TRUTH HARDWARE

Sentry II WLS®

Window or Light Skylight Motorization System Installation Instructions

Danger: To help prevent severe personal injury or death:

- Read and understand instructions completely before beginning installation.
- When connecting the Sentry 2 system to accessories, read the installation instructions supplied with each accessory before beginning installation.
- Save ALL instructions.
- Installer – please be sure to give ALL instructions to the homeowner once installation is complete.
- Wiring must be installed by a qualified electrician according to local and National Electrical Codes (N.E.C.)
- Disconnect main power before beginning installation! Verify that power is OFF at the main breaker or fuse panel by testing with a voltage meter that you know is working correctly.
- Connect power only after motor connections and settings are verified.
- This equipment does not provide a method to shut off power, and should be connected to a dedicated breaker or fused power circuit capable of providing 50 watts of power per control.
- The Sentry 2 system must not be used on windows intended to meet egress codes.
- The Sentry 2 system is intended for indoor use only, with screens in place.
- The screen interlock MUST be correctly mounted and is a required part of the installation on windows/skylights less than 8 ft from the floor. It is intended to help prevent injury that could result from reaching into the window or skylight opening during operation.
- Do not allow children to operate the wall push buttons or remote control transmitter(s).

CE Made in USA c ETL LISTED US

Battery Backup

Battery backup should be used to supply emergency power for those areas subject to frequent power outages or when operation of the power window system must be maintained for a period of time should a power outage occur.

Truth recommends the use of a UPS (uninterruptable power supply) as a battery backup. They are widely available through a variety of retail and commercial outlets and are primarily used to supply emergency backup for computer equipment.

To determine the proper VA rating for a UPS, take 50 watts and multiply by the number of windows/skylights to be backed up by a given UPS. Below is a list of the manufacturers who produce uninterruptable power supplies which we have approved as compatible with our power window systems.

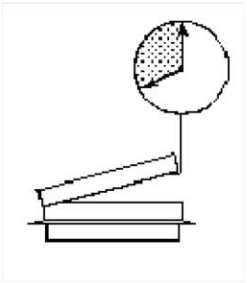
1a. Windows

The window must operate correctly and smoothly. Lubrication or cleaning of hardware may be required. This motor system will not operate correctly if the window/skylights manual hardware is not functioning properly.
Note the direction of rotation for crank to open the window as either Clockwise or Counter Clockwise (when facing the window operator)

Circle the direction to OPEN:

1b. Skylights

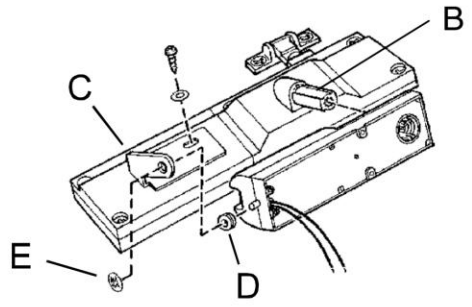
The skylight lid must weight less than 80 lbs. (40 lbs. at the chain).
A hand crank should be used to verify the skylight operates smoothly.
Lubrication, cleaning or re-alignment of hardware may be required.



Must weigh less
than 40lb (18 kg)

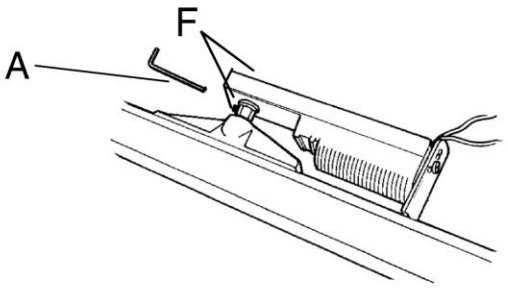
3b. Mount Motor to Skylight

Install motor by slipping it over the spline adapter (B) as shown. Secure motor with bracket (C) using the appropriate screw. Be sure to use both the isolation grommet (D) and the push-on fastener (E).



