LAUREN ILLUMINATION

Installation Guide
Model: WLVD

TILT / LIGHTING TECHNOLOGY

Wireless Low Voltage Dimmer (Receiver)

Package Contents	Tools Required
-WLVD Dimmer	-Mounting Screw (Optional)
-Antenna Cover	-Screwdriver
-Instructions	

Product Description

The TILT Wireless Low Voltage Dimmer (WLVD) is designed to control dimmable, low voltage (24V), TILT Panels and Downlights (constant voltage LED lighting products). The WLVD communicates with self-powered switches (WSS, WSD, WSRC) and self-powered occupancy sensors (WOS). The WLVD uses a pulse width modulation output to dim the fixtures.

Features Include:

- Communicates with multiple switches and sensors utilizing multiple modes to provide customized lighting controls
- Not affected by power disruptions
- Easy to link/unlink for ease of reconfiguration
- Provides full range dimming capabilities (5%-100%) using TILT lighting products
- Connectors are provided for ease of installation

Installation

Caution/Notes

- Caution: The Constant Voltage LED Dimmer is intended only for use indoors and in dry locations.
- It may be more convenient to link the wireless controls to the Dimmer prior to final installation.
- To be installed and/or used in accordance with electrical codes and regulations.
- If unsure about any part of these instructions, consult an electrician.

Specifications:

Power Supply	24 V DC Place on 24V power line prior to light load. 10A Maximum Load
RF Communications	EnOcean 902 Mhz (EOSCU)
RF Transmission Range	100-300 feet (typical)
Output Channel	1 PWM output
Dimensions	2.88" L x 1.30" W x 0.67" D (73mm x 33mm x 17mm)
Weight	1.0 oz (40g)
Mounting Height	6-8 feet recommended
Environment	Indoor Use Only, Dry 32° to 140°F (0° to 60°C)
Memory	Stores up to 25 unique transmitter IDs
Radio Certification	FCC (US): SZV-TCM300U,C I.C. (CA): 5713A-TCM2XXC

Compatible with:

- Wireless switch, single (WSS)
- Wireless switch, double (WSD)
- Wireless Remote (WSRC)
- Wireless Occupancy Sensor, Wall Mount (WOSW)
- Wireless Occupancy Sensor, Ceiling (WOSC)

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. An Antenna Cover is provided for this purpose. See Fig. 1.
- Create separation distance away from interfering electronics such as fluorescent tube ends, electronic transformers/power supplies, motors, etc.
- 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.

INSTALLATION OVERVIEW:

- Identify the best mounting locations for receiver (WLVD) and transmitter (WS, WOS).
- Perform range test to confirm operation prior to installation.
- Connect WLVD to circuit following wiring diagram and local electrical codes.
- Press and release CLR button to toggle output and confirm operation. Hold CLR to test dimming
- Link Transmitters (WS, WOS) and WLVD following *Linking Instructions* below.

LINKING INSTRUCTIONS

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

BASIC LINKING

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

Press and hold the LNK button for 3 seconds then release. The WLVD indicator will toggle a steady single blink pattern indicating Basic Link Mode (Mode 1) is active.

- To link a switch (WS+), press the top button on the switch(es) THREE times to create a link.
- To link an occupancy sensor (WOS+) press the MENU button on sensor(s) once to create a link.

The single blink pattern will pause for 3 seconds when the link is created, then will resume.
Link additional transmitters (up to 25) as needed. Link mode will exit automatically after 30 seconds of inactivity and the blink pattern will stop.

Basic Wireless Switch (WS+) Operation (Rocker):

- Quick press top to recall saved level, bottom for OFF
- Press and Hold top or bottom to adjust saved level up or down respectively
- Double press top for full brightness, bottom for OFF

Basic Occupancy Sensor (WOS+) Operation:

- AUTO ON/AUTO OFF to saved level when no switches are linked
- MANUAL ON/AUTO OFF to saved level when switches are linked

ADVANCED LINKING

Use advanced linking to activate alternate functionality for specific applications:

- Choose an operating mode for the WLVD with the specific transmitter by reviewing the *Operating Mode Descriptions* outlined in the following section.
- Activate one of 4 specific Link Modes by pressing the LNK button in the correct sequence following *Link Mode Activation Instructions*.
- Press the MENU button on the occupancy sensor or press a rocker button on a switch THREE times to link. Linking will pause ON the blinking pattern indicating the link has been made.
- Exit Link Mode by waiting 30 seconds with no activity.

