ESI ™

RF Switch Interface

Installation Guide

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Introduction

The RF Switch Interface connects to any dry contact device and communicates with all ESI RF controllable devices. Dry contact devices — wall switch, timer, motion sensor, or other — allow local control of ESI RF devices such as a window shade motor network. Up to four dry contact devices can be connected to the RF Switch Interface.

Overview of Installation Steps

1. Set up and configure (limits and scenes) an ESI RF network of motor(s) and remote(s).
2. Install the dry contact device, such as a wall switch.
3. Connect dry contact wires from the wall switch to the RF Switch Interface. DO NOT connect the battery yet.
4. Change DIP Switch settings on the RF Switch Interface, if needed.
5. Install battery into the RF Switch Interface.
6. Join the RF Switch Interface to the ESI RF network.
7. Test shade movement using buttons on the wall switch.
8. Mount the RF Switch Interface inside the wall, preferably inside a plastic junction box.

WARNING:
Always use a plastic junction box. Metal junction boxes will greatly reduce the RF signal.

WARNING:
Drill a hole in the bottom of the junction box, to let the RF antenna hang free.
DO NOT roll up the RF antenna and place it inside the junction box. The RF signal will be reduced or lost.

Parts List

Included:
- RF Switch Interface.
- Battery holder with one CR123A lithium battery.
- ESI RF Antenna (2.4 GHz).

Not Included:
- **Wire.** Requires 20-26 AWG solid conductor wire for connection to dry contact device, such as a wall switch.
- **Screwdriver.** With 2mm flat blade to release wires from terminal block.

Usage:
- Interior use only.
- Fits into most standard junction boxes.
- Dry contact wires are attached mechanically from the RF Switch Interface to a dry contact device such as a wall switch.
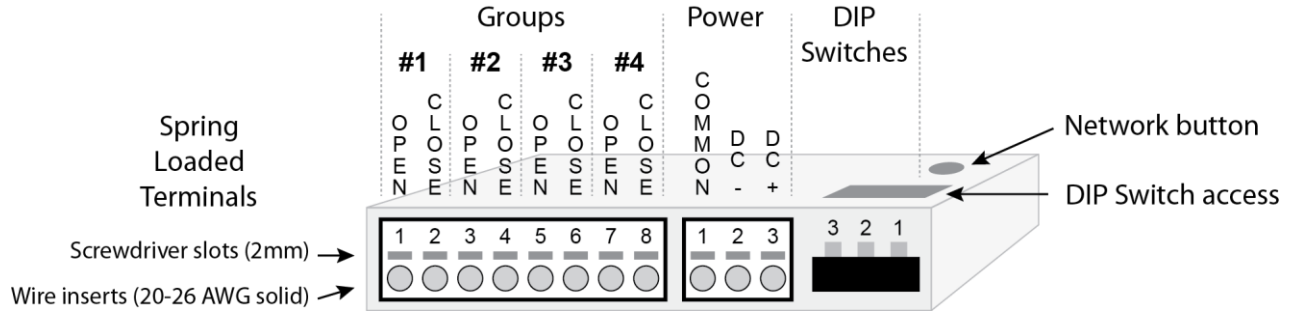
Top view (with RF antenna)
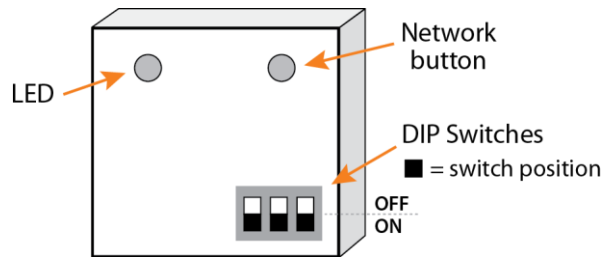

Back view (with battery; antenna not shown)

Description

Side View

LED (light emitting diode)	A single red/green LED provides visual feedback for startup blinks, network invite, and network reset actions.
Network button	Pushbutton switch used to join the RF Switch Interface to an existing ESI RF network, or used to reset network information on the RF Switch Interface.
Dry contact terminals - Groups	Open and Close contacts to control up to four groups of ESI RF devices.
Dry contact terminals - Power	DC - and DC + contacts connected to the battery.
DIP Switches	Used to configure different modes of operation.
Spring Loaded Terminals	**WIRE**: Use 20-26 AWG solid conductor wire. Insert wire: "Push-in" wire connection to the terminal for tool-free install. Release wire: Insert 2mm bladed screwdriver into slot (no levering).

