Lighting Control Drawing Package Type
Submittal

Project Name
St. John Parish Govt Complex

Location
, USA

Date
30-Aug-11

Quote #

PO #

Order #
<table>
<thead>
<tr>
<th>Nomenclature</th>
<th>Part Description</th>
<th>Type</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>GR2448 ENC 5M NE1</td>
<td>(GR2448 ENC) 48 Relay Panel Enclosure</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>GR2448 INT DTCMOD DV 1VB SM NE1</td>
<td>(GR2448) - 48 Relay Panel</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>CH1 BWH PWH</td>
<td>(CH1) - Chelsea 1 Button</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>WSD PDT LV WH</td>
<td>(WSD PDT LV) Low Voltage Wall Switch Passive Dual Technology Sensor</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>CM PDT 9</td>
<td>(CM PDT 9) Low Voltage Standard Range Ceiling Mount Passive Dual Technology Sensor</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>SYEMB 6DB3 MLS NBAR MB100</td>
<td>(SYEMB) Medium Main Feed Panel - 4 Breakered Module Capacity</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>SQCS 6P 8C WC2 SD</td>
<td>(SQCS) Architectural Preset Control Station</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>SYNERGY ENGRAVING SERVICES</td>
<td>SYNERGY ENGRAVING SERVICES</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>SQCS 5GB</td>
<td>(SQCS 5GB) 5 Gang Backbox for 4/8 Channel SQCS</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Bill of Material / Project Notes

St. John Parish Govt Complex

Job Name:

Bill of Materials

Quote #
PO #
Order #

Acuity Brands Controls

Page 2 of 24
Cabinet Catalog Number:
SYEMB 6DB3 MLS NBAR MB100

Components:
(1) SYEMB 120/277
(1) SYPMB 6DB3
(1) SYPMB MB100 NBAR
(1) SYSC MLS
FEATURES

Synergy® is a unique lighting control system that integrates all aspects of lighting control into a single system platform. Synergy combines architectural dimming, low-voltage switching, lighting automation and lighting energy management functions into a single scalable package capable of meeting the requirements of virtually any lighting control application.

- Integrated and distributed switching and dimming
- Time scheduling with day/date/astronomic functions
- Programmable low voltage inputs
- Integral keypad and display
- Stand-alone panel operation
- Optional building-wide networked operation
- BACnet® native for interoperability with other building systems
- Physical layer connections via Arcnet, Ethernet/IP, or MSTP
- Available Windows™, NT, XP and Vista configuration, control and monitoring software
- UL, C-UL listed; CEC certified

ORDERING INFORMATION

Choose the boldface catalog nomenclature that best suits your needs and write it on the appropriate line. Order accessories as separate catalog number.

<table>
<thead>
<tr>
<th>SYEMB</th>
<th>6DB3</th>
<th>MLS</th>
<th>NBAR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Series</strong></td>
<td><strong>Output quantity/type</strong></td>
<td><strong>Main feed option</strong></td>
<td><strong>Panel ships as components consisting of enclosure, power modules and controller</strong></td>
</tr>
<tr>
<td>SYEM</td>
<td>Qty. 120V 2KW dimmers with six 20A circuit breakers, six dimmers per module</td>
<td>(blank) No main lugs, no main breaker</td>
<td></td>
</tr>
<tr>
<td>SYELB</td>
<td>Qty. 277V 3.5KW dimmers with four 20A circuit breakers, six dimmers per module</td>
<td>Main lugs for 120V, 240V or 277V operation; requires 2 module positions; requires power modules with circuit breakers</td>
<td></td>
</tr>
<tr>
<td>SYELB</td>
<td>Qty single-pole 30A relays @ 120, 230 and 277 volts, and 20A @ 347 volts. Four 347V, 20A circuit breakers. Eight low voltage dry contact inputs and eight 0-10VDC dimming outputs.</td>
<td>Main breaker, 3 pole, specify # of amps, 100A maximum</td>
<td></td>
</tr>
<tr>
<td>SYEMB</td>
<td>Qty single-pole 30A relays @ 120, 230 and 277 volts, and 20A @ 347 volts. Four 277V, 20A circuit breakers. Eight low voltage dry contact inputs and eight 0-10VDC dimming outputs.</td>
<td>42 circuit neutral bar</td>
<td></td>
</tr>
<tr>
<td>SYELB</td>
<td>Qty single-pole 30A relays @ 120, 230 and 277 volts, and 20A @ 347 volts. Six 120V, 15A circuit breakers. Eight low voltage dry contact inputs and eight 0-10VDC dimming outputs.</td>
<td>Options</td>
<td></td>
</tr>
<tr>
<td>SYEM</td>
<td>Qty single-pole 30A relays @ 120, 230 and 277 volts, and 20A @ 347 volts. Four 277V, 15A circuit breakers. Eight low voltage dry contact inputs and eight 0-10VDC dimming outputs.</td>
<td>Dimming interface required for connection to DMX512 control</td>
<td></td>
</tr>
<tr>
<td>SYELB</td>
<td>Qty single-pole 30A relays @ 120, 230 and 277 volts, and 20A @ 347 volts. Four 277V, 15A circuit breakers. Eight low voltage dry contact inputs and eight 0-10VDC dimming outputs.</td>
<td>ISA Three 16-bit ISA expansion slots</td>
<td></td>
</tr>
<tr>
<td>SYEMB</td>
<td>Qty single-pole 30A relays @ 120, 230 and 277 volts, and 20A @ 347 volts. Four 277V, 15A circuit breakers. Eight low voltage dry contact inputs and eight 0-10VDC dimming outputs.</td>
<td>MODEM Modem for remote dial-up access</td>
<td></td>
</tr>
<tr>
<td>SYELB</td>
<td>Qty single-pole 30A relays @ 120, 230 and 277 volts, and 20A @ 347 volts. Four 277V, 15A circuit breakers. Eight low voltage dry contact inputs and eight 0-10VDC dimming outputs.</td>
<td>PHONE Modem for remote dial-up access and voice-prompted override (requires ISA option)</td>
<td></td>
</tr>
<tr>
<td>SYEM</td>
<td>Qty single-pole 30A relays @ 120, 230 and 277 volts, and 20A @ 347 volts. Four 277V, 15A circuit breakers. Eight low voltage dry contact inputs and eight 0-10VDC dimming outputs.</td>
<td>LEGACY Allows control of legacy MiniPac, Sequel, and Max-Star dimmer cabinets</td>
<td></td>
</tr>
</tbody>
</table>

Example: SYELB 24LB1 12DB1 MLS NBAR DMX

<table>
<thead>
<tr>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order as a separate item.</td>
</tr>
<tr>
<td>SYA SRE Recess kit for small enclosures</td>
</tr>
<tr>
<td>SYA MRE Recess kit for medium enclosures</td>
</tr>
<tr>
<td>SYA LRE Recess kit for large enclosures</td>
</tr>
</tbody>
</table>
**SYSTEM ARCHITECTURE**

![System Architecture Diagram]

* RS-485 Arcnet 156KBS, Ethernet/IP, MSTP. Available with MLX only. Additional equipment may be needed.

