GE **Total Lighting Control**

ProSys™ LM

Lighting Control System Software

User's Guide

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Minimum System Requirements

Computer System Requirements

- An LNS-based network management tool that supports plug-ins
- Windows 95, Windows 98, or Windows NT 4.0 with Service Pack 4
- Pentium 133
- 48MB of RAM (64MB recommended) for Windows 95 and 98
- 64MB of RAM (128MB recommended) for Windows NT
- CD-ROM drive
- Mouse or compatible pointing device

Chapter 1

Devices, Functional Blocks and Plug-ins

ProSys LM software allows you to configure and operate the lighting control system via three software components: devices, functional blocks and plug-ins.

Devices

" Devices" are software modules that represent the major components of the lighting control system. There are 3 devices in the PoSys LM software package:

- the panel device
- the real time clock device
- the softwired switch device

Functional Blocks

Functional blocks (also known as LonMark® Objects) are contained in these devices. A functional block represents a collection of network variables and configuration properties of a device and performs a function for that device. For example, each schedule is represented in the software by a *schedule functional block*.

The functional blocks and the devices that contain them are:

The Panel Device

- One Lighting Panel Controller functional block
- Eight Lighting Channel functional blocks

The Real Time Clock Device

- One Real Time Clock functional block
- One Calendar functional block
- Eight Schedule functional blocks

The Softwired Switch Device

- One Softwired Switch functional block

Plug-ins

Plug-ins are the applications through which you configure, monitor and control the ProSys LM Lighting System. Two plug-ins are installed with ProSys LM:

- The ProSys Configuration Plug-in
- The ProSys Viewer Plug-in

The Configuration Plug-in

The configuration plug-in enables you to configure the six functional blocks contained in the three devices. Functionality includes configuring lighting panels, scheduling, and configuring softwired switches. These plug-ins are accessed through the functional blocks.

The Viewer Plug-in

The viewer plug-in has two components:

- The Panel Viewer
- The Clock Viewer

These viewers enable you to see panel and clock settings and to change those settings in real time. These plug-ins are accessed through their devices. The viewers are described in Chapter 6, *Monitoring a Lighting Network*.

Chapter 2

Installation and Setup

The Steps in Installation and Setup

The following seven steps are required before you can configure, monitor and control your lighting network from your computer. Steps two to six are performed through your network management tool and described in its documentation.

1   Install the ProSys™ plug-ins on your computer.

2   Create a new network or open the existing lighting network.

3   Register the plug-ins.

4   Add the devices to the database.

5   Commission the devices.

6   Access the functional blocks for each device.

7   Bind network variables together so that the devices can communicate with each other.

Installing the Plug-ins on Your Computer

Install the ProSys LM software from the GE ProSys CD, following the InstallShield Wizard instructions.

Accessing Functional Blocks

Access the functional blocks that have the characteristics of, and represent, the components of the devices they belong to, for instance, the Real Time Clock's *calendar*, and *schedules*.

Binding

In order that the clock, switches and panels can communicate with each other, they must be connected to each other in the software using network variables and message tags. This operation is called *binding*. All the bindings required to enable a real time clock, panels, and switches to operate together in a ProSys LM Lighting Control System are listed below.

In the software, the network variable binding connects the functional blocks.

The bindings are documented in the following form: *LonMarkObject.NetworkVariable*

It is assumed that there is only one clock per network.

Network Variable Binding

Panels to Switches (many to many)

Panel	►	Switch
Light Panl Ctrlr.nvoGroupFb	►	Switch.nviScenFb
Light Panl Ctrlr.nvoPatternFb	►	Switch.nviPatternFb

Switches to Panels (many to many)

Switch	►	Panel
Switch.nvoScene	►	Light Panl Ctrlr.nviGroup
Switch.nvoPattern	►	Light Panl Ctrlr.nviPattern

Clock to Panels (one to many)

Clock	►	Panel
Schedule[x].nvoSchedDark	►	Channel[x].nviDarkOn
Schedule[x].nvoSchedEvent	►	Channel[x].nviSchedEvent

