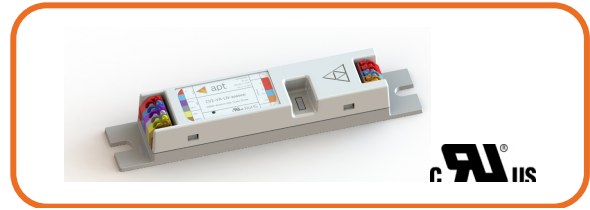


APT-CV2-Vx-LN MODULES



Features

- > APT-CV2 controllers add advanced control features to standard constant voltage (CV) drivers
- > Integrated between the CV driver and LED modules, the DC modules are powered directly from the CV driver
- > APT-CV2 controllers provide up to 2 constant current outputs for powering LED channels of varying forward voltages
- > 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), DALI-2 DT8 (VB), 2x isolated 0-10V ports (VC), or 2x non-isolated 0-10V ports (VD)
- > Wireless versions available (VWx) with Casambi BLE Mesh or Silvr BLE Mesh

Ordering Information

Product Code	Description
APT-CV2-Vx-LN-<i>www</i>	Vx – Hardware version LN – Linear form factor <i>www</i> – Internal code provided by Arkalumen as a simplified configuration code for repeat orders
Hardware Version	Functionality
VA	DMX512/RDM
VB	DALI-2 DT8
VC	0-10V (Isolated)
VD	0-10V (Non-isolated)
VWx	Wireless – BLE Mesh

System Architecture

Design Requirements
1. Ensure DC V_{IN} is greater than V_{OUT} of each channel (dictated by the LED forward voltage of the channel).
2. If optimized transition is desired, use transition calibration feature in the advanced tab of the APT Programmer
3. Minimize ΔV of each channel for optimal efficiency. ΔV_{MAX} is determined based on the channel current (I_{CH}). For $I_{CH} < 1.0A$, $\Delta V_{MAX} = 15V$ For $1.0A < I_{CH} < 2.0A$, $\Delta V_{MAX} = 10V$ For $2.0A < I_{CH} < 2.5A$, $\Delta V_{MAX} = 6.0V$ For $2.5A < I_{CH} < 3.2A$, $\Delta V_{MAX} = 3.5V$
4. LED channels should be able to handle a minimum of 80mA ripple. 80mA ripple is seen with the following conditions, 1.2A/channel and 1.2V ΔV . Current ripple is dependent on ΔV of each channel.
5. 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.

Contact Arkalumen for technical support at support@arkalumen.com

Operating Conditions

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

Arkalumen Products may be covered by patents in the US and elsewhere. www.arkalumen.com/patents

Mechanical Specifications

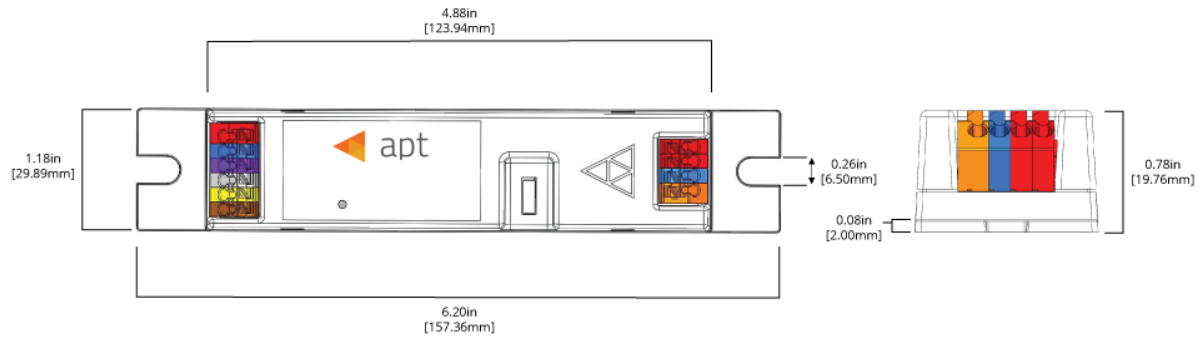


Figure 1 - APT-CV2-Vx-LN Mechanical Drawing

	Dimensions	Inches
	Length	6.20
	Width	1.18
	Height	0.78

APT-CV2-VA-LN 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
+	-	58 V		0	4,035 mA		-	100 W
CH1	-	58 V		0	3,200 mA		-	-
CH2	-	58 V		0	3,200 mA		-	-

Wiring Diagram



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

Wiring	AWG
Input, Output	16-22

INPUT, OUTPUT, EARTH



7.5-8.5mm wire preparation

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 <i>n</i>	# 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.