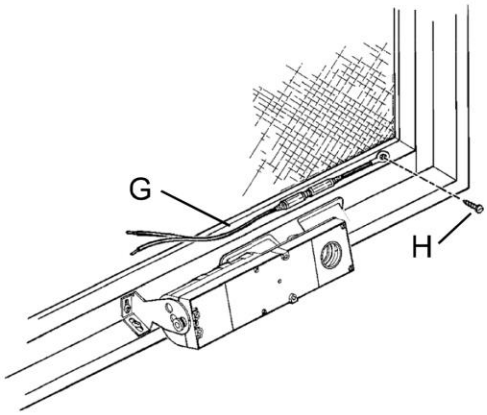
4. Align & Tighten Collar

Align motor to window or skylight and tighten set screw in black plastic alignment collar (F) with wench (A). Do Not Over Tighten



5. Install Screen Interlock!

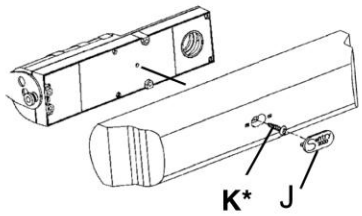
Install screen interlock (G) as shown using pan head screw (H) supplied.



WARNING: The screen interlock must be correctly installed on windows or skylights less than 8 ft from the floor. It is intended to prevent personal injury and/or window damage during operation. On vents above 8 ft a jumper wire (included) is installed into the Grey terminals of block 10.

6. Secure Wires & Install Cover

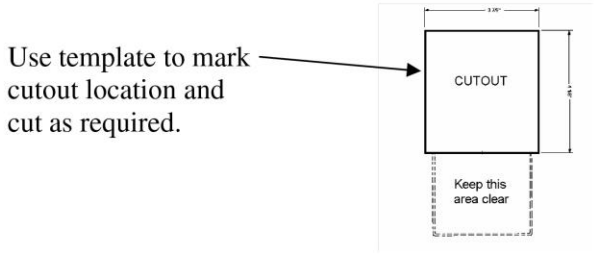
Connect motor wires per wire diagram and secure with tape. Install the motor cover using the 6X3/8 PH screw (K) found under cover button (J).



***WARNING: Use of a longer screw will damage motor.**

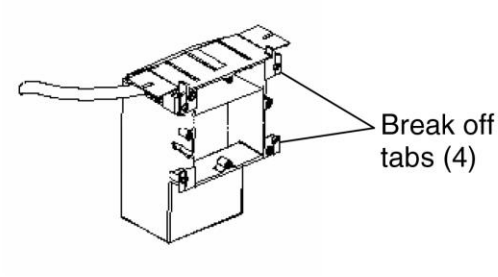
7a. Prepare Wall Opening (with finished wall)

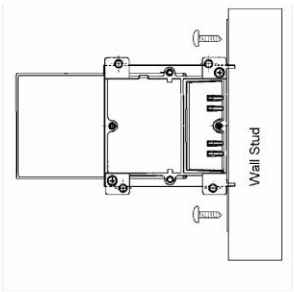
Locate the desired mounting location for the wall control unit. Verify the location of interior wall studs before selecting the mounting orientation of control box. Using the template provided, mark and cut the prescribed hole for the selected orientation.



7b. Prepare Wall Mount (with open wall)

Locate the desired mounting location for the wall control unit. Mount control box onto the selected wall stud with screws (not included) at the desired height. Using the template provided, mark and cut the prescribed hole in wall board for the intended application.

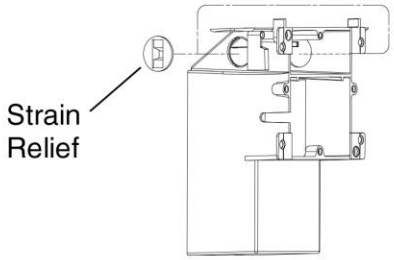




8. Route and Install wires

Route low voltage wires from motor location (including any accessory wires, such as rain sensor, power blind, etc..) into control switch opening. Route appropriate high voltage wire and select an inlet on control box which works with the selected orientation. Remove knock-out and install strain relief provided. Pull 110vac wiring into control box through strain relief.
WARNING: Power supplied to high voltage (110 vac) wiring should be disconnected at Main Breaker Panel or through other means. This motor control will need approx. 50 watts of power.
NOTE: Installation must meet local and national electrical codes.

Refer to Wire Diagram for wire size and type.

