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Project Name: Webster University - Interdisciplinary Science Building Lighting Controls

Project Number: WU-02-16

Drawing Designation: [REDACTED]

Drawing Date: [REDACTED]

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27	IR-Tec	BPD-500-SR-L	IR-TEC Light Level Sensor, 10VDC Linear Photodiode, Indoor, 0-50FC, Recessed Ceiling Mount

OVERVIEW

The **CM** family of ceiling mount occupancy sensors provide a range sensor solutions for applications with finished ceilings (e.g. ceiling tiles, sheetrock, plaster). **CM** family sensors utilize 100% digital Passive Infrared (PIR) detection and are available with several lens options, providing flexibility for multiple mounting height and coverage pattern requirements. Dual technology (**PDT**) occupancy detection can also be added as an option for applications where occupants are stationary for long periods of time.

FEATURES

- 360° coverage pattern
- Push- button programmable, adjustable time delays, and multiple operating modes
- 100 hr lamp burn-in timer
- No field calibration or sensitivity adjustments required
- Convenient test mode
- Green LED indicator

SPECIFICATIONS

Size:	4.55" diameter and 1.55" deep
Weight:	6 oz
Mounting:	3.5" octagon box, ceiling tile surface, single gang box
Color:	White
Operating Voltage:	12-24 VAC/VDC
Current Draw:	Standard 4 mA, w/ R option 16 mA
Dimming Load:	Sinks <20 mA; ~40 Ballasts @ .5 mA each
Rcmd. Power Pack:	PP20
ROHS compliant	

AcuityControls

Sensor Switch™

CM
CM PDT



Warranty

Five-year limited warranty. Complete warranty terms located at:

www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application.

Specifications subject to change without notice.



ORDERING INFORMATION

CM Family					Example: CM PDT 11 R LT
Series	Detection Technology	Coverage Type	Relay	Additional Features (choose 1)	Temp / Humidity
CM Ceiling Mount Sensor	[blank] PIR PDT* Dual Technology (PIR/ Microphonics)	6 High Bay 360° 9 Small Motion 360° 10 Large Motion 360° 11 Hallway	[blank] None R Low Voltage Relay	[blank] None D Occupancy Controlled Dimming P Photocell ADC** Photocell w/ Dimming	[blank] Standard LT Low Temp/ High humidity

* **PDT** option not available on **CM 6** models

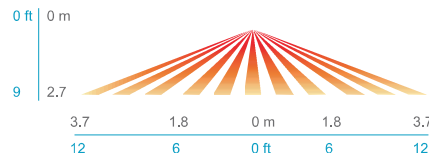
** **ADC** option not available on **CM6** models

COVERAGE PATTERNS

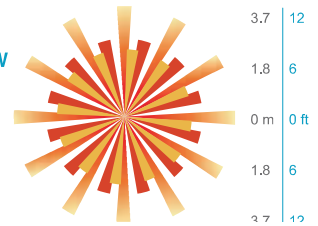
SMALL MOTION 360 (Model # CM 9/ CM PDT9¹)

- Best choice for small motion (e.g. hand movements) detection
- 360° conical shaped pattern
- Provides 12 ft (3.66 m) radial coverage (~500 ft²) when mounted to standard 9 ft (2.74 m) ceiling
- 8 to 15 ft (2.44 to 4.57 m) mounting heights provide 10 to 20 ft (3.05 to 6.10 m) radial coverage
- Lens assembly is marked with a gray ring around lens to differentiate versus the #10 lens

SIDE VIEW



TOP VIEW

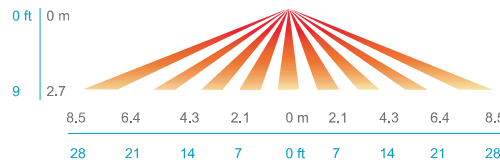


¹ Sensors with Microphonics™ provides overlapping detection of human activity over the complete PIR coverage area. Advanced filtering is also utilized to prevent non-occupant noises from keeping the lights on.

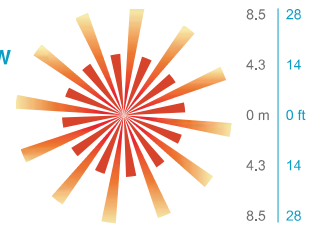
LARGE MOTION 360 (Model # CM 10/ CM PDT10¹)

- Best choice for large motion detection (e.g. walking)
- 360° conical shaped pattern
- Provides ~24 ft (7.32 m) radial coverage (~2000 ft²) when mounted at 9 ft (2.74 m)
- 7 to 15 ft (2.13 to 4.57 m) mounting heights provide 16 to 36 ft (4.88 to 10.97 m) radial coverage
- Detection range improves when walking across beams compared to into beams

SIDE VIEW



TOP VIEW

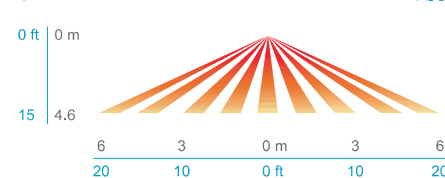


¹ Sensors with Microphonics™ provides overlapping detection of human activity over the complete PIR coverage area. Advanced filtering is also utilized to prevent non-occupant noises from keeping the lights on.

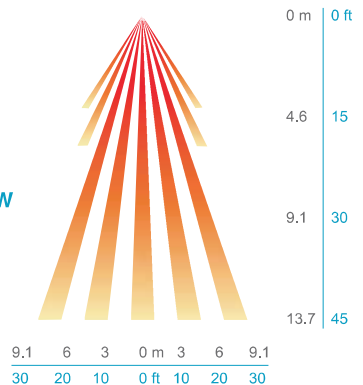
HIGH MOUNT 360 (Model # CM 6)

- Best choice for 15 to 45 ft (4.57 to 13.72 m) mounting heights
- 15 to 20 ft (4.57 to 6.10 m) radial coverage overlaps area lit by a typical high bay fixture
- Excellent detection of large motion (e.g. walking) up to 35 ft (10.76 m)
- Excellent detection of extra large motion (e.g. forklifts) up to a 45 ft (13.72 m)

LOW VIEW



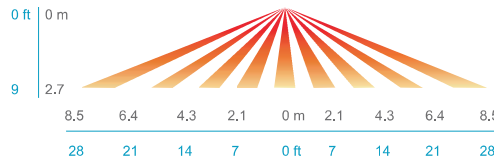
HIGH VIEW



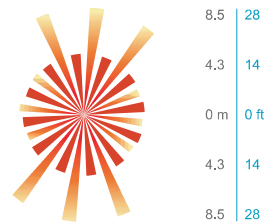
HIGH MOUNT HALLWAY (Model # CM 11/CM PDT 11¹)

- Best choice for large motion detection
- Provides 28 ft (8.53 m) of coverage when mounted to standard 9 ft (2.74 m) ceiling
- 7 to 15 ft (2.13 to 4.57 m) mounting heights provide 16 to 36 ft (4.88 to 10.97 m) hallway coverage

SIDEVIEW



TOPVIEW



¹ Sensors with Microphonics™ provides overlapping detection of human activity over the complete PIR coverage area. Advanced filtering is also utilized to prevent non-occupant noises from keeping the lights on.

WIRING (DO NOT WIRE HOT)

STANDARD WIRING

RED - Power Input (12-24 VAC/VDC)

BLACK - Common

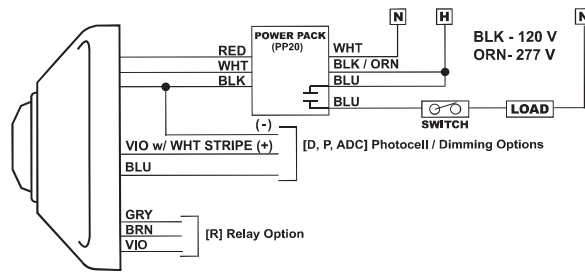
WHITE - Occupancy State (high VDC for occupied)

PHOTOCELL/DIMMING OPTIONS (D, P, ADC)

BLUE - Direct output to power pack for providing photocell control and/or secondary dim time out. Output is high VDC with occupancy & low light. Output also held high during secondary dim time out. For multi-level control, use two power packs and connect White wire to primary load and Blue to daylight load.

VIOLET w/ WHITE STRIPE - Connect to 0-10 VDC control wire (typically Violet) from 0-10 VDC dimmable ballast

GRAY from Ballast - Connect to sensor Black wire



RELAY OPTION (R)

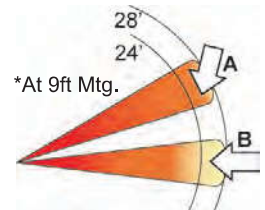
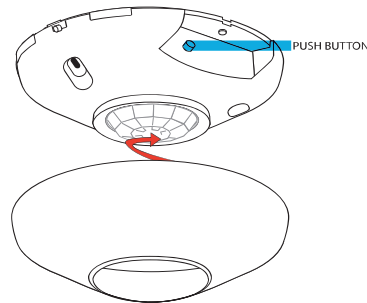
GRAY / BROWN - Connected during occupied state

VIOLET / BROWN - Connected during unoccupied state

Note: Relay is energized during unoccupied state

INSTALLATION

- Mount sensor directly to a ceiling tile or a metallic grid (two self-tapping screws provided).
- Sensor's mounting holes also align with 3.5" octagon or single gang handy box (screws not provided).
- Sensor will detect motions crossing segments more effectively than motions parallel to beams.
- For optimal detection, position sensor such that segments are crossed upon entrance and unable to view outside the space.
- **PDT** models: For maximum Microphonics sensitivity avoid locating sensor near HVAC air diffusers



A: When walking across beam, detection will occur at approximately 28 feet. (8.53 m)

B: When walking into beam, detection will occur at approximately 24 feet. (7.32 m)

OVERVIEW

The **WV 16** Series Wide View occupancy sensor is designed to mount in a corner and detect small motions up to 40 ft (12.19 m) away, and larger motions up to 70 ft (21.34 m) away. This makes it ideal for 30 ft x 30 ft (9.14 m x 9.14 m) classrooms or corridors up to 70 ft (21.34 m) long (for specific long narrow hallway applications, see **HW13** product data sheet). The enclosure's convenient tilting feature enables the sensor to be mounted at any height from 8 to 10 ft (2.44 to 3.05 m). When corner or wall mounting is not possible, the **WV BR** bracket accessory can be used to mount the **WV 16** to the ceiling. Additionally, the **WV 16** may be used in combination with other sensors to customize coverage for very large or irregularly shaped spaces. For rooms with obstructions, use the **WV PDT 16** Series sensor which adds Microphonics™ detection.

FEATURES

- 100% Digital PIR Detection, Excellent RF Immunity
- 120 by 40 ft (12.19 m) Coverage for Small Motion
- Adjustable Time Delay
- Push-Button Programmable
- Convenient Test Mode
- No Field Calibration or Sensitivity Adjustments Required
- 100 hr Lamp Burn-in Timer

SPECIFICATIONS

Size:	3.0" H x 3.6" W x 1.75" D (7.62 cm x 9.14 cm x 4.45 cm)
Weight:	5 oz
Mounting:	Directly to corner or to ceiling using WV BR bracket
Color:	White
Operating Voltage:	12-24 VAC/VDC
Current Draw:	Standard, 4 mA w/ R option, 16 mA
Rcmd Power Pack:	PP20
ROHS compliant	

AcuityControls

Sensor Switch™

WV 16
Wide View Sensor



Warranty

Five-year limited warranty. Complete warranty terms located at:

www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application.

Specifications subject to change without notice.



