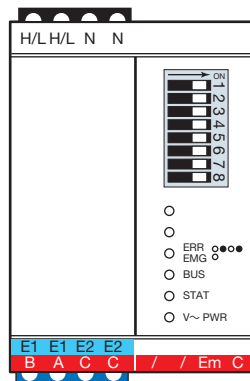


EcoSystem Bus Supply

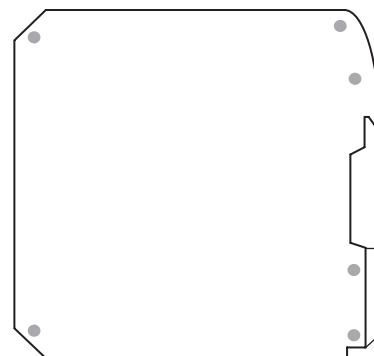
An EcoSystem lighting network containing more than one ballast, module, or driver requires an EcoSystem Bus Supply. This supply powers one or two independent EcoSystem buses with up to 64 ballasts or ballast modules per bus.

Features

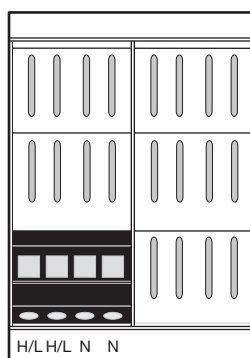
- Provides power for either one or two EcoSystem buses, depending on model.
- Reprograms settings of replacement ballasts automatically.
- Maintains redundant memory of ballast and module programming for building sustainability.
- Accepts up to two normally open or normally closed dry contact closures per bus to allow integration with occupancy sensors, demand response inputs, or AV equipment.
- Accepts one normally closed emergency input per supply to allow integration with building management and/or security systems.
- EcoSystem Bus may be wired NEC® Class 1, IEC PELV or NEC® Class 2.
- Bus wires are polarity insensitive and topology free
- Voltage input: 100–277 V~ 50/60 Hz.
- Non-volatile (EEPROM) memory stores specific system information for 10 years from power-down to power restoration.
- 100% performance tested at factory.
- Allows programming via the EcoSystem Programmer. Programming can be locked out via DIP switch.



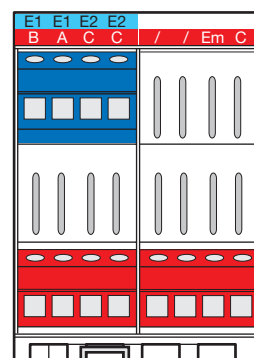
Front View
(CS-1L shown)



Side View



Top View
(CS-1L shown)



Bottom View
(CS-1L shown)

Building a Model Number

CS – XL – XM

Power Provided

Code	Number of Buses Powered
1	1 EcoSystem Bus
2	2 Independent EcoSystem Buses

Enclosure

Code	Enclosure
C	Not shipped with an enclosure
W	Unit premounted in UL-listed 8 × 8 × 4 in (203 × 203 × 102 mm) enclosure

Model Number	Links	Enclosure
CS-1L-CM	1	No
CS-1L-WM	1	Yes
CS-2L-CM	2	No
CS-2L-WM	2	Yes

Job Name:	Model Numbers:
Job Number:	

Specifications

Regulatory Approvals

- UL, CUL, and NOM listed
- Meets ANSI C62.41 Category A surge protection standards up to and including 4 kV.
- Lutron Quality Systems registered to ISO 9001.2000
- For commercial use, Class A only

Power

- Input Voltage: 100–277 V~ 50/60 Hz
- Output Voltage: 18 V== 250 mA maximum
NEC® Class 1, IEC PELV or NEC® Class 2 per bus
- Device draws less than 0.18 A.

Wiring

- Power Wiring: 12–18 AWG (1.0–4.0 mm²)
- EcoSystem Bus, Class 2 contact closures:
12–22 AWG (0.5–2.5 mm²)

Mounting Considerations

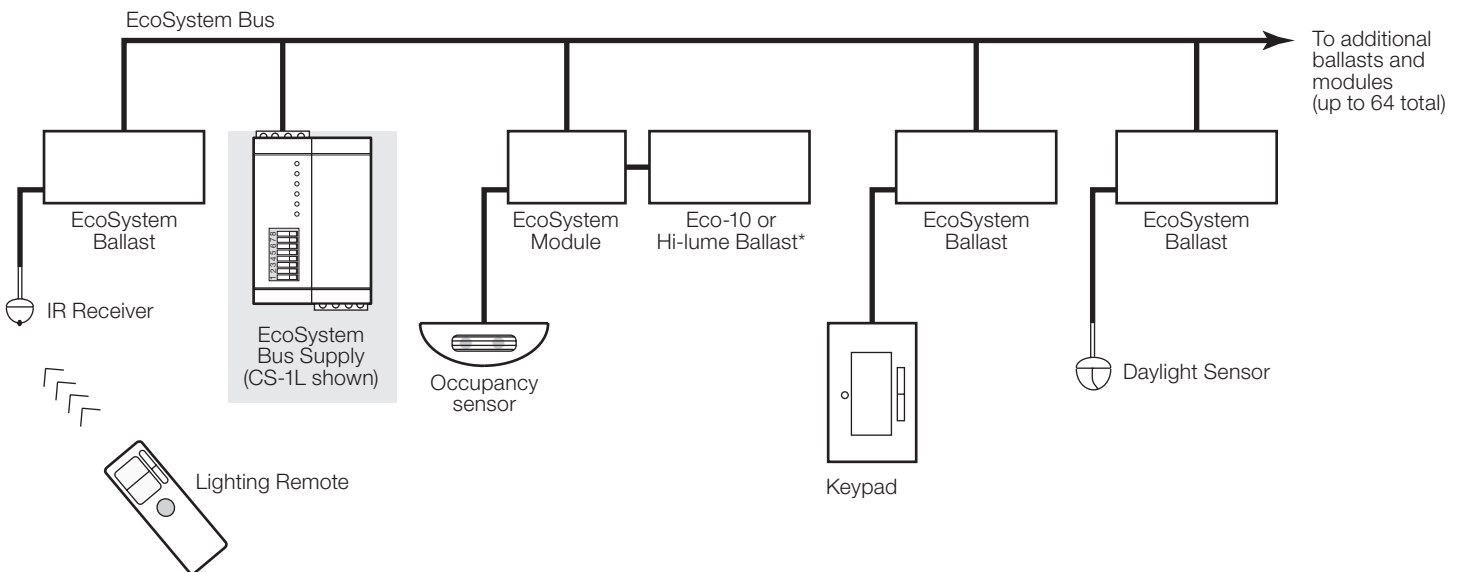
- Requires UL508 listed enclosure per NEC (customer-supplied if CM model).
- Enclosure provided if WM model is ordered.
- Mounts to standard DIN rail (included).