Wall Switches

MOMENTARY SWITCHES	MAINTAINED SWITCHES
Use momentary switches ONLY. Must have a Center Off position.	*Not supported.* Do **not** use maintained switches.

Installation — Starting Conditions

1. All ESI RF devices must be installed, networked, and configured (limits, scenes, and so on) prior to adding the RF Switch Interface into the system. Examples of ESI RF devices commonly used would be a SUITE remote and M40RF or M50RF motors used for window shades.

   To set up an ESI RF network with remotes and motors, see the instructions on any one of the following product pages on the ESI website — SUITE Arc, SUITE Step, M40RF, or M50RF.

Instructions:	M40/50RF System Quick Setup Guide
Website:	http://elec-solutions.com/

2. RF Switch Interface — NOT powered up.

Step 1 — Verify ESI RF Network Exists

Verify that an ESI RF network of remotes(s) and motor(s) is already set up and configured with limits and scenes.
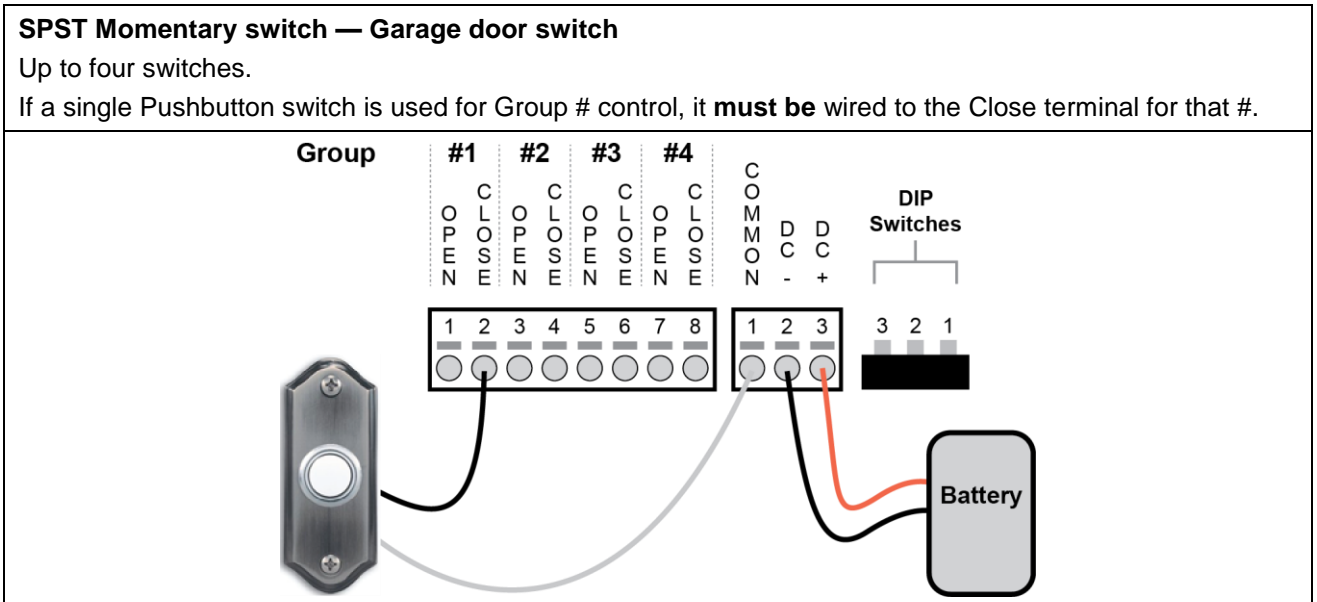
Step 2 — Install Wall Switch