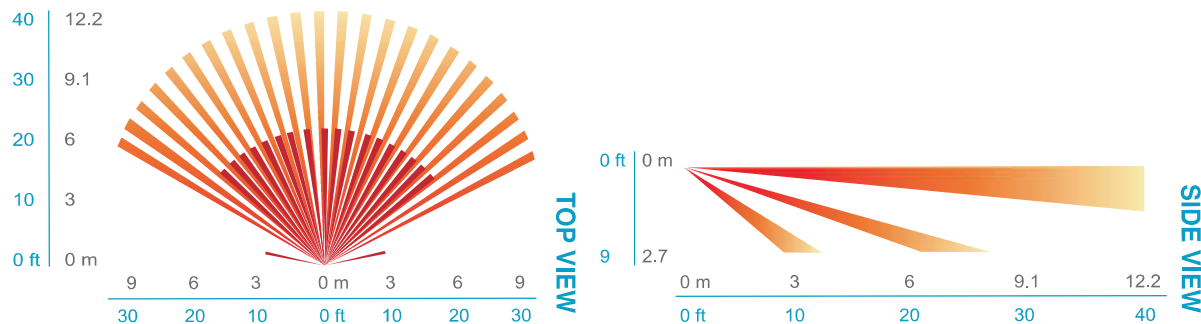
ORDERING INFORMATION

WV 16				Example: WV 16 R LT KIT
Series	Relay	Photocell	Temp / Humidity	Bracket Kit
WV 16 Wide View Sensor	[blank] None R Low Voltage Relay	[blank] None P Photocell	[blank] Standard LT Low Temp	[blank] Sensor Only KIT Sensor & WV BR Bracket

COVERAGE PATTERN

16 WIDE VIEW LENS

- Small motion (e.g. hand movements) detection up to 40 ft (12.19 m).
- Large motion (e.g. walking) detection up to 70 ft (21.34 m).
- Designed for 8 to 10 ft (2.44 to 3.05 m) high mounting in room corner



WIRING (DO NOT WIRE HOT)

STANDARD WIRING

RED - Power Input (12-24 VAC/VDC)

BLACK - Common

WHITE - Occupancy State (high VDC for occupied)

PHOTOCELL/DIMMING OPTIONS (P)

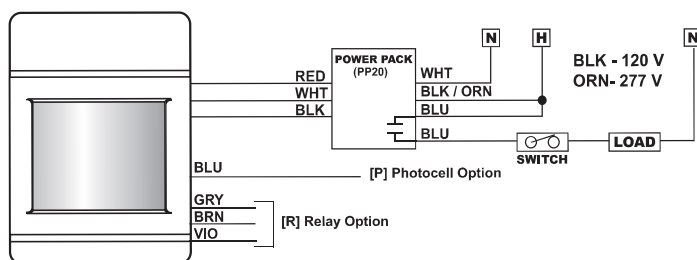
BLUE - Direct output to power pack for providing photocell control. Output is high VDC with occupancy & low light. For multi-level control, use two power packs and connect White wire to primary load and Blue to daylight load.

RELAY OPTION (R)

GRAY / BROWN - Connected during occupied state

VIOLET / BROWN - Connected during unoccupied state

Note: Relay is energized during unoccupied state



OVERVIEW

Classrooms are the ideal application for the **WV PDT 16** Dual Technology Wide View Sensor. Installed in the corner of the room along the entrance wall, this inconspicuous sensor provides line of sight PIR detection of small movements up to 40 ft (12.19 m) away, and combines overlapping Microphonics™ for detection around obstructions. Many classrooms are filled with shelving, projects, or lab benches. Total coverage of the room is always maintained no matter how cluttered the space becomes. The **WV PDT 16** is also used in corridors due to its ability to view up to 70 ft (21.34 m) for walking motions, or large open storage areas where obstructions may block the PIR's ability to view. For large lecture halls, multiple **WV PDT 16**s may be wired together, or along with any other low voltage sensors.

FEATURES

- 100% Digital PIR Detection, Excellent RF Immunity
- 120° by 40 ft (12.19 m) Coverage for Small Motion
- Patented Dual Technology with PIR / Microphonics Detection
- Adjustable Time Delay
- Push-Button Programmable
- Convenient Test Mode
- No Field Calibration or Sensitivity Adjustments Required
- 100 hr Lamp Burn-in Timer

SPECIFICATIONS

Size:	3.0" H x 3.6" W x 1.75" D (7.62 cm x 9.14 cm x 4.45 cm)
Weight:	5 oz
Mounting:	Directly to corner or to ceiling using WV BR bracket
Color:	White
Operating Voltage:	12-24 VAC/VDC
Current Draw:	Standard, 4 mA w/ R option, 16 mA
Rcmd Power Pack:	PP20
ROHS Compliant, Title 24 Component	

AcuityControls

Sensor Switch™

WV PDT 16
Wide View Sensor



Warranty

Five-year limited warranty. Complete warranty terms located at:

www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application.

Specifications subject to change without notice.



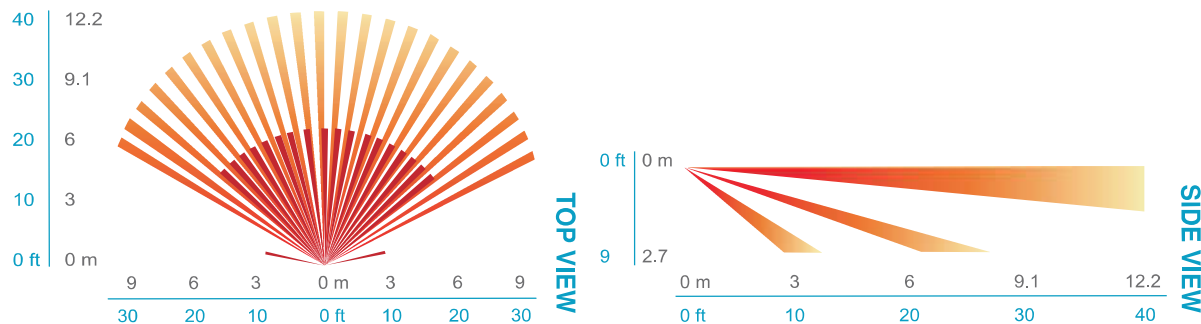
ORDERING INFORMATION

WV PDT 16				Example: WV PDT 16 R LT KIT
Series	Relay	Photocell	Temp / Humidity	Bracket Kit
WV PDT 16 Wide View Sensor	[blank] None R Low Voltage Relay	[blank] None P Photocell	[blank] Standard LT Low Temp	[blank] Sensor Only KIT Sensor & WV BR Bracket

COVERAGE PATTERN

16 WIDE VIEW LENS

- Small motion (e.g. hand movements) detection up to 40 ft (12.19 m).
- Large motion (e.g. walking) detection up to 70 ft (21.34 m).
- Designed for 8 to 10 ft (2.44 to 3.05 m) high mounting in room corner



WIRING (DO NOT WIRE HOT)

STANDARD WIRING

RED - Power Input (12-24 VAC/VDC)

BLACK - Common

WHITE - Occupancy State (high VDC for occupied)

PHOTOCELL/DIMMING OPTIONS (P)

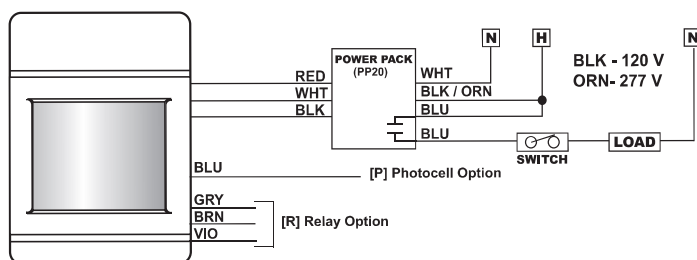
BLUE - Direct output to power pack for providing photocell control. Output is high VDC with occupancy & low light. For multi-level control, use two power packs and connect White wire to primary load and Blue to daylight load.

RELAY OPTION (R)

GRAY / BROWN - Connected during occupied state

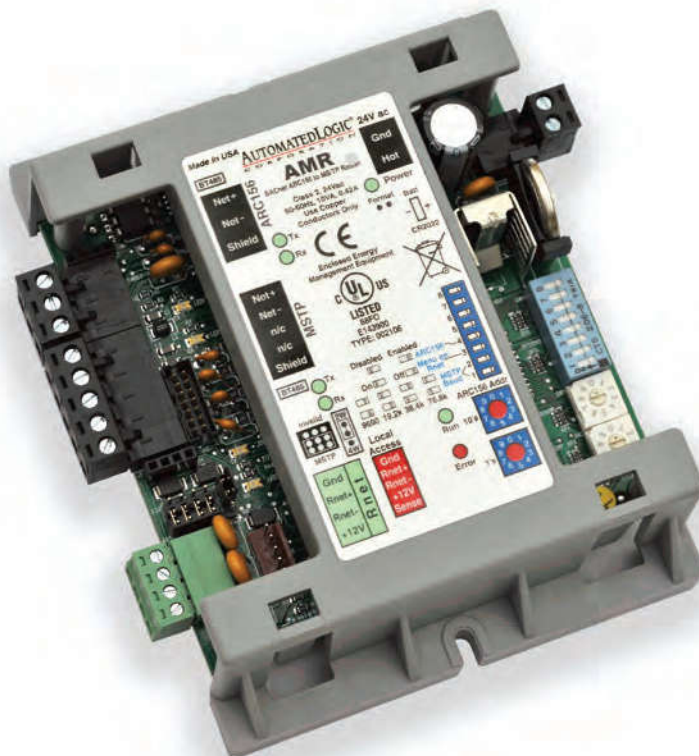
VIOLET / BROWN - Connected during unoccupied state

Note: Relay is energized during unoccupied state



AMR

BACnet MS/TP Connectivity Made Simple!



Automated Logic's AMR makes routing between ARC156 to BACnet MS/TP networks easy! The AMR is compact, rugged and cost effective, enabling faster ARC156 BACnet networks to be routed to slower MS/TP devices or networks.

Key Features and Benefits

- Serves as an economical field router to a single piece of equipment/device using BACnet MS/TP or a network of devices that communicate using BACnet MS/TP. (Note: Recommended maximum is 32 BACnet MS/TP devices.)
- Rotary address switches for setting the AMR's network address.
- Rnet port for local communication and driver download.
- Battery-backed real-time clock + RAM ensures continuous operation during power failures and communications failures.
- Flash memory allows for easy field upgrades over network.
- 16-bit microprocessor combined with ARCNET 156 kbps communications offers ample horsepower and speed for equipment integration requirements.

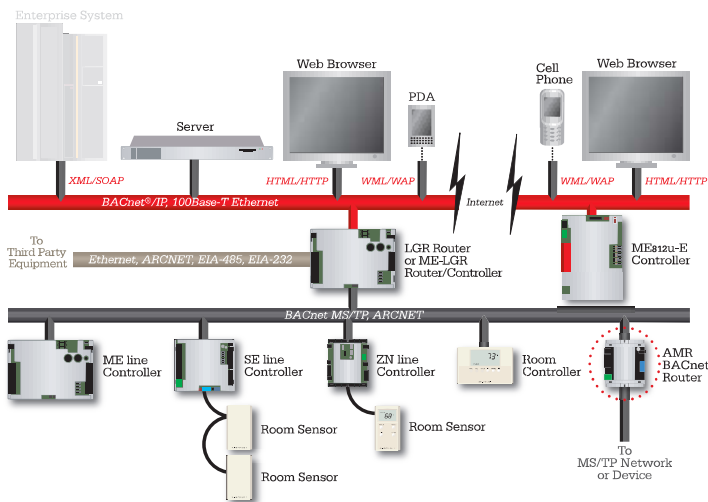
AUTOMATEDLOGIC CORPORATION

1150 Roberts Boulevard
Kennesaw, Georgia 30144
770/429-3000
Fax 770/429-3001
www.automatedlogic.com

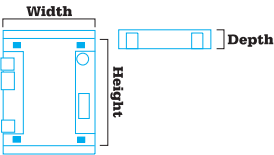
CSAMR

AMR

Specifications



BACnet Support:	Conforms to the Advanced Application Controller (B-AAC) Standard Device Profile as defined in ANSI/ASHRAE Standard 135-2004 (BACnet) Annex L.
Communication:	The following ports are available: - ARC156 port for communication with the ARC156 network. - MSTP port for communication with the MS/TP network on EIA-485 (2-wire). The AMR acts as a master device on the MS/TP network. - Local Access port for system start-up and troubleshooting. - Rnet port not used.
Microprocessor:	High speed 16-bit microprocessor with ARCNET communication co-processor.
Memory:	1 MB non-volatile battery-backed RAM, 4 MB Flash memory, 16-bit memory bus.
Real-time Clock:	Battery-backed real-time clock keeps track of time in event of power failure.
Battery:	10-year Lithium CR2032 battery provides a minimum of 10,000 hours of data retention during power outages.
Status Indicators:	LED's indicate status of communications, running, errors, and power.
Protection:	Incoming power and network connections are protected by non-replaceable internal solid-state polyswitches that reset themselves when the condition that causes a fault returns to normal. The power and network connections are also protected against voltage transient and surge events.
BT485 Connector:	A BT485 is attached to a control module at the beginning and end of a network segment to add bias and to terminate a network segment.
Listings:	UL-916 (PAZX), cUL-916 (PAZX7), FCC Part 15-Subpart B-Class A, CE EN50082-1997.
Environmental Operating Range:	0 to 130°F (-17.8 to 54.4°C), 10–90% relative humidity, non-condensing. NOTE: Control module must be installed within the building.
Power Requirements:	24 Vac ±10%, 50–60 Hz, 10 VA, single Class 2 source only 20 VA or less. 26 Vdc ±10%, 5W.
Physical:	Rugged GE C2950 Cyclopy plastic.
Weight:	0.4 lbs (0.2 kg).
Dimensions:	4" (10.2cm) width by 5" (12.7cm) height.



