

APT-CV5-Vx-SQ - Precise Multi-Channel Control



Features

- > Converts Constant Voltage Driver into a 5 Channel Constant Current System
- > Integrate intelligent tunable spectra control features into a compact square form factor
- > Select tunable color modules to achieve desired spectra mix & lumen output within a calibrated high output downlight system
- > Independent control of each channel with no perceivable flicker
- > APT Programmer enables dim-to-off, CCT range, CCT mapping, intensity mapping
- > Control Protocols: DMX/RDM & Casambi BLE



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Order Codes

APT Controller	Technology	Number of Channels	Control Protocol	Antenna	Form Factor
APT-CV5-VA-SQ-xxxx	Tunable Color	5	DMX/RDM	n/a	Square
APT-CV5-VWC-SQ-EA-xxxx	Tunable Color	5	Casambi BLE	Embedded	Square
APT-CV5-VWC-SQ-WA-xxxx	Tunable Color	5	Casambi BLE	Whip	Square

*xxxx – Firmware code provided by Arkalumen

Electrical Specifications

Order Code	Max Wattage [W]*	Min Channel Voltage [V]	Min Input Voltage [V]	Max Input Voltage [V]	Max Channel Current [mA]	Max Total Current [mA]
APT-CV5-VA-SQ-xxxx	100	12	15	60	3,760	4,000
APT-CV5-VWC-SQ-EA-xxxx	100	12	15	60	3,760	4,000
APT-CV5-VWC-SQ-WA-xxxx	100	12	15	60	3,760	4,000

*Note: Max Wattage is typically limited to the LED module populated in the APT controller

Mechanical Specifications

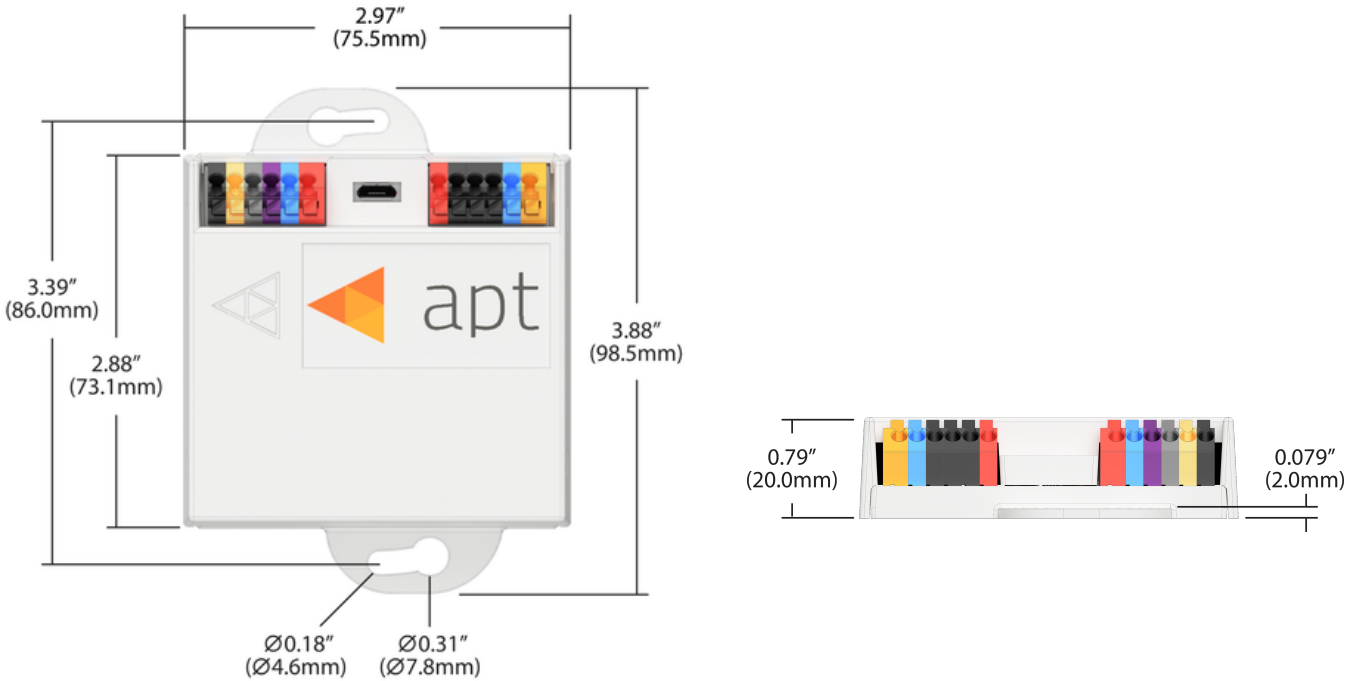


Figure 1 – Mechanical Drawing

Encasement Specifications	
Material	Plastic
RTI Elec	130°C

Operating Conditions

Temperature Limits

Max Temperature, T_c <i>If Ch1, Ch2 and Ch3 are below 3A</i>	85°C
Max Temperature, T_c <i>If Ch1, Ch2 or Ch3 are above 3A</i>	68°C
Min Ambient Temperature, T_a^*	-40°C
Max Ambient Temperature, T_a	50°C

