



LCM-IE

INTERIOR / EXTERIOR

Lighting Control Systems

PROJECT _____

LOCATION _____

Lighting Control Devices

A. General

1. The basic switching system shall consist of a microprocessor-based control module with either 2-, 3-, 4- or 6-single pole power relays, each with an integrated Hand-Off-Auto (HOA) switch, and a DIN rail to mount electrically-held multipole lighting contactors as needed.
2. System shall be enclosed in a hinged-door NEMA 1 electrostatically painted enclosure with adequate space to meet all appropriate local and national codes. Additional enclosure options (i.e., NEMA-3R, NEMA-4X and NEMA-12, etc.) shall be available for special applications.
3. Each power relay shall be individually controlled by the system microprocessor controller in one of eight operational logic choices that can be selected in the field.
4. All components and enclosures shall be mounted in electrical closets or as indicated on the drawings.
5. Device shall be a PLC Multipoint LCM-IE model number.

B. Controller

1. Controller components shall be powered by 120 or 277VAC and shall have a minimum 40-character LCD display located on front to input operational settings and display current settings and conditions.
2. System shall be pre-programmed thus allowing selection of operation parameters when installed.
3. All operating parameters can be adjusted from the face of the control module.
4. The program shall be stored in flashmemory, along with set points, accumulated run time hours and adjustable algorithm parameters using battery backup.
5. Controller shall have multi-channel seven-day time clock capability with automatic adjustment for daylight savings time.
6. Time switch will have the ability to be adjusted to any revised DST regulations.
7. The controller shall be enclosed with a barrier as per National Electric Code for low voltage, (24V max) and high voltage, (120VAC or greater).
8. The real time clock shall operate for 3650 days using battery backup. Photo sensor inputs shall be adapted by photo control algorithms to provide time delays before activation, hold-on timers for HID type fixtures, adjustable dead-bands and adjustable ON/OFF set points.
9. All algorithm parameters shall be read and set in the actual units they represent (i.e., light levels in foot candles or time in hours, minutes & seconds).
10. Timeclock shall have a minimum of 3650 day power backup to prevent setting lose during a power failure.
11. Timeclock shall automatically adjust for daylight savings time and leap year.
12. Timeclock shall be adjustable from the front of the control module with no external programming device.

C. Main Panel(s)

1. The main panel shall accommodate the microprocessor controller enclosed in a barrier-protected compartment, one low-voltage zone relay per specified zone, a power supply, a terminal block to make necessary connections and a DIN rail that can accommodate contactors.

D. Expansion Panel(s)

1. Expansion panels provide for the use of additional contactors available to be installed in main panels.
2. They shall include a power supply (277VAC version only); a terminal block to make signal connections to the main panel and DIN rail(s) that can accommodate contactors.

E. Enclosures

1. Main and expansion panels shall be enclosed in a NEMA-1 (or NEMA-3R, NEMA-4X or NEMA-12) type enclosures.

F. Loads Switching

1. Contactors shall be DIN-rail mounted electrically-held similar to PLC Multipoint type OP4, CP4 or OP8 contactors with electrical spacing for 600V 50/60 Hz.
3. Contactors shall have electrical ratings of 20A ballast loads, 30A resistive loads, 30A general load per pole and be lighting rated.
4. Mechanical life of contactors shall be 10,000,000 operations.
5. Multiple-pole contactors shall be used and grouped per zone control requirements.
6. Contactors shall be controlled by 120VAC.

G. Remote Switches

1. Remote Switches shall be momentary pushbutton dry contact inputs to the main panel.
2. Remote Switches shall conduct 24VDC
3. Remote Switches shall have LED indication lights showing zone status.
4. Remote Switches shall be available in two packages.
 - a. Wall plate pushbutton
 - b. Industrial switch station with cast housing

