

# LCS-2

Low Voltage Lighting Control  
Relay Processing Panel

## Operator's Manual



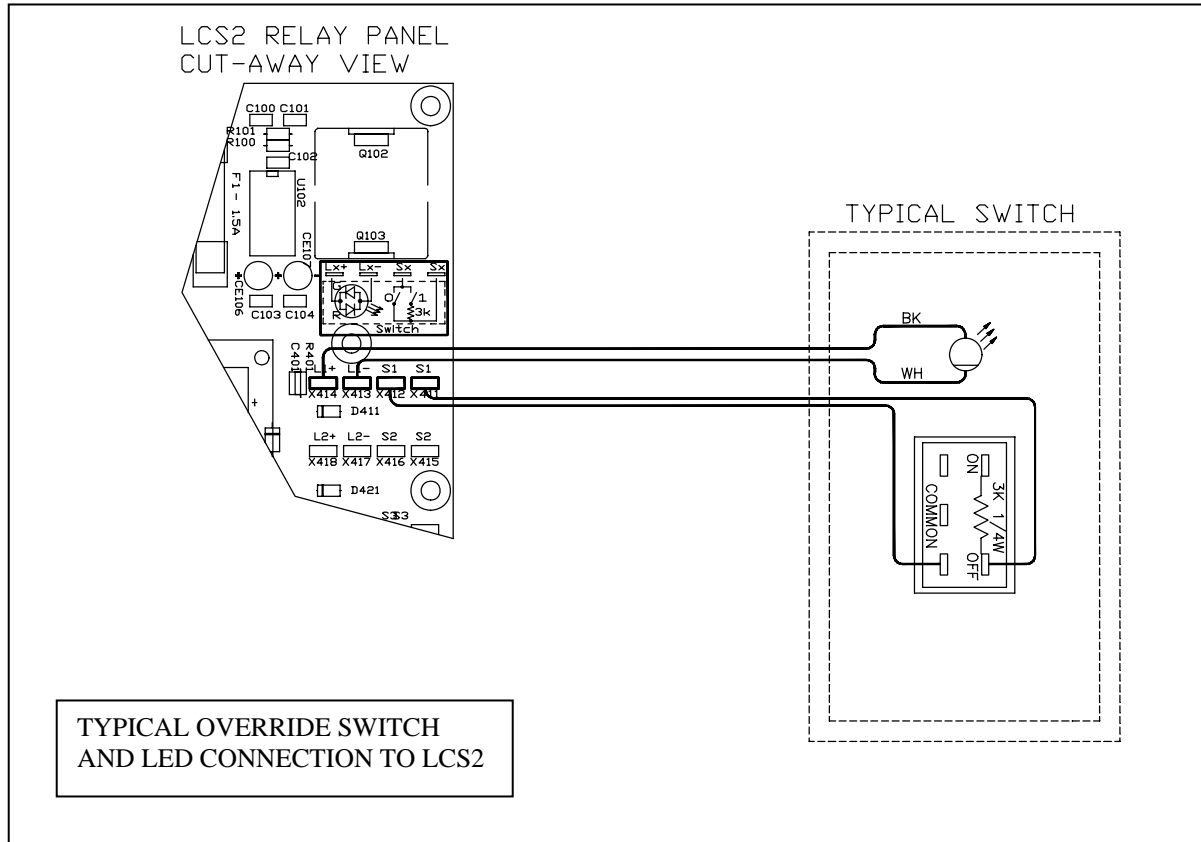
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