Install the dry contact device, such as a wall switch.
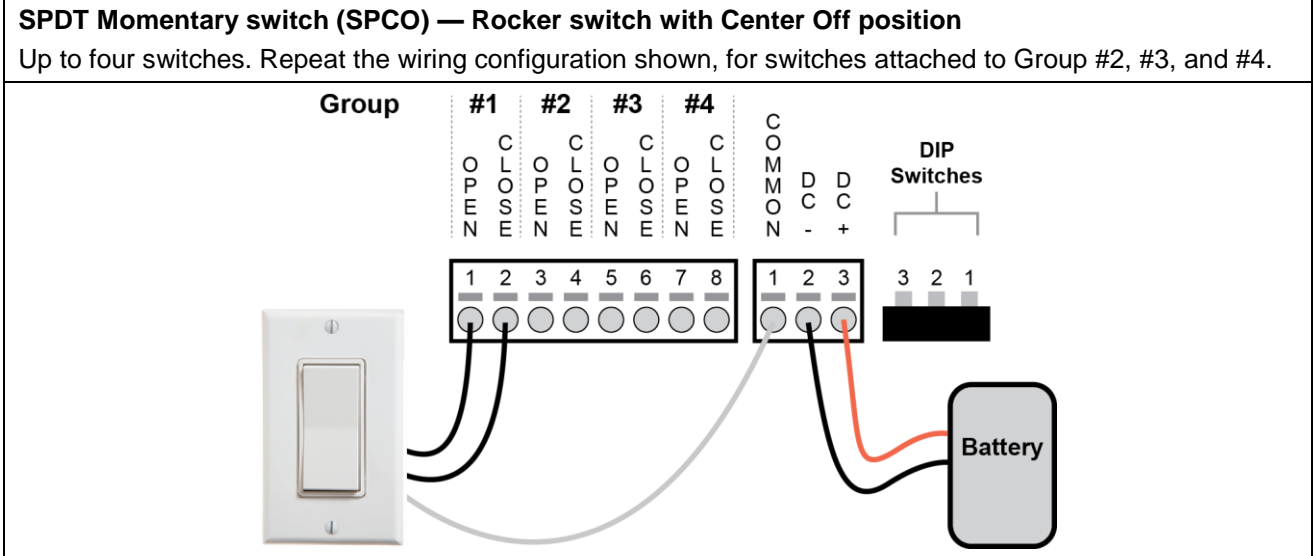
Step 3 — Connect Wires

Connect dry contact wires (20-26 AWG solid conductor) from the wall switch to the RF Switch Interface.

- Insert wires. "Push-in" connection. Push the bare end of the wire into the terminal block.
- Release wires. Use a 2mm bladed screwdriver. Push screwdriver straight into slot, no levering.
- Hook up switches in Group # order. If you have one switch, you **must** hook it up to Group #1. If you have two switches, you **must** use Group #1 and #2, and so on.
- **DO NOT** connect the battery to the RF Switch Interface yet.

■ **Wiring Diagram — SPST Momentary switch**

SPST Momentary switch — Garage door switch

Up to four switches.

If a single Pushbutton switch is used for Group # control, it **must be** wired to the Close terminal for that #.

■ **Wiring Diagram — SPDT Momentary switch (SPCO)**

SPDT Momentary switch (SPCO) — Rocker switch with Center Off position

Up to four switches. Repeat the wiring configuration shown, for switches attached to Group #2, #3, and #4.
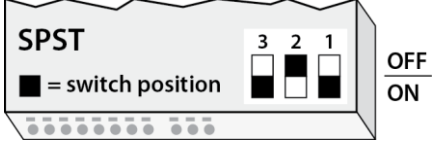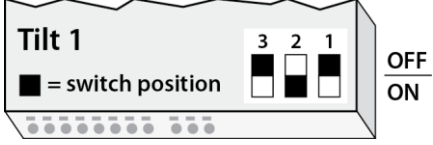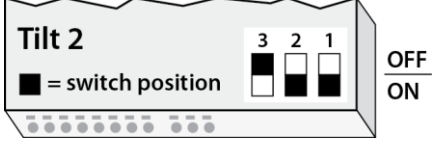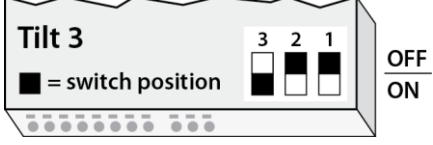

Step 4 — Set DIP Switches
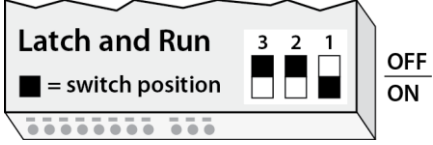
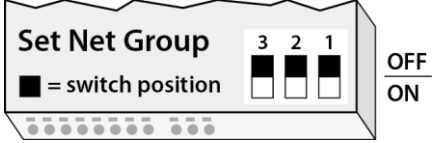Change the DIP Switch settings on the RF Switch Interface, if needed.

