apt mini

APT3/5-Vx-M2 - Ultra Compact Form Factor LED Controller

c**UL**us

Features

> Multi-channel constant current driver with up to 5 precisely controlled output channels
> Integrate intelligent tunable spectra control features into an ultra-small linear form factor
> Select tunable white or tunable color modules to achieve desired spectra mix & lumen output within a calibrated linear or downlight system
> Available in a variety of calibrated modes (ex. Intensity-CCT-Saturation-Hue [IKSH], Intensity-CCT [IK]) or independent channel mode)
> APT Programmer enables configuration changes including channel/total current, CCT range, CCT mapping, and intensity mapping
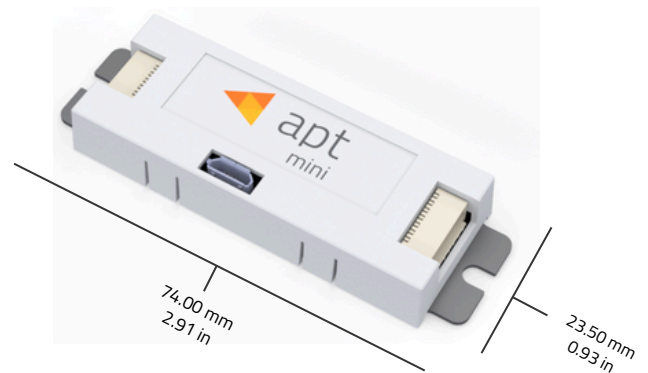> Control Protocols: APT3: 0-10V, DMX/RDM & Casambi BLE. APT5: DMX/RDM & Casambi BLE

74.00 mm
2.91 in

23.50 mm
0.93 in

Table of Contents

APT Mini M2 Order Codes

Order Code	Technology	Number of Channels	Control Protocol
APT3-VA-M2-xxxx	Tunable White	3	DMX/RDM
APT3-VD-M2-xxxx	Tunable White	3	0-10V
APT3-VWC-M2-xxxx	Tunable White	3	Casambi BLE
APT5-VA-M2-xxxx	Tunable Color	5	DMX/RDM
APT5-VWC-M2-xxxx	Tunable Color	5	Casambi BLE

xxxx – Firmware code provided by Arkalumen

APT Mini M2 Electrical Specifications

Order Code	Max Wattage [W]*	Input Voltage [V]	Max Channel Current [mA]	Max Total Current [mA]
APT3-VA-M2-xxxx	48	24	1000	2000
APT3-VD-M2-xxxx	48	24	1000	2000
APT3-VWC-M2-xxxx	48	24	1000	2000
APT5-VA-M2-xxxx	48	24	CH1,2,3 500, CH4,5 1000	2000
APT5-VWC-M2-xxxx	48	24	CH1,2,3 500, CH4,5 1000	2000

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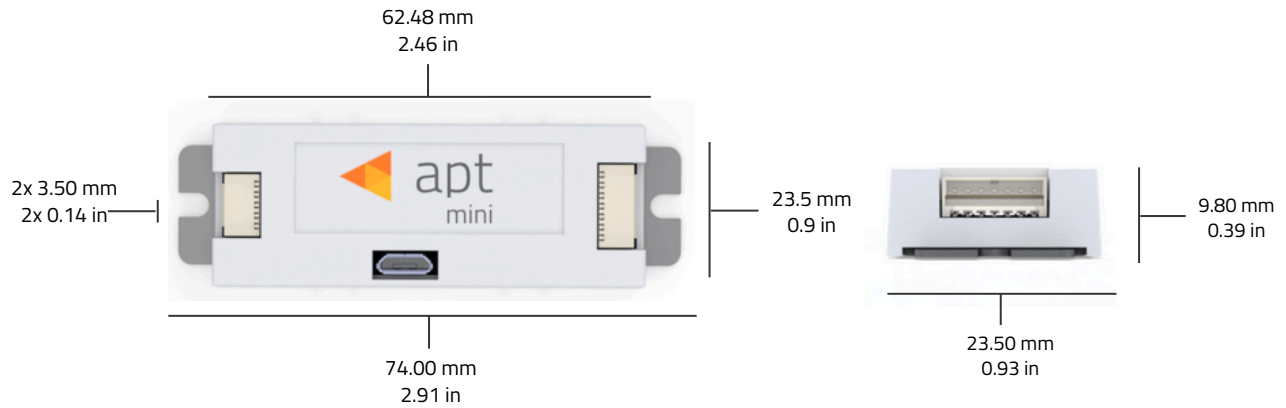
Mechanical Specifications