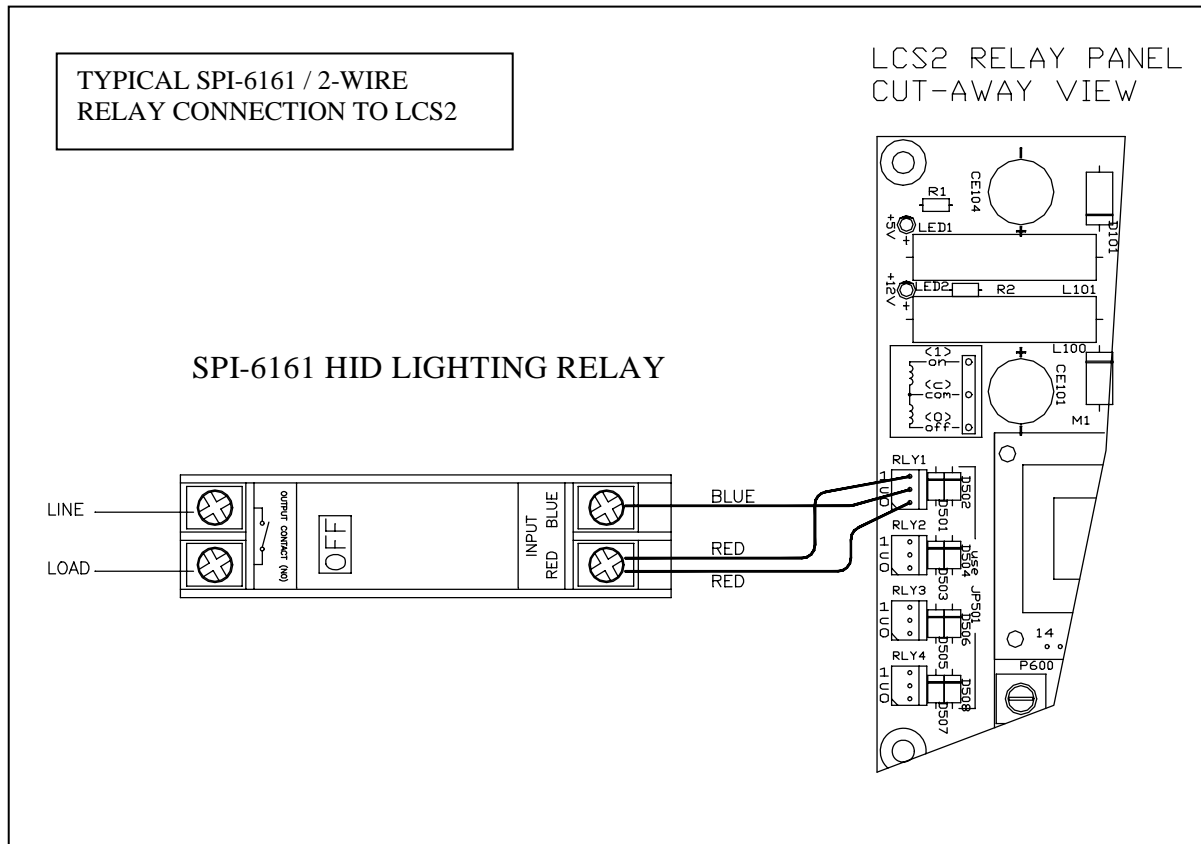
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# 1. Override Switch and Relay Connections

