



# APT-CV2-Vx MODULES



## Features

- > APT-CV2 controllers add advanced control features to constant voltage (CV) drivers
- > Integrated between the CV driver and LED light engines, 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 and addresses
- > DMX or DALI options for controlling independent channel control, overall intensity and CCT
- > Wireless modules with Casambi Bluetooth Mesh, Silvair Qualified Bluetooth Mesh, WIZ Connected Wi-Fi, and LumenRadio DMX

## Ordering Information

Product Code	Description
<b>APT-CV2-Vx-<i>www</i></b>	<b>Vx</b> – Hardware version <b><i>www</i></b> – Internal code provided by Arkalumen as a simplified configuration code for repeat orders

Hardware Version	Functionality
VA	DMX512
VB	DALI Type 8
VC	0-10V
VW	Wireless

## 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. Minimize $\Delta V$ of each channel for optimal efficiency. $\Delta V_{MAX}$ 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 $2.0A < I_{CH} < 3.2A$ , $\Delta V_{MAX} = 5.5V$

Contact Arkalumen for technical support at [support@arkalumen.com](mailto:support@arkalumen.com)

## Operating Conditions

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

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## Mechanical Specifications

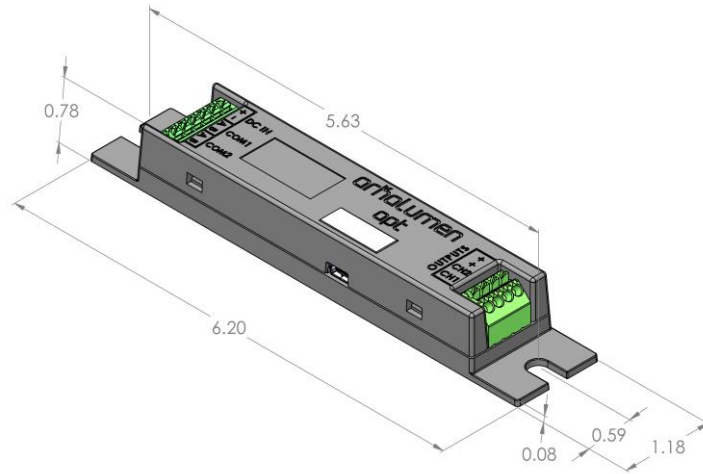


Figure 1 - APT-CV2-Vx Mechanical Drawing

Dimensions	Inches
Length	6.20
Width	1.18
Height	0.78

## APT-CV2-VA MODULE (DMX512)

### Electrical Specifications

#### Input

Port	Voltage		Current		Power	
	Min	Max	Min	Max	Min	Max
DC IN +/-	12	60 V	55	4,100 mA	-	100 W
COM1 A (DMX Data+)	-15	15 V	-0.8	1 mA	-	-
COM1 B (DMX Data-)	-15	15 V	-0.8	1 mA	-	-
COM2 A (DMX Com)	-	-	-	-	-	-
COM2 B (Earth Ground)	-	-	-	-	-	-

#### Output

Port	Voltage		Current		Power	
	Min	Max	Min	Max	Min	Max
+	-	58 V	0	4,045 mA	-	100 W
CH1	-	58 V	0	3,200 mA	-	-
CH2	-	58 V	0	3,200 mA	-	-

### Wiring Diagram

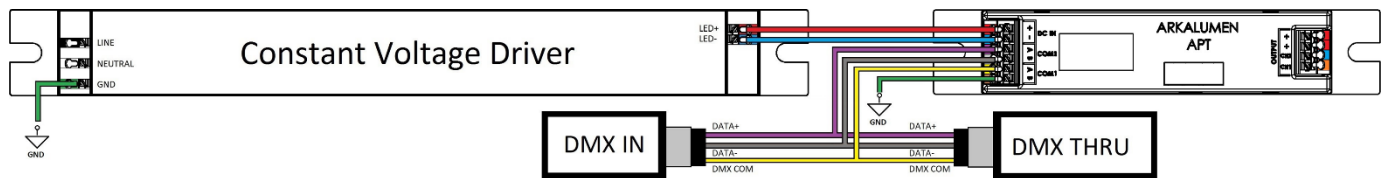


Figure 2 - APT-CV2-VA DMX Configuration

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## 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 light engine. Please refer to Figure 3 for warm white/cool white wiring application.

