



LCM-IE

INTERIOR/ EXTERIOR LIGHTING CONTROL PANEL

INSTALLATION AND MAINTENANCE MANUAL (IMM)



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INTRODUCTION

1.1 GENERAL

Please read these instructions carefully to prevent any possible injury or equipment damage. For installation of the product, the installer must be a qualified and experienced technician. Prior to any installation, inspect the panel for damage and verify the product ratings to confirm that this product will satisfy your requirements and application.

1.2 SYSTEM OVERVIEW

The LCM-IE Series Interior / Exterior Lighting Control Panel is a versatile controller. The LCM-IE series control panel is capable of supporting 2, 3, 4, or 6 zones with photo control, time clock, remote switching, and timed override with sweep sequence programs for each zone. A maximum of 48 circuits can be accommodated in each base panel (4-6 zones) and up to 96 circuits in each expansion panel.

The PLC contains a LCD screen that prompts the user to enter Photo Sensor set-points limits and time schedules which are saved in flash-memory.

Adjustments to the settings and schedules can be made with pushbuttons on the controller face. Time clock schedule switch operations use the internal real-time clock which is battery backed and accurate to one second / month and can be adjusted for daylight savings time and leap years unless otherwise specified.

Advantages of the LCM-IE series are found in the system's stability, versatility, quantity, and accuracy. Once mounted, the sensor, power, and lighting loads need only to be wired and the LCM-IE is ready to operate.

For product safety; the LCM-IE Series Interior / Exterior Lighting Control Panel is ETL approved and marked with the ETL symbol for product safety. This certification is shown by the data plate on each panel.

1.3 PURPOSE

This document is created as an aide in installing, operating, and troubleshooting the LCM-IE Lighting Panel.

1.4 SCOPE

This user's guide is intended to give the purchaser and operators of the LCM-IE Lighting Control Panel instruction for installation, set-up, and operation of the LCM-IE Lighting System. Added to the user's guide is a troubleshooting section to help if a possible repair need should arise.

1.5 DOCUMENTATION

CES- Sensors Installation and Maintenance Manual (IMM) Part No 5150XT Rev 1/22/09
LCM-IE 1/2/3 Zone Operation Sequence Manual Rev. 8.0
Remote Switch Installation guide (to include ROT2, IROT2, and SWPB1)
Contactor Installation guide (to include OP4, OP8, and CP4)
Warring Beacon guide (FLB)

1.6 ABBREVIATIONS

ETL	Electrical Testing Laboratory
UL	Underwriters Laboratories
ANSI	American National Standards Institute
NEC	National Electric Code
NFPA	National Fire Protection Association
IES	Illuminating Engineering Society
NEMA	National Electrical Manufacturers Association

1.7 EQUIPMENT

Instructions

- LCM-IE Operation Sequence Manual
- Photo Sensor installation Guide

Voltage Measuring Device (AC and DC)
DMM or Analog Voltage Meter

Hand tools

- Small 1/4" and large flat screw driver
- #1 and #2 Philips screw driver
- Sockets and wrench

Power Drill

- Handheld drill
- Drill Bits

2 CONFIGURATION

The LCM-IE Series Interior / Exterior Lighting Control Panel have been designed with safety in mind. The controller is located in the low voltage compartment of the enclosure. The LCM-IE controller is housed in a surface mount NEMA TYPE 1, hinged door, and gray painted steel enclosure. High and low voltage compartments are separated by NEC/NFPA mandated voltage barriers. The entire assembly is constructed to ANSI/UL508A and CSAC22.2-14M91 standards and each unit carries an Electrical Testing Laboratories inspection label.

2.1 FEATURES

2, 3, 4, or 6 individual zones, each with photo control, time-clock scheduling, remote switching, and timed override with sweep sequence.

Factory-preprogrammed, field-configurable controller offers eight zone configuration modes.

Accumulated run time hours are logged.

20A zone relays include integrated hands-off-auto (HOA) switches.

Menu-driven LCD screens and front control buttons allow for easy adjustment of ON/OFF set-points.

Load switching options are available with factory-wired 4 or 8-pole 20A contactors.

Base panel accommodates up to one photodiode sensor per zone, available in indoor, outdoor, atrium, and skylight models.

Photo mode can be configured for set-up (no timers) or auto (full program).

Input Photo Sensor time delay prevents intermittent or false switching.

1/2 –hour Hold-On Timer prevents high intensity discharge lighting from short-cycling.

Time Clock configurable as 7-day with two ON/OFF events per day; or 7-day with optional timed override and sweep sequence.

System has a manual ON, and an Automatic OFF operation.

System does not require Holiday Programming.

2-year warranty.

2.2 TECHNICAL DATA – LCM-IE SERIES

Input Voltage:	120VAC or 277VAC.
Output Zones:	Two (2), Three (3), Four (4), or Six (6) 20A zone relays controlling optional 20A (4 or 8-pole) contactors.
Control Modes:	Displayed on LCD mode screen; SETUP, photo set-point control (no timers). AUTO, Photo Sensor control with timers (ON at low, OFF at high set-points).
Input Delay:	Photo Sensor; 60 seconds (setup mode override).
Hold-ON-Timer:	Time clock; 30 minutes (setup mode override).
Override Switches:	Internal hand-off-auto (HOA), integrated in zones relay.
Enclosure Dimensions:	2 or 3 Zone: 16"H x 12"W x 6"D (NEMA- 1 Surface Mount Enclosure) 4- or 6-Zone: 18"H x 18"W x 6"D (NEMA-1 Surface Mount Enclosure)



2.2.1 Factory Recommended Wire Sizes.

The Table below lists the factory recommended wire sizes used in the insulation of the LCM-IE Series Interior / Exterior Lighting Control Panel.

Device	Min AWG	Max AWG	Recommended AWG
Control Power	16	12	14
Output Power	14	10	12
Photo Sensor Inputs	22	18	18
Remote Override Switches	22	18	18

Table 1:
Suggested Wire Sizes

2.2.2 LCM-IE Series Lighting Panel, 2 and 3 Zone, 120VAC

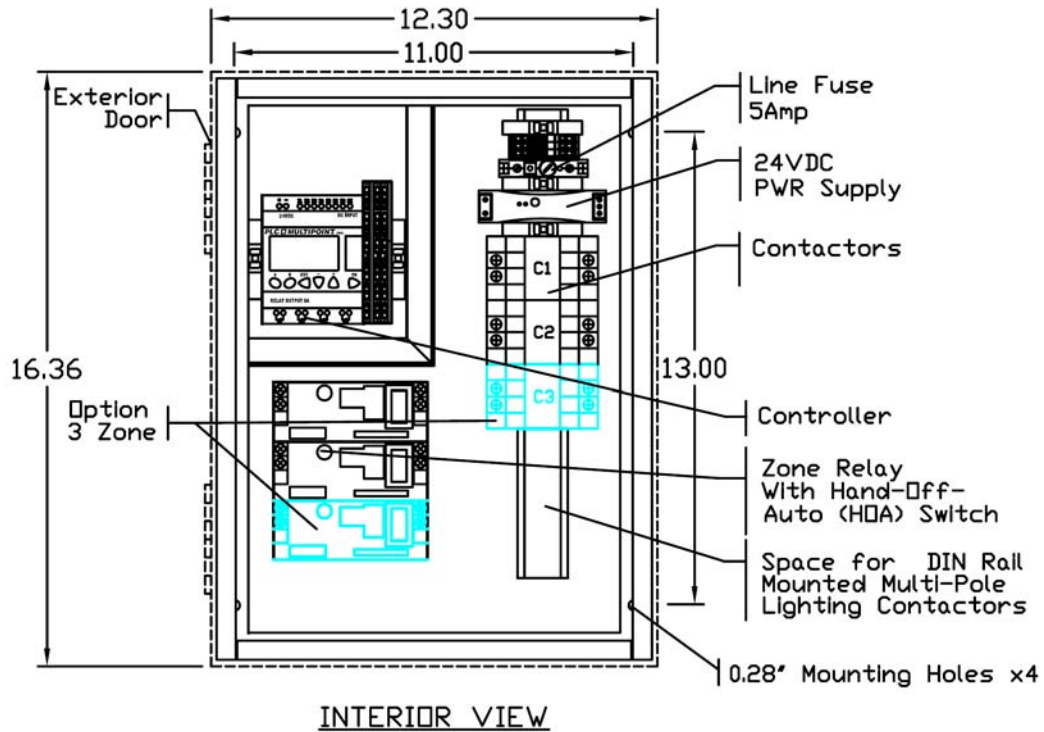


Figure 1:
LCM-IE 2-Zone & LCM-IE 3-Zone Layout

2.2.3 LCM-IE Series Lighting Panel, 4 and 6 Zone, 120VAC

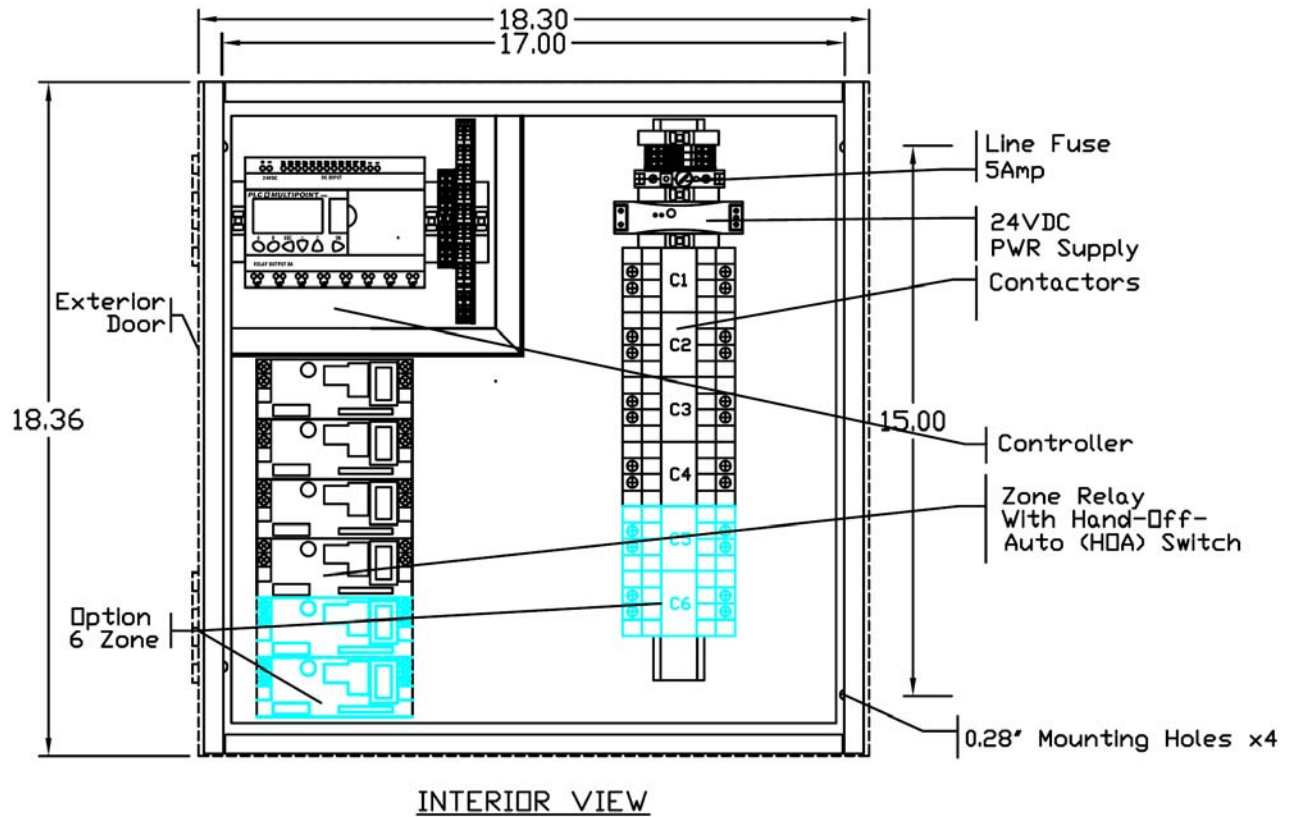


Figure 2:
LCM-IE 4-Zone Layout & LCM-IE 6-Zone Layout

2.2.4 LCM-IE Series Lighting Small Contactor Expansion Panel

XPS; Small Contactor Expansion Panel (NEMA-1 type enclosure including a terminal block and DIN rail capable of mounting a maximum of four 4- or 8-pole contactors).

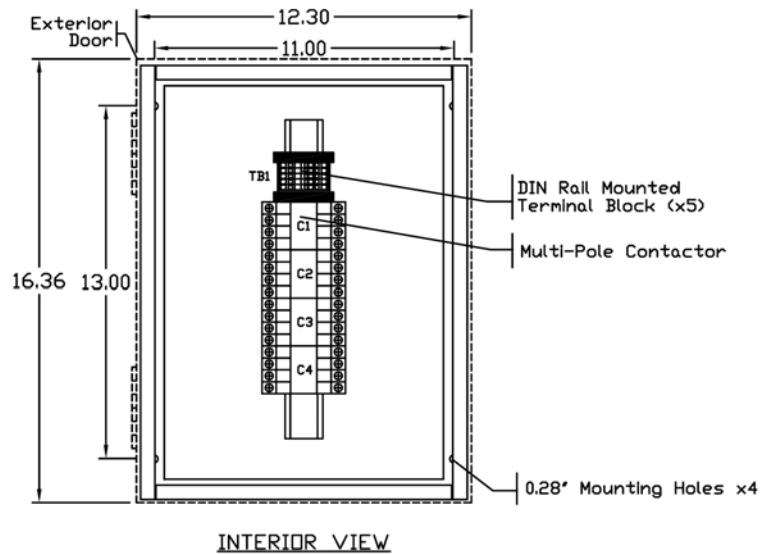


Figure 3:
LCM-IE Small Expansion Panel Layout

2.2.5 LCM-IE Series Lighting Large Contactor Expansion Panel

XPL; Large Contactor Expansion Panel (NEMA-1 type enclosure including two terminal blocks and DIN rails capable of mounting a maximum of eight 4- or 8-pole contactors).

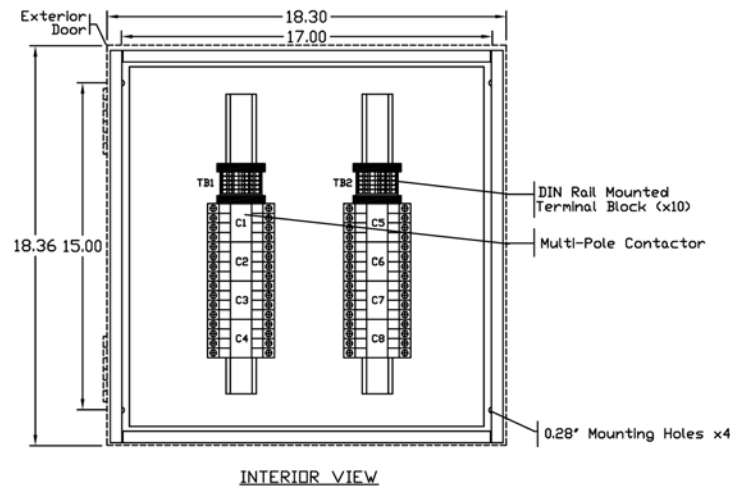
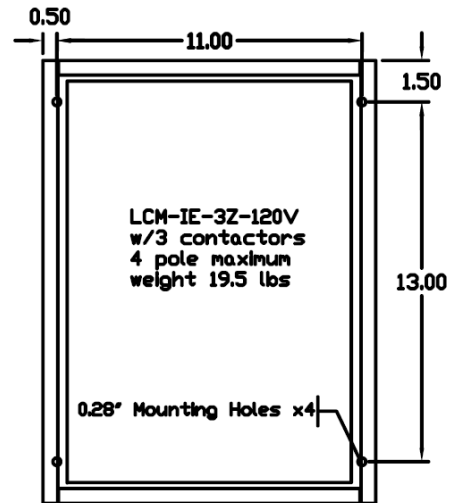


Figure 4:
LCM-IE Large Expansion Panel Layout

3 INSTALLATION

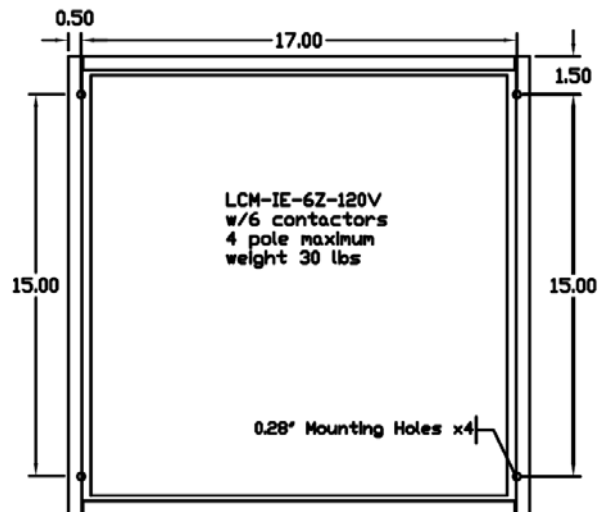
3.1 PANEL MOUNTING

The LCM IE Lighting System panel (NEMA- 1 Surface Mount Enclosure) is mounted to a structure by four 0.28" mounting holes located in the back of each panel. Each hole will accept a #1/4-20 fastener (secure the panel to the structure using hardware listed by your local code). [Figure 5 and 6: NEMA – 1 Surface Mount Enclosures](#) below shows the dimensions and footprint of the mounting holes, with the maximum weights of each panel.