Override switch input pairs are designated S1, S1 to S16, S16 and corresponding LED inputs are designated L1+, L1- to L16+, L16-. If LED's are not present, omit LED wiring. Switch and LED wiring to be 18 AWG, stranded. Relay outputs are designated RLY1 through RLY16. See I/O sheets for input-to-relay assignments. Relay wiring to be 20 AWG, stranded. Connect override switches and relays as follows:



# 1. Override Switch and Relay Connection (cont.)



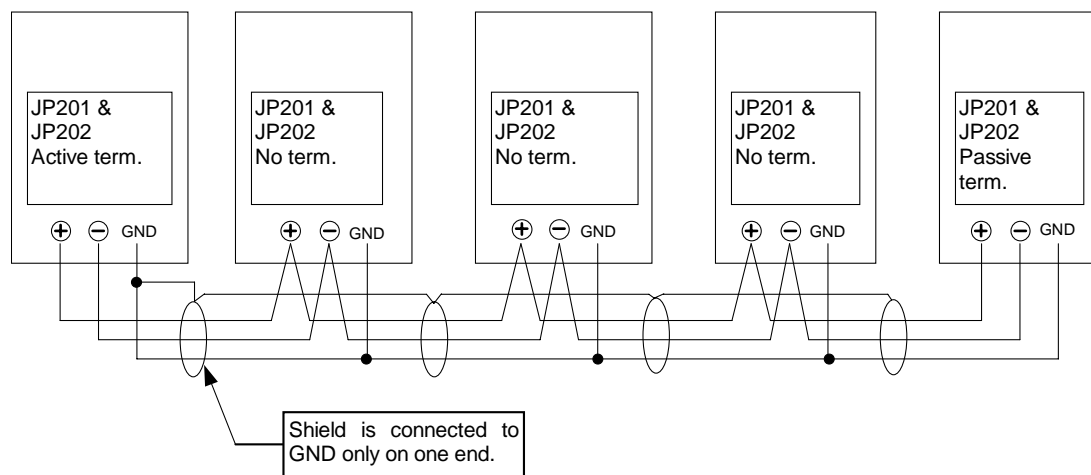
## 2. RS-485 Bus Connection

1. If more than 2 boards are connected to the bus, only the boards on the ends of the bus should have termination. For the 2 boards located at the ends of the bus, only one board may have active termination and the other should have passive termination. The boards connected to the bus at intermediate locations must not have any termination jumpers installed. After installation, check the polarity of the RS-485 bus wires.
2. Pin headers JP201 and JP202 must have identical setting:

For Passive termination, the shunt should be installed across pins 1 and 2.

For Active termination, the shunt should be installed across pins 2 and 3.

No termination is accomplished by removing the jumpers.



RS-485 bus connection

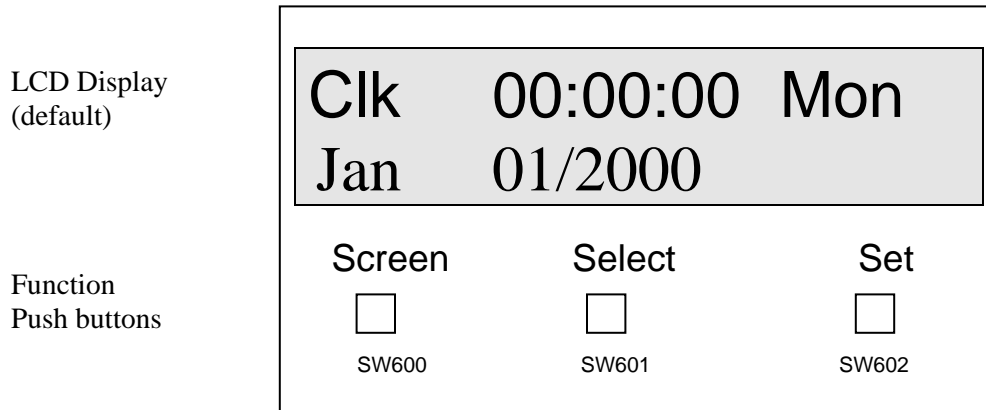
3. The cable used for RS-485 wiring should be of shielded 2-pair twisted pair type, 24 AWG (Belden 9842 typical).

1<sup>st</sup> pair is used for the signal (+ and -)

2<sup>nd</sup> pair shorted together is used as the ground wire.

Finally, the shield should be connected to ground only on one end of the cable as shown above.

### 3. Display & Function Button Overview



LCD Display  
(default)

Function  
Push buttons

LCD Display:

The system default display is shown above. The display is a LCD screen indicating date, day, and time information.

### Function Push buttons

Screen Push button:

The screen button is used to page through the menu of functions available on the system. The push button is a momentary contact. Each time the button is pressed, the next menu item is displayed.

The menu items are:

1. Clk Day, date, and time screen (default)
2. Zone Zone Status Screen
3. PGM Holiday Assignment Screen
4. PGMsw Switch Assignment Screen
5. PGMrl Follow Relay Assignment Screen
6. PGMz Zone Override Programming Screen
7. 0101R? Day Schedule Programming Screen
8. Memory Allocation Status Screen (Not programmable)

Menu items PGM, PGMsw, PGMrl, PGMz, 0101R? are programming screens to configure the lighting system. These commands program the on/off times of relays, switches that control relays, and operating multiple relays from one relay. The system can be configured to have multiple control functions on one relay or many relays. To enter each command sequentially, program numbers are assigned to each control command.

The function of the program number is to keep track or identify the command settings in a logical step by step format. Each entry from an input/output table can be numbered and recorded using the program number assignment by the LCS-2. Day schedules are numbered for identification using the program number. This way, it is a quick and simple matter to locate a schedule or input/output and modify the settings.

## Function Push buttons (cont'd)

### Select Button:

The Select button is used to move the display cursor across the display to select the field you wish to change. Each time the button is pressed, the next programmable field is selected. The selected field is distinguished by the blinking cursor.

