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FCC Part 15.249 Certification Test Report

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Manufacturer: Convia – A Herman Miller Company
Model: Wireless Switch Coordinator

Manual

ConviaRF Wireless Switch System User Guide

March 2007

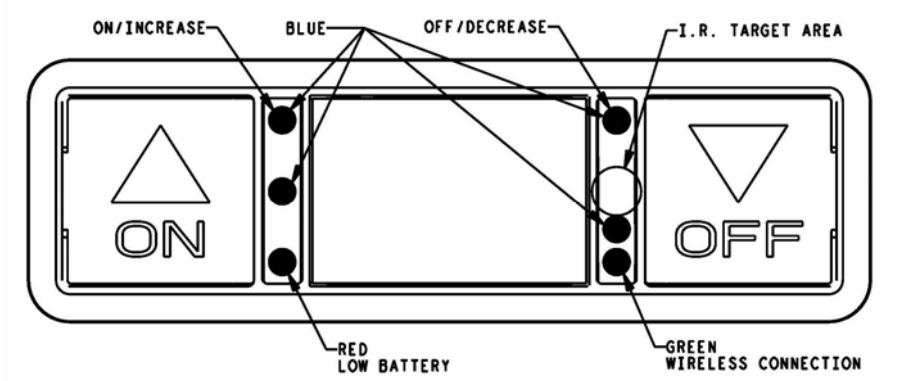
Draft

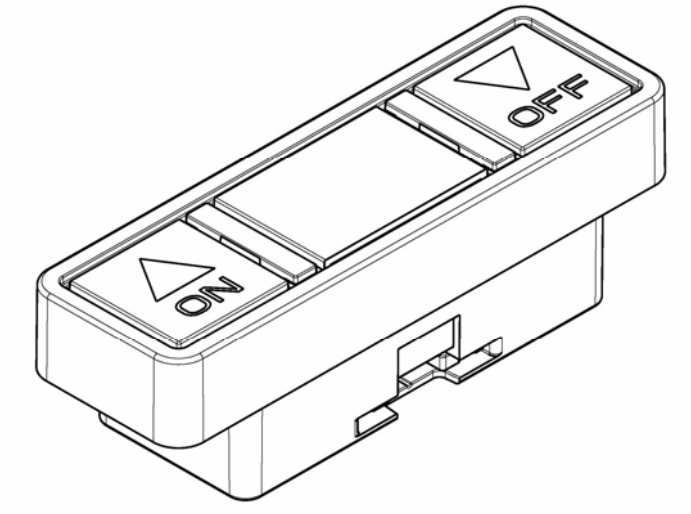
Components

There are two types of components involved in implementing a ConviaRF Wireless Switch System. They are the ConviaRF Wireless Switch and Wireless Switch Coordinator.

ConviaRF Wireless Switch (SWW)