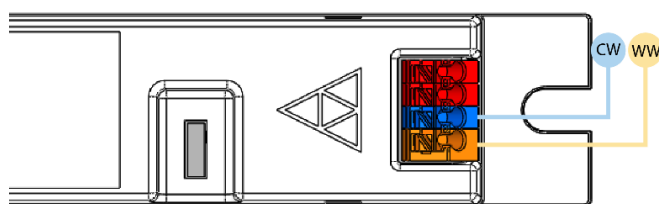


Figure 3 - Wiring APT-CV2-VA Warm White/Cool White LED module

Ordering Information

Product Code	Description
APT-CV2-VA-LN-<i>www</i>	VA – DMX512/RDM hardware version LN – Linear form factor <i>www</i> – Internal code provided by Arkalumen as a simplified configuration code for repeat orders

Configuration Code	Description
DMX<i>n</i>-A<i>mmm</i>-<i>tttt</i>-1C<i>xxx</i>-2C<i>xxx</i>	DMX<i>n</i> – DMX Address Assignment Scheme A<i>mmm</i> – Base DMX address <i>tttt</i> – Output control feature <i>yCxxx</i> – Channel-specific max current

Code	Description	Option	Configuration Trait
DMX<i>n</i>	DMX<i>n</i> denotes DMX wired communication using DMX Address Assignment Scheme <i>n</i> .	DMX<i>n</i>	DMX Address Assignment Scheme <i>n</i> . See Schemes under DMX Address Assignment on page 4.
A<i>mmm</i>	<i>mmm</i> 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
<i>tttt</i>	<i>tttt</i> 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.
<i>yCxxx</i>	<i>yCxxx</i> denotes the maximum current for channel <i>y</i> as configured in the controller's firmware in 20mA increments.	1C###	Maximum current specified up to 3,200mA.
		2C###	e.g. -1C200-2C200 would specify 2000mA max current for channel 1 and 2.

APT-CV2-VB-LN MODULE (DALI-2 DT8)

Electrical Specifications

Input

Port	Voltage			Current			Power		
	Min	Max		Min	Max		Min	Max	
DC IN +/-	12	60	V	10	4,100	mA	-	100	W
DALI DA	-6.5	22.5	V	-	2	mA	-	-	
DALI DA	-6.5	22.5	V	-	2	mA	-	-	

Output

Port	Voltage		Current		Power	
	Min	Max	Min	Max	Min	Max
+	-	58 V	0	4,090 mA	-	100 W
CH1	-	58 V	0	3,200 mA	-	-
CH2	-	58 V	0	3,200 mA	-	-

Wiring Diagram

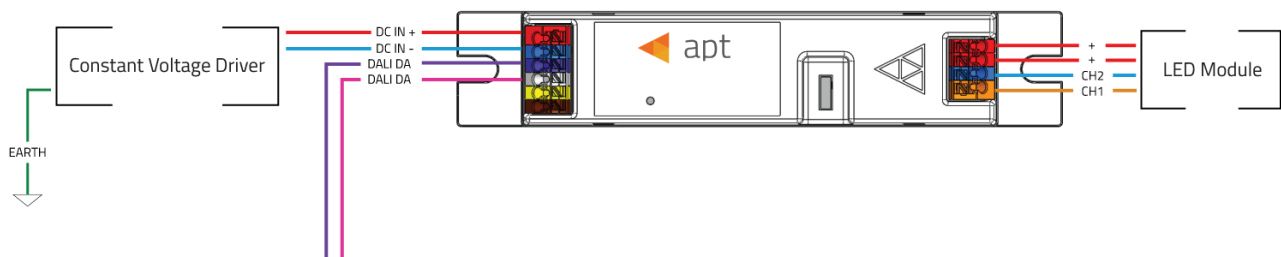


Figure 4 - APT-CV2-VB-LN DALI-2 DT8 Configuration

Wiring	AWG
Input, Output	16-22

INPUT, OUTPUT



7.5-8.5mm wire preparation

Ordering Information

Product Code	Description
APT-CV2-VB-LN-<i>www</i>	VB – DALI hardware version LN – Linear form factor <i>www</i> – Internal code provided by Arkalumen as a simplified configuration code for repeat orders

Configuration Code	Description
DALI-0000-<i>tttt</i>-1<i>Cxxx</i>-2<i>Cxxx</i>	DALI – DALI-2 DT8 Control 0000 – No base address to be specified <i>tttt</i> – Output control feature <i>yCxxx</i> – Channel-specific max current

Configuration Code Details

Code	Description	Option	Configuration Trait
<i>tttt</i>	<i>tttt</i> 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.
<i>yCxxx</i>	<i>yCxxx</i> denotes the maximum current for channel <i>y</i> as configured in the controller's firmware in 20mA increments.	1<i>C###</i>	Maximum current specified up to 3,200mA. e.g. -1C200-2C200 would specify 2000mA max current for channel 1 and 2.
		2<i>C###</i>	