### Set Button:

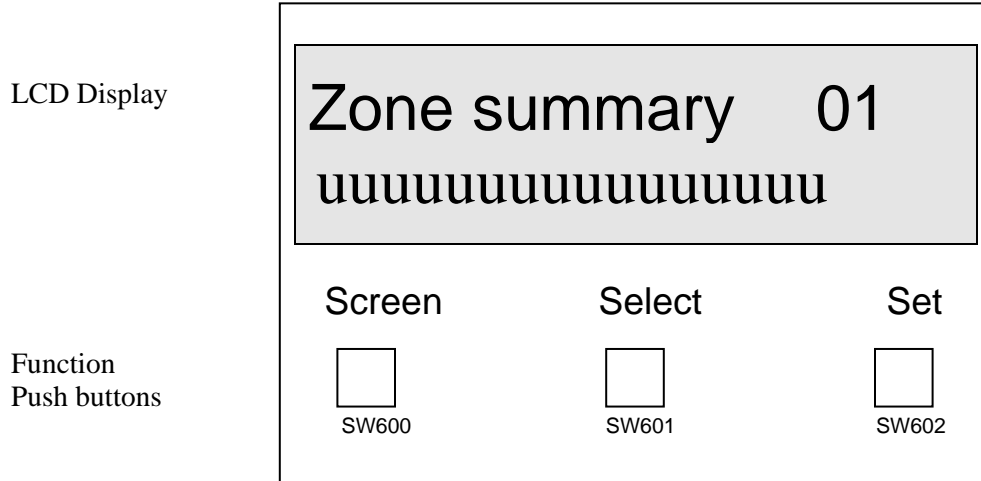
The Set button is used to change the value in the field the cursor is on. Each time the Set button is pressed, the next setting is displayed. After the last setting option is viewed, the display will return to the first setting. This way you can view all the options before setting a value in the field.

Example:        Changing date and time

1. If date and time are **not displayed**, press/release the Screen button until the date and time screen is displayed.
2. Press/release the Select button to move through the fields on the display. The selected field is indicated by the blinking cursor.
3. Press/release the Set button until the value you wish is displayed.
4. Press/release the Select button to move to the next field and repeat steps 1 to 3.
5. When finished, press/release the Screen button to move to the next screen. It is recommended you scroll through the screens back to the date screen to verify the changes are correct.

## 4. Zone Status Screen

This screen is only for viewing the Zone Status  
No Selection or Setting is possible



Zone Summary 01-32.

The zone summary indicates the panel number or zone. If the system is configured in stand alone, meaning the panels are not networked; then the panel default zone is one (01). The panel may have a number between 1 and 32, though it performs no function.

If the panels are networked, then the panel will display a number between 1 and 32. This identifies this unique panel in the system.

Zone Status – uuuuuuuuuuuuuuuu (16 zones or output relays)

The above zone statuses show “u” for unprogrammed. Lower case “u” indicates NOT programmed and status is “OFF”. Uppercase “U” indicates NOT programmed and “ON”.

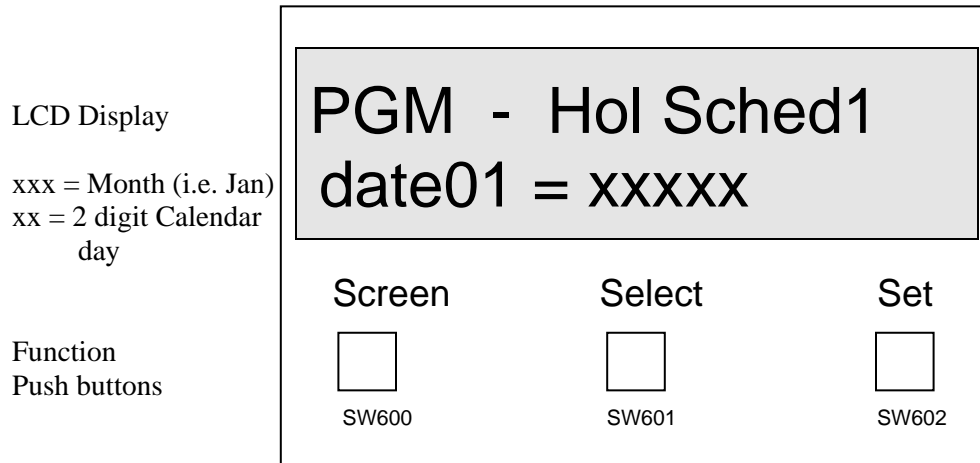
The Status codes are:

- |    |        |                           |
|----|--------|---------------------------|
| 1. | u or U | Undefined - Not scheduled |
| 2. | s or S | Scheduled                 |
| 3. | m or M | Manual Override           |

In all cases, lowercase letters u, s, or m mean “OFF” and uppercase letters, U, S, or M mean “ON”. All zones, regardless of status, may be configured for control by field override switches.