**SYSTEM COMPONENTS**

<table>
<thead>
<tr>
<th>System Functions</th>
<th>MLS Controller</th>
<th>MLX Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay Capacity (No Breakers)</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>80 Total w/ Secondary Cabinet</td>
<td>96 Total w/ Secondary Cabinet</td>
</tr>
<tr>
<td>Relay Capacity (With Breakers)</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>60 Total w/ Secondary Cabinet</td>
<td>80 Total w/ Secondary Cabinet</td>
</tr>
<tr>
<td>Dimmer Capacity</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>36 Total w/ Secondary Cabinet</td>
<td>60 Total w/ Secondary Cabinet</td>
</tr>
<tr>
<td>DMX512 Input</td>
<td>DMX Channel-to-Output Configured via controller software</td>
<td>DMX Channel-to-Output Configured via controller software</td>
</tr>
</tbody>
</table>

**System Functions**

- Analog Input: YES
- PC Support: YES
- Script Logic: YES
- Logging: YES
- Priority Logic: YES
- Network: NO
- Telephone Override: YES, optional
- BACnet*: YES, optional
- RS232: YES
- Modem: YES, optional
- Sequel Stations: YES
- Digital Remotes: YES
- Legacy Dimmers: YES, optional

**Dimensions:**

- Shown in inches (millimeters)
  - Small (SYES, SYESB): 21(533) H x 20(508) W x 6(152) D
  - Medium (SYEM, SYEMB): 34.5(876) H x 20(508) W x 6(152) D
  - Large (SYEL, SYELB): 48(1,219) H x 20(508) W x 6(152) D

**Synergy Light Control System**

- Synergy Enclosures (SYE) (Reference spec sheet SYE)
- Synergy Power Modules (SYPM and SYPMB Series) (Reference spec sheets SYPM 9L, SYPMB 6D, SYPMB CB and SYPMB SSBC)
- Synergy System Controller (SYSC) (Reference spec sheets SYSC MLS and SYSC MLX)
FEATURES
The Synergy lighting control system enclosure is designed to accommodate a variety of power module and controller choices to provide switching and dimming control of lighting in response to a variety of input sources. The enclosure is supplied prewired to accept SYPM power modules and the SYSC system controller. The power supply is factory-installed and is suitable for either 120V, 230V or 277V supply.

• Up to six power modules per cabinet
• Optional recess mounting kit available
• Locking door for circuit breakers
• Rough-in enclosure from stock
• UL and C-UL listed; CEC certified

ORDERING INFORMATION
Choose the boldface catalog nomenclature that best suits your needs and write it on the appropriate line. Order accessories as separate catalog number.

<table>
<thead>
<tr>
<th>SYE</th>
<th>MB</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Series</strong></td>
<td><strong>Capacity</strong></td>
</tr>
<tr>
<td>SYE</td>
<td>S 2 power module spaces (no circuit breaker door)</td>
</tr>
<tr>
<td></td>
<td>M 4 power module spaces (no circuit breaker door)</td>
</tr>
<tr>
<td></td>
<td>L 6 power module spaces (no circuit breaker door)</td>
</tr>
<tr>
<td></td>
<td>SB 2 power module spaces (provision for circuit breakers)*</td>
</tr>
<tr>
<td></td>
<td>MB 4 power module spaces (provision for circuit breakers)</td>
</tr>
<tr>
<td></td>
<td>LB 6 power module spaces (provision for circuit breakers)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>120/277</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power Supply Voltage</strong></td>
</tr>
<tr>
<td>120/277 120/230/277V, 50 or 60Hz operation</td>
</tr>
</tbody>
</table>

* Maximum one dimmer module

Example: SYEM 120/277

Accessories
Order as a separate catalog number
SYA SRE Recess kit for small enclosures
SYA MRE Recess kit for medium enclosures
SYA LRE Recess kit for large enclosures
SYA BP Plug for circuit breaker opening (each)

NOTE: Power modules ordered separately, or use sheet SYEN-100 for single line nomenclature.
**SPECIFICATIONS**

**MECHANICAL**
- Enclosure: NEMA 1, wall-mounted, optional accessory kit for recess mounting.
- Enclosure cover: screw-on, opening provided in cover for operation of keypad and viewing of LCD display; hinged locking door over optional circuit breakers.
- Breaker option includes thermal sensor and fan for use with dimmer modules.

**CAPACITIES**
- Small enclosure: 2 SYPM power modules maximum.
- Medium enclosure: 4 SYPM power modules maximum.
- Large enclosure: 6 SYPM power modules maximum.

**ENVIRONMENTAL**
- Operation and storage temperature: 32-104°F (0-40°C).
- Humidity: 10–90% non-condensing.

**ELECTRICAL**
- Power supply input: 120/230/277VAC, 50/60 Hz.
- Control transformer: 225VA at maximum configuration.

**FUNCTIONAL**

---

**DIMENSIONS**

All dimensions are inches (millimeters). Add 1.5” (40) to height and width for recessed version.

**Shipping weights:**
- Small enclosure – 30 lbs. (14 kg)
- Medium enclosure – 40 lbs. (18 kg)
- Large enclosure – 50 lbs. (23 kg)
FEATURES
The main feed power module is used with Synergy enclosures to facilitate connection of the enclosures to either a three-phase, four-wire or single-phase, three-wire main power source.
- Optional main breaker on ML or NBAR option
- Up to 380A, 500 MCM feed for SYPMB option
- ML option provides power feed for up to four SYE enclosures
- Neutral bar assembly
- Main breaker option has maximum 2/0 AWG size
- UL and C-UL listed

ORDERING INFORMATION
Choose the boldface catalog nomenclature that best suits your needs and write it on the appropriate line. Order accessories as separate catalog number.