Clock to Clock

Clock	►	Clock
Calendar[0].nvoSchedDay	►	Schedule[0].nviSchedDay
Calendar[0].nvoSchedDay	►	Schedule[1].nviSchedDay
Calendar[0].nvoSchedDay	►	Schedule[2].nviSchedDay
Calendar[0].nvoSchedDay	►	Schedule[3].nviSchedDay
Calendar[0].nvoSchedDay	►	Schedule[4].nviSchedDay
Calendar[0].nvoSchedDay	►	Schedule[5].nviSchedDay
Calendar[0].nvoSchedDay	►	Schedule[6].nviSchedDay
Calendar[0].nvoSchedDay	►	Schedule[7].nviSchedDay

Panels to Clock (many to one)

Panel	►	Clock
Light Panl Ctrlr.nvoGroupFb	►	Scene Panel.nviGroupFb

Clock to Panels (one to many)

Clock	►	Panel
Scene Panel.nvoGroup	►	Light Panl Ctrlr.nviGroup

Switches to Clock (many to one)

Switch	►	Clock
Switch.nvoScene	►	Switch Config.nviSwitchScene

Clock to Switches (one to many)

Clock	►	Switch
Switch Config.nvoSwitchSceneFb	►	Switch.nviScenFb

Message Tag Binding

Clock to Panels (one to many)

Clock	►	Panel
Clock.msgPanelCfg	►	Panel.msg_in

Software-install and Self-install Modes

Devices (panels, softwired switches, and real time clock) in a ProSys™ LM Lighting Control System are in *software-install mode*, which means that in order to be able to communicate they must be linked in the software by network variable binding. The devices in a stand-alone ProSys Lighting Control System (operated without a computer) are in *self-install mode*, which means that as soon as they are connected to the network they can communicate with each other—no binding required.

If, for any reason you need to put devices into self-install mode, the instructions are given below.

 WARNING: Before you put devices in self-install mode, be aware that when you return them to software-install mode (to control them through your PC) all the bindings will be lost. You will therefore have to repeat the binding procedure.

Putting Devices into Self-Install Mode

If a clock, panel or switch is in software-install mode and you want to put the device into self-install mode, press and hold its service pin. The procedure is slightly different for each device (see below).

Clock

▶**To put the Softwired Clock into self-install mode:**

1 Press and hold down the service pin.

   The screen will go blank.

2 When the screen re-forms release the service pin.

   The clock is now in self-install mode.

Panel

▶**To put a Panel into self-install mode:**

1 Press and hold down the service pin.

   The service pin's flashing green LED will stop flashing; half of the LED will turn solid red and the other half will flash green.

2 When the LED stops flashing and turns to solid green (after about 10 seconds), release the service pin.

   The panel is now in self-install mode.

Switch

▶**To put a Switch into self-install mode:**

1 Press and hold down the softwire button.

   The button LEDs will start flashing.

2 When the button LEDs and the locator LED turn off (after about 10 seconds), release the softwire button.

When the panel finds the switch, the locator LED will come back on and the switch will be in self-install mode.

<div align="right">

Chapter 3

Configuring Lighting Panel Channels

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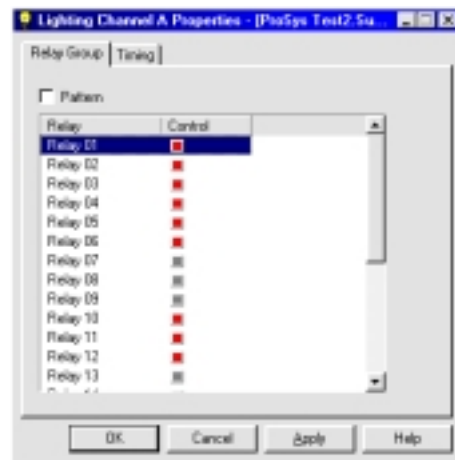## Softwiring a Relay to a Channel

A lighting panel's channel can be softwired to control:

- any relay or group of relays
- any group of relays to a pattern

Softwiring a Relay or Relay Group to a Channel

▶**To softwire a relay or relay group to a channel:**

1 From a channel's functional block, open a panel's **Channel Properties** dialog box.

This dialog box displays the channel that you have chosen (Channel A in the example above) and all the relays on the panel.