## 5. Holiday Schedule Screen



Holiday Schedules are designed to allow the operator to pre-program calendar dates as holidays. For example, Christmas and New Year's are common dates for a Holiday Schedule. Each time a new date is entered, a new program number is needed. For example, Christmas would be "date01 = Dec 25" and New Year's would be "date02 = Jan 01"

Please note the Holiday Schedule operates only in the present year. Therefore, Christmas in the year 2000 would be entered as xxx = Dec and xx = 25. New Year's 2001 cannot be entered.

Hol Sched1 (Holiday Schedule 1) can store (01-64) dates

Hol Sched2 (Holiday Schedule 2) can store (01-64) dates

**Note: Invalid dates can be entered i.e. Feb 31.  
Only dates for the PRESENT year can be entered.**

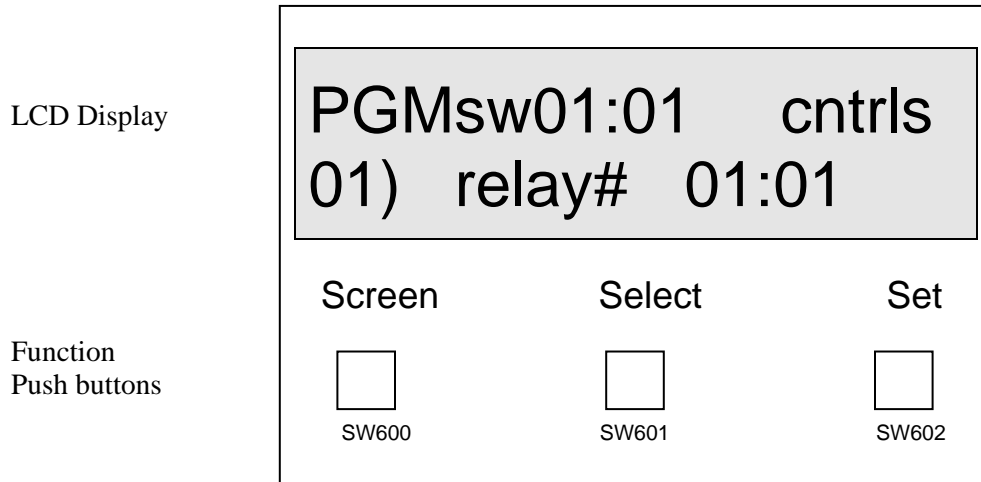
Selection Options

Date01  
Month (xxx)  
Date (xx)

Set Options

xx, 01,02,03,...64  
xxx, jan,feb,mar,apr,may,jun,jul,aug,sep,oct,nov,dec  
xx, 01,02,03,...31

## 6. Switch Assignment Screen



PGM indicates programming mode.

01:01 first 2 digits are the panel number (01-32), second 2 digits are the switch number (01-16).

cntrls short form for “controls”

01) indicates the program number (01-32)

relay#

01:01 First 2 digit indicates the panel number (xx-32), second 2 digits indicate the output relay (xx-16).

The example shown indicates LCS-2 panel 01, input switch 01 controls output relay 01 in panel 01.

The default screen for this function contains “xx” in the relay field. By pressing/releasing the SET button the control will cursor through the options from xx, 1,2, ...32.

For multiple relay control from a switch, the switch number stays unchanged and the program and relay numbers must be changed.