Environment

- Ambient Temperature Operating Range: 32–104 °F (0–40 °C)
- Relative humidity: less than 90% non-condensing

EcoSystem Lighting Network Example

- EcoSystem Bus may be wired in accordance with NEC® Class 1, IEC PELV or NEC® Class 2 practices.
- Sensors and EcoSystem Bus Supply contact closures must be wired IEC PELV or NEC® Class 2.



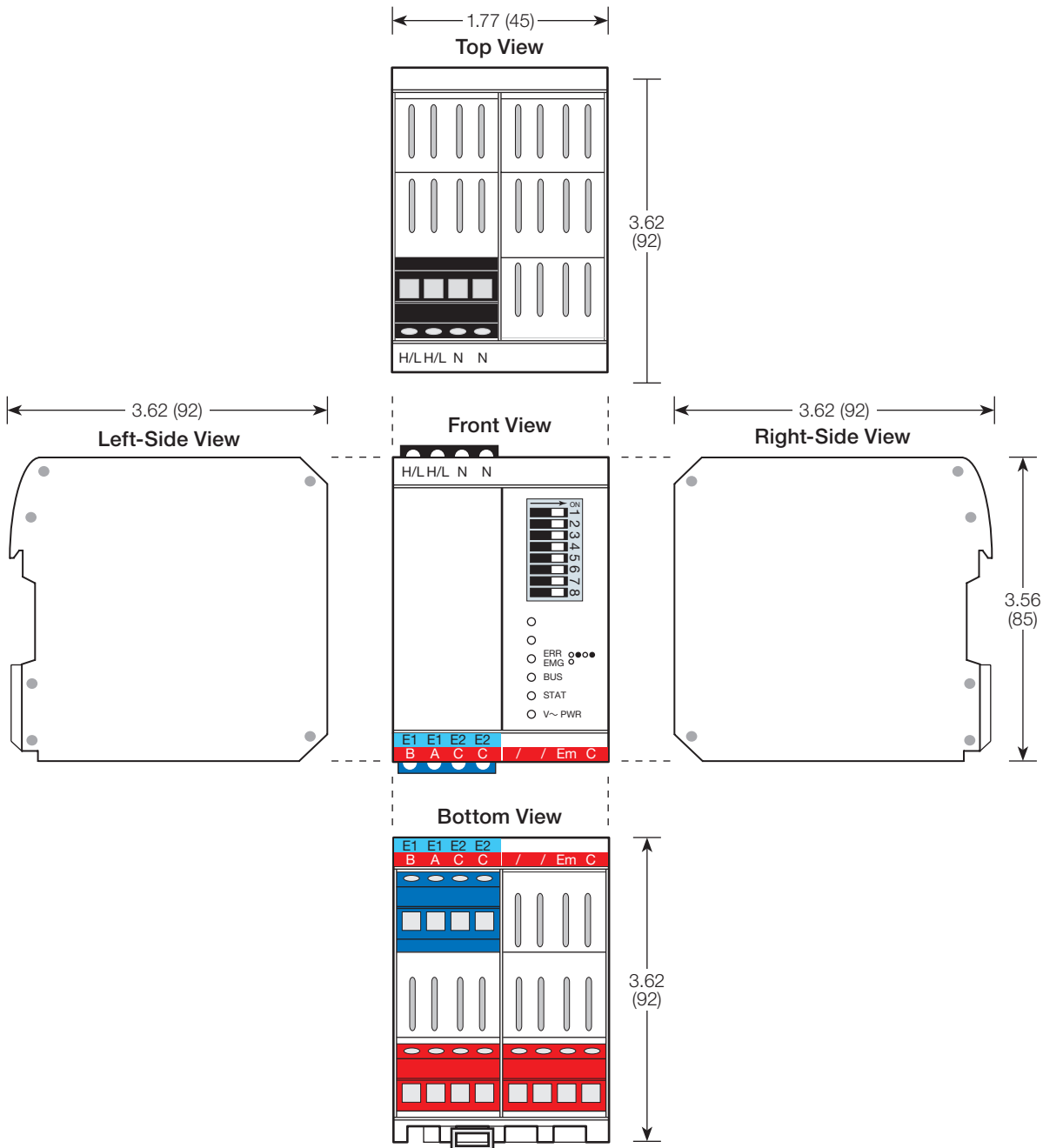
Job Name:

Model Numbers:

Job Number:

Dimensions

Measurements are shown as: in (mm)



Job Name:	Model Numbers:
Job Number:	

Mounting

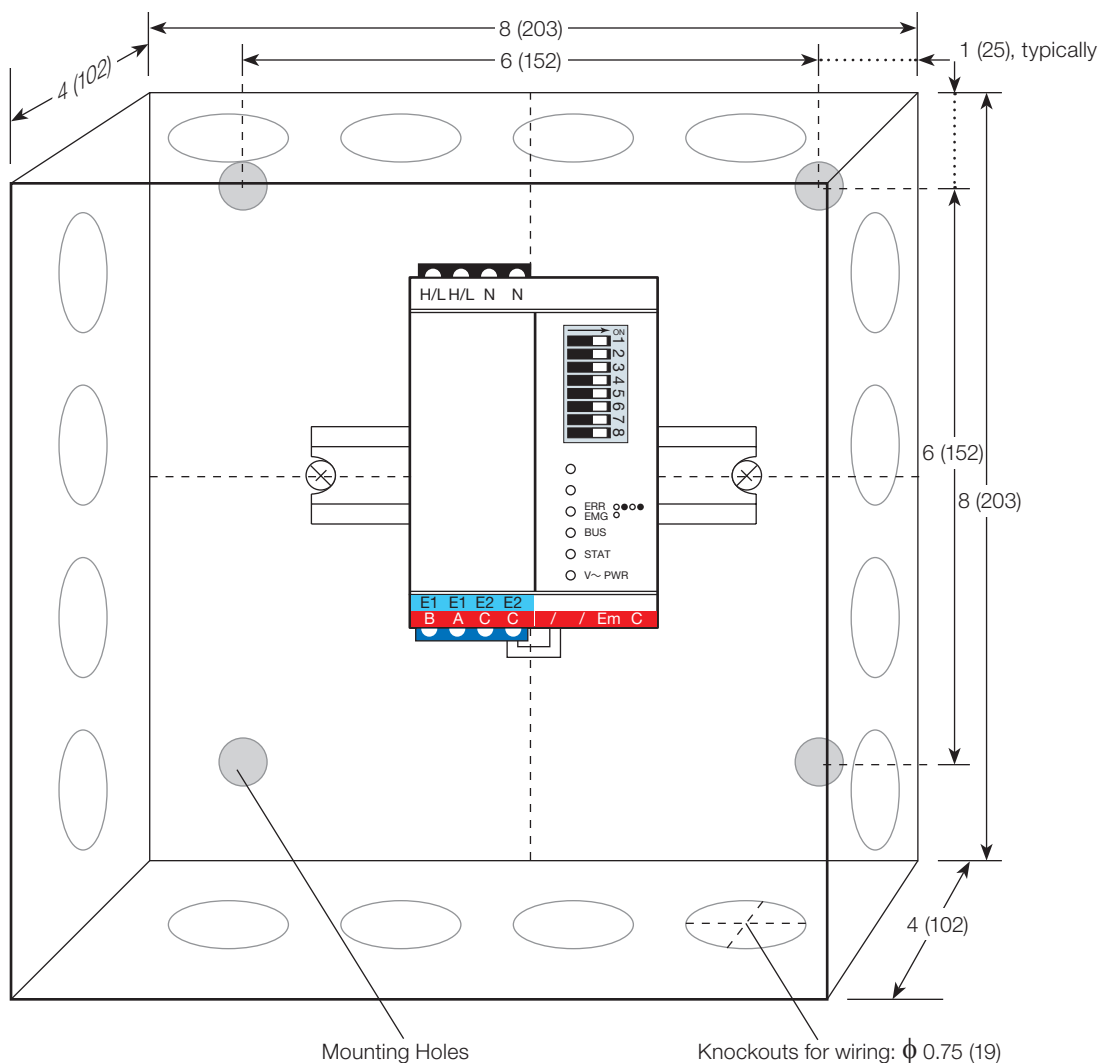
CM Models

- Select a UL508 listed electrical enclosure with minimum dimensions (w x h x d): 8 x 8 x 4 in (203 x 203 x 102 mm).
- Mount enclosure as per applicable instructions.
- Mount DIN rail horizontally in the center of the enclosure.
- Clip the EcoSystem Bus Supply onto DIN rail (see diagram below).

WM Models

- Mount enclosure using the four mounting holes within the enclosure (shown below).