2 To softwire a relay to that channel, click the relay's gray square in the **Control** column.

The gray square will turn red indicating that the relay has been "assigned" to that channel.

Softwiring a Relay Pattern to a Channel

Softwiring *a pattern* enables you to program a channel so that some of the relays will be on
and others will be off.

1 From a channel's functional block, open a panel's **Channel Properties** dialog box.

2 Click the **Relay Group** tab and click **Pattern** so that there is a checkmark in the box.
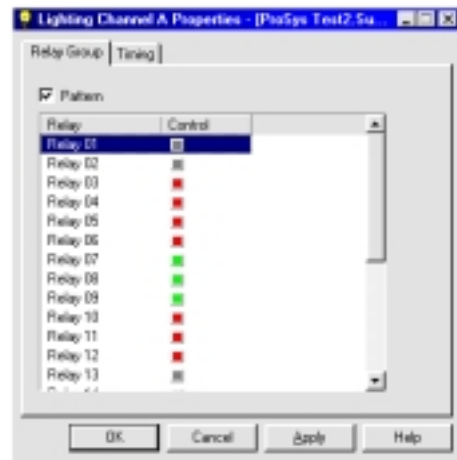
3 Select a relay by clicking its square in the **Control** column.

A red square indicates that the relay will be on; a green square indicates that the relay will be off; a
gray square indicates that the relay will not be a part of the pattern group.

Setting Flick Warn for a Channel

Flick Warn is a period of time before the end of an occupied period that the lights can be set
to blink. The maximum allowable is 30 minutes.

▶**To set a Flick Warn period:**

1 From a channel functional block open the **Channel Properties** dialog box.

2 Click the **Timing** tab, set a flick warn period (to a maximum of 30 minutes), and click **OK**.

Setting Time Delay for a Channel

Time Delay is the length of an override in an unoccupied period. The maximum allowable is 250 minutes.

▶**To set a time delay:**

1 From a channel functional block open the **Channel Properties** dialog box.
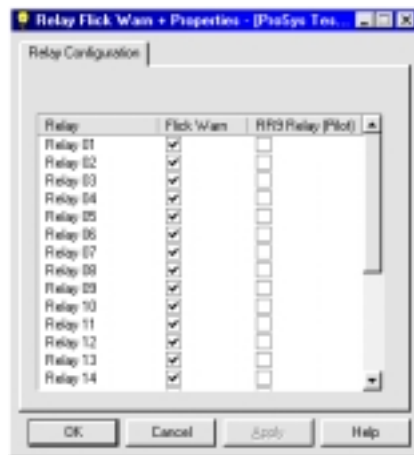

2 Click the **Timing** tab, set a time delay period (to a maximum of 250 minutes), and click **OK**.

Assigning Flick Warn to Relays

Flick Warn is assigned by relay. You will have set the Flick Warn period to each channel (see above).

▶**To assign Flick Warn to relays:**

1 From the panel device open the panel's **Properties** dialog box.

2 Assign Flick Warn to relays by clicking the boxes in the **Flick Warn** column.

3 Click **OK**.

Selecting RR9 (Pilot) Relays

This dialog box enables you to select the relays that are type RR9 so that any relay malfunction will show up on the panel. In this dialog box, if you check all the relays that are RR9, when there is a discrepancy between the panel status and the relay state (for example, the relay is on but the panel is reading it as off) the relay's LED **on the panel** will turn solid green.

▶**To select RR9 relays:**

1 From the Panel device open the panel's **Properties** dialog box.
2 Indicate the RR9 relays by clicking the boxes in the **RR9 Relay** column.
3 Click **OK**.

Chapter 4

Scheduling

Overview

Schedules are stored in the Real Time Clock. When working online, when you configure and save the schedules they are sent to the Real Time Clock, (the clock must be connected to a panel or a switch on the network.)