For example, Switch input is on panel 3 and input 16 and controls panel 1 relay 5 and panel 2 relay 3. The screen display after using the SELECT and SET buttons to change the field values are:

First data entry:

PGMsw 03:16 cntrls

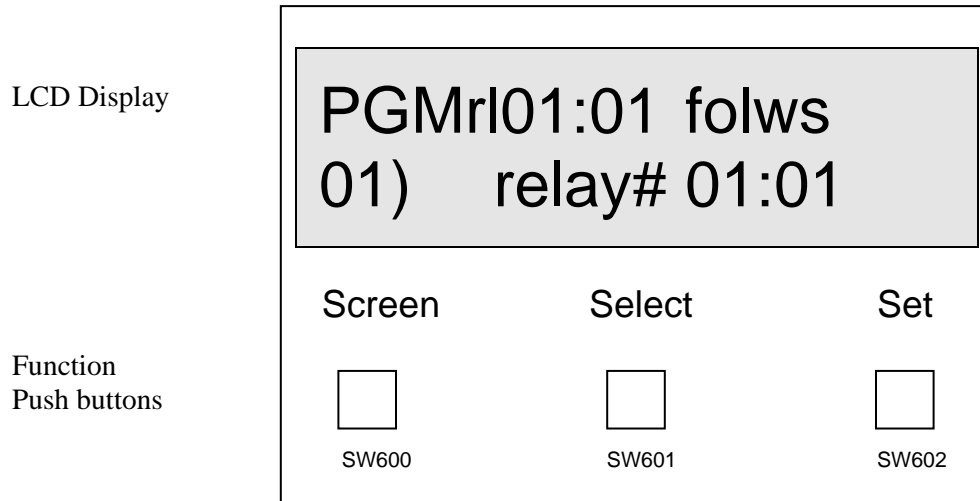
01) relay# 01:05

Second data entry:

PGMsw 03:16 cntrls

02) relay# 02:03

## 7. Relay Follow Assignment Screen



PGMrl            indicates programming for relay follow

01:01            the first 2 digits indicate the panel number (01-32) the second 2 digits indicate the relay (01-16)

folws            short spelling of follows

01)              indicates the program number (01-32)

relay#

01:01            first 2 digits indicate the panel number (01-32), the second 2 digits indicate the relay number (01-16)

Relay numbers scroll from xx,01,02,03,...32

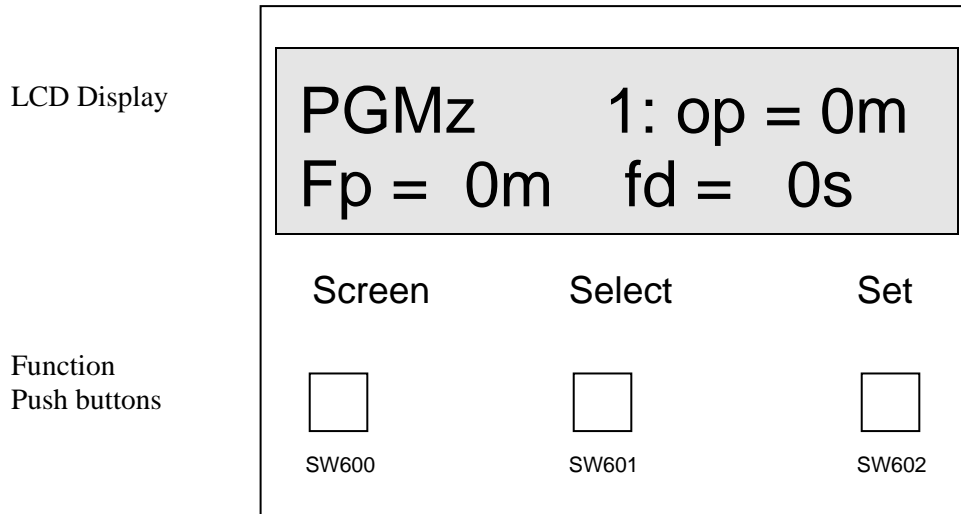
For example, create a schedule so panel 02, relay 03 follows panel 01, relay 02 and panel 03, relay 04 also follows panel 01, relay 02. The screen display after using the SELECT and SET buttons to change the field values are:

After first data entry:                      PGMrl02:03 folws  
01) relay# 01:02

After second data entry:                      PGMrl03:04 folws  
02) relay# 01:02

**To clear an entry set the relay # second 2 digits to xx and press Screen button, then scroll back to this screen and verify the screen display is – 01 relay# xx:xx.**

## 8. Zone Override Screen



PGMz indicates program mode for zone override

1 indicates the LCS-2 board switch input number (01-16)

op = 0 m 4 digits indicates the override period (0-1440) minutes of extended lighting

fp = 0 m 3 digits indicates the advance warning time (0-255) minutes that the flicker starts before the lights are scheduled to shut-off.

fd = 200s 3 digits indicates the flicker duration time (0-255) seconds (i.e. How long will the lights flicker on/off). The flicker rate is pre-programmed and not adjustable

Each digit can be selected and set or the system will count up from the selected digit.

