VANTAGE

RadioLink Keypad Station

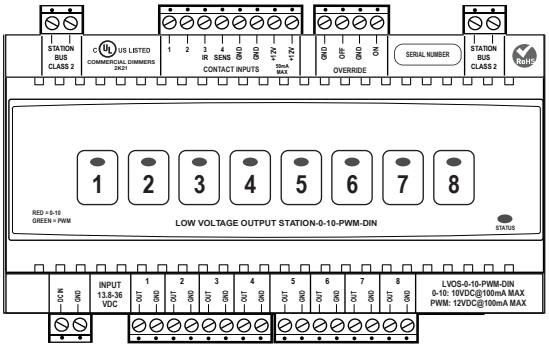
Installation Instructions • Instructions d'Installation • Instrucciones de Instalación

No: IS-0521 – rev. 3 9/23

A brand of legrand®

LVOS-0-10-PWM-DIN • Les Numéros de Catalogue • Los Números de Catálogo:

Country of Origin: Made in China • Pays d'origine: Fabriqué en Chine • País de origen: Hecho en China



OVERVIEW

The DIN Rail mounted Low Voltage Output Station (LVOS) is used for the control and automation of LED and Fluorescent lighting loads requiring either 0-10V or pulse width modulation (PWM) for dimming control. The DIN LVOS can control up to eight 0-10V loads. Unlike other LVOS products the DIN LVOS does not have relays on-board for switching. It relies on an external relay station (RS8-L-DIN) or module (MDR8CW301) to do high-voltage switching. The dry contact inputs on the station can be used with motion sensors, light sensors, optical switches, magnetic switches, and more. As part of the Legrand Architectural Dimming lighting solution, it provides control of lighting loads as well as inputs from dry contacts for lighting and automation.

FEATURES AND OPERATIONS OVERVIEW

- 8, independent 0-10V low-voltage outputs
- Outputs 1-4 can be configured as PWM or 0-10V
- Manual control and LED status for all 8 LV outputs on front
- High resolution performance when dimming
- Communicates via Station Bus
- Assembled in a 9 unit DIN case
- Override switch for ON and OFF states of all loads
- CE Certification / UL

SPECIFICATIONS

General	
Dimensions, HWD	85.7mm x 157.2mm x 61.9mm (3.38" x 6.19" x 2.44")
Weight	237g (8.36oz)
LED Indicators	Microprocessor status, configuration, loads LED on loads 1-4: Red = 0-10 / GREEN = PWM
Ambient Operating Temperature	32-104°F (0-40° C)
Relative Humidity	Maximum 90%, non-condensing
Cooling	Convection
Firmware	Upgradeable via Station Bus
Manual Control	Overlay with control/status for each output
FreeRTOS	Real-time scheduling provided by FreeRTOS (www.freertos.org)
Compliance	UKCA, UL, cUL, RoHS, CE, FCC, EN 55032, EN 55035, EN 61000-3-2, EN 61000-3-3

SPECIFICATIONS

DC Input - Power Supply	
Input Voltage	13.8 - 36VDC
Input Power Draw	<15W
Connection Type	0.20” pitch removable plug
Connection Rating	300V 10A
Relative Humidity	Maximum 90%, non-condensing

Input / Output Connections (Low-voltage)	
Station Bus Connection	24V/36V Station Bus
Station Bus Wiring Specification	2C, 16AWG / 1.31mm2, twisted, non-shielded, <30pF per foot. Separate a minimum of 12” / 30.5cm from other parallel communication and/or high-voltage runs
Station Wiring	Daisy-chain, star, branch
Station Count	0.35W on IC-24; 0.55W on IC-36
Auxiliary Inputs	4 Dry contact (3 and 4 may be used for an IR receiver and light sensor respectively)
Override Inputs	Yes - All ON or All OFF contacts

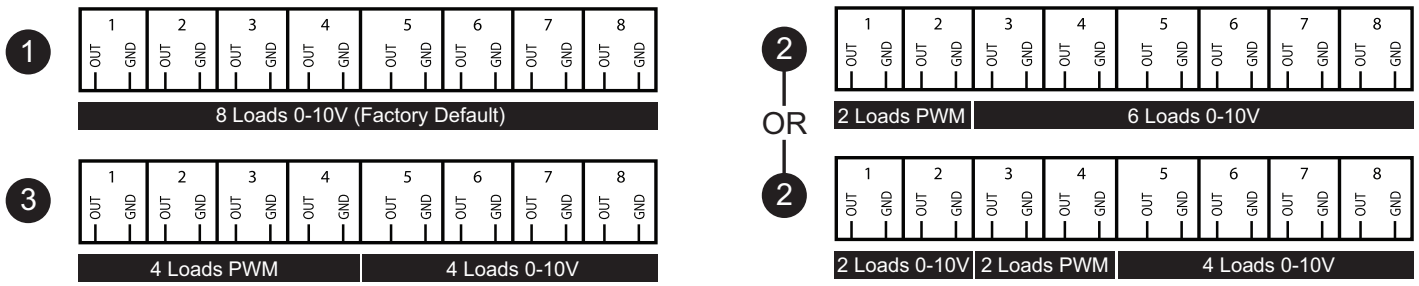
Low-voltage Output - 0-10V	
Specification	IEC 60929 Annex E
Number of Outputs	8
Output	0-10V @ 100mA sink or source
External Source Voltage	Typical 10V / Maximum 20V
Loads Per Output	50@2.0mA per load (typical)
Resolution	>1024 steps
Connection Type	0.20” pitch removable plug
Connection Rating	300V 10A