Example: SYPMB MB 100 ML

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>SYPMB NBAR MB100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>Type</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SYPMB</th>
<th>MB100</th>
<th>NBAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series</td>
<td>Main breaker</td>
<td>Lug configuration</td>
</tr>
<tr>
<td>SYPMB</td>
<td>(blank)</td>
<td>ML</td>
</tr>
<tr>
<td></td>
<td>MB</td>
<td>Main lug, one 380A primary, four secondary terminals per phase. Suitable for single- or three-phase applications.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Main neutral, one 380A primary, four secondary terminals. Includes 42 circuit neutral bar. Not available with main breaker.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NBAR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>42 circuit neutral bar for individual or tap-fed cabinets.</td>
</tr>
</tbody>
</table>
**SPECIFICATIONS**

**MECHANICAL**
- Chassis: all components mounted to steel black plane, keys into enclosure via tab and slot, secures with provided screws.

**ENVIRONMENTAL**
- Operation and storage temperature: 32-104°F (0-40°C).
- Humidity: 10-90% non-condensing.

**ELECTRICAL**
- Main lug rating: 380A, 500 MCM maximum.
- Tap lugs: (4) 2/0 wire per phase.
- Optional main breaker rating: 120 volts at 65,000 AIC or 277 volts at 14,000 AIC. (Not available for 347V)
- Use with conductors rated 90°C or higher.
- Neutral bar: 42 #14-#10 connectors.

**DIMENSIONS**

All dimensions are inches (millimeters).
Shipping weight = 15 lbs. (6.8 kg) maximum

**FUNCTIONAL**

Note:
* SYPMB MN required for use with SYPM ML or SYPMB MB ML modules, order as accessory.
FEATURES

The Synergy dimmer module is used with the Synergy enclosure to provide dimming and switching capability for a wide variety of loads. Modules contain toroidal filters, thyristor switching elements, integral air-gap relay for each dimmer, circuit breakers, analog and low-voltage switch inputs and on-board digital processor control circuit. Power modules are interchangeable within the enclosure and are field-installed.

- Six universal dimmers per module
- Compatible load types:
  - Incandescent
  - Magnetic low voltage
  - Electronic low voltage
  - Advanced Mark10® fluorescent
  - Lutron Hi-Lume® fluorescent
  - Lutron ECO10® fluorescent
  - Neon
  - Cold Cathode
- Dimmed and switched output per dimmer
- Precise digital performance
- Adjustable High/Low trims
- Square-law dimming curve
- Heavy-duty toroidal chokes
- Thermal magnetic circuit breakers
- 120V or 277V
- Air-gap relays
- Over-temperature cut-out
- Remote override input accepts contact closure to force FULL-ON operation for essential lighting applications
- Selectable soft-start for all loads
- Analog filter and advanced digital processing techniques enable consistent, reliable dimming performance in a wide variety of power environments
- UL Listed to US and Canadian safety standards

ORDERING INFORMATION

Choose the boldface catalog nomenclature that best suits your needs and write it on the appropriate line. Order accessories as separate catalog number.

<table>
<thead>
<tr>
<th>SYPMB 6D</th>
<th>B3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series: SYPMB</td>
<td>Circuit breaker voltage</td>
</tr>
<tr>
<td>6D Six dimmers per module</td>
<td>B1 Six 20A CB, 120V 10 KAIC</td>
</tr>
<tr>
<td></td>
<td>B2 Four 20A CB, 277V 14 KAIC</td>
</tr>
<tr>
<td></td>
<td>B3 Six 15A CB, 120V10 KAIC</td>
</tr>
<tr>
<td></td>
<td>B4 Four 15A CB, 277V14 KAIC</td>
</tr>
<tr>
<td></td>
<td>B5 Four 20A CB, 120V 65 K AIC</td>
</tr>
</tbody>
</table>

NOTES:

1 Normal power factor magnetic transformers. Electronic low voltage transformers must be dimmable and compatible with forward phase out dimmers with series inductive filtering. Low voltage transformers should be protected by a line-side fuse when used with dimmers.

2 Installer must coordinate lamp/ballast configuration.

Controls
SPECIFICATIONS

MECHANICAL
- Chassis: all components mounted to steel back plane, keys into enclosure via tab and slot, secures with provided screws.
- Electronic control assembly and power devices are individually field-replaceable without removing module.

ENVIRONMENTAL
- Operation and Storage temperature: 32-104°F (0-40°C).
- Humidity: 10-90% non-condensing.

ELECTRICAL
- Module rating: 10 KVA (83.5A) at 120V, 17.5 KVA (64A) at 277V.
- Dimmers: Six dimmers per module, 2 KVA each at 120V, 3.5 KVA each at 277V.
- Thermal magnetic input circuit breakers: Six 120V 10,000 AIC breakers, four 277V 14,000 AIC breakers, or four 120V 65,000 AIC breakers per module.
- Load relays: SPST, N.O. maintained air-gap in series with dimmer, enclosed silver cadmium-oxide contacts, 16A 277VAC ballast.
- Over-temperature sensor: thermal cut-out integral to anodized extruded aluminum heat sink assembly.
- Toroidal Filtering: 350 µsec current rise time measured from 10-90% of the load current waveform at a 90° conduction angle and dimmer at 50% of rated capacity.
- Efficiency: dimmer output voltage is greater than 96% of input voltage at the maximum intensity setting; maximum heat loss is 16 BTU/hour per ampere of phase-controlled current.
- Low voltage inputs: two switch inputs per module, accept momentary or maintained contacts; three analog inputs per module, accept 0-10V or 0-24V three wire signals. All inputs have removable terminal blocks that accept up to #16 AWG wires. 24VDC accessory power, 2.5A per cabinet, 500mA total per SYPM 6D.
- Override: one PC board mounted ON/AUTO/OFF switch per module, overrides all six dimmers/relays. Remote override terminals provided for remote activation of ON/AUTO/OFF switching.
- Load wire connection: board-mounted compression screw terminal blocks, #10 AWG or two #12 AWG maximum. Two terminals per dimmer - one dimmed and one non-dimmed.
- Input and feed-through lug capacity: 2/0 maximum.
- Lamp compatibility: incandescent, low-voltage¹, neon¹, cold-cathode¹, fluorescent (Advance Mark 10⁶, Lutron HiLume⁶, Tu-Wire⁶ and ECO10⁶).

FUNCTIONAL

NOTES:
1 On 4 breaker modules breaker #3 feeds dimmers 3 & 4 and breaker #4 feeds dimmers 5 & 6.
2 Minimum two (2) Lutron ballasts per dimmer required for proper operation.
FEATURES

The Synergy® MLS system controller adds programming and automation capabilities to a Synergy system. Capabilities include individual circuit control of lighting functions for a wide variety of applications. System outputs respond to time-of-day schedules via the internal time clock. In addition, inputs can be accepted from external devices such as switches, photocells, occupancy sensors, digital remotes, telephones and other control systems to directly control lighting or override scheduled events.