APT-CV2-VC-LN MODULE (0-10V ISOLATED)

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
+	-	58 V	0	4,025 mA	-	100 W
CH1	-	58 V	0	3,200 mA	-	-
CH2	-	58 V	0	3,200 mA	-	-

Wiring Diagram



Figure 5 - APT-CV2-VC-LN Dual 0-10V Dimmer Configuration

Wiring	AWG
Input, Output	16-22

INPUT, OUTPUT



7.5-8.5mm wire preparation

Ordering Information

Product Code	Description
APT-CV2-VC-LN-<i>www</i>	VC – Isolated 0-10V hardware version LN – Linear form factor <i>www</i> – Internal code provided by Arkalumen as a simplified configuration code for repeat orders

Configuration Code	Description
<i>nnnn-0000-tttt-1Cxxx-2Cxxx</i>	<i>nnnn</i> – IN1/IN2 port control features 0000 – No base address to be specified <i>tttt</i> – Output control feature <i>yCxxx</i> – Channel-specific max current

Code	Description	Option	Configuration Trait
<i>nnnn</i>	<i>nnnn</i> 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.
<i>tttt</i>	<i>tttt</i> 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.
<i>yCxxx</i>	<i>yCxxx</i> denotes the maximum current for channel <i>y</i> as configured in the controller's firmware in 20mA increments.	1C###	Maximum current specified up to 3,200mA. e.g. -1C200-2C200 would specify 2000mA max current for channel 1 and 2.
		2C###	

APT-CV2-VD-LN MODULE (0-10V NON-ISOLATED)

Electrical Specifications

Input

Port	Voltage			Current			Power		
	Min	Max		Min	Max		Min	Max	
DC IN +/-	12	60	V	10	4,100	mA	-	100	W
0-10V IN1/IN2 (Sink)	0	12	V	0	90	μA	-	-	
0-10V IN1/IN2 (Source)	0	12	V	0	700	μA	-	-	

Output

Port	Voltage		Current		Power	
	Min	Max	Min	Max	Min	Max
+	-	58 V	0	4,090 mA	-	100 W
CH1	-	58 V	0	3,200 mA	-	-
CH2	-	58 V	0	3,200 mA	-	-

Wiring Diagram



Figure 6 - APT-CV2-VD-LN Dual 0-10V Dimmer Configuration

Wiring	AWG
Input, Output	16-22

INPUT, OUTPUT



7.5-8.5mm wire preparation

Ordering Information

Product Code	Description
APT-CV2-VD-LN-<i>www</i>	VD – Non-isolated 0-10V hardware version LN – Linear form factor <i>www</i> – Internal code provided by Arkalumen as a simplified configuration code for repeat orders

Configuration Code	Description
<i>nnnn-0000-tttt-1Cxxx-2Cxxx</i>	<i>nnnn</i> – IN1/IN2 port control features 0000 – No base address to be specified <i>tttt</i> – Output control feature <i>yCxxx</i> – Channel-specific max current

Code	Description	Option	Configuration Trait
<i>nnnn</i>	<i>nnnn</i> 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.
<i>tttt</i>	<i>tttt</i> 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.
<i>yCxxx</i>	<i>yCxxx</i> denotes the maximum current for channel <i>y</i> as configured in the controller's firmware in 20mA increments.	1C###	Maximum current specified up to 3,200mA. e.g. -1C200-2C200 would specify 2000mA max current for channel 1 and 2.
		2C###	

APT-CV2-VWx-LN 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
+	-	58 V	0	4,058 mA	-	100 W
CH1	-	58 V	0	3,200 mA	-	-
CH2	-	58 V	0	3,200 mA	-	-

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

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

Wiring Diagram



Figure 7 - APT-CV2-VWx-LN Wireless Communication Configuration

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

*Integrated PCB trace antenna available



7.5-8.5mm wire preparation

Ordering Information

Product Code	Description
APT-CV2-VWx-LN-wwww	VWx – Wireless - BLE Mesh hardware version (VWC – Casambi BLE, VWS – Silvair BLE) LN – Linear form factor wwww – Internal code provided by Arkalumen as a simplified configuration code for repeat orders

Configuration Code	Description
nnn-0000-tttt-1Cxxx-2Cxxx	nnn – Wireless control protocol 0000 – No base address to be specified tttt – Output control feature yCxxx – Channel-specific max current

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.
yCxxx	yCxxx denotes the maximum current for channel y as configured in the controller's firmware in 20mA increments.	1C###	Maximum current specified up to 3,200mA. e.g. -1C200-2C200 would specify 2000mA max current for channel 1 and 2.
		2C###	