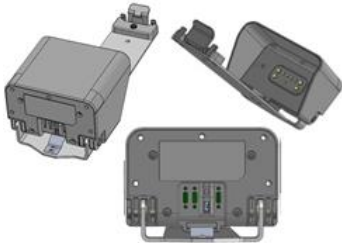


UCA-X5-USB-C3

X5 Lite Battery Cradle: USB-C IN & 2x USB-C OUT

Technical Datasheet (**PRELIMINARY** – Specifications subject to change)



USB-C IN & 2x USB-C OUT X5 Lite Battery Cradle



URB-X5 Battery inserting into X5 Lite Battery Cradle

Benefits & Features

- Easily power USB-C compatible laptop PCs, tablets/iPads, instruments and monitors, using the URB-X5 plug-in battery via:
 - URB-X5 compatible battery cradle with 2 X USB-C OUT connectors
- Charge the companion URB-X5 Lithium-ion battery via AC mains using the USB-C charge (IN) port via USB-C style charger
- An alternative to the URS-X5 power system to directly power DC portable devices on pole or mobile carts
- Attach to pole cart or mobile cart
 - Sturdy, slender aluminum bracket permits various mounting locations
- Quickly insert or remove the URB-X5 battery for recharge
 - Battery receptacle with 15 degrees of tilt flexibility
 - Durable battery locking latch with single handed release

Functional Overview

The UCA-X5-USB-C3 provides a convenient, safe, and reliable way of providing a USB-C power charge input to and a “DC Power” discharge output from an Ultralife URB-X5 battery in medical cart or other similar cart or portable applications. These USB-C power outputs provide a user with a simple interface to existing notebook computers, tablets, or other electronic devices that utilize the industry standard USB-C power source.

A separate USB-C port operates as a USB-C sink input port to charge the URB-X5 battery from a USB-C compatible charger when the URB-X5 battery is inserted in the UCA-X5-USB-C3 Cradle.

Further, a SMBus battery data bus is accessible via a USB Mini connector for access to battery status and state of charge information if desired.

Technical Specifications

Model No.	X5-LITE
Part No.	UCA-X5-USB-C3
Weight	0.5Kg
Interfaces	URB-X5 contact pins, 2x USB-C OUT, 1x USB-C IN, 1x USB mini B (SMBus)

USB-C IN Configuration

Sink (CHARGE) capability at up to 240Watts :
5V-3A, 9V-3A, 15V-3A, 20V-5A, 28V-5A, 36V-5A, 48V-5A
USB-C Charger rates must match Volts and Amps to negotiate the matched rate
Default Min V-A rate is 5V-3A. Higher V-A rate may be negotiated if matching V-A.
Over-current protection: Hiccup mode¹
Over-temperature protection: Hiccup mode¹
USB Power Delivery (PD) 3.1 Sink

USB-C OUT Configuration

Source (DISCHARGE) capability at up to 240 Watts
5V-3A, 9V-3A, 15V-3A, 20V-5A, 28V-5A, 36V-5A, 48V-5A
Over-current protection: Hiccup mode¹
Over-temperature protection: Hiccup mode¹
USB Power Delivery (PD) 3.1 Source

USB-C OUT Configuration:

Source (Discharge) capability at up to 65 Watts: 5V-5A, 9V-5A, 15V-5A, 20V-3.25A
Over-current protection: Hiccup mode¹
Over-temperature protection: Hiccup mode¹
USB Power Delivery (PD) 3.1 Source up to 20V-3.25A max

Supports simultaneous USB-C IN (CHARGE) and OUT (DISCHARGE) operation

Battery Charge:	14.4V up to 20.0A
Battery Pre-charge:	200mA to 7.5V (2.5V/cell)

Electronics Quiescent Current:	0.8mA max.
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Operational Temperature:	-10°C to 50°C (14°F to 122°F)
Charging Temperature:	0°C to 45°C (32°F to 113°F)
Storage Temperature:	-20°C to 60°C (-4°F to 140°F)

Storage Altitude:	2000m. (6,562 ft.) max
Operating Altitude:	5000m (16, 404 ft.) max
Humidity:	80% relative
Atmospheric Pressure:	79.5kPa – 110kPa

Notes

1. Hiccup mode: Output will completely turn off. Unplug/re-plug to regain
2. This product should only be used with a UL listed Class II power supply adapter with USB-C voltage ratings of 5V, 9V, 15V, 20V, 28V, 36V, and 48V and up to 5A of current.

