

Installation Manual and Operating Instructions

TRUE BLUE POWER

TA202 SERIES

HIGH POWER USB
CHARGING PORT

Manual Number
9017899



Revision K • November 10, 2020

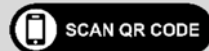
FOREWORD

This manual provides information intended for use by persons who, in accordance with current regulatory requirements, are qualified to install this equipment. If further information is required, please contact:

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We welcome your comments concerning this manual. Although every effort has been made to keep it free of errors, some may occur. When reporting a specific problem, please describe it briefly and include the manual part number, the paragraph/figure/table number and the page number. Send your comments to:

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TABLE OF CONTENTS

<u>SECTION 1</u>	<u>GENERAL DESCRIPTION</u>	<u>4</u>
1.1	PURPOSE OF EQUIPMENT	4
1.2	TECHNICAL SPECIFICATIONS	5
<u>SECTION 2</u>	<u>PRE-INSTALLATION CONSIDERATIONS</u>	<u>6</u>
2.1	COOLING	6
2.2	EQUIPMENT LOCATION	6
2.3	ROUTING OF CABLES	6
2.4	LIMITATIONS	6
2.5	MODIFICATIONS	7
<u>SECTION 3</u>	<u>INSTALLATION</u>	<u>8</u>
3.1	GENERAL INFORMATION	8
3.2	UNPACKING AND INSPECTING EQUIPMENT	8
3.3	CABLE HARNESS	8
3.4	MOUNTING	9
3.5	INSTALLATION COMPLETION	10
<u>SECTION 4</u>	<u>OPERATION</u>	<u>14</u>
4.1	ELECTRICAL PERFORMANCE	14
4.2	PROTECTIVE FEATURES	14
<u>SECTION 5</u>	<u>CONFORMANCE</u>	<u>15</u>
5.1	INSTRUCTIONAS FOR CONTINUED AIRWORTHINESS	15
5.2	ENVIRONMENTAL QUALIFICATON STATEMENT	15

REVISION HISTORY

Rev	Date	Detail	Approved
A	03/14/2016	Initial release.	BAW
B	04/25/2016	Updated formatting, added AEH statement to table 1.3	CAS
C	05/10/2016	Added single port unit mounting options, removed configurations table.	BAW
D	06/23/2016	Added two screws (1/4") to include connector kit.	ScH
E	01/04/2017	Updated to include new mounting option. Added 1.2.4.	BAW
F	05/07/2019	Added single rear mount with cover plate option.	VAA
G	06/06/2019	Updated figure 3.9 and added rear mount with circular cover plate options.	VAA
H	05/14/2020	Updated style and brand to meet Marketing and Engineering guidelines. Update Section 3.2, Optional Equipment names.	DLR
J	06/30/2020	Updated DO-160 qualifications in Section 5 based on additional testing. Updated wire length in Section 3.3.1.	DLR
K	11/10/2020	Updated DO-160 Section 21 to reflect Category M; typo from previous revision.	DLR

SECTION 1 GENERAL DESCRIPTION

1.1 PURPOSE OF EQUIPMENT

The TA202 Series High Power USB Charging Port is a certified accessory that converts 10 to 32 volts of DC electrical input from the aircraft to standard 5 volt power for any electronic product that charges using a USB connector. The TA202 provides one or two Universal Serial Bus-A or C (USB-A or USB-C) ports and can be rear mounted or front mounted in a variety of locations throughout the aircraft. The new “Type-C” USB port design is a smaller port that accommodates the latest consumer electronic devices on the market. Among other features, the Type-C connector accepts reversible cable plugging with no ‘up’ or ‘down’ requirement for cable orientation. The unit is certified to FAA TSO C71 and qualified to multiple RTCA DO-160 requirements, providing confidence and allowing installation in the cockpit or cabin.

This High Power USB Charging Port is designed as a DCP (Dedicated Charging Port) to industry-standard protocol per the *USB Battery Charging 1.2 Compliance Plan*. It also complies with the higher power requirements of *USB Power Delivery 2.0*. Newer electronics, such as the Apple iPad®, other tablets and larger devices can accept or may require 2.1 amps or more to charge and operate. As a high power DCP, the TA202 can provide up to 3.0 amps of power to charge USB devices, including the higher demand products. Most dual USB chargers typically provide 1.0 amp on one port and 2.1 amps on the second port, but the TA202 can provide 3.0 amps to both ports simultaneously (for dual port units). The unit has built-in protections for short circuit, over-current, and low voltage conditions. It is designed to protect against reverse polarity installation and has temperature monitoring and shutdown capability, allowing the unit to handle unforeseen conditions safely.