The main steps in setting up schedules for a lighting network are:

1   Setting the time for the network

2   Specifying the time zone and location of the network

3   Setting daylight savings

4   Setting the network update rate

5   Configuring schedules

6   Configuring holiday schedules

Configuring the Time, the Time Zone and Daylight Savings

Before you can start scheduling you must set the time, enter the location of the network and the dates of daylight savings. This ensures that lighting system can perform daily routines in a synchronized fashion through seasonal changes.

Setting the Time

The time is set through the Clock Viewer.

▶**To set the time:**

1   Open the Clock Viewer.

2   Click **Adjust Date/Time**.

3 Change the date and time as necessary, click **OK** to save your changes, then click **OK** to close the **Clock Viewer**.

Specifying the Time Zone and Location

The location and time zone of the lighting network are required so that sunrise and sunset can be calculated.

▶**To set the time zone and location:**

**1** Open the Real Time Clock's *Real Time Clock Configuration* functional block.

2 Click the **Timezone / Location** tab.

3 In the **Earth Position** box, highlight the **Longitude** and **Latitude** values and type in the correct values. If you do not know the Earth position of your lighting network, run the location.exe program on your plug-in CD and select the city your lighting network is located in.

4 In the **Current Timezone** box, highlight the **Offset from GMT** and type in the correct value (in minutes).
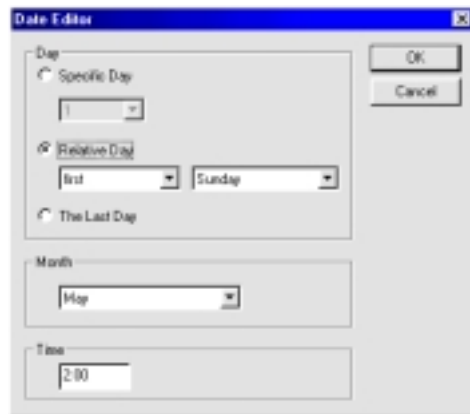
Setting Daylight Savings Time

▶**To set daylight savings time:**

1 Click the **Daylight Savings** tab.
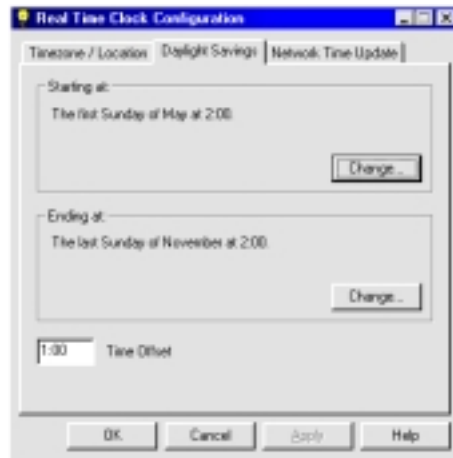
2 To change the start time for daylight savings, click the **Change** button in the **Starting at** box.

The Date Editor dialog box displays three options:

- ▪ A *Specific Day* is any day of the month.

- ▪ A *Relative Day* is a specific day of the week

- ▪ A *Last Day* is the last day of the month.

All the day types are related to the month specified in the Month box and the time specified in the Time box in the Date Editor window.

3 Select a month from the **Month** box.

4 Highlight the **Time** box and type in the time-of-day to start daylight savings time.

5 Click **OK** and then click **Change** to set the end of daylight savings.

6 Set the **Time Offset**.

The time offset is the difference between standard time in the time zone and daylight savings time.

Setting the Network Time Update

The Network Time Update is the frequency with which the Real Time Clock sends the current time out over the network.

▶**To set the Network Time Update:**

1 Click the Network Time Update tab.

2 To change the rate of update time, highlight the value in the RTC Update Rate box and type in a new value or use the *up* arrow to increase the value or *down* arrow to decrease the value.

Setting Up Daily Schedules

The schedules use the 24-hour format. For example, one o'clock in the afternoon is entered as 13:00.

