

Push CV is a 4 channel constant voltage source solution. It caters LED lighting applications of up to 336W of low-power LED load.

Push CV is DMX-512 controllable.

Push CV allows the flexibility needed in driving your low-power LEDs.

Push CV is a common positive LED output.

Push CV has built in dynamic color change sequences.

Dimensions

121mm x 106mm x 59mm

Protection

Short circuit on output

Reverse polarity on input/output

LED power output

Max. 24VDC (depends on PSU)

Max. 3.5A per channel

4 Channels

Power Input

External power supply 12 - 24VDC

Connections

Screwable terminal blocks



Chapter 1: **Introduction**

1.1 Applications

- Architectural Use
- LED lighting effects
- Theatrical and studio lighting
- Commercial and retail
- Domestic and commercial use

1.2 Features:

- DIN-Rail and infrastructure attachment
- DMX-512 controllable
- Smooth fade flicker-free light output
- High efficiency (up to 98%)
- Input and output protections
- Daisy Chain DMX-512 Control
- Easy connection and installation
- Power, communication and output state LEDs indication
- Normally On
- Stand alone test options
- Built in dynamic color change sequences

Chapter 2: Mounting and Installation

2.1 Assembly and installation:

For proper installation and subsequent operation of each Unit, pay special attention to the following recommendations :

- ❖ Upon unpacking the product, inspect the contents of the carton for shipping damages.
Do not install damaged Units.
- ❖ Ensure proper ventilation of each Unit and avoid areas where corroding, deteriorating or explosive vapors, fumes or gases may be present.
- ❖ Allow for proper clearance of Unit enclosure and wiring terminals for easy access, hardware configuration and maintenance.
- ❖ Ensure that the Unit is securely attached, properly mounted, and free of excessive vibration.



- ❖ Ensure that power is disconnected before installing, wiring, or servicing the Unit.

DO NOT HOT PLUG THE MAIN UNIT TO THE BASE!

- ❖ Do not attempt to install or use the Unit until you read and understand the installation instructions and safety labels.
- ❖ Do not use the Unit if power cables are damaged.
- ❖ Unit intended for maximum operating ambient 40°C.



The instructions and precautions set forth in this user guide are not necessarily all-inclusive, or relevant to all applications as d-led cannot anticipate all conceivable or unique situations.

2.2 Unit Connection



(1) Power In (12-24V):

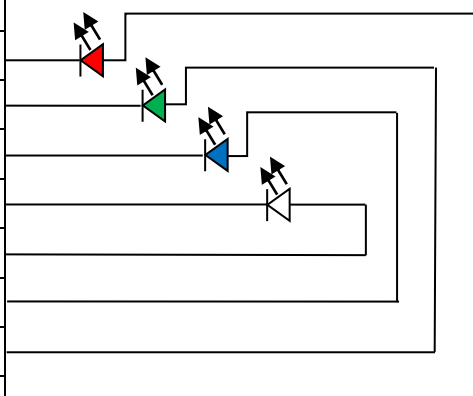
Pin	Voltage Polarity
• (-)	-V
• (-)	-V
• (+)	+V
• (+)	+V

(2, 3) DMX IN/OUT:

Pin	Designation
• GND	Signal ground
• D-	Data -
• D+	Data +

(4) Output (Max. 4x3.5A):

Pin	Designation
• CH1(-)	LED(-)
• CH2(-)	LED(-)
• CH3(-)	LED(-)
• CH4(-)	LED(-)
• COMMON(+)	LED(+)
	LED(+)
	LED(+)
	LED(+)
• N.C.	Not connected
• N.C.	



Power Wiring

- ❖ Use at least 18 AWG (0.75mm²) for DC Power In connection.
- ❖ It is highly recommended to connect all 4 terminals of the Power In screw terminal block.

Cable type / length limitations for different LED loads:

Wire cross section*		Max. load per channel [W] at designated cable length				
mm ²	AWG	10m	20m	30m	40m	50m
0.34	21	67	31	21.5	16.5	12
0.5	20	84	50	33.5	24	19
0.75	18	84	74	50	36	28
1	17	84	84	67	50	38
1.5	16	84	84	84	64	52



The calculations were made assuming the following conditions:

- ❖ Power Supply voltage is 24V.
- ❖ Drop voltage on the cable shall not exceed 3V (e. g. voltage on the load shall be at least 21V).