**Temperature ratings valid when ambient temperature inside fixture/housing is below 50C. For applications exceeding this temperature scenario, contact Arkalumen to determine if your application has alternative rating options.*



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

Figure 2 – Measuring T_c

Control Protocol: DMX/RDM

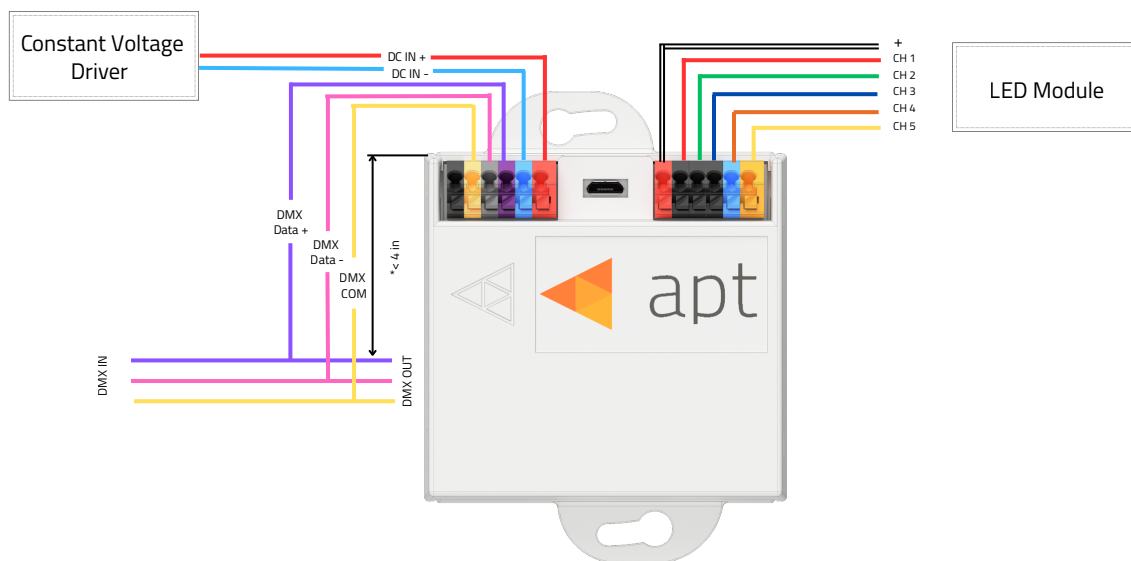


Figure 4– APT-CV5-VA-SQ Wiring Diagram

Note: 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

Control Protocol: DMX/RDM

Electrical Specifications

Input

Port	Voltage [V]		Current [mA]		Power [W]	
	Min	Max	Min	Max	Min	Max
DC IN +/-	15	60	8	4,100	-	100
DMX Data +	-10	15	-0.8	1	-	-
DMX Data -	-10	15	-0.8	1	-	-

Output

Port	Voltage [V]		Current [mA]		Power [W]	
	Min	Max	Min	Max	Min	Max
+	12	58	0	4,000	-	100
CH1	12	58	0	3,760	-	-
CH2	12	58	0	3,760	-	-
CH3	12	58	0	3,760	-	-
CH4	12	58	0	3,760	-	-
CH5	12	58	0	3,760	-	-

Control Protocol: DMX/RDM

DMX Personalities

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

DMX Personalities

DMX Address Assignment					
1	INT	CCT	-	-	-
2	R	G	B	W2	-
3	R	G	B	18K	-
4	R	G	B	22K	-
5	R	G	B	27K	-
6	R	G	B	30K	-
7	R	G	B	35K	-
8	R	G	B	40K	-
9	R	G	B	65K	-
10	R	G	B	W2	W1
11	R	G	B	INT	CCT
12	INT	CCT	SAT	HUE	-
13	HUE	SAT	INT	CCT	-

LEGEND									
Red	R	Blue	B	White 2	W2	Hue	HUE	Intensity Control	INT
Green	G			White 1	W1	Saturation	SAT	CCT Control	CCT

Figure 5 – APT-CV5-VA-SQ DMX Personalities

The assigned DMX addresses are customizable and can be selected as 8-bit or 16-bit

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.

