

HCLK8SS

Network Clock Programmer Installation Instructions



The Network Clock (HCLK8SS) adds scheduling capability to the Lighting Integrator Panel.

The Network Clock simply mounts to the DIN rail in any panel and then plugs into the local dataline connections on the Automation Card. It provides global scheduling of up to 8 different lighting groups using pre-programmed automated lighting control scenarios.

SCHEDULING FEATURES

- Eight automation channels
- Five pre-programmed scenarios
- Astronomical and standard time functions
- Automatic interface with Photocontrol Package
- 8-line graphical display
- Menu-driven data entry
- 7-day repeating schedules with holidays
- Blink warnings and protected timed overrides
- Network diagnostics capability

WattStopper®

Santa Clara, CA 95050



The Network Clock converts to a Dataline Switch Programmer with the flip of a switch.

Programming Mode allows the system installer to smartwire switches to relay groups from their remote locations without having to return to the panel.

The Network Clock plugs into the front of any dataline switch. The switch stays in the wallbox powered up. The Network Clock can smartwire a switch button to control:

- Any relay or group of relays On/Off
- Any group of relays in a Pattern
- An Automation Channel (A-H) in multiple panels

The Network Clock can also remotely smartwire relays in a panel to Channels (A-H) as either On/Off Groups or Patterns.

PROGRAMMING FEATURES

- Program any dataline switch from its remote location
- Program any channel in any panel to control groups of relays from any switch or panel location
- Confirm programming
- Alternately switch from clock to programmer mode with no loss of scheduling or smartwiring data
- 8-line graphical display with menu-driven data entry
- Program data is stored in the switch's or panel's own memory

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These instructions are appropriate for HCLK8SS
Firmware versions 3.0 and above.

SCHEDULING MODE OPERATION OVERVIEW

In a Lighting Integrator system, relays may be “smartwired” to one of eight channels in the panel, or to the button of a dataline switch. Relay groups may be controlled manually by a wall switch, or automatically by a sensor, building automation system interface or other interface.

With a Network Clock (only one Network Clock can be in the network), the eight channels can become network-wide automation groups. Relays grouped to Channel A in Panel 01 and relays grouped to Channel A in Panel 02 can be automated as a single global group.

With the Network Clock, you can assign an automation “scenario” to any channel. The type of scenario chosen depends on how the space in the building is to be used.

- Is it an interior or exterior space?
- Should occupants turn lights on, or should lights turn on automatically?
- Do occupants need to be warned when lights are about to turn off?
- Should exterior lighting stay on all night, or turn off after the building is closed?

Scheduling the groups is simplified through an occupied/unoccupied approach. Lighting events happen based on whether the area is scheduled to be occupied or unoccupied at any given time. For exterior lighting, ON/OFF events may also depend on whether or not it is “dark” outside.

CHANNEL AUTOMATION

Each channel may be assigned any one of five automation scenarios as follows:

Scenario 1: Scheduled ON/OFF (Interior Lighting)

A channel assigned this scenario turns on its associated relays whenever the building is scheduled to be occupied and turns them off when the building is scheduled to be unoccupied. As an option, the lights blink to alert occupants five minutes before the scheduled off. Any dataline switch button controlling that relay also begins to flash. Pressing the switch button stops the

flashing and a timed delay is applied to the relay, overriding the scheduled off.

Data required by the Network Clock:

- A Occupancy times by day of week
- B Override time (in 10-minute increments, up to 240 minutes)
- C Blink warn? Yes/No

Scenario 2: Manual ON / Scheduled OFF (Interior Lighting – Alternate)

A channel assigned this scenario will not turn on its associated relays until turned on by an occupant. During unoccupied periods, this scenario acts the same as Scenario 1 and the same data is required by the Network Clock.

Scenario 3: Manual ON / Sweep with Automatic Switch (Interior Lighting with AS-100 Switch)

A channel assigned this scenario does nothing during occupied times. Occupants turn on their lights by manually pressing the AS-100 Automatic Control Switch. When unoccupied, the channel “sweeps” its associated relays off for two seconds, then back on. This brief power interruption blinks the lights and signals each AS-100 Switch on the branch circuits to begin a “delay off” countdown.

Each AS-100 Automatic Control Switch must have the “Automatic Delayed-off” setting selected at the switch for this scenario to function properly. Occupants can press their AS-100 Switch to keep the lights on until the next off sweep.

Data required by the Network Clock:

- A Occupancy times by day of week
- B Sweep interval – the time from one OFF sweep to the next (in 10-minute increments, up to 240 minutes)

Scenario 4: Astro ON/OFF (Exterior Lighting – Security)

A channel assigned this scenario turns on its associated relays when it is dark outside and turns them off when it is light. “Dark” is defined as a number of minutes before or after sunset. The Network Clock uses an astronomical

function to determine when sunset and sunrise occur. It does not compensate for rainy or overcast days.

Data required by the Network Clock:

- A Building location (nearest city/state or province)
- B Time before or after sunset that the lights turn on (in 10-minute increments, up to 120 minutes)
The lights will turn off symmetrically relative to sunrise — example:
30 minutes after sunset / 30 minutes before sunrise

Scenario 5: Astro ON / Scheduled OFF (Exterior Lighting – Parking/Signs)

A channel assigned this scenario turns on its associated relays whenever it is dark outside and the building is occupied. It turns off when the building is scheduled to be unoccupied.

Data required by the Network Clock:

- A Building location (nearest city/state or province)
- B Occupancy times by day of week
- C Time in minutes before or after sunset that the lights should turn on

PHOTOCONTROL PACKAGE

With a Photocontrol Package (HPCU8SS) connected to the system, the Network Clock automatically changes the available selections in Scenarios 4 and 5 from “Astro” to “Dark.” The scenarios are then:

Scenario 4 (alternate) Dark ON/OFF

Scenario 5 (alternate) Dark ON / Scheduled OFF

The Network Clock will request Footcandle Data instead of Location and Dark Data in Scenarios 3 and 4. Typical footcandle settings are: Security and Parking = 2 to 20 fc and Signage = 20 to 200 fc.

For details on programming channels when a Photocontrol Package is on the system, refer to the Photocontrol Package Installation and Setup manual.




Careful thought must be given to which groups of relays share common scheduling and automation scenarios.

SAMPLE LIGHTING INTEGRATOR APPLICATION


For the sample application used in the Network Clock Setup and Scheduling which follows, a two story office building, shown below in Figure 1, is used.

There is one LI panel per floor. Each panel contains 16 relays controlling open office space, 4 relays controlling hallways and common areas and 2 relays controlling the branches to individual offices, with AS-100 Automatic Control Switches in those offices. There are also 4 relays for exterior security lighting and 6 for parking lot lighting and signage in Panel 01.

The documentation forms on the next page summarize the data required by the Network Clock and indicate how relays are associated with channels.

-  Channel A is assigned a Manual ON/Scheduled OFF scenario for relays controlling the open office areas. In this area, the lights will be turned on by occupants upon arrival and off per the time scheduled. Overrides will be in effect during unoccupied times.
-  Channel B is assigned a Scheduled ON/Scheduled OFF scenario for relays controlling hallways and common areas. The lighting in these areas will turn on and off per the times scheduled with no occupant action required. Overrides will be in effect during unoccupied times.
-  Channel C is assigned a Manual ON/Sweep w/Auto Switch scenario for relays controlling circuits to multiple private offices. Occupants turn on the lights in their offices upon arrival. During unoccupied times, the panel periodically blinks the AS-100 Automatic

Control Switches, starting a 5-minute “delay off” countdown. If no occupant overrides it, the AS-100 Switch will turn off the lights.

 Channel D is assigned an Astro ON/OFF scenario for relays controlling exterior security lighting. The on and off times scheduled for this lighting are based on the Network Clock’s astronomical function which determines sunrise and sunset according to geographical location.


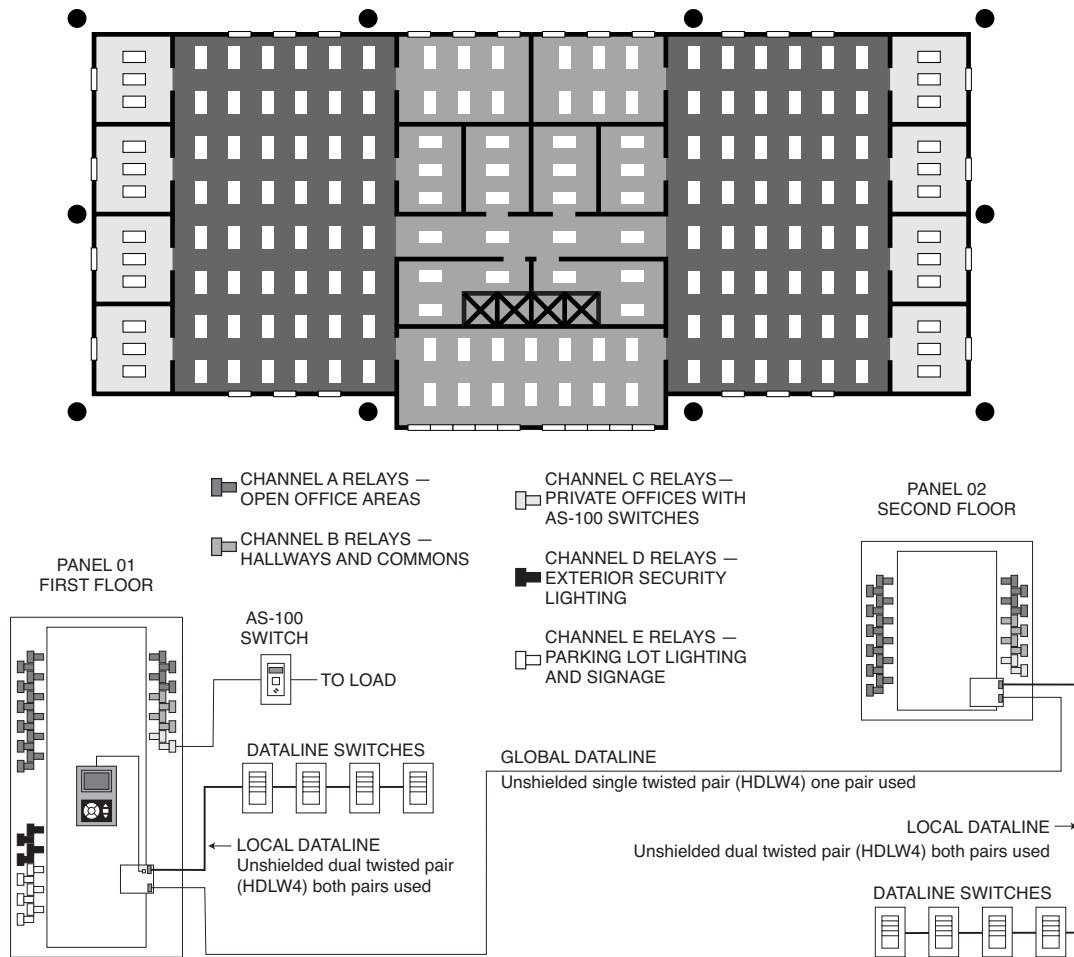
 Channel E is assigned an Astro ON/Scheduled OFF scenario for relays controlling parking lot lighting and outdoor signage. The time this lighting turns on is based on the Network Clock’s astronomical function as above, but the lights will turn off at a scheduled time.

Figure 1 – Sample Lighting Integrator Network Clock Application



DOCUMENTING AUTOMATION SCENARIOS AND RELAYS

Before proceeding with any smartwiring or scheduling, it is necessary to complete system documentation.

First, complete the Network Clock Automation Scenarios form, recording which automation scenario will be assigned to each channel (Figure 2).

Then, record the relays in each panel to be associated with those channels on the Relay Schedule form (Figure 3).

A relay should only be associated with one automation channel.