- Supports all Synergy power modules
- Seven-day scheduling with astronomic clock
- Holiday schedule dates
- Load prioritization setup
- Exclusive Script Logic Application Language
- Programmable switch inputs
- Support for SEQUEL® dimming control stations
- Support for digital Synergy® remote stations
- Timed switch overrides
- Analog source monitoring with multiple set points
- Integral keypad with backlit display
- All programming stored in non-volatile industrial compact flash memory card
- Automatic system event logging
- Internal lamp burn hours and start counters
- Optional PC software
- Optional touch-tone telephone interface for voice-prompted overrides.
- Optional support for Legacy MiniPac, Sequel, and MaxStar dimmer cabinets.
- English, Spanish or French operation
- UL and C-UL listed; CEC Certified

ORDERING INFORMATION

Choose the boldface catalog nomenclature that best suits your needs and write it on the appropriate line. Order accessories as separate catalog number.

<table>
<thead>
<tr>
<th>System Functions</th>
<th>MLS Controller</th>
<th>MLX Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay Capacity (No Breakers)</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Dimmer Capacity</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>DALI Capacity (loops)</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>DMX512 Input</td>
<td>DMX Channel-to-Output Configured via controller software</td>
<td></td>
</tr>
<tr>
<td>Scheduling</td>
<td>100 schedules/unlimited events</td>
<td>100 schedules/unlimited events</td>
</tr>
<tr>
<td>Analog Input</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>PC Support</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Script Logic</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Logging</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Priority Logic</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Network</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Telephone Override</td>
<td>YES, optional</td>
<td>YES, optional</td>
</tr>
<tr>
<td>BACnet®</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>RS232</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Modem</td>
<td>YES, optional</td>
<td>YES, optional</td>
</tr>
<tr>
<td>Sequel Stations</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Legacy Dimmers</td>
<td>YES, optional</td>
<td>YES, optional</td>
</tr>
<tr>
<td>Digital Remotes</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

Example: SYSC MLS

Accessories

- SYA SKIT: Permits two SYE enclosures to operate with a single MLS controller
- SYSW CONFIG: Windows™ configuration software and cable
- SYA CABLE4: Synergy®Class 2, four conductor, plenum rated control station network cable (Specify length: 250', 500' or 1000')

Page 13 of 24
SPECIFICATIONS

MECHANICAL
• Chassis: plug-in assembly with locking screws, field-installable in SYE enclosure.

ENVIRONMENTAL

ELECTRICAL
• Power input: 24VDC maximum, supplied by enclosure power supply.
• Data port: front-mounted DB9 RS232 serial communications connector accessible without removal of cover.
• Internal RS232 port for connection to A/V systems.
• Internal RS485 port for connection to SEQUEL control stations and digital remote stations.

FUNCTIONAL
• Program entry: numeric keypad (0-9, back and enter), “soft” function keys (F1-F4), navigation key cluster (up, down, + and -) for menu navigation and logical entry selections.
• LCD display: four-line, 80-character with back light.
• LED indicators: local status indication.
• Outputs: 128 maximum per controller in typical configurations; map inputs and schedules to any combination of connected relays, dimmers, or controllable circuit breakers.
• Groups: map output relays and dimmers into logical groups (zones) for association to inputs and schedules.
• Switch inputs: 128 maximum per controller, soft-linked through the program to control any combination of outputs; one minute to 100 hour time-out function per switch.
• Analog input: maximum of 48, each capable of multiple set-point operation or tracking operation.
• Priority on switch: switch input set to priority on cannot be overridden off by any other source until the priority on condition is removed.
• Priority off switch: switch input set to priority off cannot be overridden on by any other source until the priority off condition is removed.
• Four levels of priority provide for layering of manual and automatic functions.
• Schedules: Maximum of 100 independent schedules of time events; number of events per schedule limited only by system resources. Schedules may be assigned to days of the week and days of the year, or recurring holiday dates through 12/31/2200.
• Warn off: automatic flash of lights at scheduled off to warn occupants of impending off, user selectable from one to 99 minutes.
• Logging: automatic logging of system events including on events, off events, relay run time, relay starts, alarms, power up, power down, override on and override off, 10,000 event maximum storage with automatic overwrite of oldest data; view log data on LCD display or printout.
• Telephone Override: override selected loads via touch-tone phone using programmable four-digit codes and voice prompts using optional PHONE interface.
• DMX Control: control connected loads with DMX control signal using optional DMX input card. May be configured by hardware settings or through controller software to provide prioritized and conditional control of loads along with other input devices and schedules.
• Legacy Dimmer Control: control up to 255 legacy MiniPac, Sequel, and MaxStar dimmers with optional LEGACY card. Synergy controller replaces function of M2, M3, or M9 master controller in existing systems. Legacy dimmers may be controlled by any input or schedule in the Synergy system.
• PC software: program the controller, download data, upload data and monitor status using optional Windows™ 95, 98, 2000, NT or XP software via front-mounted DB-9, RS232 port or optional modem connection.
• Sixty digital stations maximum per MLS controllers
• Room Assignment: digital station control of up to a 4X8 room matrix that may be dynamically joined and separated to accommodate partitioned spaces. Join/Seperate action for each set of rooms may be triggered by switch input, digital station, time schedule, or partition sensor.
### FEATURES

Seuel control stations provide manual dimming and preset lighting control for architectural dimming applications. These stations are offered in a variety of styles and architectural finishes suitable for virtually any application. Control stations may be connected in parallel for multi-location control or used with matching remote stations.

- Thin architectural styling
- Metal and painted finish faceplates
- Simple operation
- LED intensity indication
- Multiple control stations per system capability
- All-digital performance
- Adjustable fade time per preset
- Preset save disable function
- Power failure memory
- Integral A/V interface terminals
- Matching remote stations
- Supplied with channel labels

### ORDERING INFORMATION

Choose the boldface catalog nomenclature that best suits your needs and write it on the appropriate line. Order accessories as separate catalog number.

<table>
<thead>
<tr>
<th>SQCS</th>
<th>6P 8C</th>
<th>WC2</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series</td>
<td>Number of presets and channels</td>
<td>Finish</td>
<td>Faceplate style</td>
</tr>
<tr>
<td>SQCS</td>
<td>6P 4C</td>
<td>6 presets, 4 channels</td>
<td>BJ4</td>
</tr>
<tr>
<td></td>
<td>6P 8C</td>
<td>6 presets, 8 channels</td>
<td>BL4</td>
</tr>
<tr>
<td></td>
<td>6P 12C</td>
<td>6 presets, 12 channels</td>
<td>WC2</td>
</tr>
<tr>
<td></td>
<td>6P 16C</td>
<td>6 presets, 16 channels</td>
<td>IE3</td>
</tr>
</tbody>
</table>

### Accessories

Order as separate catalog number.