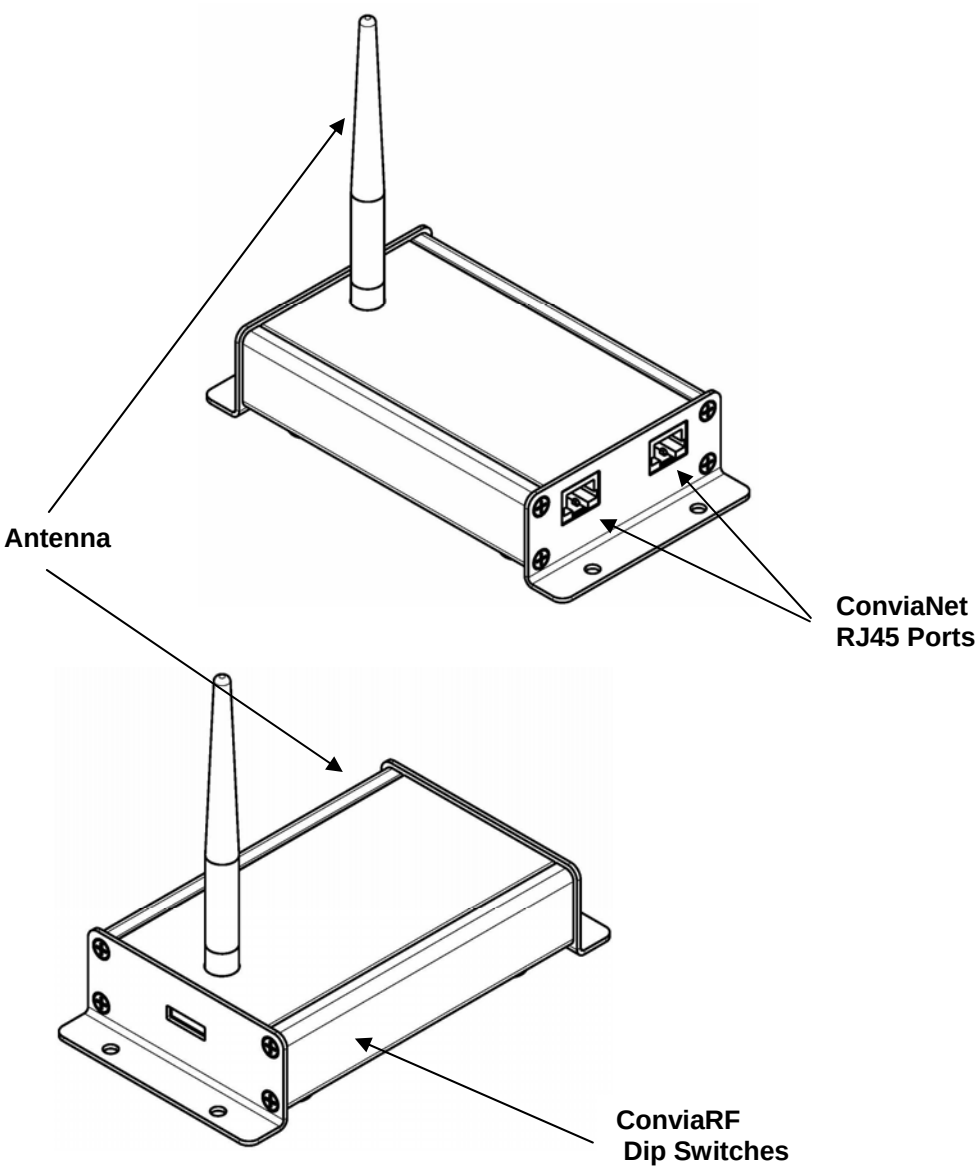
The Wireless Switch (SWW) can be used in the same way as the wired Convia switch (###). Like the wired switch, the wireless switch can be used to control lights and other devices that are connected to Convia Smart Connectors. Just like the wired switch the user manually presses the up or down switch to turn selected light fixtures on and off. The Wireless Switch It can be programmed to operate a wide configuration of light fixtures and also used to control dimming levels. The Wireless Switch will operate at a minimum of 75 feet from a ConviaRF Wireless Coordinator.





ConviaRF Wireless Coordinator (WSC)

The Wireless Switch Coordinator (Coordinator) acts as the network interface for the ConviaRF Wireless Switch. It provides a gateway to the ConviaNET communications network and allows ConviaRF Wireless Switch to be an active participant on the network. A key function of the Wireless Switch the Coordinator is that it monitors the ConviaNet communications network for relevant message commands that apply to the Wireless Switch. This allows the Wireless Switch to connect to the network less frequently and increases battery life.



How to setup your ConviaRF Wireless Switch System

Installation/Setup

a. A maximum of 10 ConviaRF Switches can be used with a single Wireless Coordinator.
b. Up to 16 ConviaRF Coordinators can be used in one space by setting each to a different dip switch setting.
c. The minimum range for a ConviaRF Wireless Coordinator is 75 feet. Multiple Coordinators can be used to cover an extended space.
d. The Coordinator can be mounted to the Open Grid or any other wall or ceiling location as long as the antenna is five feet away from any potential metal obstructions.
e. The ConviaRF Channel must be selected via dip switches on both the ConviaRF Switch(s) and the Wireless Coordinator. The dip switches must match before communications can be established between them.
f. To connect the Wireless Coordinator to the Convia network - plug one end of an approved ConviaNet RJ45 cable into a port on the Coordinator and the other into an RJ45 port of a Smart Connector or other ConviaNet device with an available port. The second RJ45 port may be used to connect other specified devices to the Convia network using the approved ConviaNet Rj45 cables.
g. Establishing the wireless connection between the wireless switch and the coordinator is achieved by holding the up and down buttons on the wireless switch until the ConviaIR Wireless Connection indicator light turns solid green. A blinking green light means the wireless switch is attempting to Connect to a ConviaRF Wireless Coordinator. If the light blink rate increases, and then the light goes out this indicates that the wireless connection failed. This means either the Coordinator has reached the maximum of 10 switches or the Wireless Switch is not in range of a Coordinator. Connection states communicated by the Wireless Connection Indicator LED are as follows:

    i. Connection in process – Green LED light is blinking
    ii. Connection process Fails – Green LED light blinks faster then goes off
    iii. Connection successful, Active State – Green LED light on solid
    iv. Connection successful, Idle State – Green LED off after being on solid for 5 minutes

