APT-CV2-Vx-LN-CVO Modules

Features

- APT-CV2 controllers add advanced control features to standard constant voltage (CV) drivers
- CVO versions of the APT controllers are operable to control multiple outputs for constant voltage LED channels simultaneously
- Integrated between the CV driver and LED modules, the DC modules are powered directly from the CV driver
- Operable for independent control over each output channel and/or control over overall intensity and CCT
- APT Programmer enables in-factory and in-field changes to control settings including CCT range, CCT mapping and Intensity mapping
- Wired versions available with DMX512/RDM (VA) or 2x isolated 0-10V ports (VC)
- Wireless versions available with Casambi BLE Mesh (VWC) or Silvair BLE Mesh (VWS)
- Wireless controller versions available with either embedded antenna (EA) or whip antenna (WA)

Ordering Information

Product Code	Description
APT-CV2-V*x*-LN-CVO-*wwww*	**V*x*** – Hardware version **LN** – Linear form factor **CVO** – Constant voltage output ***wwww*** – Internal code provided by Arkalumen as a simplified configuration code for repeat orders

Hardware Version	Functionality
VA	DMX512/RDM
VC	0-10V
VWx	Wireless – BLE Mesh

System Architecture

Design Requirements
1. APT controllers are designed to work with a wide range of drivers, but a fixture manufacturer must test the APT controller for driver compatibility and ensure proper system operation before installation.
2. The DC voltage output from the constant voltage driver should be matched to the desired voltage across each of the constant voltage LED channels.

Contact Arkalumen for technical support at **support@arkalumen.com**

Warnings

1. Do not connect/disconnect input or output wiring while powered
2. Do not connect APT Programmer while APT controller is powered by DC power source
3. Follow ESD protection procedures while handling input or output wiring, and programming port
4. Do not attach an AC input to the APT controller; DC input only
5. Use only with a driver providing an isolated DC output (ie. the output has no earth or protective ground reference).
6. Read and respect all voltage, current and power limits outlined in the electrical specifications section of the hardware version being used
7. Carefully follow and check all wiring diagrams in this document for the correct hardware version being used

Operating Conditions

Environmental	
Ambient Temperature, Range	-40 to +50°C
Material	Plastic

Mechanical Specifications

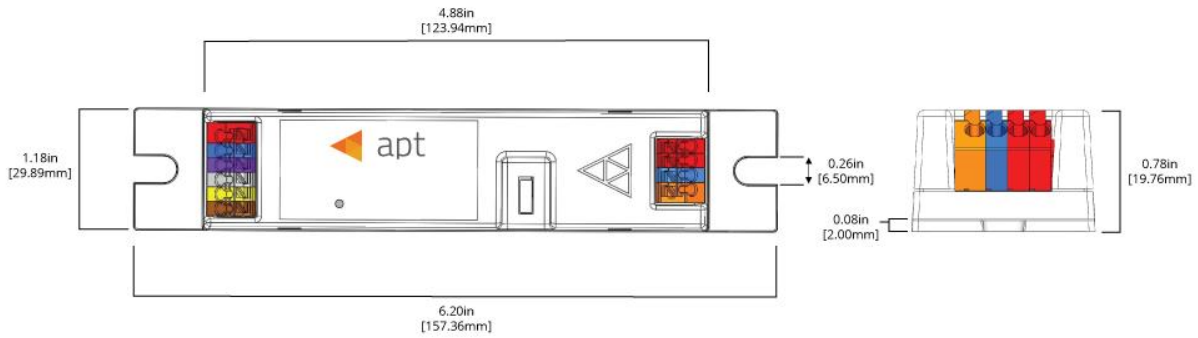


Figure 1 - APT-CV2-Vx-LN-CVO Mechanical Drawing

Dimensions	Inches
Length	6.20
Width	1.18
Height	0.78

APT-CV2-VA-LN-CVO MODULE (DMX512/RDM)

Electrical Specifications

Input

Port	Voltage			Current			Power		
	Min	Max		Min	Max		Min	Max	
DC IN +/-	12	60	V	65	4,100	mA	-	100	W
DMX Data+	-10	15	V	-0.8	1	mA	-	-	
DMX Data-	-10	15	V	-0.8	1	mA	-	-	

Output

Port	Voltage			Current			Power		
	Min	Max		Min	Max		Min	Max	
+	-	60	V	0	4,035	mA	-	100	W
CH1	-	60	V	0	4,035	mA	-	-	
CH2	-	60	V	0	4,035	mA	-	-	