- **SQCS 5GB**: 5-gang backbox for 4C and 8C stations
- **SQCS 8GB**: 8-gang backbox for 12C and 16C stations
- **SQCS RE8**: Recessed NEMA 1 enclosure for 4C and 8C stations
- **SQCS RE16**: Recessed NEMA 1 enclosure for 12C and 16C stations
- **SQCS PE8**: Portable console for 4C and 8C stations
- **SQCS PE16**: Portable console for 12C and 16C stations
- **BKLE 10P**: Engraved button caps, 10 pack
- **SYA_CABLEA4**: Plenum rated network cable, specify 250, 500 or 1000-foot length
SPECIFICATIONS

CONSTRUCTION
- Low-profile frame with hinged faceplate. Mounting requirements: Lithonia #SQCS 5GB or RACO 699 5-gang backbox for four-channel and eight-channel stations; Lithonia #SQCS 8GB 8-gang backbox for 12-channel and 16-channel stations. Consult factory for retrofit applications.

FUNCTIONAL
- CHANNEL RAISE/LOWER buttons adjust the intensity level of individual channels. LED bar graph displays intensity level. Alternate non-dim operation, selectable per channel.
- MASTER RAISE/LOWER buttons adjust the intensity of all lights dimmed from the station.
- OFF turns off all lighting.
- PRESET buttons save and activate presets.
- SELECT button for saving presets. Concealed disable switch protects saved presets.
- FADE TIME is adjustable for each preset scene. Available fade times are 0, 5, 10, 15, 30 and 45 seconds and 1, 5, 10, 30 and 60 minutes.

CAPACITIES
- Presets: six presets with master raise/lower and off. Two additional presets are switch selectable, replacing the master raise/lower function.
- Channels: 4 (4C), 8 (8C), 12 (12C) or 16 (16C).
- Terminals on rear of station allow access to 16 presets, off, master and (2) channels of raise/lower from SQRS remote stations or momentary dry contact closures.

ENGRAVED BUTTON CAPS - BKLE (ACCESSORY)
- Characters are upper case block normal type style. Maximum two lines per switch cap, seven characters per line.
- Characters are back filled with a contrasting color as follows: (cap color/back fill color) white/medium gray, ivory/beige, and black/medium gray.

ELECTRICAL
- Operating voltage: 10 – 30 VDC, Class 2.
- Network Wiring: One pair, twisted and shielded, plus (2) #16 AWG conductors. Lithonia SYA_CABLEA4, plenum rated or Belden #3105A plus two #16 AWG conductors. Network connections are made in a "daisy chain" - no "T" taps or branches.

FUNCTIONAL DESCRIPTION

STYLE CONFIGURATIONS

DIMENSIONS
All dimensions are in inches (millimeters).

4C and 8C Control Stations

SQCS 5GB Backbox: 9-1/8 W x 3-5/8 H x 3-1/2 D (232 x 92 x 89)

12C and 16C Control Stations

SQCS 8GB Backbox: 14-1/2 W x 3-5/8 H x 3-1/2 D (368 x 92 x 89)
GR 2400™ Relay Panel

**Description:** The GR 2400 system is a 100% digital solution to lighting control. Panels and switches daisy-chain together, using Cat. 5 patch cable with RJ45 connectors in any sequence.

**Features:**
- 32-channel, 365-day/astronomical time clock. Large display (21 x 8 characters) acts as the programming interface for the entire system. Non-volatile memory holds all programming indefinitely. Ten-year battery back-up for time-of-day.
- Modem includes free lifetime factory programming.
- May control mixed voltages (i.e., 120V, 277V).
- May control normal or emergency power.
- Ideal for all applications.
- Manual override of individual relays, zones or entire panel.
- Link up to 127 addresses of digital devices via Cat. 5 patch cable with RJ45 connectors.

**Specifications:**

- **Enclosure dimensions:** 20" w x 25.5" h x 6" d (32 relays)
  20" w x 37.5" h x 6" d (48 relays)
- **Enclosure type:** Surface mount, hinged locking door, NEMA 1
- **Optional enclosures:** NEMA 4, NEMA 4X, NEMA 12, flush mount
- **Relay:** Normally Closed (NCL)
  30A @ 277VAC Ballast
  20A @ 120VAC Tungsten
  20A @ 347VAC Ballast
  SCCR 18kA @ 277VAC
  Rated 250,000 Cycles
- **Optional relays:** Normally Open, (NOL) Spec same as NCL,
  Two Pole — NO or NC (480VAC);
  Double Throw 20A 277VAC

- **Addresses used:** GR 2432 (4), GR 2448 (6)
- **Listings:** UL and cUL 916 listed,
  ETL listed to UL 924 (for emergency circuit use)
- **Programming:** Via DTC, via PC with Unity 2™ Lighting Control Software
- **Max. humidity:** 10–90% non-condensing
- **Ambient temperature:** 32–105° F (0–41° C)
- **Power supply voltage:** 120/277VAC or 120/347VAC
- **Bus protocol:** RS 485 (GR 2400 bus)
- **Bus connector:** RJ45 connectors
### Overview

**Power Supply:**
120/277V or 120/347V

**DTC:**
32-channel, 365-day astro clock
Access and program the entire system

**Modem:**
Remote programming and control, includes free lifetime dial-up programming

**Bus connectors**
RJ45 connectors

**Lighting Relays:**
- Normally Closed (NCL), 30A @ 277V Ballast,
- 20A @ 120V Tungsten,
- 20A @ 347V Ballast,
- SCCR 18K A @ 277V, Rated 250,000 Cycles