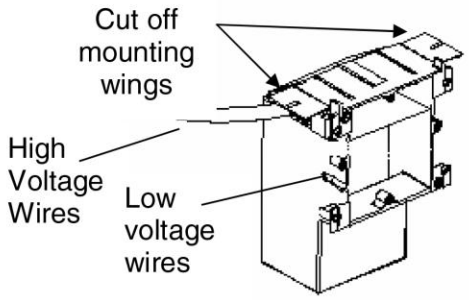


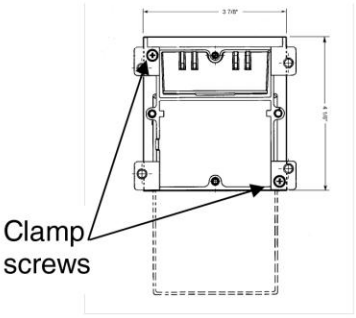
9. Install Control box (with finished wall)

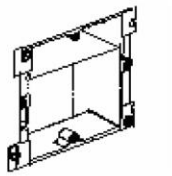
Using Template on back of this instruction booklet, mark and cut wall opening. (Cutout size is 3 7/8 inches Wide X 4 1/8 inches High) Note that a portion of the wall box is hidden inside the wall cavity, and that the box and wall plate can be mounted in any direction required.

When the box is installed <u>after</u> the wall is finished (enclosed) the mounting wings should be broken off and discarded. The wall clamps engage the wall automatically as the screws are tightened.

Insert control box into wall opening. Secure box to wall by tightening clamp screws. Route wire groups appropriately: Low voltage wires from window/skylight through the notch found on the control side of box.