UCA-X5-USB-C3 **PRELIMINARY**

Newark, New York | +1 315-332-7100 | Fax: +1 315-331-7800



Certifications Overview (Pending Test Completions)

- **Medical Safety and Performance:** IEC 60601-1:2005+AMD1:2012 (PENDING TEST APPROVALS)
- **EMC**
 - **IEC:** IEC 60601-1-2:2015+A1:2021; IEC 60601-3-2:2018+A1:2020; IEC 60601-3-3:2013+A2:2021
 - **EU:** EN 60601-1-2:2015+A1:2021; EN 61000-3-2:2014+A1:2019; EN 61000-3-3:2013+A1:2019
 - **UK:** BS EN 60601-1-2:2015+A1:2021; BS EN 61000-3-2:2014+A1:2019; BS EN 61000-3-3:2013+A1:2019
 - **AUS/NZ:** AS/NZS 3200.1.2:2005; AS/NZS 61000.3.2:2014; AS/NZS 61000.3.3:2013
- **FCC:** Federal Register CFR 47, Part 15, subpart B
- **IP41** per IEC 60529:2013

Applications

The UCA-X5-USB-C3 Cradle, when mated with the URB-X5 Battery, is ideally suited for providing USB-C DC power for computers, tablets, and instruments on

- Medical carts
- Warehouse terminal carts or podiums,
- Other portable industrial or commercial carts.

Product Usage

The UCA-X5-USB-C3 is a docking cradle that provides two USB-C power interfaces for a URB-X5 battery. Once a URB-X5 battery is securely latched into the UCA-X5-USB-C3, the operator can utilize the USB ports on the docking cradle to discharge or charge the battery.

The UCA-X5-USB-C3 Type-C IN and OUT ports operate in compliance with the USB Power Delivery (PD) specification USB PD Rev 3.1. One USB-C port can provide up to 240W of negotiated discharge or charge power at 5V-3A, 9V-3A, 15V-3A, 20V-5A, 28V-5A, 36V-5A, or 48V-5A when attached to a similar USB-C PD device. The UCA-X5-USB-C3 internally accomplishes the power conversion to safely charge and discharge the URB-X5 battery at the appropriate voltage and current rate negotiated between the connected USB-C PD Rev 2.0 device and the UCA-X5-USB-C3. The USB-C IN port on the UCA-X5-USB-C3 can be connected to a USB-C compatible charger, wall wart or similar, to charge the URB-X5.

The USB-C OUT ports can each be connected to an external (load) device, such as a tablet, to power or charge the connected device. Source (DISCHARGE) capability at up to 240 Watts 5V-3A, 9V-3A, 15V-3A, 20V-5A, 28V-5A, 36V-5A, 48V-5A on one port, and source (DISCHARGE) capability at up to 65 Watts 5V-3A, 9V-3A, 15V-3A, 20V-3.25-5A on the other port.

The UCA-X5-USB-C3 USB-B Mini connector provides a physical connection for SMBus communications as a pass-through interface to the URB-X5 battery SMBus v1.1 interface. A user can connect to this port for SMBus battery data access including status, state of charge, and programming.

Ensure that the UCA-X5-USB-C3 is not physically damaged and is free of debris prior to use. If it is damaged, do not attempt to use.

