SWITCHPAK™

OPERATION AND MAINTENANCE

Synergy®
LIGHTING CONTROLS

An AcuityBrands™ Company

Contents

Synergy Lighting Controls Conyers Ga, 30012
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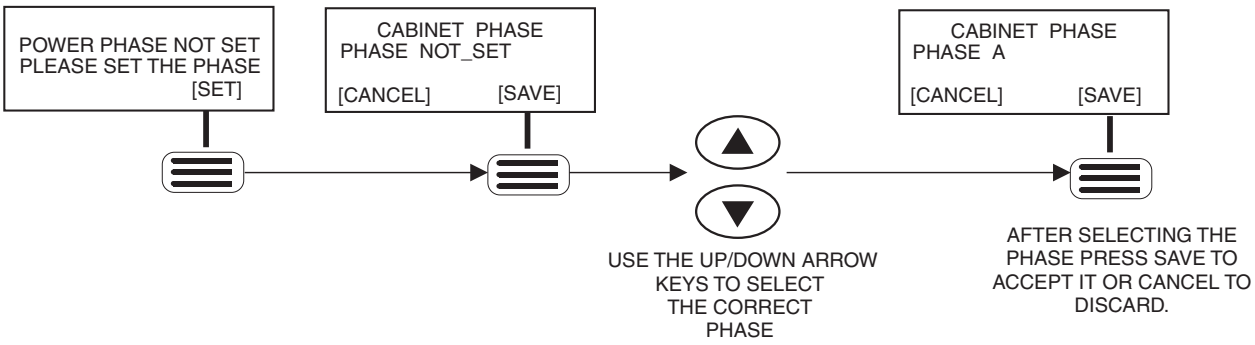
Powering Up For The First Time

When the SwitchPak is initially powered up, you will be prompted to set the PHASE of the circuit feeding the power supply. The correct Phase **must** be selected if you intend to use the ZERO-CROSS SWITCHING feature of SwitchPak. If you are NOT using ZERO-CROSS SWITCHING, any phase can be selected. However, you must select and save a PHASE option to end the warning prompt and alert beep.

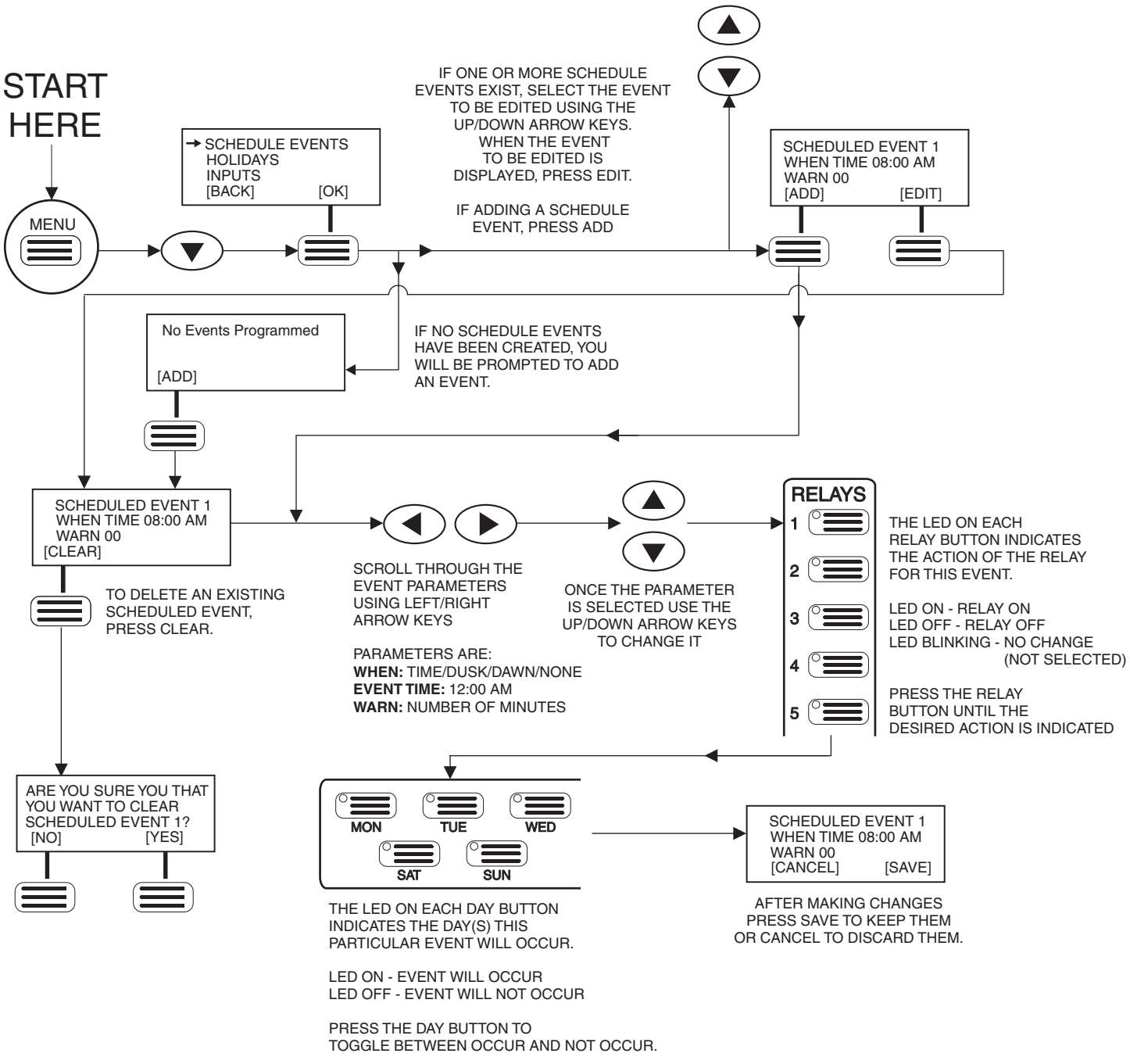
Follow the steps shown in the flow diagram below to set the power supply phase.



How Do I Program a Time Schedule Event to Control a Circuit?

SwitchPak uses schedule events to control one or more circuits (RELAYS). For each scheduled event, RELAYS can be selected to switch ON, OFF, or NO CHANGE, (not selected for event) eliminating the need to have both ON and OFF events at the same scheduled time. Each schedule event can be assigned to any combination of days.

The flow diagram below shows the programming steps to edit a SCHEDULED EVENT.



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Time Schedule Event Parameters

WHEN: (EVENT PARAMETERS)

TIME – The time the event will occur. The time is displayed as HH:MM with an AM/PM indicator.
Note: The system time must be correct for scheduled events to operate correctly. The system time setting is edited under SETTINGS, TIME/DATE. See the 'HOW DO I SET THE SYSTEM TIME AND DATE' section for more details.

DUSK – The event occurs at dusk based on the internal astronomic time-clock function. A positive or negative offset up to 999 minutes can be set for a DUSK event. A positive offset will set the event to occur the specified number of minutes after DUSK. A negative offset will set the event to occur the specified number of minutes before DUSK.
Note: The system location must be correct for the DUSK/DAWN event to operate correctly. The system location setting is edited under SETTINGS, LOCATION. See the 'HOW DO I SET THE SYSTEM LOCATION' section for more details.

DAWN – The event occurs at dawn based on the internal astronomic time-clock function. A positive or negative offset up to 999 minutes can be set for a DAWN event. A positive offset will set the event to occur the specified number of minutes after DAWN. A negative offset will set the event to occur the specified number of minutes after DAWN.
Note: The system location must be correct for the DUSK/DAWN event to operate correctly. The system location setting is edited under SETTINGS, LOCATION. See the 'HOW DO I SET THE SYSTEM LOCATION' section for more details.