IMPORTANT: The RF Switch Interface reads the DIP Switch settings ONLY at power up — after you install the battery.
If you change DIP Switch settings after the RF Switch Interface is powered up, the change will not take place until the battery is removed, then re-installed.

Determine the operational mode needed for the RF Switch Interface, then adjust the DIP Switches accordingly.

Operational Modes

Mode	Description	DIP Switch setting
Default (as shipped)	*Required Switch Type* = **SPST Momentary** *(individual momentary buttons for Open and Close)* Motor moves to limit when an Open or Close button is pressed and released. Motor stops if both Open and Close buttons are pressed simultaneously and motor was not at a limit.	
SOBR (stop on button release)	*Required Switch Type* = **SPDT Momentary (SPCO)** Motor moves toward limit as long as an Open or Close button is pressed and held. Motor stops when button is released.	

Mode	Description	DIP Switch setting
Latch and Run	*Required Switch Type* = **SPDT Momentary (SPCO)** Motor moves toward limit as long as an Open or Close button is pressed and held. If the button is released within 1.5 seconds, then the motor stops. If the button is held for more than 1.5 seconds, then released, the motor will latch and run to limit.	Latch and Run
SPST (single pole single throw)	*Required Switch Type* = **SPST Momentary "Garage door"** **Single Press** Motor moves toward limit when button is pressed and released. If button is pressed and released again (before motor reaches a limit), then motor reverses direction and moves toward the other limit. The direction of travel toggles after each button press. **Double Press** If button is pressed and released two times within 0.5 second while the motor is moving, then the motor stops. NOTE: the next time the button is pressed, the motor will move toward the other limit.	SPST
Tilt 1 Typically used for blinds with **small** vanes.	*Required Switch Type* = **SPDT Momentary (SPCO)** Pulse duration = 40 milliseconds. **Single Press** Motor pulses toward limit when Open or Close button is pressed and held. Motor stops pulsing when button is released or motor reaches a limit. **Double Press** If an Open or Close button is pressed and released two times within 0.5 second, the motor will run to limit.	Tilt 1
Tilt 2 Typically used for blinds with **medium** vanes.	*Required Switch Type* = **SPDT Momentary (SPCO)** Pulse duration = 60 milliseconds. **Single Press** Motor pulses toward limit when Open or Close button is pressed and held. Motor stops pulsing when button is released or motor reaches a limit. **Double Press** If an Open or Close button is pressed and released two times within 0.5 second, the motor will run to limit.	Tilt 2
Tilt 3 Typically used for blinds with **large** vanes.	*Required Switch Type* = **SPDT Momentary (SPCO)** Pulse duration = 100 milliseconds. **Single Press** Motor pulses toward limit when Open or Close button is pressed and held. Motor stops pulsing when button is released or motor reaches a limit. **Double Press** If an Open or Close button is pressed and released two times within 0.5 second, the motor will run to limit.	Tilt 3

