



E9X-D02FL



ILLUMRA Constant Voltage LED Dimmers are designed to control low voltage LED fixtures. The dimmer responds to self-powered wireless light switches and sensors. The ILLUMRA dimmer uses smooth, high-resolution PWM signals to dim the LED fixture.

Compatible Devices	EnOcean Equipment Profiles
Wireless Light Switch	EEPs: F6-02-01, F6-02-02, F6-03-01, F6-03-02
Key Card Switch	EEPs: F6-04-01, F6-02-01, F6-02-02
SLT Wireless Sensor	EEPs: F6-02-01, F6-02-02, Proprietary
Wireless Occupancy Sensor	EEPs: A5-07-01, A5-07-02, A5-07-03
Door/Window Sensor	EEPs: D5-00-01, A5-30-01
Central Commands	EEP: A5-38-08

- Included Components**
- (1) ILLUMRA Constant Voltage LED Dimmer
  - (1) Instruction Sheet
  - (1) Antenna Skin

- Tools Needed for Installation**
- Screws for mounting
  - Wire Nuts
  - Electrical Tape

## Installation

### Caution/Notes

- Depending on the circumstances it may be convenient to link the wireless controls to the Constant Voltage Dimmer prior to final installation.
- Always follow local electrical codes when installing this device. Only a qualified electrician should install this product.
- ILLUMRA Constant Voltage Dimmers are intended only for use in dry locations and with permanently installed fixtures.
- ILLUMRA Constant Voltage Dimmers should not be installed in close proximity to heat sources such as 75W+ ceiling fixtures. (see Operating Temperature)

### Choosing the Optimal Mounting Location

The long term reliability and performance of the dimmer is strongly influenced by the mounting location. Choose a mounting location carefully. For best radio performance:

- Straighten antenna out & away from metal. The included Antenna Skin is for this purpose (See Figure 1). To use the Antenna Skin:
  - \* Insert the antenna into the end of the Antenna Skin.
  - \* Insert the Antenna Skin into the enclosure.
- Create separation distance away from interfering electronics such as fluorescent tube ends, ballasts, electronic transformers, and motors.
- Avoid mounting inside metal enclosures.

- Obstructions of metal, concrete and dense building materials will reduce the range. Mount higher and away from obstructions to maximize the range.
- Site survey tools are available to help fine-tune wireless communications.

### Installation Overview:

- Identify best mounting locations for receiver and transmitter. Perform range test to confirm operation prior to installation.
- Link Transmitters and Receivers following Linking Instructions below.
- Connect Receiver to circuit following wiring diagram (See Figure 2) and local electrical codes.
- Mount transmitters and receivers in the final location and verify operation.

## Linking Instructions

**Note:** The Constant Voltage Dimmer must be powered on while linking. After linking, the Constant Voltage Dimmer retains the settings in the event of power loss. When in Link Mode, the Constant Voltage Dimmer's communication range is lowered to prevent accidental interference from other transmitters. For best results, transmitters should be within 15 ft. (5 m) of the Constant Voltage Dimmer when linking.

### Basic Linking

Use basic linking to connect the following devices to the receiver for common applications:

- Wireless Switch** – Press top to go to set level, press bottom for Off, press and hold to set level
- Occupancy Sensor** – Auto On/Off, Man. On/Auto off w/ switch linked
- Switch Leg Transmitter** – Circuit Interlock
- Door/Window Sensor** – Closed-ON, Open-OFF

- Press and hold the LRN button for 3 seconds then release. The LED on the dimmer will toggle a steady pattern indicating Basic Link Mode is active:
- Press wireless switch button or TCH button on transmitter, then release. Toggling will pause for 3 seconds, then resume when link is created.
- Link additional transmitters (up to 30) as needed, wait 30 seconds to exit Link Mode. Toggling stops when Link Mode stops.

### Advanced Linking

Use advanced linking to activate alternate functionality for specific applications with transmitters including:

- Wireless Switch**
- Key Card Switch**
- Occupancy Sensor**

- Choose an operating mode for the receiver with the transmitter by reviewing the modes outlined in the following sections.
- Activate a specific Link Mode by pressing the LRN button in the correct sequence.
- Press the link button on the transmitter to link the transmitter with the Constant Voltage Dimmer.
- Exit Link Mode.

The receiver supports four Link Modes with different functions for each transmitter. Instructions for activating specific Link Modes follow the *Function Descriptions* section.

## Function Descriptions

### Switches

Switches can behave in one or four ways: **Rocker, Momentary, Toggle, or Scene.**

**Link Mode 1: Rocker Mode** – Set the dim level of the Constant Voltage Dimmer by pressing and holding the top or bottom of the rocker. After holding for a half a second, the dimmer will start a slow ramp (up if top is held and down if bottom is held). The ramp will stop when the rocker is released.