▶**To view the Schedule Editor options:**

♦ Open the clock's ProSys Schedule Editor functional block for one of the eight channels.
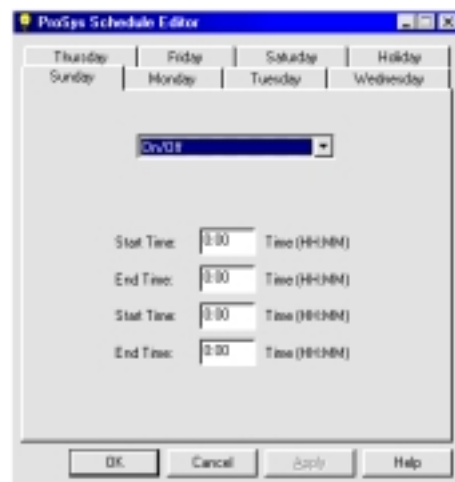
Each channel may assigned any one of the four following automation scenarios:

- *On/Off* is for interior lighting that is automatically turned on during scheduled occupied hours, and automatically turned off during scheduled unoccupied hours.

- *Manual On/ Off* is for interior lighting that is turned on by a person during occupied hours and turned off automatically during scheduled unoccupied hours.

- *Astro On/Off* is for exterior lighting (security) that uses the Real Time Clock data for sunrise and sunset times. The exterior lighting turns on and off automatically based on these times.

- *Astro On/Scheduled Off* is for exterior lighting (for parking lots and signage) that uses sunrise and sunset data from the Real Time Clock and scheduled occupied times to turn on and off automatically.

Setting Up an On/Off Schedule

Use the procedure below for setting up a schedule for every day of the week and for a holiday.

▶**To set up an On/Off schedule for a day of the week:**

1 In the **Schedule Editor** click the *down* arrow and select the On/Off scenario.

2 Highlight the **Start Time** and type the time.

Remember to use the 24-hour clock (I:00 pm would be 13:00).

3 Click **Apply** to send that day's schedule to the clock, and then click the next day to be scheduled.

There are two Start Time options and two End Time options. This enables you to schedule two different lighting periods for one day.

Setting Up a Manual On/Off Schedule

Manual On/Off is for interior lighting that is turned on by a person during occupied hours and turned off automatically during scheduled unoccupied hours.

▶**To set up a Manual On/Off schedule for a day of the week:**

1 In the **Schedule Editor** click the *down* arrow and select **Manual On/Off**.

2 Highlight the start and end times and type the times.

3 Click **Apply** to send that day's schedule to the clock, and then click the next day to be scheduled.

There are two Start Time options and two End Time options. This enables you to schedule two different lighting periods for one day.

Setting Up an Astro On/Off Schedule

Astro On/Off is for exterior lighting (security) that uses the Real Time Clock data for sunrise and sunset times. The exterior lighting turns on and off automatically based on these times.

▶**To set up an Astro On/Off schedule for a day of the week:**

1 In the **Schedule Editor** click the *down* arrow and select **Astro On/Off**.

2 Select an **Astro Offset** option (after sunset or before sunset) and type the number of minutes of offset you want to apply to the option.

For example, if you want the lighting to turn on 30 minutes after sunset and 30 minutes before sunrise, choose **After Sunset** from the **Astro Offset** list and type **30** in the **Start Time** box.
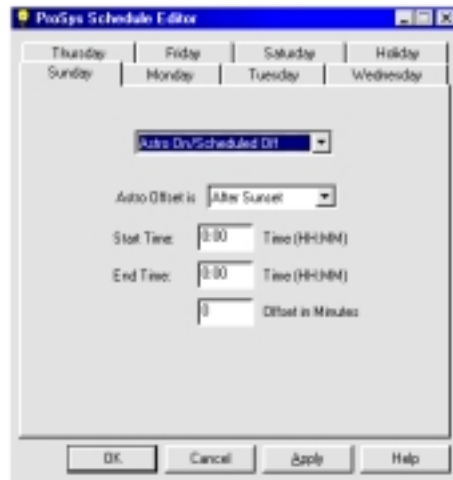
3 Click **Apply** to send that day's schedule to the clock, and then click the next day to be scheduled.