OPERATING MODE DESCRIPTIONS

SWITCHES

Switches can operate in one of four modes: **Rocker**, **Momentary**, **Toggle,** or **Scene**.

Mode 1: Rocker Dim Mode – Operation: Quick press top of rocker to ramp WLVD load ON to last saved level. Quick press bottom to ramp to OFF. Press and hold top or bottom to adjust saved level up or down. Double press top or bottom for 100% or 0%. Top and bottom of the rocker switch both link when the top rocker is pressed to link with the WLVD.

Mode 2: Momentary Mode – Operation: Pressing a button on a wireless switch causes the WLVD load to go ON to the saved level momentarily and stay on while the button is pressed. When the button is released, the WLVD load goes OFF. Each button on the switch may control a different WLVD.

Mode 3: Toggle Dim Mode – Operation: Subsequent short button presses cycle the WLVD load between 0%, Saved Level and 100%. When Saved Level is active for 10 seconds or more, a subsequent press skips 100% and dims to 0%. Long button presses adjust the Saved Level by toggling between dim up or dim down. Each rocker button on a switch may control a different WLVD. Linking multiple WLVDs to one button is not recommended as it is possible for the WLVDs to get out of sync.

Mode 4: Scene Mode — Operation: Scene mode may be used to recall a specific dim level on one or more WLVDs when a button is pressed. To link a switch that recalls a specific brightness level, first adjust the brightness to the desired level by pressing and holding the CLR button (subsequent presses reverse dim direction). When the Receiver is in the desired state, activate Link Mode 4 and ***triple*** press a switch rocker button to complete the link process.

OCCUPANCY SENSOR

Occupancy Sensors operate in one of three modes: Manual On/Auto Off, Auto On/ Auto Off, and Walk-through.

Mode 1: Manual On/Auto Off – A linked wireless switch is used to manually turn the receiver ON to Saved Level. An Occupied Timer is reset to 15 minutes and begins counting down each time an Occupied Signal is received from a linked wireless Occupancy Sensor. The receiver turns OFF when the Occupied Timer counts to 0. This mode is California Title 24 compliant. When no manual controls (i.e. wireless switches) are linked to the receiver, the receiver defaults to Auto On/Auto Off mode with Occupancy Sensor(s) linked in Mode 1.

Mode 2: Auto On/Auto Off – The receiver turns ON to the Saved Level automatically and resets a 15 minute Occupied Timer each time it receives an Occupied Signal from a linked Occupancy Sensor. When the Occupied Timer counts to 0, the receiver turns OFF. When a wireless switch is used to manually turn the receiver OFF, the Auto ON function is disabled until the Occupied Timer counts to 0.

Mode 3: Walk-through – This aggressive energy saving mode uses Auto On/Auto Off with an initial 5 minute Occupied Timer that extends up to 15 minutes when subsequent Occupied Signals are received.

Notes:
Confirm Occupancy Sensor is sufficiently charged or install battery prior to linking.
Test wireless link – After linking, confirm the link and test wireless range by pressing the LNK button on the Occupancy Sensor to toggle the receiver output.

- Test Occupancy Sensor coverage – Use the Walk Test mode built into the Occupancy Sensor if available. Perform an interactive walk test more quickly: Press Occupancy Sensor SET button or press WLVD CLR button to toggle receiver output and clear the Occupied Timer. Some wireless Occupancy Sensors can transmit an Occupied Signal with a different button press which can facilitate testing.
- The occupancy timeouts operate only after an Occupancy Sensor signal is received by the WLVD. If no linked sensors transmit or if the sensors malfunction, the receiver will not turn OFF after 15 minutes.
- If only occupancy sensors are linked to Receiver, unit will always power up ON.

LINK MODE ACTIVATION INSTRUCTIONS

The Link Modes build on each other: transition to Mode 2 while 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)

A - Mode 1: Press and hold the LNK button for 3 seconds then release. The WLVD will toggle a steady pattern indicating Link Mode 1 is active:

B - Mode 2: Press and hold the LNK button a second time for 3 seconds, then release. The WLVD will toggle a 2 blink stutter pattern indicating Link Mode 2 is active:

C - Mode 3: Press and hold the LNK button a third time for 3 seconds, then release. The WLVD will toggle a 3 blink stutter pattern indicating Link Mode 3 is active:

D - Link Mode 4: Press and hold the LNK button a fourth time for 3 seconds, then release. The WLVD will toggle a 4 blink stutter pattern indicating Link Mode 4 is active:

Press wireless switch (WS+) button three times or the occupancy sensor (WOS+) Menu button once to establish the link with the WLVD in the corresponding mode. Toggling pattern (blinks) will pause in the ON state for 3 seconds when link is created, then resume toggling.

