



**SENSORWORX®**

# WIRELESS WALL SWITCH & LOAD CONTROLLER

## INSTALLATION & OPERATION INSTRUCTIONS

MODEL NUMBERS	DESCRIPTIONS
SWX-851-xx	WIRELESS WALL SWITCH LOAD CONTROLLER, 120/277VAC, NO NEUTRAL REQUIRED

\* xx = color (WH, IV, AL, GY)

## OVERVIEW

The **SENSORWORX** wireless wall switch load controller links to remote occupancy sensors and switches without low voltage wiring in order to provide automatic lighting control. Designed with contractors in mind, the unit is significantly shallower than typical wall controllers, resulting in less crowded wall boxes. Additionally, versatile wiring enables usage with or without a neutral connection and never requires a minimum load. This switch also matches the **SENSORWORX** family of wall switch occupancy sensors and 0-10V dimming wall switch sensors. All **SENSORWORX** products are proudly made in the USA.

## BASIC OPERATION

A received wireless message indicating occupancy from one or more wirelessly linked sensors will trigger the unit's integrated relay to close. When configured for Vacancy operation, lights must be initially switched on by pressing the unit's button (or by pressing the ON button on a wirelessly linked wall station). Once closed, line voltage will flow through the relay and turn on the connected lighting load. This wall switch load controller maintains a master time delay that is reset every time a linked sensor reports occupancy. Lights will be switched off once there hasn't been an occupancy message reported for the duration of the time delay.

## FEATURES

### ELECTRICAL FEATURES

- Accommodates Neutral (3-Wire) and No-Neutral (2-Wire) Installations
- Electronically Timed Switching Ensures Long Relay Life
- No Minimum Load or External Load Capacitor (MLC) Requirements
- Meets Regulatory Guidelines for Current Leakage

### PHYSICAL FEATURES

- Enclosure is 25-40% Shallower than Other Wall Controllers (< 1" Depth into Wallbox)
- Self-Grounding Mounting Strap
- Modern Look and Intuitive Easy-Tap Button

### OPERATIONAL FEATURES

- Pairs in Seconds with Wireless Sensors & Remote Wall Stations
- Configurable Time Delays and Operational Modes (e.g. Occupancy, Vacancy, Switch Disable)
- Blue Locator LED when Lights are Off
- Settings are Adjustable Without Removing Cover Plate
- Links with up to 30 sensors and/or switches

## SPECIFICATIONS

### ELECTRICAL

#### OPERATING VOLTAGE

120-277 VAC, Single Phase, 50/60 Hz

#### LOAD RATINGS

MAX: 800W @ 120VAC

1200W @ 277VAC

MIN: None

#### LOAD TYPES

LED Driver/Lamps

CFL, Electronic/Magnetic Ballasts

(Fluorescent)

Tungsten (Incandescent)

#### ESD IMMUNITY

Tested to withstand electrostatic discharge without damage or memory loss.

#### SURGE IMMUNITY

Tested to withstand surge voltages without damage or loss of operation.

#### NON-VOLATILE MEMORY

Saves all settings even if power is disrupted.

### ENVIRONMENTAL

#### OPERATING TEMP

32°F to 122°F (0°C to 50°C)

#### RELATIVE HUMIDITY

0-95% Non-Condensing, Indoor Use Only

### OPERATION

#### OPERATING MODES

Occupancy, Vacancy, Switch Disable

#### TIME DELAY OPTIONS

1, 5, 10, 15, 20, 30 min.