Small, compact and powerful, with plenty of installation flexibility, the TA202 is an ideal choice as a highly useful and effective addition to any aircraft.

1.2 TECHNICAL SPECIFICATIONS

Electrical Attributes	
Input Voltage	10-32 VDC
Input Power	35 watts max; 2.5 amps @ 14 VDC / 1.25 amps @ 28 VDC
Output Voltage	5 VDC ±0.25 per port
Output Power	3.0 amps max per port
Efficiency	~90% nominal

Table 1.1

Physical Attributes	
Weight	1.3 oz. (38 g) (dual port), 0.8 oz. (23 g) (single port)
Dimensions (Dual Port Units) (not including connector)	1.50 inches wide X 1.03 inches high X 1.25 inches deep
Dimensions (Single Port Units) (not including connector)	1.50 inches wide X 0.52 inches high X 1.25 inches deep
Charging Ports Type	USB Standard-A or USB Standard-C
Connector Kit	MCIA P/N 9017960
Mounting	Panel mount; rear or front

Table 1.2

Qualifications	
Certification	FAA TSO-C71
	EASA ETSO-C71
Environmental Qualification	RTCA DO-160G Environmental Category See Section 5.2
Airborne Electronic Hardware	RTCA DO-254, Design Assurance Level E

Table 1.3

Configurations				
	Non Lighted	Lighted	Power Input Location	USB Connector
Part Numbers	6430202-1	6430202-11	Rear	Dual: Type A+Type C
	6430202-2	6430202-12	Bottom	
	6430202-3	6430202-13	Rear	Dual: Type C+Type C
	6430202-4	6430202-14	Bottom	
	6430202-5	6430202-15	Rear	Dual: Type A+Type A
	6430202-6	6430202-16	Bottom	
	6430202-7	6430202-17	Rear	Single: Type C
	6430202-8	6430202-18	Bottom	
	6430202-9	6430202-19	Rear	Single: Type A
	6430202-10	6430202-20	Bottom	

Table 1.4

SECTION 2 PRE-INSTALLATION CONSIDERATIONS

2.1 COOLING

No external cooling is required. The unit will become warm when in use. This is normal and within operational parameters. No special mounting considerations are required; however, mounting to a metal surface can help dissipate any heat generated and extend the life of the product.

2.2 EQUIPMENT LOCATION

The TA202 High Power USB Charging Port is designed for mounting flexibility, allowing for installation in the cockpit or in the cabin. It is designed for panel mounting and can be installed in a rectangular configuration or, with an available installation kit, can be front mounted with a cosmetic cover plate. An instrument mounting adapter bracket is also available to easily mount the unit in a standard 2-inch round instrument opening that may already exist in the cockpit panel. There are two versions to choose from which allow the input connector to be located either on the rear of the unit or from the bottom.

The unit can be mounted in any orientation. Clearance should be provided for the mating connector which may require an additional inch beyond the rear of the unit.

2.3 ROUTING OF CABLES

Avoid sharp bends in cabling and routing near aircraft control cables. Avoid close proximity and contact with aircraft structures, avionics equipment or other obstructions that could chafe wires during flight and cause undesirable effects.

2.4 LIMITATIONS

Environmental qualifications were verified per RTCA DO-160, Revision G in lieu of those identified within the minimum performance standards (MPS) of the TSO.

The conditions and tests for TSO approval of this article are minimum performance standards. Those installing this article, on or in a specific type or class of aircraft, must determine that the aircraft installation conditions are within the TSO standards, specification of the article and deviations as listed above. TSO articles must have separate approval for installation in an aircraft. The article may be installed only according to 14 CFR part 43 or the applicable airworthiness requirements.

The USB Type-C interface is an exciting new connector for electronic devices. Beyond the physical format of the Type-C connector, it also allows for a variety of interface options when communicating with compatible devices. This device-to-charger communication is defined within the USB 3.1 Specification and Power Delivery 2.0 standards. However, manufacturers of consumer electronic devices and/or cables may choose to implement proprietary versions or modifications of the USB standards to operate specifically with their own charging equipment. The TA202 has been tested with and supports a wide variety of devices now emerging on the open market. However, compatibility with all devices may not be guaranteed. True Blue Power continues to be proactive in evaluating new devices and strives to continually improve the product as needed to serve the vast majority of USB Type-C electronic products.

2.5 MODIFICATIONS

This product has a nameplate that identifies the manufacturer, part number, description, certification(s) and technical specifications of the unit. It also includes the “MOD” or modification number representing notable changes in the hardware design of the unit.