INTERIOR VIEW

**Figure 5:
NEMA-1 Surface Mount Enclosure LCM IE 2 and 3 Zones**



INTERIOR VIEW

**Figure 6:
NEMA-1 Surface Mount Enclosure LCM IE 4 and 6 Zones**

3.2 PANEL WIRING

There are up to four types of field wiring requiring connections when installing an LCM-IE. Control Power, Output Load, Photo Sensor Input, and Remote Override Switch Input (which may or may not include a Pilot Light connection). Wire size; refer to [Table 1, Suggested Wire Sizes](#)

WARNING: Working with high-voltage can be dangerous; whenever possible turn the LCM-IE Lighting System OFF at the incoming power breaker when working with the system.

3.2.1 LCM-IE 120V Line Control Power Connections

For 120VAC powered LCM-IEs; Line terminal blocks, Neutral terminal block, and a green/yellow Ground terminal block are mounted to TB1. The panel fuse (FU1/L 5A) is mounted located as part of the Line terminal block, shown below in [Figure 7; 120VAC Line Connections](#).

The 120V Line conductor from the appropriate circuit breaker connects to the Line terminal block, marked (L). The 120V Neutral conductor from the neutral bus bar connects to the Neutral terminal block, marked (N). The Ground conductor from the ground bus bar connects to the green/yellow Ground terminal block, marked (G).

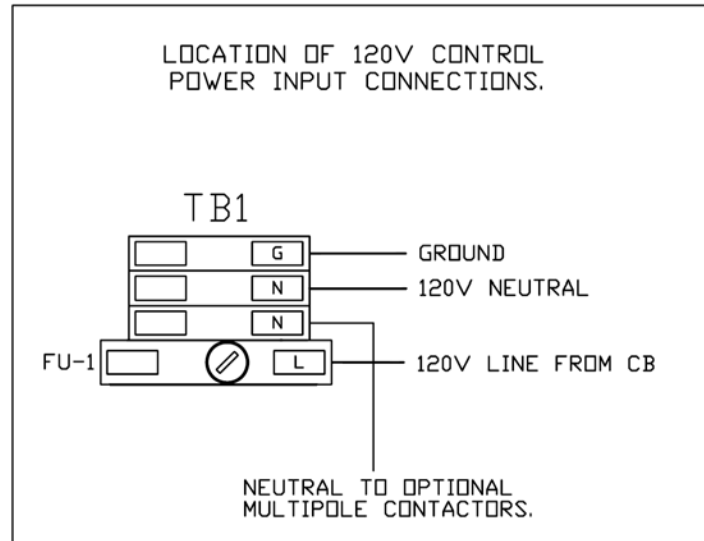


Figure 7:
LCM IE 120VAC Line Connections

3.2.2 LCM-IE 277V Line Control Power Connections

For 277V powered LCM-IEs; Line terminal blocks, Neutral terminal block, and a green/yellow Ground terminal block are mounted to TB1. The panel fuse (FNQ 1/2A) is mounted on the low-voltage barrier, shown below in [Figure 8: 277VAC Line Connections](#).

The 277V Line conductor from the appropriate circuit breaker connects to the Line terminal block, marked (L). The 277V Neutral conductor from the neutral bus bar connects to the Neutral terminal block, marked (N). The Ground conductor from the ground bus bar connects to the green/yellow Ground terminal block, marked (G).

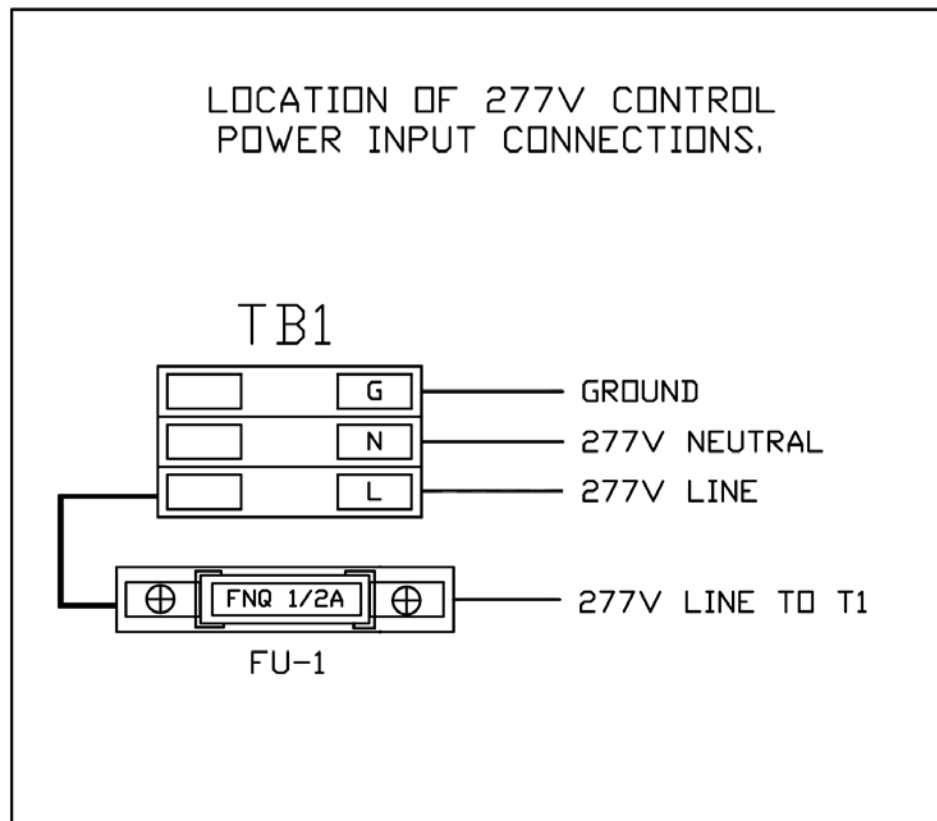


Figure 8:
LCM IE 277VAC Line Connections

3.2.3 LCM-IE 2 and 3 Zone Low Voltage Field Connections

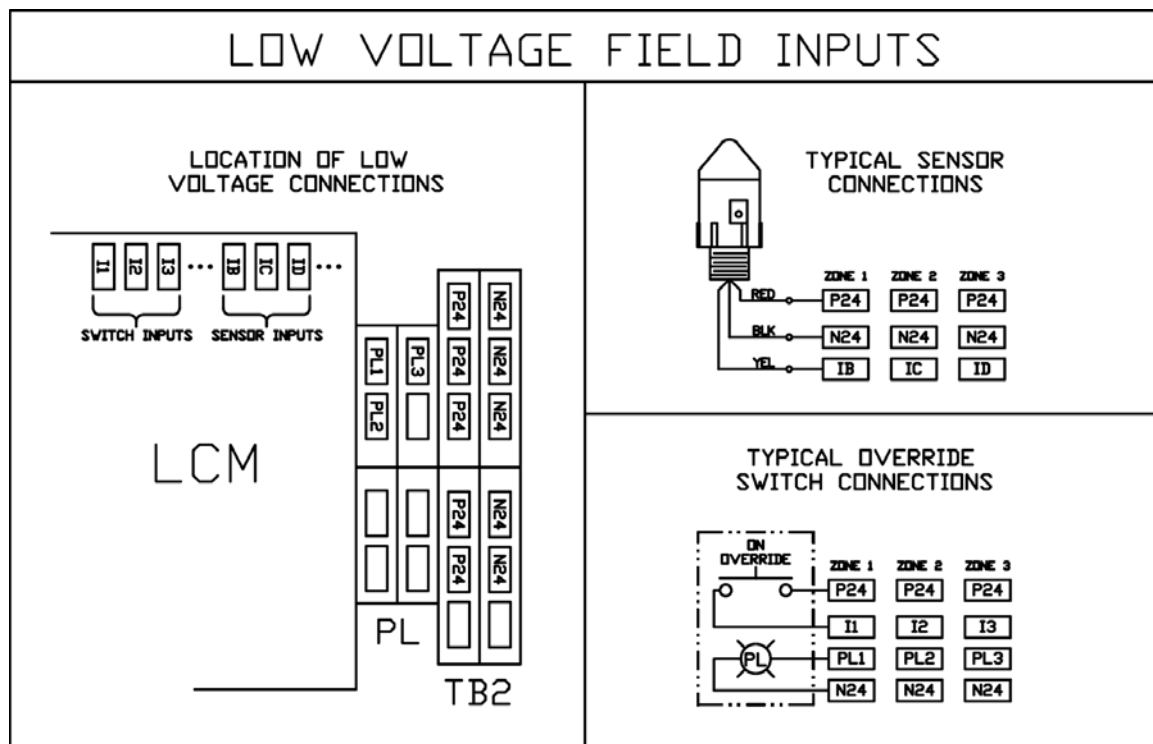
The Low Voltage Field connections are the CES Photo Sensor inputs and the Remote Switch inputs. Suggested wire size for Low Voltage Field Inputs can be found in [Table 1: Suggested Wire Sizes](#). A typical wiring method for both 2 and 3 Zone panels are shown below in [Figure 9: LCM IE 2 and 3 Zone Low Voltage Field Inputs](#). The Low Voltage section of the LCM – IE Lighting Control System is located in the top left area of the enclosure.

Sensors

The RED wire of any sensor is connected to any P24 connection of terminal TB2. The BLACK wire is the 24 volt return and is connected to any N24 connection of TB2 terminal. The YELLOW wire is the analog signal and depending control, will connect to IB (Zone 1), IC (Zone 2), or ID (Zone 3) of the controller.

Remote Override Switches

The high side of the Remote Switch is connected to any P24 connection of terminal TB2. The low side of the switch is the control input and depending on control, will connect to either I1 (Zone 1), I2 (Zone 2), or I3 (Zone 3) of the controller. Remote Switches with status Pilot lights are connected to PL1 (Zone 1), PL2 (Zone 2), or PL3 (Zone 3) of the PL terminal block. The 24V Return of the Pilot light will connect to any N24 connection of TB2.



**Figure 9:
LCM IE 2 and 3 Zone Low Voltage Field Inputs**

3.2.4 LCM-IE 4 and 6 Zone Low Voltage Field Connections

The Low Voltage Field connections are the CES Photo Sensor inputs, and the Remote Switch inputs. Suggested wire size for both Low Voltage Field Inputs can be found in [Table 1: Suggested Wire Sizes](#).

A typical wiring method for both 4 and 6 Zone panels are shown below in, [Figure 10: LCM IE 4 to 6 Zone Low Voltage Field Inputs](#). The Low Voltage section of the LCM – IE Lighting Control System is located in the top left area of the enclosure.

Sensors

The RED wire of any sensor is connected to any P24 connection of terminal TB2. The BLACK wire is the 24 volt return and is connected to any N24 connection of TB2 terminal. The YELLOW wire is the control and depending control, will connect to IB (Zone 1), IC (Zone 2), ID (Zone 3), IE (Zone 4), IF (Zone 5), or IG (Zone 6) of the controller.

Remote Override Switches

The high side of the Remote Switch is connected to any P24 connection of terminal TB2. The low side of the switch is the control input and depending control, will connect to either I1 (Zone 1), I2 (Zone 2), I3 (Zone 3), I4 (Zone 4), I5 (Zone 5), or I6 (Zone 6) of the controller. Remote Switches with status Pilot lights are connected to PL1 (Zone 1), PL2 (Zone 2), PL3 (Zone 3), PL4 (Zone 4), PL5 (Zone 5), or PL6 (Zone 6) of the PL terminal block. The 24V Return of the light will connect to any N24 connection of TB2.

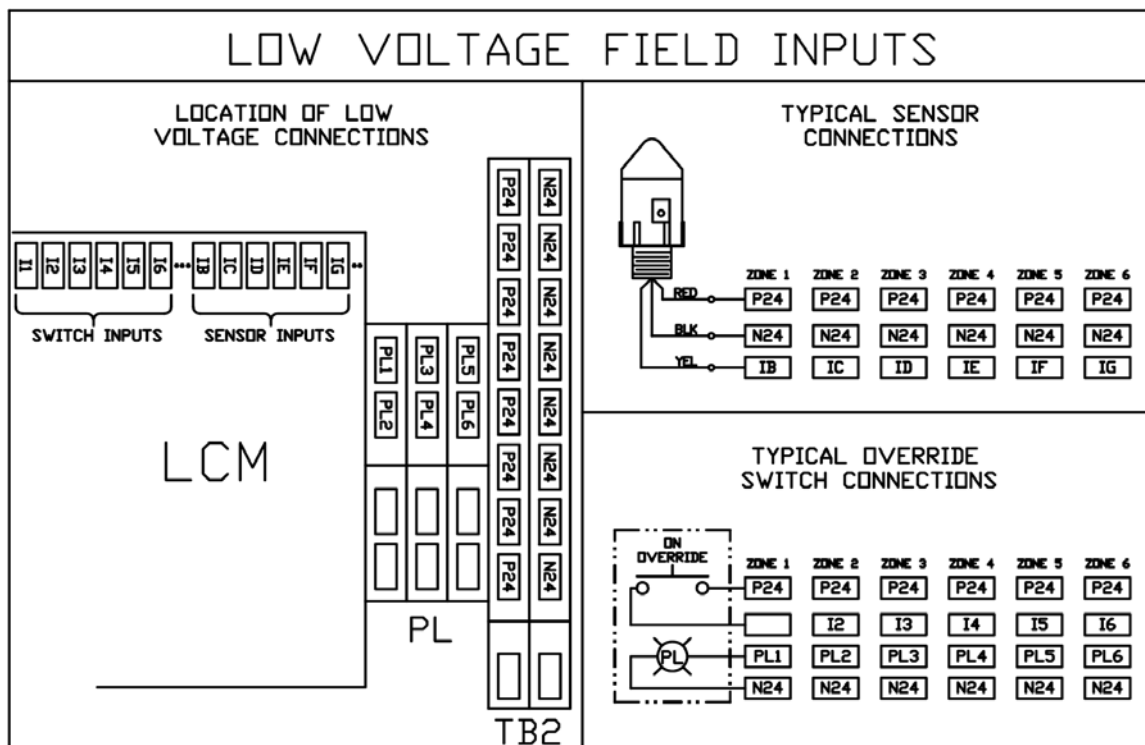
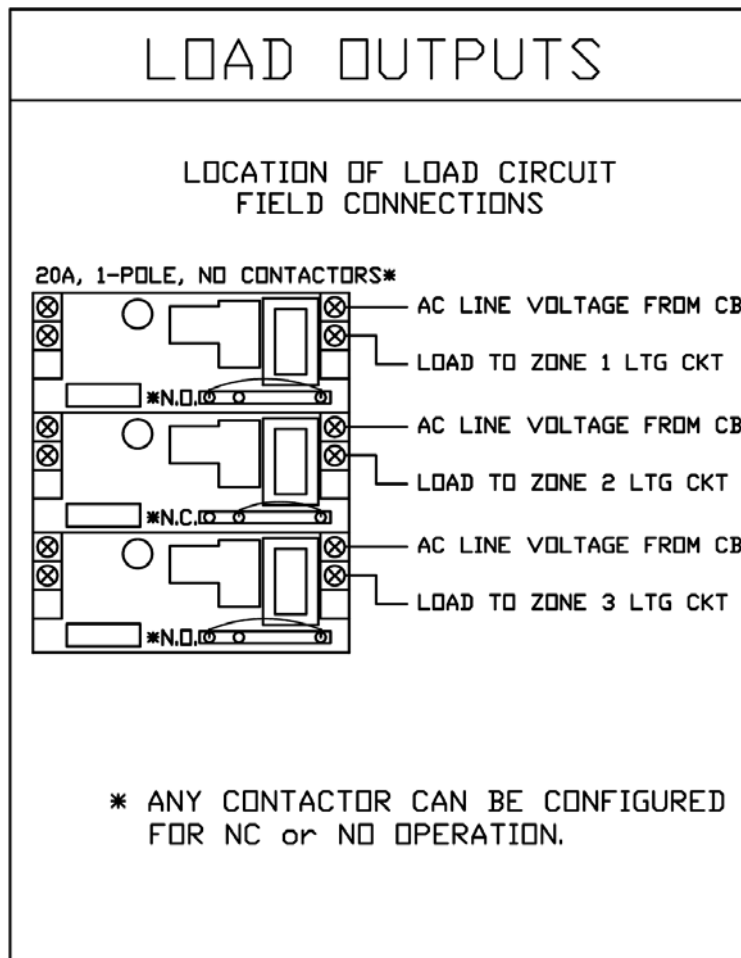


Figure 10:
LCM IE 4 and 6 Zone Low Voltage Field Inputs

3.2.5 LCM IE 2 and 3 Zone, HOA Control Switch / Convertible Output Relay Connections

A single-pole, 20 Amp internal Hand-Off-Auto (HOA) zone relay is supplied for each zone of lighting control. Each zone relay is controlled by the output of the controller. On the relay is a HOA 3-position switch (Closed = Dry contacts are CLOSED, Open = Dry Contacts are OPEN, and Auto = Dry contacts are operated by the Controller). The dry-contact is convertible to NO or NC by changing the position of a Jumper wire.