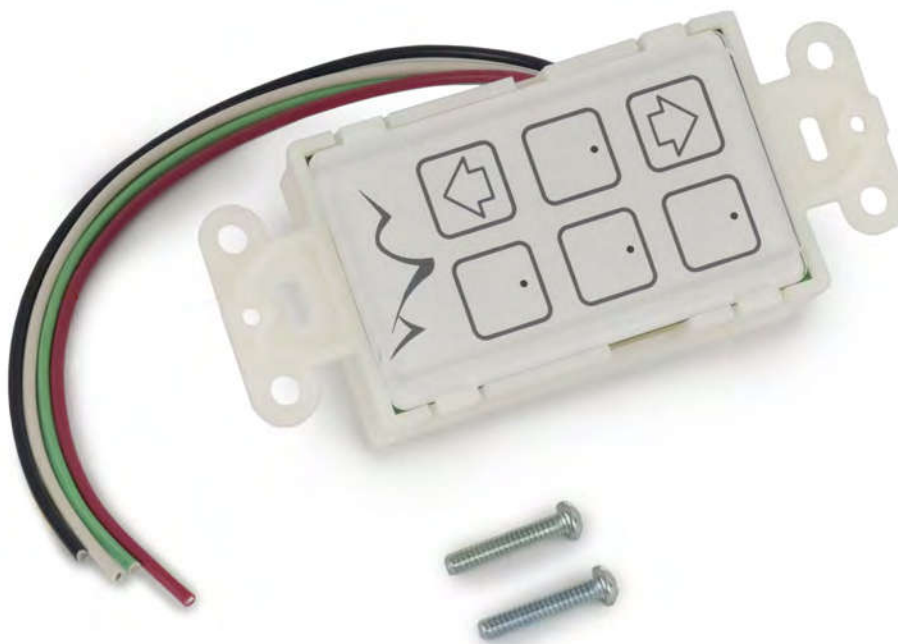
Mounting:	5 9/16" (14.1 cm) between mounting slot centerlines. Recommended panel depth: 1.75" (5.1 cm)
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Automated Logic Corporation . 1150 Roberts Boulevard . Kennesaw, Georgia 30144 . 770/429-3000 . Fax 770/429-3001 . www.automatedlogic.com

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CSAMR





Overview

Capacitive Touch Stations (CTS) provide local occupant interface on the CANbus Network. CTS are available in three versions; Channel On/Off, Channel Raise/Lower, and Preset, with several button layouts. The CTS interface features LED and audible chirp indication as well as schedule transition warnings. CTS fit decorator style wall plates, are gang-able with other devices, and are available in four standard colors.

Features

Resides on CANbus Network
 Available Colors: Black, Gray, Light Almond, or White
 Fits decorator style wall plates
 Gang-able with other decorator style devices
 Cleaning mode for wipe down without disturbing lights
 Extended life cycle

- No moving switch parts
- LED indicator

Preset Station applicable on platforms w/dimming capable Controller Board only

General Specifications

Construction: Acrylic face, ABS/polycarbonate back box / mounting frame
 Dimensions:
 Station: 4.13"(105mm)H x 1.75"(44mm)W x 1.13"(29mm)D
 Capacitive Touch Surface: 0.5"(13mm)H x 0.5"(13mm)W per button
 Weight: 3oz (85g)
 Mounting: Standard single gang or multi-gang switch box, (2) #6/32 screws (included), and Decorator style wall plate (not included)
 Operating Environment: 32-125°F (0-50°C), 20-95%RH, non-condensing

Warranty

Two (2) year limited manufacturer warranty from date of shipment (extended warranty optional)

Power

Power / Draw: 24VDC / 15mA per CTS

CANbus Specifications

Network Slot / Address: DIP switch selectable
 Topology: Daisy Chain Wiring only
 Wire Requirement: CL3P, 18AWG Two Twisted Pairs
 Max 1300' (396m), 120Ω characteristic impedance, capacitance conductor-to-conductor 15pF/ft
 Network Termination: DIP switch

Station Specifications

Button Layout
 Channel On/Off: 1, 2, 3, 4, and 6
 Channel Raise/Lower: 3 (raise, lower, and On/Off), 6 (2 raise, 2 lower, and 2 On/Off)
 Preset: 6 (preset 1, 2, 3, raise, lower, and On/Off), 6 (preset 1, 2, 3, 4, 5, and 6)

Button Operation
 On/Off and Preset: Momentary On/Off
 Raise/Lower: Press and hold for raise or lower

Indicator Operation (On/Off and Preset Buttons)
 Audible Indication: Chirp when button is pressed
 LED Status Indication: LED is on when associated lighting is on. LED is dimly lit when associated lighting is off providing locator light.
 LED Schedule Transition Warning: Rapid blinking

Button Configuration
 Button-channel links are stored in the Controller Board Configuration Database.
 Default: Buttons have a default setting enabling basic function before system configuration.
 Channel On/Off: Each button is linked to a Channel
 Channel Raise/Lower: Each set of buttons is linked to a Channel
 Preset: Each button is linked to Preset

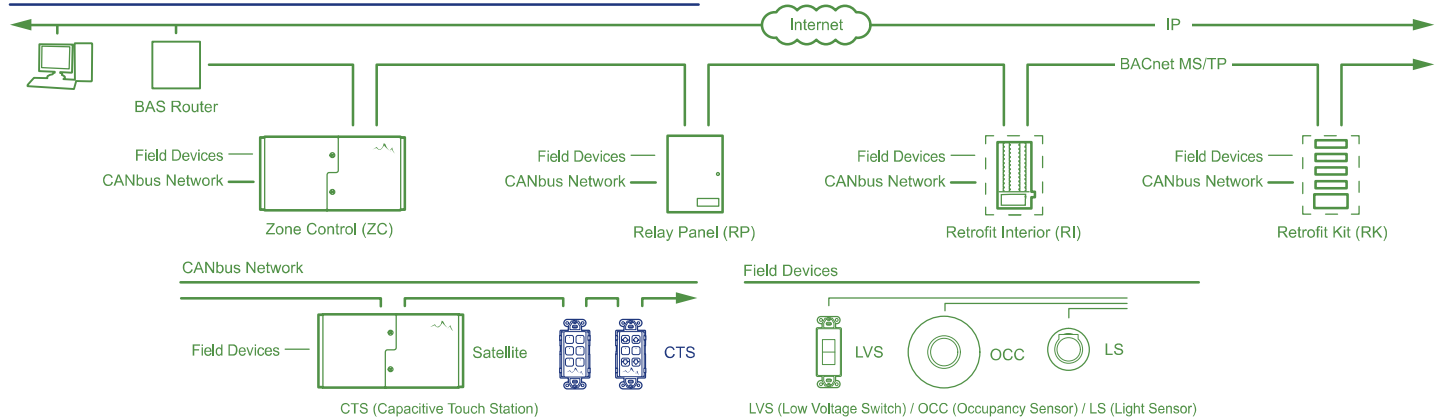
3-way / 4-way Operation: Requires CTS of same type and button layout. Accomplished by using same network address (may require additional power).

Capacitive Touch Station

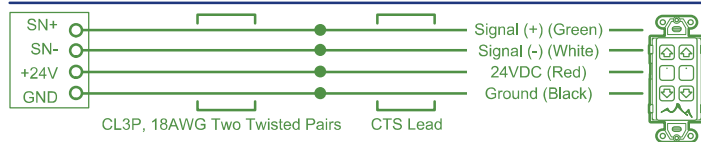
www.BRTint.com : 800-241-9173 Blue Ridge Technologies® © 2014 Blue Ridge Technologies International, LLC All Rights Reserved. CTS-DS-V14.05

Data Sheet : Catalog Page 71

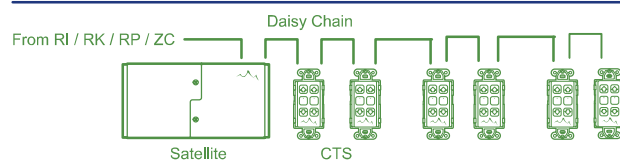
General Architecture



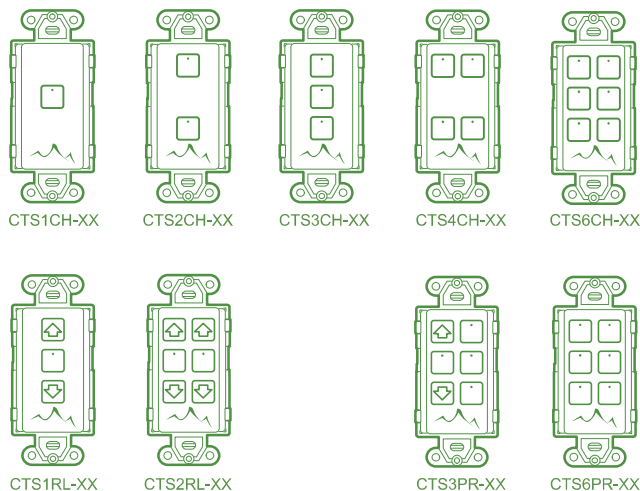
RI / RK / RP / ZC / Satellite Terminations



CANbus Network Structure

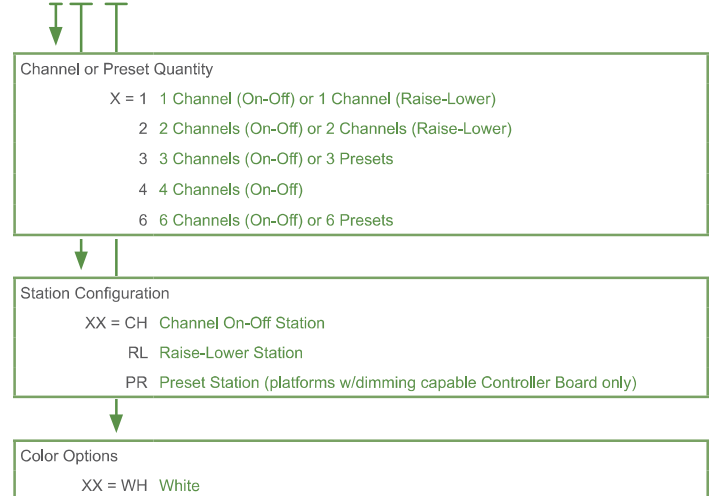


Button Layout Options



Ordering Information

CTS X XX - XX



Custom colors including Black, Grey, and Light Almond are available contact Blue Ridge Technologies for details



Overview

LS24 is a photodiode light level sensor compatible with Aperio Platform products. The 0-10VDC signal converts to both Foot-candle (FC) and LUX values to facilitate local as well as BAS daylight harvesting functions. LS24 features a compact white polymer housing and is available for atrium, indoor, outdoor, or skylight applications.