Press and release (less than half a second) bottom of rocker to turn OFF. When OFF, press and release top of rocker to turn ON to set Level. When ON, press and release top of rocker to turn full ON. Double clicking the top rocker jumps to full ON. Double clicking the bottom rocker jumps to OFF.

**Link Mode 2: Momentary Mode** – Pressing a button on a wireless switch cause the dimmer to ramp ON momentarily and stay on while the button is pressed. When the button is released, the dimmer ramps OFF. Each button on the switch may control a different dimmer.

**Link Mode 3: Toggle Mode** – Pressing a button on a wireless switch causes the dimmer to ramp ON. Pressing it again cause the dimmer to ramp OFF. Each button on the switch may control a different dimmer.

**Link Mode 4: Scene Mode** – Scene mode is used to link a receiver to recall a specific dim level when a button is pressed.

To link a receiver to recall a specific dim level, set the Constant Voltage Dimmer to the desired state. (This is done by linking a switch in rocker mode and then setting a dim level). Once the Constant Voltage Dimmer is in the desired state, activate Link Mode 4 to complete the link process.

### Notes:

If a dimmer has a dim level set by a switch in mode 1, any switch learned in modes 2 or 3 will cause the dimmer to ramp ON to the set dim level. Otherwise, any switch learned in modes 2 or 3 will cause the dimmer to ramp to full ON.

### Occupancy Sensors

Occupancy Sensor can behave in one of three ways: **Manual On/Auto Off, Auto On/Auto Off, and Walkthrough.**

**Link Mode 1: Manual On/Auto Off** – User turns on the dimmer manually. The dimmer remains ON while the sensor detects occupancy. If the sensor detects no occupancy for 15 minutes, the dimmer will ramp to OFF over 1 minute. This mode is California Title 24 compliant.

When no manual controls (i.e. wireless switches) are linked to the dimmer, the dimmer will use Auto On/Auto Off function when linked in Mode 1.

**Link Mode 2: Auto On/Auto Off** – When the sensor detects occupancy, it ramps ON the dimmer. If the sensor detects no occupancy for 15 minutes, the dimmer will ramp OFF over 1 minute.

**Link Mode 3: Walkthrough** – an aggressive energy saving mode similar to Auto ON/Auto OFF with a shorter delay timer. The Constant Voltage

Dimmer turns ramps ON when the Occupancy Sensor detects occupancy. The Constant Voltage Dimmer turns OFF automatically after 2-15 minutes of no occupancy, depending on sensed motion.

### Notes:

If a dimmer has a dim level set by a switch in mode 1, any occupancy sensor learned in modes 2 or 3 will cause the dimmer to ramp ON to the set dim level. Otherwise, any occupancy sensor learned in modes 2 or 3 will cause the dimmer to ramp to full ON.

When not in Link Mode, pressing the occupancy sensor link button causes the dimmer output to toggle on linked dimmers.

When the dimmer is turned OFF with a manual control, Auto On is disabled until the occupancy sensor timeout expires (15 minutes of no activity).

Dimmer Occupancy timeout operates only after a linked occupancy sensor packet is received by the dimmer. If no linked sensors detect occupancy or if they malfunction, the dimmer will not time out after 15 minutes.

### Key Card Switch

#### Link Mode 1: Not Supported

**Link Mode 2: Key Card Switch** – Dimmer ramps ON when a key card is inserted. Dimmer ramps OFF when the key card is removed.

### Note:

If a dimmer has a dim level set by a switch in mode 1, any Key Card Switch learned will cause the dimmer to ramp ON to the set dim level. Otherwise, any Key Card Switch learned will cause the dimmer to ramp to full ON.

### Switch Leg Transmitter (SLT)

**Link Mode 1: SLT** – When the Switch Leg Transmitter is energized, the dimmer ramps on. When power is removed from the SLT, the dimmer ramps off.

### Note:

If a dimmer has a dim level set by a switch in mode 1, any SLT learned will cause the dimmer to ramp ON to the set dim level. Otherwise, any SLT learned will cause the dimmer to ramp to full ON.

### Door/Window Sensor

**Link Mode 1: Instantaneous Mode** – Door/Window Sensor opens, dimmer ramps off. Door/Window Sensor closes, dimmer ramps on.

### Note:

If a dimmer has a dim level set by a switch in mode 1, any Door/Window Sensor learned will cause the dimmer to ramp ON to the set dim level. Otherwise, any Door/Window Sensor learned will cause the dimmer to ramp to full ON.