For example: The "op = ---0m" field has 4 digits. Selecting the most significant digit, pressing set, and the digit will toggle between 0 and 1. Selecting the least significant digit, pressing set, and the digit will count from 0 to 9 increment the other digits until 1440 is reached and then rolling over to 0000.

To remove the time setting, select the most significant digit and press/release the SET button until the value rolls over to zero (0). If you select any other digit the system will count up to the maximum value before rolling over to zero (0).

Zone Overrides are LCS-2 panel input switches. Previously, using the Switch Override Screen the switches are programmed to turn ON/OFF relays that control the lighting in designated areas. Now in this screen you are programming the switches to **override** any scheduling and to **warn** the occupants that the lights are scheduled to turn off.



## 9. Day Schedule Screen (cont'd)

### Adding Day Schedules

To add a day of the week or holiday to a new schedule or existing schedule, press the SELECT button to the desired field and press the SET button to change the value. Press the SELECTION button to move the cursor to the day you wish to add to the schedule. Press the SET button to toggle the day from lower to upper case. When the day changes from lower case "t" to upper case "T" that day of the week is included in the schedule being programmed.

Start time ON                    xx:xx, time when the ON command is activated  
 Stop time ON                    xx:xx, time when the ON command ends / Start time for OFF command

Enter both the start time and stop time for the ON command. For example, the start time is 06:00 and the stop time is 17:00. After pressing the SET button on the "!", the screen will display the start time as 17:00, the stop time as xx:xx and OFF as the command. If you have no other start times, press SELECT to the "!" and press SET. If you wish to add another ON command, enter the ON time as the stop time for the OFF command. When all commands are entered for that schedule, press SELECT to the Read/Write field and press SET to display R.

SELECT the "?" and press SET, the screen will scroll to display the schedule you have entered. If you wish to view another schedule, using SELECT and SET, change the panel digits and relay digits to the appropriate numbers, SELECT "?", press SET and the display will scroll through the schedule.

### Removing Day Schedules

To remove Day Schedule programming select and set the panel and relay numbers (i.e. 0204). The screen **must** be in the read mode (R?). Select the "!" field and scroll through the days of the week (Mtwfshh) pressing the SET button at each day. Each day will change to upper case to indicate selection. The display will show xx:xx = xx:xx and not change after all days are selected. Scroll through the menu using the SCREEN button back to the Day Schedule Screen and verify the deletion.

**To enter the start/stop times the "!" MUST be selected and the SET button pressed.**

# 10. Memory Allocation Screen

This screen is for diagnostic purposes only.

LCD Display

B0	01	00	52	3F
B4	20	4D	74	77

Function  
Push buttons

Screen



SW600

Select



SW601

Set



SW602

This screen is for service representatives only. Users should not select or set any information into this screen.

## 11. Board Address Setting

The board address is set by jumpers BA0 to BA4. Valid addresses are 1 through to 32. Each board on the network must have a unique address. **There must always be a working board with address #1** since it is responsible for synchronising the real-time clocks of all panels in the network.

### Jumper settings for network address

The network address is a 5-bit binary number. Its least significant bit is BA0 and its most significant bit is BA4. If a jumper is installed, the corresponding bit is 1, otherwise, it is 0.

In the following table 0 means jumper not installed, X means jumper installed.