### WIRELESS

#### RANGE

80' line of site w/o obstruction (walls)  
40' with obstruction (walls/floors)

#### FREQUENCY

915 MHz ISM Band

#### WIRELESS LINKING

Simple 3 sec. Push Button Process

#### SECURITY

All Wireless Data is Encrypted

### PHYSICAL

#### SIZE

2.74"H x 1.68"W x 1.39"D  
(6.96 x 4.27 x 3.53 cm)  
<1" Wallbox Mounting Depth

#### WEIGHT

4.5 oz

#### MOUNTING

Single Gang Switch Box

#### LED STATUS INDICATOR

Bi-color White & Blue

### CODE COMPLIANCE

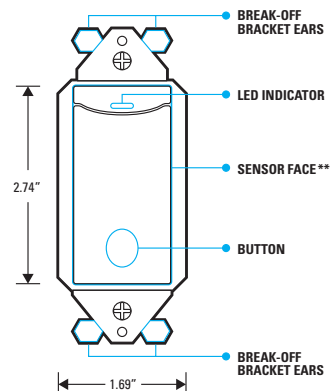
These load controllers can be used to meet ASHRAE 90.1, IECC, & Title 24 energy code requirements.



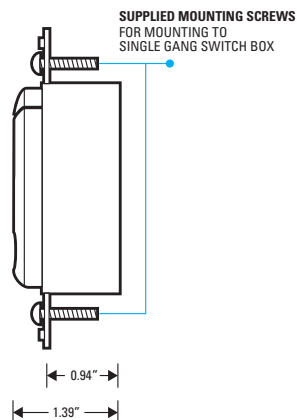
# INSTALLATION INSTRUCTIONS

- Designed to mount in 1-gang wall box with 3.28" hole spacing.
- Units can also share multiple gang wall boxes with other devices.
- Unit face is field removable in order to change colors. Contact factory for additional faces.

## FRONT



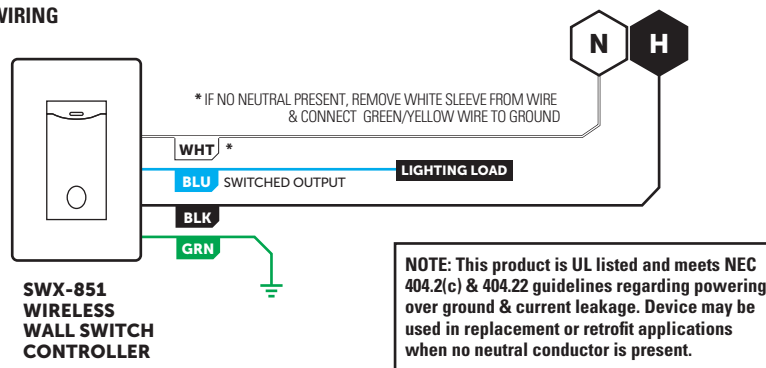
## SIDE



# WIRING

- Unit works both in installations where Neutral connection is available as well as installations where only Ground connection is present.
- If no neutral is present, remove the white sleeve from the wire & connect the now Green/Yellow wire to Ground.
- Note, either the white wire or green/yellow wire must be connected. The all green wire is just for safety.

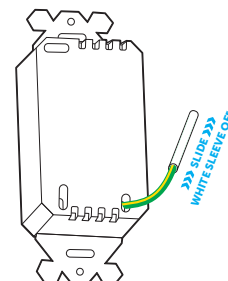
## BASIC WIRING



**WARNING: TURN POWER OFF AT THE CIRCUIT BREAKER BEFORE WIRING**

## NEUTRAL TO GROUND CONVERSION DETAIL

- The white wire has a removable sleeve which reveals a green/yellow wire



# APPLICATIONS

## SMALL SPACES

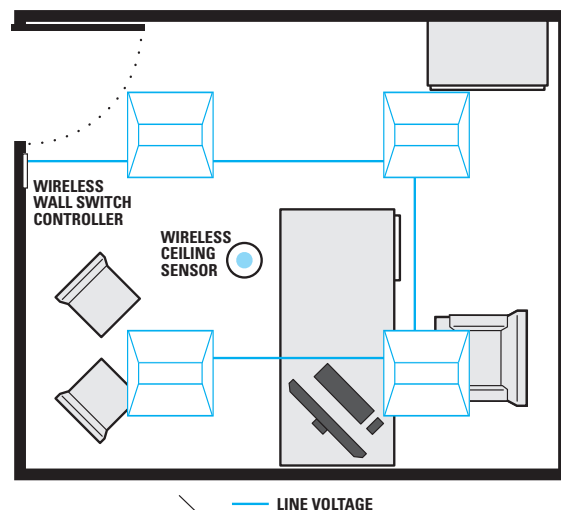
For control of small spaces like a private office, a wireless wall switch controller linked to a single wireless ceiling sensor (**SWX-201-B**) is recommended (see diagram on right). Both occupancy (auto-on) and vacancy (manual-on) operation are achievable in order to meet energy code requirements.