Setting Up a Astro On/Scheduled Off Schedule

Astro On/Scheduled Off is for exterior lighting (for parking lots and signage) that uses sunrise and sunset data from the Real Time Clock and scheduled occupied times to turn on and off automatically.

▶**To set up an Astro On/Scheduled Off schedule for a day of the week:**

**1** In the **Schedule Editor** click the *down* arrow and select **Astro On/Scheduled Off**.

2 To set up this type of schedule, choose an **Astro Offset** option (after sunset or before sunset) and type the number of minutes of offset you want to apply to the option.

For example, if you want the exterior lighting to automatically turn on 30 minutes after sunset and 30 minutes before sunrise, choose **After Sunset** from the **Astro Offset** list, and type **30** in the **Start Time** box.

3 In the **Start Time** and **End Time** boxes, schedule the time for the lighting to automatically turn on when it is dark outside and the building is occupied, and off when it is unoccupied.

4 Click **Apply** to send that day's schedule to the clock, and then click the next day to be scheduled.

Setting up a Holiday Schedule

When you set up a holiday schedule, that schedule will apply to every day that is specified as a holiday in the Calendar Editor.

The Calendar editor enables you to specify what days of the year are holidays.

- ▪ *Single Day Exceptions* tab is used to mark individual days that are exceptions to a day in your schedules.

- ▪ *Multiple Day Exceptions* tab is used to mark consecutive days that are exceptions to a group of consecutive days in your schedules.
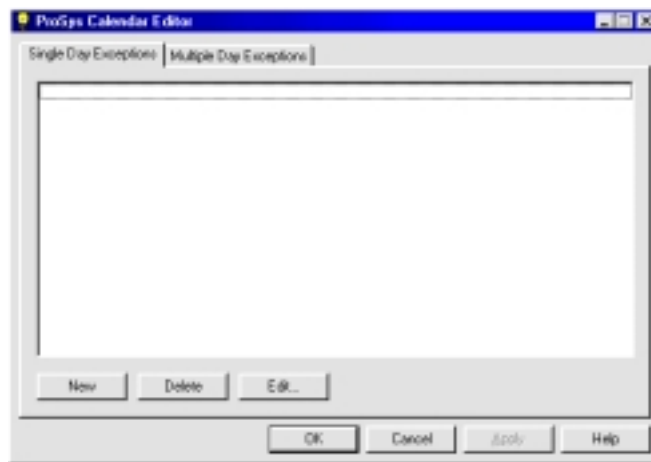
Creating a Single-Day Holiday

Use this option to designate a one-day holiday.

▶**To create a single day exception:**

1 In the Calendar Editor click **New** and click **Edit**.

2 In the Date Editor dialog box select the day, month, and year and click **OK**.

Creating a Multiple-Day Holiday

Use this option to designate a holiday consisting of a range of days.

▶**To create a multiple-day holiday:**

1 Click the **Multiple Exceptions** tab and click **New**.

The range of days in the exception are displayed in the window.

2 To change the start date of the exception click **Edit Start…** to display the **Date Editor**.

3 Choose a day, month, and year then click **OK**.

4 Click **Edit End…** to display the **Date Editor** and choose a day, month, and year then click **OK.**

The range of the multiple-day holiday is displayed in the window.

Chapter 5

Configuring Softwired™ Switches

Softwiring A Switch's Buttons

The Softwired Switch can be configured so that each button can control:

- Any channel on any panel
- Any relay or group of relays on a single panel to a pattern

Softwiring a Button to Control Channels

A softwired switch button can be softwired to any channel on any panel.

▶**To softwire a button to control channels:**

1 From the Switch functional block, open the **Switch Editor** for the switch to be configured.

The dialog box will display the same number of buttons as the switch that you are configuring. You can select seven different combinations of channels and panels.

