Benefits of Lighting Control Systems

The benefits of lighting control systems include enhanced comfort, productivity, security, environmental aesthetics and of course, energy savings. In terms of energy savings, many lighting control systems can easily pay for themselves in less than two years.

Siemens has developed two lighting control systems which are simple in both design and installation. They efficiently cover a complex range of lighting schemes with a minimal investment of time and money.

The Siemens i-3 and LCP3000EZ Lighting Control Systems have been designed to make lighting control genuinely accessible for any building, whether the need is a single ON-OFF panel, or a complicated fully networked system of control panels sequencing on-off schemes across a building. In short, lighting control is something you can do quickly and affordably.

The i-3 system is integrated into the panelboard; it is circuit breaker based. The LCP3000EZ system is relay based. For production details and pricing, please contact your nearest local Siemens sales office or contact the Siemens Call Center at 1-800-964-4114 for technical information.

Code Requirements

ANSI/ASHRAE/IESNA require positive lighting control beyond the historical light switch and circuit breaker disconnect panel. The code states: Interior lighting in non-residential buildings larger than 5000 square feet and not in operation 24 hours a day shall be controlled with an automatic control device to shut off building lighting in all spaces. This automatic control device shall function on a scheduled basis or an occupancy sensor or a signal from an other control or alarm system.

The LCP3000EZ and i-3 are California Title 24 Certified.
P1 Series Lighting Panel

i-3 Control Technology

Features

- i-NTEGRATION
  - Reduced electrical room size
  - Reduced total installation cost
  - Small footprint - up to 2 panels of 42 circuits in one section of IPS

- i-NSTALLATION
  - For use in new and existing Siemens installations
  - Reduced wiring complexity over traditional systems
  - Fits standard P1 lighting panelboard enclosures
  - Reduced labor costs

- i-NTERFACE
  - Dry-contact, Modbus, BACnet, EIB, and Analog
  - USB interface
  - Commissioning wizards
  - Touch panel

- P1 Panelboard - Panel Size
  - 18 Circuits
  - 30 Circuits
  - 42 Circuits

- Service Information
  - 3 ph/4-w, 480Y/277V AC, 208Y/120V AC
  - 1 ph/3-w, 120/240V AC
  - Up to 250A

- System is UL 916 listed

- Panel is UL 67 listed

- Panel enclosure is UL 50 listed

Note: This device/system may only be set up and used in conjunction with the instruction manuals. Installation, maintenance, and operation of this device/system may only be performed by qualified personnel. Qualified persons are defined as persons who have the skills and knowledge related to the construction and operation of the electrical equipment and installations and have received safety training to recognize and avoid the hazards involved.
P1 Series Lighting Panel

P1 Lighting Control Panel with i-3 Control Technology

Main Breaker: 250A Max.
Main Lugs Only: 250A Max.
480Y/277V Maximum 3Ø 4W

Specifications

General:
- i-3 Lighting Control Panels comply with the following standards:
  - UL 50 Enclosures
  - UL 67 Panelboards
  - UL 916 Energy Management
  - UL 489 Breakers
  - CA Title 24 certified

Operating Conditions:
- Operating: 23°F to 104°F (-5°C to 40°C)
- Storage: -13°F to 158°F (-25°C to 70°C)

Controllers: I/O and System:
- I/O Mapping
- Configurable Zones
- Up to 480 scheduled events (System Controller Only)
- LCD color touchscreen (System Controller Only)
- USB Interface (System Controller Only)

Protocols:
- Modbus RTU
- Modbus TCP/IP
- EIB
- BACnet MSTP

I/O:
- 20 2-wire or 10 3-wire digital inputs
- Up to 2 analog inputs and 2 analog outputs

SIPODS:
- 20 and 30 amp 1 Pole and 2 pole for added flexibility
  SIPODS that can be coupled with 15, 20, 25 and 30 Amp BQD circuit breakers
- UL 489 circuit breaker accessory
- 20 Amp SIPOD is rated for 500,000 operations at full load. 30 Amp SIPOD is rated for 200,000 operations at full load.
- Same short circuit ratings as BQD breaker

P1 Panelboard dimensions

<table>
<thead>
<tr>
<th>Main Lug Gutter</th>
<th>End Gutter (Inches)</th>
<th>Neutral Location (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>125</td>
<td>10.50</td>
<td>11.50</td>
</tr>
<tr>
<td>250</td>
<td>10.50</td>
<td>11.50</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Branch Breaker Side Gutter</th>
<th>Wiring Space (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BQD + SIPOD Combo</td>
<td>3.25</td>
</tr>
<tr>
<td>BQD</td>
<td>5.50</td>
</tr>
<tr>
<td>BL</td>
<td>6.375</td>
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</table>