Wiring Diagram

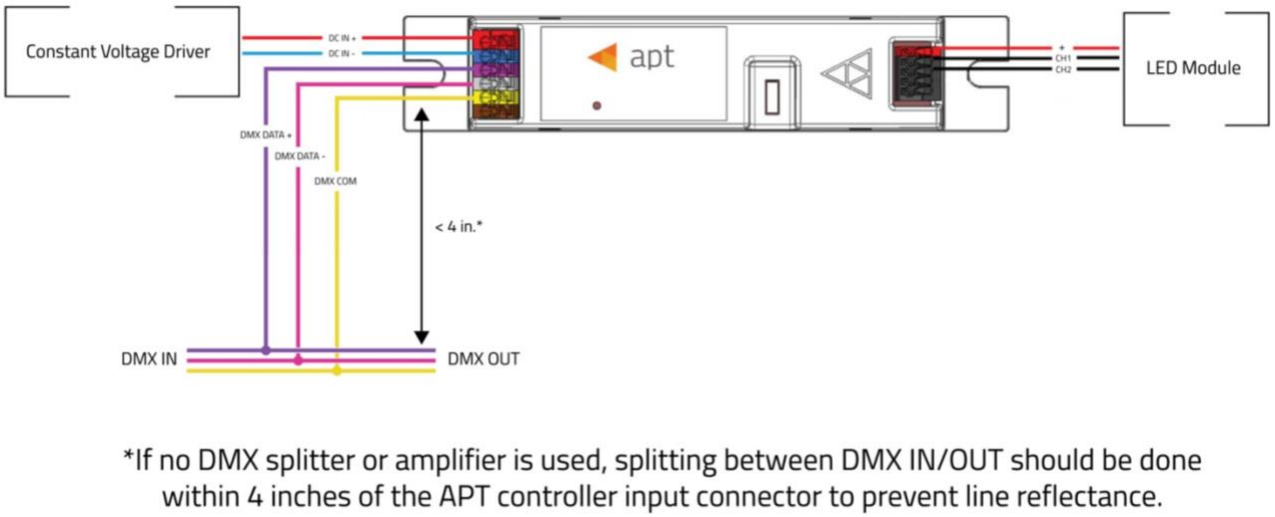
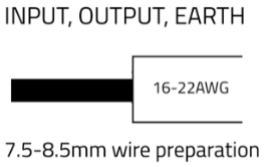


Figure 2 - APT-CV2-VA-LN-CVO DMX512/RDM Configuration

1. Please follow all best practices for DMX wiring to ensure correct operation of the system such as using shielded wires and proper termination resistance for DMX daisy chain.
2. APT controller acts as a floating device as per ANSI E1.11 – 2008. Use only with a driver with an output not referenced to earth or protective ground (ie. isolated output).
3. It is recommended that each fixture should have DMX IN and DMX OUT wires to allow for installation in a DMX daisy chain*.
   **Exception for installations where a splitter or amplifier will be used for each DMX branch*
4. If no DMX splitter or amplifier is used, splitting between DMX IN/OUT should be done within 4 inches of the APT controller input connector to prevent line reflectance.

Wiring	AWG
Input, Output	**16-22**



DMX Address Assignment

Enabled Features	Required DMX Channels
Independent Channel Control	One DMX address is required per available output channel
Calibrated CCT Control	Two additional DMX addresses are required if calibrated CCT mapping is enabled, one for controlling the CCT and one for controlling the overall light intensity

Schemes

Scheme ***n***	# of DMX Addresses	DMX Address			
		Base	+1	+2	+3
1	2	**CCT**	**INT**	**-**	**-**
2	2	**WW**	**CW**	**-**	**-**
3	4	**CCT**	**INT**	**WW**	**CW**
4	4	**WW**	**CW**	**CCT**	**INT**

Legend			
Warm White	**WW**	**CCT Control**	**CCT**
Cool White	**CW**	**Intensity Control**	**INT**

1. The assigned DMX addresses are customizable. The above table is a list of the default schemes available.
2. Changing the DMX Address Assignment does not change the physical wiring of the controller to the LED module. Please refer to Figure 3 for warm white/cool white wiring application.

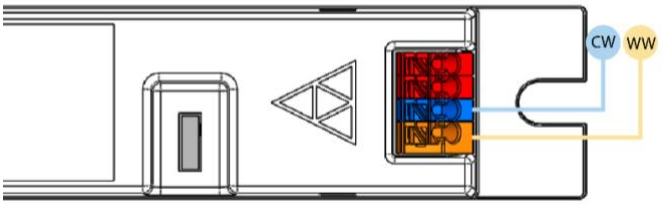


Figure 3 - Wiring APT-CV2-VA-CVO Warm White/Cool White LED module

Ordering Information

Product Code	Description
APT-CV2-VA-LN-CVO-*wwww*	**VA** – DMX512/RDM hardware version **LN** – Linear form factor **CVO** – Constant voltage output ***wwww*** – Internal code provided by Arkalumen as a simplified configuration code for repeat orders

Configuration Code	Description
DMX*n*-A*mmm*-*tttt*	**DMX*n*** – DMX Address Assignment Scheme **A*mmm*** – Base DMX address ***tttt*** – Output control feature

Code	Description	Option	Configuration Trait
DMX*n*	**DMX*n*** denotes DMX wired communication using DMX Address Assignment Scheme ***n***.	**DMX*n***	DMX Address Assignment Scheme ***n***. See Schemes under DMX Address Assignment on page 4.
A*mmm*	***mmm*** denotes the base address of the controller on a DMX bus.	**A001**	Lowest base address option
		A###	Base address specified between 1 and 512
		A512	Highest base address option
tttt	***tttt*** denotes the output control features enabled on the controller.	**0000**	Calibrated CCT mapping disabled
		CALC	Calibrated CCT enabled. Calibrated CCT can be customized to output specific desired light metrics.