- Small Offices
- Copy Rooms
- Private Restrooms

## MEDIUM SIZE SPACES

For control of medium size spaces like a conference room or small classroom, a wireless wall switch controller linked to a single wireless wide view sensor (**SWX-401-B**) provides an excellent solution. Linking additional sensors is also an option if necessary. Switching from a second location (e.g. 3-way) is achieved by linking a remote wireless wall switch (**SWX-852**) to the wireless switch controller.

- Small Classrooms
- Conference Rooms
- Short Hallways
- Break Rooms



## APPLICATIONS (CONT.)

### COMPATIBLE WIRELESS DEVICES

The below chart lists the devices that can be used in a **SENSORWORX** wireless application. Note that sensors and remote switch & dimmer devices are transmit only devices and therefore must be linked to a load controller for switching or dimming of lighting.

MODEL #	DESCRIPTION	WIRELESS TYPE	POWER TYPE
SWX-201-B	Small Motion 360° Sensor, PIR	Transmit	Battery
SWX-401-B	Wide View Sensor, PIR	Transmit	Battery
SWX-402-B	Long Range Hallway Sensor, PIR	Transmit	Battery
SWX-851-xx	Wall Switch Load Controller, No Neutral Required, <xx = color>	Transmit & Receive	120-277 VAC
SWX-852-B-xx	Remote Switch (On/Off), <xx = color>	Transmit	Battery
SWX-854-B-xx	Remote Dimming Switch (On/Off, Raise/Lower), <xx = color>	Transmit	Battery
SWX-950	Power Pack Load Controller, 20A	Receive	120/277 VAC
SWX-950-D2	Power Pack Load Controller, 20A, 0-10V Dimming	Receive	120/277 VAC
SWX-950-AX	Hybrid Wireless/Wired Power Pack Load Controller, 20A	Transmit & Receive	120/277 VAC
SWX-950-AX-D2	Hybrid Wireless/Wired Power Pack Load Controller, 20A, 0-10V Dimming	Transmit & Receive	120/277 VAC

## WIRELESS LINKING (PAIRING)

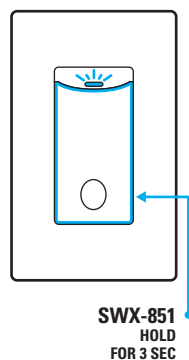
Linking a wall switch controller with a sensor, power pack, dimmer, or another wall switch controller is quickly done via the following procedure:

- Step 1.** Enter pairing mode by holding down the wall switch's button for 3 seconds until the LED starts alternating blue and white, then release.
- Step 2.** At the sensor (or other remote device), hold down the programming button for 3 seconds until the LED starts alternating blue and white. Releasing will link the sensor with the switch in pairing mode (see note 1 below).
- Step 3.** Repeat step 2 to link another sensor or device.
- Step 4.** When all devices have been linked, exit pairing mode on the wall switch controller by pressing the button 1 time. Pairing will also be automatically closed after 15 minutes of no new devices being linked.