Both forms are in the Documentation section of the Lighting Integrator Installation and Operation Manual.

Figure 2 –Automation Scenario Form ▶

Figure 3 – Relay Schedule Form ▼

Network Clock Automation Scenarios

CHANNEL	DESCRIPTION OF GROUP	AUTOMATION SCENARIO	DATA
A	GENERAL OFFICE LIGHTING	<input type="checkbox"/> SCHEDULED ON/OFF	OCCUPIED MON-FRI 7AM-6PM
		<input checked="" type="checkbox"/> MANUAL ON/SCHEDULED OFF	SATURDAY 7AM-NOON
		<input type="checkbox"/> MANUAL ON/SWEEP AUTO SW	120 MINUTE OVERRIDE
		<input type="checkbox"/> ASTRO (DARK) ON/OFF	BLINK WARN
B	HALLWAYS AND COMMON AREAS	<input checked="" type="checkbox"/> SCHEDULED ON/OFF	OCCUPIED MON-FRI 6AM-10PM
		<input type="checkbox"/> MANUAL ON/SCHEDULED OFF	SATURDAY 6AM-NOON
		<input type="checkbox"/> MANUAL ON/SWEEP AUTO SW	120 MINUTE OVERRIDE
		<input type="checkbox"/> ASTRO (DARK) ON/OFF	BLINK WARN
C	MANAGERS' OFFICES	<input type="checkbox"/> SCHEDULED ON/OFF	OCCUPIED MON-FRI 7AM-6PM
		<input type="checkbox"/> MANUAL ON/SCHEDULED OFF	SATURDAY 7AM-NOON
		<input checked="" type="checkbox"/> MANUAL ON/SWEEP AUTO SW	SWEEP INTERVAL 120 MIN
		<input type="checkbox"/> ASTRO (DARK) ON/OFF	
D	OUTDOOR SECURITY	<input type="checkbox"/> SCHEDULED ON/OFF	LOCATION - BIRMINGHAM, AL
		<input type="checkbox"/> MANUAL ON/SCHEDULED OFF	DARK 30 MIN AFTER SUNSET
		<input type="checkbox"/> MANUAL ON/SWEEP AUTO SW	
		<input checked="" type="checkbox"/> ASTRO (DARK) ON/OFF	
E	PARKING LOT LIGHTING	<input type="checkbox"/> SCHEDULED ON/OFF	LOCATION - BIRMINGHAM, AL
		<input type="checkbox"/> MANUAL ON/SCHEDULED OFF	DARK 30 MIN AFTER SUNSET
		<input type="checkbox"/> MANUAL ON/SWEEP AUTO SW	OPEN MON-FRI 6AM-11PM
		<input checked="" type="checkbox"/> ASTRO (DARK) ON/SCHED OFF	SATURDAY 6AM-NOON
F		<input type="checkbox"/> SCHEDULED ON/OFF	
		<input type="checkbox"/> MANUAL ON/SCHEDULED OFF	
		<input type="checkbox"/> MANUAL ON/SWEEP AUTO SW	
		<input type="checkbox"/> ASTRO (DARK) ON/OFF	
G		<input type="checkbox"/> SCHEDULED ON/OFF	
		<input type="checkbox"/> MANUAL ON/SCHEDULED OFF	
		<input type="checkbox"/> MANUAL ON/SWEEP AUTO SW	
		<input type="checkbox"/> ASTRO (DARK) ON/OFF	

RELAY SCHEDULE		PANEL NUMBER	AUTOMATION CHANNEL							
RELAY NUMBER	SUPPLY	LOAD DESCRIPTION	A	B	C	D	E	F	G	H
-01	LP1-1	OPEN OFFICE - 1ST FLOOR - NW AREA 1	X							
-02	LP1-2	" " " 2	X							
-03	LP1-3	" " " 3	X							
-04	LP1-4	" " " 4	X							
-05	LP1-5	" " SW AREA 1	X							
-06	LP1-6	" " " 2	X							
-07	LP1-7	" " " 3	X							
-08	LP1-8	" " " 4	X							
-09	LP1-9	" " NE AREA 1	X							
-10	LP1-10	" " " 2	X							
-11	LP1-11	" " " 3	X							
-12	LP1-12	" " " 4	X							
-13	LP1-13	" " SE AREA 1	X							
-14	LP1-14	" " " 2	X							
-15	LP1-15	" " " 3	X							
-16	LP1-16	" " " 4	X							
-17	LP1-17	ENTRY / RECEPTION - 1ST FLOOR		X						
-18	LP1-18	CONFERENCE ROOMS - 1ST FLOOR		X						
-19	LP1-19	WASHROOMS - 1ST FLOOR - WEST		X						
-20	LP1-20	" " EAST		X						
-21	LP1-21	MANAGERS' OFFICES - WEST			X					
-22	LP1-22	" " - EAST			X					
-23										
-24										
-25	LP1-25	SECURITY - NORTH				X				
-26	LP1-26	" - EAST				X				
-27	LP1-27	" - SOUTH				X				
-28	LP1-28	" - WEST				X				
-29	LP1-29	PARKING - NORTH 1					X			
-30	LP1-30	" - NORTH 2					X			
-31	LP1-31	" - EAST					X			
-32	LP1-32	" - SOUTH 1					X			
-33	LP1-33	" - SOUTH 2					X			
-34	LP1-34	" - WEST					X			
-35										
-36										
-37										

SCHEDULED ON/OFF
 MANUAL ON/SCHEDULED OFF
 MANUAL ON/SWEEP AUTO SW
 ASTRO (DARK) ON/OFF
 ASTRO (DARK) ON/SCHED OFF

week and holidays

)

placed with *Open 00:00 thru 00:00*

week and holidays

/province/city) & minutes before/after sunset until "dark"

el that equals "dark"

urity & Parking = 2 to 20 fc, Signage = 20 to 200 fc

S:

week and holidays

anta Clara, CA 95050

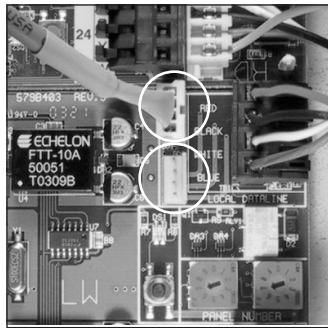
INSTALLATION AND SMARTWIRING

When both the Network Clock Automation Scenarios form and the Relay Schedule form are complete, begin with the Network Clock installation as follows:

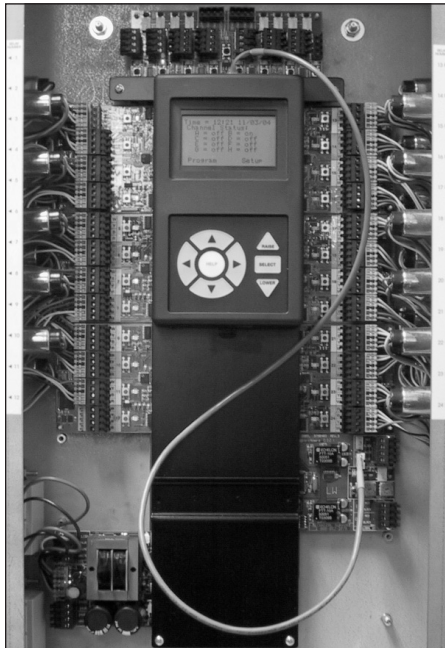
Step 1:

Install the Network Clock

Plug the Network Clock cable into the connector on the top edge of the Network Clock then into the LOCAL DATALINE connector on the Automation Card in the LI panel as shown below. The Network Clock snaps onto the DIN rail in any LI panel.



Plug the Network Clock cable into the 4-pin connector next to the LOCAL DATALINE terminals on the Automation Card.



Position the Network Clock on the DIN rail as shown above.

Step 2: Smartwire Each Relay to its Associated Channel

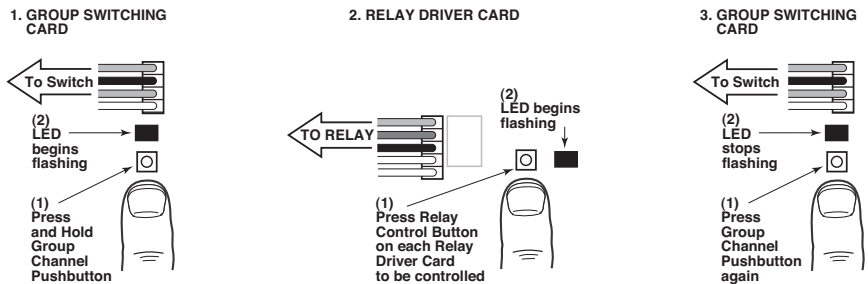
With the Relay Schedule form in hand, smartwire the relays in each lighting panel to channels as show in Figure 4.

Step 3: Enter Data into the Network Clock

You are now ready to enter data.

The sample application in Figure 1 on page 3 is used in the instructions that follow on pages 6 through 13.

Figure 4 – Smartwiring Relays to Channels



- 1 Press and hold the Group Channel Pushbutton for several seconds. The red channel LED will begin to flash. If any relays are currently controlled by that channel, their LEDs will begin to flash as well.
- 2 Select the relays to be controlled. The LED for each relay “smartwired” to the channel input selected will be flashing ON/OFF. Press the associated Relay Control Button to add/delete that relay to/from the group.
- 3 Press the Group Channel Pushbutton again. The LEDs will stop flashing and the channel will now control the relays selected.

Test by pressing the Group Channel Pushbutton to toggle the group on/off/on. The channel LED will track the last action. Now turn off each relay in the group using the individual Relay Control Buttons. When the last relay is turned off, the channel LED should also go off.

NETWORK CLOCK KEYPAD

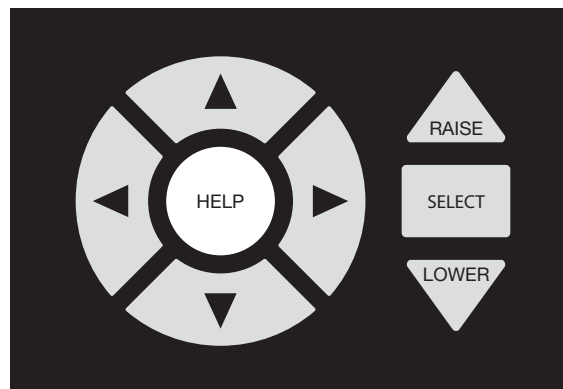
The Network Clock’s keypad is composed of eight keys as follows:

Four cursor keys (▲▼◀▶) for navigating among the data fields.

RAISE and LOWER keys for modifying data fields

A SELECT key confirms data entries and advances to the next appropriate screen or data field.

A HELP key for technical assistance.



DATA ENTRY – SETUP

Entering data into the Network Clock involves two steps: Setup and Scheduling.

Channel Status Screen

This is the first screen shown when you plug in the Network Clock (Figure 5). All channels will initially show off as the Network Clock polls the relay panels in the system for status data. Within several minutes, all of the panels will be polled and the correct status of each channel will be shown.

If a channel is shown as:

- off all relays assigned to that channel are off in every panel in the system
- on all relays assigned to that channel are on in every panel in the system
- mix some relays assigned to that channel are On and some are off.
- blk this channel is in the delay period after a blinkwarning, before turning the relays off

From the Channel Status screen, the user may choose either to set up the base data for the system (Setup) or to schedule the clock (Program).

Setting Up Base System Data

Using the left or right cursor keys (◀▶), highlight Setup and press the SELECT key. The next screen (Figure 6) shows the Time (in 24-hour military units) Date (MM/DD/YY) and the day of the week. Any of these can be changed by using the cursor keys to highlight the desired field and then using the RAISE or LOWER key to change the information. (Hint: To get to 99, it's easier to go down from 00.)

Daylight Savings Time

If you use Daylight Savings Time, cursor to Select next to Daylight Savings on the Setup screen (Figure 7), then press the SELECT key.