## Link Mode Activation Instructions

The Link Modes build on each other: transition to Link Mode 2 while Link Mode 1 is active, etc as outlined below.

### Link Mode Instructions:

- Enter Link Mode (follow steps a-d until desired Link Mode is active, then skip to step 2)

- Link Mode 1:** Press and hold the LRN button for 3 seconds then release. The LED on the dimmer will toggle a steady pattern indicating Link Mode 1 is active:   
 — — — — —
  - Link Mode 2:** Press and hold the LRN button a second time for 3 seconds, then release. The LED on the dimmer will toggle a 2 blink stutter pattern indicating Link Mode 2 is active.   
 — — — — —
  - Link Mode 3:** Press and hold the LRN button a third time for 3 seconds, then release. The LED on the dimmer will toggle a 3 blink stutter pattern indicating Link Mode 3 is active.   
 — — — — —
  - Link Mode 4:** Press and hold the LRN button a fourth time for 3 seconds, then release. The LED on the dimmer will toggle a 4 blink stutter pattern indicating Link Mode 4 is active:   
 — — — — —
- Press wireless switch button or TCH button on transmitter. Toggling will pause in the ON state for 3 seconds, then resume toggling when the link is created.
  - Link additional transmitters (up to 30) as needed, wait 30 seconds to exit Link Mode. Toggling stops when Link Mode stops.

## Additional Functions

### CLR button Functions

**Toggle dimmer** – Press and release the CLR button is less than one second to toggle the dimmer state between ON and OFF.

**Purge All Links** – Press and hold the CLR button for 3 seconds to purge all Links from the dimmer and activate Link Mode 1. The LED on the dimmer will blink a steady pattern indicating Link Mode 1 is now active.

### Selective Link Deletion

To remove one link from the dimmer and leave others unaffected:

- Activate the Link Mode used to Link the transmitter. The LED on the dimmer will toggle a pattern indicating the active Link Mode.
- Press the link button for the transmitter to be deleted. Toggling will pause in the OFF state for 3 seconds then resume when the Link has been deleted. (Toggling pauses in the ON state when Links are added.)
- Wait 30 seconds for Link Mode to exit. Toggling stops when Link Mode stops.

### Repeater

Repeater capability extends the range for other compatible transmitters and receivers in the area by retransmitting any packets received. This receiver supports Level 2 Repeating which means that the relay will repeat all signals that have not already been repeated, and all signals that have been repeated once. The factory setting for repeater mode is Disabled. To change repeater status hold the LRN button during power up and observe the LED on the dimmer toggling 1 or 2 times to indicate the new repeater status: 1 – Disabled, 2 – Enabled. When more than 10 receivers are deployed in the same area it is recommended that some repeaters be disabled to reduce the possibility of interference from too many repeaters. If more than 10-15 repeaters are enabled the system performance may degrade.

### Switching Mode

The Constant Voltage Dimmer can be set in a mode where it does not dim, but rather switches the output ON or OFF. To change the mode of the dimmer hold the CLR button during power up and observe the LED on the dimmer toggling 1 or 2 times to indicate the new operating mode: 1 – Dimming, 2 – Switching.

### State Memory

The Constant Voltage Dimmer stores in memory every 10 seconds the dim level to which it is set. If power is ever lost, the dimmer will power back up to the last dim level it was at before the power was removed.

### Troubleshooting Tips:

- Briefly press and release CLR button to toggle dimmer output and confirm correct wiring and operation.
- Press TCH button on Linked Occupancy sensors to toggle the dimmer output to confirm link and test RF range.

## Specification Table

Range	50 - 150 feet (typical)
Frequency	902.875MHz
Power Supply Input Rating	8-28VDC
Output Rating	5A
Output Channels	1 output PWM
Operating Temperature	+32°F to +140°F (0°C to 60°C)
Storage Temperature	-40°F to +140°F (-40°C to +60°C)
Dimensions (enclosure)	2.88"(W) x 1.30"(H) x 0.67"(D) 7.32cm x 3.30cm x 1.70cm
Radio Certification	FCC (United States): SZV-STM300U I.C. (Canada): 5713A-STM300U
LED Load Type(s)	Constant Voltage, SELV 12, 24, or 8-28VDC, 5A max