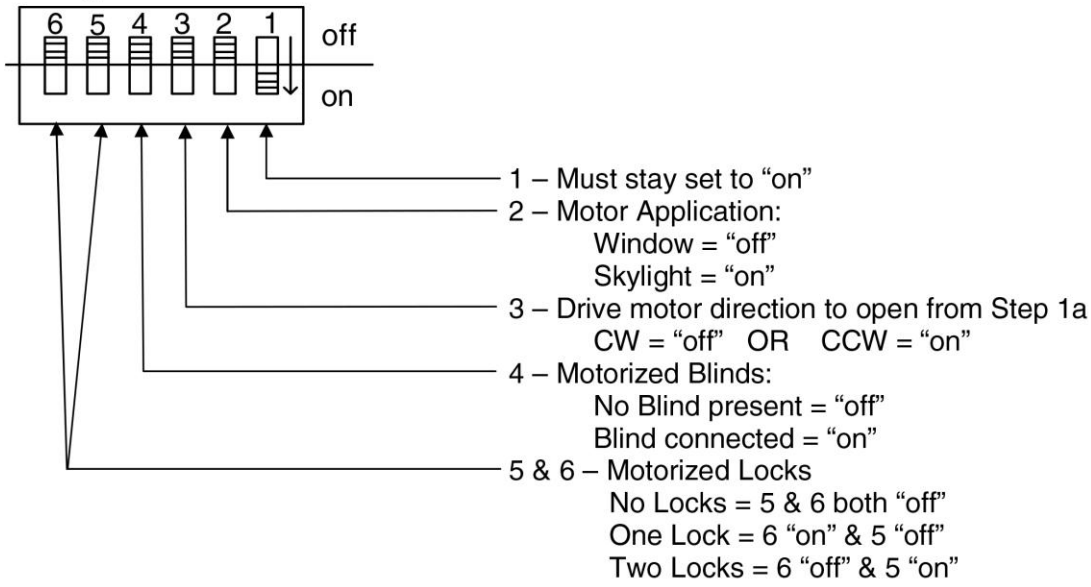


10. Connect Wires Per Wire Diagram

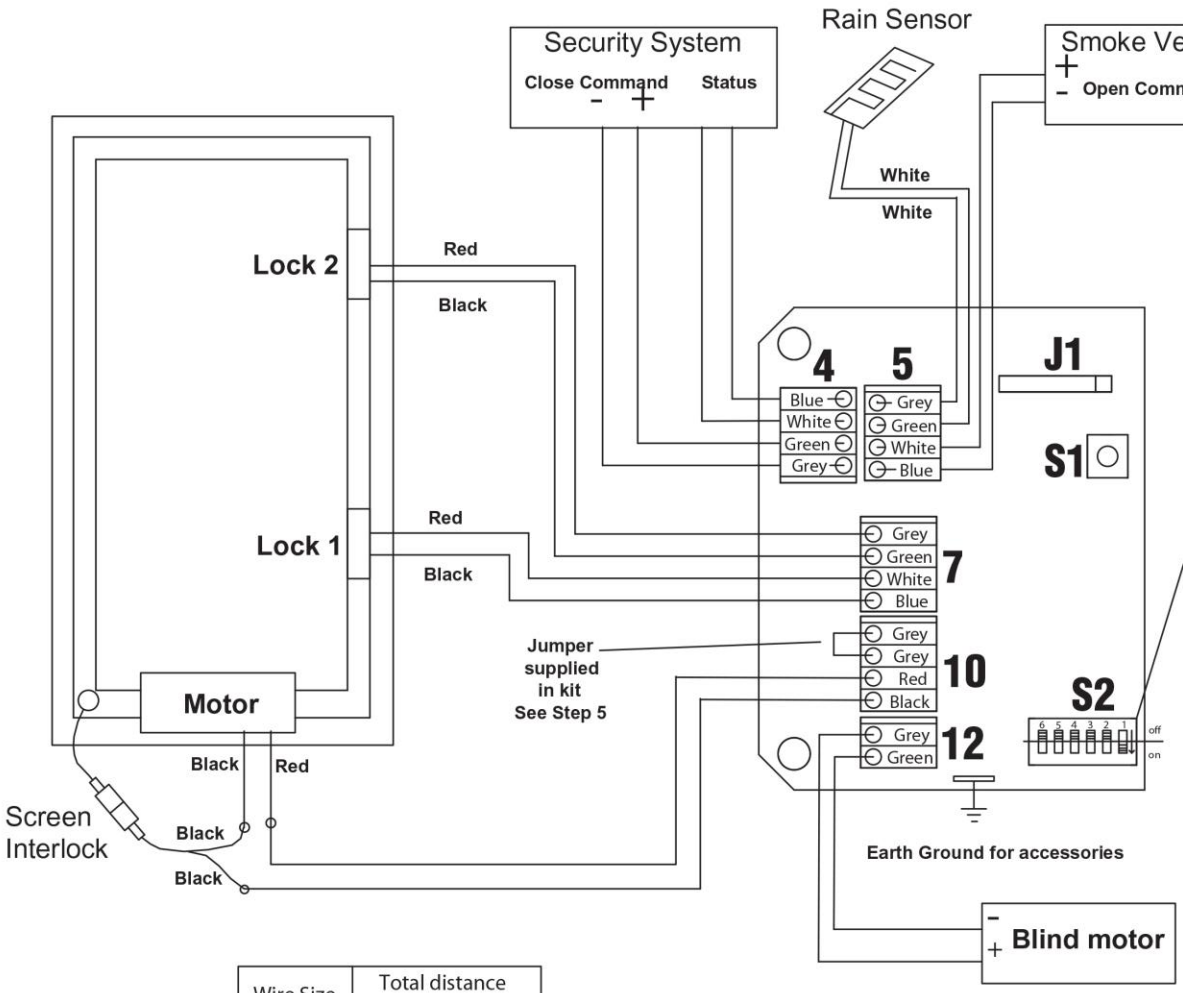
Connect low voltage wires to the control panel as outlined in wire diagram.
See Connection Blocks 1 thru 5.

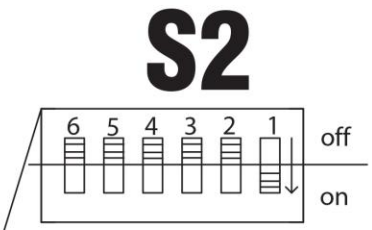
11. Set Function Dip Switches

The Function Settings on Dip Switch (See S2 on wire diagram) need to be configured for each motor application.



Note: Dip switch settings should be made with Power disconnected.





Function Settings for Dip Switches:

1 - Must stay set to "on"

2 - Motor Application:
Window application = "off"
Skylight application = "on"

3 - Drive motor direction to Open:
CW ="off" Or CCW = "on"

4 - Motorized Blind:
No Blind present = "off"
Blind connected = "on"

5&6 - Motorized lock s:
No locks = 5 & 6 both "off"
One lock = 6 "on" & 5 "off"
Two locks = 6 "off" & 5 "on"