Mode	Description	DIP Switch setting
Set Net Group	*Required Switch Type* = **n/a** Use the Set Net Group mode to send commands to a different set of ESI RF motors. The default set is Net Groups 1, 2, 3, and 4. If additional remotes and motors are joined into an ESI RF network, the motors can be assigned to Net Groups 5, 6, 7, 8 **or** Net Groups 9, 10, 11, 12 **or** Net Groups 13, 14, 15, 16. Use this operational mode to change to a different set of Net Groups. **IMPORTANT**: if at any point in the installation process, you need to "reset" the RF Switch Interface, for example, during the "Join the Network" step later on, you will need to Set the Net Group again, because a "reset" also defaults the Net Groups back to 1, 2, 3, and 4. **ASSUMPTION**: There is an active wire connection to the Group # Open or Close button that you need to use to set the correct Net Group. You may use a temporary jumper from the Common to the Group # (Open or Close). For example, if you intend to use only one wall switch, wired to Group #1, but you want Group #1 to control Net Group 5 (or 9, or 13 — see Steps below for explanation), then you need to run the jumper from Common to the Group #2 button (for Net Group 5), or to the Group #3 button (for Net Group 9), or to the Group #4 button (for Net Group 13). **Steps** NOTE: if you change Net Groups, you must still choose one of the previously listed Operational Mode DIP Switch settings before continuing with the Installation steps (see 8. below). 1. Remove battery (if not already removed). 2. Set DIP Switches to Set Net Group mode. 3. Install battery. 4. After the version blink, the LED goes out. 5. Press and release the Group # button (Open or Close) that is associated with one of the following sets of Net Groups: Group #1 button = Net Group 1, 2, 3, 4 Group #2 button = Net Group 5, 6, 7, 8 Group #3 button = Net Group 9, 10, 11, 12 Group #4 button = Net Group 13, 14, 15, 16 6. The green LED blinks once each time that you press a Group #1, #2, #3, or #4 button. NOTE: each time you press a Group # button, it overwrites the previous Net Group value. 7. Remove battery. 8. Set the DIP Switches to one of the other Operational Modes. 9. Install battery. After the green LED blinks for 60 seconds, the LED turns off. *[skip to Step 6 below "Join the Network"]* **Scenarios** ***Net Groups 1, 2, 3, and 4 (the Default).*** If you press a button (Open or Close) for Group #1 on the RF Switch Interface, commands are sent to all motors that were assigned to Net Group 1 during the ESI RF network setup. The Group #2 button will send commands to all motors assigned to Net Group 2. Group #3 sends commands to Net Group 3.	

Mode	Description	DIP Switch setting
	Group #4 sends commands to Net Group 4.	
	Net Groups 5, 6, 7, and 8	
	The Group #1 (Open or Close) button will send commands to all motors that were assigned to Net Group 5.	
	Group #2 sends commands to Net Group 6.	
	Group #3 sends commands to Net Group 7.	
	Group #4 sends commands to Net Group 8.	
	Net Groups 9, 10, 11, and 12	
	(follows the pattern described above).	
	Net Groups 13, 14, 15, and 16	
	(follows the pattern described above).	

Step 5 — Install Battery

Install battery into the RF Switch Interface.
- LED shows a startup blink sequence.
- The green LED blinks for 60 seconds during Network Search mode, then turns off.

Result: RF Switch Interface enters Network Search mode (for 60 seconds), and does not find a network.

Step 6 — Join the Network

NOTE: If the RF Switch Interface was previously joined to an ESI RF network, skip to **Step 7**.

ASSUMPTION: An ESI RF network already exists, with one or more motors, and one or more SUITE remotes. There is no active Network Invite on either the motors or SUITE remote (all LEDs are off).

Join the RF Switch Interface to the ESI RF network.
1. Wake up the remote (press and release the UP or DOWN button).
2. Put the remote into Setup Mode.
3. Put the remote into Network Invite mode (press and release the STOP button).
4. Single press the Network button on the RF Switch Interface (starts Network Search).
   - Green LED starts blinking (RF Switch Interface).
   - Hub motor jogs once when RF Switch Interface joins the network (within a few seconds).
   - Green LED turns off (RF Switch Interface).
5. The RF Switch Interface has now joined the network.

Step 7 — Test Wall Switch

Test shade movement using the wall switch button(s).

Test the functionality based on the Operational Mode chosen.

Step 8 — Install the RF Switch Interface

Mount the RF Switch Interface inside the wall, preferably inside a plastic junction box.

Place the RF Switch Interface behind the wall switch, and as close to the wall switch as possible.

WARNING:
Always use a plastic junction box. Metal junction boxes will greatly reduce the RF signal.

WARNING:
Drill a hole in the bottom of the junction box, to let the RF antenna hang free.
DO NOT roll up the RF antenna and place it inside the junction box. The RF signal will be reduced or lost.