Control Protocol: Wireless Casambi BLE

Wiring Diagrams

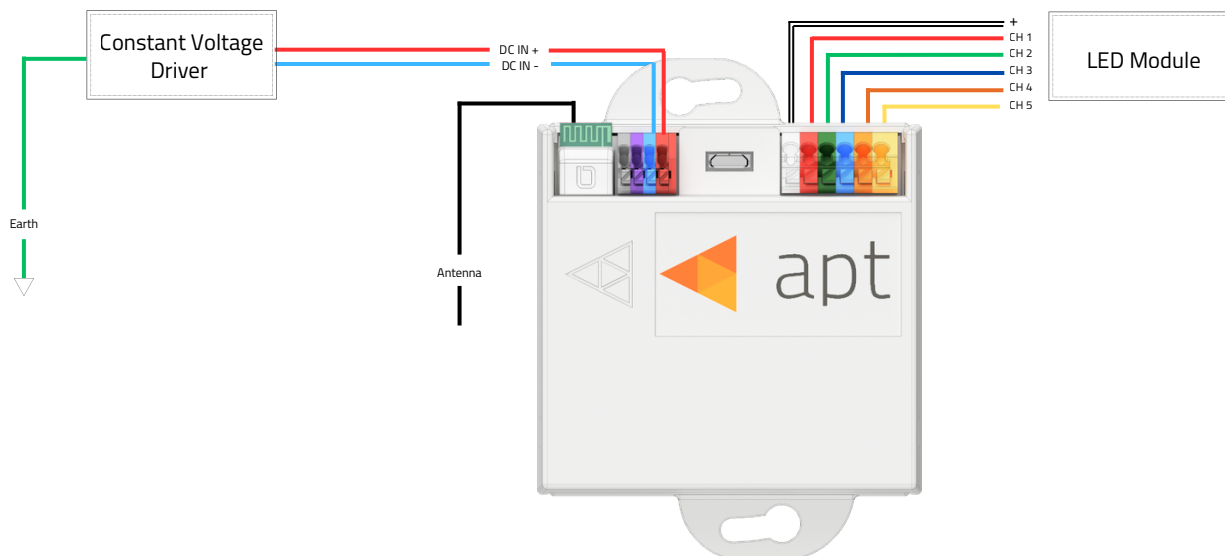
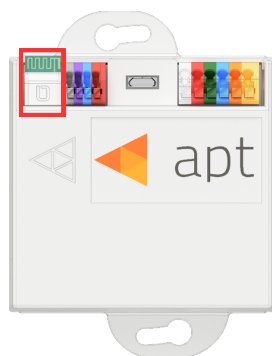


Figure 6 – APT-CV5-VWC-SQ Wiring Diagram

APT controller acts as a floating device as per ANSI E1.11 – 2024. Use only with a driver with an output not referenced to earth or protective ground (ie. isolated output)



When designing and placing the embedded antenna in its enclosure, it is crucial to ensure that no metal is placed near the antenna area, both above and below it. The presence of metal in close proximity to the module can significantly degrade its RF performance.

Figure 7 – Embedded Antenna Location

Control Protocol: Wireless Casambi BLE

Electrical Specifications

Input

Port	Voltage [V]		Current [mA]		Power [W]	
	Min	Max	Min	Max	Min	Max
DC IN +/-	15	60	45	4,100	-	100

Output

Port	Voltage [V]		Current [mA]		Power [W]	
	Min	Max	Min	Max	Min	Max
+	12	58	0	4,000	-	100
CH1	12	58	0	3,760	-	-
CH2	12	58	0	3,760	-	-
CH3	12	58	0	3,760	-	-
CH4	12	58	0	3,760	-	-
CH5	12	58	0	3,760	-	-

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.

APT Programmer

Arkalumen's APT controllers are customizable using our APT Programmer, which allows users to easily configure the controller for your applications. To configure, you will need an APT controller, an APT Programmer hardware unit and the latest version of the APT Programmer user interface.

APT Programmer Hardware:

To request an APT Programmer hardware unit, please contact support@arkalumen.com and a unit can be sent to you.

APT Programmer Software:

To download the latest APT Programmer user interface, please request a download link via the Arkalumen website www.arkalumen.com/apt-programmer/. You will be prompted to add in your information and a link will be sent to you via email with the latest version of the software. If you do not receive the email, please ensure to check your spam folder.

Programable Features

Features	APT-CV5-VA-SQ	APT-CV5-VWC-SQ
Control Protocol	DMX/RDM	Casambi BLE
DMX Personality	✓	✓
Retrieve Settings	✓	
Dim-to-Warm		
Dim-to-Off	✓	✓
Fade-to-Off	✓	✓
Set Max Current	✓	✓
CCT Ranges	✓	✓
CCT Mapping Table	✓	✓
INT Mapping Table	✓	✓

Ecosystem Accessories

Approved Drivers

Arkalumen Systems are compatible with a wide range of isolated 24V constant voltage output drivers. Please contact Arkalumen to confirm the compatibility of your selection.

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

System Architecture:

1. Ensure DC VIN is greater than VOUT 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 (ICH). For $ICH < 1.0A$, $\Delta V_{MAX} = 15V$, For $1.0A < ICH < 2.0A$, $\Delta V_{MAX} = 9V$, For $2.0A < ICH < 3.76A$, $\Delta V_{MAX} = 4.5V$
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 Us

For any further support please contact Arkalumen at support@arkalumen.com or toll free at 1.877.865.5533