The DST Setup screen, shown in Figure 8, will appear. If you want to follow Daylight Savings Time, cursor to Autofill?, use the RAISE or LOWER key to change Off to On, and press the SELECT key. The correct dates for Spring and Fall will be filled in automatically, and the screen display will show Follow DST? has changed from No to Yes. During times of the year when Daylight Savings Time applies, the Sunrise and Sunset times will also be adjusted automatically.

To save the data, cursor to SAVE and press the SELECT key. To exit without saving the data, cursor to ABORT and press the SELECT key.

When you SAVE, the Network Clock moves back to the Setup screen (Figure 6).

Figure 5 – Channel Status Screen

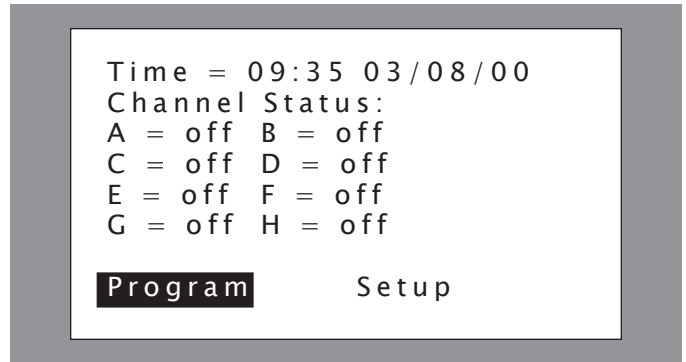


Figure 6 – Setup Screen

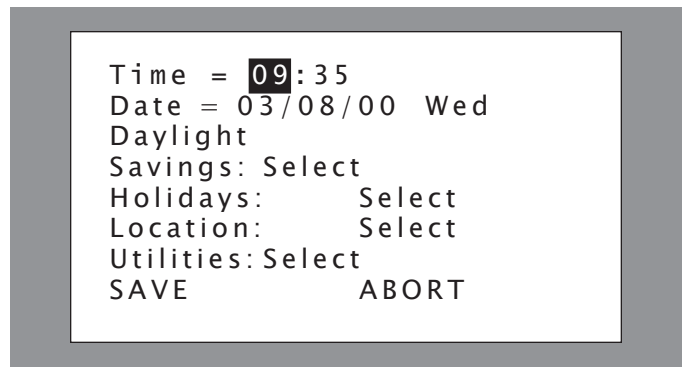


Figure 7 – Selecting Daylight Savings Time

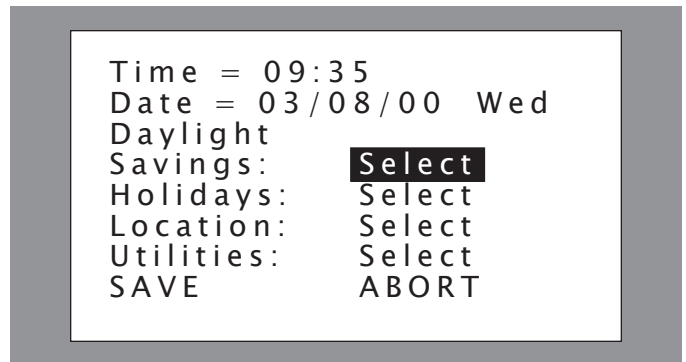
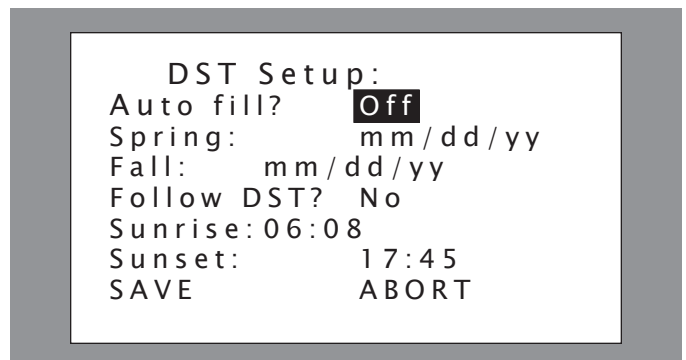


Figure 8 – Daylight Savings Setup Screen



Scheduling Holidays

When you select the Holidays option, you will see a listing of twelve individual holiday date entries (Figure 9). If more are needed, cursor to the arrow (▶) in the lower right and press SELECT. There are three screens of twelve date entries each for a total of 36 holiday date entries. The Network Clock will execute a holiday schedule on the dates entered.

When a holiday (or vacation period) extends for several consecutive days, rather than entering numerous individual dates, you may choose to enter a holiday/vacation date range. Cursor to RANGE and press SELECT. A screen of six range entries appears (Figure 10). Enter the first date of the holiday range and then the date the normal schedule resumes. When completed, cursor to SAVE and press SELECT. This will return you to the Holidays Setup screen. When all holiday dates are entered, again cursor to SAVE and press SELECT to return to the Setup screen.

Location Entry

The next data entry on the Setup screen (Figure 6) is Location. Selecting this field advances to the Location Setup screen shown in Figure 11. (Location data is not requested when a Photocontrol Package is connected to the system.) Setting the geographical location of your site allows the Network Clock to determine the correct sunrise and sunset times when using the "Astro" scenarios.

Cursor to State and use the RAISE or LOWER key to select your state (or province). Use the same technique to select the City closest to you. (Depending on your location, you may want to choose a city in another state that is even closer to you). In our example, Birmingham, AL – the default setting – was chosen.

The GMT Offset (Greenwich Mean Time) and Coordinates fill in automatically based on the State/City you've selected.

If your location is not represented in the State/City choices available, or if you know your exact coordinates, you can fill in your latitude/longitude manually. In the State field, use the RAISE or LOWER key to find AL (Alabama, the first State listed alphabetically), then LOWER once more until the State field displays two asterisks, as shown in Figure 12. Cursor down to the Coordinates fields to enter your latitude and longitude. Starting with the first digit, use the RAISE or LOWER key to change the number, then use the cursor keys to move to the next digit, and so on.

When the Coordinates are completely entered, use the down cursor (▼) to move to GMT Offset. Use the RAISE or LOWER key to set the number of hours difference between your location and Greenwich Mean Time. Example: The U.S. Eastern Time Zone is -6 hours (-5 hours during Daylight Savings Time).

When the location has been entered, cursor to SAVE and press SELECT to return to the Setup screen.

Figure 9 – Holiday Setup Screen

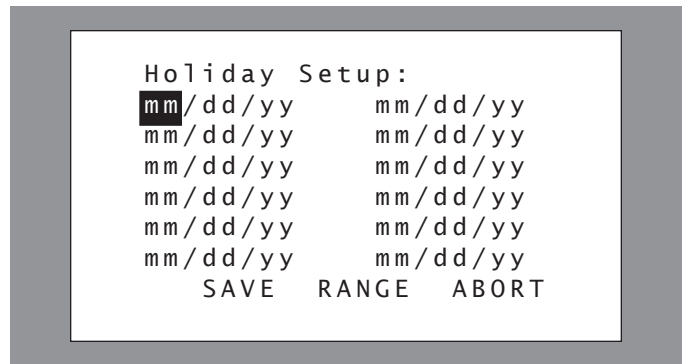


Figure 10 – Holiday Range Screen

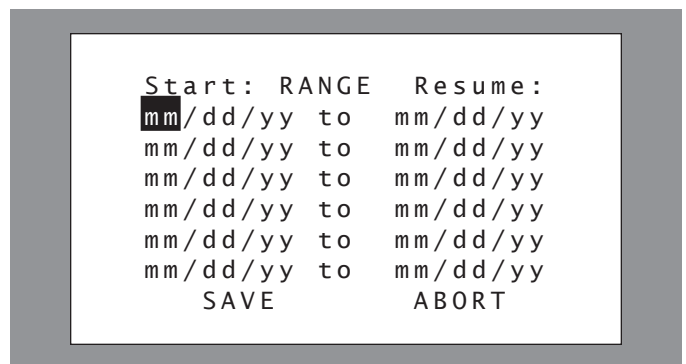


Figure 11 – Location Setup Screen

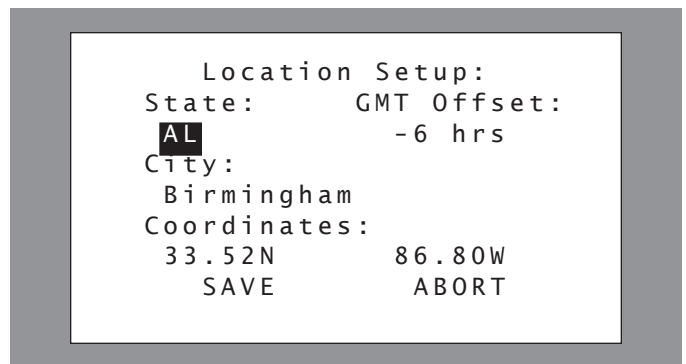
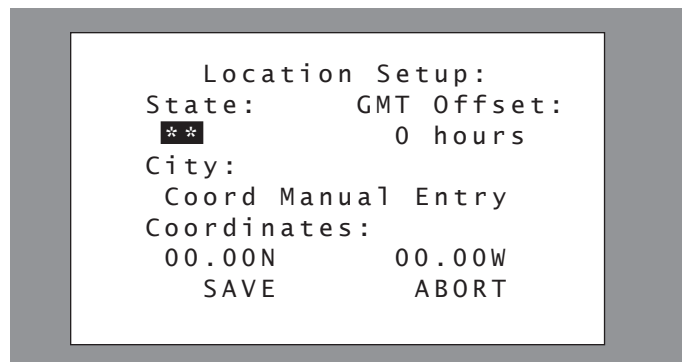


Figure 12 – Enter Location Coordinates



Utilities

The final selection on the Setup screen (Figure 6) is Utilities. The Utilities screen offers two options, Diagnostics (Diags) and Clear Memory (Clear mem) as shown in Figure 13.

Diagnostics are used to identify hardware and firmware versions, and to verify that each device on the system is installed properly. For more information on Diagnostics, refer to that section on pages 12 and 13).

Clearing the Memory

If you want to clear the Network Clock's memory to enter completely new data, cursor to Clear mem and press SELECT. The screen shown in Figure 14 will appear. Use the RAISE or LOWER key to change No to Yes and press SELECT. The cursor will move to Done.

CAUTION!
Pressing SELECT again will completely clear ALL of the data in the Network Clock's memory.

Press SELECT again to clear memory and return to the Setup screen to begin again.

System Data Setup is now complete. Proceed to the following section to begin Scheduling the Network Clock.

DATA ENTRY – SCHEDULING

Scheduling is simply taking the data from the Network Clock Automation Scenarios form and entering it into the Network Clock. Once that's been done — and all Setup steps are completed — the Network Clock has all of the data necessary to control the Lighting Integrator network.

To illustrate the data entry process, let's use the actual data from our example as illustrated in Figure 1 on page 3 and the sample forms shown in Figures 2 and 3 on page 4.

Return to the Channel Status screen (Figure 15). (Hint: You can return to this screen at any time by selecting SAVE or ABORT on any data screen and pressing SELECT.) The cursor will default to Program. Press SELECT to advance to the Channel scheduling screen (Figure 16).

Channel A – Manual ON / Scheduled OFF

Referring to the Network Clock Automation Scenarios sample form on page 4, we see that Channel A is to be assigned a Manual ON / Scheduled OFF scenario, which is the screen's default setting.