**Optional Relays:**
- Normally Open (NOL) Spec same as NCL,
- Two Pole — NO or NC (480V); Double Throw 20A 277V

**High/Low Voltage Barrier:**
(16 gauge steel)

**Relay Control Card**
(Manual control of zones or individual relays)

**Master Relay Panel**

**Chelsea Digital/Switch™**

**Remote Relay Panel w/PCC1 card**

**Photosensor PCELL 2WO**

**Cat. 5 patch cable with RJ45 connectors**

### Ordering Logic

**Enclosure**

<table>
<thead>
<tr>
<th>GR2448 ENC</th>
<th>SM NE1</th>
<th>Examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay Panel Enclosure</td>
<td>Enclosure Mounting, NEMA Rating, Knockouts</td>
<td>GR2448 ENC SM NE1</td>
</tr>
<tr>
<td>GR2448 ENC = 48 Relay Enclosure</td>
<td>SM NE1 = Surface Mount, NEMA 1 with knockouts</td>
<td>GR2448 INT 12NCL 12DPNC DTCMOD DV</td>
</tr>
<tr>
<td>GR2432 ENC = 32 Relay Enclosure</td>
<td>FM NE1 = Flush Mount, NEMA 1 with knockouts</td>
<td>48 relay, surface mount NEMA 1 enclosure with knockouts,</td>
</tr>
<tr>
<td></td>
<td>SM NE1 NKO = Surface Mount, NEMA 1 no knockouts</td>
<td>with 12 normally closed relays, 12 double pole normally</td>
</tr>
<tr>
<td></td>
<td>FM NE1 NKO = Flush Mount, NEMA 1 no knockouts</td>
<td>closed relays, with a digital time clock and modem (master</td>
</tr>
<tr>
<td></td>
<td>SM NE4 = Surface Mount, NEMA 4</td>
<td>panel), and a 120/277V dual voltage transformer (also, no</td>
</tr>
<tr>
<td></td>
<td>SM NE12 = Surface Mount, NEMA 12</td>
<td>voltage barriers).</td>
</tr>
<tr>
<td></td>
<td>SM NE4X = Surface Mount, NEMA 4X</td>
<td></td>
</tr>
</tbody>
</table>

**Examples:**
- GR2448 ENC SM NE1
- GR2448 INT 12NCL 12DPNC DTCMOD DV

**Interior**

<table>
<thead>
<tr>
<th>GR2448 INT</th>
<th>DTCMOD</th>
<th>DV</th>
<th>1VB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay Panel Interior</td>
<td>Relays</td>
<td>Clock Option</td>
<td>Transformer</td>
</tr>
<tr>
<td>GR2448 INT = 48 Relay Interior</td>
<td>[qty]NCL = Normally Closed Latching</td>
<td>DTCMOD = Digital time clock with modem</td>
<td>DV = Dual voltage</td>
</tr>
<tr>
<td>GR2432 INT = 32 Relay Interior</td>
<td>[qty]NOL = Normally Open Latching</td>
<td>DTC = Digital time clock</td>
<td>120/277V</td>
</tr>
<tr>
<td></td>
<td>[qty]DPNC = Double Pole Normally Closed</td>
<td>without modem</td>
<td>CNDV = 120/347V</td>
</tr>
<tr>
<td></td>
<td>[qty]DPNO = Double Pole Normally Open</td>
<td>REMOTE = Remote panel, no clock</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[qty]RRNO = Reed Relay Normally Open (pair)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[qty]SPDT = Single Pole Double Throw</td>
<td></td>
<td>¹ = Check with NEC or CEC, State or Province,</td>
</tr>
<tr>
<td></td>
<td>[qty]SPDTC = Single Pole Double Throw Contactor</td>
<td></td>
<td>and local regulations as</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>well as your electrical</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>inspector about</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>allowances for voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>barriers within panels.</td>
</tr>
</tbody>
</table>

1 = Check with NEC or CEC, State or Province, and local regulations as well as your electrical inspector about allowances for voltage barriers within panels.
**Chelsea DigitalSwitch™**

**Description:** The Chelsea DigitalSwitch™ is a 100% digital switch which connects directly to the GR 2400 bus via Cat. 5 patch cable with RJ45 connectors. Chelsea DigitalSwitches™ can be ordered with 1, 2, 3, 4 or 6 buttons per gang and can be mounted in any standard 2.25" deep switch box with a decorator style switch plate. All Chelsea DigitalSwitches™ are 100% backwards compatible with all LC&D systems.

**Features:**
- May be programmed to control any relay, SmartBreaker™ or dimmer in any panel
- Custom button engraving at no cost (2 lines 8 character/line)
- Available in a choice of plate and button colors
- All push buttons are annunciated with a pilot light
- A programmable green "Locator Light" at the top of each unit is always on, can be programmed to blink to show Horn Driver Mode or help locate a switch
- Programmable Status LED logic
- Adjustable debounce time to avoid accidental trigger
- Factory preprogrammed. May be reprogrammed in the field using the DTC (Digital Time Clock)
- Link up to 127 digital addresses via Cat. 5 patch cable with RJ45 connectors
- Can be enabled/disabled by optional KeyEnable™ switch
- Audible beep alert for warning or switch locating
- Alternate button programming to allow more flexibility of use, for example the same button can perform a different task at different times of the day
- Capable of being digitally enabled/disabled over the bus on a per button or per switch basis

**Advanced Programming Features:**
- Programmable Status LED logic
- Adjustable debounce time to avoid accidental trigger
- Audible beep alert for warning or switch locating
- Alternate button programming to allow more flexibility of use, for example the same button can perform a different task at different times of the day
- Capable of being digitally enabled/disabled over the bus on a per button or per switch basis

**Specifications:**

- **Dimensions:** 1.3" w x 4" h x 1.3" d
- **Switch plate:** Decorator style
- **Mounting:** 2.25" deep-switch box
- **Switch addresses available:** 1–119
- **Address per switch:** 1
- **Function:** ON, OFF, Mixed, Group Control, Toggle, Scene Control
- **Programming:** Via DTC
- **Humidity:** 10–90% non-condensing
- **Ambient temperature:** 32–105°F (0–41°C)
- **Power supply:** Powered from GR 2400 bus
- **Bus connector:** Two RJ45 connectors
- **Bus termination:** Manual end-of-line termination with jumper

Cover plate provided by contractor
**Ordering Information**

Chelsea DigitalSwitches™ are available in 1, 2, 3, 4 or 6 buttons. Center plates are available in white, ivory and brushed stainless steel. Indicator light is red and locator light is green.