Modification (MOD) 0 is the initial release of the product and is identified on the nameplate by the lack of marking on the MOD numbers 1 through 9 (i.e. 1-9 are visible). All subsequent modifications are identified on the nameplate by the marking/blacking out of that particular MOD number (i.e. for MOD 1, the number 1 is not visible and 2-9 are visible - see Figure 2.1 for examples). MODs do not have to be sequentially inclusive and may be applied independent of each other.

For additional details regarding specific changes associated with each MOD status refer to the product published Service Bulletins at www.truebluepowerusa.com.

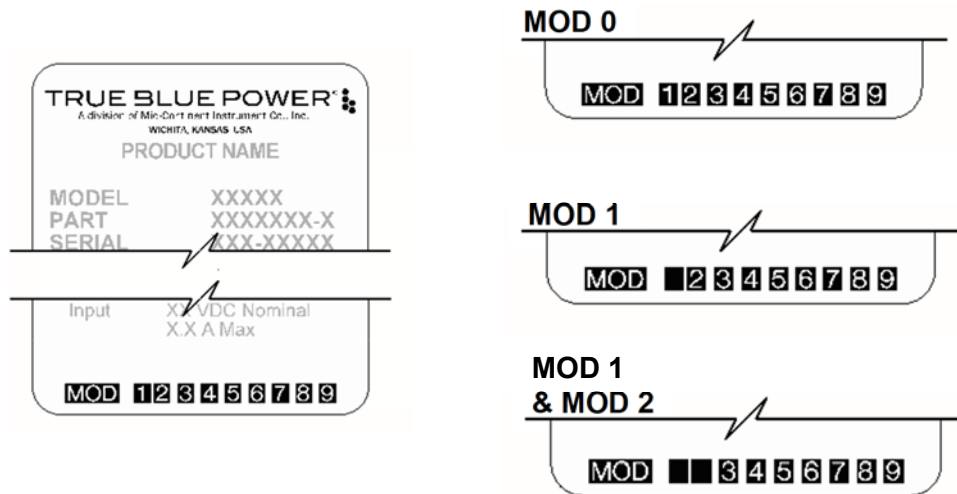


Figure 2.1

Nameplate and MOD Status Example

SECTION 3 INSTALLATION

3.1 GENERAL INFORMATION

This section contains interconnect diagrams, mounting dimensions and other information pertaining to the installation of the TA202 Single and Dual USB Charger. After installation of cabling and before installation of the equipment, ensure that power and ground are applied to the proper pins specified in Section 3.3.2, Pin Assignment Information.

3.2 UNPACKING AND INSPECTING EQUIPMENT

When unpacking this equipment, make a visual inspection for evidence of any damage that may have occurred during shipment. The following parts should be included:

- | | |
|--|----------------------|
| A. High Power USB Charging Port | MCIA P/N 6430202-() |
| B. Installation Manual | MCIA P/N 9017899 |
| C. Connector Kit | MCIA P/N 9017960 |
| i. Mating Connector, 2-pin | |
| ii. Pins (4) (2 required, 2 spares) | |
| iii. Screws, #4-40 x 1/4 flat-head (2) | |
| iv. Screws, #4-40 x 5/16 flat-head (2) | |

Optional Equipment Available:

- | | |
|--|--------------------|
| A. Dual Port Front Mount Faceplate Kit | MCIA P/N 9017897 |
| B. Dual Port Instrument Mount Adapter Kit | MCIA P/N 9017947 |
| C. Dual Port Rear Mount Faceplate Kit | MCIA P/N 9017958 |
| D. Single Port Rear Mount Faceplate Kit | MCIA P/N 9019351-1 |
| E. Dual Port Rear Mount Circular Faceplate | MCIA P/N 9019384-4 |
| F. Single Port Rear Mount Circular Faceplate | MCIA P/N 9019384-3 |

Equipment Not Provided:

- | | |
|-----------------------------------|--|
| A. Cable Harness Wire | See Section 3.3.1 for specifications |
| B. Circuit Breaker Recommendation | 3 amp (2 amp may be sufficient for 28V aircraft) |

3.3 CABLE HARNESS

Construct the cable harness following the instructions outlined below and per Figure 3.1. Refer to Section 2: Pre-Installation Considerations, for routing precautions.

3.3.1 Wire Gauge Selection

Use of PTFE, ETFE, TFE, Teflon or Tefzel insulated wire is recommended for aircraft use. The wire harness should utilize 20-24 AWG stranded wire. Refer to table 3.1 below. This table is provided to aid in the consideration of voltage drop due to harness length. Any other wiring standards that are applicable to the installation should also be considered.