Figure 1: Placing Antenna Skin

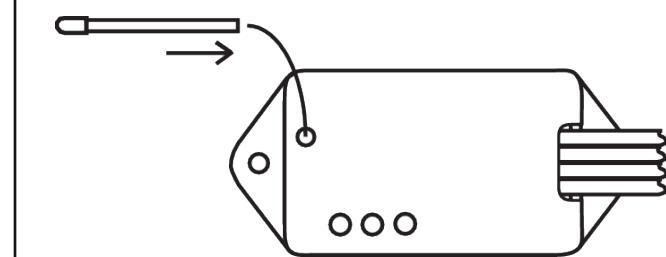
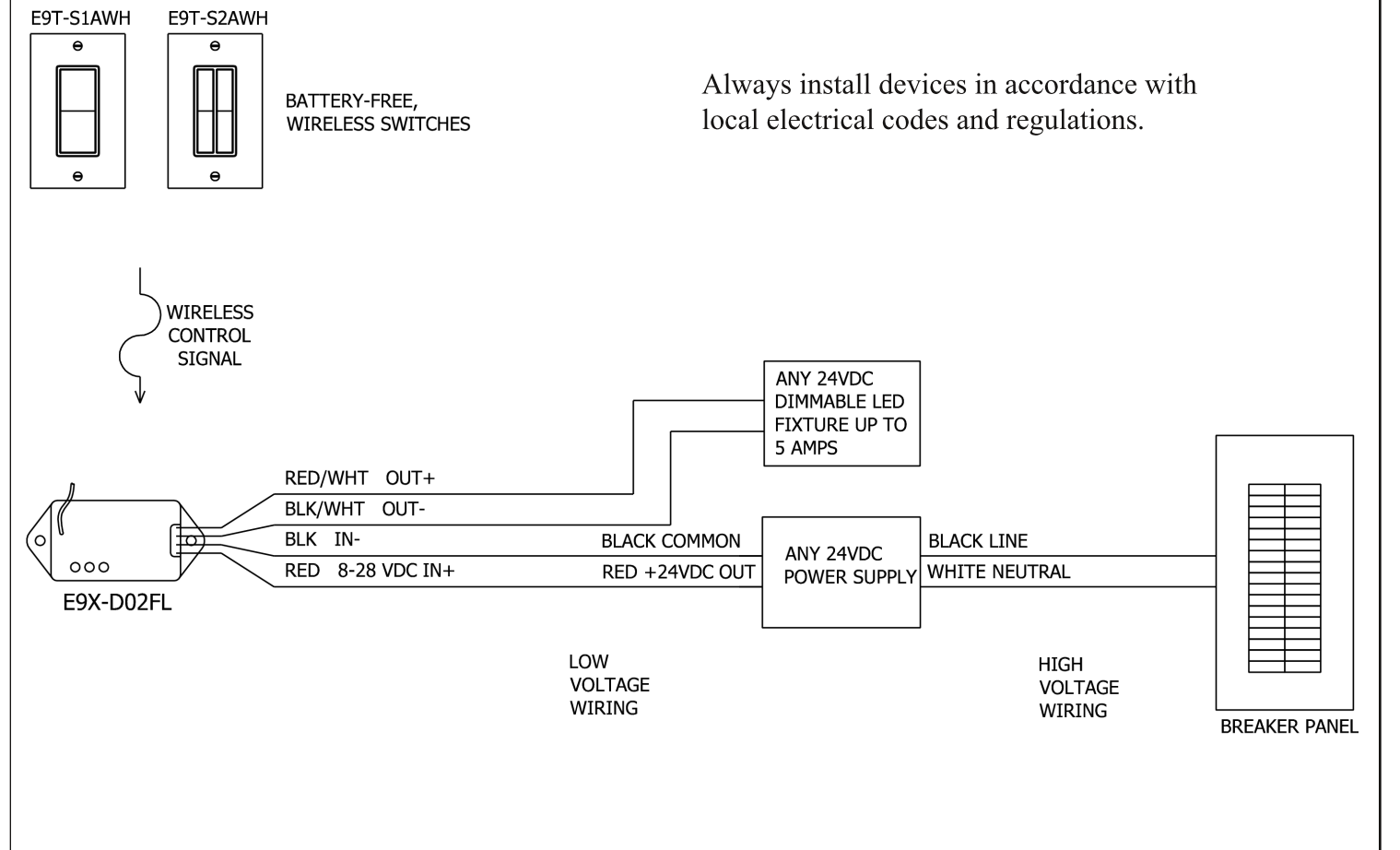


Figure 2: Wiring Diagram



Contains FCC ID: SZV-STM300U

The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (i.) this device may not cause harmful interference and (ii.) this device must accept any interference received, including interference that may cause undesired operation.

Contains IC: 5713A-STM300U

Contient le module d'émission IC: 5713A-STM300U



This device or certain aspects thereof is protected by at least one U.S. or international patent or has at least one such patent application pending.

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