Features

- UL and ETL Listed
- Compatible with all platforms
- Available for various applications

General Specifications

- Construction: White polymer
- Approximate Weight: 1oz(30g)
- Operating Environment: -40-140°F (-40-60°C)

Photodiode Specifications

- Type: Blue enhanced photodiode
- Signal: 0-10VDC linear
- Time Response: 10 second full range
- Tolerance: 12%
- Repeatability: +/-0.5%
- Linearity: 2%
- Temperature: +/-10%

Electrical Specifications

- Power Input / Draw: 24VDC / 1mA
- Leads: 6"(152mm)L, 18AWG, 3-wire
 - Red: 24VDC
 - Black: Common
 - Yellow: Signal

Certifications

- UL Listed, UL916, US/Canada
- ETL Listed, US/Canada
- NEC Class 2
- CEC Title 24
- RoHS

Warranty

Two (2) year limited manufacturer warranty from date of shipment (extended warranty optional)

Atrium Sensor (LS24A) Specifications

- Dimensions: 2.19"(56mm) Protrusion when mounted x 1.31"(33mm)Dia.
- Mounting Method: Male 1/2"NPT / 1/2"Knockout
- Mounting Orientation: Sensor window horizontal
- Sensor Range: 0-1000FC

Outdoor Sensor (LS24O) Specifications

- Dimensions: 2.19"(56mm) Protrusion when mounted x 1.31"(33mm)Dia.
- Mounting Method: Male 1/2" NPT / 1/2"Knockout
- Mounting Orientation: Sensor window horizontal with hood up
- Sensor Range: 0-250FC

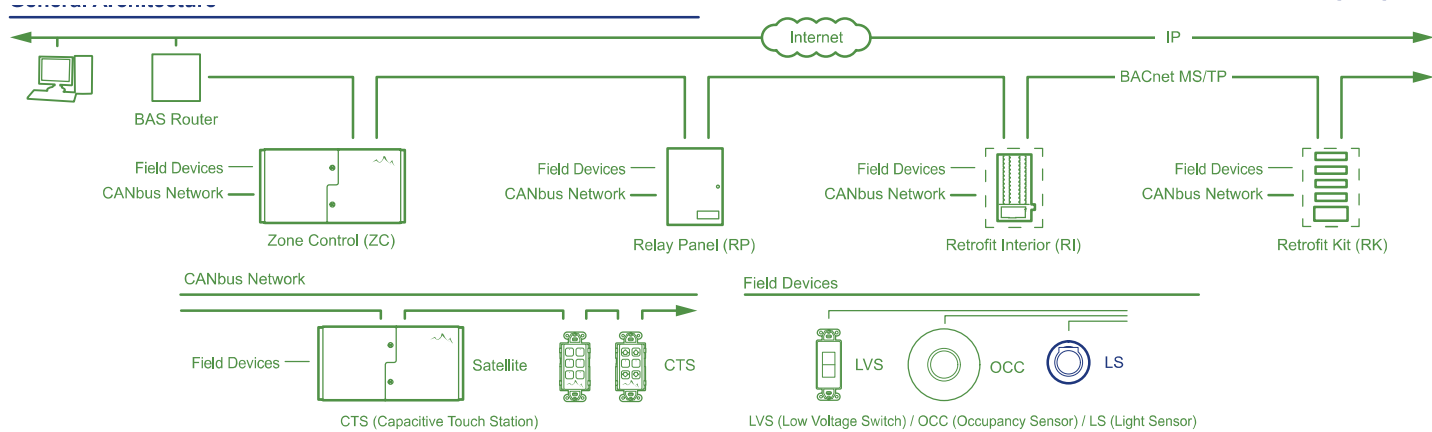
Sky Light Sensor (LS24S) Specifications

- Dimensions: 2.19"(56mm) Protrusion when mounted x 1.31"(33mm)Dia.
- Mounting Method: Male 1/2" NPT / 1/2"Knockout
- Mounting Orientation: Sensor window up
- Sensor Range: 0-2000FC

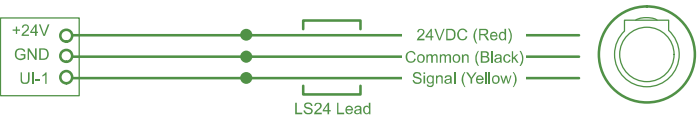
Light Sensor 24

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Data Sheet : Catalog Page 79



Universal Input Terminations



Ordering Information

Part Number	Description
LS24A	Light Level Sensor, 10VDC Linear Photodiode for Atrium Use
LS24O	Light Level Sensor, 10VDC Linear Photodiode for Outdoor Use
LS24S	Light Level Sensor, 10VDC Linear Photodiode for Sky Light Use

Overview

Relay Panel (RP) is a UL Listed lighting control panel. RP may be scheduled from any BACnet BAS and is compatible with all low voltage switches, occupancy sensors, and light level sensors. RP mounts near the circuit breaker panel to provide centralized control of branch lighting circuits. Relay Panel 08 (RP08) features up to 8 Lighting Tough Relays (LTR) and a removable door.

Features

- UL Listed
- Switching and Dimming (DLH / Presets) models available
- BACnet MS/TP communication to BAS network
- Sub network for Satellite and Capacitive Touch Stations (CTS)
- Line and low voltage compartment separation
- Upgradable Controller Board firmware
- Available 347VAC Transformer

General Specifications

Construction: 16ga steel with black powder coat finish
 Dimensions:
 Enclosure: 14.75"(375mm)H x 13.00"(330mm)W x 5.75"(146mm)D
 Door Surface Mount: 14.94"(379mm)H x 13.16"(334mm)W
 Weight: 20.5lbs(9.3 kg)
 Mounting: Surface mounted
 Operating Environment: 32-125°F (0-50°C), 20-95%RH, non-condensing, Type 1 (dry / indoor environment)

Certifications

UL Listed, UL916 Standard for Energy Management Equipment, US/Canada
 FCC Part 15
 CEC Title 24
 Electronics meet or exceed IEC Level 3

Warranty

Two (2) year limited manufacturer warranty from date of shipment (extended warranty optional).

Firmware Specifications (Controller Board)

Platform: Aperio Open Control Platform
 Time Clock: Real-time clock with BACnet time sync
 Schedule: BACnet Schedule, Monday – Sunday, Holidays, and Exceptions
 Non-Volatile Memory: 16MB total, 2MB for trend data (15min trend requires 2K per day)
 RAM: 2MB total, data stored in non-volatile memory upon power loss
 Configuration: Tech Kit 2.0(see data sheet for details)
 Configuration Connection: Micro-B USB or Bluetooth Wireless

Low Voltage Specifications (Controller Board)

Power In: 24VAC +/-10%, 30VA, 50-60 Hz
 Auxiliary Out: 24VAC, 800mA (devices with full wave rectified power supply only)
 Universal Input (UI) and Satellite / Station Network Power Out: 24VDC, 200mA total
 Universal Input: 24 two-wire inputs
 Universal Input Software Configuration:
 Digital Input (DI)
 Analog Input (AI): 0-5VDC, 0-10VDC, or 4-20mA
 Universal Input Wire Requirement / Maximum Length: 18AWG (Solid or Stranded) / 500'(152m)



BAS Network Specifications

Protocol: BACnet MS/TP
 Baud Rate: DIP switch selectable 9.6K, 19.2K, 38.4K, 76.8K, or 115.2K
 Device Profile: BACnet Advance Application Controller (AAC)
 Address Range: 1 – 99 selectable with rotary dials
 Unit Load: 1/8 unit load
 Topology: RS-485, half duplex, daisy chain wiring
 Wire Requirement / Maximum Length: CL3P, 22AWG, 2 conductor, shielded, low cap / 4000'(1216m)
 Points: See PIC Statement

Satellite / Station Network Specifications

Compatible with CTS and Satellite devices. See data sheet for details.

Transformer Specifications

Type: 30VA Inherently Limited
 Primary: Dual Tap 120 or 277VAC +/-10%, 30VA, 50-60 Hz
 Secondary: 24VAC +/-10% Inherently Limited
 Wire Requirement: 18AWG Minimum (Solid or Stranded)

LTR Specifications

Type:
 UL Listed
 SPST latching with manual override lever
 Electrically operated mechanically held, pulse driven
 Short Circuit Current Rating (SCCR) 30,000A @ 277 VAC
 Maximum Ratings: Tungsten 20A @ 347VAC / Ballast 30A @ 347VAC / Resistive 20A @ 347VAC / 1.5HP @ 120VAC
 Load Terminal: Universal screw terminal, box type clamp
 Terminal Capacity (per side): (2) 14-10AWG or (1) 8AWG (Solid or Stranded copper wire)

Optional Equipment Specifications

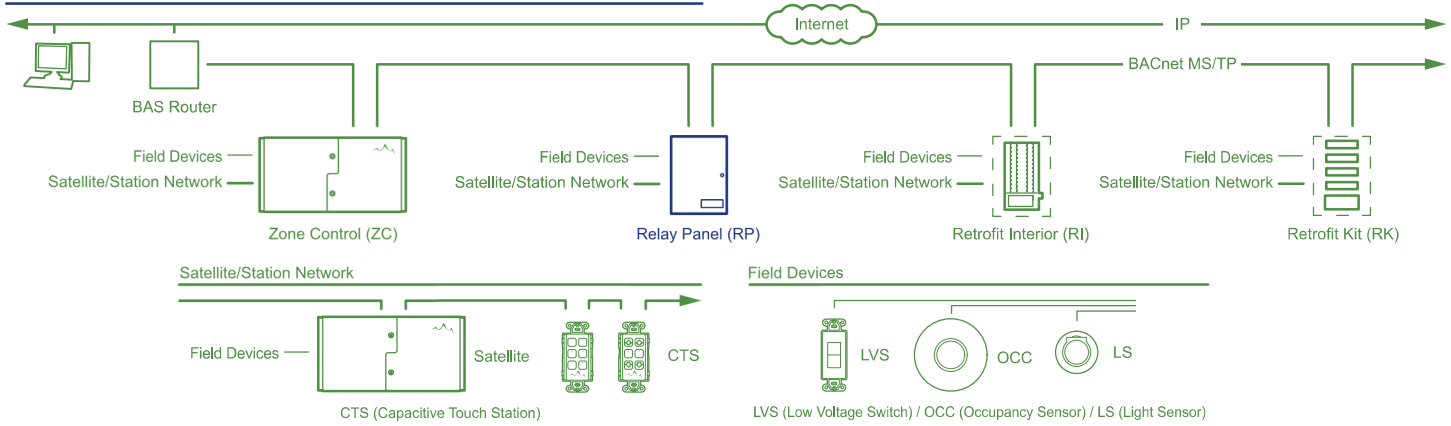
347 Transformer Specifications
 Type: 50VA Inherently Limited UL Listed
 Primary: Single Tap 347VAC, 50VA, 60 Hz
 Secondary: 24VAC +/-10% Inherently Limited
 Wire Requirement: 18AWG Minimum (Solid or Stranded)

Relay Panel 08

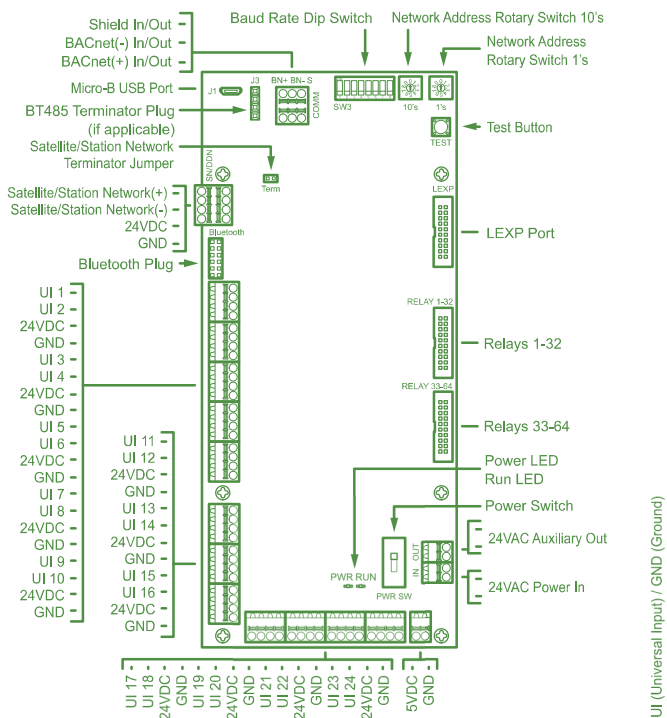
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Data Sheet : Catalog Page 7

General Architecture



Controller Board Terminations



Ordering Information

RP XX 08 - XX - X

Controller Board Options

XX = SS Switching Standard: Supports Satellite / CTS for Switching Applications
DS Dimming Standard: Supports Satellite / CTS for Dimming (DLH) Applications

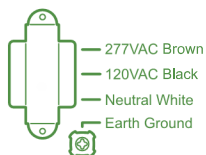
Quantity of Relays Installed

XX = 01 thru 08 Up to 8 Relays Installed

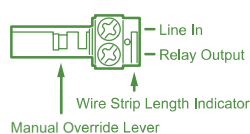
Power Options

X = 0 120 / 277VAC Transformer
1 347VAC Transformer

Transformer Terminations



LTR Terminations



Project		Part Number		Ref.	
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Overview

Relay Panel (RP) is a UL Listed lighting control panel. RP may be scheduled from any BACnet BAS and is compatible with all low voltage switches, occupancy sensors, and light level sensors. RP mounts near the circuit breaker panel to provide centralized control of branch lighting circuits. Relay Panel 16 (RP16) features up to 16 Lighting Tough Relays (LTR) in a black powder coated steel enclosure with a hinged reversible door.