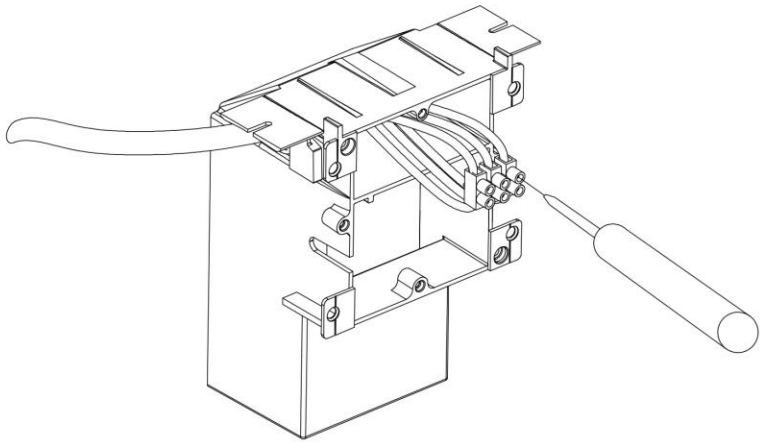
Wire Size (Class 2)	Total distance from Control to farthest motor
18 AWG	50 ft (15m) Max.
14 AWG	100 ft (30m) Max.
12 AWG	150 ft (60m) Max.

Solid Core Wire Recommended.
Refer to Class 2 codes

Main Wiring Diagram

12. Connect Power wires.

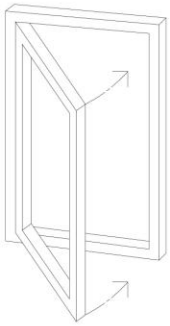
Connect high voltage wires (110vac) to the wire harness and connector as shown.
Please note that no power should be present. Power service to this equipment must be shut off at the main breaker or fuse panel until installation is complete.



13. Turn on Power.

Power to the control panel can now be restored.
Note: Upon power-up the unit should **Close** the window/skylight.

If the window/skylight Opens,
(Refer to the window crank direction in Step 1a and Dip Switch Settings Step 11)
Disconnect power, change dip switch 3 on S2, reapply power... The window/skylight should now close.

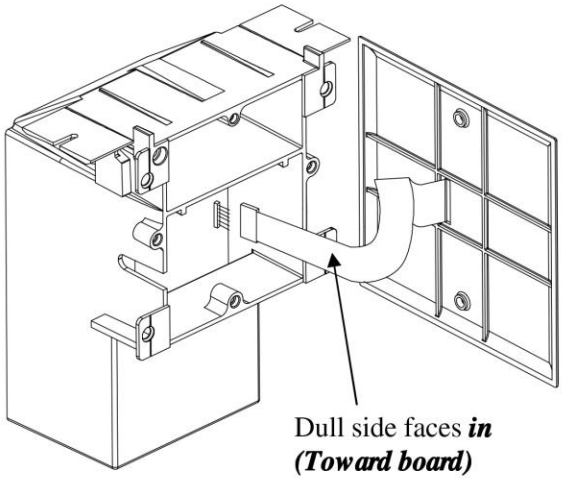


14. Program Remote Control*.

If optional Hand Held Remote was purchased, it can now be programmed using the “Learn” button (see No. 7 on wire diagram) Please see the instructions included with the remote.
*If no Hand Held Remote is present on site, skip to Step 15.

15. Plug in and install cover plate.

Plug in the ribbon cable from the wall plate onto control board (See No. J1 on wire diagram)
Note: orientation of plug is critical to correct wall switch and LED functions. The dull side of the ribbon cable faces toward the board (the shiny side with paper tag faces toward side of wall box), If functions are reversed (blind buttons controlling window etc..) the ribbon plug needs to be reversed.



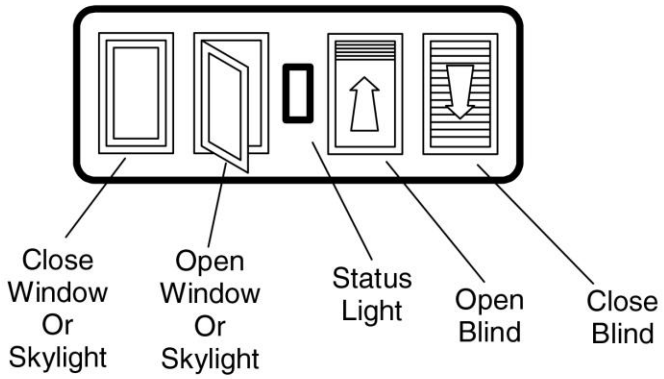
16. Establishing Operating Memory.