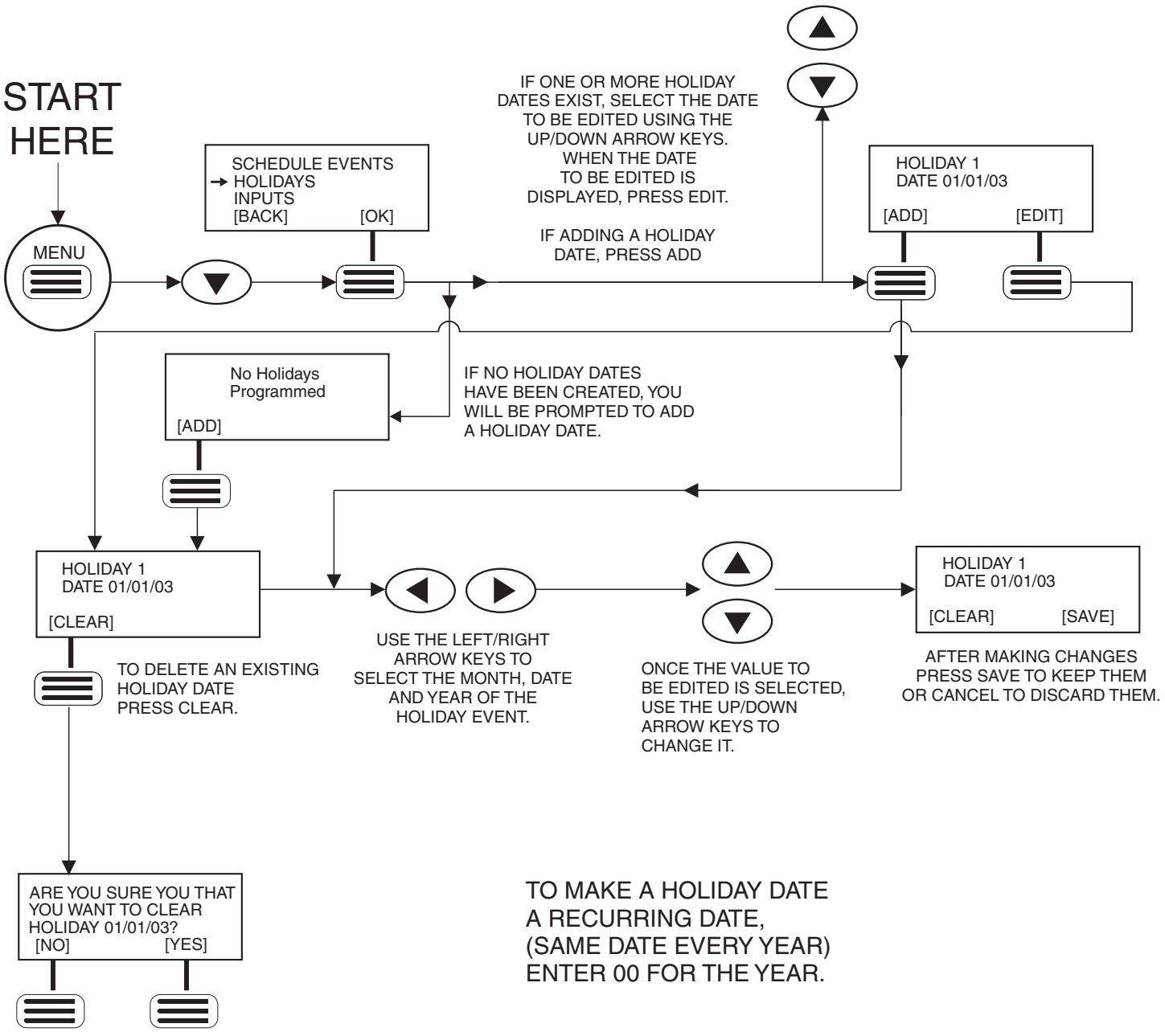
NONE – The event can be permanently REMOVED by setting the TIME field to NONE.

WARN – The event can be given a WARN value up to 99 minutes. This feature will blink any relays scheduled OFF for a period of 1 second. This warns the occupants the lights are about to go OFF and gives them time to exit the building, or press a switch to get additional lighting for the required area. Relays programmed ON or NO CHANGE will not be affected by the WARN event. Set WARN to 00 if you do not want the WARN function to operate.
Example: If event 1 is programmed with a 5 min. WARN, relays 1 and 2 are selected to switch on, and relays 7 & 8 are selected to switch off, then **only** RELAYS 7 & 8 will blink OFF, five minutes before the scheduled off command.

How Do I Enter Holiday Dates to be Used With Time Schedule Events?

SwitchPak contains 32 holiday (calendar) dates for special occasions. Events occurring on holiday dates override any standard schedule events. Holiday dates are entered using the MM/DD/YY format. Once the holiday date(s) are programmed, use the HOLIDAYS button to assign programmed events to the holiday date. See 'HOW DO I PROGRAM A SCHEDULED EVENT TO CONTROL A CIRCUIT' for more event programming information.

The flow diagram below shows the programming steps to create/edit HOLIDAY DATES.



TO MAKE A HOLIDAY DATE A RECURRING DATE, (SAME DATE EVERY YEAR) ENTER 00 FOR THE YEAR.

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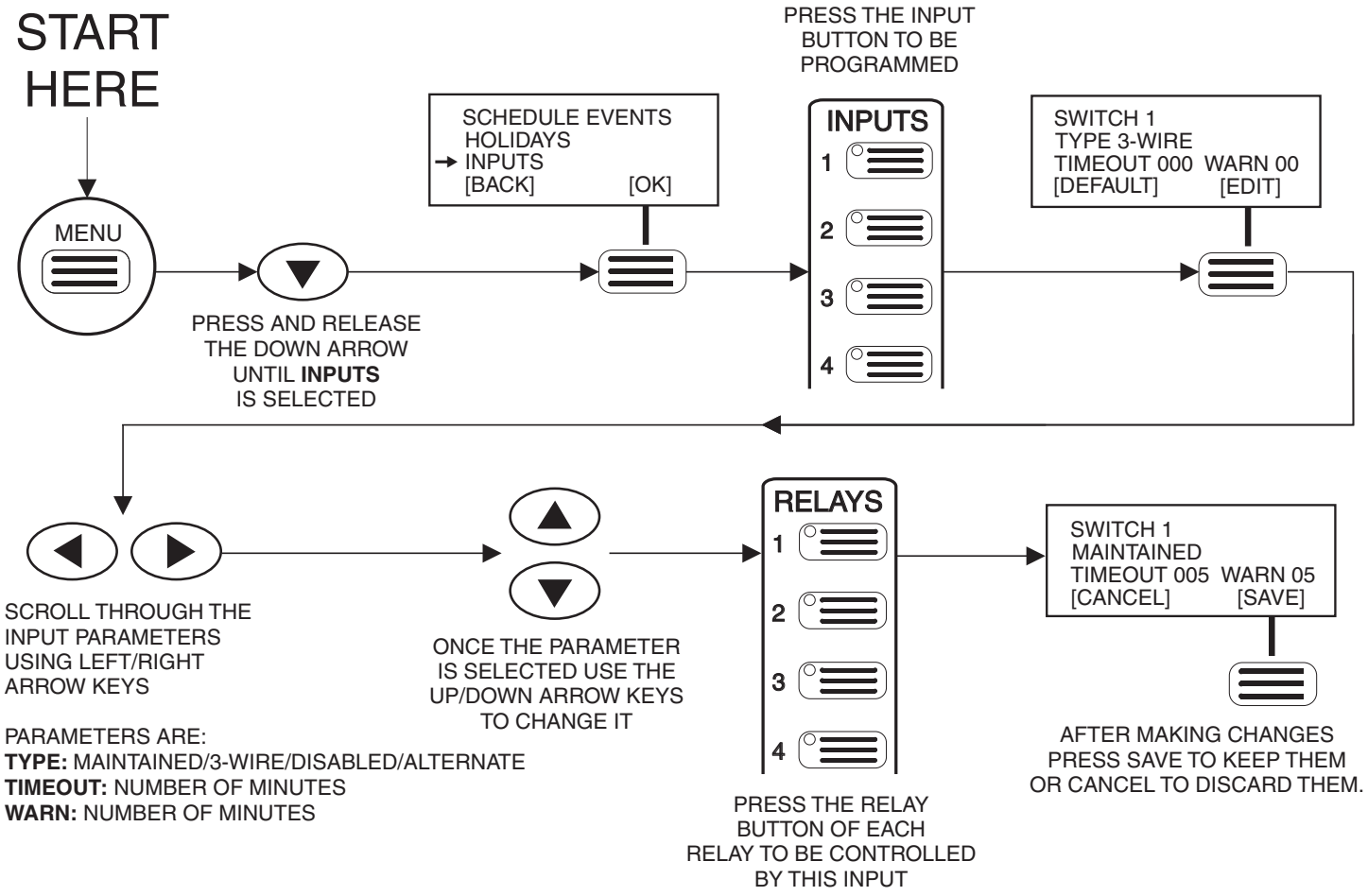
How Do I Assign A Switch To Control A Circuit?

SwitchPak can assign a switch (INPUT) to control one or multiple circuits (RELAYS.) This eliminates the need to rewire switches and loads if your control scheme changes. Switchpak contains eight inputs for switches, sensors or other dry contact closure devices.

The flow diagram below shows the programming steps to configure an input.



Switch Input Parameters

TYPES:

MAINTAINED (2-wire SPST) – Terminated between ON and COM. Typically a standard wallswitch that is used in residential applications. A maintained switch can also be terminated between OFF and COM to provide an inverted output.

ALTERNATE (2-wire momentary SPST) – Terminated between ON and COM. Press once to turn ON. Press again to turn OFF. Example Cat # - LVRS 1G 8BT

3-WIRE MOMENTARY (SPDT) – Terminated between ON, OFF and COM. Typically has an ON and OFF button. Press the ON button to turn the relay(s) on and the OFF button to turn the relay(s) off. Example Catalog # - LVMS IV.

DISABLED – The INPUT is not used. Any switches, photocells, or sensors wired to this input will not function.

Interfacing to other building systems

Others systems such as fire alarm, HVAC and energy management are often required to control a building's lighting. These systems interface to SwitchPak using dry-contact closures via Class 2, low-voltage conductors. Typically these inputs are connected in the "Maintained" INPUT scenario shown above and programmed like any other switch input.

TIMEOUT - A timer can be associated with an INPUT that will turn the lights OFF after a specified time. Some states or local codes require an override switch to keep the lights on for only 2 or 4 hours. Enter the time in minutes the switch should keep the lights ON.