Link additional transmitters (up to 25) as needed, wait 30 seconds to exit Link Mode. Toggling stops when Link Mode stops.

ADDITIONAL FUNCTIONS

CLR BUTTON FUNCTIONS:
Toggle Dim - Press and release the CLR button to select between 0%, Saved Level and 100%. Press and hold CLR button to dim up and down, subsequent presses reverse dim direction.

Purge All Links - First activate Link mode by holding the LNK button until the receiver starts toggling, then press and hold the CLR button for 3 seconds to purge all Links from the receiver. The receiver will pause toggling when CLR button is pressed and resume toggling when the CLR process is complete.

SELECTIVE LINK DELETION
To remove one Link for the WLVD and leave others unaffected:

- Activate the specific Link Mode used to Link the transmitter (e.g. Link mode 1,2 or 3, etc). WLVD will toggle a pattern indicating the active Link Mode.
- Press the Menu button on the occupancy sensor (WOS+) or press the button three times on wireless switch for the transmitter to be deleted. Toggling will pause in the OFF state for 3 seconds indicating the link is removed, then resume toggling. (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 mode is disabled by default. This capability extends the range for other compatible transmitters and receivers in the area by retransmitting any packets received. This WLVD supports 2 level repeating meaning that it will repeat both original packets and packets that have been repeated one time. Packets already repeated twice will not be repeated again. To change repeater status hold the LNK button for 20 seconds while powering up the receiver and observe the Status LED toggling 1 or 2 times to indicate the new repeater status:

1 = Disabled: Repeater OFF
2 **= Enabled**: Repeater ON

It is recommended that not more than 10 repeaters be deployed in the same area without careful planning to reduce the possibility of interference from too many repeaters.

POWER UP MODE
The WLVD will power up to the ON state unless a wireless switch is linked. When a wireless switch is linked, the WLVD will use state memory and power up in the state active before the power was shut off.

SWITCHING MODE
The WLVD LED Dimmer may be set in a mode that deactivates PWM dimming and instead toggles the output between On and OFF. Switching mode is disabled by default. Select this mode by holding the CLR button while powering up the receiver and observe the Status LED toggling 1 or 2 times to indicate the newly selected Output Mode.

1 = Disabled: Adjust brightness with smooth full range dimming
2 = Enabled: ON/OFF switching mode only, no dimming

STATE MEMORY
State Memory - Power up to the state active prior to the power cycle. State Memory is active when a wireless switch is linked to the WLVD. If a WLVD is linked to only occupancy sensors or nothing at all, the WLVD will power up ON to the Saved Level. If no switch is linked, power cycling the WLVD will turn the unit ON in the event of a light or occupancy sensor malfunction. Also, upon initial installation the WLVD will power up ON when they are not linked to any devices.

Troubleshooting:

Unsure if Link has been made	Briefly press and release CLR button to toggle receiver output and confirm correct connection.
Switch Operation is not reliable	Relocate the WLVD closer to the switch or sensor. Avoid shielding by metal structures.
Switch will not Link to WLVD	Switch linking requires 3 consecutive signals within 3 seconds and with no other signals mixed in between. If linking in an environment with many wireless signals, try pressing switch faster and 5 times in a row to link.

FIG. 1 – ANTENNA COVER PLACEMENT

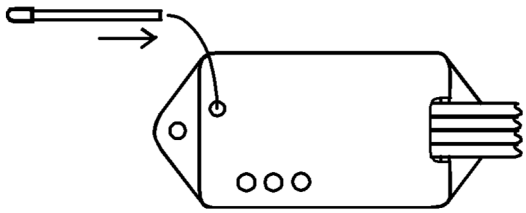

FIG. 2 - WIRING DIAGRAM

Always install devices in accordance with local electrical codes and regulations

- **Contains FCC ID: SZV-TCM300U or SZV-TCM300C**
- **Contains IC: 5713A-TCM300U or 5713A-TCM300C**
- **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.**

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.