The top terminal is normally connected to the Line from the circuit breaker that feeds the zone's lighting load and the bottom terminal connects to the lighting Load, see [Figure 11: LCM IE 2 and 3 Zone HOA Relays](#).



**Figure 11:
LCM IE 2 and 3 Zone HOA Relays**

3.2.6 LCM IE 4 and 6 Zone, HOA Control Switch / Convertible Output Relay Connections

The single-pole, 20 Amp internal Hand-Off-Auto (HOA) zone relay is supplied for each zone of lighting control. Each zone relay is controlled by the output of the controller. On the relay is a HOA 3-position switch (Closed = Dry contacts are CLOSED, Open = Dry Contacts are OPEN, and Auto = Dry contacts are operated by the Controller). The dry-contact is convertible to N.O. or N.C. by changing the position of a Jumper wire. In general, the N.O. position is used. When driving a Contactor with Normally Closed Contacts, or operating in Failsafe Mode, the N.C. position is used, see [Table 10: Relay Configurations](#).

The top terminal is normally connected to the Line from the circuit breaker that feeds the zone's lighting load and the bottom terminal connects to the lighting Load, see [Figure 12: LCM IE 4 and 6 Zone HOA Relays](#).

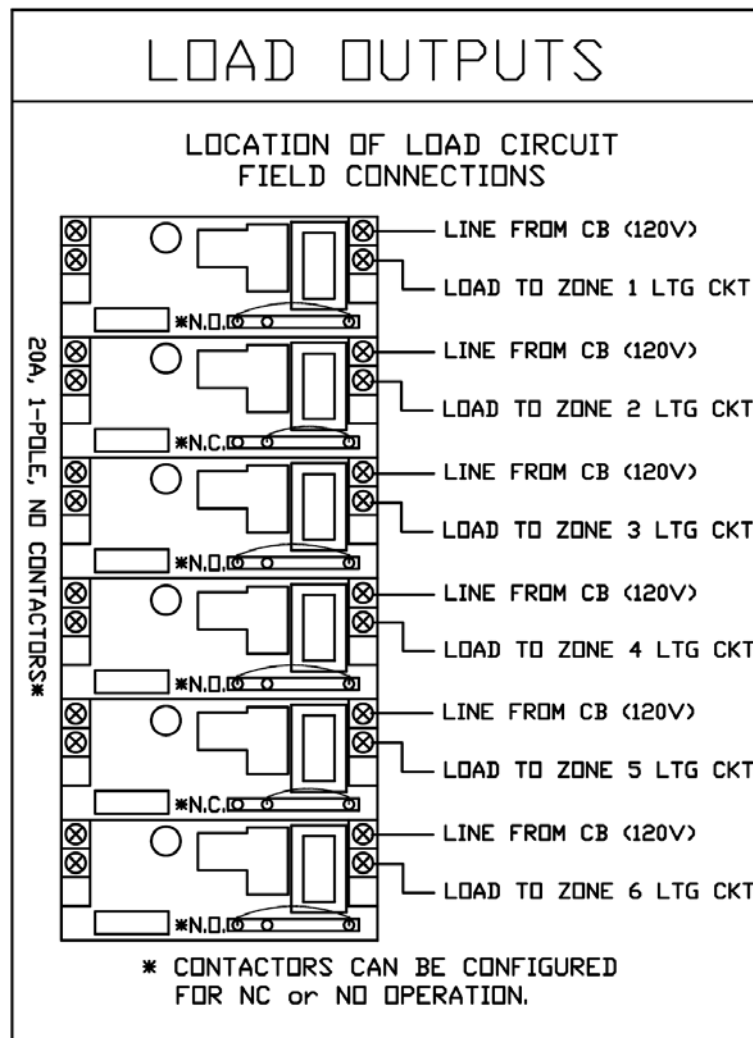


Figure 12:
LCM IE 4 and 6 Zone HOA Relays

3.2.7 LCM IE Multi-Pole Lighting Contactor

As an addition to the standard LCM-IE Lighting System, the multi-pole contactor provides control of a greater number of circuits per zone. The methods of wiring a typical multi-pole contactor are shown in Figure 13: Multi - Pole Load Outputs.

A number of multi-pole lighting contactors, rated for lighting, can be installed as accessories to the LCM IE Lighting System, they are:

OP4 - 4 pole 20A Normally Open Contactor

CP4 - 4 pole 20A Normally Closed Contactor

OP8 - 8 pole 20A Normally Open Contactor

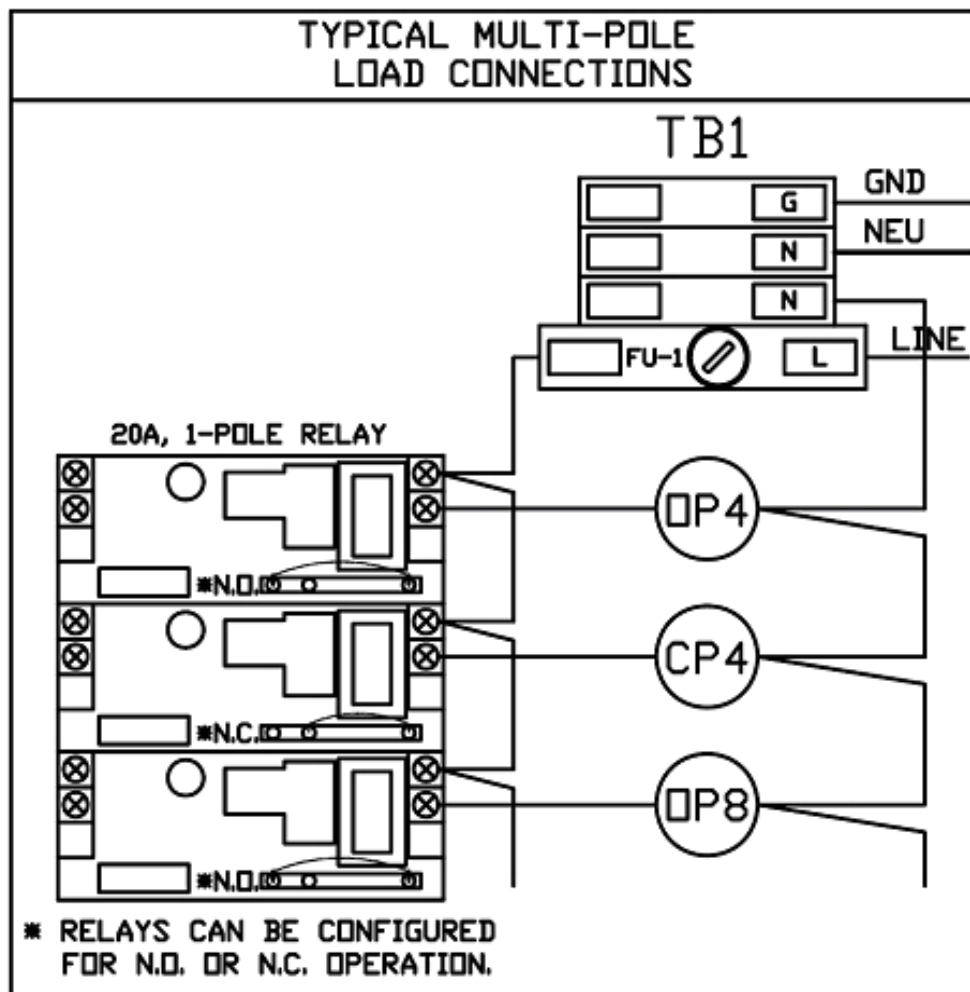


Figure 13:
Multi-Pole Load Outputs

3.2.8 LCM IE Expansion Panel Load Connections

If a greater number of Load Contactors are needed an Expansion Panel may be added to the LCM IE Lighting System. The typical Expansion Panel wiring method is shown in Figure 14: Typical Expansion Panel Load Connections.

There are two sizes of Expansion Panels, they are:

XPS; Small Contactor Expansion Panel can hold up to four 4- or 8-pole contactors.

XPL; Large Contactor Expansion Panel can hold up to eight 4- or 8-pole contactors.

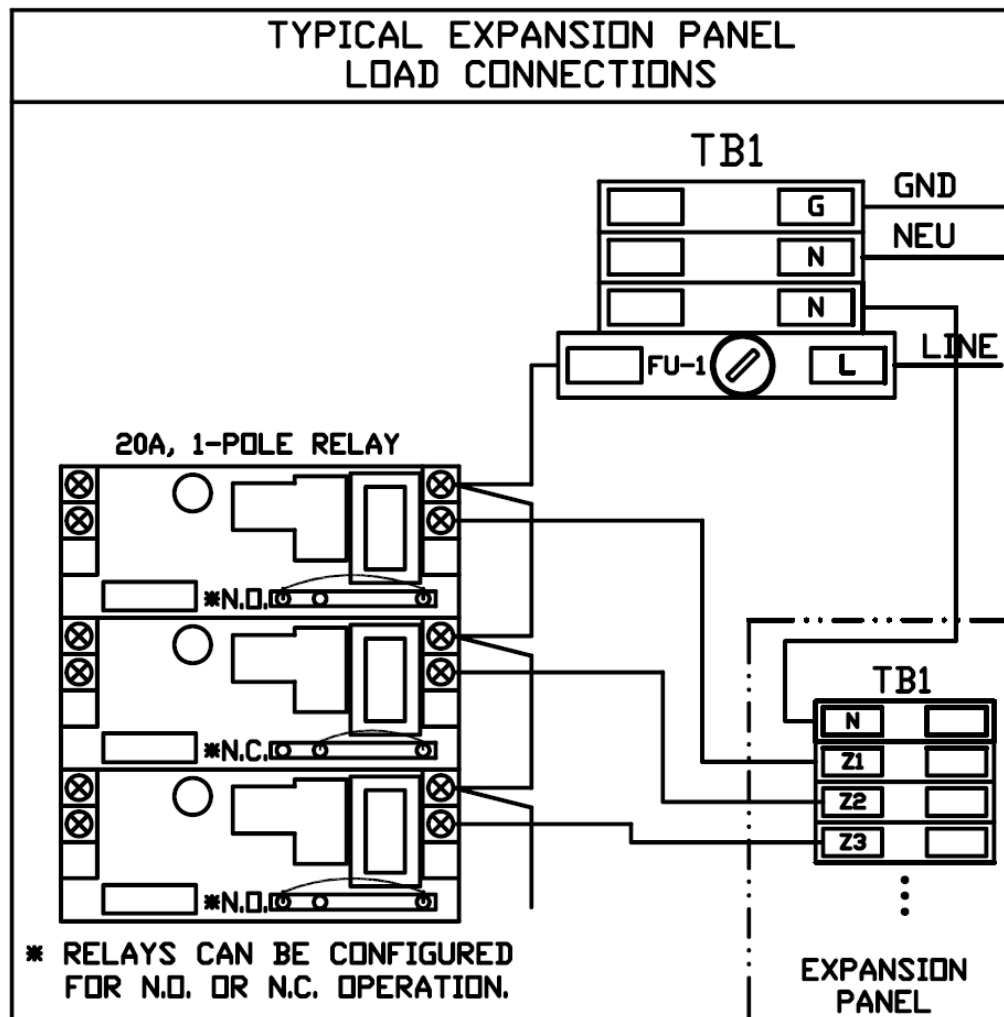
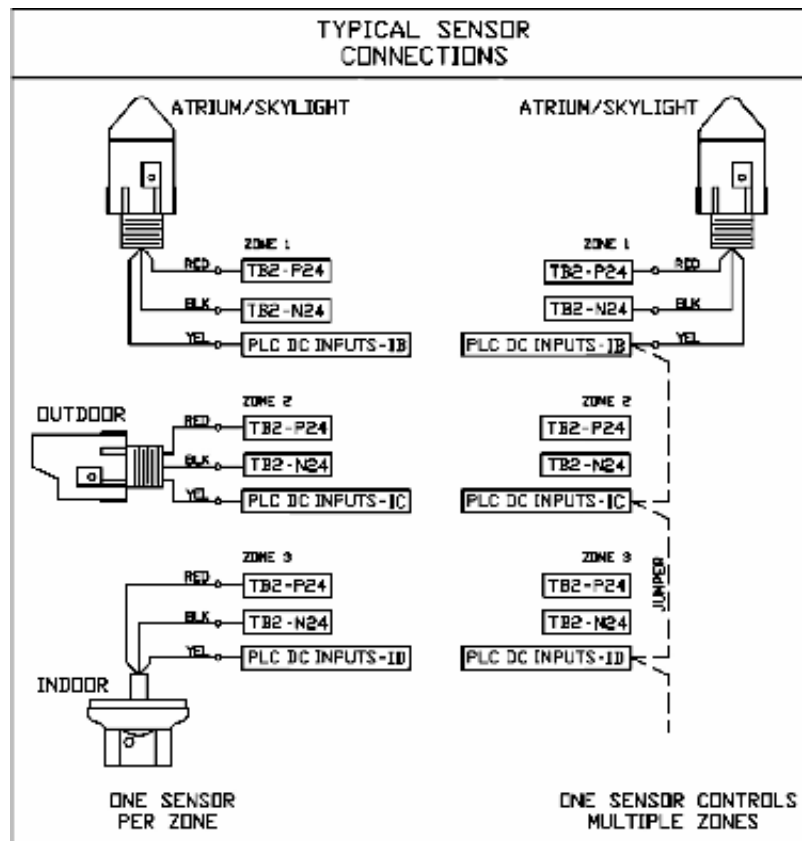


Figure 14:
Typical Expansion Panel Load Connections

3.2.9 Photo Sensor Connections

There are four styles of CES Photo Sensor that can be connected to the LCM-IE. All four connect in the same manner and return a 1-10VDC signal to the controller. Each sensor has three wires. The RED wire is the power wire and connects to the P24 Distribution terminal block labeled TB2. The BLACK wire is the common return and is connected to the N24 terminal block labeled TB2. The YELLOW wire carries the analog signal and is connected to one of the INPUT terminal located along the top of the Controller. One sensor can be used to control a single zone or one can be wired to control multiple zones Figure 15: Photo Sensor Wiring Guide.

Refer to CES Sensors Installation and Maintenance Manual (P/N 5150XT rev 1/22/09) for further instruction.



3.2.10 Remote Switch Connections

Remote Switches are wired into TB2 in the top left corner of the enclosure. Each switch requires two wires; 24VDC power and a signal wire. 18AWG wire is the recommended wire size for this connection; see [Table 1: Suggested Wire Sizes](#). The 24VDC wire is connected to the P24 on terminal block TB2. The signal wire is connected to the switch input terminal on the controller. If it is desirable to have one Remote Switch affects more than one zone, small jumper wires can be used to share the remote switch signal, see [Figure 16: Typical Remote Switch Connections](#).