62.48 mm
2.46 in

2x 3.50 mm
2x 0.14 in

23.5 mm
0.9 in

9.80 mm
0.39 in

74.00 mm
2.91 in

23.50 mm
0.93 in

Figure 1 – Mechanical Drawing

Encasement Specifications	
Material	Plastic
RTI Elec	130°C

Operating Conditions

Temperature Limits	
Min Ambient Temperature, Ta	-40°C
Max Ambient Temperature, Ta	50°C

Control Protocol: DMX/RDM

## Wiring Diagrams

Figure 2 – APT3-VA-M2 Wiring Diagram

Figure 3– APT5-VA-M2 Wiring Diagram

*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

Thermal Feedback: Equipped with a smart temperature sensor system, the controller gradually adjusts current to regulate temperature, preventing overheating and ensuring stable operation and component longevity. Only use with Arkalumen's integrated thermal feedback LED modules, otherwise leave thermal feedback unconnected.

ARK-C1-5A-30

Wire Length: 11.81in [300mm]

Strip length: 0.28in [7mm]   Wire guage: 24 AWG
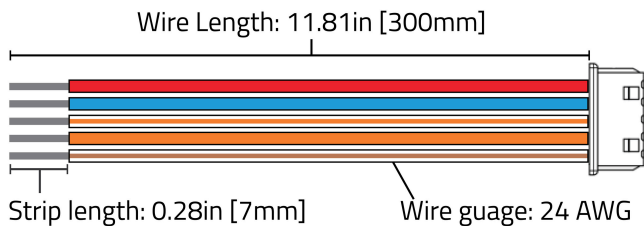
Please contact Arkalumen if you would like a different length of cable

Figure 4 – DMX/RDM Cable Assembly

Function	Wire Color
DC IN +	Red
DC IN -	Blue
DMX Data +	White & Orange
DMX Data -	Orange
DMX COM	White & Brown

Control Protocol: DMX/RDM

Electrical Specifications

Port	Voltage [V]		Current [mA]	
	Min	Max	Min	Max
DMX Data +/Data -	-10	15	-0.8	1

DMX Personalities

Personalities for DMX [y]	DMX Address Assignment		
1	DTW	-	-
2	INT	CCT	-
3	CH1	CH2	-
4	CH1	CH2	CH3

LEGEND					
CH1	CH1	CH2	CH2	CH3	CH3
Intensity Control	INT	CCT Control	CCT	Dim-to-Warm	DTW

Figure 5 – APT3-VA-M2-VA DMX Personalities

Personalities for DMX [y]	DMX Address Assignment				
1	INT	CCT	-	-	-
2	R	G	B	-	-
3	R	G	B	W1	-
4	R	G	B	W1	W2
5	R	G	B	INT	CCT
6	INT	CCT	SAT	HUE	-

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

Figure 6 – APT5-VA-M2-VA 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.