CS-1/2L- (CS-1L shown)
Measurements are shown as: in (mm)

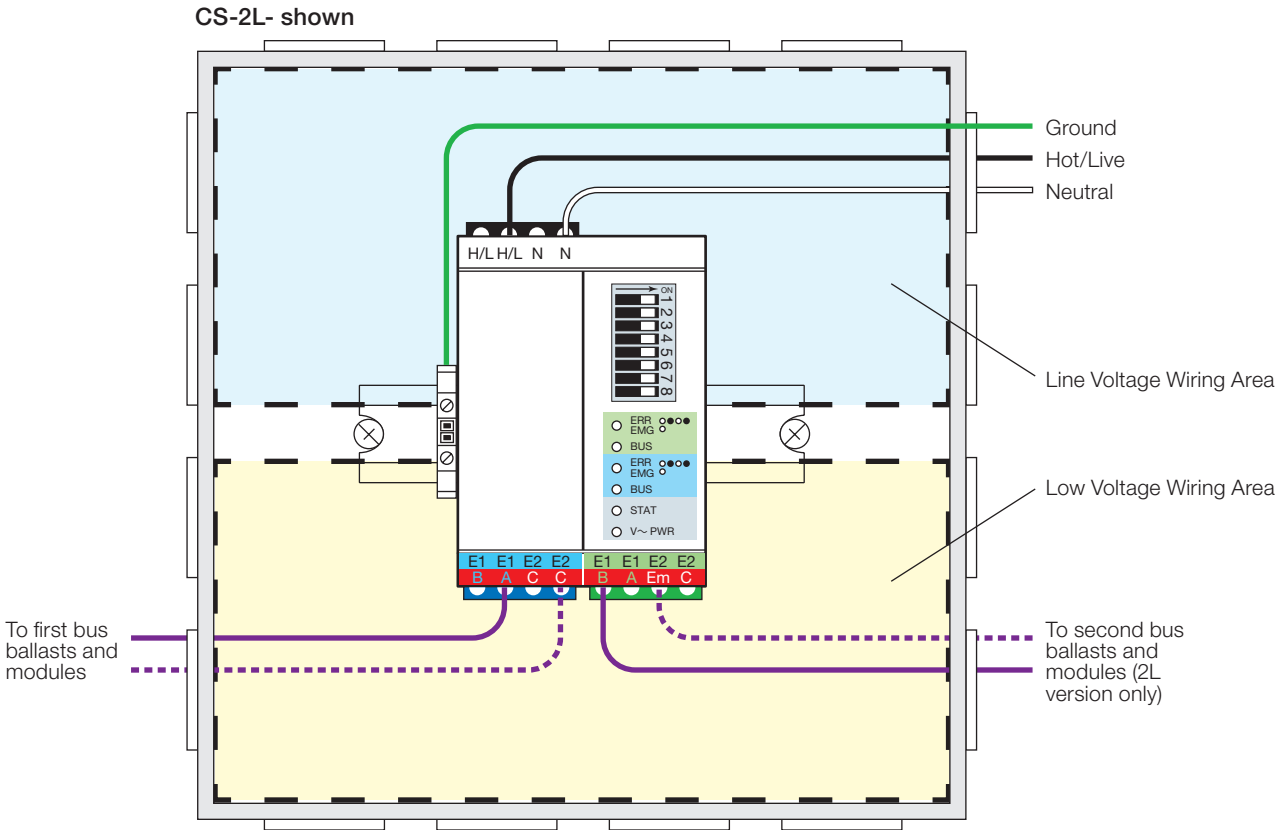


Job Name:	Model Numbers:
Job Number:	

Wiring: Overview

Mains Wiring and Low-Voltage Separation

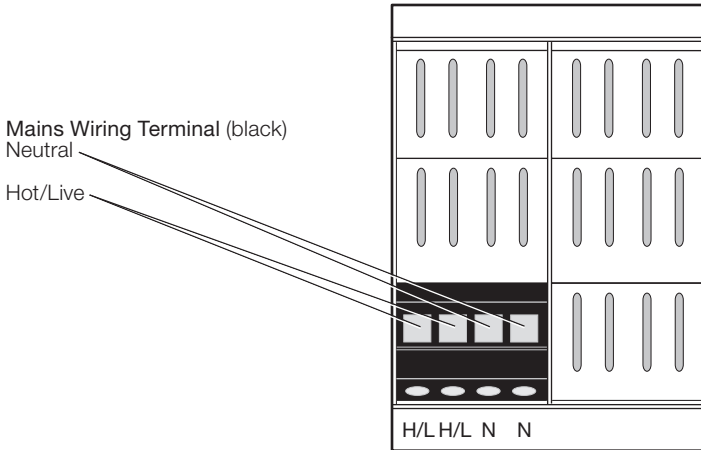
- The EcoSystem® Bus Supply is designed to separate mains wiring (NEC® Class 1) and low-voltage IEC PELV or NEC® Class 2 circuits
- Follow appropriate local and national codes to avoid violating required separation guidelines



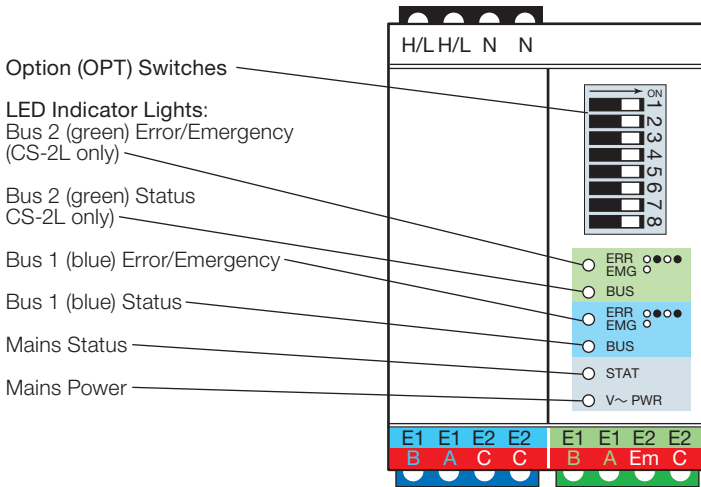
Job Name:	Model Numbers:
Job Number:	