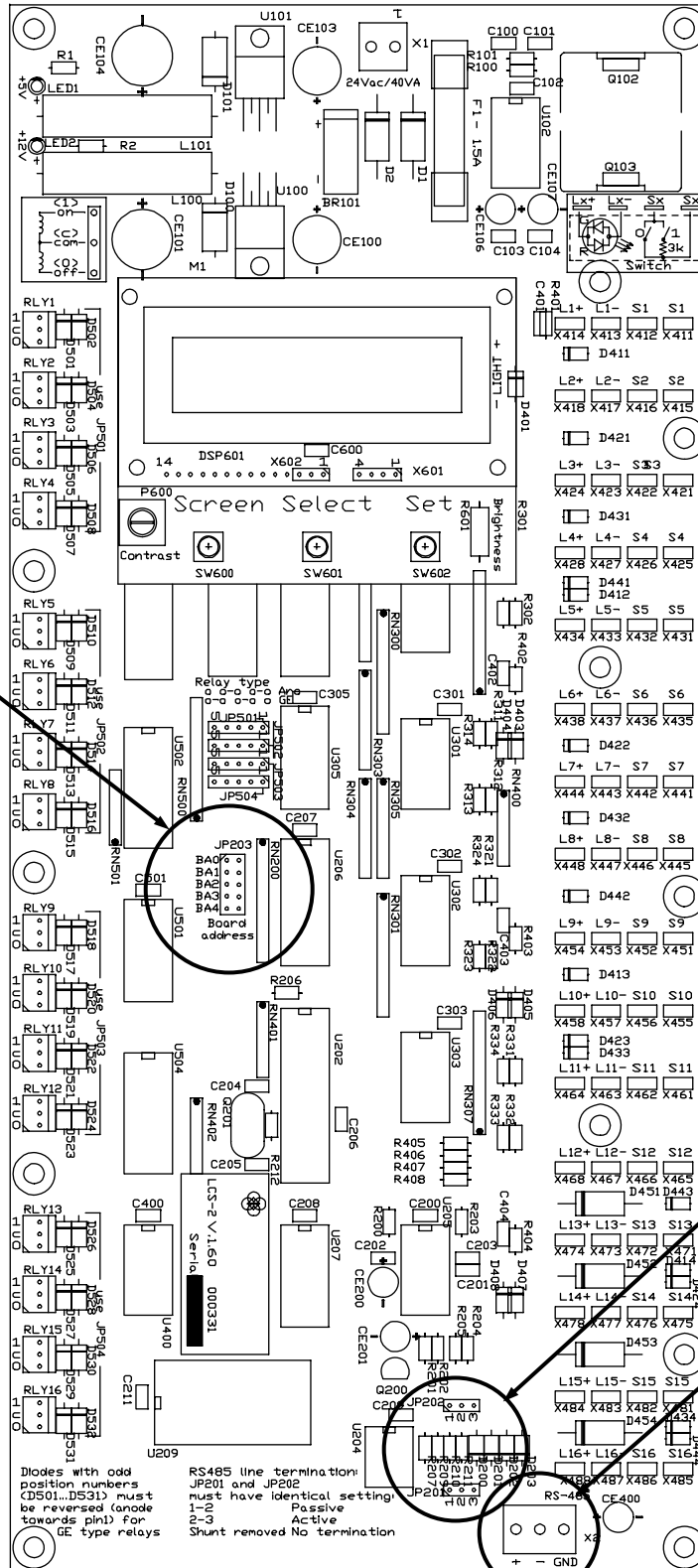
Jumpers installed					Board Address
BA4	BA3	BA2	BA1	BA0	
0	0	0	0	0	1
0	0	0	0	X	2
0	0	0	X	0	3
0	0	0	X	X	4
0	0	X	0	0	5
0	0	X	0	X	6
0	0	X	X	0	7
0	0	X	X	X	8
0	X	0	0	0	9
0	X	0	0	X	10
0	X	0	X	0	11
0	X	0	X	X	12
0	X	X	0	0	13
0	X	X	0	X	14
0	X	X	X	0	15
0	X	X	X	X	16
X	0	0	0	0	17
X	0	0	0	X	18
X	0	0	X	0	19
X	0	0	X	X	20
X	0	X	0	0	21
X	0	X	0	X	22
X	0	X	X	0	23
X	0	X	X	X	24
X	X	0	0	0	25
X	X	0	0	X	26
X	X	0	X	0	27
X	X	0	X	X	28
X	X	X	0	0	29
X	X	X	0	X	30
X	X	X	X	0	31
X	X	X	X	X	32



# Board Address Setting (cont.)

## Board Layout

Board Address Headers



RS-485 Bus Termination Headers

RS-485 Bus Connection

Diodes with odd position numbers (DS01, DS31) must be reversed (anode towards pin1) for GE type relays

RS485 line termination: JP201 and JP202 must have identical setting:

1-2	Passive
2-3	Active
Shunt removed	No termination