Features

UL Listed

Switching and Dimming (DLH / Presets) models available
 BACnet MS/TP communication to BAS network
 Sub network for Satellite and Capacitive Touch Stations (CTS)
 Line and low voltage compartment separation
 Upgradable Controller Board firmware

Available options:

- Low/Line Voltage Bays
- Multi-pole Lighting Contactors
- 24VAC Auxiliary Transformer
- 24VDC Power Supply
- BACnet IP Router
- UL924 Emergency Bypass
- 347VAC Transformer

General Specifications

Construction: 16ga steel with black powder coat finish

Dimensions:

Enclosure: 16.20"(411mm)H x 18.00"(457mm)W x 5.75"(146mm)D

Door Surface Mount: 16.45"(418mm)H x 18.08"(459mm)W

Door Recessed (Flush): 17.70"(450mm)H x 19.58"(497mm)W

Weight: 32lbs(14.5kg)

Mounting: Surface or recess mounted

Operating Environment: 32-125°F (0-50°C), 20-95%RH, non-condensing, Type 1 (dry / indoor environment)

Certifications

UL Listed, UL916 Standard for Energy Management Equipment, US/Canada
 FCC Part 15
 CEC Title 24
 Electronics meet or exceed IEC Level 3

Warranty

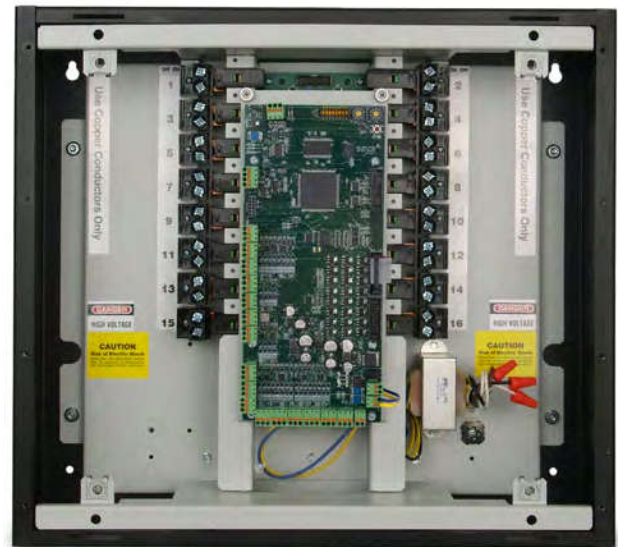
Two (2) year limited manufacturer warranty from date of shipment (extended warranty optional).

Firmware Specifications (Controller Board)

Platform: Aperio Open Control Platform
 Time Clock: Real-time clock with BACnet time sync
 Schedule: BACnet Schedule, Monday – Sunday, Holidays, and Exceptions
 Non-Volatile Memory: 16MB total, 2MB for trend data (15min trend requires 2K per day)
 RAM: 2MB total, data stored in non-volatile memory upon power loss
 Configuration: Tech Kit 2.0 (see data sheet for details)
 Configuration Connection: Micro-B USB or Bluetooth Wireless

Low Voltage Specifications (Controller Board)

Power In: 24VAC +/-10%, 30VA, 50-60 Hz
 Auxiliary Out: 24VAC, 800mA (devices with full wave rectified power supply only)
 Universal Input (UI) and Satellite / Station Network Power Out: 24VDC, 200mA total
 Universal Input: 24 two-wire inputs
 Universal Input Software Configuration:
 Digital Input (DI)
 Analog Input (AI): 0-5VDC, 0-10VDC, or 4-20mA
 Universal Input Wire Requirement / Maximum Length: 18AWG (Solid or Stranded) / 500'(152m)



BAS Network Specifications

Protocol: BACnet MS/TP
 Baud Rate: DIP switch selectable 9.6K, 19.2K, 38.4K, 76.8K, or 115.2K
 Device Profile: BACnet Advance Application Controller (AAC)
 Address Range: 1 – 99 selectable with rotary dials
 Unit Load: 1/8 unit load
 Topology: RS-485, half duplex, daisy chain wiring
 Wire Requirement / Maximum Length: CL3P, 22AWG, 2 conductor, shielded, low cap / 4000'(1216m)
 Points: See PIC Statement

Satellite / Station Network Specifications

Compatible with CTS and Satellite devices. See data sheet for details.

Transformer Specifications

Type: 30VA Inherently Limited
 Primary: Dual Tap 120 or 277VAC +/-10%, 30VA, 50-60 Hz
 Secondary: 24VAC +/-10% Inherently Limited
 Wire Requirement: 18AWG Minimum (Solid or Stranded)

LTR Specifications

Type:
 UL Listed
 SPST latching with manual override lever
 Electrically operated mechanically held, pulse driven
 Short Circuit Current Rating (SCCR) 30,000A @ 277 VAC
 Maximum Ratings: Tungsten 20A @ 347VAC / Ballast 30A @ 347VAC / Resistive 20A @ 347VAC / 1.5HP @ 120VAC
 Load Terminal: Universal screw terminal, box type clamp
 Terminal Capacity (per side): (2) 14-10AWG or (1) 8AWG (Solid or Stranded copper wire)

Optional Equipment Specifications

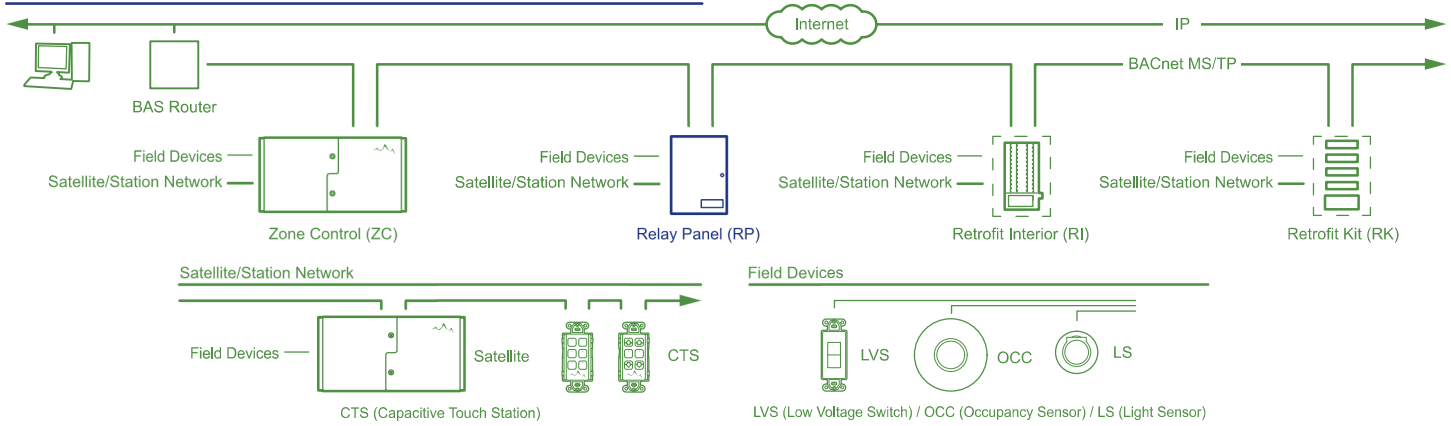
See Relay Panel Optional Equipment Data Sheet

Relay Panel 16

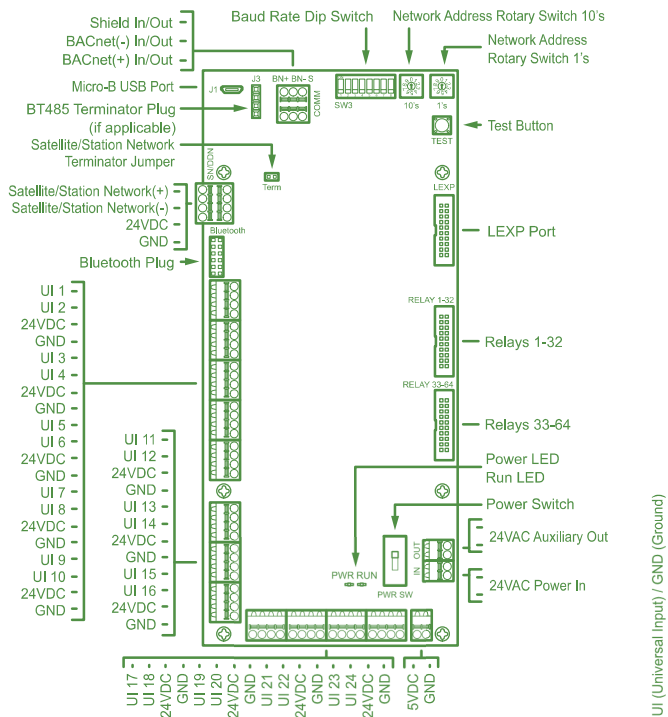
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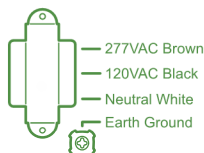
General Architecture



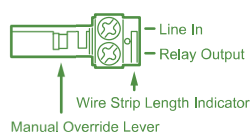
Controller Board Terminations



Transformer Terminations



LTR Terminations



Ordering Information*

RP XX 16 - XX - X - XX - XX - XX

Controller Board Options

- XX = SS Switching Standard: Supports Satellite / CTS for Switching Applications
- DS Dimming Standard: Supports Satellite / CTS for Dimming (DLH) Applications

Quantity of Relays Installed

- XX = 01 thru 16 Up to 16 Relays Installed

Power Options

- X = 0 120 / 277VAC Transformer
- 1 347VAC Transformer
- 2 120 / 277VAC Transformer + 120 / 277VAC Auxiliary Transformer
- 3 347VAC Transformer + 347VAC Auxiliary Transformer

Special Options

- XX = 00 None
- X1 UL924 Emergency Bypass (Relays 1-16 only)

Low Voltage Bay Options (Bottom of Panel)

- XX = Blank None
- L1 9" Bay
- LA 9" Bay + (1) 2.5A 24VDC Power Supply
- LB 9" Bay + (2) 2.5A 24VDC Power Supply
- LC 9" Bay + (1) BACnet IP Router
- LD 9" Bay + (1) BACnet IP Router + (1) 2.5A 24VDC Power Supply
- LE 9" Bay + (1) BACnet IP Router + (2) 2.5A 24VDC Power Supply

Line Voltage Bay Options with Dead Front Cover (Top of Panel)

- XX = Blank None
- H1 9" Bay
- HA 9" Bay + (1) 4 Pole 30A Electrically Held Lighting Contactor, 120V Coil
- HB 9" Bay + (2) 4 Pole 30A Electrically Held Lighting Contactor, 120V Coil
- HC 9" Bay + (4) 4 Pole 30A Electrically Held Lighting Contactor, 120V Coil
- HD 9" Bay + (1) 4 Pole 30A Electrically Held Lighting Contactor, 277V Coil
- HE 9" Bay + (2) 4 Pole 30A Electrically Held Lighting Contactor, 277V Coil
- HF 9" Bay + (4) 4 Pole 30A Electrically Held Lighting Contactor, 277V Coil

* See Price List for Recessed (Flush) door panels.

Project		Part Number		Ref.	
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Data Sheet : Catalog Page 70



Overview

Satellite is a distributed lighting control expander that includes an additional circuit for control of emergency lighting during normal operation and provides emergency function during power loss.

Features

UL924 Emergency Function
 Plenum Rated
 Resides on CANbus Network
 Line and low voltage compartment separation
 Additional Inputs and Outputs

- 6 Universal Inputs
- 2 Line Voltage Inputs
- 2 Relay Outputs
- 2 Analog Outputs on dimming model

Dimming model applicable on platforms w/dimming capable Controller Board only

General Specifications

Construction: 20ga steel white powder coat finish
 Dimensions: 5.063"(129mm)H x 10.00"(254mm)W x 2.50"(64mm)D
 Weight: 3lbs (1.36kg)
 Mounting: 4" or 4 11/16" junction box (Check local code requirements)
 Operating Environment: 0-140°F(-18-60°C), 10-90% RH, non-condensing
 Type 1 (dry / indoor environment)
 Plenum Rated

Power

Input: 120- 277VAC, 50/60hz, +/- 10%, single phase, 20A circuit
 Output: 24VDC, 200mA total

Certifications

UL Listed, UL916/UL924, US/Canada
 FCC Part 15
 CEC Title 24
 Electronics meet or exceed IEC Level 3

Warranty

Two (2) year limited manufacturer warranty from date of shipment (extended warranty optional).