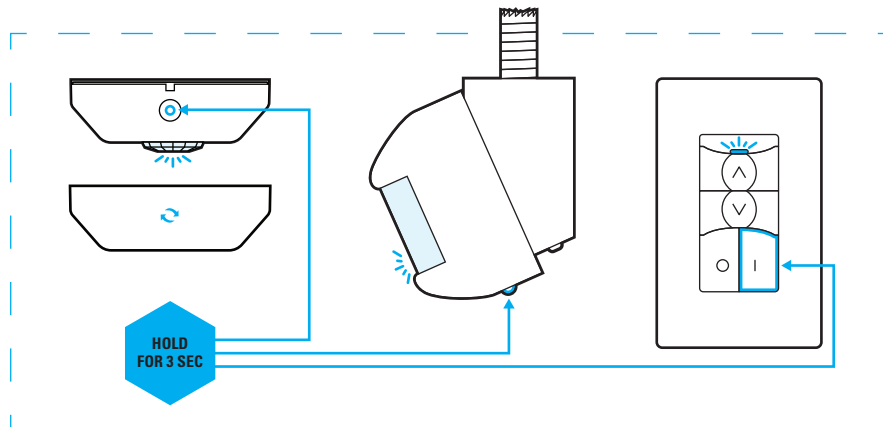
**Note 1:** Once a device(s) is linked, the alternating LED colors on the wall switch controller will periodically pause and blink out total number of linked devices. There will be no blinks during the pause until after the first device is linked.

**Note 2:** Pairing two wall switch controllers (or one wall switch controller and one wireless power pack) can be done by putting each device in pairing mode first (i.e. Step 1 above) before continuing to Step 2 for each device. After Step 2 has been completed for each device, continue to Step 3 for each device.

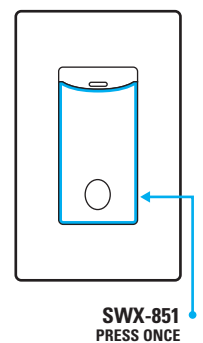
#### STEP 1 WALL SWITCH



#### STEP 2 & STEP 3 WIRELESS SENSORS & REMOTE SWITCHES



#### STEP 4 WALL SWITCH



# CONFIGURATION SETTINGS

All configuration settings for the wireless wall switch load controller are organized into several parameter functions with values that can be accessed and changed by pressing the unit's push-button and observing the LEDs feedback.

## FUNCTION #2 OCCUPANCY TIME DELAY

Unlike wired occupancy sensor systems, the time frame between when occupancy was detected last and connected lights turning off is a setting that is maintained in the load controller and not the sensor itself. This arrangement enables the sensors to conserve battery life. See additional notes below for more information on wireless sensor communications to a load controller.

SETTING #	DESCRIPTION	FUNCTION #
2	1 Min	
3	5 Min	
4	10 Min	Default for all models
5	15 Min	
6	20 Min	
7	30 Min	

**NOTE:** A 5-10 second time delay sensor test mode can be initiated from a sensor in order to test coverage. Test mode will expire after 10 minutes.

## CHANGING THE OCCUPANCY TIME DELAY

- 1 Read through the above list and note the number of the desired setting (e.g. 4 = 10 minutes).
  - 2 Enter programming mode by pressing and holding the button for **6 seconds** until the LED begins flashing **blue only**, then release.
  - 3 Enter **Function #2: Occupancy Time Delay** by tapping and releasing the unit's pushbutton **2 times**.
  - 4 The LED will blink back white the number of times equal to the current setting (e.g., 4 times for 10 minutes). Following a short pause, this blink back sequence will repeat (3x before exiting). Interrupt blink back by pressing the button the number of times equal to the new desired setting (e.g. 5 = 15 minutes). The LED will blink back white the new setting number as confirmation
  - 6 To **Save** and **Exit** programming mode, press and hold the button until blue LED changes to white, then release. The LED will then blink white twice as confirmation of success.
- Note:** To Exit without saving during any step, release button and wait until the unit double flashes blue.

## ADDITIONAL NOTES ON OCCUPANCY TIME DELAY

- By default, every ~60 seconds wireless sensors transmit a status message whether or not occupancy was detected during the previous period.
- Referred to as the sensor's "heartbeat", this period can be reduced to ~30 seconds although this will decrease expected battery life.
- If a sensor transmitted "unoccupied" at its last heartbeat, any new occupancy detection event will be transmitted immediately.
- If a sensor transmitted "occupied" at its last heartbeat, new occupancy events will only be transmitted at the heartbeat interval, thus conserving battery life.
- All wirelessly linked wall switch load controllers and/or power packs have a master time delay that is reset every time a linked sensor reports occupancy. Lights will be switched off once all linked sensors have continuously reported unoccupied for the duration of the time delay.
- If a wall switch load controller does not receive a heartbeat transmission from a linked sensor for 10 minutes it will blink out an error code (4 blue blinks, followed by a pause). If more than one sensor is linked, the sensor heartbeats from all sensors must have stopped for the error warning to begin blinking.