WARN - If the INPUT has a TIMEOUT value, the warn function will blink the lights before the TIMEOUT expires. This warns the occupants the lights are about to go OFF and gives them time to exit the building or press a switch to get additional lighting for the specified TIMEOUT period.
Example: INPUT 2 has a 120 minute TIMEOUT and it is set to WARN 5 minutes prior to OFF. After 115 minutes have elapsed (5 minutes before the TIMEOUT expires) the relay or relays will blink OFF for 1 second, then turn back ON. After 120 minutes, the relays will go OFF and stay OFF, unless the occupant presses the switch again which will restart the timeout at 0.

Set the WARN to 00 if you do not want the WARN function to operate.

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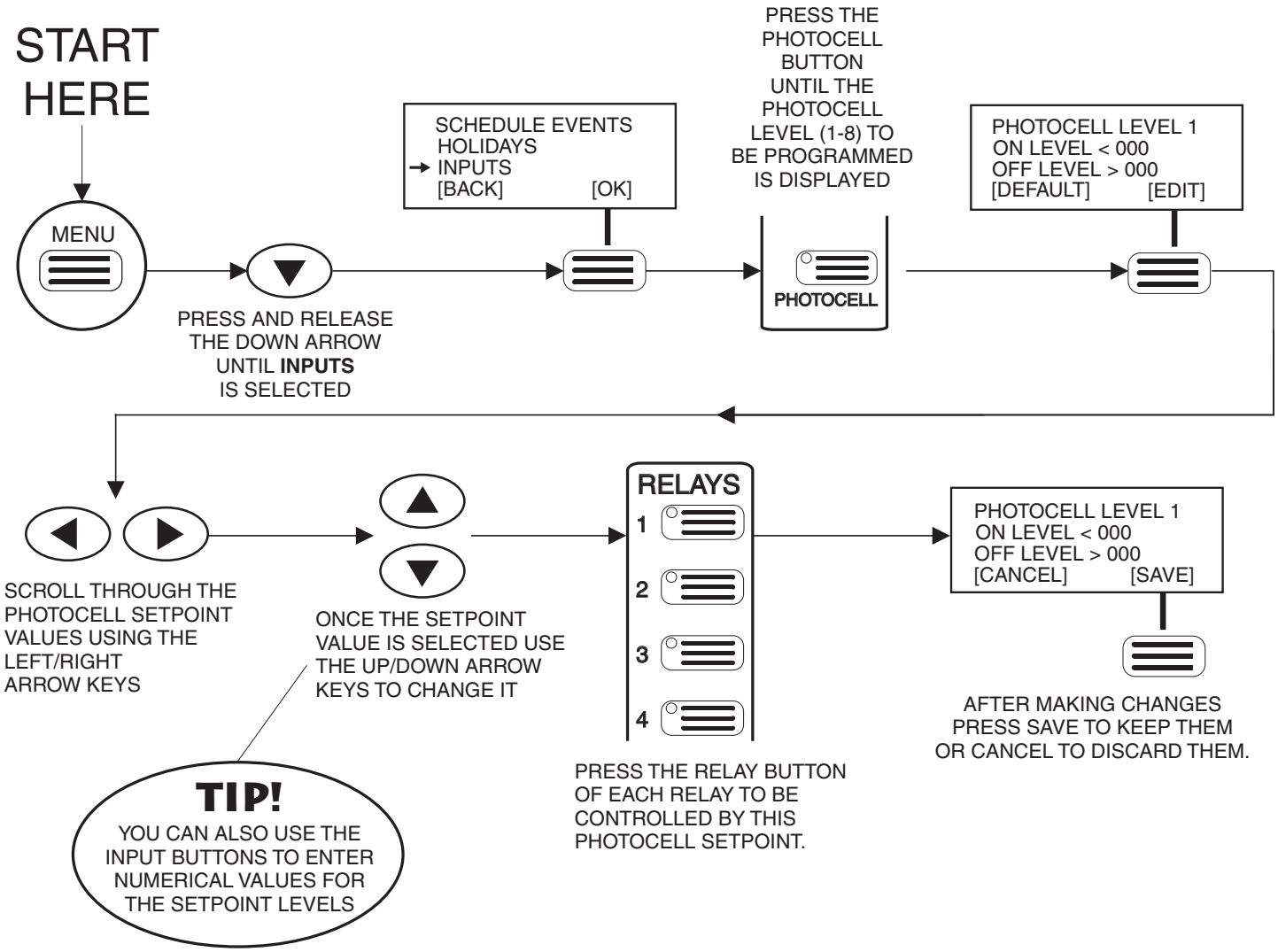
How Do I Assign an Analog Photocell To Control A Circuit?

SwitchPak has one analog photocell input and can assign it to control one or multiple circuits (RELAYS.) SwitchPak can assign up to 8 different levels (set points) of photocell control, each set point being based on the amount of light the photocell is seeing. The analog photocell must be terminated on the ANALOG PHOTOCELL input (AGND, INPUT, +20V.)

The flow diagram below shows the programming steps to program the analog photocell input.



Photocell Parameters

The photocell ON and OFF LEVELS use a 0 to 100 scale. 0 signifies the photocell does not see any light, 100 signifies the photocell is seeing the maximum footcandle amount it's calibrated for.

Lithonia Analog Photocell Ratings:	
LSA APS IN (indoor)	**0-100 FC**
LSA APS OL (outdoor)	**0-100 FC**
LSA APS OH (outdoor)	**0-1000 FC**
LSA APS S (skylight)	**0-10,000 FC**
	* FC = Foot-Candle

ON LEVEL - The level the photocell (not FC level) will turn the lights ON.
OFF LEVEL - The level the photocell (not FC level) will turn the lights OFF.

< > - The ON/OFF <> (less than/greater than) levels can be swapped if needed.

ON LEVEL < 000		ON LEVEL > 000
OFF LEVEL > 000	can be swapped to	OFF LEVEL < 00

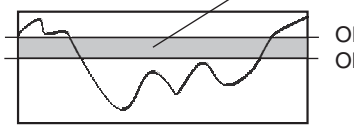
Example: The photocell should turn ON the exterior lighting (RELAY 1) when the light level is less than 55% and turn it OFF when the light level is more than 75%. It should also turn ON the signage (RELAY 2) when the photocell light level is less than 35% and turn if OFF when the light level is more than 85%. A unique PHOTOCELL LEVEL must be used for each setpoint. See the example below:

Using the LSA APS OL, your screen should show the following for the exterior lighting:

```
ON LEVEL < 055
OFF LEVEL > 075
[CANCEL]        [SAVE]
```

Using the LSA APS OL, your screen should show the following for the signage:

```
PHOTOCELL LEVEL 2
ON LEVEL < 035
OFF LEvEL > 085
[CANCEL]        [SAVE]
```



THE RANGE BETWEEN THE ON LEVEL AND OFF LEVEL IS CALLED THE “DEAD BAND”. HAVING A DEAD BAND OF SUFFICIENT RANGE ENSURES THE LOADS WILL NOT “QUICK CYCLE” - SWITCHING ON AND OFF DUE TO SMALL CHANGES IN LIGHT LEVEL.

BE SURE TO SET UP A DEAD BAND OF SUFFICIENT RANGE TO AVOID “QUICK CYCLING”.

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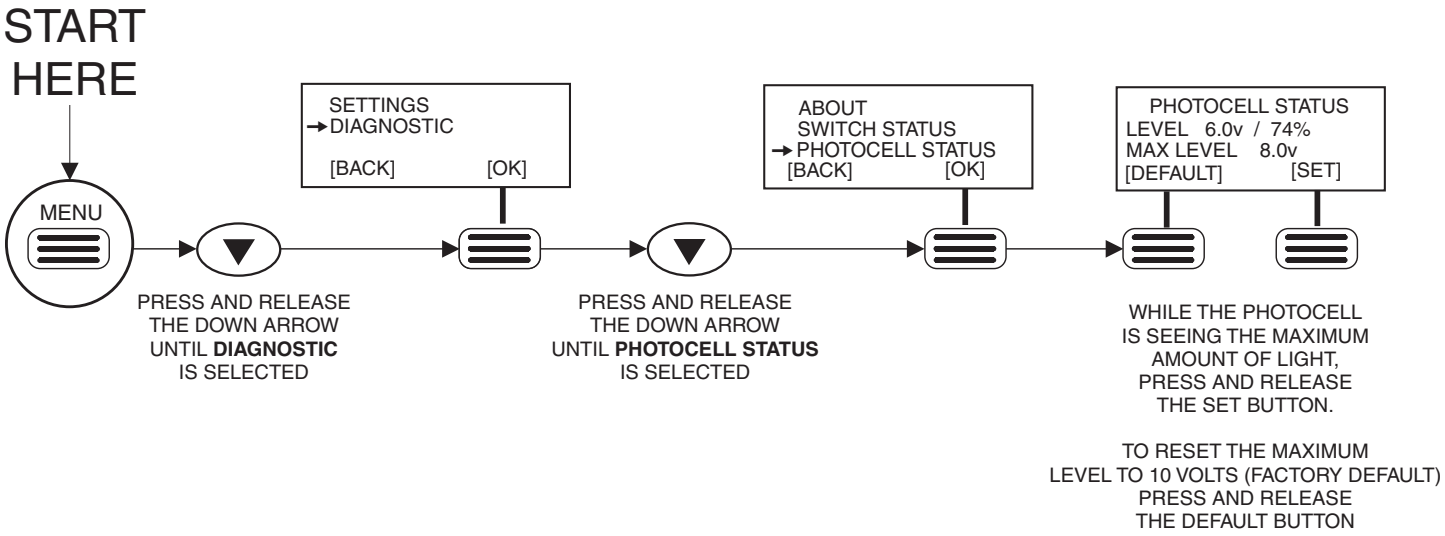
How Do I Calibrate the Photocell?