Figure 13 – Utilities Screen

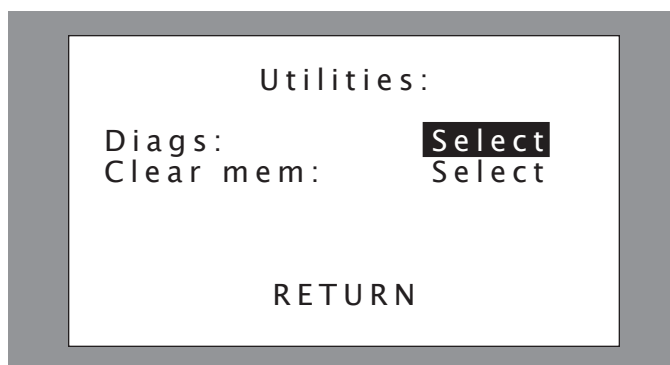


Figure 14 – Clear Memory Screen

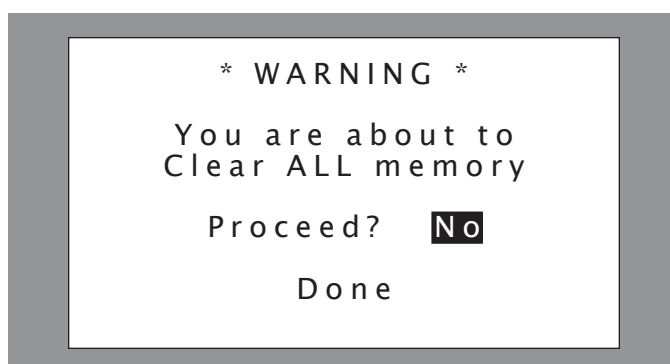


Figure 15 – Channel Status Screen

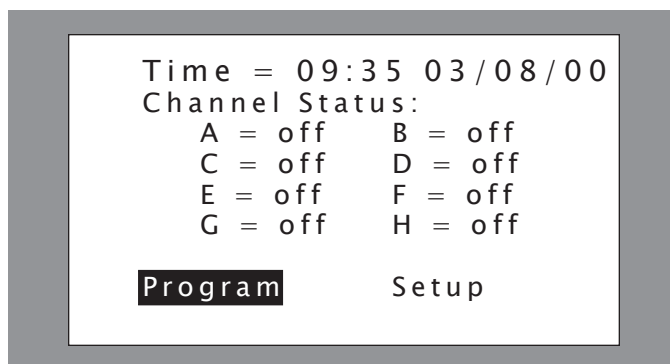
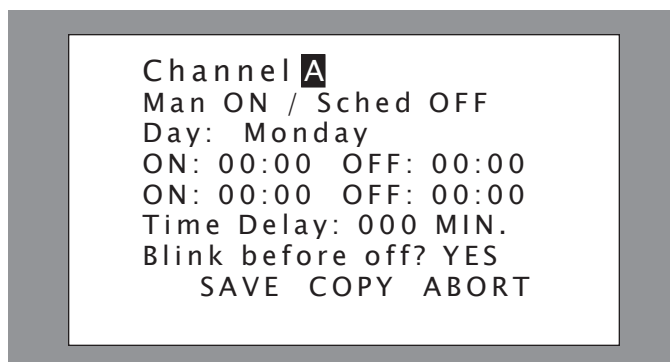


Figure 16 – Channel Scheduling Screen



HCLK8SS Network Clock – Scheduling Mode

The form shows that the general office area is occupied on weekdays from 7:00 a.m. through 6:00 p.m., and on Saturday from 7:00 a.m. til noon. A time limit of 120 minutes on overrides during unoccupied periods and a “blink warn” before the scheduled OFF are also documented on the form.

Figure 17 shows the entry of the required data for Monday. Start by entering the occupied time. Move the cursor to each time field and enter the time the floor is “open” or “occupied.” Remember to use 24-hour military time units.

Note: You may enter two sets of times, but this is not typically required. For example, in some applications, selected lighting is turned off at lunchtime, and a typical schedule in this case might be:

```
Open: 07:00 thru 12:00
Open: 13:00 thru 18:00
```

After entering data in each field, cursor to the next field, or simply press SELECT to automatically go to the next field. Then enter the Time Delay (in 10-minute increments, up to 240 minutes). The example is set at 120 minutes. Finally, set the Blink before off? to YES.

At this point there are three choices:

- SAVE this information to memory, in which case the schedule data for only Monday would be saved.
- COPY this data to other days of the week and then save the schedules for all of these days.
- ABORT to exit without saving any data.

Because the same schedule occurs each weekday, choice 2 will save a lot of time in this case. To copy the Monday schedule to other weekdays, cursor to COPY and press SELECT. The screen shown in Figure 18 will appear.

Copying A Schedule

To copy the Monday schedule to Tuesday through Friday, move the cursor to the Tues field and press the RAISE or LOWER key to “X” that selection. Repeat for Wed, Thur and Fri as shown in Figure 19.

To save the operating schedule for Monday through Friday, cursor to SAVE and press SELECT. The screen will return to the Channel scheduling screen.

To schedule Saturday, simply follow the same process as used to schedule weekdays. Cursor to Monday, use the RAISE or LOWER key to change to Saturday, press SELECT or cursor to the next field to enter the occupied times, time delay and blink warn. Cursor to SAVE and press SELECT.

Since Sundays and holidays most likely do not have an “occupied” or open schedule, there is no need to make any time entries. The Network Clock will automatically assume the area is unoccupied. Remember to enter a time delay and blink warn, however, for those occupants who may come in to work on these days as shown in Figure 20. (Note: You may use different time delays for different days of the week. Some owners, for example, prefer a longer override on weekends.)

Figure 17 – Man ON / Sched OFF Data Entry

```
Channel A
Man ON / Sched OFF
Day: Monday
Open:07:00 thru: 18:00
      00:00 thru: 00:00
Time Delay: 120 MIN.
Blink before off? YES
SAVE COPY ABORT
```

Figure 18 – Copy Screen

```
Copy from:
Monday
Copy to:
 -Mon    -Tues    -Wed
 -Thur   -Fri      -Sat
 -Sun    -Hol
SAVE ABORT
```

Figure 19 – Copying A Schedule

```
Copy from:
Monday
Copy to:
 - Mon    -Tues    -Wed
 -Thur   -Fri      -Sat
 Sun     Hol
SAVE ABORT
```

Figure 20 – Sunday (or Holiday) Data Entry

```
Channel A
Man ON / Sched OFF
Day: Sunday
Open: 00:00 thru: 00:00
      00:00 thru: 00:00
Time Delay: 240 MIN.
Blink before off? YES
SAVE COPY ABORT
```

Channel B– Scheduled ON/OFF

Channel B on our Network Clock Automation Scenarios form is assigned a Scheduled ON/OFF scenario for hallways and common areas. Lights in these areas turn on at 6:00 a.m. in anticipation of early arrivers and turn off at 10:00 p.m., well after the last occupants have most likely gone home.

To select this scenario for Channel B, return to the Channel scheduling screen. Move the cursor to the Channel field and use the RAISE or LOWER key to change to B. Then cursor to the next field and change to Scheduled ON/OFF (Figure 21).

When this scenario is selected, the time fields change from Open...thru to ON...OFF. For our example, we would cursor to the first ON field and enter 06:00; then to the OFF field and enter 22:00.

Note: You may enter two sets of times, but this is not typically required. For example, in some applications, selected lighting is turned off at lunchtime, requiring two ON/OFF schedules. Another example would be an application which requires an ON/OFF period to start on one day and extend past midnight to the next day. This is called "time spanning" and is explained on the next page.

Set the Time Delay at 120 minutes and the Blink before off? to YES. Figure 22 shows the complete data entry for this scenario.

As with the general office area, use the COPY function to enter the times for Tuesday through Friday. Then Saturday, Sunday and Holidays are scheduled separately.

Channel C– Manual ON / Sweep Auto Sw

One line-voltage AS-100 Automatic Control Switch is installed in each of the private offices associated with Channel C. Occupants turn on their own lights manually upon arrival. At 6:00 p.m. when the area goes unoccupied, the panel will interrupt power briefly to all AS-100 switches on this channel, causing the lights to blink, and signaling the switches to start a 5-minute "delay off" count-down. Each AS-100 Automatic Control Switch must have the "Automatic Delayed-off" setting selected at the switch for this scenario to function properly. This signal will be repeated every two hours until 7:00 a.m. the next morning.

To set up this scenario, return to the Channel scheduling screen. Move the cursor to the Channel field and use the RAISE or LOWER key to change to C. Cursor to the next field and use the RAISE or LOWER key to change the scenario to Man ON/ Sweep Auto Sw (see Figure 23).

Set the occupied times for Monday as described for Channel A on the previous page. Cursor to the Sweep Intr field and use the RAISE or LOWER key to set the Sweep Interval to 120 minutes (see Figure 24). Cursor to SAVE and press ENTER, or cursor to COPY to copy Monday's schedule to the other days of the week as described on the previous page. Finally, repeat these steps to change the day to Saturday and schedule as outlined on the sample form.

Figure 21 – Selecting Scheduled ON/OFF

```

Channel B
Scheduled ON / OFF
Day: Monday
ON: 00:00 OFF: 00:00
ON: 00:00 OFF: 00:00
Time Delay: 000 MIN.
Blink before off? YES
SAVE COPY ABORT
  
```

Figure 22 – Scheduled ON/OFF Data Entry

```

Channel B
Scheduled ON / OFF
Day: Monday
ON: 06:00 OFF: 22:00
ON: 00:00 OFF: 00:00
Time Delay: 120 MIN.
Blink before off? YES
SAVE COPY ABORT
  
```

Figure 23 – Selecting Manual ON/Sweep Auto Sw

```

Channel C
Man ON / Sweep Auto Sw
Day: Monday
Open: 00:00 thru:00:00
      00:00 thru:00:00
Sweep Intr: 000 MIN.

SAVE COPY ABORT
  
```

Figure 24 – Man ON/Sweep Auto Sw Data Entry

```

Channel C
Man ON / Sweep Auto Sw
Day: Monday
Open: 07:00 thru:18:00
      00:00 thru:00:00
Sweep Intr: 120 MIN.

SAVE COPY ABORT
  
```

Note: With this scenario, the Channel Status screen will almost always indicate that Channel C is ON. Since power is always restored to the circuit immediately after each OFF Sweep, it is not a true “sweep” in the traditional sense. Because the AS-100 Switch takes over the job of turning off the lights, the panel does not report whether lighting in any of the offices is on or off.

Channel D– Astro ON/OFF

The security lighting associated with Channel D on the sample Network Clock Automation Scenarios form is to turn on every night and turn off every morning. In this example, the lighting will be set to turn on 30 minutes after sunset and off 30 minutes before sunrise.

In the Channel scheduling screen shown in Figure 25, use the RAISE or LOWER key to change the Channel field to D and choose Astro ON/OFF in the scenario field. Then press the SELECT key to advance to the screen shown in Figure 26.

Use the RAISE or LOWER key to enter 030 in the minutes field (settings can be in 10-minute increments, up to 120 minutes) and then cursor to the before field. Again, use the RAISE or LOWER key to toggle from before to after. Cursor to SAVE and press SELECT.

Channel E– Astro ON / Schedule OFF

Parking lot lighting should turn on when it is dark and turn off after the building (and parking lot) is unoccupied. On the sample documentation form, the parking lot lights are associated with Channel E, which is assigned the Astro ON / Scheduled OFF scenario. With this scenario, the parking lot lighting will only be turned on if Channel E is scheduled to be “occupied” and it is “dark.”

In the Channel scheduling screen shown again in Figure 27, choose Channel E and Astro ON / Sched OFF using the RAISE or LOWER key and then pressing the SELECT key.

In our example, we define parking lot occupancy as Monday through Friday, 6:00 a.m. until 11:00 p.m. and Saturday, 6:00 a.m. until noon. Darkness was defined as 30 minutes after sunset (Figure 28). Use the COPY function to enter this daily schedule for Tuesday through Friday, SAVE and then enter the data for Saturday, Sunday and Holidays.

Photocontrol Package

When an HPCU8SS Photocontrol Package is added to the system, the two exterior lighting scenario choices change automatically from Astro to Dark. For details on programming channels using the Dark scenarios, refer to the Photocontrol Package Installation and Setup document.