# CONFIGURATION SETTINGS (CONT.)

## FUNCTION #3: OPERATIONAL MODES

Wireless wall switch load controllers have several sequence of operation choices.

SETTING #	MODE	DESCRIPTION
2	Vacancy Mode	Pressing the unit's button (or an ON button push on a linked wireless switch) is required to initially turn lights on. Lights will turn off automatically if the <b>OCCUPANCY TIME DELAY</b> (Function #2) expires between received occupied messages from a sensor. Lights can also be switched off manually by pressing the unit's button (or if an OFF button push on a linked wireless switch is received).
3	Occupancy Mode (Override Off)	Lights come on automatically when an occupancy signal is received from a wirelessly linked sensor. Lights will turn off automatically if the <b>OCCUPANCY TIME DELAY</b> (Function #2) expires between received occupied messages from a sensor. Lights can also be switched off manually by pressing the unit's button (or an OFF button push on a linked wireless switch is received). After being switched off manually, lights will <b>not</b> revert to an Automatic On state (i.e. they must be manually switched back on).
4*	Occupancy Mode (Presentation) <b>DEFAULT SETTING</b>	Lights come on automatically when an occupancy signal is received from a wirelessly linked sensor. Lights will turn off automatically if the <b>OCCUPANCY TIME DELAY</b> (Function #2) expires between received occupied messages from a sensor. Lights can also be switched off manually by pressing the unit's button (or an OFF button push on a linked wireless switch is received). After being switched off manually, lights will revert back to the Automatic On state once the unit's time delay expires.
5	Automatic On (Disabled Off Switch)	Lights come on automatically when an occupancy signal is received from a wirelessly linked sensor. Lights will turn off automatically if the <b>OCCUPANCY TIME DELAY</b> (Function #2) expires between received occupied messages from a sensor. Lights <b>cannot</b> be switched off from its own button or any wirelessly linked switch.

### CHANGING THE OPERATIONAL MODE

- 1 Read through the above list and note the number of the desired setting (e.g. 2 = Vacancy Mode).
  - 2 Enter programming mode by pressing and holding the button for at least **6 seconds** until the LED begins flashing **blue only**, then release.
  - 3 Enter **Function #3: Operational Modes** by tapping and releasing the unit's pushbutton **3 times**.
  - 4 The LED will blink back white the number of times equal to the current setting (e.g., 3 times for Automatic On Occupancy Mode). Following a short pause, this blink back sequence will repeat (3x before exiting). Interrupt blink back by pressing the button the number of times equal to the new desired setting (e.g. 2 = Vacancy Mode). The LED will blink back white the new setting number as confirmation.
  - 6 To **Save** and **Exit** programming mode, press and hold the button until blue LED changes to white, then release. The LED will then blink white twice as confirmation of success.
- Note:** To Exit without saving during any step, release button and wait until the unit double flashes blue.

### ADDITIONAL NOTES ON OPERATIONAL MODES

- When running in the default operating mode (**Setting 3 - Occupancy Mode (Presentation)**), if the lights are manually switched off when there are still occupants in a space (to show a presentation for example), the Automatic On operation will be disabled until the sensor time delay expires.
- In applications with wirelessly linked sensors, if the switch is pressed but no occupancy signal is ever received, the lights will come on for 1 minute and then shut off.
- When in **Vacancy (Manual On) Mode** (Setting #2), there is a 15 second "grace" period after the sensor times out when the sensor will switch lights back on automatically if occupancy is detected. After 15 seconds the sensor will revert to vacancy (manual on) operation.

## FUNCTION #4: FORGET LINKED DEVICES

To clear the unit's list of linked wireless devices the following commands can be executed.