<table>
<thead>
<tr>
<th>BQD Circuit Breaker Interrupting Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Voltage (AC)</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>1-p</td>
</tr>
<tr>
<td>15A, 20A, 25A, 30A</td>
</tr>
<tr>
<td>2-p</td>
</tr>
<tr>
<td>15A, 20A, 25A, 30A</td>
</tr>
</tbody>
</table>
MLO/Main Breaker Location on a “Top Fed” P1 panelboard

Enclosure

BQD Breaker

SIPOD

Data Rail

Class 2 Wire Barrier

Neutral Extension

Ribbon Cable

Class 2 Wire Barrier

Neutral Extension

Ground Bar

Controller
SIPOD

SIPOD is a UL 489 circuit breaker accessory for the Siemens BQD circuit breaker and assumes the short circuit rating of the circuit breaker. See BQD circuit breaker interrupting ratings.

1. Blow-closed mechanism
2. Manual override (for contact closing)
3. Maglatch mechanism
4. Extended life 200,000 - 500,000 operations fully loaded
5. Same lug size as BQD circuit breaker
6. Integrated electronics

<table>
<thead>
<tr>
<th>System voltage</th>
<th>BQD Interrupting ratings (Amps RMS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>120V AC</td>
</tr>
<tr>
<td>1-pole 15-20A</td>
<td>65,000</td>
</tr>
<tr>
<td>2-pole 15-20A</td>
<td>-</td>
</tr>
<tr>
<td>1-pole 30A</td>
<td>65,000</td>
</tr>
<tr>
<td>2-pole 30A</td>
<td>-</td>
</tr>
</tbody>
</table>

I/O controller

- Dry-contact inputs
- Modbus RTU and TCP/IP (Optional)
- BACnet MSTP
- EIB
- I/O mapping and output groups

System controller

- Dry-contact inputs
- Modbus RTU and TCP/IP
- I/O mapping and output groups
- USB interface
- Color touch screen panel
- Event scheduling and zoning
- Basic setup (wizard driven)
- Tools, overrides
- Advanced setup
- Three levels of password protection
What is a SIPOD (Siemens POD)?

A SIPOD is a remotely operated, electro-mechanical contactor that is attached to a Siemens BQD molded case circuit breaker. The SIPOD is a key component of the i-3 Control Technology lighting controls system. The SIPOD provides a set of contacts in series with the circuit breaker that allow loads to be switched ON and OFF from a remote location or according to a time schedule. The SIPOD contacts are not intended to interrupt short circuit events.

The SIPOD connects to the load side of the breaker using a conductor tab (tang) inserted into the breaker load lug. The load wiring is connected to the load lug of the SIPOD which is the same size as the circuit breaker lug. The SIPOD assumes the short circuit current rating of the attached BQD breaker due to the design of the blow closed mechanism.

What is the blow closed mechanism?

The blow closed mechanism is designed to keep the SIPOD contacts closed during short circuit and overload conditions, allowing the circuit breaker to interrupt the high current levels.

When relays are used, short circuit levels must be restricted (often to 10kA or lower).

The SIPOD avoids these concerns. The blow closed mechanism is designed to keep the SIPOD contacts closed during overload and short circuit events.

The SIPOD switching mechanism is created through implementation of a maglatch mechanism.

The SIPOD matches the short circuit ratings of the BQD breaker.

The maglatch mechanism requires approximately 1.7A @ 24VDC for 2-25 milliseconds to break continuity in less than 4.5 milliseconds. The lower voltage results in a much longer mechanical life. The maglatch mechanism allows the SIPOD to operate quietly (only the sound of the contacts striking can be heard) with lower power, and operate rapidly without unnecessary complexity.

To learn more about the SIPOD and i-3 control technology in general, visit the product webpage:

www.usa.siemens.com/i-3

or contact your local Siemens sales office.
System Connections Layout

Building Automation System (ModBus or BACnet Master)

- Modbus or BACnet communications bus (22-18 AWG shielded copper wire)
- Modbus or BACnet communications connector

Twisted pair, 18 AWG solid copper wire (Maximum total wire length 3,300 ft.)