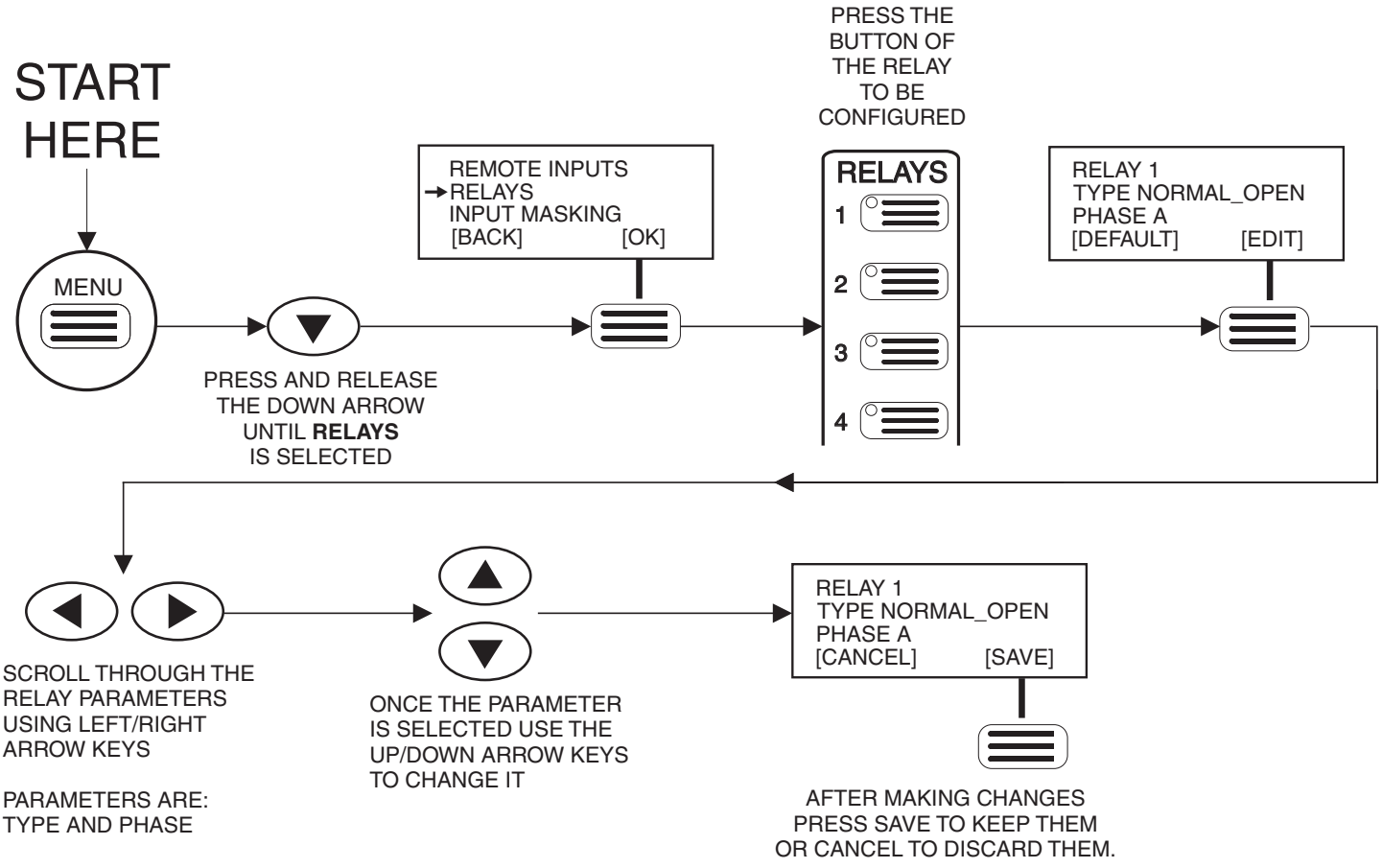
SwitchPak's analog photocell input is desgned to work with a 0 - 10 volt photocell. Whenever the photocell sees the maximum footcandle amount it's rated for, it's output should be at 10 Volts. If the photocell is installed in a location where it does not receive enough light to cause it's output to operate in the entire 0 - 10 volt (0 - 100%) range, any photocell input programming based on a full range will not function correctly. To correct this situation, the photocell input can be calibrated to acheive the full 0 - 100% range at footcandle levels less than the photocell maximum.
To calibrate the photocell, choose a sunny day and time when the photocell is seeing the maximum amount of light possible. Then follow the steps below:



How Do I Set Up A Relay For Different Load Types?

SwitchPak can configure it's RELAYS to control different load types. This eliminates the need to wire additional interfaces between the relay output and load to achieve the desired operation. All output circuits are terminated directly to one of the eight RELAY terminals.
The PHASE of the circuit being controlled by each relay can be set, enabling the zero-cross switching feature of SwitchPak. This feature should be use when switching high inrush lighting loads, such as HID, to minimize the high start-up current of these types of loads. Zero-cross switching can also be used to minimize contact arcing when switching the relay ON or OFF, which can extend the life of the relay.

The flow diagram below shows the programming steps to configure the relay type:



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Relay Parameters

TYPES:

NORMAL_OPEN

The relay contacts are open when the relay is in the OFF state and closed when the relay is activated ON as indicated by the LED indicator on the relay button. This is the typical setting for most applications.

NORMAL_CLOSED

The relay function is inverted, which means the contacts are closed when the relay is in the OFF state and open when the relay is activated ON as indicated by the LED indicator on the relay button.

MOMENTARY_ON

The relay creates a momentary ON/OFF pulse when activated by an ON command from either inputs or schedule events. This is used to control loads which require a pulse to turn the load ON. See the example in the MOMENTARY OFF section.

MOMENTARY_OFF

The relay creates a momentary ON/OFF pulse when activated by an OFF command from either inputs or schedule events. This is used to control loads which require a pulse to turn the load OFF.

Example: Mechanically held relays typically require a separate on and off pulse for operation. To create this operation, configure two relays, one as MOMENTARY ON and the other as MOMENTARY OFF. Then configure an event, or input, to control both relays. One relay will supply the ON pulse, the other the OFF pulse.

SWEEP

This option must be used when a RELAY has Sweep Switches on the circuit for remote switching. In this mode, the relay will operate as a NORMALLY CLOSED relay for the ON event. The OFF event (either from a schedule or switch input) will open the contacts for the specified time required to reset the Sweep Switch, then the relay contacts will close. When the output type is set to SWEEP, all loads connected to the relay **must** be controlled through a Sweep Switch for full ON/OFF control.
Note: With this setup, the user ***can not*** override the OFF command following a WARN signal. The Sweep Switch can be used to turn the lights back on following the OFF command.

INTELISWITCH

This selection must be used when a RELAY has an InteliSwitch® (not available from Lithonia) on the circuit for remote switching. In this mode, the relay will operate as a NORMALLY CLOSED relay for the ON event. The OFF event (either from a schedule or switch input) will pulse the output OFF to signal the InteliSwitch an OFF command was activated. When the output type is set to INTELISWITCH, all loads connected to the relay **must** be controlled through an InteliSwitch for full ON/OFF control.
Note: With this setup, the InteliSwitch will flash the lights to provide a WARN-OFF signal. The lights will turn off following time-out of the internal timer in the InteliSwitch (see product instructions for timer settings). The user can override the OFF command at the InteliSwitch following the WARN-OFF signal.

DISABLED

The relay is disabled and will not switch ON or OFF and is disabled in a NORMALLY_OPEN state. This also disables any INPUT mapped to this relay. If the INPUT is mapped to multiple RELAYS, the input will turn the remaining relays ON, but will not turn the relays off. This disabled relay should be removed from the INPUT mapping if control of the remaining relays is required.