APT-CV2-VC-LN-CVO Module (0-10V)

Electrical Specifications

Input

Port	Voltage			Current			Power		
	Min	Max		Min	Max		Min	Max	
DC IN +/-	12	60	V	75	4,100	mA	-	100	W
0-10V IN1/IN2 (Sink)	0	20	V	98	104	µA	-	-	
0-10V IN1/IN2 (Source)	0	20	V	0	300	µA	-	-	

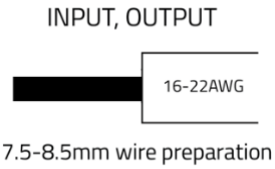
Output

Port	Voltage			Current			Power		
	Min	Max		Min	Max		Min	Max	
+	-	60	V	0	4,025	mA	-	100	W
CH1	-	60	V	0	4,025	mA	-	-	
CH2	-	60	V	0	4,025	mA	-	-	

Wiring Diagram

Figure 4 - APT-CV2-VC-LN-CVO Dual 0-10V Dimmer Configuration

Wiring	AWG
Input, Output	**16-22**



Ordering Information

Product Code	Description
APT-CV2-VC-LN-CVO-*wwww*	**VC** – Isolated 0-10V hardware version **LN** – Linear form factor **CVO** – Constant Voltage Output ***wwww*** – Internal code provided by Arkalumen as a simplified configuration code for repeat orders

Configuration Code	Description
nnnn*-0000-*tttt	***nnnn*** – IN1/IN2 port control features **0000** – No base address to be specified ***tttt*** – Output control feature

Code	Description	Option	Configuration Trait
nnnn	***nnnn*** denotes the control features assigned to each IN port.	**IN00**	Intensity control enabled on IN2 port.
		CICI	Independent channel control enabled.
		INCT	Intensity control enabled on IN2 port and CCT control enabled on IN1 port.
tttt	***tttt*** denotes the output control features enabled on the controller.	**0000**	Calibrated CCT mapping disabled.
		CALC	Calibrated CCT enabled. Calibrated CCT can be customized to output specific desired light metrics.

APT-CV2-VWx-LN-CVO Module (Wireless)

Electrical Specifications

Input

Port	Voltage			Current			Power		
	Min	Max		Min	Max		Min	Max	
DC IN +/-	12	60	V	42	4,100	mA	-	100	W

Output

Port	Voltage			Current			Power		
	Min	Max		Min	Max		Min	Max	
+	-	60	V	0	4,058	mA	-	100	W
CH1	-	60	V	0	4,058	mA	-	-	
CH2	-	60	V	0	4,058	mA	-	-	

Wireless Operating Conditions[1]	
Maximum Transmitter Power	+4dBm
Operating Frequencies	2.4GHz
Maximum Open-Air Range	270m

Contains modular transmitter with FCC ID: X8WBM832, IC (Industrial Canada) ID: 4100A-BM832
Wireless signal range of the controller will decrease if placed in a metal enclosure or placed near other wireless devices operating at similar frequencies, keep the VWx controller at least 20cm away from other VWx controllers or wireless devices. The end product with this module may subject to perform FCC part 15 unintentional emission test requirement and be properly authorized.
This device is intended for OEM integrator only.
If used with ANT020 antenna or integrated PCB trace antenna, device does not require routine evaluation or SAR testing.

Wiring Diagram

Figure 5 - APT-CV2-VWx-LN-xA-CVO Wireless Communication Configuration

Wiring	AWG
Input	**20-26**
Output	**16-22**
Antenna	**ANT020***

***Integrated embedded PCB trace antenna option available on request, ANT020 antenna does not come with device by default, please include request for antenna if necessary**

Ordering Information

Product Code	Description
APT-CV2-VWx-LN-yA-CVO-*wwww*	**VWx** – Wireless - BLE Mesh hardware version (VWC – Casambi BLE, VWS – Silvair BLE) **LN** – Linear form factor **yA** – Antenna version (EA – embedded antenna, WA -whip antenna) **CVO** – Constant voltage output ***wwww*** – Internal code provided by Arkalumen as a simplified configuration code for repeat orders

Configuration Code	Description
nnn*-0000-*tttt	***nnn*** – Wireless control protocol **0000** – No base address to be specified ***tttt*** – Output control feature

Configuration Code Details

Code	Description	Option	Configuration Trait
nnn	***nnn*** denotes the wireless communication source implemented.	**CBM**	Wireless via Casambi BLE Mesh
		SBM	Wireless via Silvair BLE Mesh
tttt	***tttt*** denotes the output control features enabled on the controller.	**0000**	Calibrated CCT mapping disabled.
		CALC	Calibrated CCT enabled. Calibrated CCT can be customized to output specific desired light metrics.