Wiring: Overview (continued)

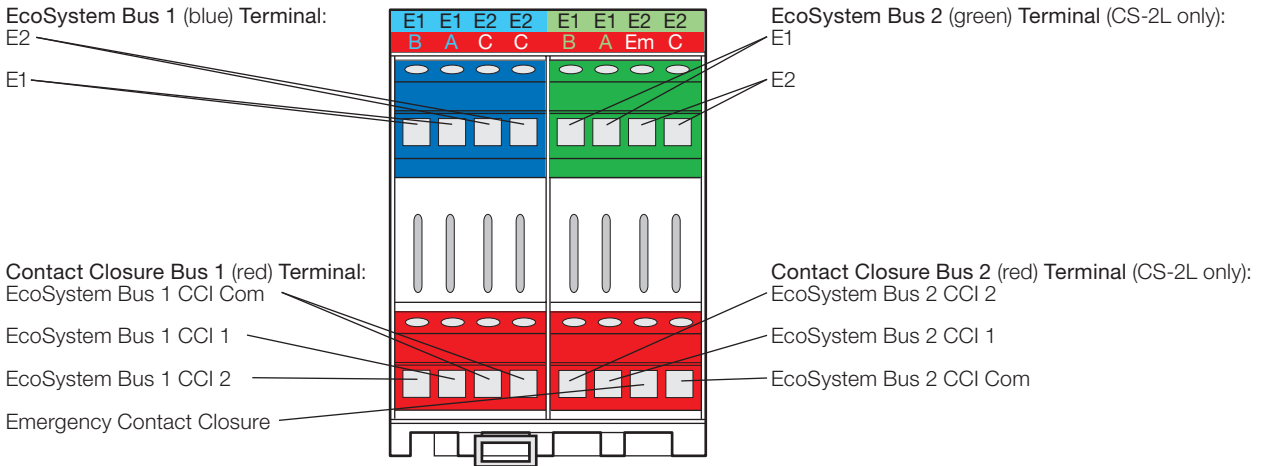
Top View (CS-2L- shown)



Front View (CS-2L- shown)



Bottom View (CS-2L- shown)



Job Name:	Model Numbers:
Job Number:	

Wiring: Line Voltage (Mains)

Wiring from Distribution to Bus Supply

- Select source of feed for the EcoSystem Bus Supply (100–277 V~).
- Turn off breaker at distribution panel.
- Run hot, neutral, and ground wires from distribution panel to the EcoSystem Bus Supply.
- The EcoSystem Bus Supply is grounded via ground clips on bottom of module through the DIN rail. Ensure that the enclosure and DIN rail are properly grounded per national and local electrical codes.

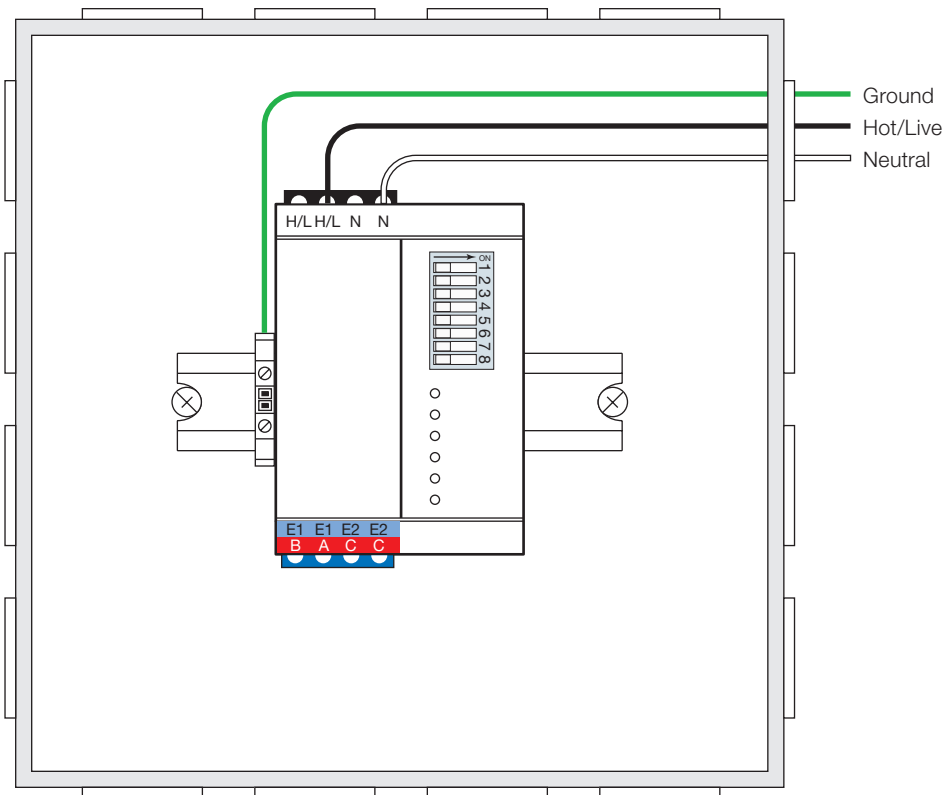
Note: Ballasts, modules, and drivers are in emergency (bypass) mode (lights at full output) until power is applied to the EcoSystem Bus Supply.

Emergency Feeds and the Bus Supply

- Use normal (non-essential) power only.
- When normal power drops out, the EcoSystem Bus Supply cannot power the EcoSystem Bus. When this occurs, ballasts, modules, and drivers go to emergency (bypass) mode (full light output by default).

