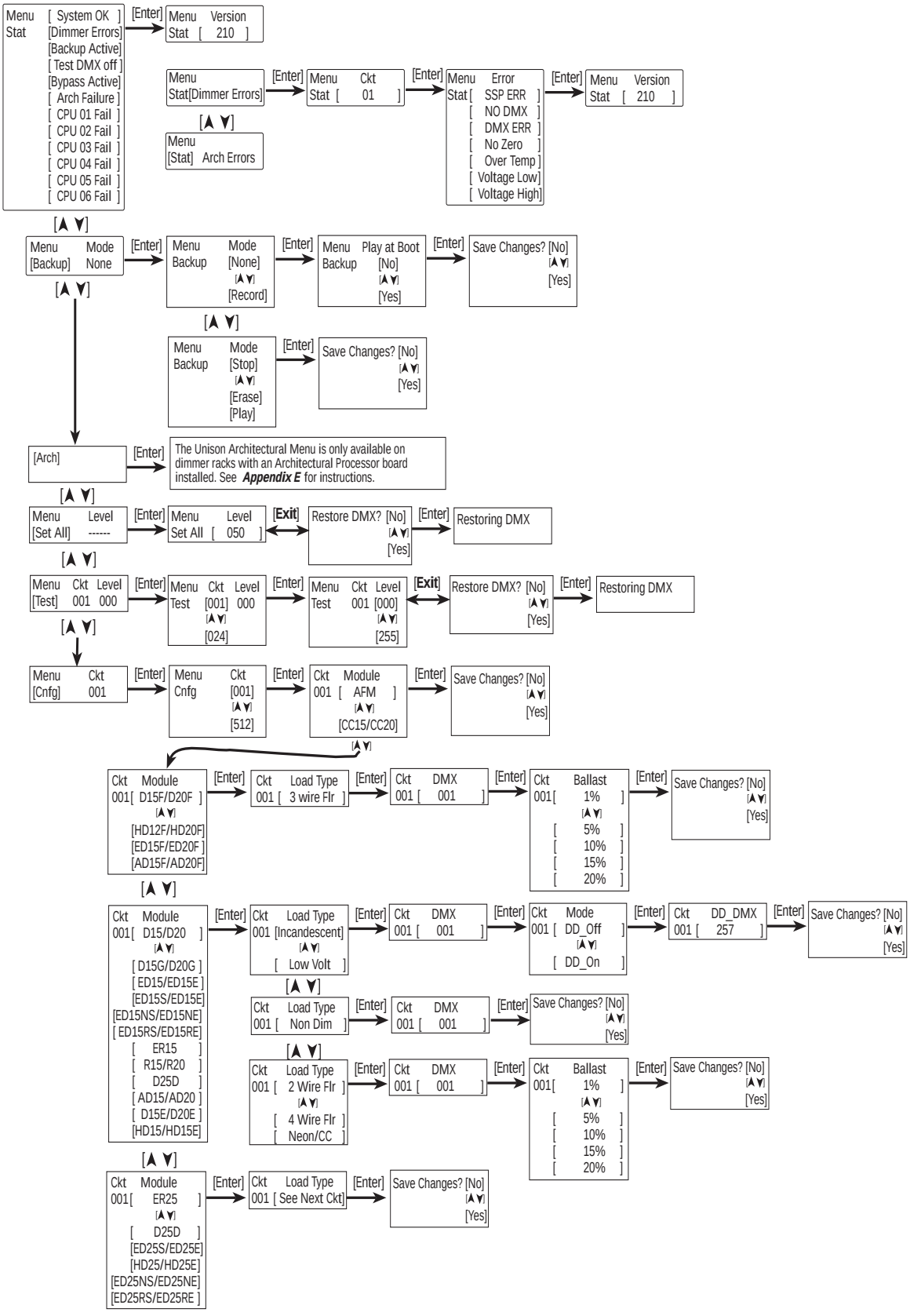
Use this chart to list dimmer load and circuit information.