The Remote Switches have an LED pilot light. The LCM-IE illuminates the LED for the zone currently switched ON. The LED will have two wires connected to it; one will be connected to the N24 on terminal block TB2, and the signal wire will be connected to the appropriate PL terminal located next to the TB2 terminal blocks, [Figure 16: Typical Remote Switch Connections](#).

Note that if one Remote Override Switch is controlling several zones, the pilot light's signal wire should be connected to only one of the affected zones.

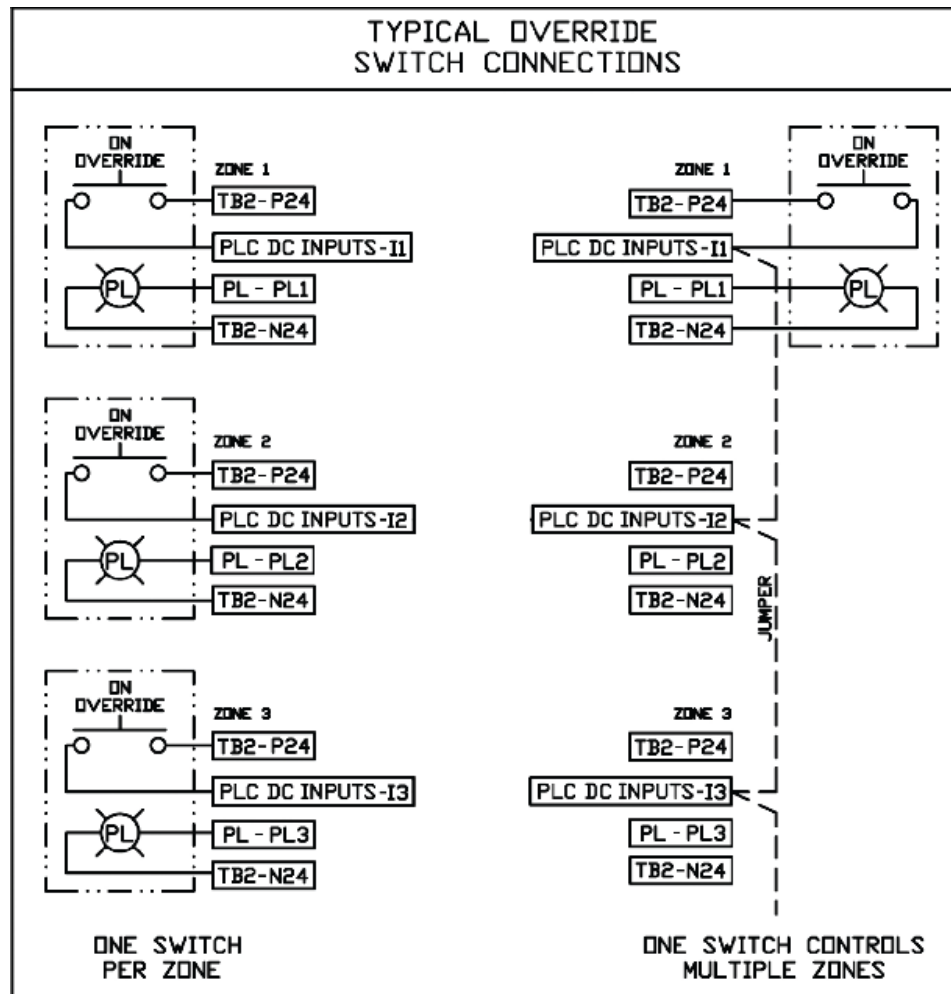


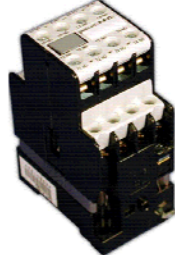
Figure 16:
Typical Remote Switch Connections

3.2.11 LCM-IE Accessories

LCM-IE Accessories, Remote Switching Devices

ROT2, Industrial Remote Single Pushbutton 22mm Mounting Collar with one N.O.24VAC/DC Contact Legend Plate, 22mm, One-Hole, Zinc. Enclosure, 22mm, One-Hole Zinc Recommended wire size #18AWG	
IROT2, Illuminated Industrial Remote Single Pushbutton 22mm Green LED with one N.O. 24VAC/DC Contact Legend Plate, 22mm ON Enclosure, 22mm, One-Hole, Zinc Recommended wire size #18AWG	
SWPB1, Commercial Remote LED Single Pushbutton Single Low Voltage wall switch with LED, N.O. Contact 24VAC/DC Recommended wire size #18AWG	

LCM-IE Accessories, Load Contactors

OP4 (4-Pole Normally-Open Contactor / 20A / 120V Coil). <u>Contact Rating:</u> 600V 50/60Hz 4-Pole isolated normally-open (NO) contacts. 20A (Lighting) 30A (General Purpose / Ballast) <u>Wiring:</u> #16 to 10 AWG 75 Degree copper only	
OP8 (8-Pole Normally-Open Contactor / 20A / 120V Coil). <u>Contact Rating:</u> 600V 50/60Hz 8-Pole isolates normally –open (NO) contacts. 20A (Lighting) <u>Wiring:</u> #16 to 10 AWG 75 Degree copper only.	
CP4 (4-Pole Normally-Closed Contactor / 20A / 120V Coil). <u>Contact Rating:</u> 600V 50/60Hz 8-Pole isolates normally –closed (NC) contacts. 20A (Lighting) <u>Wiring:</u> #16 to 10 AWG 75 Degree copper only.	

LCM-IE Accessories, Panel Heater

PHR Panel Heater 120 VAC / 240 VAC only, Factory installed.



LCM-IE Accessories, Warning Beacon

FLB, Beacon for HID Sweeps, Factory Installed
Needs Technical information
Visual Signal (Amber)
NEMA type 4X enclosure 3.88" x 3.25"



LCM-IE Accessories, Enclosures

NEMA 3R, Rain Tight Outdoor rain resistant, ANSI 61
Grey polyester powder paint finish.

SMALL: 16 x 16 x 6 – 16 gauge

LARGE: 24 x 20 x 8 – 16 gauge



NEMA 4X, Water Tight / Corrosion Resistant; 304 stainless steel wash down and corrosion resistant.

SMALL: 16 x 20 x 6

LARGE: 20 x 20 x 6



NEMA 12, Oil tight; used in industrial areas where cutting oils or other non corrosive mists are found in the environment.

SMALL: 16 x 20 x 6

LARGE: 20 x 20 x 6



4 CONTROLLER OPERATION

Section 4 outlines and explains the operation sequence for the LCM-IE Series Control Panel.

4.1 DAYLIGHTING CONTROL FEATURES

4.1.1 Actual foot-candle level sensed displayed

This real-world measure of light is used in IES standards for the standard light levels required for particular tasks. (i.e. 30FC is suggested in a library for easy reading.) The sensor calibrated value is used to set the ON and OFF levels for photo-controlled circuits.

4.1.2 User adjustable set-points

User adjustable set-points allow the user to define the actual light levels at which lighting events occur. The photo-control setup screen will show the actual, current foot-candle level, the high (On-to-Off), and the low (Off-to-On) set points.

4.1.3 Input delays

Input delays (on-to-off) and (off-to-on) allow the user to determine how long a light level must remain in excess of the set-point before a lighting event occurs. This delay prevents transient lighting events such as lightening flashes or dark clouds from affecting the lighting.

4.1.4 Hold-on timer

The hold-on timer is used to guarantee that once an on-state is achieved, the lamps and ballasts will have an adequate on period to avoid degradation of the lamps and ballasts which can considerably reduce the lamp and fixture life. (Typical 30 min HID, 3 min Fluorescent)

4.1.5 Run-time hours displayed

The current accumulated run time hours can be used to schedule a non-obtrusive period for changing lamps. If all lamps are changed at one time the expense is minimized and if these hours are reset upon re-lamping, a regularly scheduled re-lamping based upon operational hours becomes possible.

4.1.6 Time Clock(s)

A seven-day multiple schedule time clock automatically adjusts for daylight savings time. Each time-clock has the potential of fourteen unique events. An on-off time takes two events. Unused schedules are set to be off every day of the week. Time schedules can be front panel adjustable.

Note: See Factory Preset section for default Schedules and Events.

4.2 PHOTO CONTROL SEQUENCE

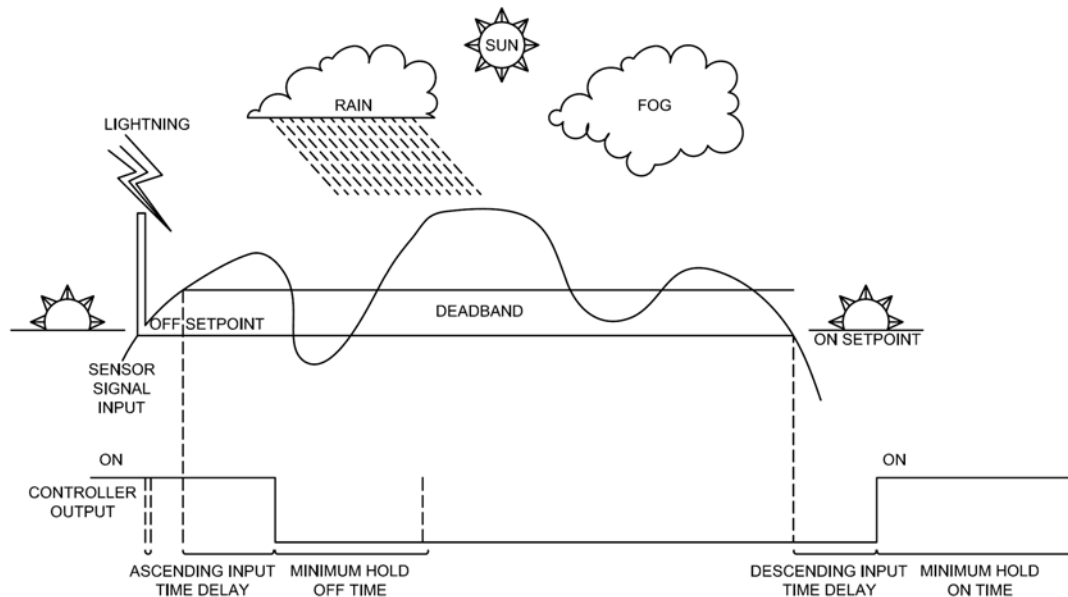


Figure 17:
Photo Control Sequence

Lighting Control Sequence

Each controller uses the following control algorithms to provide photo-level control. All input changes pass through a user definable five (5) minute time delay to avoid nuisance light level changes due to sudden light level changes caused by headlights, lightening or clouds.

Photo-sequence from dark-to-light

All lamps are on. The light level value is less than the low-limit (On) set point.
As the light level value rises above the high-limit (Off) set point, the input time delay is initiated, after which the high level interposing relay is de-activated.
All lamps are off. The light level value is greater than the high-limit (Off) set point.

Photo-sequence from light-to-dark

All lamps are off. The light level value is greater than the high-limit (Off) set point.
As the light level value falls below the low-limit (On) set point, the input time delay is initiated, after which the low-level interposing relay is turned ON. A *half-hour* hold-on timer is used to avoid HID lamp damage in the event that light levels rise above the high-limit off set-point while the lamps are warming.
All lamps are on. The light level value is less than the low-value (On) set point. The program and set points are stored in flash. Real time clock settings are battery protected for up to 10 years. The program resumes operation after a power outage.

4.3 LCM-IE CONFIGURATION GUIDE

Each output zone can be configured for one of eight modes of operation. For simple applications, the Photo Control can be used for exterior lighting or the Time clock for scheduled events. Most modes which use the RSW or remote switch are turned on by the RSW and switched off by the time clock automatically. The sweep function is initiated at the end of the Time clock schedule or during unoccupied hours and is a sequence which warns the occupants with a single flash and then provides a grace period to extend the period that the lights stay on.

No.	Mode	Description	Priority
1	PC	Photo Control Only.	PC
2	TC	Time Clock Only.	TC
3	PC+TC	Photo Control and Time Clock.	PC or TC
4	TC+RSW	Time Clock and Switch.	TC
5	PC+TC+RSW	Photo, Switch and Switch.	Switch must initiate start of the PC+TC sequence. Switch Priority ON/OFF when PC is ON only.
6	PC+RSW+OVR	Photo, Switch and Override.	PC, Switch ON/OFF with PC OFF 30min OVR. OVR time is programmable. TC is ON 24/7
7	TC+RSW+SWP	Time Clock, Switch and Sweep.	TC, Switch ON/OFF with after hours sweep.
8	PC+TC+RSW+SWP	Photo, Time Clock, Switch & Sweep	Switch must initiate start of the PC+TC sequence. Switch priority ON/OFF when PC is ON only. Warning flash, sweep and grace after hours.

Table 2:
LCM-IE Lighting System Mode Chart

Notes:

Zones 1-6 have independent control.

When Photo Control (PC) is not selected the input should be disconnected.

When using Mode-9 for any zone, the TC must set to always ON, (24/7).

DESCRIPTION	Modes: Where Used as it Applies to Each Zone
Warning Timer	7 , 8
Sweep Timer	7 , 8
Grace Timer	7 , 8
Photo Control (PC) In-Delay	1 , 3 , 5 , 6 , 8
Photo Control (PC) Hold-ON	1 , 3 , 5 , 6 , 8
Override Timer	6
Time Clock Control	2 , 3 , 4 , 5 , 6 , 7 , 8
Photo Gain A Control	1 , 3 , 5 , 6 , 8
Photo Gain B Control	1 , 3 , 5 , 6 , 8

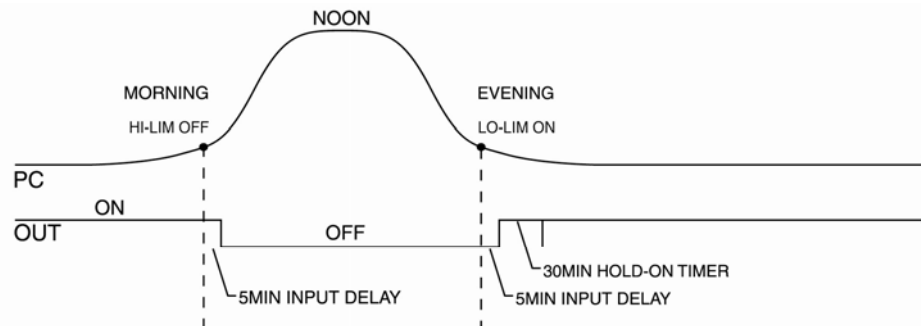
Table 3:
Timers and Control Functions

4.4 LCM-IE TIMING CHARTS, Modes 1, 2, 3 and 4

1

Photo Control Only

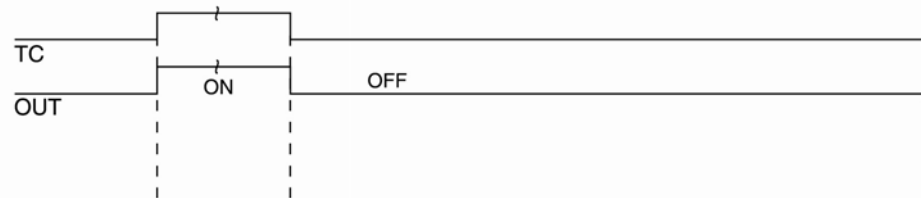
Outdoor Lighting



2

Time Clock Only

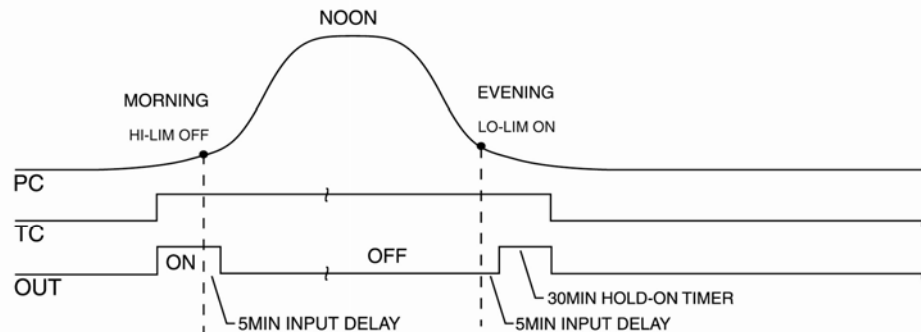
Indoor Lighting



3

Photo Control &
Time Clock

Outdoor Lighting
Sign Lighting



4

Time Clock &
Switch

Rooms
Offices

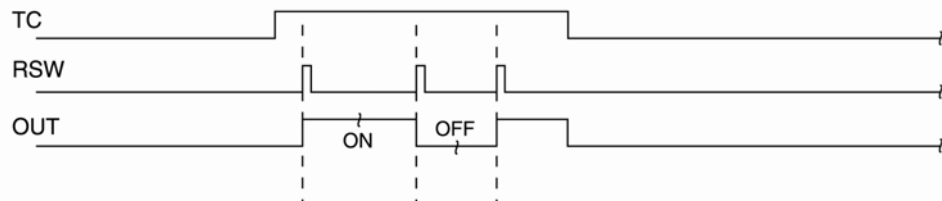
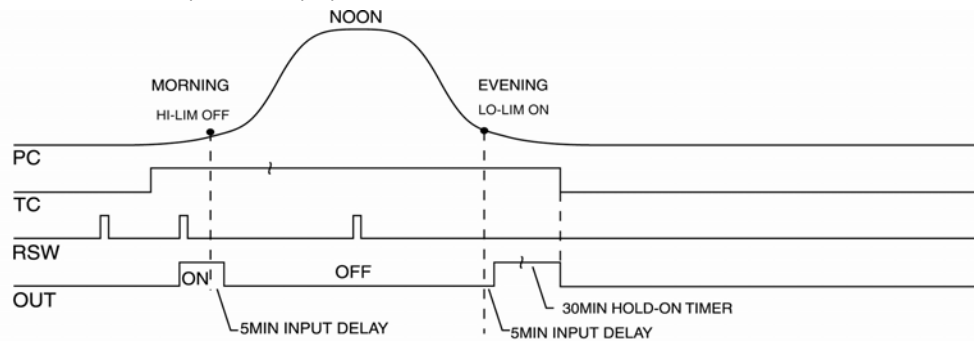