See Application Note #140 for additional information related to emergency feed wiring.

CS-1L- shown



Job Name:	Model Numbers:
Job Number:	

Wiring: EcoSystem Bus

The EcoSystem Bus connects all ballasts together and requires a Bus Supply. 1L models power one EcoSystem Bus; 2L models power two independent EcoSystem buses. Each EcoSystem Bus can support a maximum of 64 ballasts, modules, or drivers.

Class 1 and Class 2 Wiring

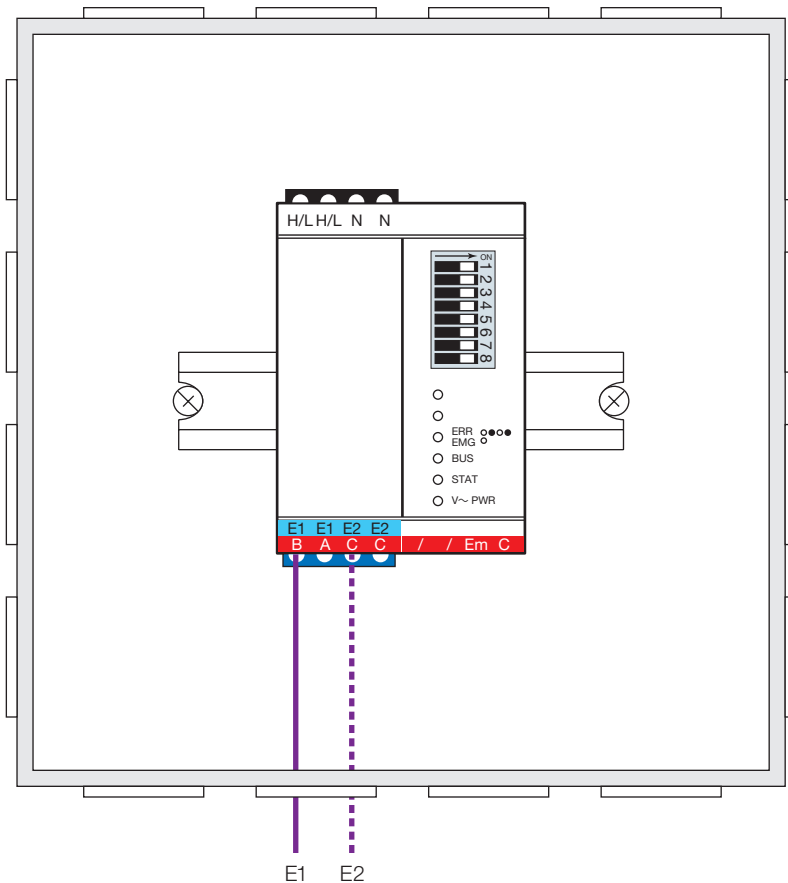
- The EcoSystem Bus may be NEC® Class 1, IEC PELV or NEC® Class 2
 - NEC® Class 1: Low-voltage bus wiring may be run with mains voltage to any fixture the bus is controlling
 - IEC PELV or NEC® Class 2: Low-voltage bus wiring must be separated from all mains and Class 1 wiring
- Using two different colors for E1 and E2 wire helps prevent miswires when multiple buses are present in the same conduit
- Consult all national and local electrical codes for separation requirements

Wiring Details

- E1 and E2 wires are not polarity sensitive
- Bus length is limited by the wire gauge used for E1 and E2 as follows:

Wire Gauge	Bus Length (max)
12 AWG (4.0 mm ²)	2200 ft (671 m)
14 AWG (2.5 mm ²)	1400 ft (427 m)
16 AWG (1.5 mm ²)	900 ft (275 m)
18 AWG (1.0 mm ²)	570 ft (175 m)

CS-1L- shown



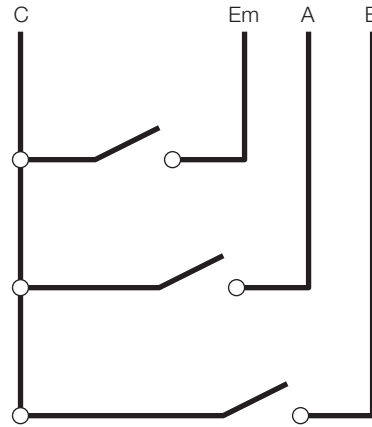
Job Name:	Model Numbers:
Job Number:	

Wiring: Contact Closures

Contact closure inputs are IEC PELV or NEC® Class 2 circuits and cannot be run with mains wiring. Unless otherwise specified, the voltages should not exceed 12–35 V_{DC}. These circuits comply with the requirements of NFPA 70, National Electric Code (NEC®). Follow all applicable national and/or local wiring regulations.