USB-C Pass-through Mode and URB-X5 Hot-Swap

The USB-X5-USB can operate in a USB-C power pass-through mode when a USB-C charger is plugged into the USB-C IN port, and a load is plugged into the USB-C OUT port. When the USB-C charger is plugged in and properly negotiated, the URB-X5 can be removed from the cradle and the power from the USB-C IN port will automatically supply the USB-C OUT load; allowing for the URB-X5 to be hot-swapped with a different URB-X5 without needing to turn off the load.

In order for the pass-through mode to operate, the following must occur:

1. A URB-X5 must be installed when the USB-C OUT negotiation takes place. The pass-through mode will not operate if the user attempts to plug in a charger to the USB-C IN and then a load into the USB-C OUT without a URB-X5 present.
2. The USB-C IN charger must be able to supply and negotiate a higher power (W) than the USB-C OUT load. If the USB-C IN charger cannot supply enough power, the USB-C OUT load will overcurrent and turn off. If this occurs, the USB-C OUT cable will need to be unplugged and plugged back in to re-negotiate.

Product Maintenance and Service

UCA-X5-USB-C3 connectors should be kept clear of moisture and excessive dust. If exposed to dirt or dust, the connectors should be cleaned with compressed air.

The UCA-X5-USB-C3 product is not user serviceable. Any service, repair, or replacement should be performed only by the manufacturer.

UCA-X5-USB-C3 **PRELIMINARY **

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Product Cleaning

The UCA-X5-USB-C3 product can be cleaned with the following, as needed, over the life of the product:

- Cloth moistened with 70% isopropyl alcohol (IPA) solution
- Soap/water solution
- Common germicidal or disinfectant wipes.

Never use an abrasive sponge, cleaning pad or cloth on the UCA-X5-USB-C3.

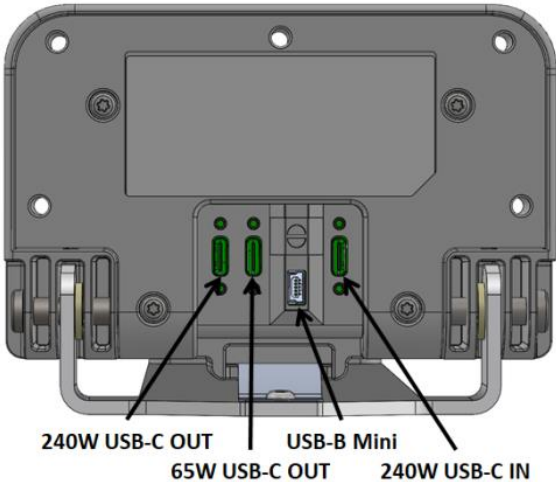
Never use aggressive alkaline (basic) or acidic cleaners on the aluminum mounting plate.

Ensure that the product is dry from cleaning before use.