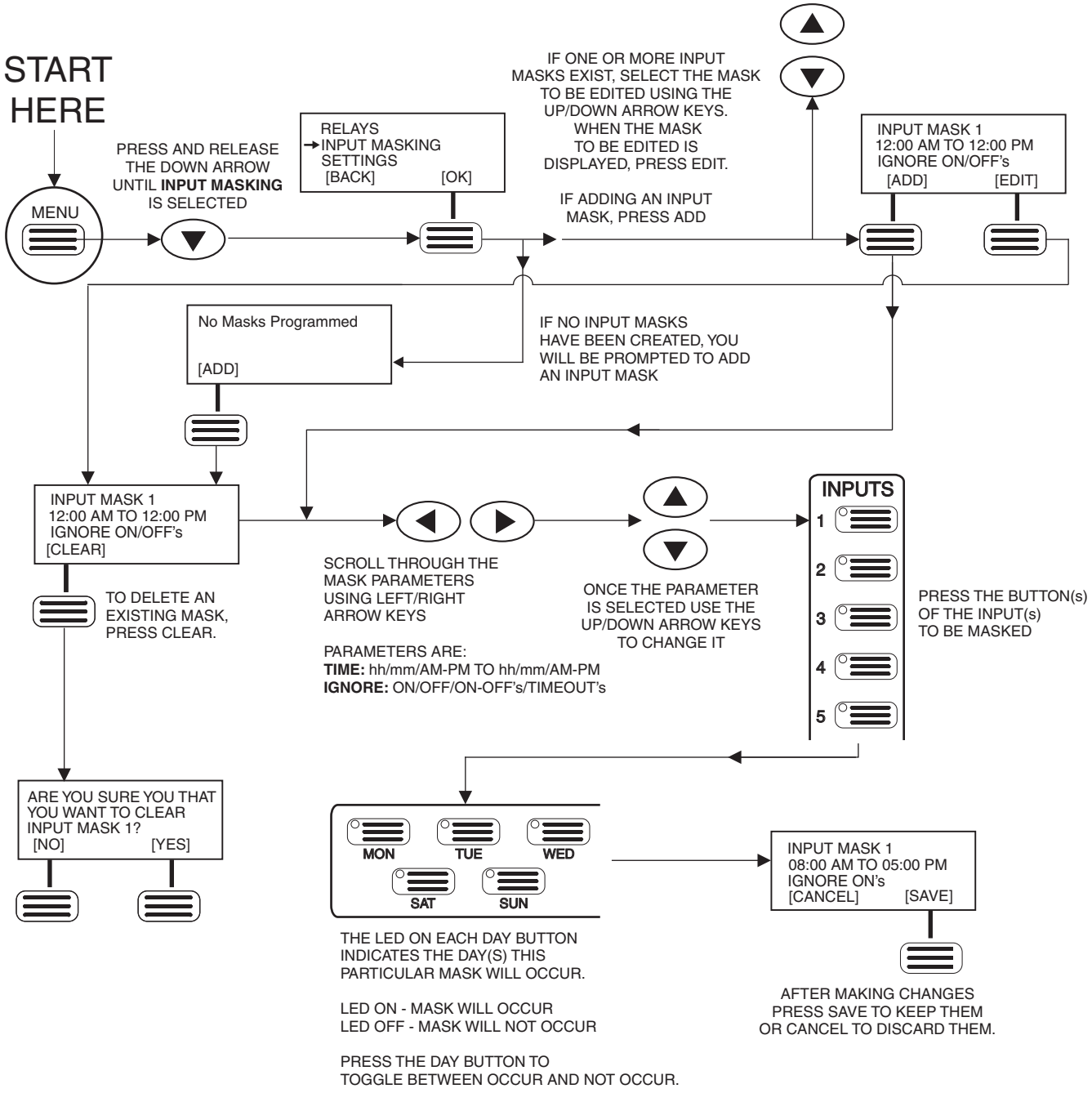
PHASE

The PHASE can be set to A, B, C or NONE. To maximize relay life, the PHASE should be set to the appropriate phase for each relay.

How Do I Mask (Ignore) Inputs For Priority Control?

SwitchPak can setup a maximum of 25 INPUT MASKs. INPUT MASKING causes inputs to be ignored during the time period when the MASK is active. Masking is used to setup priority relationships between SCHEDULED EVENTS and INPUTS, or between multiple INPUTS. INPUT MASKS are configured by entering a time range, selecting the DAY(s) it will occur, and choosing the desired IGNORE parameter. Each INPUT MASK can be configured to IGNORE ON's, IGNORE OFF's, IGNORE ON/OFF's, and IGNORE TIMEOUT's. Masking provides a simple and effective method for input or schedule priorities.

The flow diagram below shows the programming steps to configure INPUT MASKING:



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Input Masking Parameters

TIMES:

Enter the start and ending time for each INPUT MASK.

IGNORE OPTIONS:

IGNORE ON's

Ignores ON commands from the selected INPUTS during the specified times.

Example: A photocell input's ON event being MASKED (ignored) between 7 AM and 7 PM to prevent cloud cover from turning on the exterior lighting.

IGNORE OFF's

Ignores OFF commands from the selected INPUTS during the specified times. This can be used to insure lighting is not turned off during business hours or critical time periods.

Example: An off button being MASKED (ignored) between 8 AM and 8 PM to prevent the lighting in a space from being accidentally turned off.

IGNORE ON/OFF's

Ignores ON and OFF commands from the selected INPUTS during the specified times. This option totally disables selected INPUTS for times when remote overrides are not wanted.

Example: An override switch being MASKED (ignored) between 9 AM and 5 PM to prevent the lighting in a space from being overridden during normal hours.

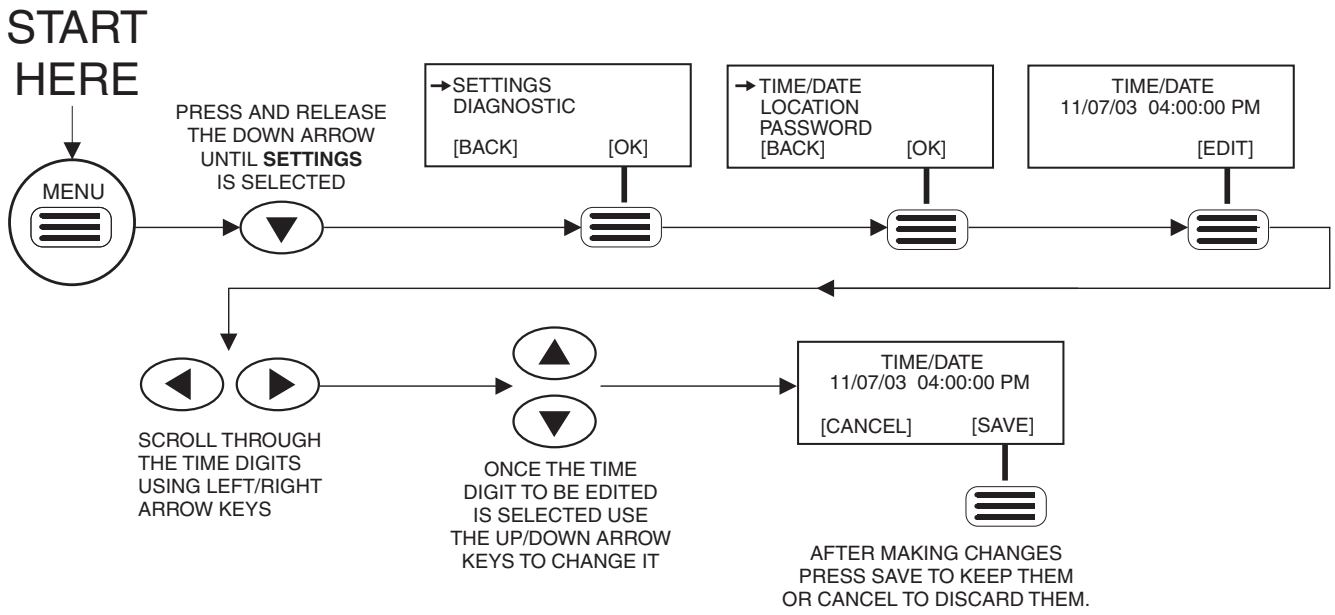
IGNORE TIMEOUT's

Ignores timeouts associated with INPUTS during the specified times. See the "How do I assign a switch to control a circuit?" section for more information on input timeouts. This option allows an INPUT to be used for normal ON/OFF operation during normal business hours, then allow the timeout feature to be activated if the switch is pressed after hours.

Example: A switch used for ON/OFF operation during normal business hours, after normal hours the timeout feature activates to turn the lights after the specified time period.

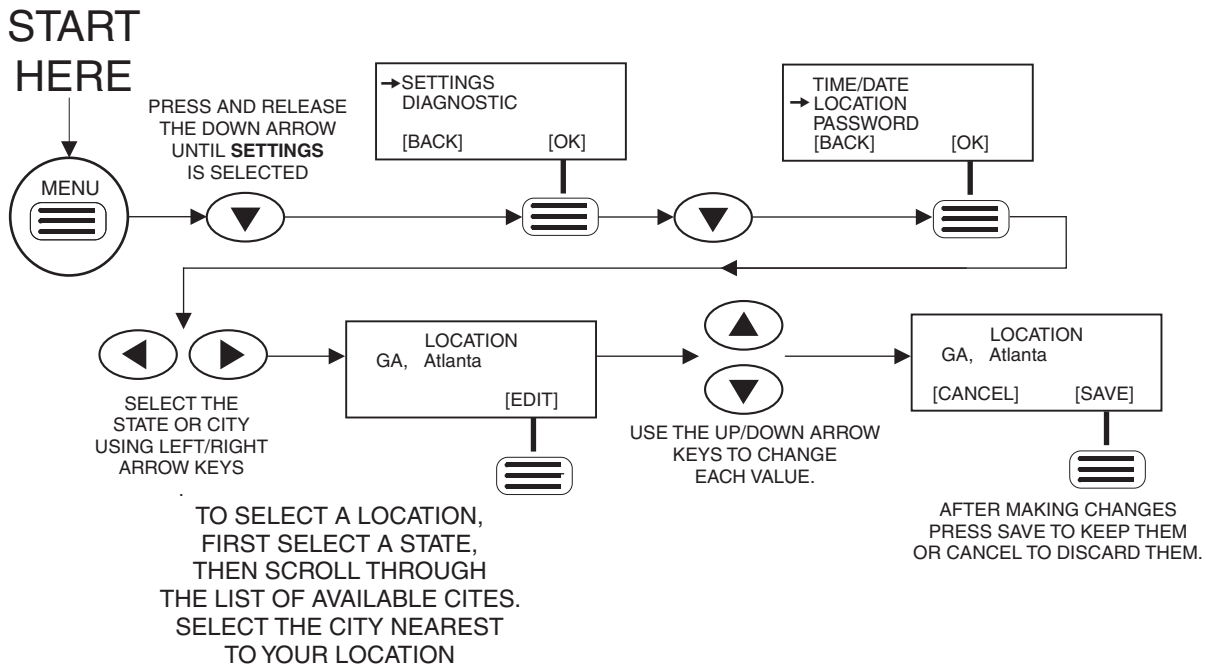
How Do I Set the Time and Date?