Contact Closure Bus Terminals

Terminal	Unit Label	Function
C	COM	Common
Em	CCI-EMERG	Emergency
A	CCI-1	Contact Closure 1
B	CCI-2	Contact Closure 2

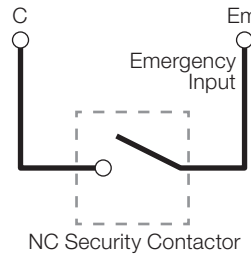


Emergency

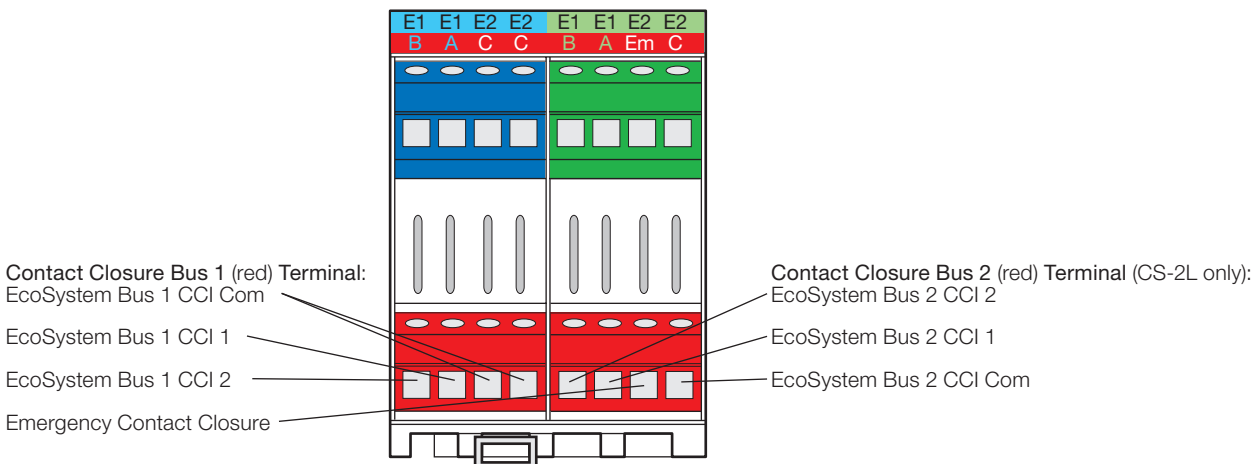
For integration with a security or fire alarm system, the emergency input may be used. The alarm system must have a normally closed relay for proper operation. Wiring is shown to the right.

Common is Terminal C and Emergency is Terminal Em on the EcoSystem Bus Supply. On a 2-link supply, there is only one Emergency Input, which affects both links.

Emergency mode must be activated using OPT switch 5. By default emergency inputs are ignored (DIP switch 5 set to “ON”). When switch 5 is “OFF” an open condition between terminals 5 and 6 results in emergency mode activation.



Bottom View (CS-2L- shown)



Job Name:	Model Numbers:
Job Number:	

Operation: Contact Closures

Contact Closure Inputs

Contact Closure Inputs (CCI) on the Bus Supply may be used to integrate a BMS system or occupancy sensors with an EcoSystem Lighting Network. On a 2-link supply, there is one pair of CCIs for each EcoSystem Bus.

There are three modes of CCI operation:

- Occupancy mode
- Demand Response mode
- Scene Selection mode

These modes can be selected and configured using the EcoSystem Programmer.

Occupancy Mode

CCIs command assigned groups on the corresponding bus to an “Occupied” light level or an “Unoccupied” light level when the contact closures are opened or closed.

- When the CCI is in the “occupied” state, the system will command ballasts assigned to that CCI to go to their “occupied” level.
- When the CCI is in the “unoccupied” mode, the system will command ballasts assigned to that CCI to go to their “unoccupied” level.

Note that if ballasts are grouped to both a CCI in Occupancy mode and an occupancy sensor, the occupancy sensor will not sweep the group to its unoccupied level unless the CCI is also unoccupied.

Demand Response Mode

In demand response mode, each CCI, when closed, applies a configurable “demand response” level to the group. When the CCI is opened, the demand response level is cleared.

Ballasts will scale their current light level by the demand response level (e.g., if the demand response level is set to 25%, all ballasts will dim to a light level that is 75% of their previous level and will not dim above 75% until the CCI is opened).

CCI-2 takes priority over CCI-1, so if the same group of ballasts are assigned to both CCIs, when both CCIs are closed, the ballasts will scale to the level set for CCI-2.

Scene Select Mode

When the CCIs are closed and maintained according to the table below, the corresponding scene is selected on all ballasts on the link. Momentary contact inputs may be used if Scene 1 is set to “Unaffected”.

CCI 1	CCI 2	Scene
Open	Open	1
Closed	Open	2
Open	Closed	3
Closed	Closed	4

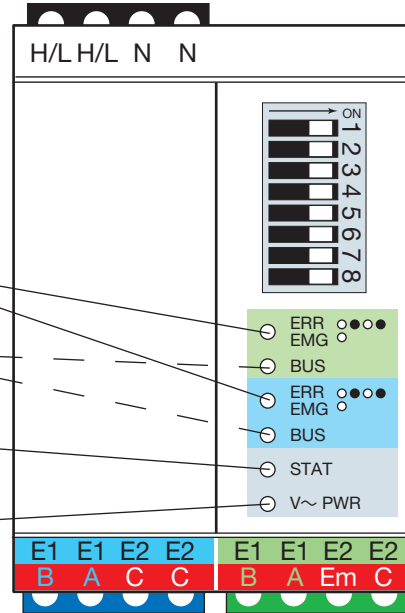
See Application Note #236 for further information on EcoSystem Bus Supply contact closure input modes.

Job Name:	Model Numbers:
Job Number:	

Operation: Status LEDs

LEDs on the EcoSystem Bus Supply indicate network status. The specific LEDs, color and flashing method is detailed below.