Rack number: _____		**Rack voltage:**_____	**Feed panel #:** _____	
Rack type: *DR*-_____		**Rack DMX512 starting address:** _____		
Dimmer circuit #	**Module type**	**Load type**	**DMX512 #**	**DMX # (DD only)**

Appendix E: Architectural Menu Flow Chart



Appendix F: Dimmer Menu Flow Chart



Appendix G: U.S. Time Zone and Location Map

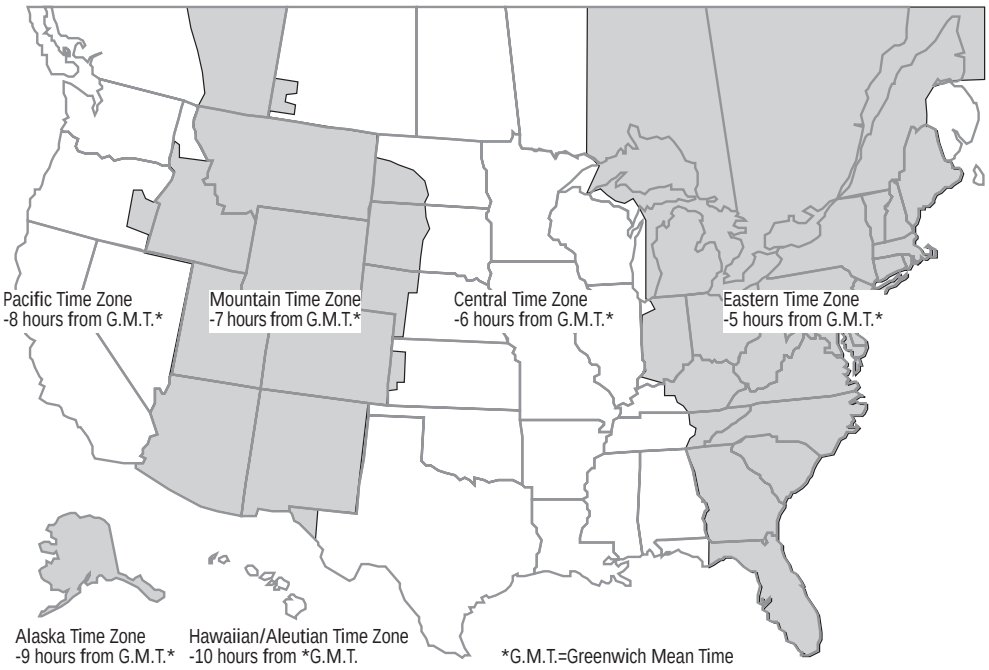
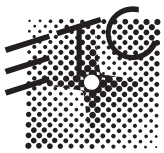