The current time and date must be correct for time schedule events to operate correctly.
The flow diagram below shows the programming steps to set the time.



How Do I Set the System Location ?

The current geographical location must be set for the DUSK/DAWN events to work properly. The Astronomical Time Clock calculates the DUSK/DAWN event times.
The flow diagram below shows the programming steps to set the Astronomical Time Clock:



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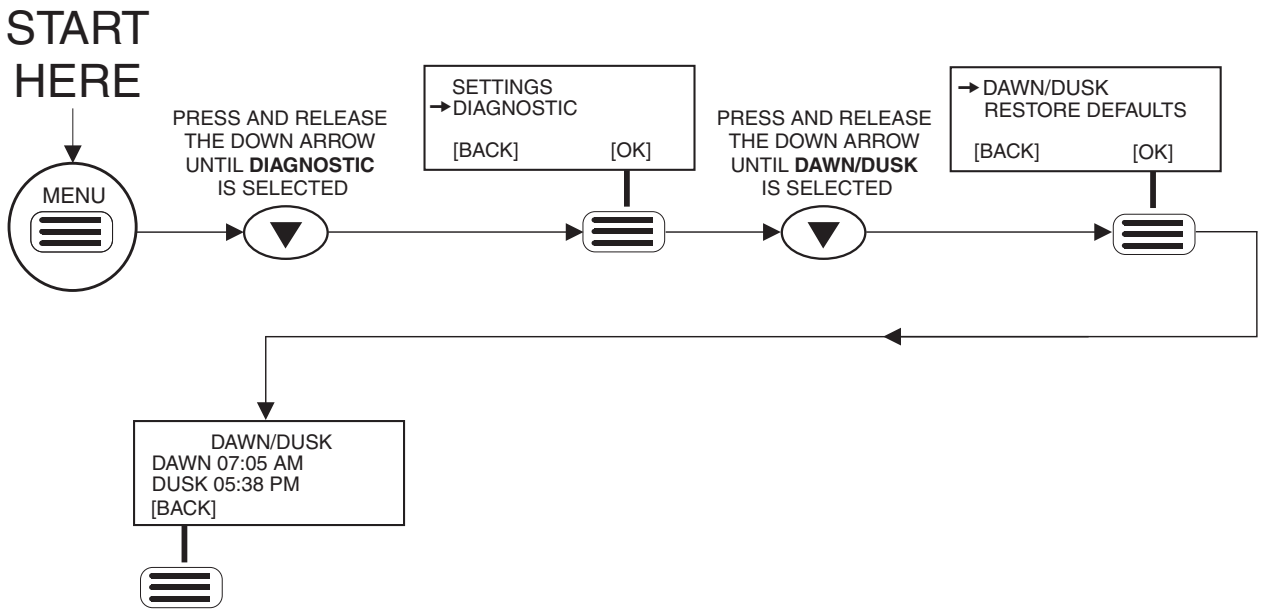
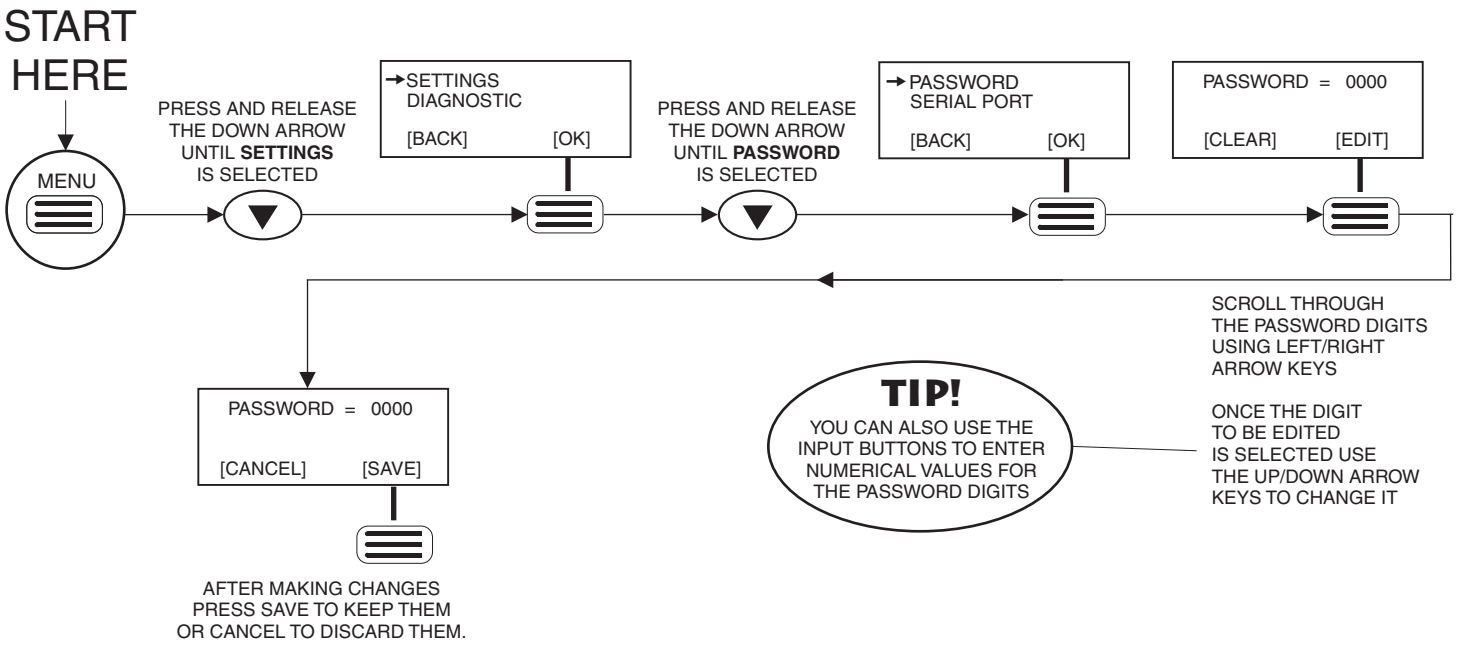
How Do I Check the Calculated Dawn and Dusk Times?

The flow diagram below shows the programming steps to check the DUSK/DAWN TIMES

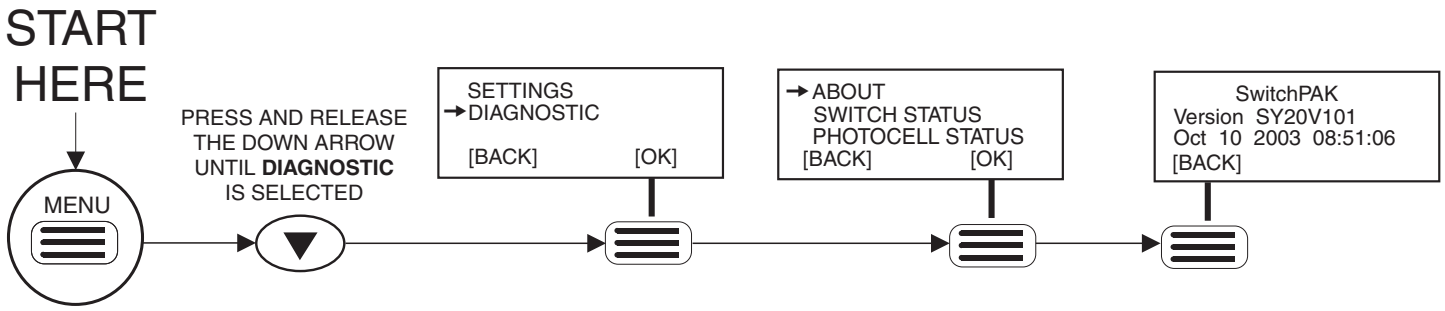


How Do I Set A System Password?