LED	Normal Operation	Problem Indicator	Probable Cause
ERR/EMG	Off	On	Emergency contact closure is active
		Steady flash	Miswire detected on corresponding bus
BUS	Intermittent flash or Off	On	Unit fault
STAT	Steady flash	Off	No Mains power or unit fault
		On	Unit fault
V~ PWR	On	Off	No Mains power



Job Name:	Model Numbers:
Job Number:	

Operation: OPT Switches

OPT switches are used to configure the Bus Supply. The table below describes the options. To place an OPT switch in the OFF position, slide the switch to the left. Default switch position is ON.

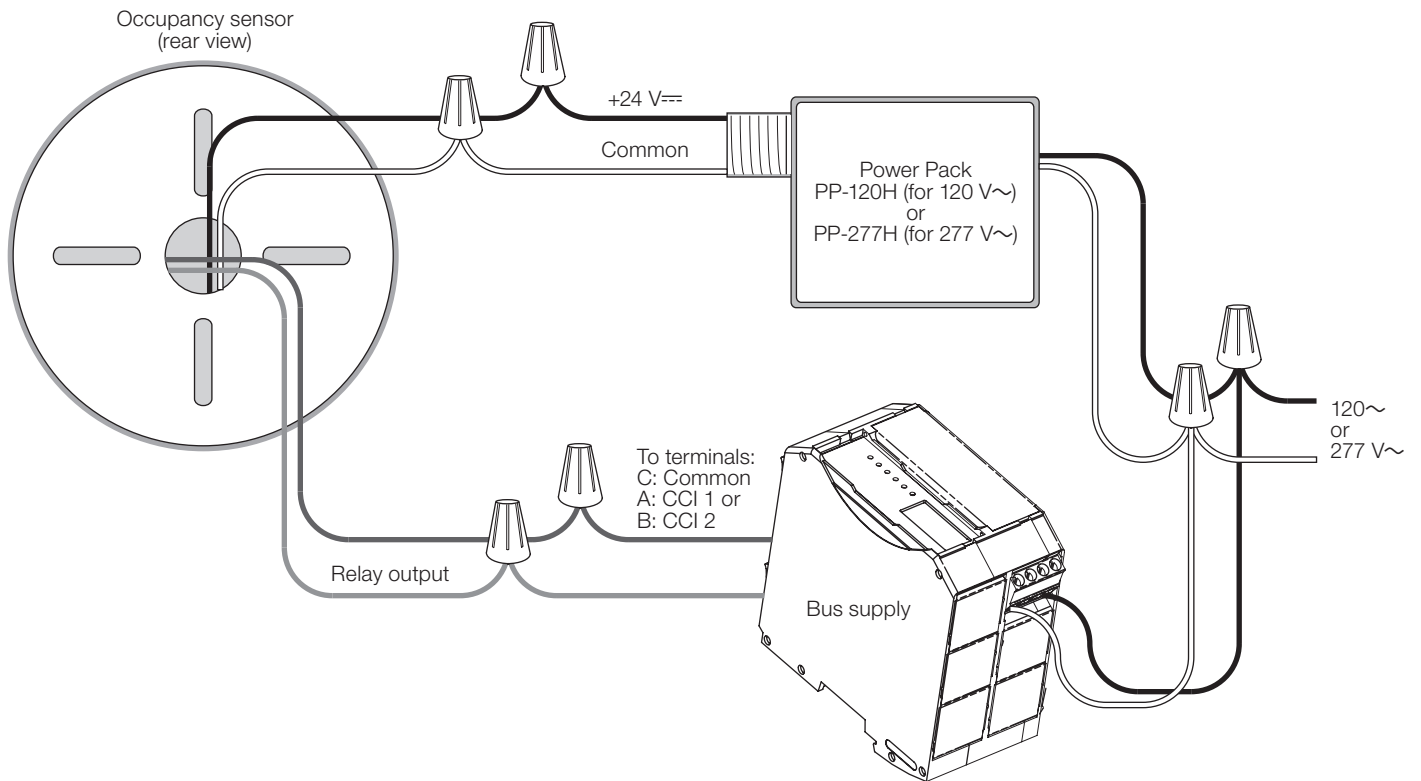
OPT	Description	Switch Position	Function
1	First bus (green) CCI-1 input type	ON	Normally open ¹ (default)
		OFF	Normally closed ²
2	First bus (green) CCI-2 input type	ON	Normally open ¹ (default)
		OFF	Normally closed ²
3 ³	Second bus (blue) CCI-1 input type	ON	Normally open ¹ (default)
		OFF	Normally closed ²
4 ³	Second bus (blue) CCI-2 input type	ON	Normally open ¹ (default)
		OFF	Normally closed ²
5	Emergency disable	ON	Emergency contact closure input disabled (default)
		OFF	Emergency contact closure input enabled
6	Programming	ON	Programming enabled via EcoSystem programmer (default)
		OFF	Programming disabled via EcoSystem programmer
7, 8	Normal/Override	7 ON, 8 ON	Normal operation (default)
		7 ON, 8 OFF	Override: High end
		7 OFF, 8 ON	Override: Low end
		7 OFF, 8 OFF	Override: Off

Job Name:	Model Numbers:
Job Number:	

Operation: Combining Occupancy Sensors with CCIs

Occupancy sensors with relay outputs can be wired to the contact closure inputs on the bus supply. Follow the diagram below.

Occupancy sensor relay outputs can be normally open or normally closed. Set the OPT switch for the CCI to match the type of sensor output being used.



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Job Name:	Model Numbers:
Job Number:	