Table 4:
LCM-IE Timing Chart Modes 1 to 4

4.5 LCM-IE TIMING CHARTS, Modes 5, 6, 7 and 8

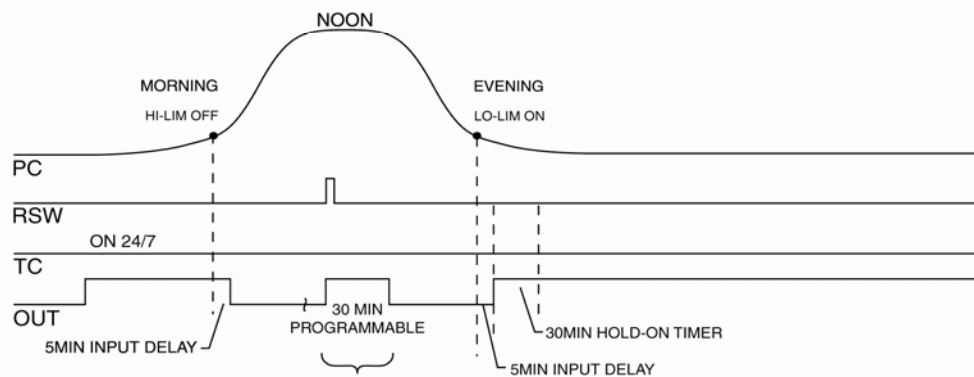
5
Photo Control
Time Clock
Switch

Interior
Daylight
Harvesting



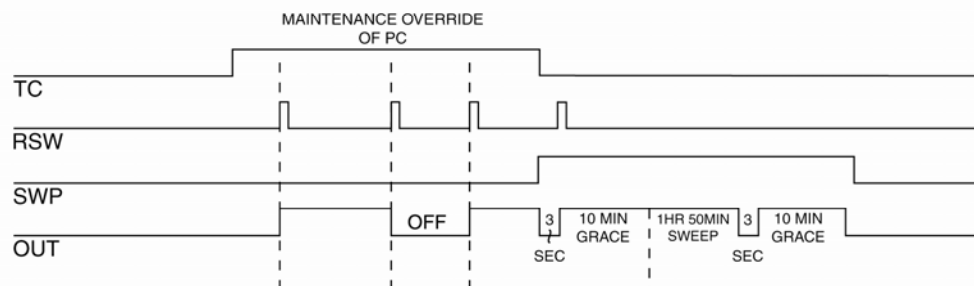
6
Photo Control
Switch
Override

Outdoor
Indoor
Offices



7
Time Clock
Switch
Sweep

Indoor
Room
Offices



8
Photo Control
Time Clock
Switch
Sweep

Outdoor
Indoor
Room
Offices

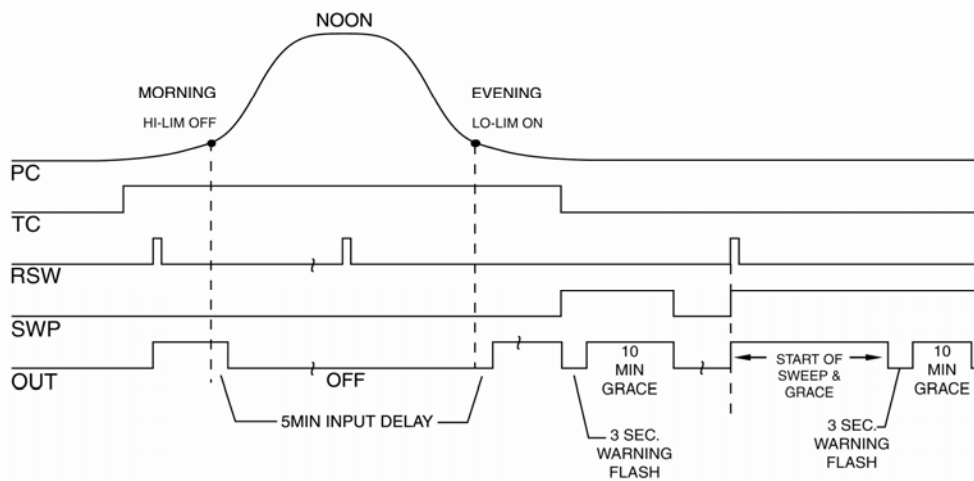
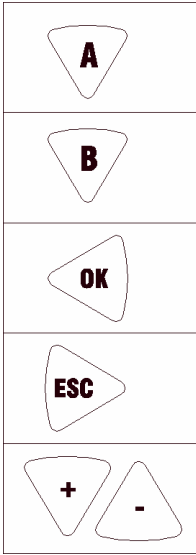


Table 5: LCM-IE Timing Chart Modes 5 to 8

4.6 SCREEN CONTROLS AND MODES

	(A) Key is used in specific screen to toggle settings. (B) Key is used to navigate through the various display and setting screens. (OK) This key is used to select a variable for modification in SELECT mode and is used to confirm the value change in ADJUST mode. (ESC) Key is used to cancel value changes in ADJUSTMENT mode. (+/-) These keys are used to move to a variable on the current screen for modification in SELECT mode and used to increment/decrement values in ADJUSTMENT mode.
ADJUSTMENT MODE (FLASH) A flash alternation as shown to the right will flash from a dark text block to a blank block, indicating that the selected value is ready to be changed. Only a selected adjustable value will flash. In this mode the (+) and (-) keys are used to increase and decrease adjustable variables. Press and HOLDING (OK) confirms the variable change, putting the display back into SELECT mode	24VDC DC INPUTS ZONE 1 Sens FC 00138 HiLim 00100 LoLim 00000 24VDC DC INPUTS ZONE 1 Sens FC 00138 HiLim 00100 LoLim 00000 A B ESC - + OK  RELAY OUTPUTS 

LCM CONTROLLER

The LCM-IE controller has a LCD screen that display's the current status of the system. The up and down arrows are used to navigate menus. The + and - keys increment and decrement the delay values. The (ESC) key and (OK) key are used to abort or confirm menu selections. The LCM has multiple screens, use the (B) key to page between screens. The last display wraps around to the first display. Refer to section 1.22 (*Screen Control and Modes*) for information regarding menu selection changes.

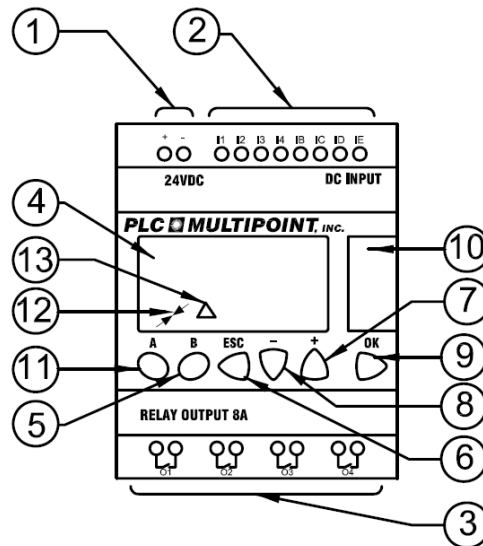


Figure 18: CD12 Controller 2 and 3 Zones

CD12 Controller

1. 24VDC power and DC return inputs
2. Digital and Analog Inputs (I1 - I4, and IA – IE)
3. Dry Contact Relay Outputs (O1 – O4)
4. Controller Screen
5. Pushbutton B Key
6. Pushbutton ESC Key
7. Pushbutton + Key
8. Pushbutton – Key
9. Pushbutton OK Key
10. Programming Port
11. Pushbutton A Key
12. Hourglass indicator; when rotating the controller program is RUNNING
13. Controller ERROR indicator

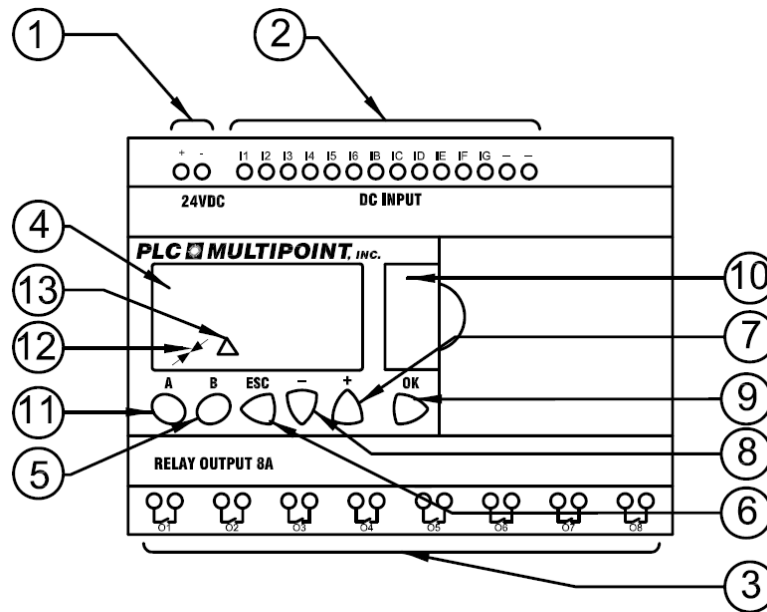


Figure 19:
XD26 Controller 4 and 6 Zones

XD26 Controller

1. 24VDC power and DC return inputs
2. Digital and Analog Inputs (I1 - I4, and IA – IE)
3. Dry Contact Relay Outputs (O1 – O4)
4. Controller Screen
5. Pushbutton B Key
6. Pushbutton ESC Key
7. Pushbutton + Key
8. Pushbutton – Key
9. Pushbutton OK Key
10. Programming Port
11. Pushbutton A Key
12. Hourglass indicator; when rotating the controller program is RUNNING
13. Controller ERROR indicator

4.7 LCM CONFIGURATION

The LCM-IE has an operator interface which allows several modes of operation through the use of up, down, left and right arrows and plus and minus keys. Information is shown on a 18x4-line Liquid Crystal Display. The menu system allows for selection current system status, operating parameter review and editing, as well as sensor scaling.

Set point adjustment example: Refer to Figure 1.8

Task: Increase the HiLim set-point value for Zone 1.

Press "B" (5) until the Zone 1 Sens FC screen is displayed.

Press "+" (7) until the HiLim setting "BLINKS".

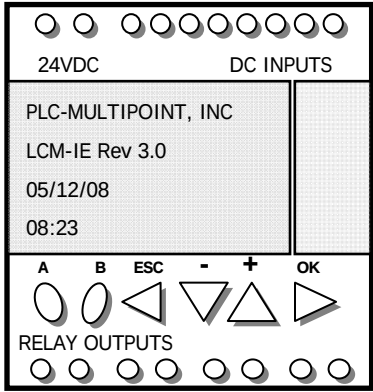
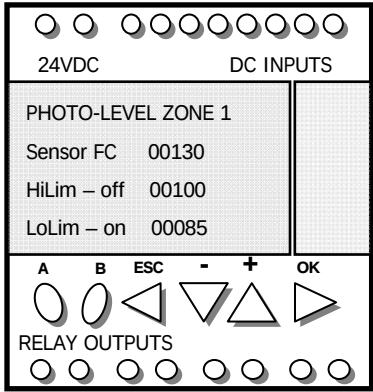
Press "OK" (9) and hold for about a second, the HiLim register should now be in flash mode.

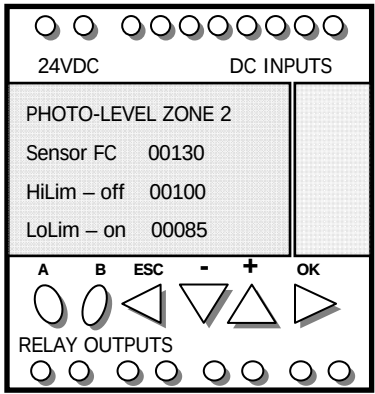
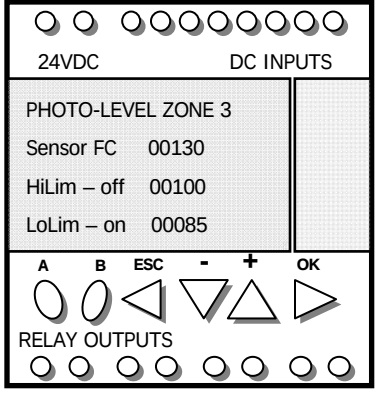
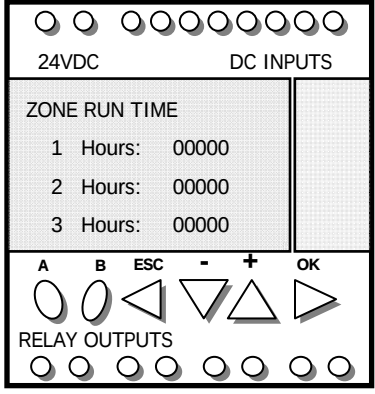
Press "+" (7) to increase the limit and "-" (8) to reduce it.

Once the HiLim setting is adjusted, press "OK" (9) and hold for about a second. The HiLim register should now be back in blink mode.

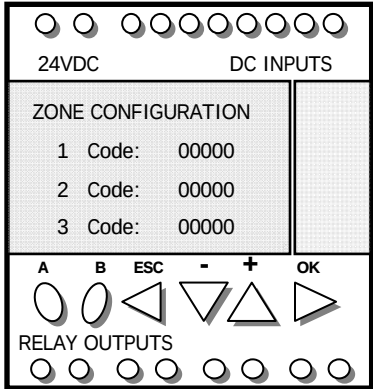
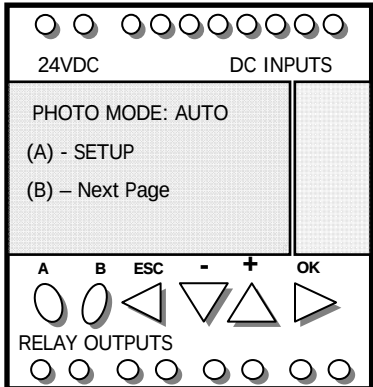
NOTE: If the HiLim register does not return to the "BLINK" mode or if "ESC" (6) is pushed. The change will not be recorded in the controller.

4.8 CONTROLLER STATUS SCREENS

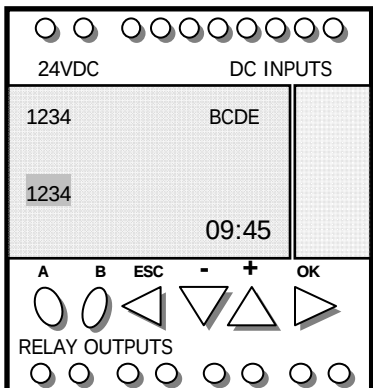
	Main Status Screen Press the (ESC) button at any time to access this screen. The job number may be shown on the top line.
	Photo Level settings for Zone 1 Press the (ESC) and continue to press the (B) button until the Photo screens are reached. Sensor FC is the current light level Seen by the sensor HiLim is the OFF set-point from low to high light levels. LoLim is the ON set-point from high to low light levels.