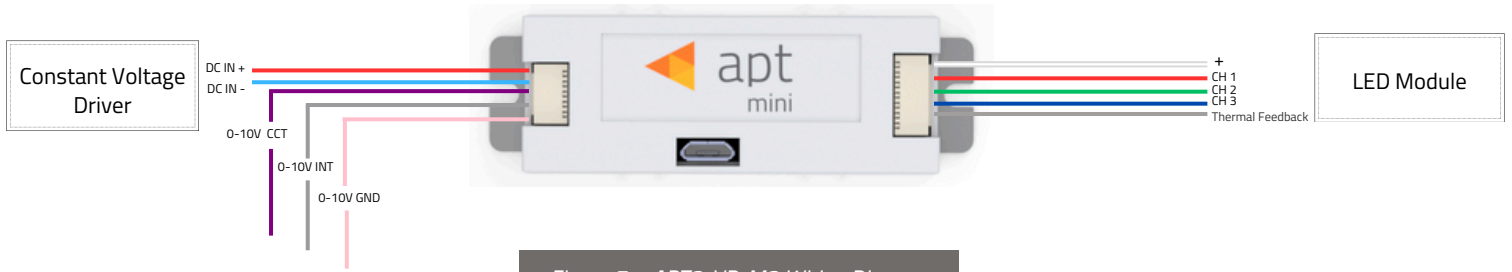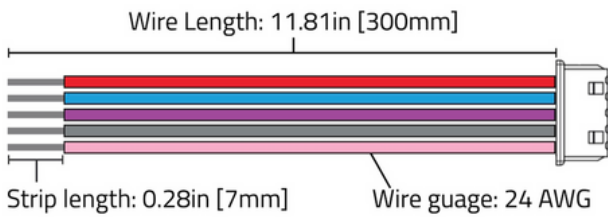# Control Protocol: 0-10V

Wiring Diagram

Figure 7 — APT3-VD-M2 Wiring Diagram

Thermal Feedback: Equipped with a smart temperature sensor system, the controller gradually adjusts current to regulate temperature, preventing overheating and ensuring stable operation and component longevity. Only use with Arkalumen's integrated thermal feedback LED modules, otherwise leave thermal feedback unconnected.

ARK-C1-5B-30

Please contact Arkalumen if you would like a different length of cable

Figure 8 — 0-10V Cable Assembly

Function	Wire Color
DC IN +	Red
DC IN -	Blue
0-10V CCT	Purple
0-10V INT	Grey
0-10V Gnd	Pink

Electrical Specifications

Port	Voltage [V]		Current [mA]	
	Min	Max	Min	Max
0-10V (Sink)*	0	9.36	-	6

*Specification indicates port output ranges only, to be used exclusively with sinking 0-10V dimmers

Control Protocol: Wireless Casambi BLE

Wiring Diagrams

Figure 9 – APT3-VWC-M2 Wiring Diagram


Figure 10 – APT5-VWC-M2 Wiring Diagram

Thermal Feedback: Equipped with a smart temperature sensor system, the controller gradually adjusts current to regulate temperature, preventing overheating and ensuring stable operation and component longevity. Only use with Arkalumen's integrated thermal feedback LED modules, otherwise leave thermal feedback unconnected.
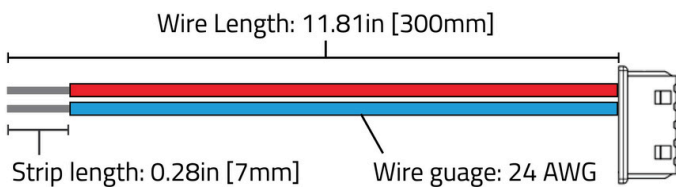
Please contact Arkalumen if you would like a different length of cable

Figure 11 – Wireless Cable Assembly

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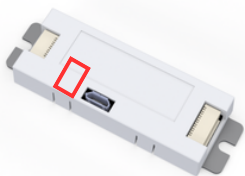
When designing and placing the embedded antenna in its enclosure, it is crucial to ensure that no metal is placed near the antenna area, both above and below it. The presence of metal in close proximity to the module can significantly degrade its RF performance.

Figure 12 – Embedded Antenna Location

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)

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	APT3-VA-M2	APT3-VD-M2	APT3-VWC-M2	APT5-VA-M2	APT5-VWC-M2
Control Protocol	DMX/RDM	0-10V	Casambi BLE	DMX/RDM	Casambi BLE
Thermal Feedback	✓	✓	✓	✓	✓
DMX Personality	✓			✓	
DMX Base Address	✓			✓	
DMX Error Rejection Level	✓			✓	
DMX Fail Mode	✓			✓	
Max Total Current	✓	✓	✓	✓	✓
Retrieve Configurations	✓	✓	✓	✓	✓
Turn Off Transitions (Instantaneous or Fade)	✓	✓	✓	✓	✓
CCT Mapping Table	✓	✓		✓	
INT Mapping Table	✓	✓	✓	✓	✓