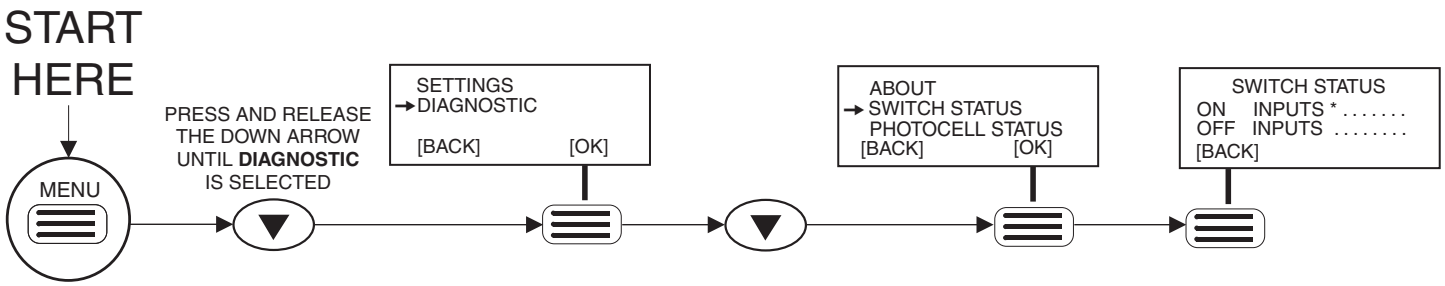
SwitchPak allows the user to configure a system password. Having a system password in effect prevents programming changes from being made by unauthorized individuals. Individual inputs and relays can still be overridden, without knowing the PASSWORD.
The flow diagram below shows the programming steps to set up a PASSWORD:



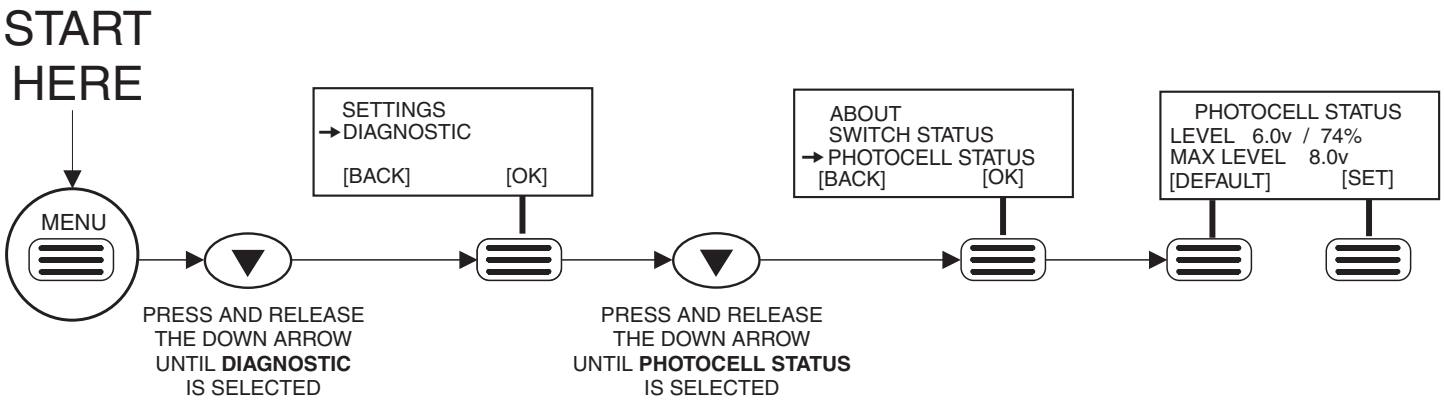
How Do I Check the Firmware Version?



How Do I Check the Actual Status of the Low Voltage Inputs?



How Do I Check the Photocell Input Level?



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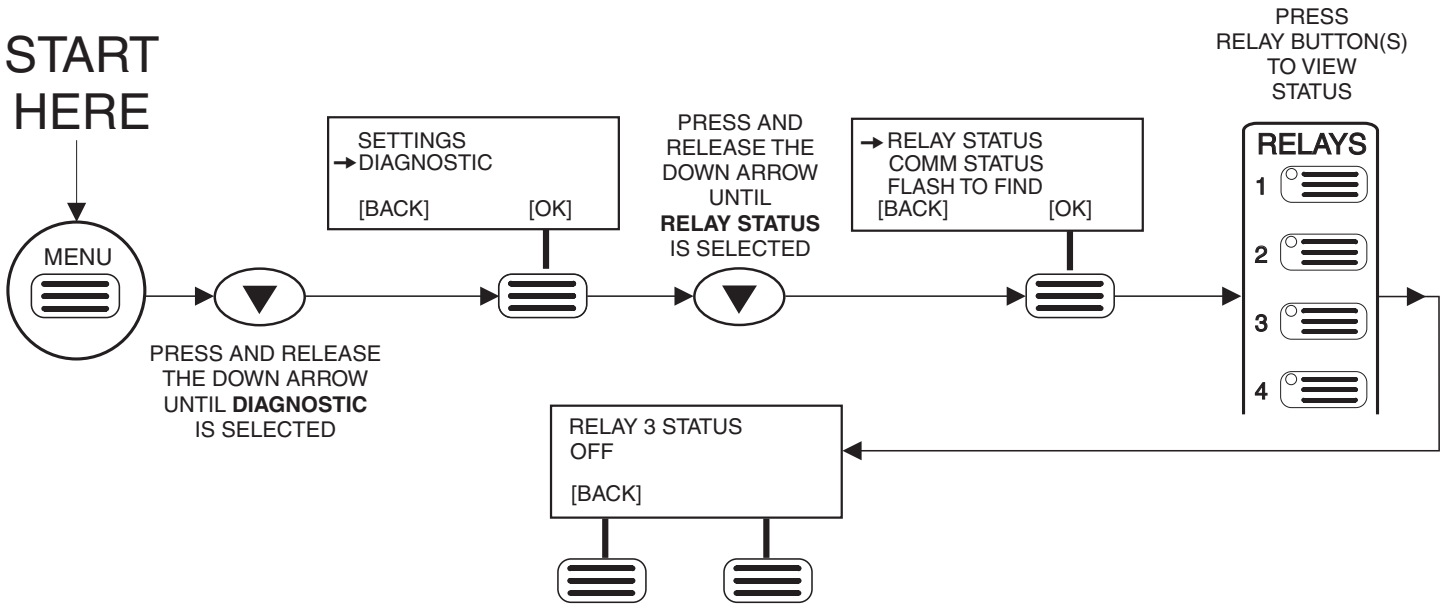
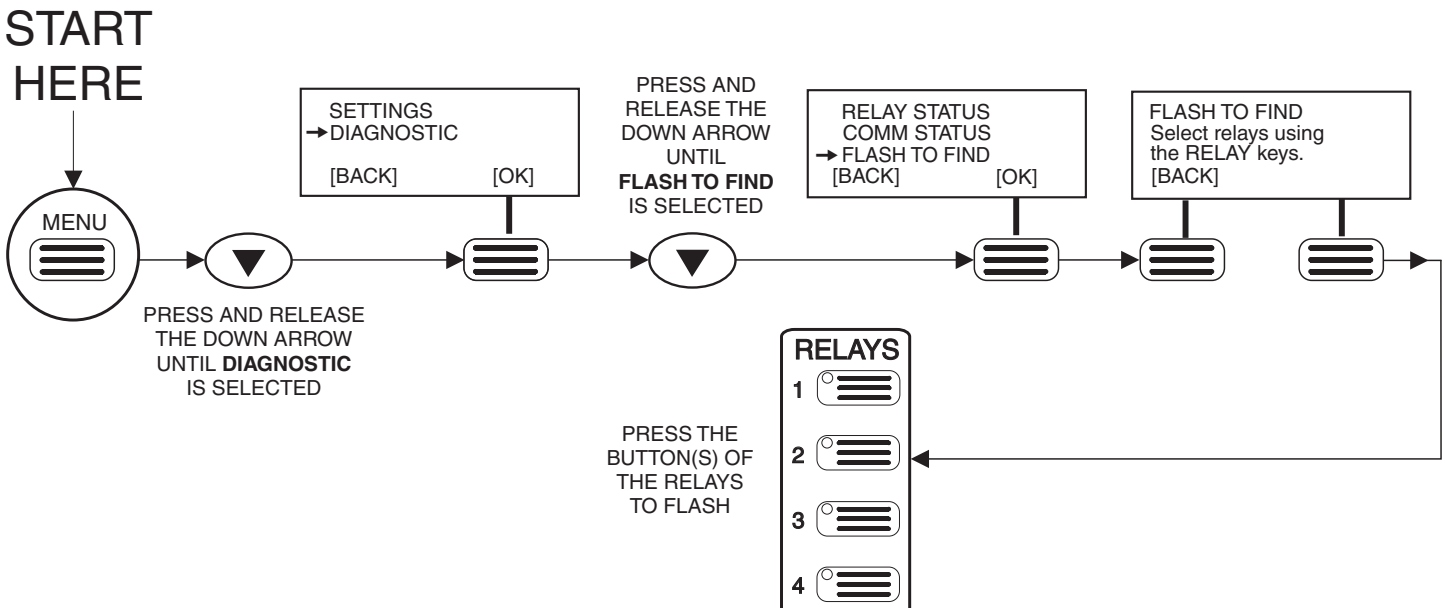
How Do I Check the Relay Status and Timeout Value?