Wire Gauge	Wire Length
20 AWG stranded wire	24 ft
22 AWG stranded wire	14 ft
24 AWG stranded wire	9 ft

Table 3.1
Wire Gauge and Length

3.3.2 Pin Assignment Information

INPUT POWER:

Pin A (keyed) – Positive DC input +10 to 32 VDC power

Pin B – Negative DC input / ground

Note: Pins should be crimped using Molex Hand Crimp Tool 63819-0000 (Preferred), 63811-2800 (obsolete) or 11-01-0200 (obsolete). See the Molex Hand Crimp Tool User Manual for crimp procedures.

3.3.3 Harness Verification

Note:

The TA202 has built-in reverse polarity protection for the power connector. If Pins A and B are swapped, the unit will not be damaged, but will also not function.

Once the cable harness is prepared, prior to connecting the TA202, activate the aircraft power bus and use a multimeter to verify that aircraft power and ground is supplied with appropriate voltage on the proper pins within the mating harness.

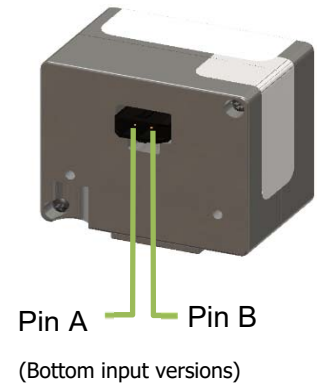
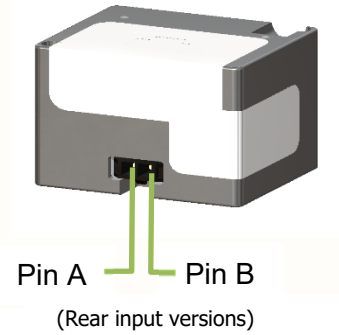


Figure 3.1

3.4 MOUNTING

The TA202 can be installed in one of five ways:

- rear mount, rectangular
- instrument mount ^{1 2 3}
- front mount, decorative faceplate ^{1 2 4}
- rear mount, decorative faceplate ^{1 4}
- rear mount, circular faceplate ^{1 3}

¹ Installation kit required. See Section 3.2, Optional Equipment Available for part number reference

² Dual port units only

³ Black anodized

⁴ Brushed aluminum, bare (appropriate for additional plating/finish)

Prepare the panel cutout as shown in Figures 3.4 thru 3.11 per the selected mounting option.

- Countersinks shown in the panel cutouts for flat head screws are optional. However, flat head screws are provided for flush appearance. For Rear Mount Cover Plate Installations, countersinks in the panel are required.
- For Rear Mount Installations:
Mounting screws length MUST be between (PT +0.150") and (PT +0.210"). [PT = panel thickness]
Mounting screws provided with the unit are 0.24" and 0.31". (Accommodates 0.030" to 0.160" PT)
For PT greater than 0.125, the USB connector will be below the surface of the panel (below flush).
- For Front Mount Installations: Minimum panel thickness is 0.04". Maximum panel thickness is 0.20".
- For Rear Mount Installation with Cover Plate: Panel thickness greater than 0.065 will cause the USB connector to be below the surface of the Cover Plate (below flush).

3.5 INSTALLATION COMPLETION

Prior to operating the unit in the aircraft, it is recommended to verify the output and functionality of the unit. In order to prevent accidental damage to other systems, it is not recommended to attach the output to other equipment prior to verification. Verify the output of the unit at the terminating end of the cable with a multimeter to ensure proper voltage and polarity. Once verified, installation can be completed and functionality should be checked.