The values presented in the tables of this section are general guidelines only, and as such should be used with caution. Always check the specifications of the LED strips used as a load and confirm whether the conditions stated above satisfy the needed requirements.

* Wires thicker than 1.5mm²/16AWG cannot be inserted directly into the Unit's output terminal blocks. Use additional intermediate terminal blocks suited for a thicker wire cross section to extend the output line. At 2.5mm²/10AWG wires or thicker it is possible to connect full load (84W per channel) at line length up to 50m.

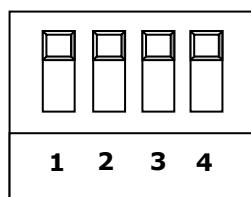
LED strip power [W/m]	Wire cross section*		Max. LED strip length [m] depending on distance from PUSH CV				
	mm ²	AWG	10m	20m	30m	40m	50m
14.4	0.34	21	4.7	2.2	1.5	1.1	0.8
	0.5	20	5.8	3.5	2.3	1.7	1.3
	0.75	18	5.8	5.1	3.5	2.5	1.9
	1	17	5.8	5.8	4.7	3.5	2.6
	1.5	16	5.8	5.8	5.8	4.4	3.6
9.6	0.34	21	7.0	3.2	2.2	1.7	1.3
	0.5	20	8.8	5.2	3.5	2.5	2.0
	0.75	18	8.8	7.7	5.2	3.8	2.9
	1	17	8.8	8.8	7.0	5.2	4.0
	1.5	16	8.8	8.8	8.8	6.7	5.4
6	0.34	21	11.2	5.2	3.6	2.8	2.0
	0.5	20	14.0	8.3	5.6	4.0	3.2
	0.75	18	14.0	12.3	8.3	6.0	4.7
	1	17	14.0	14.0	11.2	8.3	6.3
	1.5	16	14.0	14.0	14.0	10.7	8.7

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Chapter 3: Unit Setup and Operation

3.1 Dip-Switch Settings

DIP SW MODE				Working mode				
DP1	DP2	DP3	DP4	CH1	CH2	CH3	CH4	Mode
OFF	OFF	OFF	OFF	DMX value ¹	DMX value ¹	DMX value ¹	DMX value ¹	Standard 4 channels working mode
ON	OFF	OFF	OFF	100%	0%	0%	0%	R test mode ⁵
OFF	ON	OFF	OFF	100%	100%	0%	0%	RG test mode ⁵
ON	ON	OFF	OFF	0%	100%	0%	0%	G test mode ⁵
OFF	OFF	ON	OFF	0%	100%	100%	0%	GB test mode ⁵
ON	OFF	ON	OFF	0%	0%	100%	0%	B test mode ⁵
OFF	ON	ON	OFF	100%	0%	100%	0%	BR test mode ⁵
ON	ON	ON	OFF	0%	0%	0%	100%	W test mode ⁵
OFF	OFF	OFF	ON	RGB sequence ²			0%	RGB test mode ⁵
ON	OFF	OFF	ON	RGBW sequence ³				RGBW test mode ⁵
OFF	ON	OFF	ON	DMX value ¹				1 channel working mode
ON	ON	OFF	ON	DMX value ¹		DMX value ¹		2 channels working mode
OFF	OFF	ON	ON	Dimmed level ⁴	Dimmed level ⁴	Dimmed level ⁴	Dimmed level ⁴	Master dim mode (5 th virtual channel)



OFF
ON



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Notes:

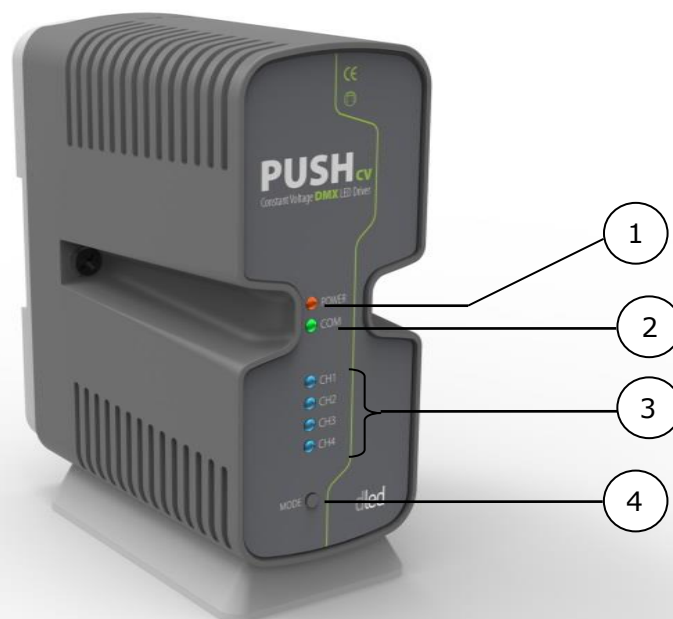
1. In case no DMX connected all channels shall be at 100%.
2. Channels 1-3 shall fade in the following looping sequence: R→RG→G→GB→B→BR
Color transition time: 7sec.
3. Channels 1-4 shall fade in the following looping sequence: R→RG→G→GB→B→BR→W
Color transition time: 7sec.
4. A virtual "5th channel" shall determine the Master dim level according to:

$$[CH(X) \text{ DMX level } \%] \times [\text{Master dim level } \%] = [CH(X) \text{ Dimmed level } \%]$$
5. Standalone only.



Upon power up (at any mode) the Unit shall perform a short self-test sequence:
CH1→CH2→CH3→CH4 shall briefly light up one after another.

3.2 Device Overview



- 1 – Power status indication LED
- 2 – Communication status indication LED
- 3 – Output channels status indication LEDs
- 4 – Mode Button

3.3 LED Indication

CH1-CH4 LEDs	Description
OFF	Channel dimmer value = 0
ON	Channel dimmer value > 0
Fast blink	Channel short-circuit

Power LED	Description
ON	Power is on, normal operation
Fast blink	PSU voltage is out of range
Pulse	Unit overheat

Communication LED	Description
OFF	No DMX512 signal detected
Blink	DMX512 signal present

3.4 Mode Button Functions

#	Press duration	Function
0	Press 0~1sec	Fixture Identify mode
1	Press 2~4 sec	System Test mode
2	Press 6~9 sec	Set DMX Address mode
3	Press 10~12 sec	Set Level Upon Power Up mode
4	Press 14~17 sec	Reset mode



How to use:

1. Press and hold the Mode button for time duration corresponding the desired "mode".
2. While holding the Mode button, CH1+CH2 LEDs will flash alternating with CH3+CH4. The LEDs will flash faster during time window of (any) "mode" and slower during time window of "break".
3. During the time window of the desired "mode" – release the Mode button. If the button is released during time window of a "break", the unit shall return to normal operation.

3.5 (0) Fixture Identify Mode

1. Short press the Mode button to activate this mode.
2. This mode can be used to identify the LEDs that are connected to the unit. When activated channels 1-4 shall fade in the following looping sequence: R→G→B→W



3. To exit this mode short-press the Mode button.

3.6 (1) System Test Mode

1. Press and hold the Mode button for 2~4s to activate this mode.
2. This mode can be used to test the system after the installation without connecting DMX.

Short-press the Mode button to turn on each channel sequentially: R→G→B→W→RGBW

3. To exit this mode long-press (>2 sec) the Mode button.



3.7 (2) Set DMX Address Mode

To set the DMX address, follow the next simple steps:

1. On the DMX control panel, set the value of the desired address to '255' (Hexadecimal 'FF').
2. On the PUSH unit press and hold the Reset button for duration of 6~9 sec and then release the button. PUSH will assume the address of the channel on which '255' was detected.

If the operation was successful, the LEDs on the Unit shall flash in a sequence:

CH1→CH2→CH3→CH4

Note: If more than one channel was set to '255' on the DMX control panel, then PUSH will disregard it and return to previous operation mode.

3.8 (3) Set Level Upon Power Up Mode

1. Press and hold the Mode button for 10~12s to activate this mode.
2. When working standalone, this mode can be used to set the light level upon power up: Press and hold the Mode button – the light will fade up and down. Full scale one-way duration is 8 sec.
3. Release the button when the light reaches the desired intensity.
4. If further adjustment is required – repeat steps 1 and 2 (the fade shall resume from the point it previously stopped at).
 - To save the current level and exit short-press the button 3 times. If the operation was successful, the LEDs on the Unit shall flash in a sequence: CH1→CH2→CH3→CH4.
 - To exit without saving short-press the button 5 times or more, alternatively wait for a 60 sec timeout.