Line Voltage Specifications (FI-1 Board)

Relay Maximum Load Rating per Circuit: 20A tungsten @120VAC, 20A ballast @ 277VAC, 20A resistive @ 277VAC, 1.5HP @ 120 VAC
 Line In: Powers ZC and feeds Relay Output 1
 Line In 2: Feeds Relay Output 2
 Relay: 2 mechanically latching relays with manual override lever
 Relay Status: Opto-isolated Power Tap (PT) on load side of relay contacts
 Line Voltage Input: 2 inputs, utilize same power as Line 1 or 2
 Line Voltage Input Type: Configurable for maintained or state-change
 Wire Requirement: 14-10AWG (Solid or Stranded copper wire only)

Low Voltage Specifications (FI-2 Board)

Universal Input (UI)
 Universal Input: 6 two-wire inputs
 Universal Input Software Configuration:
 Digital Input (DI)
 Analog Input (AI): 0-5VDC, 0-10VDC, or 4-20mA
 Universal Input Wire Requirement / Maximum Length: 18AWG (Solid or Stranded) / 500'(152m)
 Analog Output: 2 outputs
 Analog Output Compatibility: 0-10VDC dimming ballasts (see *Ballast Compatibility Data Sheet* for details)
 Analog Output Sink / Source: 100mA / 5mA per output
 Analog Output Wire Requirement / Maximum Length: 18AWG (Solid or Stranded) / 1,000' (304m)

CANbus Specifications

Protocol: CANbus
 Maximum Satellite: 3 ZC Standard, 12 ZC Extended, 16 RI / RP (RI / RP are limited to a maximum of 64 zones including those added with Satellite)
 CANbus Network Slot: Rotary dial selectable
 Topology: Daisy Chain Wiring only
 Wire Requirement / Maximum Length: CL3P, 18AWG, Twisted Pairs, 4 conductors,
 Unshielded / 1300'(396.24m)
 Network Termination: Jumper

Sequence of Operations

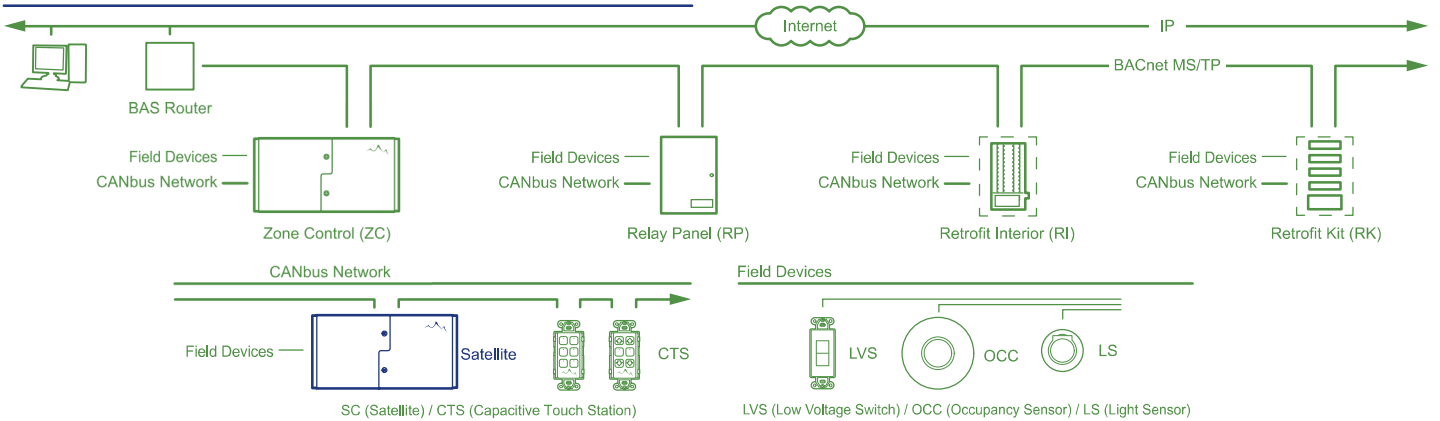
1. Emergency circuit is controlled by Relay 2. The SC UL924 configuration jumper is set for Emergency Action Close Relay 2.
2. Power loss is detected by the SC UL924.
3. Emergency circuit controlled by Relay 2 is forced ON. Analog Outputs also move to full output (applicable on dimming SC only). No external power source or input is required for SC UL924 emergency function.
4. Relay 1 remains in present state (On/Off).
5. Generator transfer switch (not located in the SC UL924) reacts and allows generator to feed dedicated emergency circuits previously fed by normal (utility) power. Relay 2 is already ON, so the only possible source of delay in emergency lighting is the generator or emergency transfer switch.
6. Dedicated emergency lighting circuit will remain On while emergency power source is applied.
7. Normal power is restored and the emergency transfer switch returns all circuits to normal power.
8. Relay 2 will remain On and Analog Outputs will maintain full output during normal power restoration.
9. Relay 1 remains in present state (On/Off).
10. SC UL924 resumes normal control of Relays as well as Analog Outputs and returns lighting to the correct level.

Satellite UL924

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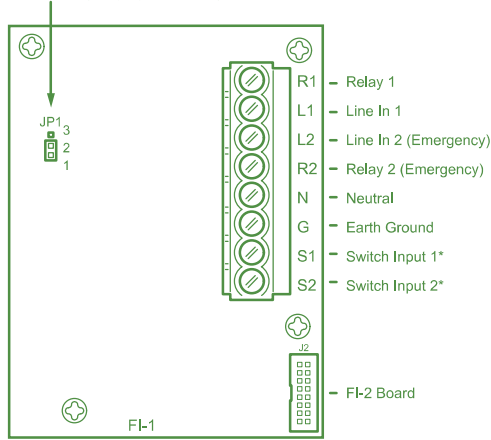
Data Sheet : Catalog Page 71

General Architecture



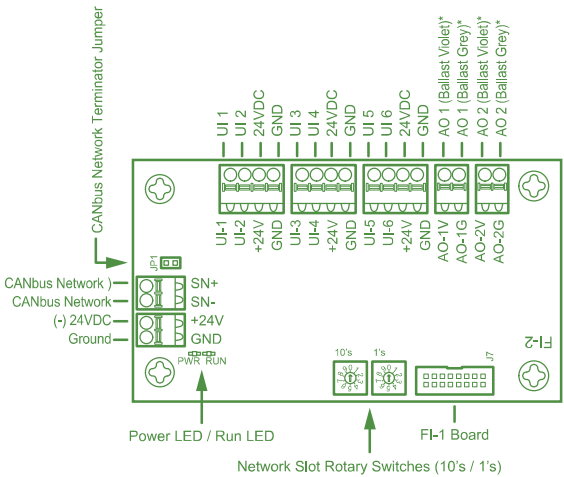
FI-1 Board Terminations

UL924 Emergency Bypass Configuration Jumper



*Must utilize same power source as Line In 1 or Line In 2.

FI-2 Board Terminations



*Applicable on Satellite with Dimming Option only.

Ordering Information

SC XX - X1

Controller Options
XX = SS Switching
DS Dimming (platforms w/dimming capable Controller Board only)

Project

Part Number

Ref.

Data Sheet : Catalog Page 68



Overview

Satellite is a distributed lighting control expander. This compact junction box mounted package provides additional input and output capacity on the CANbus Network. Satellite is available for switching and dimming applications.

Features

UL Listed and Plenum Rated
 Resides on CANbus Network with Capacitive Touch Stations (CTS)
 Line and low voltage compartment separation
 Additional Inputs and Outputs

- 6 Universal Inputs
- 2 Line Voltage Inputs
- 2 Relay Outputs
- 2 Analog Outputs on dimming model

Dimming model applicable on platforms w/dimming capable Controller Board only

General Specifications

Construction: 20ga steel white powder coat finish
 Dimensions: 5.063"(129mm)H x 10.00"(254mm)W x 2.50"(64mm)D
 Weight: 3lbs (1.36kg)
 Mounting: 4" or 4 11/16" junction box (Check local code requirements)
 Operating Environment: 0-140°F(-18-60°C), 10-90% RH, non-condensing
 Type 1 (dry / indoor environment)
 Plenum Rated

Power

Input: 120- 277VAC, 50/60hz, +/- 10%, single phase, 20A circuit
 Output: 24VDC, 200mA total

Certifications

UL Listed, UL916/UL924, US/Canada
 FCC Part 15
 CEC Title 24
 Electronics meet or exceed IEC Level 3

Warranty

Two (2) year limited manufacturer warranty from date of shipment (extended warranty optional).

Line Voltage Specifications (FI-1 Board)

Relay Maximum Load Rating per Circuit: 20A tungsten @120VAC, 20A ballast @ 277VAC, 20A resistive @ 277VAC, 1.5HP @ 120 VAC
 Line In: Powers ZC and feeds Relay Output 1
 Line In 2: Feeds Relay Output 2
 Relay: 2 mechanically latching relays with manual override lever
 Relay Status: Opto-isolated Power Tap (PT) on load side of relay contacts
 Line Voltage Input: 2 inputs, utilize same power as Line 1 or 2
 Line Voltage Input Type: Configurable for maintained or state-change
 Wire Requirement: 14-10AWG (Solid or Stranded copper wire only)

Low Voltage Specifications (FI-2 Board)

Universal Input (UI)
 Universal Input: 6 two-wire inputs
 Universal Input Software Configuration:
 Digital Input (DI)
 Analog Input (AI): 0-5VDC, 0-10VDC, or 4-20mA
 Universal Input Wire Requirement / Maximum Length: 18AWG (Solid or Stranded) / 500'(152m)
 Analog Output: 2 outputs
 Analog Output Compatibility: 0-10VDC dimming ballasts (see *Ballast Compatibility Data Sheet* for details)
 Analog Output Sink / Source: 100mA / 5mA per output
 Analog Output Wire Requirement / Maximum Length: 18AWG (Solid or Stranded) / 1,000' (304m)

CANbus Specifications

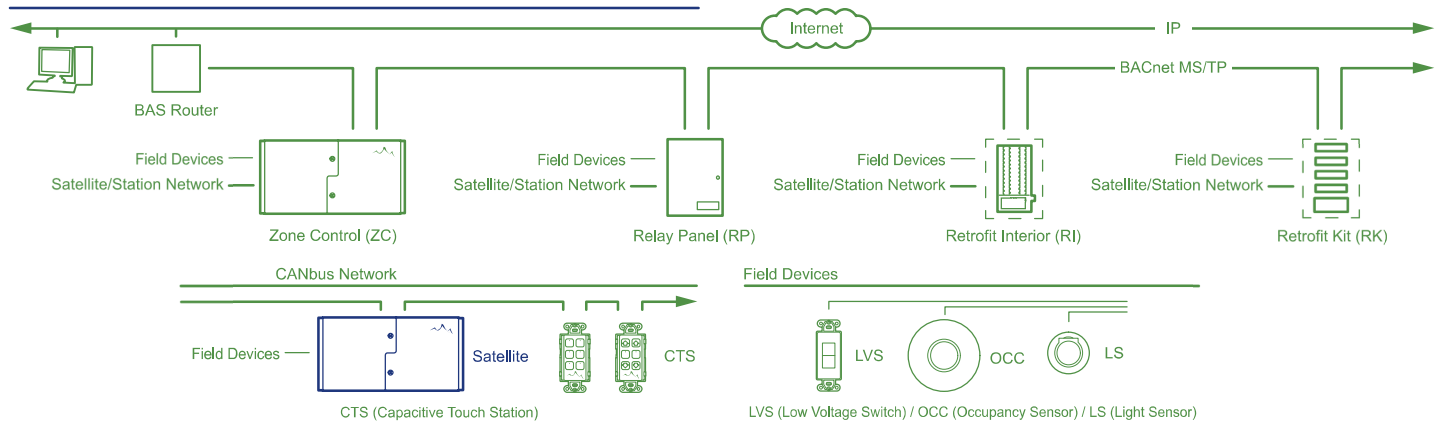
Protocol: CANbus
 Maximum Satellite: 3 ZC Standard, 12 ZC Extended, 16 RI / RP, RI / RP are limited to a maximum of 64 zones including those added with Satellite
 CANbus Network Slot: Rotary dial selectable
 Topology: Daisy Chain Wiring only
 Wire Requirement / Maximum Length: CL3P, 18AWG, Twisted Pairs, 4 conductors, Unshielded / 1300'(396.24m)
 Network Termination: Jumper