---

### Chelsea Digital Switch™

<table>
<thead>
<tr>
<th>CH1</th>
<th>BWH</th>
<th>Plate Colors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Buttons</td>
<td>Single/Multicolor</td>
<td></td>
</tr>
<tr>
<td>CH1 = 1 button Chelsea</td>
<td>BWH = All buttons white</td>
<td>PWH = White plate</td>
</tr>
<tr>
<td>CH2 = 2 button Chelsea</td>
<td>BIV = All buttons ivory</td>
<td>PIV = Ivory plate</td>
</tr>
<tr>
<td>CH3 = 3 button Chelsea</td>
<td>BGY = All buttons gray</td>
<td>PST = Stainless steel plate</td>
</tr>
<tr>
<td>CH4 = 4 button Chelsea</td>
<td>BBK = All buttons black</td>
<td>PBK = Black plate</td>
</tr>
<tr>
<td>CH6 = 6 button Chelsea</td>
<td>BGR = All buttons green</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BBU = All buttons blue</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BYL = All buttons yellow</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BOR = All buttons orange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MC = Multicolored buttons</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(please select quantities from the multicolor button section)</td>
<td></td>
</tr>
</tbody>
</table>

#### Multicolor Button Colors

<table>
<thead>
<tr>
<th>Button Quantity</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1B = 1 button</td>
<td>WH = White</td>
</tr>
<tr>
<td>2B = 2 buttons</td>
<td>IV = Ivory</td>
</tr>
<tr>
<td>3B = 3 buttons</td>
<td>GY = Grey</td>
</tr>
<tr>
<td>4B = 4 buttons</td>
<td>BK = Black</td>
</tr>
<tr>
<td>5B = 5 buttons</td>
<td>RD = Red</td>
</tr>
<tr>
<td></td>
<td>GR = Green</td>
</tr>
<tr>
<td></td>
<td>BU = Blue</td>
</tr>
<tr>
<td></td>
<td>YL = Yellow</td>
</tr>
<tr>
<td></td>
<td>OR = Orange</td>
</tr>
</tbody>
</table>

#### Multicolor Examples:

- CH6 MC 2BWH 4BBK PST
- CH4 MC 2BBU 1BGR 1BYL PWH

- 6 button Chelsea with white and black buttons on a stainless steel faceplate
- 4 button Chelsea with blue, green, and yellow buttons on a white faceplate

**Button Quantity** represents the number of buttons on a switch that will be in the selected color—number may not exceed total number of buttons on switch - total of all button color quantities must equal total number of buttons on switch (refer to examples).

**Examples:**

- CH6 BWH PWH = 6 button Chelsea with all white buttons and a white faceplate
- CH3 MC 1BRD 2BBK PST = 3 button Chelsea with 1 red button, 2 black buttons, and a stainless steel faceplate

---

**ORDERING LOGIC**

Cat. 5 patch cable with RJ45 connectors • Up to 127 digital addresses • Up to 4,000 ft.
MODEL NUMBERING SYSTEM: WSD-PDT-LV-[LENS]-[LV RELAY]-[COLOR*]-[TEMP/HUMIDITY]

**TYPICAL APPLICATIONS**
- Private Offices where occupant turns back to sensor
- Restroom with Stalls
- Storage rooms with shelving

**FEATURES**
- Patented Dual Technology with PIR/Microphonics™ Detection
- Small Motion Detection to 20 Feet
- Time Delay: 30 sec. to 20 minutes, selectable in 2.5 min. increments
- Green LED Activity Indicator
- Push-Button Programmable

**AVAILABLE OPTIONS**
- Vandal-Resistant Lens (-V)
- Isolated Low Voltage Relay (-R)
- Low Temp/Hi Humidity (-LT)

**SPECIFICATIONS**
- Size: 4.2" H x 1.8" W x 1.5" D (10.67cm x 4.57cm x 3.81cm)
- Sensor Weight: 5 Ounces
- Colors: Ivory, White, Gray, Almond
- Mounting Height: 30 to 48 inches
- Relative Humidity: 20 to 90% non-condensing
- Operating Temp: 14° to 85° F (-10° to 29° C)
- Storage Temp: -14° to 160° F (-26° to 71° C)
- Operating Voltage: 12-24 VAC/VDC
- UL and CUL Listed
- 5 Year Warranty
- Made in U.S.A.

**LOW TEMP/HI HUMIDITY (-LT)**
- Conformally coated Circuit Board is corrosion resistant from moisture
- Operates down to -4° F (-20°C)

**LOW VOLTAGE RELAY OPTION (WSD-PDT-LV-R)**
To enable a sensor to interface with a building management system, the -R option provides dry contact closure via a SPDT, 1 Amp, 40 Volt relay. The relay is energized while the sensor registers “Unoccupied”. The relay is then de-energized when the sensor registers “Occupied”.

**Sensors with Passive Dual Technology (PDT) first “See” motion using Passive Infrared (PIR) and then engage Microphonics™ to “Hear” sounds that indicate continued occupancy. This patented technology uses Automatic Gain Control (AGC) to dynamically self adapt a sensor to its environment by filtering out constant background noise and detecting only noises typical of human activity. When occupancy is detected, a DC output goes high and can drive up to 200 mA of connected load. The sensor is powered with 12-24 VAC/VDC and typically operates with a PP-20 or MP-20 Power Pack; enabling complete 20 Amp circuits to be controlled. An internal timer, factory set at 10 minutes, keeps the lights “On” during brief periods of no activity. This timer is selectable at 2.5 minute increments from 30 seconds to 20 minutes, and is reset every time occupancy is re-detected. If needed, a 10 second grace period also allows the lights to be voice reactivated after shutting off.

**SENSORS OPERATIONS**

DUAL TECHNOLOGY in a low voltage Wall Switch Sensor!

The **WSD-PDT-LV Series** is by far the most powerful Decorator occupancy sensor ever invented. This sensor combines Passive Infrared (PIR) detection with patented Microphonics™; enabling it to literally “See & Hear” occupants in areas with or without obstructions. A user programmable time delay ensures that once the room is vacated the sensor will time out and turn off the lights. **WSD-PDT-LV** sensors also have additional On Modes and Switch Modes that are all fully programmable using the front push-button. Additionally, the **WSD-PDT-LV** offers a Vandal Resistant version for high abuse or public areas.
WIRING INSTRUCTIONS
Wire lead connections are Class II, 18 to 22 AWG.

OPERATIONAL MODES
On Modes (*Default)
- **Automatic On** - The sensor automatically turns the lights on when the sensor detects occupancy.
- **Manual On** - The occupant must push the sensor’s button to turn the lights on.
- **Reduced Turn-On** - The sensor is set to initially only detect large motions, effectively ignoring any reflected PIR signals while still sensing occupants when they enter the room. Once on, the sensor returns to maximum sensitivity.

Switch Modes
The default operation of the push-button switch will turn the lights off no matter what the occupancy state. The lights will stay off until the switch is pressed again, restoring the sensor to Automatic On.

Other switch modes include:
- **Switch Disable** - Prevents user from manually turning off the lights via the push-button.
- **Predictive Off** - Pressing the switch overrides the lights off and disables the occupancy detection. After an exit time delay (default 10 seconds) the occupancy detection reactivates and monitors for an additional grace period time (default 10 seconds). If no occupancy is detected during this period, the sensor will revert to Automatic On operation.
  - If occupancy is detected, the sensor will remain in permanent off mode requiring the switch to be pressed again in order to restore the sensor to Automatic On.

