APT-CV4-VWC-SQ MODULES

Features

- APT-CV4 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-CV4 controllers provide up to 4 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 calibrated channel mix
- APT Programmer enables in-factory and in-field changes to control settings including CCT range, CCT mapping and Intensity mapping
- Wireless version available with Casambi BLE Mesh (VWC)
- Wireless controller versions available with either embedded antenna (EA) or whip antenna (WA)

Ordering Information

Product Code	Description
APT-CV4-V*x*-SQ-*wwww*	**V*x*** – Hardware version **SQ** – Square form factor ***wwww*** – Firmware code provided by Arkalumen

Hardware Version	Functionality
VWC	Wireless – Casambi 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, ΔV_{MAX} = 15V For 1.0A < I_{CH} < 2.0A, ΔV_{MAX} = 9V For 2.0A < I_{CH} < 2.5A, ΔV_{MAX} = 5V For 2.5A < I_{CH} < 3.2A, ΔV_{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**

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

Mechanical Specifications

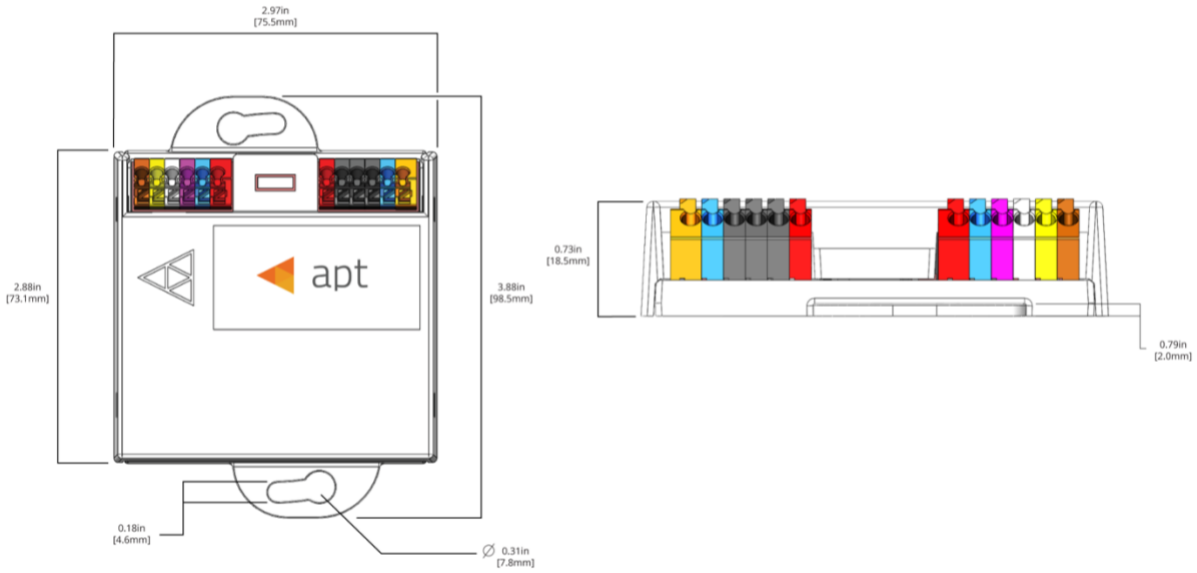


Figure 1 - APT-CV4-Vx-SQ Mechanical Drawing

Dimensions	Inches
Length	2.97
Width	3.88
Height	0.73

APT-CV4-VWC-SQ MODULE (WIRELESS)

Electrical Specifications

Input

Port	Voltage			Current			Power		
	Min	Max		Min	Max		Min	Max	
DC IN +/-	12	60	V	45	4,100	mA	-	100	W

Output

Port	Voltage			Current			Power		
	Min	Max		Min	Max		Min	Max	
+	-	58	V	0	4,055	mA	-	100	W
CH1	-	58	V	0	3,200	mA	-	-	
CH2	-	58	V	0	3,200	mA	-	-	
CH3	-	58	V	0	3,200	mA	-	-	
CH4	-	58	V	0	3,200	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

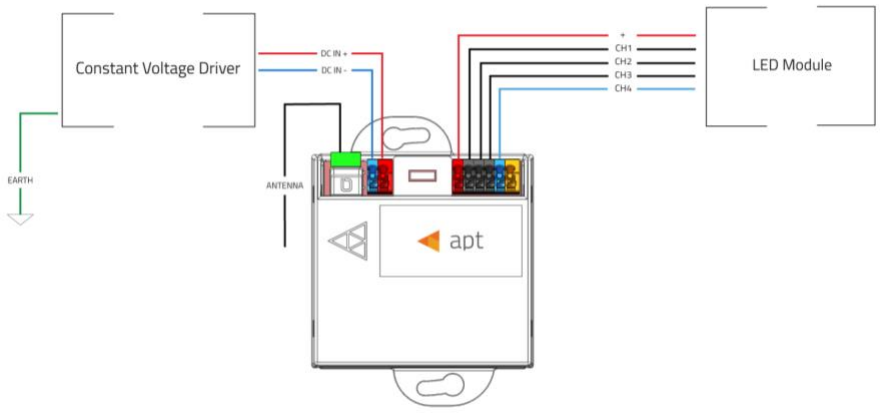
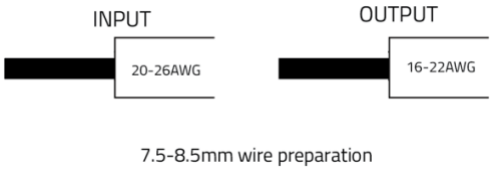


Figure 5 - APT-CV4-VWC-SQ Wireless Communication Configuration

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**



Operating Conditions

Temperature Limits	
Max Temperature, Tc	75°C
Min Ambient Temperature, Ta	-40°C
*Temperature Limits valid when electrical limits are respected and mounting surface is kept at 75°C or below	

Fig. 6 - Tc is measured on metal sleeve of micro-USB programming port in location specified above

Ordering Information

Product Code	Description
APT-CV4-VWC-SQ-yA-*wwww*	**VWC** – Wireless – Casambi BLE Mesh hardware version **SQ** – Square form factor **yA** – Antenna version (EA – embedded antenna, WA -whip antenna) ***wwww*** – Firmware code provided by Arkalumen

Configuration Code	Description
CBMn*-0000-*tttt*-1C*xxx*-2C*xxx*-3C*xxx*-4C*xxx	***CBMn*** – Casambi BLE Mesh wireless control protocol **0000** – No base address to be specified ***tttt*** – Output control feature ***y*C*xxx*** – Channel-specific max current

Configuration Code Details

Code	Description	Option	Configuration Trait
CBMn	**CBM*n*** denotes wireless communication using Scheme Address Assignment ***n***.	***CBMn***	Address Assignment Scheme ***n***. See Schemes under Scheme Address Assignment on page 9.
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.
y*C*xxx	***y*C*xxx*** 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. -1C200-2C030-3C030-4C030-5C030 would specify 2000mA max current for channels 1, and 300mA for channels 2, 3 and 4.
		2C###	
		3C###	
		4C###	