Note:

In case the button was short pressed any other number of times, the unit will disregard it and stay in "Set Level Upon Power Up Mode" until timeout.

3.9 (4) Reset Mode

1. Press and hold the Mode button for 14~17s to activate this mode.
Reset the following settings to default values:
 - DMX Address = 1
 - Power Up Level = 100%



After Reset the Unit shall perform a short self-test sequence:
CH1→CH2→CH3→CH4 shall briefly light up one after another.

Chapter 4: Technical Data

4.1 Electrical

Specification	Notes/ Conditions	Value
Input Voltage	Via external stabilized power supply	12-24VDC
Rated output power	24V 12V	Max. 336W total Max. 168W total
Output voltage	Depends on PSU	12-24VDC
Output channels configuration	Each channel independant	4 channels - up to 3.5A each
Output resolution	Output curve is optimized for the best visual performance	256 steps (per channel)

4.2 Interface

Specification	Value
Control Method	DMX512
Working Mode	DMX512 (1-4 channels work synchroniously or separately)
Loss of Input Signal	Preserves previous state on all outputs, failure indication on front LEDs

4.3 Connections

Specification	Value
Power In Connection Type	Screw terminal block, 4 contacts, pitch 5mm Wire range: 22-14AWG/2.5mm ²
DMX Connection Type	Screw terminal block, 3 contacts, pitch 3.5mm Wire range: 26-16AWG/1.5mm ²
Output Connection Type	Screw terminal block, 10 contacts, pitch 3.5mm Wire range: 26-16AWG/1.5mm ²

4.4 Protection

Specification	Value
Input Protection	Reverse polarity
Output Protection	Short line Overload Reverse polarity
Thermal Protection	Internal circuitry overheat protection: <ul style="list-style-type: none"> thermal feedback under poor ventilation conditions (internal circuitry temperature $>70^{\circ}\text{C}$) shuts down completely at extreme thermal conditions (internal circuitry temperature $>85^{\circ}\text{C}$), resets after power cycle.

4.5 Environment

Specification	Value
Ingress Protection	IP20
Operating Ambient temp.	Range: $-18^{\circ}\text{C} \sim +40^{\circ}\text{C}$ $(0^{\circ}\text{F} \sim +104^{\circ}\text{F})$
Storage temp.	Range: $-18^{\circ}\text{C} \sim +60^{\circ}\text{C}$ $(0^{\circ}\text{F} \sim +140^{\circ}\text{F})$
Humidity	85% RH

Chapter 5: Problem Solving

5.1 Troubleshooting

The following table provides corrective actions for possible trouble situations. If further assistance is required, please contact a d-led customer service representative.

PUSH CV DMX Troubleshooting table:

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Device does not function, power LED is OFF	Unit is not receiving power from the external DC Power Supply	Verify POWER IN connections. Ensure PSU's AC circuit breaker is not tripped.
Device not responding to DMX-512 input signal	Unit is not in DMX-512 Run Mode	Check DIP-Switches setting, make sure it's on either 1/2/4 channels working mode or master dim mode (in this case also check the value of virtual channel #5, make sure it's not zero)
	Bad DMX-512 wiring or DMX-512 signal is missing	Check DMX-512 wiring. When Unit is receiving correct DMX-512 signal the green COM LED on the device will be blinking.
CH(X) LED is blinking	Possible wiring problem with the X channel (X can be 1,2,3 or 4).	Check the load connection for possible short-circuit or overload.
Power LED blinking	Wrong power supply voltage	Check the power supply voltage; make sure it's in the correct range: 12-24VDC.
	Unit overheat	Verify proper ventilation conditions

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Cannot set the desired DMX address	Unit is not in DMX-512 Run Mode	Check DIP-Switches setting, make sure it's on either 1/2/4 channels working mode
	Wrong order of operations	Make sure to follow exactly the procedure described in the Mode Button Functions and Set DMX Address Mode sections
	DMX controller doesn't transmit exactly '255' (Hexadecimal 'FF')	Make sure that your DMX controller is capable of transmitting exactly '255' (Hexadecimal 'FF'), some DMX controllers may display '100%' but the DMX actual value may be less than '255'. It is highly recommended to use professional DMX tester for this procedure
	Two or more transmitted channels are set to '255' (Hexadecimal 'FF')	Make sure that only the desired channel is set to '255'