H. Photo Sensor(s)

1. Photo sensors shall be specifically designed to operate with the environment in which they are placed, and shall provide a 1-10 VDC signal to the input of the controller. This signal shall be directly proportional to the amount of daylight entering the monitored area.
2. Sensor range shall be from a minimum of 0FC to an adjustable range to 7,500FC maximum. Actual range shall be, 0-55FC indoor low light; 0-100FC for indoor normal light; 0-250FC for outdoor; 0-1,000FC for atrium; and 0-2,000FC for skylight operation unless specified on the facility drawings and shall be set at the factory and sealed against tampering in the field.
3. Foot-candle 'on' setpoint and 'off' setpoint shall be preset at the factory and field tuning adjustments shall be made at the controller.
4. Location of sensor shall be specified on the drawings and placed in such a way to prevent interference from obstacles.
5. Sensors must have an accuracy of +/- 1% at 70 degrees F or +/- 5% over a 100 degree F temperature range.
6. The sensor shall have a focusing lens to provide the proper view for the area being monitored.
7. Wiring of the sensor shall be with a shielded four-wire stranded cable rated at NEC Class 2 or 2P. It shall be #14 AWG or higher. Conductor shall be Beldon type 27082AS or equal. (Colors must match sensor conductors and are Yellow = 1-10VDC signal; red = 24VDC supply; Black = -24VDC Return; Blue = spare conductor).
8. The Photo-Sensor shall be a PLC-Multipoint or approved equal.

I. Miscellaneous

1. Contrast Lighting – Contrast Lighting should be available by changing the output relay from normally open to normally closed configuration.
2. LCM-IE 2Z or 3Z has 4th output which operates the optional beacon during a sweep sequence's grace period. The maintained contact output is closed during the 10 minutes between the end of a sweep period and the end of the grace period
3. A 50W, 120V panel heater shall have an integrated thermo-disc and shall be mounted to the inside wall of the enclosure.

J. Zone Operation Modes

1. Each zone of the LCM-IE system shall independently operate the connected lighting loads based on one of eight field selectable zone operation modes selectable on the controller.
2. Exterior – Photo: Photo sensor measures light levels and sends a 1 -10 VDC signal to controller that is compared to field adjustable selectable ON/OFF light level set points. Once light level readings reach and maintain set points, the controller automatically turns connected lighting loads ON or OFF. When HID type lamps are controlled, the system invokes a 30 minute hold on timer once these types of lamps are energized.
3. Exterior – Time: Zone lighting is energized and de-energized based on field adjustable 7 day time schedule only.
4. Exterior – Photo/Time: Time and photo control are combined to energize and de-energize connected zone lighting by ambient light levels and field adjustable 7 day time schedule.
5. Interior – HID Time: This is a time clock function only. Zone lighting is enabled based on field selectable 7 day time schedule. Lighting is only energized when remote override switch is manually activated, thus eliminating holiday scheduling input to controller
6. Interior – HID Photo/Time: Time and photo control are combined to enable zone lighting based on ambient light levels and field adjustable 7 day time schedule. Lighting is only energized when remote override switch is manually activated while ambient light level readings are above the ON set point and the time clock has enabled the zone. This option eliminates holiday scheduling input to controller
7. Exterior – Photo with Maintenance Timed Override: The controller automatically turns connected lighting loads ON or OFF. When HID type lamps are controlled, the system invokes a 30 minute hold on timer once these types of lamps are energized. This option includes a remote override switch that allows the exterior lighting fixtures to be energized for a thirty minute period when manually activated. This allows daytime maintenance to be performed on all exterior lighting and insures that control of this zone reverts back to the photo control function once the timed override expires
8. Interior – Time with Timed Override & Sweep Sequence: This is a time clock enabled function only. The lighting is energized when remote override switch is manually activated during the enabled timed periods. Once activated the lighting remains ON till the end of day based on field adjustable 7 day time clock settings. Ten minutes prior to the lighting being automatically turned off, the lighting connected to this zone will flash ON/OFF for 3 seconds. The flash followed by a ten minute grace period before the lights automatically turn off. A remote override switch has to be manually activated to begin a two hour after-hours sweep sequence. Once the two hour operation sequence expires, the lights automatically turn off unless the override switch has been manually activated once again. The same sequence can be used to energize the lighting during an after hours situation where the time clock has turned the lighting off based on selected time schedule. This option eliminates holiday scheduling input to controller.
9. Interior – Photo/Time with Timed Override & Sweep Sequence: Time and photo control are combined to enable zone lighting based on ambient light levels and a field adjustable 7 day time schedule. Lighting is only energized when a remote override switch is manually activated while ambient light level readings are above the “On” set point. Ten minutes prior to lighting being automatically turned off, lighting connected to this zone flash On/Off for 3 seconds. This is followed by a ten minute grace period before the lights automatically turn off unless remote override switch has been manually activated to begin a two hour after-hours operation sequence. Once the two hour operation sequence expires, the lights automatically turn off or the override switch has to be manually activated once again. The same sequence can be used to energize the lighting during an after hours situation where the time clock has turned the lighting off based on selected time schedule. This option eliminates holiday scheduling input to controller.