Low-voltage Output - PWM	
Specification	IEC 60929 Annex E
Number of Outputs	4
Output Voltage	12V (source only)
Output Current	100mA per channel, 400mA total
Loads Per Output	50@2.0mA per load (typical)
Resolution	>1024 steps
Duty Cycle	Variable 0% to 99.9%
Frequency	300V 10A

Protection	
DC input, over current protection	PTC fuse (self-resetting)
Low-voltage 0-10V output over current protection	
Low-voltage PWM output over current protection	

LOAD CONFIGURATIONS

Setting up the load configurations, as shown below, is done in Design Center software. Only loads 1-4 may be configured as PWM. Set all four loads as PWM or in sets of two (loads 1 and 2, or loads 3 and 4)



LOW-VOLTAGE OUTPUTS, 0-10V (ANALOG)

Low-voltage controls 1-8 and Ground are used to control devices that work with an analog 0-10V signal. Ground provides the negative reference for the output voltages. All Grounds are connected internally to each other. Each control output, 1-8 can sink or source 0-100mA at any voltage from 0-10VDC. The load level sets the percentage between the minimum and maximum voltage that is selected for that load. LED load indicators are red for all loads in 0-10V mode; loads 5-8 are only 0-10V.

PWM OUTPUTS, 12V (SOURCE)

Low-voltage outputs 1-4 may be configured as PWM (Pulse Width Modulation). Only use combinations 1-4, 1 and 2, or 3 and 4 as illustrated for PWM outputs. PWM duty cycles are programmed using *Power Profiles* from 0%-Minimum On to 100% Maximum On (99.9% actual). The load level is a percentage between the minimum and maximum duty cycle (Power Profile Minimum On and Maximum On). The output can be reversed in Design Center through the *Power Profile*. For example, a 0% duty cycle can either be load ON or load OFF. LED load indicators 1-4 are green for loads in PWM mode.

NOTE: Loads 1 – 8, low-voltage outputs, should be limited to 250 feet / 76.2 meters for each wire run, using a minimum of 18AWG / 0.823mm2 gauge wire. All connections use 4.4 inch pound torque. Stranded wire recommended.

SOFTWARE / FIRMWARE

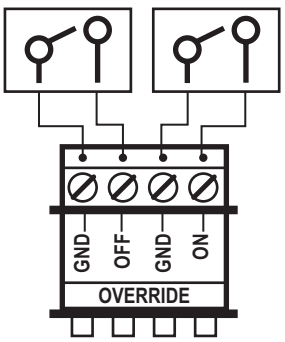
Design Center Software version 4.x or higher and accompanying Firmware, are compatible. For new projects it is recommended that software and firmware be kept to the most current release.

POWER PROFILES / POWER OUTAGES

The Dimmer Station stores Power Profile configuration data locally so that it will continue to operate correctly if communication with the system is lost. This information includes: load profile-duty cycle settings, last load level, and PWM or 0-10V power profiles. If a station is moved to a new location or if the load type connected is changed from a 0-10V load to a PWM load, or vice-versa, remember to change the load type in Design Center, to avoid unwanted results. Before testing new load type via the local buttons on the front, program the station to the system so the new load type is active in the station's output.

If a power outage occurs, when power is restored the station will return the loads to the last load level with all profiles at there last known settings. This occurs whether or not the station is connected to the Controller.

OVERRIDE WIRING DIAGRAM



BUTTON OPERATION

ACTUATOR BUTTONS
The actuator buttons on the front of the station are for local control only and are not programmable through Design Center software. In Diagnostics, these eight buttons and the four dry-contacts have not been implemented in Button Press Monitor.

Button Action	Load Operation
Press/Release	1. The load ramps to 100% or fades to 0% over three seconds, alternating with every other press and release 2. If the button is pressed again before the three seconds time, the load stops ramping/fading at its current level
Press and Hold/Learn	*Press and Hold* and *Learned Level* features are not supported from the front panel buttons

INSTALLATION
Installation of Legrand Architectural Dimming products should be performed or supervised by a certified Legrand installer. Each LVOS-0-10-PWM-DIN must be installed inside of a properly vented and covered DIN enclosure. Connection torque is 4.4 inch pounds.

STATION CONNECTION
The LVOS-0-10-PWM-DIN connects to a Legrand Architectural Dimming System via Station Bus. Two screw terminals are located in the low-voltage section of the electrical box (through top). The two connectors are internally wired, in parallel, to facilitate daisy chaining the Station Bus. The wire should comply with the Legrand Architectural Dimming Station Bus wiring specification.