Operation of ConviaRF Wireless Switch

Once linked, the ConviaRF Wireless Switch will respond and act similar to a wired Convia Switch as detailed in the “Convia Lighting User Guide”. With the following notable exception:

A previously Connected but idle wireless switch will not respond to wand commands directed at it but will respond (though in a slightly delayed fashion) to wand command directed to other non-wireless devices that had previously been Linked to it. An idle connected Wireless Switch will continue to send on/off and dimmer commands when its buttons are pressed. Once in the active state, A ConviaRF Wireless Switch will respond to wand commands similar to the wired Convia Switch.

The CoviaRF Wireless Switch, when in an energy saving idle state, will not be actively connected to the network until one of the following happens:

h. The connection is made active by holding the up and down buttons on the wireless switch until the ConviaIR Wireless Connection indicator light turns solid green.
i. A programming sequence occurs with a Convia Smart Connector device which the Wireless Switch has previously been Linked to. (There may be a slight delay to moving from idle to active state, up to 2 seconds)

How to use the ConviaRF Wireless Switch

Connect a ConviaRF Wireless Switch and Light

This procedure is the foundation for creating a lighting configuration.
It establishes a connection between a Convia switch and a light fixture.
1. To start the programming sequence, use the link button on the wand to select the switch. The Status Indicator Light turns on.
2. Use the link button to select the Smart Connector that controls the light. The Status Indicator Light turns on.
Both Status Indicator Light lights stay on until the programming is concluded, as follows:
3. Use the link button to select either the Smart Connector or the switch a second time. The Status Indicator Lights on both the switch and Smart Connector turn off. The system is in now in idle mode.
4. Result of programming: The switch and Smart Connector are now linked. When you manually press the switch, the light fixture turns on or off. The Status Indicator Light next to the button turns on when the button is depressed.

Connect a ConviaRF Wireless Switch to more than one light

A Convia switch can operate any number of light fixtures. For this example, we'll program a switch to operate three light fixtures.
1. To start programming, use the link button on the wand to select the switch. The Status Indicator Light turns on.
2. Use the link button to select the three Smart Connectors that control the light fixtures, one after the other. The Status Indicator Lights on the Smart Connectors turn on.
3. To complete programming, use the link button to select the switch or any of the Smart Connectors a second time. All the Status Indicator Lights turn off. The system is now in idle mode.
4. Result of programming: The switch and Smart Connectors are now linked. When you manually press the switch, the light fixtures turn on or off.

Disconnect a light from a ConviaRF Wireless Switch

Individual light fixtures can be deleted from an existing configuration by unlinking their Smart Connectors.
1. To start programming, use the link button on the wand to select the ConviaRF Wireless Switch. The Status Indicator Lights turn on for the switch and any Smart Connectors linked to the switch.
2. Use the unlink button to delete the Smart Connector that controls the light fixture to be unlinked. The Status Indicator Light turns off.
3. Repeat step 2 for any other light fixtures to be deleted. The Status Indicator Lights turn off.

4. To complete programming, use the link button to select any lit component a second time. All the Status Indicator Lights turn off. The system is now in idle mode.
5. Result of programming: The switch no longer operates the deleted light fixtures, but it still operates the light fixtures that were not deleted.

Warning: If you accidentally start at step 2 and delete a Smart Connector before you've selected the switch, you delete all connections to other components. Then you have to reprogram the Smart Connector to re-link it to other components.

Disconnect a ConviaRF WirelessSwitch from a lighting configuration

A ConviaRF Wireless Switch can be disconnected from an existing lighting configuration.
1. Both switches control all three lights, as shown.
2. To start programming, aim the wand at the Wireless switch you want to disconnect and press the unlink button on the wand; hold the unlink button down until the Status Indicator Light on the switch flashes; then release the unlink button.
3. While the Status Indicator Light on the switch is flashing, press the unlink button on the wand again. The Status Indicator Light turns off. The system is now in idle mode.
4. Result of programming: The switch no longer operates the lighting configuration. No light fixtures turn on when you press the switch.