Arkalumen Accessories

Input Cables

Arkalumen Part Number	Compatibility	Number of Wires	Wire Colors	Length [mm]
ARK-C1-5A-30	APT3-VA-M2-xxxx APT5-VA-M2-xxxx	5	Red, Blue, White/Orange, Orange, White/Brown	300
ARK-C1-5B-30	APT3-VD-xxxx	5	Red, Blue, Purple, Grey, Pink	300
ARK-C1-2A-30	APT3-VWC-M2-xxxx APT5-VWC-M2-xxxx	2	Red, Blue	300

Molex Part Number 874390500

Output Cables

Arkalumen Part Number	Compatibility	Number of Wires	Wire Colors	Length [mm]
ARK-C2-5A-30	APT3-VA-M2-xxxx APT3-VD-xxxx APT3-VWC-M2-xxxx	5	Grey, Blue, Green, Red, White	300
ARK-C2-7A-30	APT5-VA-M2-xxxx APT5-VWC-M2-xxxx	7	Brown, Orange, Yellow, Blue, Green, Red, White	300

Molex Part Number 874390700

APT3-Vx-M2 Output Cable - ARK-C2-5A-30

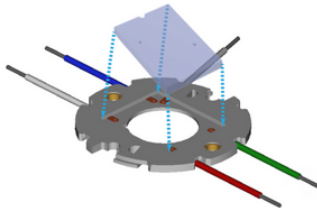## APT5-Vx-M2 Output Cable - ARK-C2-7A-30

Arkalumen Accessories

Compatible LoDA Holders

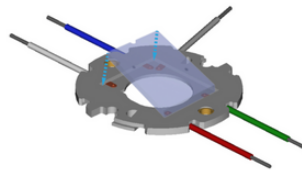| Arkalumen Part Number	Compatibility
ARK-BW-TWA	APT3-VA-M2-xxxx APT3-VD-M2-xxxx APT3-VWC-M2-xxxx
ARK-BW-TCA	APT5-VA-M2-xxxx APT5-VWC-M2-xxxx

How to Align LoDA to Bender+Wirth COB Holder

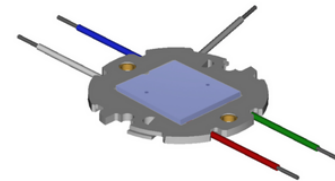### **Tunable White** - APT3-Vx-M2 & ARK-BW-TWA

Step 1	Step 2	Step 3

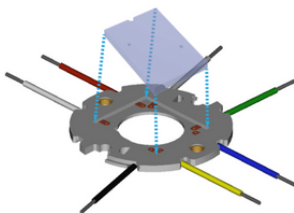*Insert LoDA into the COB holder at a 45° angle*   *Once LoDA is aligned with the bottom of the COB holder, push down into a flush position*   *LoDA properly inserted into COB Holder*

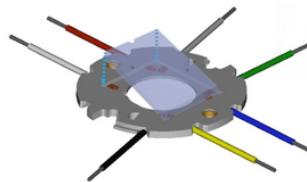*Note: Ensure the notch on LoDA is inserted in between the white & blue wires on the Bender+Wirth holder*

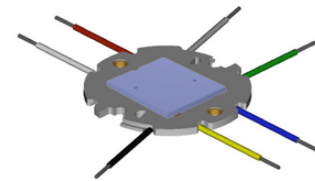### **Tunable Color** - APT5-Vx-M2 & ARK-BW-TCA

Step 1	Step 2	Step 3

Insert LoDA into the COB holder at a 45° angle   *Once LoDA is aligned with the bottom of the COB holder, push down into a flush position*   *LoDA properly inserted into COB Holder*

Note: Ensure the notch on LoDA is inserted in between the white & red wires on the Bender+Wirth holder

Ecosystem Accessories

Approved Drivers

Arkalumen ORB 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

Contact Us

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

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