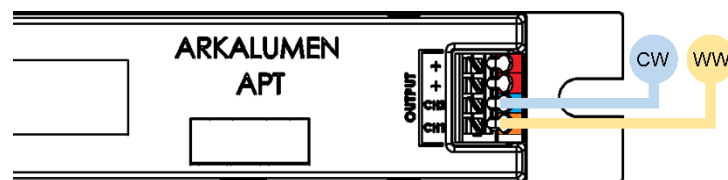


Figure 3 - Wiring APT-CV2-VA Warm White/Cool White Light Engine

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## Ordering Information

Product Code	Description
<b>APT-CV2-VA-<i>wwww</i></b>	<b>VA</b> – DMX hardware version <b><i>wwww</i></b> – Internal code provided by Arkalumen as a simplified configuration code for repeat orders

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

## Configuration Code Details

Code	Description	Option	Configuration Trait
<b>DMX<i>n</i></b>	<b>DMX<i>n</i></b> denotes DMX wired communication using DMX Address Assignment Scheme <i>n</i> .	<b>DMX<i>n</i></b>	DMX Address Assignment Scheme <i>n</i> . See Schemes under DMX Address Assignment on page 4.
<b>A<i>mmm</i></b>	<b><i>mmm</i></b> denotes the base address of the controller on a DMX bus.	<b>A001</b>	Lowest base address option
		<b>A###</b>	Base address specified between 1 and 512
		<b>A512</b>	Highest base address option
<b><i>tttt</i></b>	<b><i>tttt</i></b> denotes the output control features enabled on the controller.	<b>0000</b>	Calibrated CCT mapping disabled
		<b>CALC</b>	Calibrated CCT enabled. Calibrated CCT can be customized to output specific desired light metrics.
<b>yC<i>xxx</i></b>	<b>yC<i>xxx</i></b> denotes the maximum current for channel <i>y</i> as configured in the controller's firmware in 20mA increments.	<b>1C###</b>	Maximum current specified up to 3,200mA. e.g. -1C200-2C200 would specify 2000mA max current for channel 1 and 2.
		<b>2C###</b>	

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## APT-CV2-VB MODULE (DALI TYPE 8)

### Electrical Specifications

#### Input

Port	Voltage		Current		Power	
	Min	Max	Min	Max	Min	Max
DC IN +/-	12	60 V	10	4,100 mA	-	100 W
COM1 A (DALI1)	-6.5	22.5 V	-	2 mA	-	-
COM1 B (DALI2)	-6.5	22.5 V	-	2 mA	-	-
COM2 A (Not Used)	-	-	-	-	-	-
COM2 B (Not Used)	-	-	-	-	-	-

#### 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

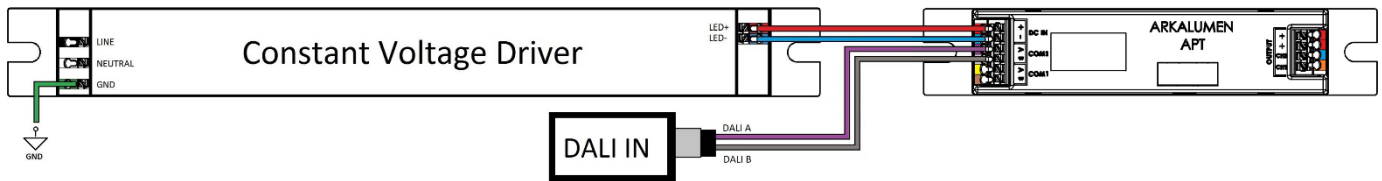


Figure 4 - APT-CV2-VB DALI Configuration

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## Ordering Information

Product Code	Description
<b>APT-CV2-VB-<i>wwww</i></b>	<b>VB</b> – DALI hardware version <b><i>wwww</i></b> – Internal code provided by Arkalumen as a simplified configuration code for repeat orders