SwitchPak can display each relay's status, ON or OFF, as well as the current timeout value (if there is one in effect) The flow diagram below shows the steps to check relay status.



How Do I Use Flash To Find To Locate the Circuit(s) Being Controlled?

Flash To Find turns the selected relay on and off repeatedly, once every 2 seconds (approx), allowing you to move about the areas being controlled and locate the fixtures (loads) controlled by that particular relay.



System Remote Operation

SwitchPak panels can be networked together to provide master schedules and inputs from one master panel to a maximum of 31 secondary panels. This is accomplished through a simple, unidirectional two-wire network, and requires no device addressing. The Switchpak network is based on standard RS-485 architecture and requires network termination be applied to the panels at each end of the network.

Switchpak networking is accomplished by broadcasting master panel switch input messages across the network. Each switch input in the master panel (inputs 1 - 8) broadcasts it's status across the network when activated, either ON or OFF. Each relay in the secondary panel can be programmed to act on any of the 8 switch inputs in the master panel, in any desired combination.

For example, relays 1 - 8 in the secondary cabinet, or cabinets, are programmed to listen for master panel switch input 1. When master panel switch input 1 is turned on, a message is broadcast across the network stating it is ON. Relays 1-8 in the secondary cabinet(s) will switch ON. When master panel switch input 1 is turned OFF, a message is broadcast across the network stating it is OFF and relays 1 - 8 in the secondary cabinet(s) will switch OFF.

In the same example, relay 2 in the secondary cabinet(s) is programmed to listen for master panel switch input 2, relay 3 in the secondary cabinet(s) is programmed to listen for master panel switch input 3 and so on. There is no restriction as to which switch input can control which relay, or how many switch input groups each relay can be in.

All SwitchPak panels are network capable. Switchpak panels ship from the factory configured as secondary panels and have the TRANSMIT/RECEIVE switch in the RECEIVE position. To convert a panel to become the MASTER panel move the TRANSMIT/RECEIVE switch to the TRANSMIT position.

Note:
Only one master panel can be on a network.

Master Panel (Transmitter) — The operation of networked and non-networked master panels are identical. There are no programming differences between a networked or non-networked master panel.

Secondary Panel (Receiver) – Secondary panels have an additional programming menu called REMOTE INPUTS. The REMOTE INPUTS function allows you to map the 8 remote signals from the master panel (RELAYs 1-8) to any combination of RELAYs (output circuits) on each secondary panel. Secondary panels still have the full programming capability and functionality of scheduled events and inputs.

Master Panel Timeouts & Warn Times – Master inputs programmed with a timeout and/or warn time will have the warn/timeout transferred to the secondary panel outputs. Therefore, programming of timeout and warn times for master signals is not required on the secondary units.

Master Panel Priorities – Master panel signals have priority over all secondary scheduled events and inputs.

Clock Synchronization – Setting of date and time is only required on the Master panel. This information is then transferred to all secondary panels.

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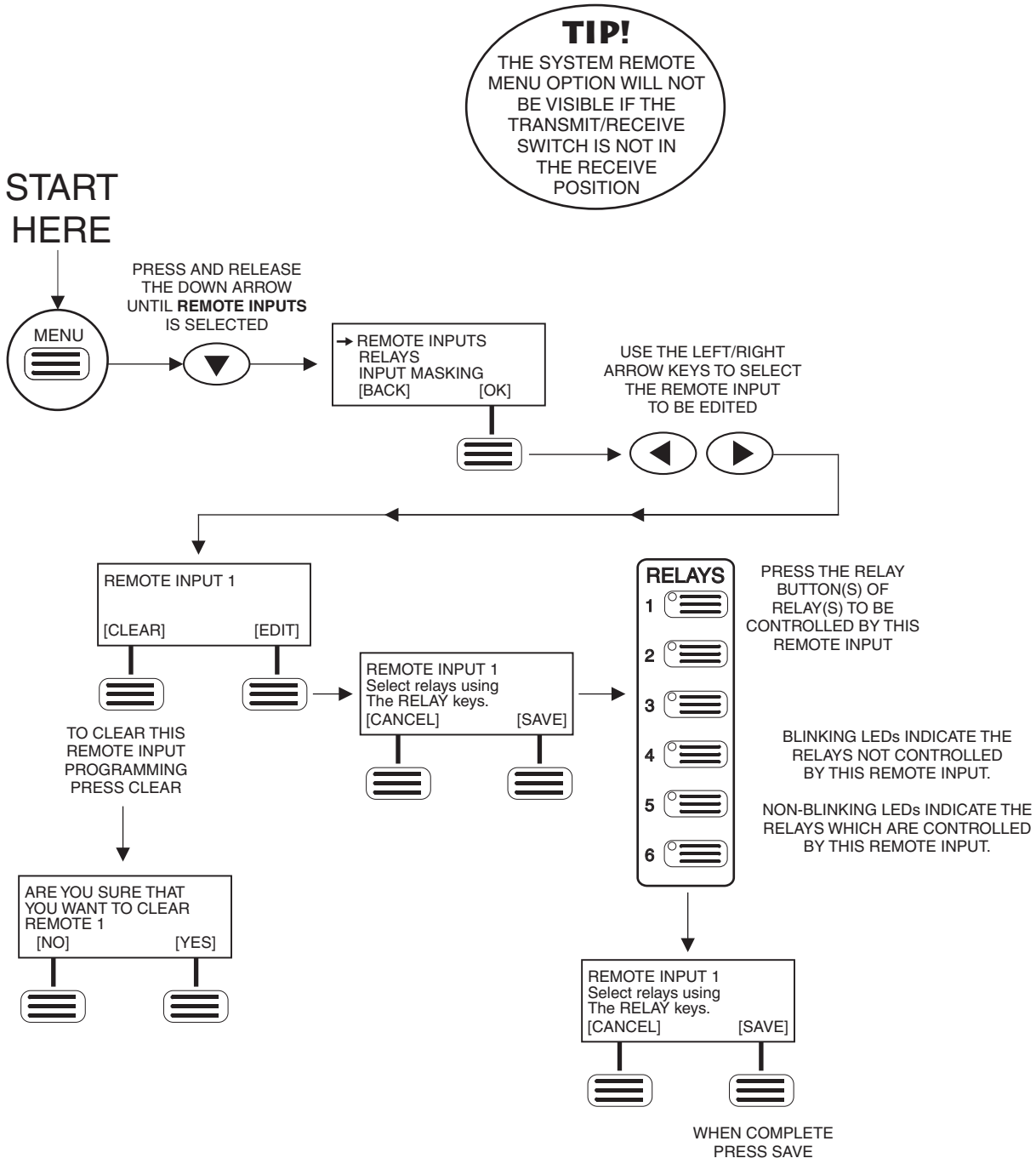
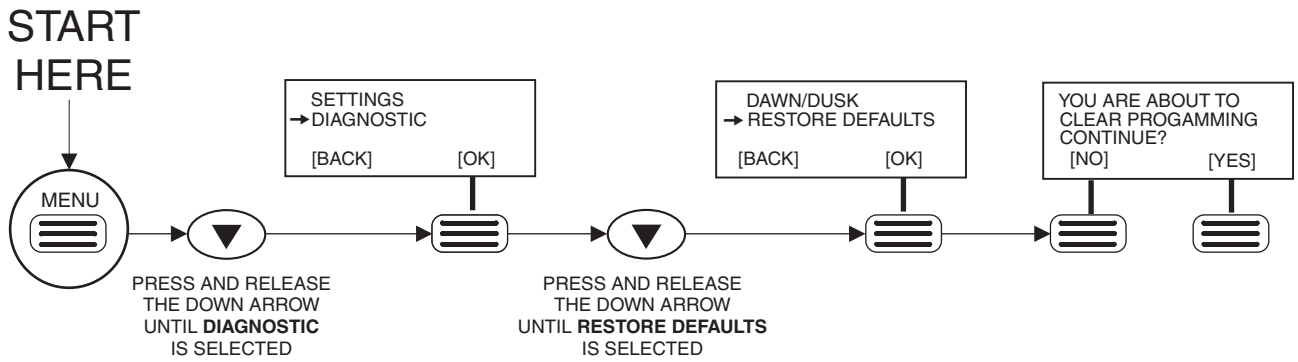
How Do I Set Up Remote Inputs?

See the previous page for a detailed explanation of system remote operation.



How Do I Restore the Factory Default Programming?

You can erase all the user programming and return to the factory defaults. SwitchPak will give you a warning prompt to ensure you want to proceed, if you answer the warning prompt by pressing the OK key, all user programming will be lost.



Contact Synergy Lighting Controls Technical Support at 800-533-2719. Synergy Lighting Controls Technical Support is available from 8:00 a.m. to 5:00 p.m. EST Monday through Friday for phone consultation.

Visit Synergy Lighting Controls on the internet at **http://www.synergylightingcontrols.com** for additional information on products, technical data and installation instructions.

Warranty

Synergy Lighting Controls warrants SPAK equipment to be free from defects in manufacturing under normal and proper storage, installation and operation for a period of one (3) years. Our guarantee liability extends only to the repair or replacement of the defective part and no labor charges for correction of the defect by repair or replacement will be honored by Synergy Lighting Controls unless prior written authorization has been granted by our Customer Service Department.

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