At this point, scheduling per our example is now complete. For your installation, use the Network Clock Automation Scenarios form first to document the system’s operation and then to guide your programming.

Figure 25 – Selecting Astro ON/OFF

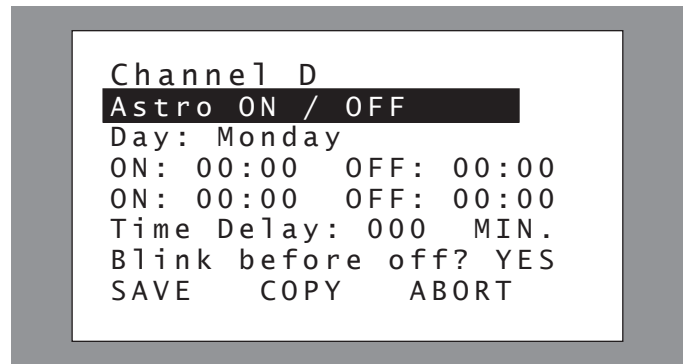


Figure 26 – Astro ON/OFF Data Entry



Figure 27 – Selecting Astro ON / Sched OFF

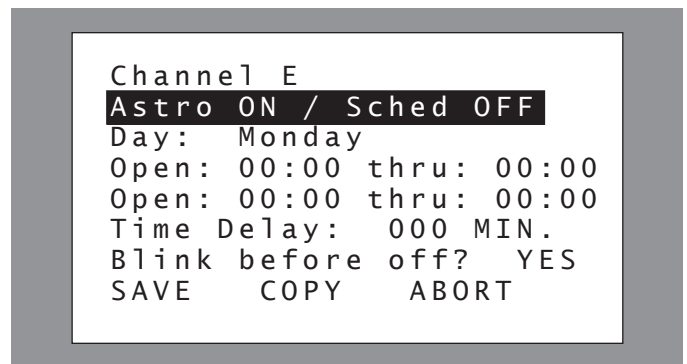


Figure 28 – Astro ON / Sched OFF Data Entry



TESTING

When scheduling is completed, be sure to return to the Channel Status screen (Figure 29). The Network Clock must be displaying this screen for the schedules to operate. Check the time and date at the top of the screen.

Go to each panel with the Relay Schedule forms and confirm that the Channels are properly smartwired. Confirm that each Channel in the Network Clock has the proper scenario and time entries. Select Program and then sequence through the days of the week for each Channel. Make certain the data is complete for each day of the week and holidays. When finished reviewing Channel A, go to B, and so on.

When you have confirmed the data for each Channel, you can run a real-time test. Simply set the Network Clock for 2 minutes before a scheduled action, return to the Channel Status screen and confirm the actual operation. (There may be a 20-30 second delay between the minute change on the screen and the transmission of the data to the field panels.)

Scheduling Tip – Time Spanning

In some cases, a building's occupied hours may need to span from one day into the next. For example, a restaurant may open for dinner at 5 p.m. and stay open until 2 a.m. To set this occupancy time from Tuesday through Saturday, the actual data entry for each day of the week must be (also see Figure 30):

Tuesday	ON: 17:00 OFF: 00:00 ON: 00:00 OFF: 00:00
Wednesday through Saturday	ON: 00:00 OFF: 02:00 ON: 17:00 OFF: 00:00
Sunday	ON: 00:00 OFF: 02:00 ON: 00:00 OFF: 00:00

If you were to use 23:59 ending time and 00:00 beginning time, the lights would turn off for one minute just before midnight. To avoid this, you must use "00:00" to indicate midnight for both days.

Figure 29 – Channel Status Screen

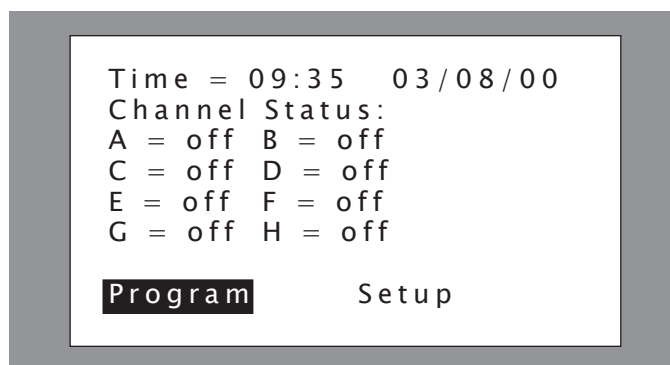
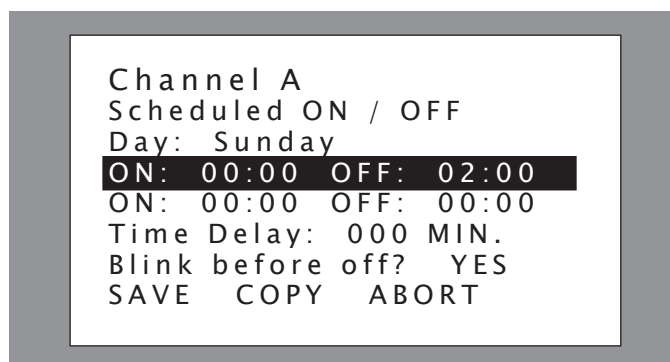
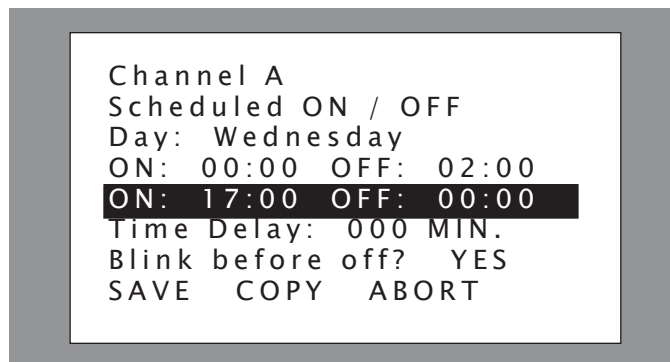
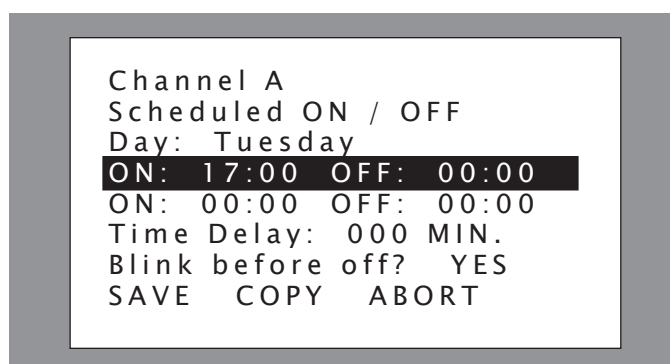


Figure 30 – Time Spanning



DIAGNOSTICS

The Diagnostics utilities allow you to:

- Identify any device on the network
- Test that each device is installed properly
- Identify the hardware and firmware versions of each device

From the Setup screen (Figure 31), cursor to Utilities and press the SELECT key. The Utilities screen shown in Figure 32 appears. Make sure the word Select to the right of Diags is highlighted and press SELECT again.

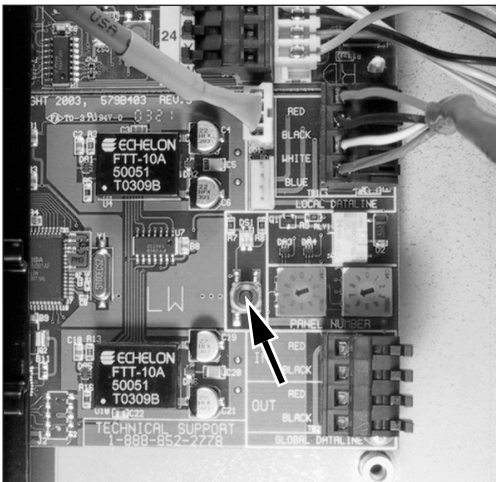
The Diagnostics screen shown in Figure 33 appears. No data is visible yet.

Testing a Dataline Device

To check the status of any device on the system, make sure the Network Clock is connected to the dataline (at any panel), and ready at the Diagnostics screen. The screen prompts Press Svc Pin to Test.

On the device to be tested, press the "Service Pin." The Service Pin on each device can be found as follows:

Lighting Integrator panel: The Service Pin is located on the Automation Card, next to the PANEL NUMBER dials.



Dataline Switch: The Service Pin is the Smartwire tab inside the front of the switch. To access this tab, remove the wallplate and flip open the master button.



Figure 31 – Setup Screen

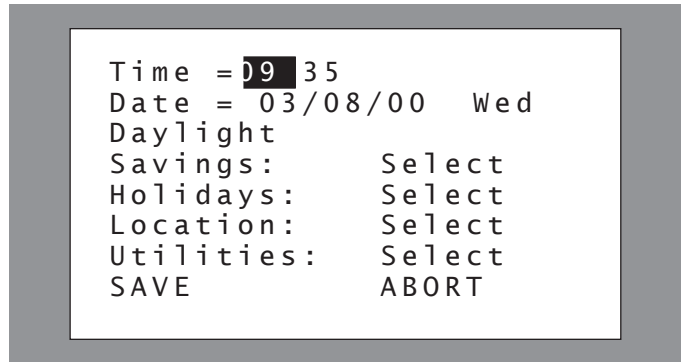


Figure 32 – Utilities Screen

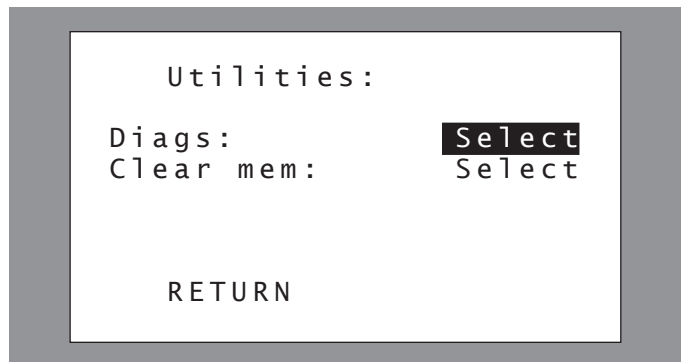
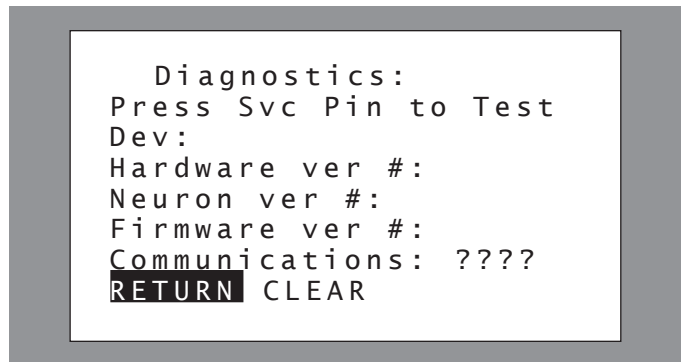
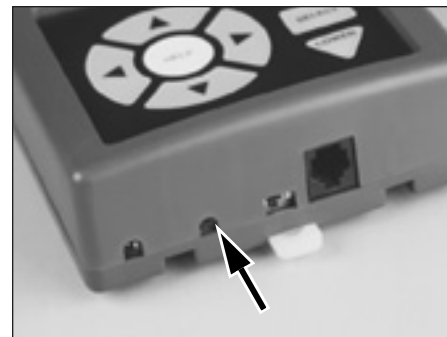


Figure 33 – Diagnostics Screen

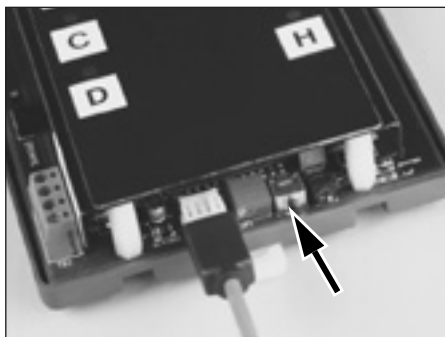


Network Clock: The Service Pin is located between the LED and the Mode Switch on the bottom of the Network Clock.