Add lights to a ConviaRF Wireless Switch

You can add any number of light fixtures to an existing configuration.
1. To start programming, use the link button on the wand to select the ConviaRF Wireless Switch. The Status Indicator Lights turn on for the switch
and all Smart Connectors linked to the switch.
2. Use the link button to select the Smart Connector that controls the light fixture to be added to the switch. The Status Indicator Light turns on.
3. Repeat step 2 for any other light fixtures to be added. The Status Indicator Lights turn on.
4. To complete programming, use the link button to select any lit component a second time. All the Status Indicator Lights turn off. The system is now in idle mode.
5. Result of programming: The new light fixtures are now added to the configuration. When you manually press the switch, the added light fixtures turn on or off with the original light fixtures.

Set Dimmer Levels

All ConviaRF Wireless Switches have a dimmer function, operated by manually pressing up/on button to increase dimming, and the down/off arrow to decrease dimming. The Smart Connector that the light fixture is connected to must have dimming capability.

1. Manually press the up/on button and hold until the desired dimming level is set.
2. Manually press and release the down/off button to turn the switch off.
3. Result of programming: The switch now remembers the last dimming level set. When you manually press and release the up/on button on the switch, the linked dimmers brighten to their full on level. When you manually press and release the down/off button, the dimmers fade to off. To change the dimmer level, repeat the steps above.

View Linked ConviaRF Wireless Switches and Smart Connectors

The following procedures are critical first steps when reconfiguring an existing lighting configuration. By seeing which Convia switches and Smart Connectors are currently linked, it's easier to determine how to proceed.

To see which switches a Smart Connector is linked to:
A1. Use the link button on the wand to select a Smart Connector. The Status Indicator Lights turn on for the Smart Connector and all switches linked to the Smart Connector.
A2. Use the link button to select a lit component a second time. All the Status Indicator Lights turn off. The system is in idle mode.

To see which Smart Connectors are linked to a switch:
B1. Use the link button to select the switch. The Status Indicator Lights turn on for the switch and all Smart Connectors linked to the switch.
B2. Use the link button to select a lit component a second time. All Status Indicator Lights turn off. The system is now in idle mode.

Troubleshooting

- Switch not responding to button presses OR a red Low Battery LED blinking.
    - Check and replace AA batteries. AA batteries should last up to two years under normal operation.
- Switch Link LED flashing.
    - Switch has not successfully linked to a ConviaRF Wireless Coordinator. Move closer to coordinator and re-attempt to link to the coordinator.
    - Switch has been accidentally shielded from the ConviaRF connection for over 5 minutes and has been actively unlinked. Re-link to coordinator.
- When programming in a Convia space the wireless switches appear to be delayed at times.
    - This is normal operation and only occurs when the switch is moving from idle state to active operational states.

FCC Registration Information

General Statements

(Applies to both ConviaRF Wireless Switches and Wireless Switch Coordinators)

This device and it's antenna must not be co-located with or operated in conjunction with any other antenna or transmitter. To comply with FCC RF exposure requirements, only use Convia supplied antennas.

Warning: Changes or modifications to this device not expressly approved by Convia^{tm} – A Herman Miller Company could void the user's authority to operate the equipment.

FCC Requirements – Part 15

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.

Industry Canada Notice

The term "IC:" before the radio certification number only signifies that Industry Canada technical specifications were met.

This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. 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.

Cet appareillage numérique de la classe B répond à toutes les exigences de l'interférence canadienne causant des règlements d'équipement. L'opération est sujette aux deux conditions suivantes: (1) ce dispositif peut ne pas causer l'interférence nocive, et (2) ce dispositif doit accepter n'importe quelle interférence reçue, y compris l'interférence qui peut causer l'opération peu désirée.

ConviaRF Wireless Switch Coordinator

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

This device has been designed to operate with the antennas listed below, and having a maximum gain of 2.20 dB. Antennas not included in this list or having a gain greater than 2.20 dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

The following is a list of all antennas acceptable for use with the ConviaRF Wireless Switch Coordinator:

Linx Technologies ANT-2.4-CW-RCT-RP
Linx Technologies ANT-2.4-CW-RCTA-RP
Linx Technologies ANT-2.4-CW-RCTA-RP-FP