Configuration Code	Description
<b>DALI-0000-<i>tttt</i>-1<i>Cxxx</i>-2<i>Cxxx</i></b>	<b>DALI</b> – DALI type 8 Control <b>0000</b> – No base address to be specified <b><i>tttt</i></b> – Output control feature <b><i>yCxxx</i></b> – Channel-specific max current

## Configuration Code Details

Code	Description	Option	Configuration Trait
<b><i>tttt</i></b>	<b><i>tttt</i></b> denotes the output control features enabled on the controller.	<b>0000</b>	Calibrated CCT mapping disabled
		<b>CALC</b>	Calibrated CCT enabled. Calibrated CCT can be customized to output specific desired light metrics.
<b><i>yCxxx</i></b>	<b><i>yCxxx</i></b> denotes the maximum current for channel <b><i>y</i></b> as configured in the controller's firmware in 20mA increments.	<b>1<i>C###</i></b>	Maximum current specified up to 3,200mA. e.g. -1C200-2C200 would specify 2000mA max current for channel 1 and 2.
		<b>2<i>C###</i></b>	

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## APT-CV2-VC MODULE (0-10V)

### Electrical Specifications

#### Input

Port	Voltage		Current		Power	
	Min	Max	Min	Max	Min	Max
DC IN +/-	12	60 V	10	4,100 mA	-	100 W
COM1 A/B (0-10V Sink)	0	10 V	0	90 $\mu$ A	-	-
COM1 A/B (0-10V Source)	0	10 V	0	700 $\mu$ A	-	-
COM2 A/B (0-10V Sink)	0	10 V	0	90 $\mu$ A	-	-
COM2 A/B (0-10V Source)	0	10 V	0	700 $\mu$ A	-	-

#### 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

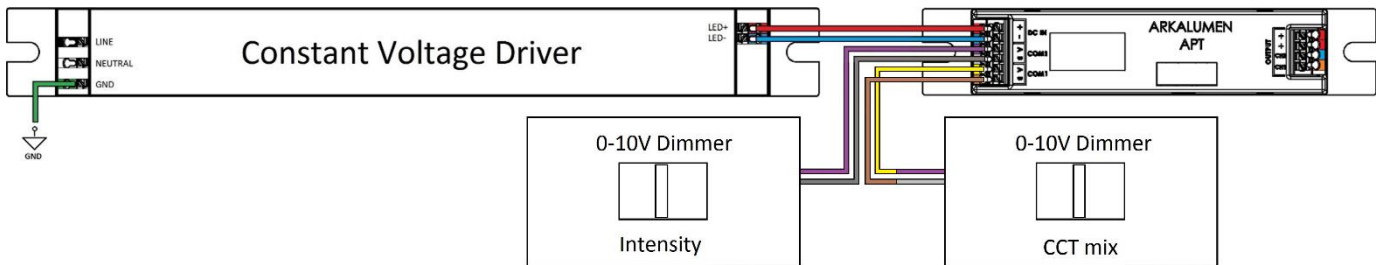


Figure 5 - APT-CV2-VC Dual 0-10V Dimmer Configuration



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## Ordering Information

Product Code	Description
<b>APT-CV2-VC-<i>wwww</i></b>	<b>VC</b> – 0-10V hardware version <b><i>wwww</i></b> – Internal code provided by Arkalumen as a simplified configuration code for repeat orders