AREA OF COVERAGE:
The PIR collector beams view out horizontally in a wall-to-wall pattern. The beams will see out to 50 feet, however, their effectiveness with **Standard Lens** is 20 feet for small hand or body motions and 10 feet for the **Vandal Resistant** lens. The Microphonics™ will detect normal human activity up to 20 feet, but will detect greater distances in spaces with hard floors or very quiet rooms with little or no background noise.

STANDARD vs. VANDAL RESISTANT LENS
The Standard lens should be used in typical offices or rooms where occupants work for extended periods of time. The Vandal Resistant lens should be used in high abuse or public areas, where occupants simply come and go and make larger types of motions. Copy rooms, small public restrooms, storage or janitor’s closets are ideal applications. A sensor with a Vandal Resistant lens will have its PIR detection range reduced by 50%, however the Microphonics™ range is not affected.

LOW VOLTAGE RELAY OPTION WIRING
GRAY / BROWN – Connected during Occupied state
VIOLET / BROWN – Connected during Unoccupied state
Note: Relay is energized during Unoccupied state and must have power at all times to function.

**STANDARD WSD-LV**
RED – 12 to 24 VAC/VDC
BLACK – Common
WHITE – Output (High DC for Occupancy)

**LOW VOLTAGE RELAY OPTION WIRING**
GRAY / BROWN – Connected during Occupied state
VIOLET / BROWN – Connected during Unoccupied state

Note: Relay is energized during Unoccupied state and must have power at all times to function.
STANDARD RANGE 360° SENSOR
CEILING MOUNT • LOW VOLTAGE • DUAL TECHNOLOGY (PDT)

OVERVIEW
Open area office lighting control is made cost-effective with the use of the CM PDT 9 Series Standard Range 360° occupancy sensor. This sensor provides line-of-sight PIR detection of small motion in a circular pattern, and combines overlapping Microphonics™ coverage for detection of occupants working in their cubicle space. By installing multiple CM PDT 9s on 30 ft (9.14 m) centers, large control zones are created (typically one per circuit of lighting). The lighting is then controlled in blocks similar to manual switching. Restrooms with stalls, large storage areas with shelving, and libraries with study carrels are also easily and cost-effectively controlled by the CM PDT 9.

SENSOR OPERATION
Sensors with Passive Dual Technology (PDT) first see motion using 100% digital Passive Infrared (PIR) detection and then engage Microphonics™ to hear sounds that indicate continued occupancy. This patented technology uses Automatic Gain Control (AGC) to dynamically self adapt a sensor to its environment by filtering out constant background noise and registering only noises typical of human activity. When occupancy is detected, a DC output goes high and can drive up to 200 mA of connected load. If needed, a 10 second grace period also allows the lights to be reactivated after shutting off. The sensor is powered with 12-24 VAC/VDC and typically operates with a PP20 or MP20 power pack, enabling complete 20 Amp circuits to be controlled.

LAMPMAXIMIZER® TECHNOLOGY
• Protects Lamp Life while Maximizing Energy Savings
• Minimum On Timer (15 min default)
• Occ. Time Delay (10 min default)
• LampMaximizer+ Mode - Optimizes Lamp Life & Energy Savings (disabled by default)
• Switch Counter (in 1000’s)
• Total Lamp On Time (in khrs)

PHYSICAL SPECS
SIZE 4.55” Dia. (11.56 cm)
1.55” Deep (3.94 cm)
WEIGHT 6 oz
MOUNTING
Ceiling Tile Surface
3.5” Octagon Box
Single Gang Handy Box
COLOR White

ELECTRICAL SPECS
OPERATING VOLTAGE 12-24 VAC/VDC
CURRENT DRAW Standard, 4 mA
w/ R option, 16 mA
DIMMING LOAD Sinks < 20mA;
~40 Ballasts @ .5mA each
RECOMMENDED POWER PACK PP20

ENVIRONMENTAL SPECS
OPERATING TEMP 14° to 160° F (-10° to 71° C)
STORAGE TEMP -14° to 160° F (-26° to 71° C)
RELATIVE HUMIDITY 20 to 90% non-condensing
SILICONE FREE
ROHS COMPLIANT

OPTIONS
LOW VOLTAGE RELAY (R)
• Enables sensors to interface with other systems (e.g., BMS, lighting panels)
• Provides dry contact closure via a SPDT, 1 Amp, 40 Volt relay
• Only one relay needed per zone
• Changes state when all connected sensors register unoccupied
• Relay requires sensor power to function

OCCUPANCY CONTROLLED DIMMING (D)
• Provides dimming output to control 0-10 VDC dimmable ballasts
• Provides a second occupancy time-out period that enables the lights to go to a dim setting before turning off
• Adjustable max/min dim setting
• Only one sensor per zone needs to have dimming output

PHOTOCELL (P)
• Auto set-point calibration
• Two selectable modes of operation
• On/Off mode: Photocell has full control during periods of occupancy
• Inhibit mode: Photocell can prevent lights from turning on if adequate daylight is available, but cannot turn lights off

PHOTOCELL W/ DIMMING (ADC)
• Photocell within sensor maintains total room light level by controlling levels of 0-10 VDC dimmable ballasts
• Photocell also has full on/off control during periods of occupancy
• Provides a second occupancy time-out period that enables the lights to go to a dim setting before turning off

Note: LampMaximizer+ features not available with ADC option

LOW TEMP/HIGH HUMIDITY (LT)
• Sensor is corrosion resistant to moisture
• Operates down to -4º F (-20º C)

ORDERING INFO
CM PDT 9 [RELAY] [DIMMING/PHOTOCELL] [TEMP/HUMIDITY]
**COVERAGE PATTERN**

**9 STANDARD RANGE 360° LENS WITH MICROPHONICS™**

- Best choice for small motion (e.g. hand movements) detection
- Viewing angle of 56° in a 360° conical shaped pattern
- Provides 12 ft (3.66 m) radial coverage 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
- 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.

**SIDE VIEW**

**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
- For maximum Microphonics™ sensitivity avoid locating sensor near HVAC air diffusers

**PROGRAMMING**

Refer to instruction card IC7.001 for default settings and directions on programming the sensor via the push-button.

---

**WARRANTY:** Sensor Switch, Inc. warrants these products to be free of defects in manufacture and workmanship for a period of 60 months. Sensor Switch, Inc., upon prompt notice of such defect, will, at its option, provide a Returned Material Authorization number and repair or replace returned product.

**LIMITATIONS AND EXCLUSIONS:** This Warranty is in full lieu of all other representation and expressed and implied warranties (including the implied warranties of merchantability and fitness for use) and under no circumstances shall Sensor Switch, Inc. be liable for any incidental or consequential property damages or losses.