Upon pressing the open button the unit will cycle through a full “open and close” range (this may take up to 3 minutes depending on application), during this time the “Red” LED will be lit and the unit will establish the operating memory which is then stored and protected from loss.

17. Normal Operation

The normal operating functions are as follows:

- Pressing “Open” on either the wall switch or the remote will “Open” the window/skylight, If locks are present they will function as part of the window.
- Note that the full open position of a window varies with operating hardware and sash width. The typical stop position is approx. 75% of full opening range.
- Pressing “Close” on either the wall switch or the remote will “Close” the window/skylight
- Pressing the “opposite” function while the motor is running (such as pressing “Close” while the window/skylight is opening) will “Stop” the motor. The motor is restarted by pressing either “Open” or “Close” again.
- During motor operation the LED in the center of the wall plate should glow “Green”. This indicates normal operation.



Status Codes

During setup and operation the status light on the wall plate will provide information regarding system function. The following list will help to understand the different conditions indicated:

Flashing Red – This indicates the following:

1. Upon powerup - This indicates that the dip switches have not been set correctly. (See Step 11)
2. During motor operation – It indicates that the motor has run into an obstruction or that the window/skylight hardware requires service. The motor is seeing too high an operating load.
3. Upon pressing an “open” or “close” button on the remote – This indicates that the control did not receive a complete command. You may need to move closer with the remote and/or repeat the command. Check battery status on remote.

Solid Red – This indicates the following:

1. During Installation – This indicates that the dip switches are set correctly but the motor needs to be initialized by pressing the open button on the wall switch or remote.
2. During motor operation – The motor is running through initialization to learn the range of motion.

Solid Green – This indicates normal motor operation and should only be lit while motor is in operation.

Flashing Green – This indicates the Rain sensor has detected rain or moisture and is closing the window/skylight.

Optional Accessories

Rain Sensor (Included)

The sensor will close the window/skylight when “beading” moisture is present on the surface of the panel. It will also cause the “Green” LED on the wall plate to blink (indicating rain is present). Once the panel is dry, normal operation is regained.

Note:

1. Connect the supplied sensor panel to the Grey & Green terminals on Block 4 (See Wire Diagram)
2. The window/skylight can be forced to open even when the sensor is “wet” but the motor will immediately re-close the vent.

Rain Sensor Guidelines:

- Install the sensor with "grid" exposed.
- **Do Not** use rain sensor if the control is being used as a Smoke Vent (See HPI)
- Wire with 22 AWG - 2 conductor shielded, twisted pair 50 ft (15m) Max. Note: Connect shield to earth ground to reduce interference from lightning.
- Consider prevailing winds when locating the sensor. Keeping away from obstructions.
- The sensor can be mounted outside (maximum sensitivity) or inside vent edge (minimum maintenance)
- Maintenance; Regular cleaning of sensor panel with a mild cleaning agent. Dirt or debris can cause the vent to stay closed even when rain is not present.
- Do Not route sensor wire through the chain port, damage to wire will result in erratic operation of motor system.

High Priority Inputs (HPI)

The control panel also has inputs for various input devices such as home automation, security systems, smoke ventilator/detectors, etc. Note: The Wire Diagram shows which terminals on Blocks 4 & 5 to use for various control devices. The following list will describe how each input will function:

1. Close & Hold - Grey & Green terminals on Block 4
   (Intended for Security Systems)
   a. When connected by constantly "closed" dry contacts, the window/skylight will close and lock. All other input devices (except for Open & Hold) will be "locked-out" until the contacts "re-open".
   b. When connected by momentary "close" dry contacts, the window/skylight will close and lock. Once the window/skylight is closed all other input devices will function normally.
   c. If window/skylight is "opening" (in motion) when momentary "close" is given, the motor will stop. In this way a partial opening position is achieved.
2. System Status - Blue & White terminals on Block 4
   a. Functions as a set of normally open dry contacts, which close when the window/skylight has completed a "close" cycle.
   b. Intended as status indicator or "feedback" for security systems.