2 Click a button tab to softwire that button.

3 Click the *down* arrow to select **Scene**.

4 Click the square in the first row so that there is a checkmark in it.

5 Select a panel and a channel.

6 Repeat as necessary for other panel/channel combinations.

Softwiring a Button to Control One or More Relays

A switch button can be softwired to any relay or group of relays on any one panel.

▶**To softwire a button to control panel relays:**

1 From the Switch functional block, open the **Switch Editor** for the switch to be configured.
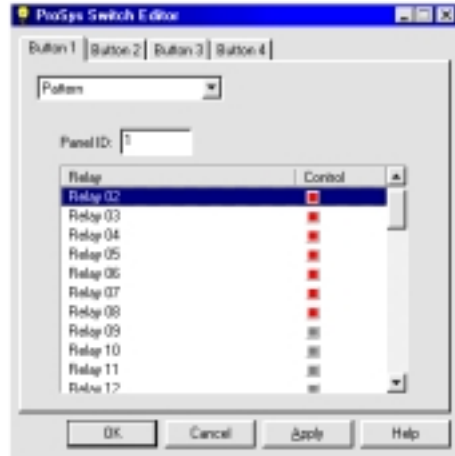
The dialog box will display the same number of buttons as the switch that you are configuring.

2 Click a button tab to softwire that button.

3 Click the *down* arrow and select **Pattern**.

4 Type the number of the panel in the **Panel ID** box.

5 Select relays to be on by clicking them.

Click the relays so that the squares are red. Do not select green squares—green means that the relay will be *off*.

Softwiring a Button to Control One or More Relays (to a Pattern)

A switch button can be softwired to any relay or group of relays on any one panel. Softwiring *to a pattern* means that you can program some of the relays to be on and others to be off.

▶**To softwire a button to control panel relays to a pattern:**

1 From the Switch functional block, open the **Switch Editor** for the switch to be configured.
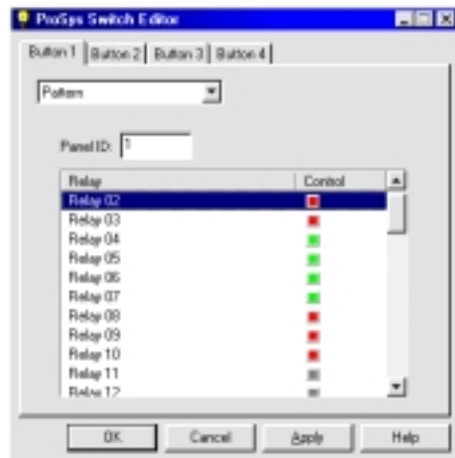
The dialog box will display the same number of buttons as the switch that you are configuring.

2 Click a button tab to softwire that button.

3 Click the *down* arrow and select **Pattern**.

4 Type the number of the panel in the **Panel ID** box.

5 Select relays by clicking them.

A red square indicates that the relay will be on; a green square indicates that the relay will be off; a gray square indicates that the relay is not a part of the pattern group

The Panel Viewer

The Panel Viewer is opened from the Panel device. This viewer enables you to:

- view the status of the lighting relays on all the channels of a panel

- switch relays on and off

- channels on and off
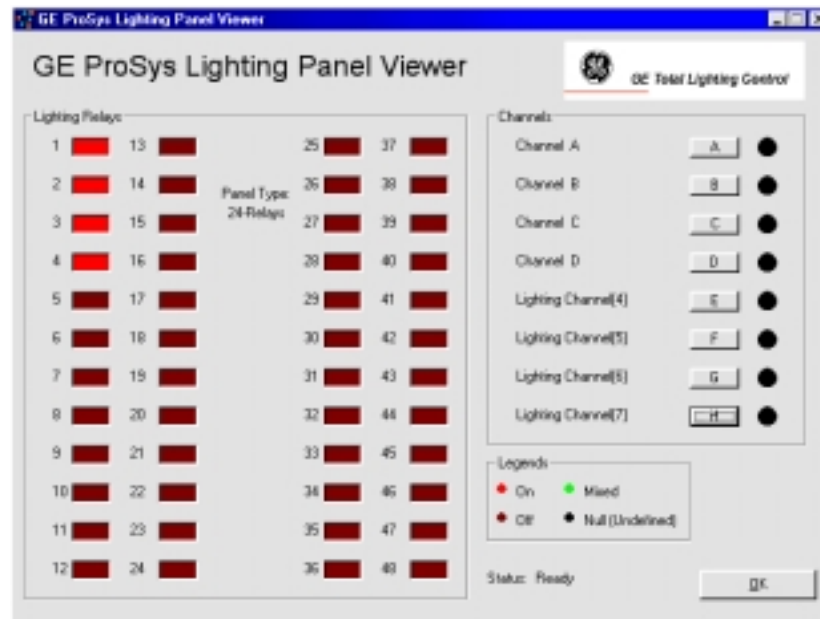
Viewing Lighting Channels