Step 9 — Finish the Installation

Put the remote into User Mode.
Make sure that motors can be controlled by the SUITE remote(s).
Make sure that motors can be controlled by the wall switch(es).

NETWORK BUTTON — FUNCTION

Single-press
Wakes up the RF Switch Interface if asleep (LED is off), and goes into Network Search mode for 60 seconds.

Triple-press (within 0.5 second)
Clears network information, resets the Net Groups, and goes into Network Search mode for 60 seconds (see "RESET").

RESET to FACTORY DEFAULT

A reset clears network information and resets the Net Groups back to the default of 1, 2, 3, and 4.

A reset is typically performed:
- if there is a communication error with the ESI RF network, or
- if the RF Switch Interface needs to be disassociated from one network and joined to a different network.

Important:
The SUITE remote must be awake for any Network joins, or any Network disassociates, to update the remote's network table.

Important:
If the Net Groups were changed previously, you will need to "Set Net Group" again, because a "reset" defaults the Net Groups back to 1, 2, 3, and 4.

RESET — Re-establish communication with an existing ESI RF network.
1. SUITE remote: Wake up — *press and release the UP or DOWN button*.
2. SUITE remote: Start Network Invite — *press and release the STOP button*.
3. RF Switch Interface: Reset — *triple-press the Network button within 0.5 second*.
4. The RF Switch Interface enters Network Search mode (green LED blinking) and joins to the ESI RF network:
   a. Hub motor jogs once.
   b. Green LED on RF Switch Interface turns OFF.

RESET — Disassociate from an existing ESI RF network.
1. SUITE remote: Wake up — *press and release the UP or DOWN button*.
2. RF Switch Interface: Reset — *triple-press the Network button within 0.5 second*.
3. The RF Switch Interface enters Network Search mode (green LED blinking) for 60 seconds.
4. Wait until the RF Switch Interface goes to sleep (green LED is OFF).

Troubleshooting

Problem	Solution
Can't set limits or toggle motor direction using the RF Switch Interface.	The RF Switch Interface only provides RF communication from a dry contact device to an ESI RF network and cannot be used to administer an ESI RF network. Use a SUITE remote to administer (set up and configure) an ESI RF network.
The battery life lasts only a few hours.	Maintained Switches -- do not use. The battery will run down quickly. The RF Switch Interface does not support any type of maintained switch.
Motor doesn't move when button is pressed on RF Switch Interface.	Check all wiring and connections. Solid conductor wire must be used. Stranded wire with stray strands touching other contacts can disable the circuit. Stranded wire is not recommended. Ensure that the RF Switch Interface is properly joined to a working ESI RF network. Upper and Lower limits MUST be set on a motor in order for the Puck to control that motor.

Net Group control is lost.	If the Set Net Group operational mode was used to change the Net Groups, and a Reset was performed on the RF Switch Interface, the Net Groups will be reset back to default.
	
	 Use "Set Net Group" to change to the correct Net Group.
	
	 Net Groups
	
	     1, 2, 3, 4 (the Default)
	     5, 6, 7, 8
	     9, 10, 11, 12
	     13, 14, 15, 16

Change DIP Switch settings after the RF Switch Interface is powered up.	• Remove the battery. • Change the DIP Switch settings. • Install the battery.
For questions, please contact your ESI distributor.	

OPERATION

A single RF Switch Interface communicates to a single ESI RF network, which is controlled by a wall switch.

The RF Switch Interface is typically attached to a wall switch that has a Center Off position.

Rocker Switch

Up – shade moves toward open position

Center – off

Down – shade moves toward close position

REPLACE THE BATTERY

Remove the battery from the holder and replace with a fresh, CR123A lithium battery.

Lithium batteries contain lithium metal compounds and should be recycled. Exchange lithium batteries at the time of purchase or deliver an HHW collection site.

SPECIFICATIONS

Overall Dimensions: L: 1.82 in.   W: 1.76 in.   H: 1.13 in.

Electrical
Communicates with ESI RF devices, version 1, and later.
DC current, dry contacts.
Power: 3V Lithium battery, CR123A
Frequency: 2.4 GHz

Regulatory Compliance

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 interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie 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, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This Class B digital apparatus complies with Canadian ICES-003.

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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC ID: P7RRFSWTINTRFC

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