	Photo Level settings for Zone 2 Press the (ESC) and continue to press the (B) button until the Photo screens are reached. Sensor FC is the current light level Seen by the sensor HiLim is the OFF set-point from low to high light levels. LoLim is the ON set-point from high to low light levels.
	Photo Level settings for Zone 3 Press the (ESC) and continue to press the (B) button until the Photo screens are reached. Sensor FC is the current light level Seen by the sensor HiLim is the OFF set-point from low to high light levels. LoLim is the ON set-point from high to low light levels. Note: A negative Sensor FC value indicates an input signal problem. Each pressing of button (B) will display the next Photo Level Zones screens, not shown are panels with Photo Level Zones 4-6. For additional photo Level Zone information regarding individual panels, refer to the Operational Sequence Manual shipped with the unit.
	Zone Run Time Hours Screen Press the (ESC) and then press the (A) button. This screen displays the run hours accumulated on all zones. The run hour range is from 0 to 32767. To reset the run hours, press the (-) button to move the cursor over the selected zone. Press and hold the (OK) button for 1 sec to change to edit mode. Press (+) or (-) buttons to adjust value. Press the (OK) button to accept the change.

4.9 CONTROLLER ZONE CONFIGURATION MODE SCREEN

 The diagram shows the Zone Configuration Mode Screen. At the top, there are two rows of indicator lights labeled '24VDC' and 'DC INPUTS'. Below these is a section titled 'ZONE CONFIGURATION' with three rows: '1 Code: 00000', '2 Code: 00000', and '3 Code: 00000'. At the bottom, there is a row of five buttons labeled 'A', 'B', 'ESC', '-', and '+', followed by an 'OK' button. Below the buttons is a row of six indicator lights labeled 'RELAY OUTPUTS'.	Zone Configuration Mode Screen The LCM configuration numbers are the result of specific system input and outputs requirements. Refer to the chart in section 4.3 of this document to determine the number. Press the (–) button to move the cursor over the selected zone. Press and hold the (OK) button for 1 sec to change to edit mode. Press (+) or (–) buttons to adjust the number. Press the (OK) button to accept. Note: use ONLY codes listed in the Configuration Table 2, Table LCM-IE Lighting System Mode Chart from Section 4.3; otherwise the controller may have unpredictable results.
 The diagram shows the Photo Mode Screen. At the top, there are two rows of indicator lights labeled '24VDC' and 'DC INPUTS'. Below these is a section titled 'PHOTO MODE: AUTO'. Below this are two lines of text: '(A) - SETUP' and '(B) – Next Page'. At the bottom, there is a row of five buttons labeled 'A', 'B', 'ESC', '-', and '+', followed by an 'OK' button. Below the buttons is a row of six indicator lights labeled 'RELAY OUTPUTS'.	Photo Mode Screen. (Default=AUTO) Press the (B) button until the Mode screen is reached. Pressing key (A) will change the mode to SETUP or AUTO. Pressing key (B) will continue to the next screen. SETUP mode will bypass all photo timing functions and allow for a fast Photo Sensor response. There is a 60min walk-away timer that will automatically switch from setup back to AUTO MODE Note: For Troubleshooting Purposes, ONLY

4.10 CONTROLLER INPUT / OUTPUT SCREEN

 The diagram shows the Controller Input / Output Screen. At the top, there are two rows of indicator lights labeled '24VDC' and 'DC INPUTS'. Below these is a section with two rows of numbers: '1234' and 'BCDE'. Below these is a row of six indicator lights labeled 'RELAY OUTPUTS'. At the bottom, there is a row of five buttons labeled 'A', 'B', 'ESC', '-', and '+', followed by an 'OK' button. Below the buttons is a row of six indicator lights labeled 'RELAY OUTPUTS'.	Controller Input / Output Screen Press the (ESC) button and HOLD. This screen displays the controller I/O status. The top row shows the controller switch inputs. The lower left numbers show the controller output relay status. If an input or output is ON the number is highlighted. Note: for demonstration only the 2 and 3 Zone Controller is shown
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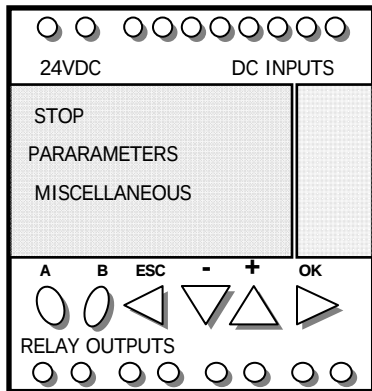
4.11 TIME SCHEDULE SETTINGS (BUILT IN MENUS)

ENTERING THE MENU SCREENS



Pressing (ESC) And (OK) at the same time enters the controller function control screens.

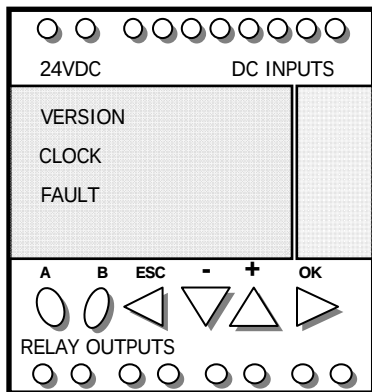
SETTING THE REAL TIME CLOCK



LCM MENU SCREEN CONTROL SCREEN

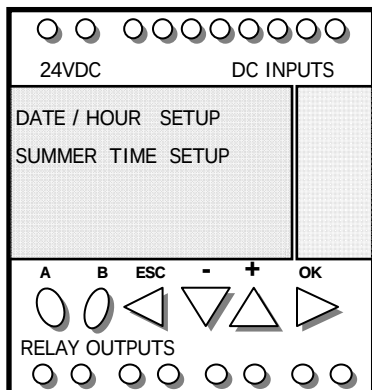
To SET the Real Time Clock:

Move the cursor to MISCELLANEOUS by pressing (+), then press (OK).



LCM MENU SCREEN CONTROL SCREEN

Move the cursor to CLOCK by pressing (-), then press (OK).



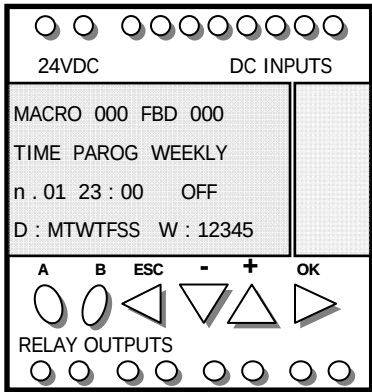
LCM MENU SCREEN CONTROL SCREEN

Move the cursor to DATE / HOUR SETUP and press (OK).

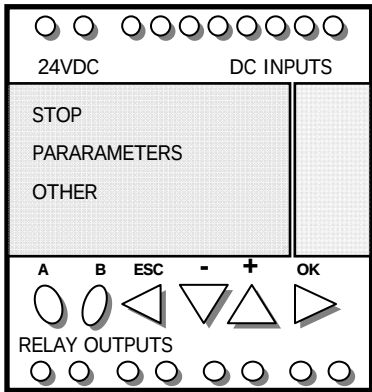
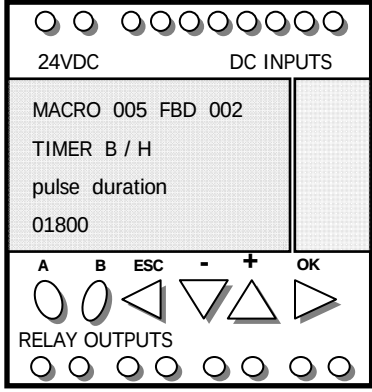
	REAL TIME CLOCK SETTING SCREEN Use (+) or (-) to move to the desired field. Press and hold (OK) for 1 sec to change to edit mode. Press (+) or (-) to adjust value. Press (OK) To accept change. Repeat until set. Press (ESC) to go back to the control screen. Press (ESC) again to go back to the previous screens. Calibrate: Resets Clock once a week by the number of seconds entered.
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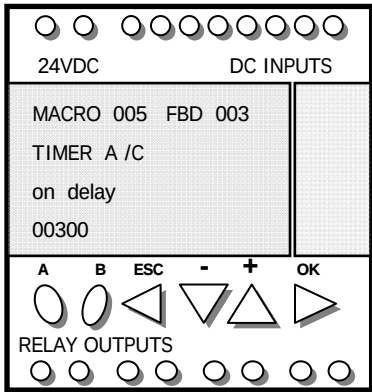
4.12 SETTING THE TIME CLOCK SCHEDULES

	LCM MENU SCREEN CONTROL SCREEN To enter the Time Clock Schedules, move cursor to PARAMETERS by pressing (-), then press (OK). Enter the Macro ### and FBD ### for the TC that requires change. Use (+) or (-) to move to the desired field. Press and hold (OK) for 1 sec to change to edit mode. Press (+) or (-) to adjust value. Press (OK) To accept change. Repeat for all entries until set. Press (ESC) to go back to the control screen. Press (ESC) again to go back to the previous screens. Note: see Section 4.20 for Factory Preset Schedules.
	LCM MENU SCREEN CLOCK SCHEDULE SETTING (ON) SCREEN To Set the Time Clock Schedules for ON: MACRO ### and FBD: ###: Time Clock number. n.00: Schedule event number (MAX 14). Event hour and minutes: Military (Zulu) Time 0000 – 2300. D: Day of the week the schedule applies to, Mon...Sun. W: 12345: The week of the month the schedule applies to. ON: Indicator for clock event ON. Refer to Section 4.18 and 4.19 Factory Presets for MACRO and FBD Adjusting Location Values. Refer to Section 4.20 Factor Preset Schedules for Schedule Settings.

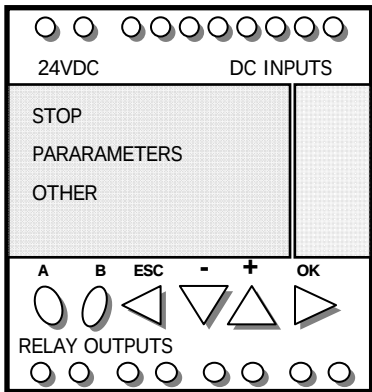
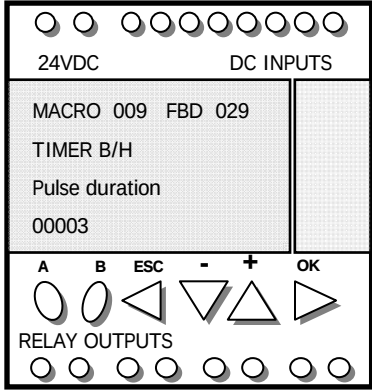
	LCM MENU SCREEN CLOCK SCHEDULE SETTING (OFF) SCREEN <u>To Set the Time Clock Schedules for OFF:</u> MACRO ### and FBD: ###: Time Clock number. n.00: Schedule event number (MAX 14). Event hour and minutes: Military (Zulu) Time 0000 – 2300. D: Day of the week the schedule applies to, Mon...Sun. W: 12345: The week of the month the schedule applies to. OFF: Indicator for clock event OFF. Refer to Section 4.18 and 4.19 Factory Presets for MACRO and FBD Adjusting Location Values. Refer to Section 4.20 Factor Preset Schedules for Schedule Settings.
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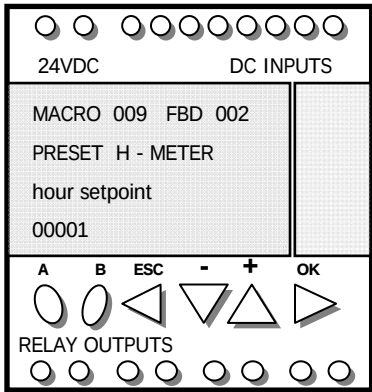
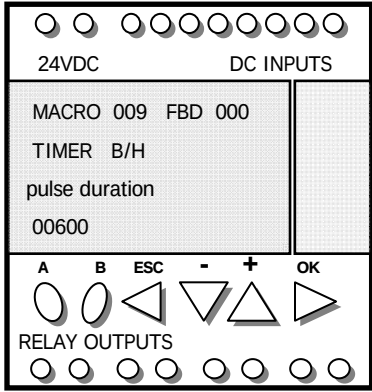
4.13 SETTING IN-DELAY AND HOLD-ON DELAY TIMERS

	LCM MENU SCREEN CONTROL SCREEN <u>To Set the Delay Timers:</u> Press (ESC) and (OK) at the same time to enter the controller function control screens. Move cursor to PARAMETERS by pressing (–), then press (OK).
	LCM MENU SCREEN HOLD-ON TIMER <u>To set Hold-On Timer</u> Use (+) or (–) to move to the FBD field Press and hold (OK) for 1 sec to change to edit mode. Press (+) or (–) to adjust the MACRO ### and FBD ### Hold-ON-Delay value for the Required Zone. Press (OK) To accept change. Use (+) or (–) to move to the pulse duration and Press (OK) for 1 second to enter the edit mode. Press (+) or (–) to adjust pulse duration in 1 seconds. (01800 / 60 seconds = 30 minutes) Refer to Section 4.18 and 4.19 Factory Presets for MACRO and FBD Adjusting Location Values.

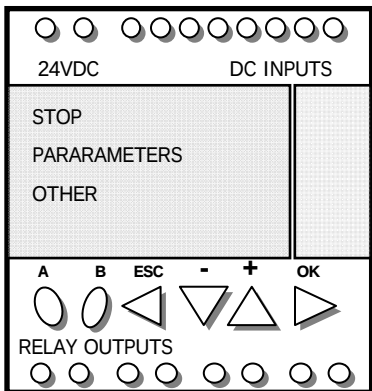
 24VDC DC INPUTS MACRO 005 FBD 003 TIMER A /C on delay 00300 A B ESC - + OK RELAY OUTPUTS	LCM MENU SCREEN INPUT TIME DELAY <u>Input Time Delay</u> Use (+) or (-) to move to the FBD field Press and hold (OK) for 1 sec to change to edit mode. Press (+) or (-) to adjust the MACRO ### and FBD ### Timer A/C: Timer value for the Required Zone. Press (OK) To accept change. Use (+) or (-) to move to the pulse duration and Press (OK) for 1 second to enter the edit mode. Press (+) or (-) to adjust pulse duration in 1 seconds. (00300sec / 60 sec = 5min). Move cursor to on delay, Press and hold for 1 second Press (+) or (-) to change to off duration and repeat above process for the OFF setting. Both ON/OFF must be set. Refer to Section 4.18 and 4.19 Factory Presets for MACRO and FBD Adjusting Location Values.
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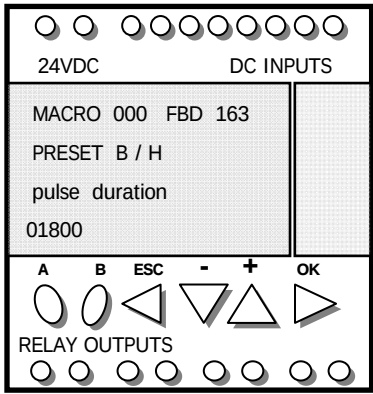
4.14 SETTING WARNING, SWEEP, AND GRACE TIMERS

 24VDC DC INPUTS STOP PARAMETERS OTHER A B ESC - + OK RELAY OUTPUTS	LCM MENU SCREEN CONTROL SCREEN <u>To Set the Warning, Sweep, and Grace Timers:</u> Press (ESC) and (OK) at the same time to enter the controller function control screens. Move cursor to PARAMETERS by pressing (-), then press (OK).
 24VDC DC INPUTS MACRO 009 FBD 029 TIMER B/H Pulse duration 00003 A B ESC - + OK RELAY OUTPUTS	LCM MENU SCREEN WARNING TIMER Use (+) or (-) to move to the FBD field Press and hold (OK) for 1 sec to change to edit mode. Press (+) or (-) to adjust the MACRO ### and FBD ### Warning Timer value for the Required Zone. Press (OK) To accept change. Use (+) or (-) to move to the pulse duration and Press (OK) for 1 second to enter the edit mode. Press (+) or (-) to adjust pulse duration in 1 seconds. Refer to Section 4.18 and 4.19 Factory Presets for MACRO and FBD Adjusting Location Values.