BMS Interface Module: The Service Pin is to the left of the LED on the lower edge of the unit.

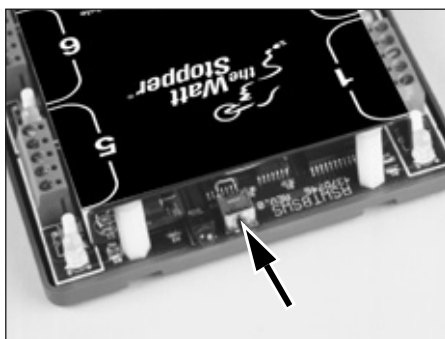
Note: Normally, a Network Clock and BMS Interface Module should not be connected to a Lighting Integrator panel at the same time.



Photocontrol Module Service Pin
(location on BMS Interface Module is the same)

Photocontrol Package: The Service Pin is to the left of the LED as on the BMS unit.

Universal Switch Interface Module: The Service Pin is to the right of the LED on the top edge of the unit.



Universal Switch Interface Unit Service Pin

Telephone Control Module: The Service Pin is located on the lower edge next to the telephone connections.

Pressing the Service Pin on any dataline device will send information about that unit to the Network Clock. The Diagnostics screen fields will fill with data as shown in the examples (Figures 34 through 36).

Dev indicates the type of device being tested.

Hardware and firmware revision information is displayed after Hardware ver#, Neuron ver # and Firmware ver #. This information may be required when calling technical support for service.

Communications should read Good. To confirm good communications, the test should be repeated a few times. To repeat the test, cursor to CLEAR and press the SELECT key to first clear the screen. Then press the Service Pin on the device again. When testing a Dataline Switch, press the Service Pin a second time to toggle it out of Smartwire mode.

Figure 34 – Network Clock Diagnostics

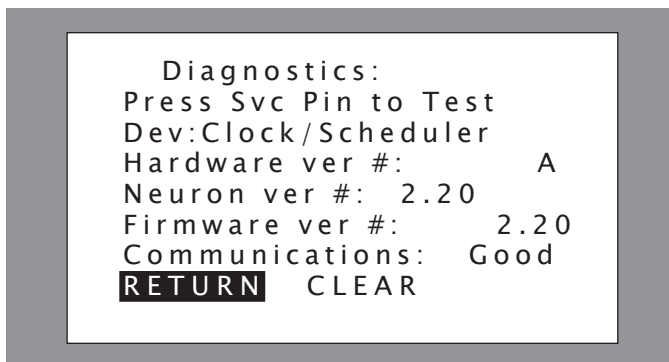


Figure 35 – Dataline Switch Diagnostics

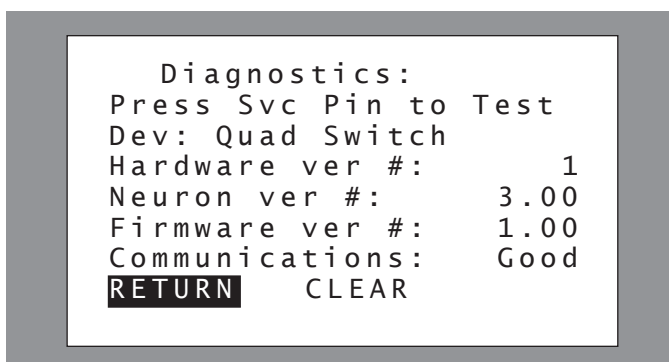
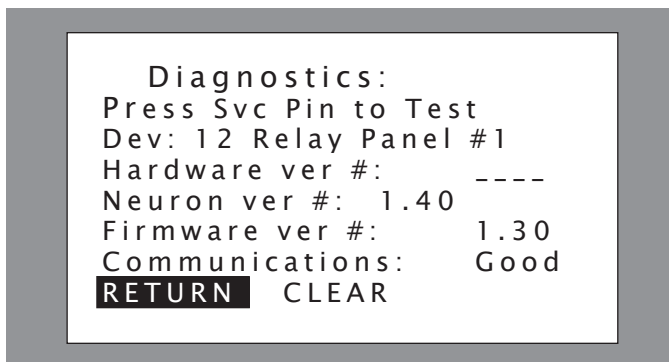


Figure 36 – Relay Panel Diagnostics



If the Communications field is filled with ????, or if it varies between Good and ????, during repeated tests, there is a problem with this device communicating over the dataline. Check all dataline connections and repeat this test.

Cursor to RETURN and press the SELECT key to return to the Utilities screen.

For questions or technical assistance, call our Service Team at: 888-852-2778.

PROGRAMMING SETUP AND OPERATION

To convert the Network Clock to Programming Mode, move the small slide switch on the bottom of the unit to the right as shown. Plug the Network Clock into the dataline at either:

- 1 One of the Local Dataline 4-pin connectors on the Automation Card in any panel (as shown below left), or
- 2 The 4-pin connector on the front face of any dataline switch (remove the wall plate and flip open the Master button as shown below right)

The Program Menu screen shown in Figure P1 will appear. You can choose to program Channel(s) in a Panel (see below) or Button(s) on a Dataline Switch.

Local Dataline 4-Pin Connectors:

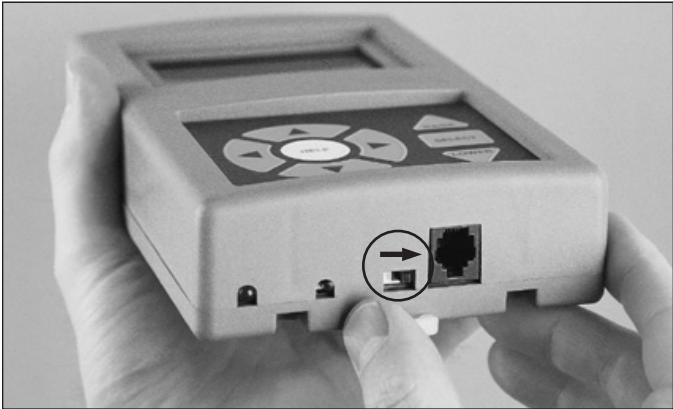
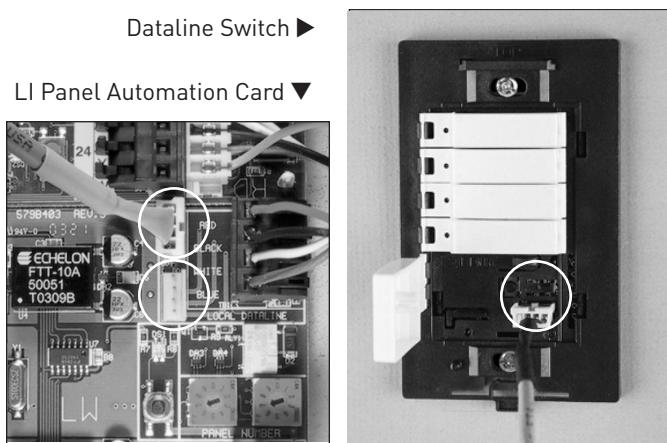


Figure P1 – Program Menu Screen

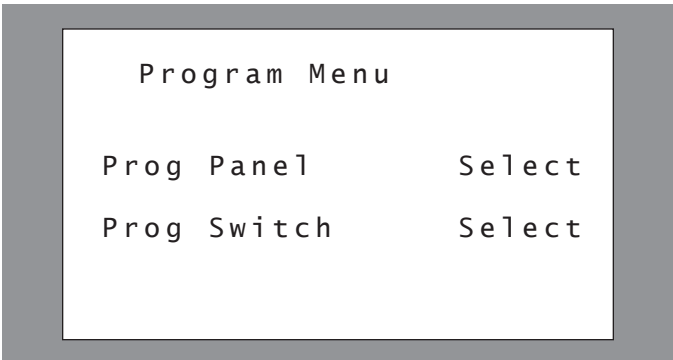


Figure P2 – Panel Configuration Screen

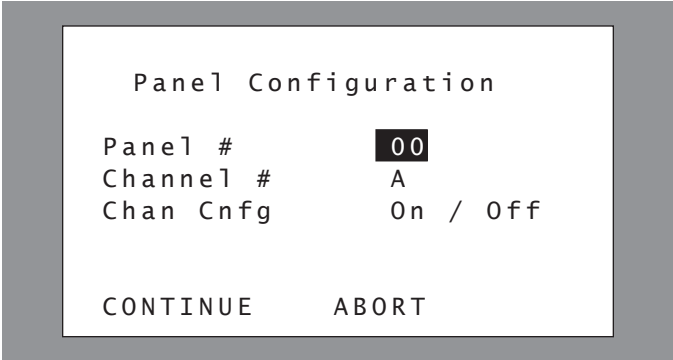
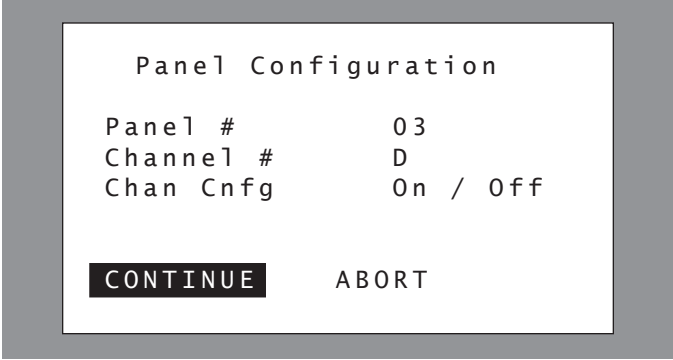


Figure P3 – Example 1 Screen



Programming Channels in a Panel

Channels in a panel are used to group relays for common control, either as On/Off groups or in a Pattern of Ons and Offs. Refer to the Relay Schedule form for channel programming assignments for each panel. Channels may be smartwired to relays very simply at the panel by pressing the Channel and Relay buttons on the panel interior and the Group Switching Card (see the LI panel Installation Instructions). Alternately, the Network Clock may be used in Programming Mode to smartwire channels.

In the Program Menu screen (Figure P1), cursor to Prog Panel Select using the ▲▼◀▶ keys and press the SELECT key on the Network Clock’s keypad. The Panel Configuration screen, shown in Figure P2, appears. Use the RAISE or LOWER key to set the desired panel number (the panel address is physically set using two dials on the panel’s Automation Card – see the Lighting Integrator Installation Instructions). Cursor to the next field and RAISE or LOWER to select the Channel to be programmed. Finally, cursor to Chan Cnfg and use the RAISE or LOWER key to toggle between On/Off or Pattern.

Example 1: Programming Relays to a Channel as On/Off

In this first example, as shown in Figure 3, we’ve chosen Panel # 03, Channel # D, On/Off. Cursor to CONTINUE and press the SELECT key. The screen shown in Figure P4 appears.

The first 12 relays in the panel are displayed, with a blinking cursor under the first one. Any previous smartwiring assignments also appear. Use the RAISE or LOWER key to change the relay from Off (blank) to On (⚡). Cursor to each relay to be selected, and RAISE or LOWER to set the symbols to Off or On as documented on the SS Relay Schedule form.

If the panel contains more than 12 relays, additional screens will automatically be available. To reach the next set of 12 relays, cursor to the small arrow at the lower right corner of the screen and press SELECT. To move to a previous screen, highlight the small arrow on the left and SELECT. Continue to select On or Off symbols as described above until all relays for that channel have been selected.

When all relay assignments are set, cursor to SAVE and press SELECT as shown in Figure P5.