REMOTE INFRARED RECEIVER OR DRY-CONTACT
A remote infrared receiver (part # REMOTEIR) may be connected to the LVOS-0-10-PWM-DIN dry-contact 3. This terminal is not compatible with remote infrared receivers from other manufacturers.

The receiver connects to +12V, IR IN (dry contact 3) and Gnd. If not used with an IR receiver this input may be used as a standard dry contact input, connecting the contact between IR IN (dry contact 3) and Gnd.

SENSOR INPUT OR DRY-CONTACT
Dry contact 4 connects to +12V, SENSOR IN and Gnd. If not used for a light sensor, this input may be used as a standard dry contact input, connecting the contact between SENSOR IN (dry contact 4) and Gnd.

WIRING
Loads 1 – 8, low-voltage outputs, should be limited to 250 feet / 76.2 meters for each wire run, using a minimum of 18AWG / 0.823mm2 gauge wire. All connections use 4.4 inch pound torque. Stranded wire recommended.

OVERRIDE
The station supports two Override modes, ON and OFF. When either switch is closed, using a simple toggle switch, all loads are ON or OFF depending on which override loop is closed. However, the ON override takes precedence over the OFF override if both switches are closed. NOTE: Station does not communicate to controller when in override.

POWER CONNECTION
Connect the 13.8 – 36VDC power feed. Legrand recommends the PSU36-DIN 36VDC (CE only) or ACPDXXSM2 24VDC power supplies*. This provides power for the LVOS-0-10-PWM-DIN and is required for the station to operate. Use 16AWG / 1.31mm2 wire between power supply and stations using a daisy-chain topology. Total wire length for all stations connected to power supply should not exceed 100ft / 30.5m.

*DIN Power Supply	LVOS-0-10-PWM-DIN Stations Supported
PSU36-DIN – 36V DC 3.5A 130W Max (CE only, no UL application for the US)	Supports up to 8 stations
ACPDXXSM2 – 24V DC 2.5A 60W Max	Supports up to 4 stations

CONFIGURATION
When the LVOS 0 10-PWM DIN station is first connected to the Station Bus, the diagnostic LED will blink twice followed by a pause. In Design Center, click on Configure Stations, the Status LED will blink 5 times followed by a pause. To finish configuring press any button on the Station 3 times. The station may also be configured by typing the serial number in the project file, using this method the station will automatically be configured when the system is programmed.

DIAGNOSTIC LED INFORMATION

The Status LED blinks evenly or flashes 2, 3, 4 or 5 times followed by a pause to indicate status information.

LED STATUS BLINKING PATTERNS

Off: The station is not powered. A power connection has not been made.
One even blink: Station is operating correctly and is configured.
Two blinks: Station is operating correctly but is not configured.
Three blinks: Station is ***not*** communicating with the Main Controller. Verify that Station Bus wiring conforms to guidelines.
Four blinks: Station problem, please contact the factory.
Five blinks: Configuration mode.

FIRMWARE UPGRADEABLE FROM DESIGN CENTER

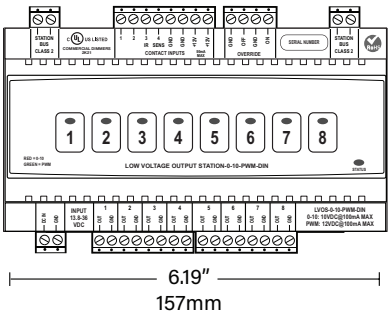
1. The station must always be configured and programmed to the system in order to perform a firmware update.
2. Click on *System* | *Update Firmware* | *Update DIN LVOS Firmware*.
3. Select the check box for each DIN-LVOS-PWM station needing the firmware upgrade.
4. Complete the upgrade – wait for the process to finish.

PLACING STATION IN BOOT CODE

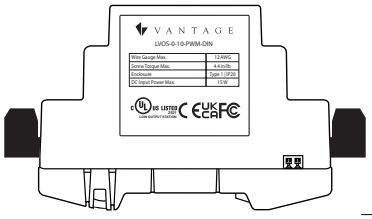
If the application code is corrupted it may not be possible for Design Center to connect to the DIN-LVOS-PWM station to update. If this condition is suspected, place the DIN-LVOS-PWM station into boot code and then update following the steps above.

1. Remove DC voltage power to the station.
2. Press and hold buttons 2 and 3 while DC voltage power is restored.
3. All of the station's load and status LED lights will flash in unison.
4. While in this mode attempt the regular firmware update steps 2-4 again. (Above - *Firmware Upgradeable From Design Center*)
5. When the firmware update is finished the update dialog box will display a green check mark and the station will reboot automatically.

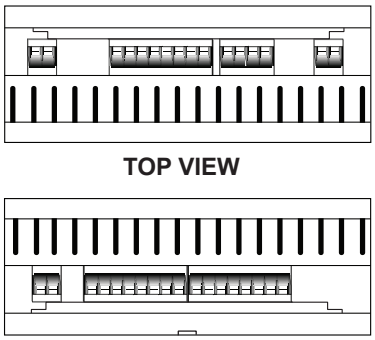
MULTI-VIEW LINE DRAWINGS



FRONT VIEW



SIDE VIEW



TOP VIEW

BOTTOM VIEW

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