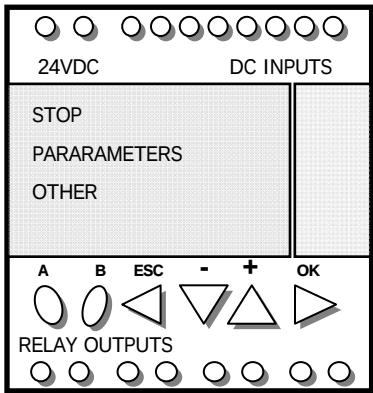
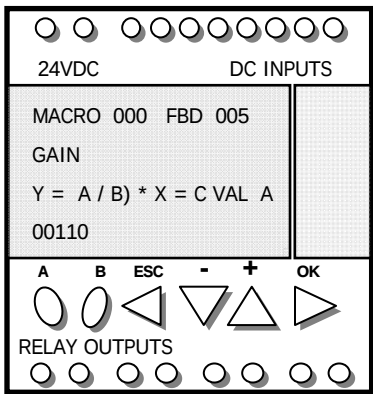
 The diagram shows the LCM MENU SCREEN SWEEP TIMER interface. At the top, there are two rows of indicator lights labeled '24VDC' and 'DC INPUTS'. Below these, a large display area shows 'MACRO 009 FBD 002', 'PRESET H - METER', 'hour setpoint', and '00001'. At the bottom, there is a control panel with buttons labeled 'A', 'B', 'ESC', '-', '+', and 'OK', and a row of indicator lights labeled 'RELAY OUTPUTS'.	LCM MENU SCREEN SWEEP TIMER Use (+) or (-) to move to the FBD field Press and hold (OK) for 1 sec to change to edit mode. Press (+) or (-) to adjust the MACRO ### and FBD ### PRESET H METER value for the Required Zone. Press (OK) To accept change. Use (+) or (-) to move to the hour setpoint and Press (OK) for 1 second to enter the edit mode. Press (+) or (-) to adjust hour setpoint in 1 hour increments. Press (OK) to accept change, move cursor to hour setpoint. Press and hold (OK) for 1 sec to change to edit mode. Press (+) or (-) to change to minute setpoint increments, and repeat process above to change minutes setting. Refer to Section 4.18 and 4.19 Factory Presets for MACRO and FBD Adjusting Location Values.
 The diagram shows the LCM MENU SCREEN GRACE TIMER interface. At the top, there are two rows of indicator lights labeled '24VDC' and 'DC INPUTS'. Below these, a large display area shows 'MACRO 009 FBD 000', 'TIMER B/H', 'pulse duration', and '00600'. At the bottom, there is a control panel with buttons labeled 'A', 'B', 'ESC', '-', '+', and 'OK', and a row of indicator lights labeled 'RELAY OUTPUTS'.	LCM MENU SCREEN GRACE TIMER Use (+) or (-) to move to the FBD field Press and hold (OK) for 1 sec to change to edit mode. Press (+) or (-) to adjust the MACRO ### and FBD ### Grace Timer value for the Required Zone. Press (OK) To accept change. Use (+) or (-) to move to the pulse duration and Press (OK) for 1 second to enter the edit mode. Press (+) or (-) to adjust pulse duration in 1 seconds. (00600sec / 60 sec = 10min) Refer to Section 4.18 and 4.19 Factory Presets for MACRO and FBD Adjusting Location Values.

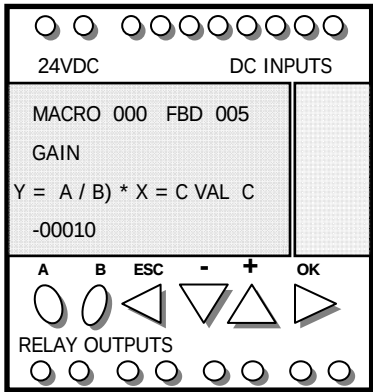
4.15 SETTING MODE 9 OVERRIDE DELAY TIMER

 The diagram shows the LCM MENU SCREEN CONTROL SCREEN interface. At the top, there are two rows of indicator lights labeled '24VDC' and 'DC INPUTS'. Below these, a large display area shows 'STOP', 'PARAMETERS', and 'OTHER'. At the bottom, there is a control panel with buttons labeled 'A', 'B', 'ESC', '-', '+', and 'OK', and a row of indicator lights labeled 'RELAY OUTPUTS'.	LCM MENU SCREEN CONTROL SCREEN <u>To Set the Override Delay Timers:</u> Press (ESC) and (OK) at the same time to enter the controller function control screens. Move cursor to PARAMETERS by pressing (-), then press (OK).
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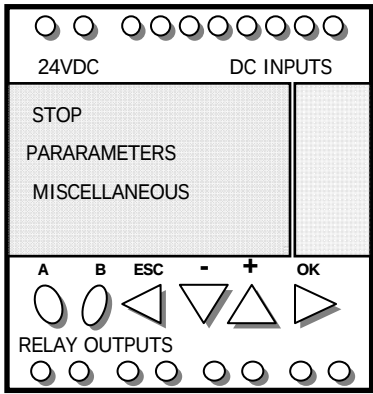
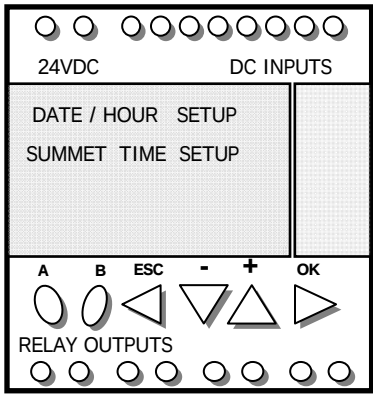
 24VDC DC INPUTS MACRO 000 FBD 163 PRESET B / H pulse duration 01800 A B ESC - + OK RELAY OUTPUTS	LCM MENU SCREEN MODE 9 OVR TIMER Use (+) or (-) to move to the FBD field Press and hold (OK) for 1 sec to change to edit mode. Press (+) or (-) to adjust the MACRO ### and FBD ### MODE 9 OVR TIMER value for the Required Zone. Press (OK) To accept change. Use (+) or (-) to move to the pulse duration and Press (OK) for 1 second to enter the edit mode. Press (+) or (-) to adjust pulse duration in 1 seconds. (01800 / 60 seconds = 30 minutes) Refer to Section 4.18 and 4.19 Factory Presets for MACRO and FBD Adjusting Location Values.
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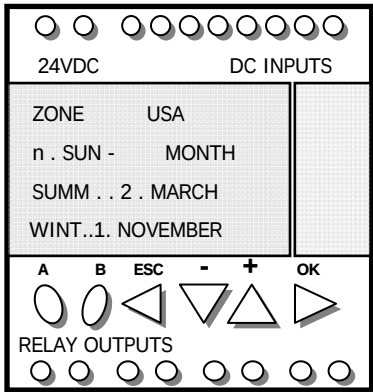
4.16 SETTING DEFAULT PHOTO CONTROL GAIN

 24VDC DC INPUTS STOP PARAMETERS OTHER A B ESC - + OK RELAY OUTPUTS	LCM MENU SCREEN CONTROL SCREEN <u>To Set the Photo Control Gain:</u> Press (ESC) and (OK) at the same time to enter the controller function control screens, shown to the left. Move cursor to PARAMETERS by pressing (-), then press (OK)
 24VDC DC INPUTS MACRO 000 FBD 005 GAIN $Y = A / B * X = C \text{ VAL } A$ 00110 A B ESC - + OK RELAY OUTPUTS	LCM MENU SCREEN Photo Control Gain A Zones Settings Use (+) or (-) to move to the FBD field Press and hold (OK) for 1 sec to change to edit mode. Press (+) or (-) to adjust the MACRO ### and FBD ### Photo Control Gain A value for the Required Zone. Press (OK) To accept change. Use (+) or (-) to move to Gain A value, Press (OK) for 1 second to enter the edit mode. Press (+) or (-) to adjust the Gain A, Press (OK) To accept change. Refer to Section 4.20 for Gain A Factory Preset values for each CES type sensor.

	LCM MENU SCREEN Photo Control Gain C Zones Settings Use (+) or (-) to move the cursor to the above field Press and hold (OK) for 1 sec to change to edit mode. Press (+) or (-) to adjust the Gain C, Press (OK) To accept change. Refer to Section 4.20 for Gain C Factory Preset values for each CES type sensor.
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4.17 SETTING DAYLIGHT SAVING TIME

	LCM MENU SCREEN CONTROL SCREEN <u>To Set the time clock schedules:</u> Move the cursor to MISCELLANEOUS by pressing (+), then press (OK).
	LCM MENU SCREEN DAYLIGHT SAVINGS TIME Select SUMMER TIME SETUP, and then press (OK).

	LCM MENU SCREEN DAYLIGHT SAVINGS TIME Use (+) or (-) to move to the desired field. Press and hold (OK) for 1 sec to change to edit mode. Press (+) or (-) to adjust value. Press (OK) To accept change. Repeat until set. Press (ESC) to go back to the control screen. Press (ESC) again to go back to the previous screens. Factory Setting are shown to the Left (Summer, 2 March, and Winter, 1 November)
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4.18 FACTORY ZONE PRESETS FOR LCM IE 2 and 3

ZONE / LEVEL 1 TITLE	ZONE 1 SETTING	ADJUSTING LOCATION
OFF LIMIT (HiLim)	50 FC	Display
ON LIMIT (LoLim)	30 FC	Display
IN DELAY ON/OFF	5 min (300 second)	Macro 005 FBD 003
HOLD-ON	30min	Macro 005 FBD 002
TIME CLOCK	Schedule TC1	Macro 000 FBD 000
SWEEP PERIOD	1hr 50min	Macro 009 FBD 002
GRACE PERIOD	10min	Macro 009 FBD 000
WARNING PERIOD	3s Flash	Macro 009 FBD 029
OVRER TIMER	30min	Macro 000 FBD 163
PHOTO GAIN VALUE A	00110	Macro 000 FBD 005
PHOTO OFFSET VALUE C	-10	Macro 000 FBD 005
ZONE / LEVEL 2 TITLE	ZONE 2 SETTING	ADJUSTING LOCATION
OFF LIMIT (HiLim)	50 FC	Display
ON LIMIT (LoLim)	30 FC	Display
IN DELAY	5 min	Macro 006 FBD 003
HOLD-ON	30min	Macro 006 FBD 002
TIME CLOCK	Schedule TC2	Macro 000 FBD 001
SWEEP PERIOD	1hr 50min	Macro 013 FBD 002
GRACE PERIOD	10min	Macro 013 FBD 000
WARNING PERIOD	3s Flash	Macro 013 FBD 029
OVRER TIMER	30min	Macro 000 FBD 164
PHOTO GAIN VALUE A	00110	Macro 000 FBD 057
PHOTO OFFSET VALUE C	-10	Macro 000 FBD 057
ZONE / LEVEL 3 TITLE	ZONE 3 SETTING	ADJUSTING LOCATION
OFF LIMIT (HiLim)	50 FC	Display
ON LIMIT (LoLim)	30 FC	Display
IN DELAY	5 min	Macro 007 FBD 003
HOLD-ON	30min	Macro 007 FBD 002
TIME CLOCK	Schedule TC3	Macro 000 FBD 002
SWEEP PERIOD	1hr 50min	Macro 015 FBD 002
GRACE PERIOD	10min	Macro 015 FBD 000
WARNING PERIOD	3s Flash	Macro 015 FBD 029
OVRER TIMER	30min	Macro 000 FBD 165
PHOTO GAIN VALUE A	00110	Macro 000 FBD 058
PHOTO OFFSET VALUE C	-10	Macro 000 FBD 058

Table 6:
Factory Zone Presets LCM IE 2 and 3

4.19 FACTORY ZONE PRESETS FOR LCM IE 4 and 6

ZONE / LEVEL 1 TITLE	ZONE 1 SETTING	ADJUSTING LOCATION
OFF LIMIT (HiLim)	50 FC	Display
ON LIMIT (LoLim)	30 FC	Display
IN DELAY	5 min	Macro 001 FBD 003
HOLD-ON	30min	Macro 001 FBD 002
TIME CLOCK	Schedule TC1	Macro 000 FBD 000
SWEEP PERIOD	1hr 50min	Macro 004 FBD 002
GRACE PERIOD	10min	Macro 004 FBD 000
WARNING PERIOD	3s Flash	Macro 004 FBD 029
OVRER TIMER	30min	Macro 000 FBD 067
PHOTO GAIN VALUE A	00110	Macro 000 FBD 006
PHOTO OFFSET VALUE C	-10	Macro 000 FBD 006
ZONE / LEVEL 2 TITLE	ZONE 2 SETTING	ADJUSTING LOCATION
OFF LIMIT (HiLim)	50 FC	Display
ON LIMIT (LoLim)	30 FC	Display
IN DELAY	5 min	Macro 002 FBD 003
HOLD-ON	30min	Macro 002 FBD 002
TIME CLOCK	Schedule TC2	Macro 000 FBD 001
SWEEP PERIOD	1hr 50min	Macro 005 FBD 002
GRACE PERIOD	10min	Macro 005 FBD 029
WARNING PERIOD	3s Flash	Macro 005 FBD 029
OVRER TIMER	30min	Macro 000 FBD 068
PHOTO GAIN VALUE A	00110	Macro 000 FBD 033
PHOTO OFFSET VALUE C	-10	Macro 000 FBD 033
ZONE / LEVEL 3 TITLE	ZONE 3 SETTING	ADJUSTING LOCATION
OFF LIMIT (HiLim)	50 FC	Display
ON LIMIT (LoLim)	30 FC	Display
IN DELAY	5 min	Macro 003 FBD 003
HOLD-ON	30min	Macro 003 FBD 002
TIME CLOCK	Schedule TC3	Macro 000 FBD 002
SWEEP PERIOD	1hr 50min	Macro 006 FBD 002
GRACE PERIOD	10min	Macro 006 FBD 000
WARNING PERIOD	3s Flash	Macro 006 FBD 029
OVRER TIMER	30min	Macro 000 FBD 069
PHOTO GAIN VALUE A	00110	Macro 000 FBD 034
PHOTO OFFSET VALUE C	-10	Macro 000 FBD 034

Table 7 Continued on Pg.44

ZONE / LEVEL 4 TITLE	ZONE 4 SETTING	ADJUSTING LOCATION
OFF LIMIT (HiLim)	50 FC	Display
ON LIMIT (LoLim)	30 FC	Display
IN DELAY	5 min	Macro 009 FBD 003
HOLD-ON	30min	Macro 009 FBD 002
TIME CLOCK	Schedule TC4	Macro 000 FBD 003
SWEEP PERIOD	1hr 50min	Macro 008 FBD 002
GRACE PERIOD	10min	Macro 008 FBD 000
WARNING PERIOD	3s Flash	Macro 008 FBD 029
OVRER TIMER	30min	Macro 000 FBD 097
PHOTO GAIN VALUE A	00110	Macro 000 FBD 082
PHOTO OFFSET VALUE C	-10	Macro 000 FBD 082
ZONE / LEVEL 5 TITLE	ZONE 5 SETTING	ADJUSTING LOCATION
OFF LIMIT (HiLim)	50 FC	Display
ON LIMIT (LoLim)	30 FC	Display
IN DELAY	5 min	Macro 011 FBD 003
HOLD-ON	30min	Macro 011 FBD 002
TIME CLOCK	Schedule TC5	Macro 000 FBD 004
SWEEP PERIOD	1hr 50min	Macro 010 FBD 002
GRACE PERIOD	10min	Macro 010 FBD 000
WARNING PERIOD	3s Flash	Macro 010 FBD 029
OVRER TIMER	30min	Macro 000 FBD 130
PHOTO GAIN VALUE A	00110	Macro 000 FBD 110
PHOTO OFFSET VALUE C	-10	Macro 000 FBD 110
ZONE / LEVEL 6 TITLE	ZONE 6 SETTING	ADJUSTING LOCATION
OFF LIMIT (HiLim)	50 FC	Display
ON LIMIT (LoLim)	30 FC	Display
IN DELAY	5 min	Macro 013 FBD 003
HOLD-ON	30min	Macro 013 FBD 002
TIME CLOCK	Schedule TC6	Macro 000 FBD 005
SWEEP PERIOD	1hr 50min	Macro 012 FBD 002
GRACE PERIOD	10min	Macro 012 FBD 000
WARNING PERIOD	3s Flash	Macro 012 FBD 029
OVRER TIMER	30min	Macro 000 FBD 157
PHOTO GAIN VALUE A	00110	Macro 000 FBD 148
PHOTO OFFSET VALUE C	-10	Macro 000 FBD 148

Table 7:
Factory Zone Presets LCM IE 4 and 6

4.20 FACTORY PRESET SCHEDULES

Time Clock (TC1- TC3) presets are set the same. The default is set to a maximum of 14 schedule events which is a single on/off event for each day of the week.