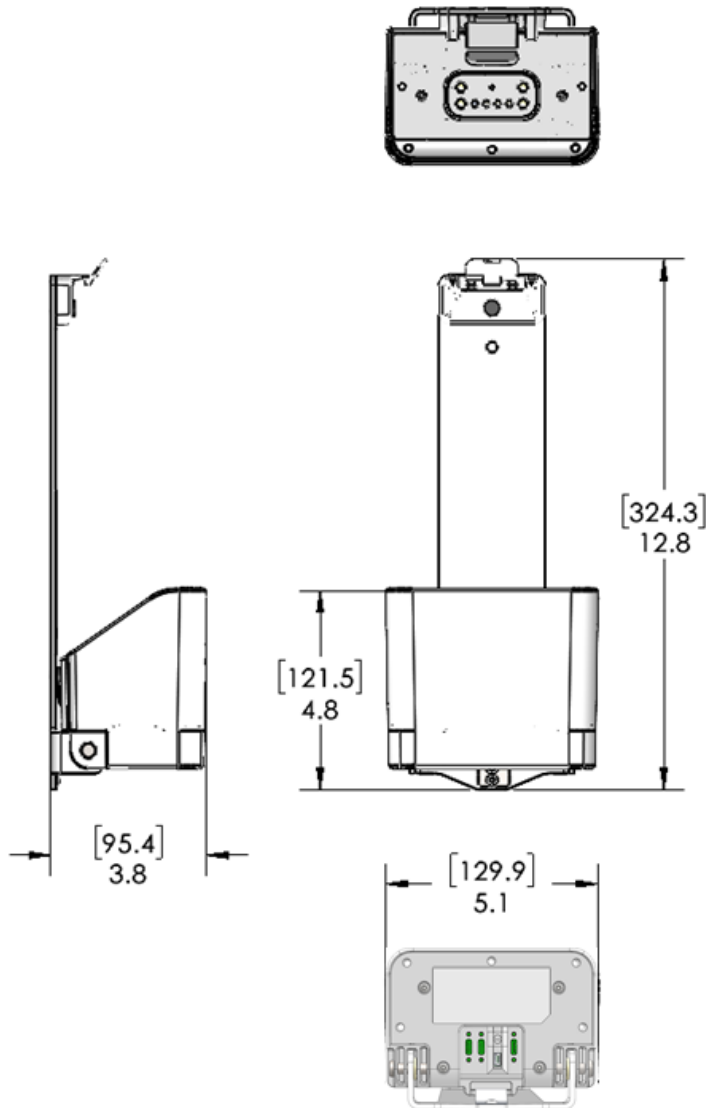
Connector Locations & Pinout

- USB-C IN Connector- Socket Type
 - Shown at USB-C location
 - Standard USB-C Pinout
- USB-C OUT Connector- Socket Type
 - Shown at USB-C location
 - Standard USB-C Pinout
- USB-C OUT Connector- Socket Type
 - Shown at USB-C location
 - Standard USB-C Pinout
- USB-B Mini Connector- Socket Type
 - Shown in USB-B Mini location
 - SMBus Custom Pinout as follows:

USB-B Mini Connector SMBus Pinout	
Pin	Function
1	5V
2	SCL
3	SDA
4	N/C
5	GND



Product Dimensions



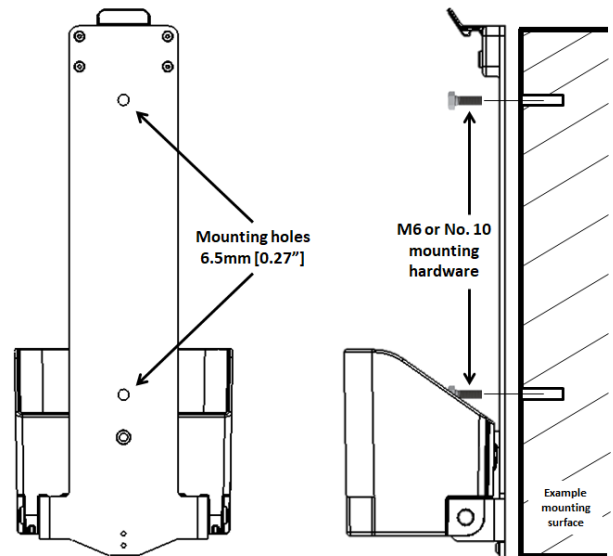
Dimensions: [mm] in

Product Installation

The UCA-X5-USB-C3 provides two 6.5mm (0.26") mounting holes on the mounting bracket to facilitate rigid mounting.

Install the UCA-X5-USB-C3 using M6 or No. 10 hardware into a stable structure, ensuring the hardware and structure are capable of supporting at least 22.7 Kg (50 lbs).

NOTE: The use of lock washers or thread-locker is recommended if mounting on a cart or alternate location where vibration is possible.



Return / Disposal

The UCA-X5-USB-C3 may be subject to Federal, State, or local regulations. Consult the applicable regulations prior to disposal as waste electronic equipment.