Table 10: Longitude, Latitude and Time Zones of Major Cities

City and State	Time Zone	Latitude	Longitude	City and State	Time Zone	Latitude	Longitude
Anchorage, AK	-10 G.M.T.	61° 10´ N	149° 11´ W	Fargo, ND	-6 G.M.T.	46° 52´ N	96° 49´ W
Montgomery, AL	-6 G.M.T.	32° 21´ N	86° 17´ W	Albuquerque, NM	-7 G.M.T.	35° 07´ N	106° 37´ W
Little Rock, AR	-6 G.M.T.	34° 43´ N	92° 21´ W	Las Vegas, NV	-7 G.M.T.	36° 12´ N	115° 13´ W
Phoenix, AZ	-7 G.M.T.	33° 32´N	112° 04´ W	Buffalo, NY	-5 G.M.T.	42° 53´ N	78° 51´ W
Tucson, AZ	-7 G.M.T.	32° 11´ N	110° 53´ W	New York, NY	-5 G.M.T.	40° 46´ N	73° 58´ W
Los Angeles, CA	-8 G.M.T.	34° 05´ N	118° 24´ W	Syracuse, NY	-5 G.M.T.	43° 02´ N	76° 08´ W
San Diego, CA	-8 G.M.T.	32° 48´ N	117° 08´ W	Cincinnati, OH	-5 G.M.T.	39° 08´ N	84° 31´ W
San Francisco, CA	-8 G.M.T.	37° 47´ N	122° 33´ W	Cleveland, OH	-5 G.M.T.	41° 8´ N	81° 40´ W
Denver, CO	-7 G.M.T.	39° 46´ N	104° 52´ W	Oklahoma City, OK	-6 G.M.T.	35° 28´ N	97° 30´ W
Hartford, CT	-5 G.M.T.	41° 45´ N	72° 41´ W	Portland, OR	-8 G.M.T.	45° 32´ N	122° 39´ W
Washington D.C.	-5 G.M.T.	38° 54´ N	77° 00´ W	Pittsburg, PA	-5 G.M.T.	40° 26´ N	79° 58´ W
Miami, FL	-5 G.M.T.	25° 49´ N	80° 13´ W	Philadelphia, PA	-5 G.M.T.	40° 00´ N	75° 08´ W
Tampa, FL	-5 G.M.T.	27° 57´ N	82° 28´ W	Providence, RI	-5 G.M.T.	41° 49´ N	71° 25´ W
Atlanta, GA	-5 G.M.T.	33° 45´ N	84° 25´ W	Charleston, SC	-5 G.M.T.	32° 47´ N	79° 59´ W
Savannah, GA	-5 G.M.T.	32° 01´ N	81° 07´ W	Sioux Falls, SD	-6 G.M.T.	43° 32´ N	96° 43´ W
Honolulu, HI	-10 G.M.T.	21° 79´ N	157° 48´ W	Memphis, TN	-6 G.M.T.	35° 06´ N	90° 00´ W
Des Moines, IA	-6 G.M.T.	41° 34´ N	93° 37´ W	San Antonio, TX	-6 G.M.T.	29° 27´ N	98° 30´ W
Boise, ID	-7 G.M.T.	43° 36´ N	116° 13´ W	Dallas, TX	-6 G.M.T.	32° 47´ N	96° 45´W
Chicago, IL	-6 G.M.T.	41° 50´ N	87° 41´ W	Fort Worth, TX	-6 G.M.T.	29° 46´ N	95° 23´ W
New Orleans, LA	-6 G.M.T.	30° 03´ N	89° 55´ W	Salt Lake City, UT	-7 G.M.T.	40° 46´ N	111° 55´W
Boston, MA	-5 G.M.T.	42° 20´ N	71° 01´ W	Richmond, VA	-5 G.M.T.	37° 31´ N	77° 28´ W
Baltimore, MD	-5 G.M.T.	39° 18´ N	76° 36´ W	Burlington, VT	-5 G.M.T.	44° 29´ N	73° 13´ W
Bangor, ME	-5 G.M.T.	45° 32´ N	95° 10´ W	Seattle, WA	-8 G.M.T.	47° 37´ N	122° 21´ W
Detroit, MI	-5 G.M.T.	42° 22´ N	83° 06´ W	Madison, WI	-6 G.M.T.	43° 04´ N	89° 23´ W
Minneapolis, MN	-6 G.M.T.	44° 57´ N	93° 16´ W	Milwaukee, WI	-6 G.M.T.	43° 03´ N	87° 58´ W
Kansas City, MO	-6 G.M.T.	39° 07´ N	94° 33´ W	Cheyenne WY	-6 G.M.T.	41° 08´ N	104° 47´ W
Billings, MT	-7 G.M.T.	45° 47´ N	108° 32´ W	Vancouver, B.C.	-8 G.M.T.	49° 15´ N	123° 07´ W
Lincoln, NB	-6 G.M.T.	40° 48´ N	96° 41´ W	Toronto, Ont.	-5 G.M.T.	43° 39´ N	79° 23´ W
Charlotte, NC	-5 G.M.T.	35° 11´ N	80° 50´ W	Montreal, Que.	-5 G.M.T.	45° 30´ N	73° 36´ W



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