Note: This default setting produces a 6:00AM (06:00) to 6:00PM (18:00) Monday – Sunday time clock scheme.

<u>TC1 Macro 000 FBD 000</u>					
Day	Time ON	Event	Day	Time OFF	Event
Monday	06:00	n=0	Monday	18:00	n=1
Tuesday	06:00	n=0	Tuesday	18:00	n=1
Wednesday	06:00	n=0	Wednesday	18:00	n=1
Thursday	06:00	n=0	Thursday	18:00	n=1
Friday	06:00	n=0	Friday	18:00	n=1
Saturday	06:00	n=0	Saturday	18:00	n=1
Sunday	06:00	n=0	Sunday	18:00	n=1

<u>TC2 Macro 000 FBD 001</u>					
Day	Time ON	Event	Day	Time OFF	Event
Monday	06:00	n=0	Monday	18:00	n=1
Tuesday	06:00	n=0	Tuesday	18:00	n=1
Wednesday	06:00	n=0	Wednesday	18:00	n=1
Thursday	06:00	n=0	Thursday	18:00	n=1
Friday	06:00	n=0	Friday	18:00	n=1
Saturday	06:00	n=0	Saturday	18:00	n=1
Sunday	06:00	n=0	Sunday	18:00	n=1

<u>TC3 Macro 000 FBD 002</u>					
Day	Time ON	Event	Day	Time OFF	Event
Monday	06:00	n=0	Monday	18:00	n=1
Tuesday	06:00	n=0	Tuesday	18:00	n=1
Wednesday	06:00	n=0	Wednesday	18:00	n=1
Thursday	06:00	n=0	Thursday	18:00	n=1
Friday	06:00	n=0	Friday	18:00	n=1
Saturday	06:00	n=0	Saturday	18:00	n=1
Sunday	06:00	n=0	Sunday	18:00	n=1

<u>TC4 Macro 000 FBD 003</u>					
Day	Time ON	Event	Day	Time OFF	Event
Monday	06:00	n=0	Monday	18:00	n=1
Tuesday	06:00	n=0	Tuesday	18:00	n=1
Wednesday	06:00	n=0	Wednesday	18:00	n=1
Thursday	06:00	n=0	Thursday	18:00	n=1
Friday	06:00	n=0	Friday	18:00	n=1
Saturday	06:00	n=0	Saturday	18:00	n=1

INSTALLATION & MAINTENANCE MANUAL LCM-IE Series Interior/ Exterior Lighting Control Panel	REV: 8
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Sunday	06:00	n=0	Sunday	18:00	n=1
<u>TC5 Macro 000 FBD 004</u>					
Day	Time ON	Event	Day	Time OFF	Event
Monday	06:00	n=0	Monday	18:00	n=1
Tuesday	06:00	n=0	Tuesday	18:00	n=1
Wednesday	06:00	n=0	Wednesday	18:00	n=1
Thursday	06:00	n=0	Thursday	18:00	n=1
Friday	06:00	n=0	Friday	18:00	n=1
Saturday	06:00	n=0	Saturday	18:00	n=1
Sunday	06:00	n=0	Sunday	18:00	n=1

<u>TC6 Macro 000 FBD 005</u>					
Day	Time ON	Event	Day	Time OFF	Event
Monday	06:00	n=0	Monday	18:00	n=1
Tuesday	06:00	n=0	Tuesday	18:00	n=1
Wednesday	06:00	n=0	Wednesday	18:00	n=1
Thursday	06:00	n=0	Thursday	18:00	n=1
Friday	06:00	n=0	Friday	18:00	n=1
Saturday	06:00	n=0	Saturday	18:00	n=1
Sunday	06:00	n=0	Sunday	18:00	n=1

Table 8:
Factory Preset Schedules

4.21 FACTORY PRESET PHOTO SENSOR GAIN and SETPOINT VALUES

Sensor	Setpoints HiLim / LoLim	Style	Factory Setting	Gain A	Offset C
CES/I	50FC/30FC	Indoor	100 FC	110	-10
CES/O	100FC/80FC	Outdoor	250 FC	275	-25
CES/A	500FC/300FC	Atrium	1000 FC	1100	-100
CES/S	1000FC/800FC	Skylight	2000 FC	2200	-200

Table 9: Factory Preset Photo Sensor Gain and Setpoint Values

4.22 RELAY CONFIGURATIONS

Operating Mode	4-Pole Contactor	Relay Configuration
NORMAL	OP4 (N.O.)	N.O.
FAILSAFE	CP4 (N.C.)	N.C.

Table 10:
Relay Configurations

3101 111 th St SW #F, Everett WA 98204 TEL: 425 353-7552 FAX: 425 353-3353 WEB: WWW.PLCMULTIPOINT.COM	46 / 52
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SYSTEM TROUBLESHOOTING

4.23 LCM_IE PANEL HARDWARE TROUBLESHOOTING GUIDE

4.23.1 Electrical Hardware

TROUBLESHOOTING GUIDE	
High Voltage Electrical	
SYMPTOMS	DESCRIPTION
Panel does not switch ON	Check Main Breaker: With the Main AC Breaker ON, measure the AC voltage at Panel between TB1 Inputs AC Line to Neutral, if voltage is incorrect replace Main Breaker and/or repair wiring.
	Check Fuse (F1): Switch control power to the panel OFF at the main AC Breaker and check FI located on DIN Rail High Voltage section of panel. If fuse is open replace.
	Check for Loose Wiring: Switch control power to the panel OFF at the main AC Breaker and measure continuity between wire connections, or with Panel On measure for voltage drops between connections. With control power to the panel switched OFF tighten loose connections.
Contactor/s not functioning	Check for Loose Wiring: Set the Zone Relay to CLOSED, the contactor is activated. Measure the contactor coil from the coil input to GND, the applied voltage should be present. Switch OFF the control power to the Panel at the Main Breaker and tighten connections, if problem is not corrected replace contactor.
AC to DC Converter, 24VDC output not correct or missing	Check AC to DC Power Supply: Visually check to see if the GREEN light of the AC to 24VDC converter is operating, if light is not operating measure the AC Input between the AC Line and Neutral Inputs. If the applied AC voltage is not present trace back to terminal connection, repair.
Low Voltage Electrical	
SYMPTOMS	DISCRIPTION
Converter, 24VDC power on the output side of the controller	Check 24VDC Output of Supply: Measure the DC Voltage at the Controller, between the V+ and V-, if the output voltage is not with-in specification adjust the voltage to 24VDC (24VDC between 19.2 – 30VDC). If not, the Power Supply is not working or can not be adjusted, replace.
Controller not switching ON	Check the 24VDC to the Controller: Follow the 24VDC wiring to the Controller section of the panel making sure the wires are secure, measure the voltage at the controller, between + (P24)and – (N24). If the applied voltage is present and the controller still does not function, contact PLC Multipoint for further instructions.
Zone Relay not operating in Auto Mode.	Check the Zone Relay Auto Function: From the Controller, set the Zone Configuration MODE for that Zone to mode 1 (Section 4.9) Check for RED light located on the Zone Relay. If LED does not illuminate contact PLC Multipoint for further instructions.

4.23.2 Controller Operation

TROUBLESHOOTING GUIDE	
Controller	
SYMPTOMS	DESCRIPTION
Controller does not switch ON	Check for 24VDC: Return to Section 5.1.1 and check for 24VDC. If no voltage contact PLC Multipoint for further instructions.
Controller ON, but appears to be frozen and non responsive.	Check for Controller Function: With the Controller ON, check for movement of the hourglass symbol (Section 4.6, Figure 18/19 No. 12) if not rotating try rebooting the controller by switching OFF the panel's control power and wait ten seconds and switch the panel back ON. If the problem does not correct it's self contact PLC Multipoint for further instructions.
The controller appears to operate in an abnormal manner.	Check for ERROR Codes: The Default menu of the controller's screen is used to display and acknowledge the ERRORS or WARNINGS detected by the controller software. When an ERROR or WARNING has been detected by the controller software, the screen will display a symbol (Section 4.6, Figure 18/19, No 13). The ERROR Codes are stored in memory. To enter the ERROR Code, select the FAULT Screen Section 4.11 Entering the Menu Screens. Once in the FAULT mode an ERROR code will be displayed. Record the ERROR and press OK to acknowledge the ERROR. Press ESC until the Front Screen is displayed. If the controller continues to with the problem, call PLC Multipoint for further instructions.
ERROR	TYPE of WARNING
00	No faults
01	Fault in writing to EEPROM
02	Clock write error
04	Overload on solid state (controller) relay outputs
50	Controller software is damaged
51	Cycle overflow
52	The controller has executed an unknown operation
53	Link between controller and bus extension faulty
54	Link between controller and Input/Output extension faulty
58	A fault is present in the controller software or on a part of the controller hardware
59	At the start of the application in ON mode on the controller: The application cannot switch to ON mode because it is incompatible with the physically powered controller
60	At the start of the application in ON mode the controller: program incompatible with the bus extension physically connected to the supply
61	At the start of the application in ON mode on the controller: program incompatible with the Input/Output extension physically connected to the supply
62	Version incompatibility when loading a program from the backup memory
63	Hardware configuration incompatibility when loading a program from the backup memory

4.23.3 Field Inputs & Outputs

TROUBLESHOOTING GUIDE	
Field Inputs & Outputs	
SYMPTOMS	DESCRIPTION
Outdoor Lights ON to long, or stay ON all the time	Check for Photo Sensor Malfunction: To test the Photo Sensor; disconnect the yellow signal wire at the sensor, place a cover over the lens and measure the voltage across the yellow and black wires. With the lens covered the voltage should read 1VDC. Next shine a light directly in to the lens and read the voltage. The voltage should read 10VDC; if the Photo Sensor does not behave properly replace the sensor. Check for proper sensor Installation: Refer to CES Sensors Installation and Maintenance Manual P/N 5150XT rev 1/22/09, or relocate sensor. Check for Controller Mode Settings: To verify that the controller's settings are correct, switch the control power to the panel ON and follow the operation instruction in Section 4, and Table 2:, LCM-IE Lighting System Mode Chart Check for Negative Sensor FC Values: To verify that the sensor FC value is not negative, refer to Section 4.8 Controller Status Screen. If the sensor FC value is negative, check for proper wiring or replace the Photo Sensor. Check for an incorrect HiLim (OFF) Setpoint: If the Hi Setpoint value is set to high for the sensor used, the value will never be reached or reached too late in the day, the controller will not signal the lights to switch OFF. Verify the settings are correct, by referring to Section 4 Controller Operation, and LCM-IE Factory Preset. Correct values, by referring to Section 4.8 Controller Status Screen and 4.9 Controller Zone Configuration Mode. Check for Faulty Remote Switch: Measure the voltage across the two connections, if the switch is OPEN the value will be the applied voltage, if the switch is CLOSED value will approach zero the switch will be functioning properly, if not replace switch, or rewire if miss-wired. Check for Incorrect Zone Time Clock settings: to check the Time Clock settings for each Zone refer to Section 4.12 Setting the Time Clock Schedules of this document.
Outdoor Lights are not switching ON	Check for Photo Sensor Malfunction: To test the Photo Sensor; disconnect the yellow signal wire at the sensor, place a cover over the lens and measure the voltage across the yellow and black wires. With the lens covered the voltage should read 1VDC. Next shine a light directly in to the lens and read the voltage. The voltage should read 10VDC, If voltage remains too high the controller will not know to switch ON the lights, replace the sensor. Check for proper sensor Installation: Refer to CES Sensors Installation and Maintenance Manual P/N 5150XT rev 1/22/09, or relocate sensor

	Check for Controller Mode Settings: To verify that the controller's settings are correct, switch control power to the panel ON and follow the operation instruction in Section 4, and Table 2, LCM-IE Lighting System Mode Chart Check for an incorrect LoLim (ON) Setpoint: If the Low Setpoint value is set too Low for the sensor used, the value will never be reached to signal the controller to switch ON the lights. Verify the settings are correct, by referring to Section 4 Controller Operation, and LCM-IE Factory Preset. Correct values, by referring to Sections 4.8 Controller Status Screen and 4.9 Controller Zone Configuration Mode. Check for Faulty Remote Switch: Measure the voltage across the two connections, if the switch is OPEN, the value will be the applied voltage. If the switch is CLOSED, the value will approach zero the switch will be functioning properly, if not replace switch, or rewire if mis-wired. Check for Incorrect Zone Time Clock settings: To check the Time Clock settings for each Zone refer to Section 4.20 Setting the Time Clock Schedules of this document.
Indoor Light Stay ON, or Stay ON to Long	Check for Photo Sensor Function: To test the Photo Sensor; disconnect the yellow signal wire at the sensor, place a cover over the lens and measure the voltage across the yellow and black wires. With the lens covered the voltage should read 1VDC. Next shine a light directly in to the lens and read the voltage. The voltage should read 10VDC, If the does not behave properly replace the sensor. Check for proper sensor Installation: Refer to CES Sensors Installation and Maintenance Manual P/N 5150XT rev 1/22/09, or relocate sensor. Check for Negative Sensor FC Values: to verify the sensor FC value is not negative refer to Section 4.8 Controller Status Screen. If the sensor FC value is negative check for proper wiring or replace the Photo Sensor. Check for an incorrect HiLim (OFF) Setpoint: If the Hi Setpoint value is set too high for the sensor used, the value will never be reached or reached too late in the day, the controller will not signal the lights to switch OFF. Verify the settings are correct by referring to Section 4 Controller Operation, and LCM-IE Factory Presets. Correct values by referring to Section 4.8 Controller Status Screen and 4.9 Controller Zone Configuration Mode. Check for Faulty Remote Switch: Measure the voltage across the two connections, if the switch is OPEN, the value will be the applied voltage. If the switch is CLOSED, the value will approach zero the switch will be functioning properly, if not replace switch, or rewire if mis-wired. Check for Incorrect Zone Time Clock settings: To check the Time Clock settings for each Zone refer to Section 4.20 Setting the Time Clock Schedules of this document.

Indoor Light will not turning ON.	Check for Photo Sensor Malfunction: To test the Photo Sensor; disconnect the yellow signal wire at the sensor, place a cover over the lens and measure the voltage across the yellow and black wires. With the lens covered the voltage should read 1VDC. Next shine a light directly in to the lens and read the voltage. The voltage should read 10VDC, If voltage remains too high the controller will not know to turn ON the lights, replace the sensor. Check for proper sensor Installation: Refer to CES Sensors Installation and Maintenance Manual P/N 5150XT rev 1/22/09, or relocate sensor Check for Controller Mode Settings: to verify that the controller's settings are correct, turn ON the Panel and follow the operation instruction in Section 4, and Table 2, LCM-IE Lighting System Mode Chart Check for an incorrect LoLim (ON) Setpoint: if the Low Setpoint value is set to Low for the sensor used, the value will never be reached to signal the controller to turn ON the lights. Verify the settings are correct, by referring to Section 4 Controller Operation, and LCM-IE Factory Preset. Correct values, by referring to Section 4.8 Controller Status Screen and 4.9 Controller Zone Configuration Mode. Check for Faulty Remote Switch: Measure the voltage across the two connections, if the switch is OPEN the value will be the applied voltage, if the switch is CLOSED value will approach zero the switch will be functioning properly, if not replace switch, or rewire if missed wired. Check for Incorrect Zone Time Clock settings: To check the Time Clock settings for each Zone refer to Section 4.20 Setting the Time Clock Schedules of this document. Ensure the Zone is configured to the proper System Mode setting; Section 4.3 Table 2, for controller settings, Section 4.9 Controller Zone Configuration Mode Screen.
Maintenance Override lights will not switch ON/OFF as required	Check for incorrect override time setting: The programmable maintenance override may be set incorrectly for the user's needs. Refer to Section 4.15 Setting Mode 9 Override Delay Timers; the Zone must be in MODE 9 for this application to function. If reprogramming the Override Delay and the electrical Section 5.1.1 are working properly Contact PLC Multipoint for further instructions.
Mode 15, Warning FLASH, Grace Period, or Sweep and Grace are not functioning properly.	Check for incorrect time settings: The Grace Period, or Sweep and Grace are user programmable settings. To configure all timers refer to Section 4.14 Setting Warning Sweep and Grace Timers and follow the instruction to review and set the times needed for your application. Tables showing factory presets are located in Section 4.18 and 19 to help with programming the timers. If this does not solve the problem and the electrical Section 5.1.1 are working properly Contact PLC Multipoint for further instructions.