If the channel you are smartwiring in a given panel has been previously programmed, and you are changing those selections, the WARNING screen shown in Figure P6 will appear. If you're sure the changes are correct, cursor to Proceed? No and use the RAISE or LOWER key to toggle to Yes. Cursor to Done and press SELECT.

If you're not sure, check earlier programming by going to the panel in question and pressing and holding the Channel pushbutton to observe which relays are smartwired to that Channel. If you want to cancel the change(s), leave Proceed? set to No, cursor to Done and press SELECT.

Example 2: Programming Relays to a Channel as a Pattern

To program relays to a Channel in a Pattern using the Network Clock/Programmer, repeat the steps above until you reach the Panel Configuration screen (Figure P2). At Chan Cnfg, use RAISE or LOWER to change On/Off to Pattern, cursor to CONTINUE and press SELECT.

The same screens of 12 relays as shown in the previous steps appear. This time, however, another symbol is available to select for each relay (see Figure P7). As before, use the cursor keys to move to the relays in question, and use RAISE or LOWER to toggle between the following three choices:

- In the group, turn Off when the Channel is activated
- ⚡ In the group, turn On when the Channel is activated
- (blank) Not in the group

When all channels have been programmed as documented on the Relay Schedule form, return to the Program Menu screen (Figure P1).

To program switch buttons to relays or channels, proceed to the next page. If no more programming is required, return the Network Clock to the panel where it is to be mounted and slide the switch on the bottom of the Network Clock back to the Schedule Mode position (left).

Figure P4 – Selecting Relays for On/Off Configuration

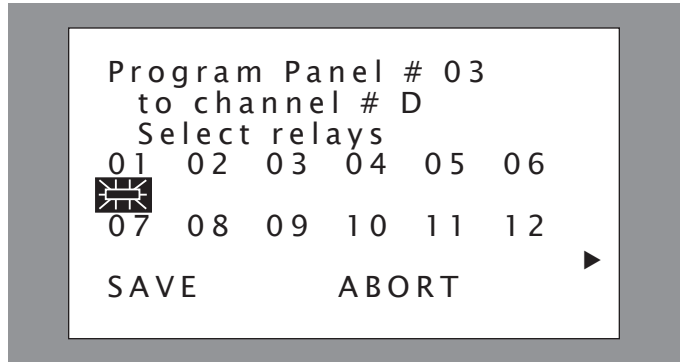


Figure P5 – Saving Selections

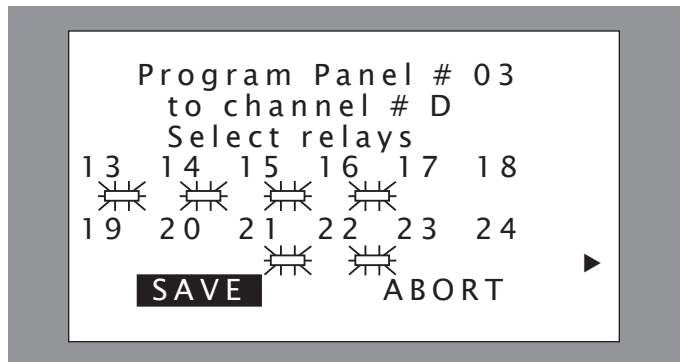


Figure P6 – Panel Configuration Warning Screen

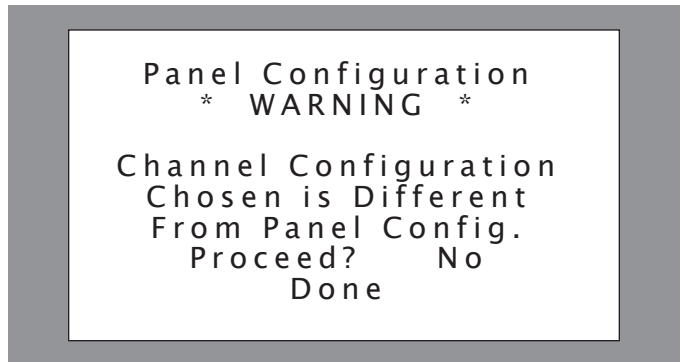
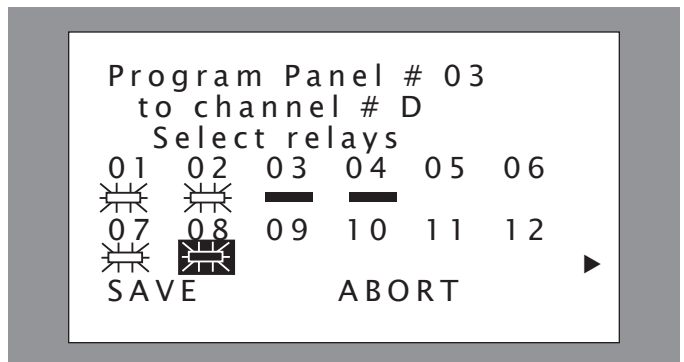


Figure P7 – Selecting Relays for Pattern Configuration



PROGRAMMING A SWITCH BUTTON

From the Program Menu screen (Figure P1), cursor to Prog Switch Select and press the SELECT key. The Smartwiring Mode screen shown in Figure P7 will appear. Proceed to the next step, or press the SELECT key to return to the Program Menu screen.

Press the SMARTWIRE tab on the front of the dataline switch (Figure P8A). All of the switch button LEDs will begin flashing. Then press the switch button to be programmed (Figure P8B). The LED for the selected button will remain flashing, but all others will stop.

The screen will change to the Program button screen shown in Figure P9, and the Relay (Channel) field will be highlighted.

From this point, the selected switch button can be smartwired to control a relay or group of relays On/Off or to a Pattern, or to control an Automation Channel in every panel within the system.

Hint: At any time during the programming sequence, advancing to ABORT and pressing the SELECT key on the Network Clock’s keypad will clear the data entered for that sequence and return to the Smartwiring Mode screen.

- 1 To program the switch button to control a relay or relay group On/Off, go to page 19.
- 2 To program the switch button to control a relay group to a Pattern, go to page 20.
- 3 To program the switch button to an Automation Channel, go to page 21.

Figure P7 – Smartwiring Mode Screen

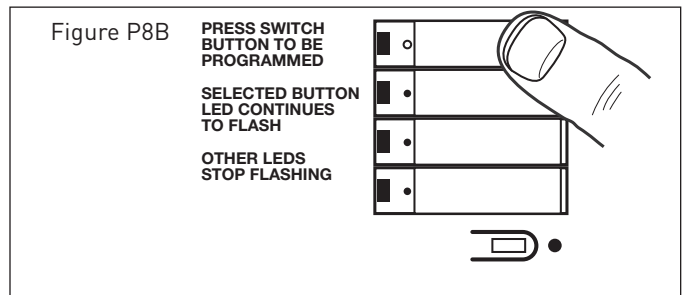
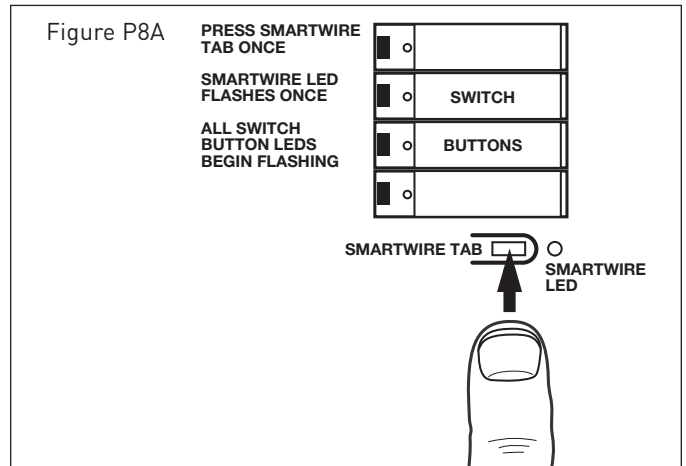
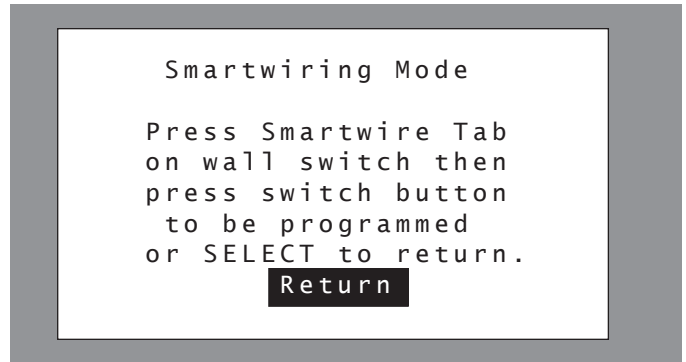


Figure P9 – Program Button Screen




Controlling a Relay or Relay Group On/Off

In the Program button screen, use the RAISE or LOWER key, if necessary, to select Relay. Using the down cursor key (▼), advance to CONTINUE at the bottom of the screen and press the SELECT key. (Hint: Pressing the SELECT key twice will produce the same results.)

The next screen to appear is the Select relay configuration screen as shown in Figure P10. Use the RAISE or LOWER key, if necessary, to select On/Off. Once again, press the down cursor key to advance to CONTINUE and press the SELECT key (or press the SELECT key twice).

The next screen is the Smartwire button screen shown in Figure P11. First, use the RAISE or LOWER key to enter the panel # in the first field, and then cursor down to the next field or press the SELECT key.

Select the relay(s) to be controlled by cursoring to each relay position on the screen, and when highlighted, use either the RAISE or LOWER key to add/remove that relay to/from the group. A  symbol below the relay number indicates that relay is in the group; a blank indicates the relay is not (see Figure P12). The RAISE or LOWER keys toggle between the two.

Advance to the arrow (▶) at the lower right of the screen and press the SELECT key to view relays 13 through 48 on the next three screens, if necessary. Use the back and forward arrows (◀▶) to move among the relay screens.

After selecting the relay(s) to be included in the group, advance to SAVE and press the SELECT key to save all data (see Figure P13).

The selected switch button is now smartwired to the relay group and the screen returns to the Program Menu screen in Figure P1 to enable smartwiring of any remaining switch buttons or channels, if necessary.

If no further switch programming is to be done at this time, flip the master button closed and replace the wallplate on the dataline switch. Move the small slide switch on the bottom of the Network Clock to the left to return the unit to Clock Mode, and return the Network Clock to the LI panel.