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

Code	Description	Option	Configuration Trait
<b><i>nnnn</i></b>	<b><i>nnnn</i></b> denotes the control features assigned to each COM port.	<b>IN00</b>	Intensity control enabled on COM1 port.
		<b>CICI</b>	Independent channel control enabled.
		<b>INCT</b>	Intensity control enabled on COM1 port and CCT control enabled on COM2 port.
<b><i>tttt</i></b>	<b><i>tttt</i></b> denotes the output control features enabled on the controller.	<b>0000</b>	Calibrated CCT mapping disabled.
		<b>CALC</b>	Calibrated CCT enabled. Calibrated CCT can be customized to output specific desired light metrics.
<b><i>yCxxx</i></b>	<b><i>yCxxx</i></b> denotes the maximum current for channel <b><i>y</i></b> as configured in the controller's firmware in 20mA increments.	<b>1C###</b>	Maximum current specified up to 3,200mA. e.g. -1C200-2C200 would specify 2000mA max current for channel 1 and 2.
		<b>2C###</b>	

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## APT-CV2-VW MODULE (WIRELESS)

### Electrical Specifications

#### Input

Port	Voltage		V	Current		mA	Power		W
	Min	Max		Min	Max		Min	Max	
DC IN +/-	12	60		30	4,100		-	100	
COM1 A (Not Used)	-	-		-	-		-	-	
COM1 B (Not Used)	-	-		-	-		-	-	
COM2 A (Not Used)	-	-		-	-		-	-	
COM2 B (Not Used)	-	-		-	-		-	-	

#### Output

Port	Voltage		V	Current		mA	Power		W
	Min	Max		Min	Max		Min	Max	
+	-	58		0	4,070		-	100	
CH1	-	58		0	3,200		-	-	
CH2	-	58		0	3,200		-	-	

Wireless Operating Conditions <sup>1</sup>	
Maximum Transmitter Power	+4dBm
Operating Frequencies	2.36-2.5GHz
Maximum Open-Air Range	300m

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 VW controller at least 20cm away from other VW controllers or wireless devices

### Wiring Diagram

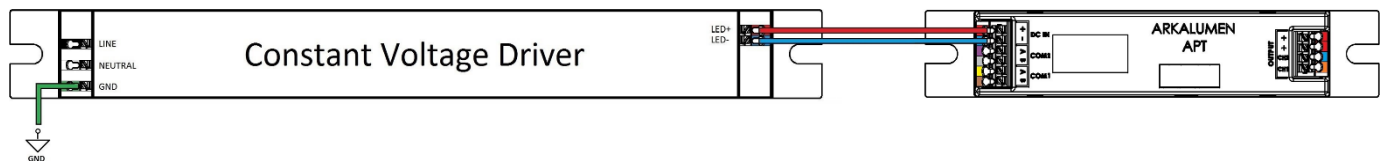


Figure 6 - APT-CV2-VW Wireless Communication Configuration

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## Ordering Information

Product Code	Description
<b>APT-CV2-VW-<i>wwww</i></b>	<b>VW</b> – Wireless hardware version <b>wwww</b> – Internal code provided by Arkalumen as a simplified configuration code for repeat orders

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

## Configuration Code Details

Code	Description	Option	Configuration Trait
<b><i>nnnn</i></b>	<b><i>nnnn</i></b> denotes the wireless communication source implemented.	<b>CBM</b>	Wireless via Casambi Bluetooth Mesh
		<b>QBM</b>	Wireless via Silvair Qualified Bluetooth Mesh
		<b>WIZ</b>	Wireless via WiZ Connected Wi-Fi
		<b>LRX</b>	Wireless DMX via LumenRadio
<b><i>tttt</i></b>	<b><i>tttt</i></b> denotes the output control features enabled on the controller.	<b>0000</b>	Calibrated CCT mapping disabled.
		<b>CALC</b>	Calibrated CCT enabled. Calibrated CCT can be customized to output specific desired light metrics.
<b><i>yCxxx</i></b>	<b><i>yCxxx</i></b> denotes the maximum current for channel <b>y</b> as configured in the controller's firmware in 20mA increments.	<b>1C###</b>	Maximum current specified up to 3,200mA. e.g. -1C200-2C200 would specify 2000mA max current for channel 1 and 2.
		<b>2C###</b>	

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