Satellite

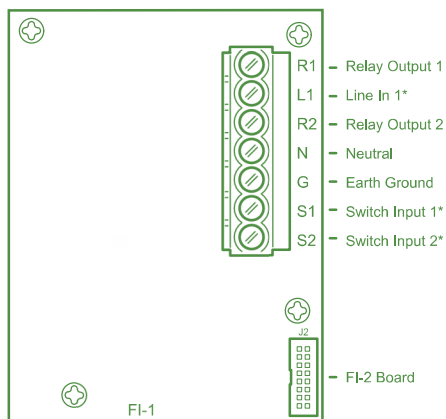
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General Architecture

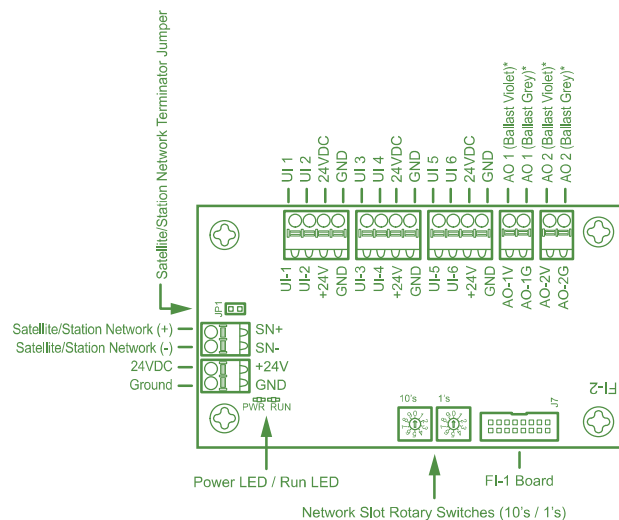


FI-1 Board Terminations



*FI-1 terminations are compatible with 120, 230, or 277VAC single phase circuits. Do not mix voltages or phase on the same unit.

FI-2 Board Terminations



*Applicable on Satellite with Dimming Option only.

Ordering Information

SC XX - XX

Power Options

XX = 00 120, 230, 277VAC

Controller Board Options

XX = SS Switching

DS Dimming (platforms w/dimming capable Controller Board only)



Overview

Zone Control UL924 (ZC UL924) has all the energy saving features of Zone Control (ZC). ZC UL924 includes an additional circuit for energy management control of emergency lighting during normal operation while maintaining emergency function during power loss.

Sequence of Operations

- Emergency circuit is controlled by Relay 2. The ZC UL924 configuration jumper is set for Emergency Action Close Relay 2.
- Power loss is detected by the ZC UL924.
- Emergency circuit controlled by Relay 2 is forced ON. Analog Outputs also move to full output (applicable on dimming ZC only). No external power source or input is required for ZC UL924 emergency function.
- Relay 1 remains in present state (On/Off).
- Generator transfer switch (not located in the ZC UL924) reacts and allows generator to feed dedicated emergency circuits previously fed by normal (utility) power. Relay 2 is already ON, so the only possible source of delay in emergency lighting is the generator or emergency transfer switch.
- Dedicated emergency lighting circuit will remain On while emergency power source is applied.
- Normal power is restored and the emergency transfer switch returns all circuits to normal power.
- Relay 2 will remain On and Analog Outputs will maintain full output during normal power restoration.
- Relay 1 remains in present state (On/Off).
- ZC UL924 resumes normal control of Relays as well as Analog Outputs and returns lighting to the correct level.

General Specifications

Construction: 20ga steel white powder coat finish
 Dimensions: 5.063"(129mm)H x 10.00"(254mm)W x 2.50"(64mm)D
 Weight: 3lbs (1.36kg)
 Mounting: 4" or 4 11/16" junction box (Check local code requirements)
 Operating Environment: 0-140°F(-18-60°C), 10-90% RH, non-condensing
 Type 1 (dry / indoor environment)
 Plenum Rated

Power

Input: 120- 277VAC, 50/60hz, +/- 10%, single phase, 20A circuit
 Output: 24VDC, 200mA total

Certifications

UL Listed, UL916/UL924, US/Canada
 FCC Part 15
 CEC Title 24
 Electronics meet or exceed IEC Level 3

Warranty

Two (2) year limited manufacturer warranty from date of shipment (extended warranty optional).

Line Voltage Specifications (FI-1 Board)

Relay Maximum Load Rating per Circuit: 20A tungsten @120VAC, 20A ballast @ 277VAC, 20A resistive @ 277VAC, 1.5HP @ 120 VAC
 Line In: Powers ZC and feeds Relay Output 1
 Line In 2: Feeds Relay Output 2
 Relay: 2 mechanically latching relays with manual override lever
 Relay Status: Opto-isolated Power Tap (PT) on load side of relay contacts
 Line Voltage Input: 2 inputs, utilize same power as Line 1 or 2
 Line Voltage Input Type: Configurable for maintained or state-change
 Wire Requirement: 14-10AWG (Solid or Stranded copper wire only)

Low Voltage Specifications (FI-2 Board)

Universal Input (UI)
 Universal Input: 6 two-wire inputs
 Universal Input Software Configuration:
 Digital Input (DI)
 Analog Input (AI): 0-5VDC, 0-10VDC, or 4-20mA
 Universal Input Wire Requirement / Maximum Length: 18AWG (Solid or Stranded) / 500'(152m)
 Analog Output: 2 outputs
 Analog Output Compatibility: 0-10VDC dimming ballasts (see *Ballast Compatibility Data Sheet* for details)
 Analog Output Sink / Source: 100mA / 5mA per output
 Analog Output Wire Requirement / Maximum Length: 18AWG (Solid or Stranded) / 1,000' (304m)

BAS Network Specifications

Protocol: BACnet MS/TP
 Baud Rate: DIP switch selectable 9.6K, 19.2K, 38.4K, 76.8K, or 115.2K
 Device Profile: BACnet Advance Application Controller (AAC)
 Address Range: 1 – 99 selectable with rotary dials
 Unit Load: 1/8 unit load
 Topology: RS-485, half duplex, daisy chain wiring
 Wire Requirement / Maximum Length: CL3P, 22AWG, 2 conductor, shielded, low cap / 4000'(1216m)
 Points: See *PIC Statement*

CANbus Network Specifications

Compatible with CTS and Satellite devices. See individual data sheet for details.
 Topology: Daisy Chain Wiring only
 Wire Requirement / Maximum Length: CL3P, 18AWG, Twisted Pairs, 4 conductors, Unshielded / 1300'(396.24m)
 Network Termination: Jumper

Firmware Specifications (Controller Board)

Platform: Aperio Open Control Platform
 Time Clock: Real-time clock with BACnet time sync
 Schedule: BACnet Schedule, Monday – Sunday, Holidays, and Exceptions
 Non-Volatile Memory: 16MB total, 2MB for trend data (15min trend requires 2K per day)
 RAM: 2MB total, data stored in non-volatile memory upon power loss
 Configuration: Tech Kit 2.0 (see data sheet for details)
 Configuration Connection: Micro-B USB or Bluetooth Wireless

DE Dimming Extended: DLH. Maximum 16 Relays / 12 Satellite / 16 CTS / 16 Pre



Overview

Zone Control (ZC) is a distributed lighting controller in a compact junction box mounted package. ZC may be scheduled from any BACnet BAS, and it is compatible with all low voltage switches, occupancy sensors, and light level sensors. ZC is suited for new or existing buildings, and may be scaled from basic to advanced control sequences; including daylight harvesting (DLH), load shedding, equipment optimization, and trending.

Features

- UL Listed and Plenum Rated
- BACnet MS/TP communication to BAS network
- Line and low voltage compartment separation
- Switching and Dimming (DLH / Presets) models available
- CANbus network for Satellite and Capacitive Touch Stations (CTS)
- Standard and Extended models available:
 - Standard - up to 8 relays / channels with Satellite
 - Extended - up to 16 relays / channels with Satellite
- Micro-USB and Bluetooth (optional) ports for configuration
- Monitor and measure equipment performance:
 - Track lamp, ballast, and relay life
 - Track schedule, occupancy sensor, manual control, and daylight harvest savings

General Specifications

Construction: 20ga steel white powder coat finish
 Dimensions: 5.063"(129mm)H x 10.00"(254mm)W x 2.50"(64mm)D
 Weight: 3lbs (1.36kg)
 Mounting: 4" or 4 11/16" junction box (Check local code requirements)
 Operating Environment: 0-140°F(-18-60°C), 10-90% RH, non-condensing
 Type 1 (dry / indoor environment)
 Plenum Rated

Power

Input: 120- 277VAC, 50/60hz, +/- 10%, single phase, 20A circuit
 Output: 24VDC, 200mA total

Certifications

UL Listed, UL916/UL924, US/Canada
 FCC Part 15
 CEC Title 24
 Electronics meet or exceed IEC Level 3

Warranty

Two (2) year limited manufacturer warranty from date of shipment (extended warranty optional).

Line Voltage Specifications (FI-1 Board)

Relay Maximum Load Rating per Circuit: 20A tungsten @120VAC, 20A ballast @ 277VAC, 20A resistive @ 277VAC, 1.5HP @ 120 VAC
 Line In: Powers ZC and feeds Relay Output 1
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 Line Voltage Input Type: Configurable for maintained or state-change
 Wire Requirement: 14-10AWG (Solid or Stranded copper wire only)

Low Voltage Specifications (FI-2 Board)

Universal Input (UI)
 Universal Input: 6 two-wire inputs
 Universal Input Software Configuration:
 Digital Input (DI)
 Analog Input (AI): 0-5VDC, 0-10VDC, or 4-20mA
 Universal Input Wire Requirement / Maximum Length: 18AWG (Solid or Stranded) / 500'(152m)
 Analog Output: 2 outputs
 Analog Output Compatibility: 0-10VDC dimming ballasts (see *Ballast Compatibility Data Sheet* for details)
 Analog Output Sink / Source: 100mA / 5mA per output
 Analog Output Wire Requirement / Maximum Length: 18AWG (Solid or Stranded) / 1,000' (304m)

BAS Network Specifications

Protocol: BACnet MS/TP
 Baud Rate: DIP switch selectable 9.6K, 19.2K, 38.4K, 76.8K, or 115.2K
 Device Profile: BACnet Advance Application Controller (AAC)
 Address Range: 1 – 99 selectable with rotary dials
 Unit Load: 1/8 unit load
 Topology: RS-485, half duplex, daisy chain wiring
 Wire Requirement / Maximum Length: CL3P, 22AWG, 2 conductor, shielded, low cap / 4000'(1216m)
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 Topology: Daisy Chain Wiring only
 Wire Requirement / Maximum Length: CL3P, 18AWG, Twisted Pairs, 4 conductors, Unshielded / 1300'(396.24m)
 Network Termination: Jumper

Firmware Specifications (Controller Board)