Safety Notices / Symbols

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PN



SN



CE



FC



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EMC ACCOMPANYING DOCUMENT

The UCA-X5-USB-C3 requires special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in these accompanying documents. Portable and mobile RF communications equipment can affect medical electrical equipment.

WARNING: A risk of increased emissions or decreased immunity may result when charger cables are attached.

WARNING: Observe to verify normal operations if it is necessary to use adjacent to or stacked with other equipment.

Guidance and Manufacturer's Declaration – Electromagnetic Emissions		
The UCA-X5-USB-C3 is intended for use in the electromagnetic environment specified below. The customer or the user of the UCA-X5-USB-C3 should assure that it is used in such an environment.		
Emissions Test	Compliance	Electromagnetic Environment - Guidance
RF emissions CISPR 11/EN55011	Group 1	The UCA-X5-USB-C3 is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
RF emissions CISPR 11/EN55011	Class A	
Harmonic emissions IEC/EN 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC/EN 61000-3-3	Complies	

Guidance and Manufacturer's Declaration – Electromagnetic Immunity			
The UCA-X5-USB-C3 is intended for use in the electromagnetic environment specified below. The customer or the user of the UCA-X5-USB-C3 should assure that it is used in such an environment.			
Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment - Guidance
Electrostatic Discharge (ESD) IEC/EN 61000-4-2	±6kV contact ± 8kV air	±6kV contact ± 8kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Power Frequency (50/60 Hz) Magnetic Field IEC/EN 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be a levels characteristic of a typical location in a typical commercial or hospital environment.
Electrical Fast Transient/Burst IEC/EN 610004-4	+2kV for power supply lines	+2kV	Mains power quality should be that of a typical commercial or hospital environment
Surge IEC/EN 61000-4-5	+1kV line(s) to line(2) +2kV line(s) to earth	+1kV line to line +2kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.



Voltage dips, short interruptions and voltage variations on power supply input lines IEC/EN 61000-4-11	<5% UT (>95% dip in UT) For 0,5 cycle	Complies	Mains power quality should be that of a typical commercial or hospital environment.
	50% UT (60% dip in UT) For 5 cycles	Complies	
	70% UT (30% dip in UT) For 25 cycles	Complies	
	<5% UT (>95% dip in UT) For 5 s	Complies	
Conducted RF IEC/EN 61000-4-6	3Vrms	3Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the UCA-X5-USB-C3, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = [3.5/3] \sqrt{P}$ $d = [3.5/3] \sqrt{P} \text{ 80 MHz to 800 MHz}$ $d = [7/3] \sqrt{P} \text{ 800 MHz to 2.5 GHz}$ where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, - Should be less than the compliance level in each frequency range. - Interference may occur in the vicinity of equipment marked with the following symbol: 
Radiated RF IEC/EN 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	

NOTE 1: For system level certification of Radiated RF, a USB-C charger that is emissions certified should be used, or a ferrite (ex. Fair-Rite PN 0431167281) double-looped with USB-C cable may be needed.

NOTE 2: At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 3: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

- Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the UCA-X5-USB-C3 is used exceeds the applicable RF compliance level above, the UCA-X5-USB-C3 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the UCA-X5-USB-C3.



Recommended Separation Distances between Portable and Mobile RF Communications Equipment and the UCA-X5-USB-C3			
The UCA-X5-USB-C3 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the UCA-X5-USB-C3 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the UCA-X5-USB-C3 as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power of transmitter(W)	Separation distance according to frequency of transmitter (m)		
	150 kHz to 80 MHz $d = [3.5/3] \sqrt{P}$	80 MHz to 800 MHz $d = [3.5/3] \sqrt{P}$	800 MHz to 2.5 GHz $d = [7/3] \sqrt{P}$ 800 MHz to 2.5 GHz
0.01	0.117	0.117	0.233
0.1	0.369	0.369	0.738
1	1.167	1.167	2.333
10	3.689	3.689	7.379
100	11.667	11.667	23.333
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.			
NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.			
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			