Twisted pair, 18 AWG solid copper wire with EIB connector (Recommended: Belden 6320)
Emergency Lighting Circuits Control Application

The emergency lights control is accomplished with a two-pole circuit breaker, one pole is controlled with an i-3 SIPOD. Both poles of the circuit breaker are connected to the same phase; this is meant to meet NEC requirements to turn the emergency lights ON in case of a power failure. The controlled pole feeds the standard ballast of the light fixture, which operates under normal conditions. The non-controlled pole is connected to the emergency ballast of the light fixture in order to keep the emergency ballast battery charged at all times. In case of a power outage, the sensor circuit in the emergency ballast switches the lights to be powered by the emergency ballast battery.
## P1 Series Lighting Panel
### i-3 Control Technology

#### Replacement Parts

### i-3 Replacement Parts

<table>
<thead>
<tr>
<th>Diagram Identifier</th>
<th>Part Description</th>
<th>Catalog Number</th>
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</thead>
<tbody>
<tr>
<td>1§</td>
<td>18 Circuit i-3 P1-250 Deadfront</td>
<td>11-D-3155-01</td>
</tr>
<tr>
<td>1§</td>
<td>30 Circuit i-3 P1-250 Deadfront</td>
<td>11-D-3155-02</td>
</tr>
<tr>
<td>1§</td>
<td>42 Circuit i-3 P1-250 Deadfront</td>
<td>11-D-3155-03</td>
</tr>
<tr>
<td>2§</td>
<td>1/2” Diameter Hole Plug for Deadfront</td>
<td>11-1836-01</td>
</tr>
<tr>
<td>3§</td>
<td>Breaker Filler Plate</td>
<td>QF3</td>
</tr>
<tr>
<td>4§</td>
<td>BQD 15 Amp 1 Pole</td>
<td>BQD115</td>
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<tr>
<td>4§</td>
<td>BQD 20 Amp 1 Pole</td>
<td>BQD120</td>
</tr>
<tr>
<td>4§</td>
<td>BQD 15 Amp 2 Pole</td>
<td>BQD215</td>
</tr>
<tr>
<td>4§</td>
<td>BQD 20 Amp 2 Pole</td>
<td>BQD220</td>
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<tr>
<td>4§</td>
<td>BQD 30 Amp 1 Pole</td>
<td>BQD130</td>
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<td>4§</td>
<td>BQD 30 Amp 2 Pole</td>
<td>BQD230</td>
</tr>
<tr>
<td>5§</td>
<td>Neutral Extension (Right)</td>
<td>11-A-3555-01</td>
</tr>
<tr>
<td>5§</td>
<td>Neutral Extension (Left)</td>
<td>11-A-3555-02</td>
</tr>
</tbody>
</table>

§ Can be replaced by user.  
§ Must be replaced by a Siemens trained technician or licensed electrician.  
§ Must be replaced by a Siemens trained technician.
P1 Series Lighting Panel

i-3 Features Selection Requirements for an Installation

START
Selection of required features

P1 250 Amp (Max) 1 or 2 pole 15, 20, 25 or 30 Amp BQD breakers for controlled circuits

Bus opposite end to the incoming line it is not available. No TVSS nor sub feed lugs or feed through are allowed.

End of bus opposite to incoming line is available

Yes

1 and 2 pole, 15, 20, 25 and 30 Amp controlled circuits are available.

Yes

30 Amp or less controlled circuits are required

Yes

Emergency Lights Control required

Yes/No

20 two wire digital inputs, or less, per panel is required

Yes

2 analog inputs, and 2 analog outputs per panel is required

Yes

Single panel or up to 8 panels on stand alone network (or BAS is involved)

Networked with BAS Modbus RTU, Modbus TCP/IP or BACnet MSTP or dry contacts

LAN Communications required (Modbus TCP/IP)

Modbus TCP/IP

Ethernet connectivity required

Yes/No

i-3 Control Technology Lighting Controls system MEETS your requirements

Not available at this time

Higher than 250 Amp

Yes

More than 30 Amps or 3 poles

Yes

More than 20

Yes

More than 2

Stand alone more than 8 panels

Modbus TCP/IP or other

BACnet/IP or other

BACnet/IP or other

Yes/No

Yes

More than 30 Amps or 3 poles

Yes

More than 20

Yes

More than 2

Stand alone more than 8 panels

Modbus TCP/IP or other

BACnet/IP or other

BACnet/IP or other

Yes/No

Yes

Bus opposite end to the incoming line is not available. No TVSS nor sub feed lugs or feed through are allowed.

To comply with NEC 700.12(f).

Maximum number of two wire digital inputs per panel is 20

Maximum number of analog inputs and outputs per panel is 2

On a stand alone system (no BAS), the maximum number of panels on a network is 8. One System Controller and up to 7 EIB I/O controllers

Gateway supplied by others may be required if the communications protocol is different from the list

BACnet/IP is not available. Use a gateway (supplied by others)

SIEMENS software will be provided. No embedded Web pages are available