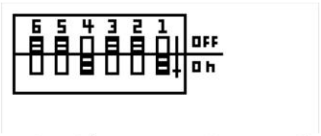
3. Open & Hold - Blue & White terminals on Block 5
   (Intended for Smoke Ventilation)
   a. When connected by constantly "closed" dry contacts, the window/skylight will open. All other input devices will be "locked-out" until the contacts "re-open".
   b. When connected by momentary "close" dry contacts, the window/skylight will open. Once the window/skylight is open all other input devices will function normally.
   c. If window/skylight is "closing" (in motion) when momentary "open" is given, the motor will stop. In this way a partial opening position is achieved.

Power Blinds

The control panel is capable of controlling 12 VDC operated mini-blinds or shades. The blind to be connected must operate with less than 1 amp Max. power draw and be range controlled (open & close) by internal limit switches.

Note:

1. The Wire Diagram shows the Grey & Green terminals on Block 12
2. Dip Switch #4 on “S2” is set to “on” position.



3. Polarity is important for correct operation. Verify connections with instructions provided with your power blind/shade.
4. When the blinds are used in combination with the smoke detection / ventilation function via the HPI, the blinds will open automatically before the skylight is opened.

Trouble Shooting

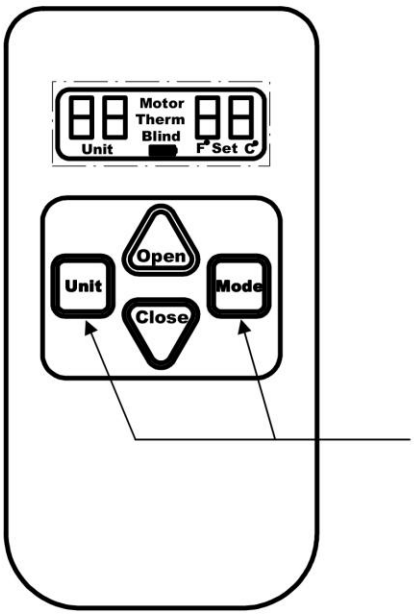
Disconnecting the power by shutting off the appropriate supply breaker will normally correct most operating anomalies. When the power is re-applied the unit/s will close automatically and normal function should be restored.

Note: During weather related power outages, unless the equipment is backed up by an UPS (see battery backup at the beginning of this manual) the motor will not be able to close the skylight. However, when the power is restored the unit will automatically close.

Once the motor is installed and initialized, the memory is protected from loss, even during extended power outages. However, when the motor has hit an obstruction or the manual hardware requires cleaning or service, an initialization can be performed to re-learn the skylights full range of motion. This is called a forced "Reset".

A forced "Reset" can be initiated by the following methods:

1) By changing any of the Dip Switches (See Step 9) and cycling the power "off" and back "on". The switches need to be set correctly once the power is reapplied.
2) With the window/skylight closed, While Holding the vent "close" button down, Press the blind "close" button (on the wall plate).
3) By initiating 3 cycles of Open then Close (within 3 seconds) via the HPI (See HPI information)
4) By setting the remote to the appropriate "Unit Code" on the remote and then pressing and holding both the "Unit" & "Mode" keys down for 10 seconds.
   This may need to be repeated up to three times depending on application.



To "Re-Initialize" the system:
Press and Hold these buttons until ***Motor*** icon flashes

Regulatory Compliance

United States of America

Federal Communications Commission (FCC)

Unintentional emitter per FCC Part 15

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Warning: Changes or modifications not expressly approved by Truth Hardware could void the FCC compliance and negate your authority to operate the product.

FCC Declaration of Conformity

According to 47 CFR, Parts 15.107 and 15.109 Class B

Responsible party: Truth Hardware, 700 West Bridge St., Owatonna, MN 55060
www.truth.com or 1-800-324-4487

Product: Sentry 2 Hand Held Remote (43.53)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received including interferences that may cause undesired operation.

Canada

Industry Canada (IC)

Unintentional emitter per ICES-003

This class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme á la norme NMB-003 du Canada.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Europe

European Community EMC Directive (CE)

Compliance with these directives implies conformity to the following European Norms or Regulations:

Emissions
ETSI EN 300-220-1 v1.3.1 (2000-09)
ETSI EN 300-220-3 v1.1.1 (2000-09)
ETSI EN 301 489-3 v1.2.1 (2000-08)
EN 55014-1: 1997

Immunity
ETSI EN 301 489-3 v1.2.1 (2000-08)
EN 55014-2: 1997