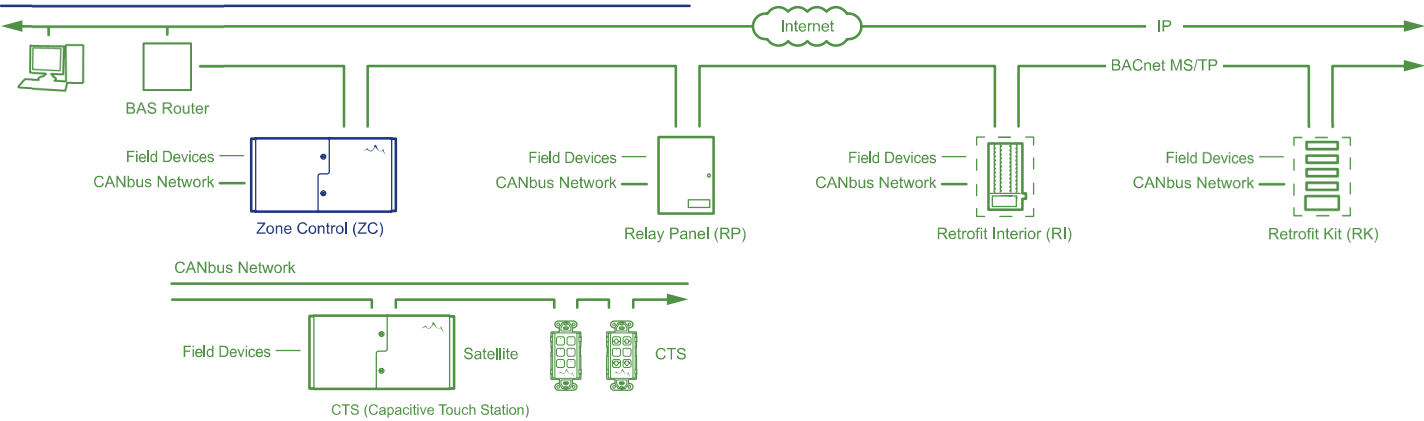
Platform: Aperio Open Control Platform
 Time Clock: Real-time clock with BACnet time sync
 Schedule: BACnet Schedule, Monday – Sunday, Holidays, and Exceptions
 Non-Volatile Memory: 16MB total, 2MB for trend data (15min trend requires 2K per day)
 RAM: 2MB total, data stored in non-volatile memory upon power loss
 Configuration: Tech Kit 2.0 (see data sheet for details)
 Configuration Connection: Micro-B USB or Bluetooth Wireless

Zone Control

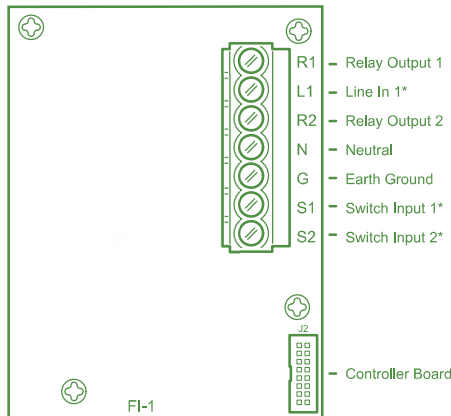
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General Architecture

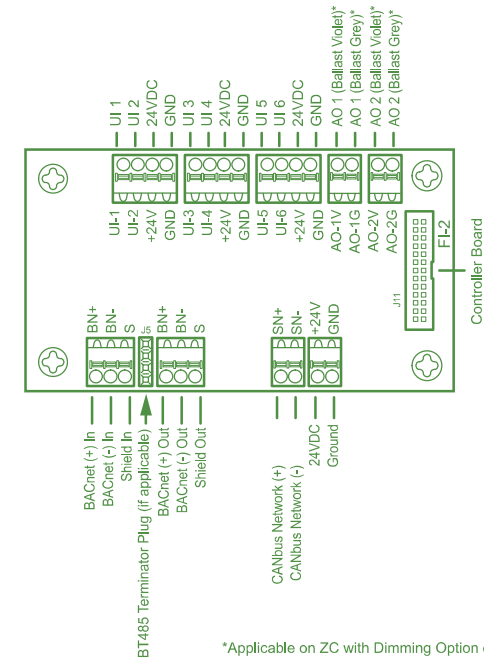


FI-1 Board Terminations



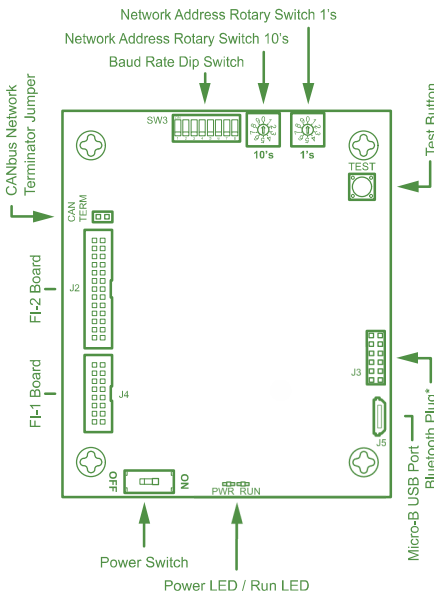
*FI-1 terminations are compatible with 120, 230, or 277VAC single phase circuits. Do not mix voltages or phase on the same unit.

FI-2 Board Terminations



*Applicable on ZC with Dimming Option only.

Controller Board Terminations



*Applicable on ZC with Bluetooth Wireless Option only.

Ordering Information

ZC XX - XX - XX



Wireless Options
XX = 00 No Wireless
BT Bluetooth

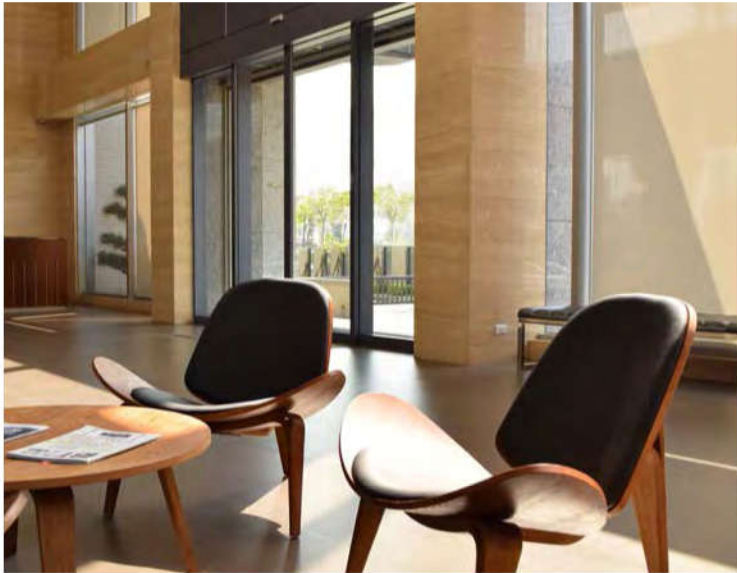
Power Options
XX = 00 120, 230, 277VAC

Controller Board Options
XX = SS Switching Standard: Maximum 8 Relays / 3 Satellite / 8 CTS
DS Dimming Standard: DLH, Maximum 8 Relays / 3 Satellite / 8 CTS / 8 Preset
DE Dimming Extended: DLH, Maximum 16 Relays / 12 Satellite / 16 CTS / 16 Preset

BPD-500 series

Low Voltage Daylight Sensor

TRANS



OVERVIEW

The BPD-500 series member of the TRANS family is a low voltage daylight sensor designed for automatic daylighting control. This sensor is able to continuously measure the ambient light level in the controlled area and respond with digital and analog outputs for automatic lighting control via an IR-TEC Power Pack or panel system.

This daylight sensor employs a cutting edge digital ambient light sensor (ALS) with an advanced algorithm to provide closed loop, dynamic ambient light level sensing capability. When the ambient light level is lower/higher than the setpoint for a period of time, the sensor will automatically engage/disengage its isolated dry contact output to turn the connected light ON/OFF. In addition to the digital output, the sensor also provides 0-10V analog output to report the ambient light level change of the controlled area in timely basis.

The innovative Accu-Set digital potentiometer makes ON/OFF threshold adjustment easier, faster and more accurate than conventional potentiometer. Like all sensors in the TRANS family, the BPD-500 series is also available in various mounting options. This feature offers a second-to-none design and installation flexibility for daylight harvesting and control applications in sustainable buildings.

FEATURES

- Digital data control ambient light sensor
- Human-eye matching spectral response
- Sensor operation LED indicator built-in
- 12~24VDC low voltage power operation
- Isolated dry contact for ON/OFF switching
- 0~10V present ambient light level output
- Accu-Set digital ON/OFF threshold settings
- Available with variety of mounting options

APPLICATION

The BPD-500 series daylight sensor can be used in various applications to meet the requirements for daylight harvesting in areas defined as daylight control zones.

- ☒ Educational
- ☒ Industrial/retail
- ☒ Public Buildings
- ☒ Commercial

BPD-500 series

Low Voltage Daylight Sensor

TRANS

OPERATION

The BPD-500 series is a closed loop daylight sensor operated by 12-24VDC to provide digital and analog outputs for automatic daylighting control. The sensor can be applied to control lights in areas that receive sufficient daylight, thus the electric lights can be reduced or switched OFF via IR-TEC Power Pack or panel system. The isolated dry contact will be activated when the ambient light level is lower than the ON setpoint. The relay output will be disengaged when the ambient light level is higher than the OFF setpoint.

Mounting Options

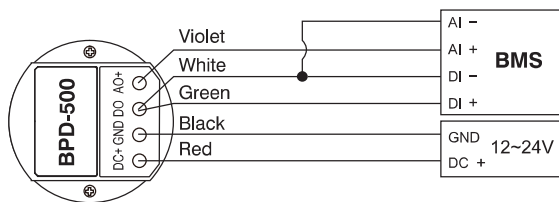
The BPD-500SX series can be mounted into the ceiling or attached to a fixture. The mounting options are available by combining a specific mounting bracket from the chart below. The bracket will be shipped with the sensor when ordered with the respective code.

Code	Mounting Option	Mounting Bracket
F	Fixture Integrated	---
W*	Wet Location	---
E	Fixture External	EMB-500
S	Ceiling Surface	SMB-500
P*	IP-66 Fixture External	PMB-500
C	Junction Box	CMB-500
R	Ceiling Recess	RMB-500

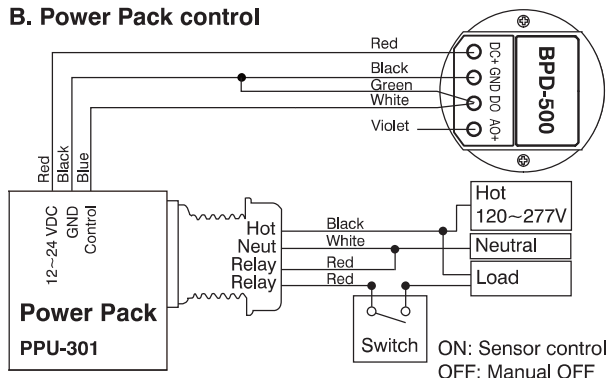
*Available for IP-66 fixture integration

Wiring Diagram

A. Building Management System control



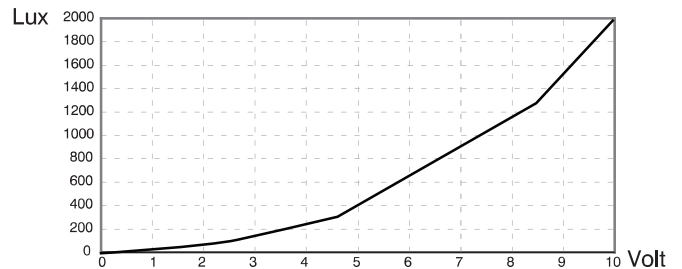
B. Power Pack control



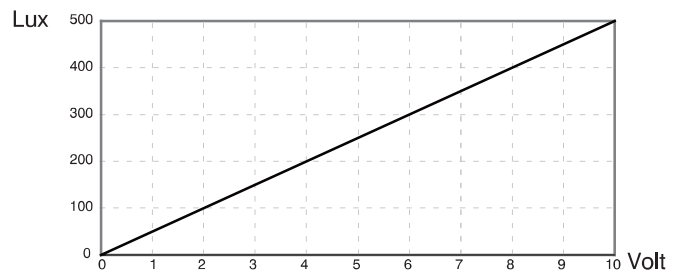
Output vs Ambient Light Level

The analog output of BPD-500 series will vary with ambient light level. The below charts indicate the output vs ambient light of different models.

BPD-500Sx (0~2,000 Lux)



BPD-500Sx-L (0~500 Lux)



The above charts are based on the test result result from manufacturer's lab. Actual performance may vary with different installation site.

SPECIFICATIONS

Power supply	12~24 VDC $\pm$ 5%
Photo sensor	Digital data control ambient light sensor
Current drain	15mA typical
Digital output (DO)	Isolated dry contact, max. 1A
Analog output (AO)	0-10V
Sensing range	BPD-500Sx: Approx. 0.2~200 fc (2~2,000 lux) BPD-500Sx-L: Approx. 0.2~50 fc (2~500 lux)
Mounting height	8~12 ft. (2.4~3.6m)
Field of view	Approx. 80°
Threshold setting	7-level Accu-Set digital potentiometer
Op. humidity	Max. 95% RH
Op. temperature	-40°F ~ 131°F (-40°C ~ 55°C)
Dimensions	Ø2.56" x H1.77" (Ø65 x H45mm)