SETTING #	DESCRIPTION
3	Enter Forget Mode (opposite of Pairing/Linking Mode)
4	Forget All Linked Devices
5	Send a "Forget Me" Message

### FORGETTING LINKED DEVICES

- 1 Read through the above list and note the number of the desired command (e.g. 4 = Forget All Linked Devices).
  - 2 Enter programming mode by pressing and holding the button for at least **6 seconds** until the LED begins flashing **blue only**, then release.
  - 3 Enter **Function #4: Forget Linked Devices** by tapping and releasing the unit's pushbutton **4 times**.
  - 4 Interrupt blink back by pressing the button the number of times equal to the new desired setting (e.g. 4 = Forget All Linked Devices). The LED will blink back white the new setting number as confirmation.
  - 5 To **Execute** the command and **Exit** programming mode, press and hold the button until blue LED changes to white, then release. The LED will then blink white twice as confirmation of success.
- Note:** To Exit without saving during any step, release button and wait until the unit double flashes blue.

# CONFIGURATION SETTINGS (CONT.)

## FUNCTION #5: RELAY ENABLE/DISABLE

If the wall switch load controller is being used as a remote switch for another load controller and not controlling a lighting load of its own, the relay can be disabled. To disable, follow the below steps.

SETTING #	DESCRIPTION
2	Relay enabled ( <b>default</b> )
3	Relay disabled (i.e. always closed)

### DISABLING THE RELAY

- 1 Enter programming mode by pressing and holding the button for at least **6 seconds** until the LED begins flashing **blue only**, then release.
  - 2 Press and release the unit's pushbutton **5 times**, wait 2 seconds, then press the button **3 times** to disable the relay (or 2 times to enable).
  - 3 To **Save** the setting and **Exit** programming mode, press and holding the button until the LED changes to **blue**, then release. The LED will then blink white twice as confirmation of success.
- Note:** To Exit without saving during any step, release button and wait until the unit double flashes blue.

## FUNCTION #7: LED BEHAVIOUR

When the load controller has switched the lights off, the unit's LED will be solid blue as a locator. To disable this locator LED functionality, follow the below steps.

SETTING #	DESCRIPTION
2	Locator LED enabled ( <b>default</b> )
3	Locator LED disabled

### CHANGING THE LED BEHAVIOUR

- 1 Enter programming mode by pressing and holding the button for at least **6 seconds** until the LED begins flashing **blue only**, then release.
  - 2 Press and release the unit's pushbutton **7 times**, wait 2 seconds, then press the button **3 times** to disable location functionality (or 2 times to enable).
  - 3 To **Execute** the command and **Exit** programming mode, press and holding the button until the LED changes to **blue**, then release. The LED will then blink white twice as confirmation of success.
- Note:** To Exit without saving during any step, release button and wait until the unit double flashes blue.

## FUNCTION #8: RESTORE FACTORY DEFAULTS

To return a wall switch controller to its original factory default settings, follow the below steps:

- 1 Enter programming mode by pressing and holding the button for at least **6 seconds** until the LED begins flashing **blue only**, then release.
  - 2 Press and release the unit's pushbutton **8 times**, wait 2 seconds, then press the button **3 times**.
  - 3 To **Execute** the command and **Exit** programming mode, press and holding the button until the LED changes to **blue**, then release. The LED will then blink white twice as confirmation of success.
- Note:** To Exit without saving during any step, release button and wait until the unit double flashes blue.

## FCC INFORMATION (FCC ID: 2AVRY-SWX0001)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation

Changes and Modifications not expressly approved by BLP Technologies can void your authority to operate this equipment under Federal Communications Commission's rules.

In order to comply with FCC/ISED RF Exposure requirements, this device must be installed to provide at least 20 cm separation from the human body at all times.

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 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

## ISED CANADA INFORMATION (IC: 26012-SWX0001)

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

In order to comply with FCC/ISED RF Exposure requirements, this device must be installed to provide at least 20 cm separation from the human body at all times.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.
3. Afin de se conformer aux exigences d'exposition RF FCC / ISED, cet appareil doit être installé pour fournir au moins 20 cm de séparation du corps humain en tout temps