Figure P10 – Select Relay Configuration Screen

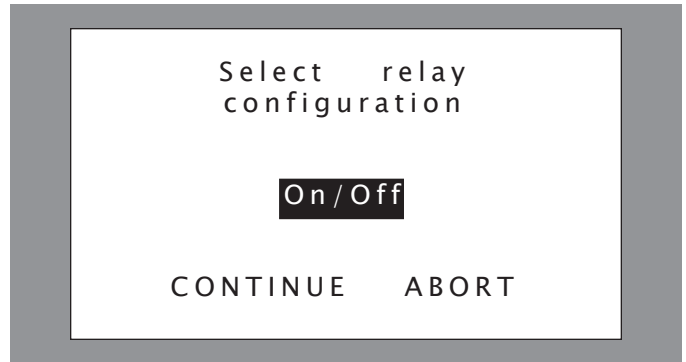


Figure P11 – Smartwire Button Screen

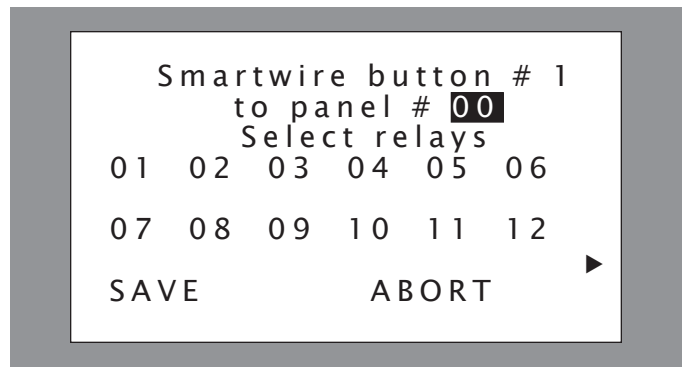


Figure P12 – Selecting Relays

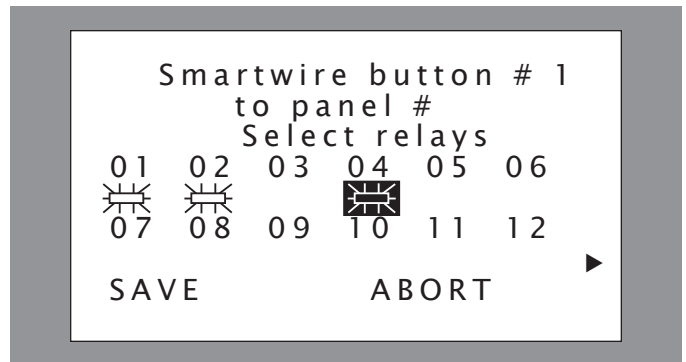
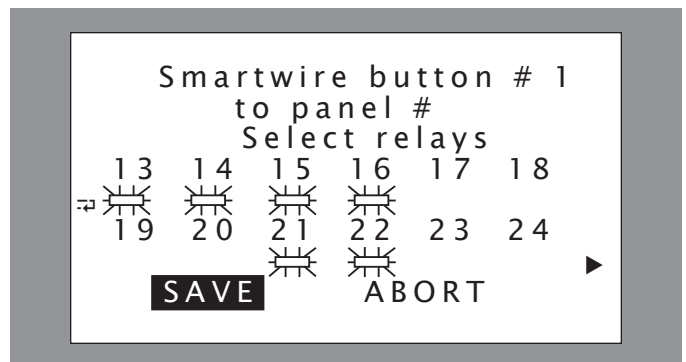


Figure P13 – Saving Selections





Controlling a Group of Relays to a Pattern

In the Program button screen shown in Figure 9 on page 4, use the RAISE or LOWER key, if necessary, to select Relay. Using the down cursor key (▼), advance to CONTINUE at the bottom of the screen and press the SELECT key. (Hint: Pressing the SELECT key twice will produce the same results.)

The next screen to appear is the Select relay configuration screen as shown in Figure 14. Use the RAISE or LOWER key, if necessary, to select Pattern. Once again, press the down cursor key to advance to CONTINUE and press the SELECT key (or press the SELECT key twice).

The next screen is the Smartwire button screen shown in Figure 15. First, use the RAISE or LOWER key, if necessary, to enter the panel # in the first field, and then cursor down to the next field or press the SELECT key.

Select the relay(s) to be controlled by cursoring to each relay position on the screen, and when highlighted, use either the RAISE or LOWER key to add/remove that relay to/from the group. A  symbol below the relay number indicates that relay is in the group and On; a  symbol indicates the relay is in the group but Off; and a blank indicates the relay is not included in the group (Figure 16).

Advance to the arrow (▶) at the lower right of the screen and press the SELECT key to view relays 13 through 48 on the next three screens, if necessary. Use the back and forward arrows (◀▶) to move among the relay screens.

After selecting the relay(s) to be included in the group, advance to SAVE and press the SELECT key to save all data (Figure 17).

The selected switch button is now smartwired to the relay group and the screen returns to the Program Menu screen in Figure 1 on page 2 to enable smartwiring of any remaining switch buttons or channels, if necessary.

If no further switch programming is to be done at this time, flip the master button closed and replace the wallplate on the dataline switch. Move the small slide switch on the bottom of the Network Clock to the left to return the unit to Clock Mode, and return the Network Clock to the LI panel.

Figure P14 – Select Relay Configuration Screen

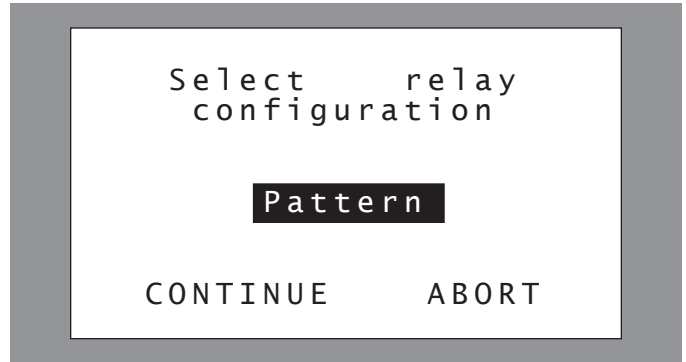


Figure P15 – Smartwire Button Screen

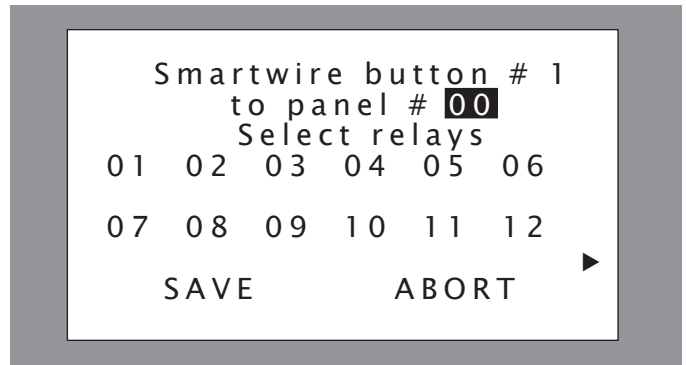


Figure P16 – Selecting Relays

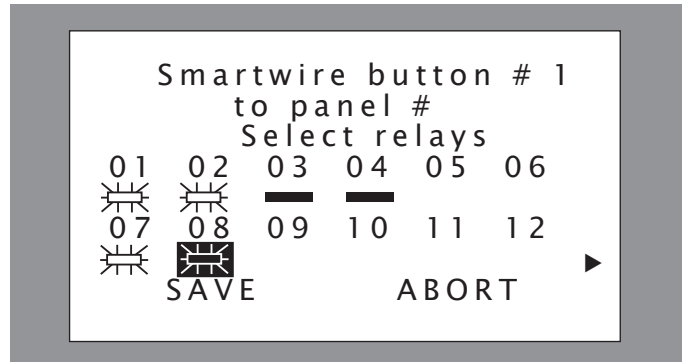
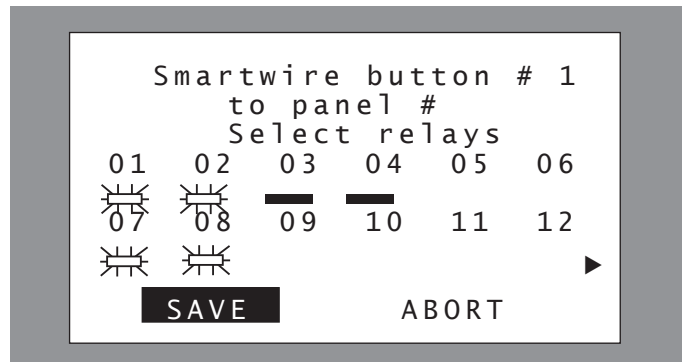


Figure P17 – Saving Selections



Controlling an Automation Channel

In the Program button screen shown in Figure P9, use the RAISE or LOWER key, if necessary, to select Channel. Using the down cursor key (↓), advance to CONTINUE at the bottom of the screen and press the SELECT key. (Hint: Pressing the SELECT key twice will produce the same results.)

The next screen is the Smartwire button screen shown in Figure P18. First, use the RAISE or LOWER key, if necessary, to enter the Channel (A through H) in the first field, and then cursor down to the next field or press the SELECT key.

As shown in Figure P19, use the RAISE or LOWER key to enter Listing or All and press the down cursor or the SELECT key.

Selecting All will select all LI panels in the system and advance to SAVE (Figure P21); selecting Listing will advance to the next field on the screen, allowing entry of up to twelve LI panel numbers (Figure P20).

Enter the panel numbers by cursoring to a blank entry position and using the RAISE or LOWER key. When finished selecting panels, advance to SAVE using the cursor or SELECT keys, and press the SELECT key to save data.

The selected switch button is now smartwired to the Automation Channel in the selected panels and the screen returns to the Program Menu screen in Figure P1.

If no further switch programming is to be done at this time, unplug the Network Clock cable from the switch unit, flip the master button closed and replace the wallplate on the dataline switch. Move the small slide switch on the bottom of the Network Clock to the left to return the unit to Clock Mode, and return the Network Clock to the LI panel.

Figure P18 – Smartwire Button Screen

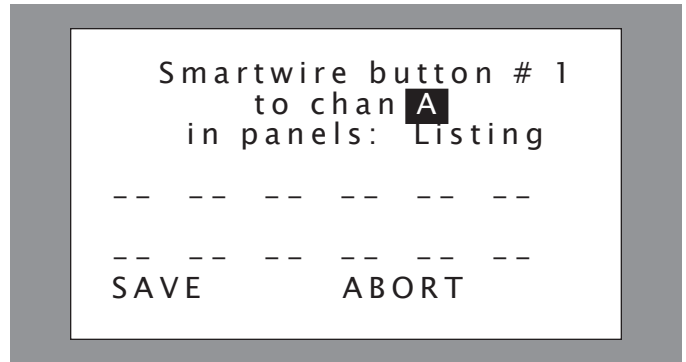


Figure P19 – Selecting All or Listing

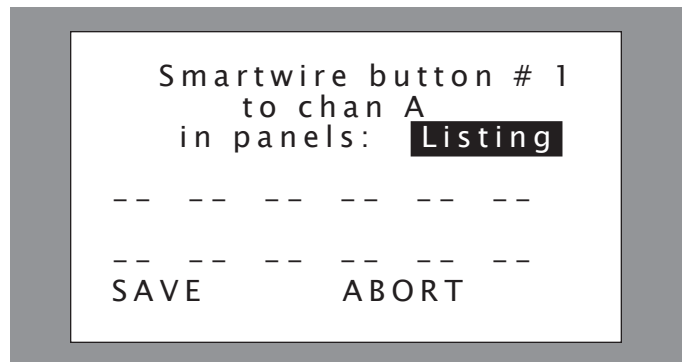


Figure P20 – Selecting Panels

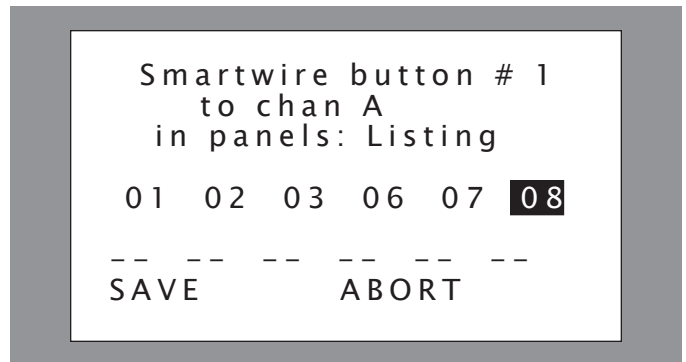
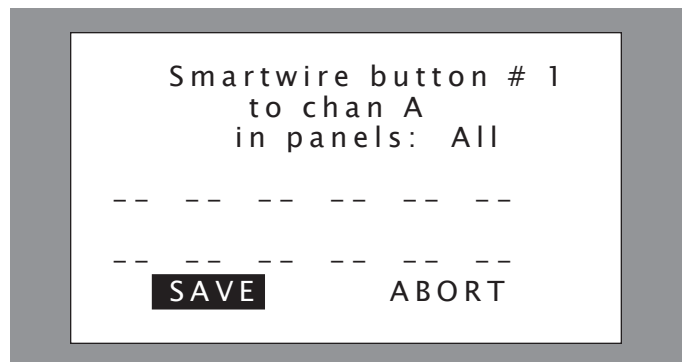


Figure P21 – Saving Selections



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