The channel buttons enable you to view relay status by channel. When a channel is displayed as *mixed* (green), this means that some of its relays are on and some are off.

Changing a Relay's Status

By clicking a relay (clicking the rectangle to the right of the relay number) you can change that status of that relay. The change will be sent to the relay in real time.

Changing a Channel's Status

By clicking a channel (clicking the buttons labeled A-H) you can change the status of that channel. The change will be sent to the channel in real time.

The Clock Viewer

The Clock Viewer is opened from the Clock device. Before you can use the Clock Viewer you must set it up (see below).

The Clock Viewer enables you to:

- change the time and date
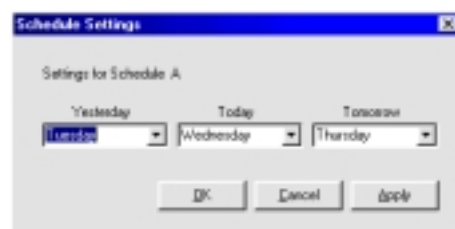- view the status of all eight schedules simultaneously
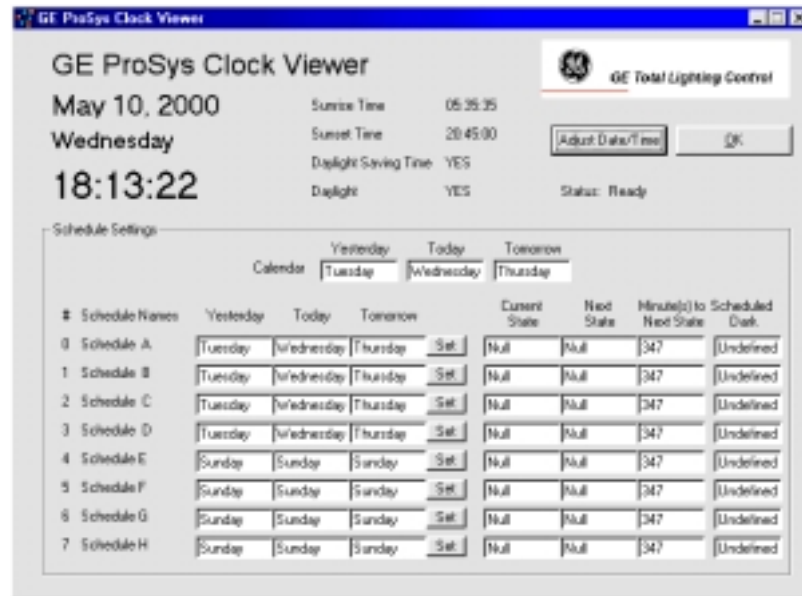
Setting Up the Clock Viewer

Setting up the Clock Viewer entails inputting the day of the week in each schedule—letting the Clock Viewer know what day it is.

▶**To set the day for a schedule:**

1 From the **Clock Device** open the **Clock Viewer**.

2 Click **Set** for a schedule.

3 In the **Schedule Settings** dialog box click the *down* arrows to set the days.

For example, if you are setting up the viewer on a Monday, select *Monday* from the drop-down list; then select *Sunday* for yesterday and *Tuesday* for tomorrow

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GE Total Lighting Control