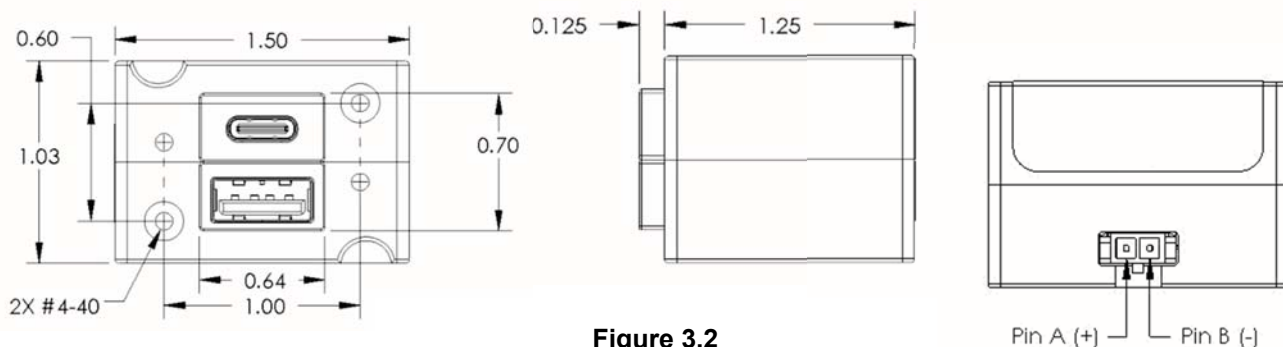


Figure 3.2
TA202 Outline Drawing

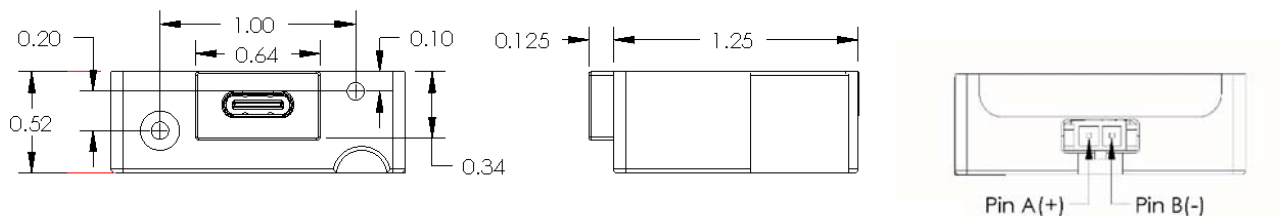


Figure 3.3
TA202 Outline Drawing

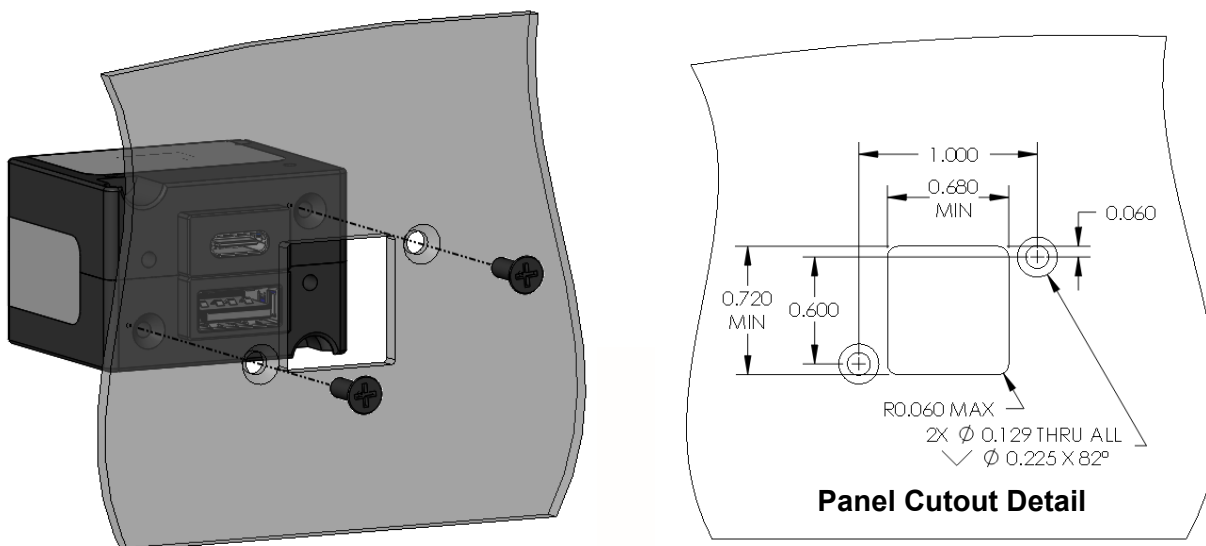


Figure 3.4
Dual Port Rear Mount Installation Kit

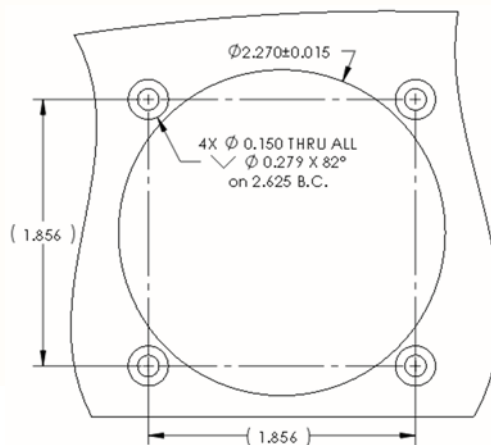
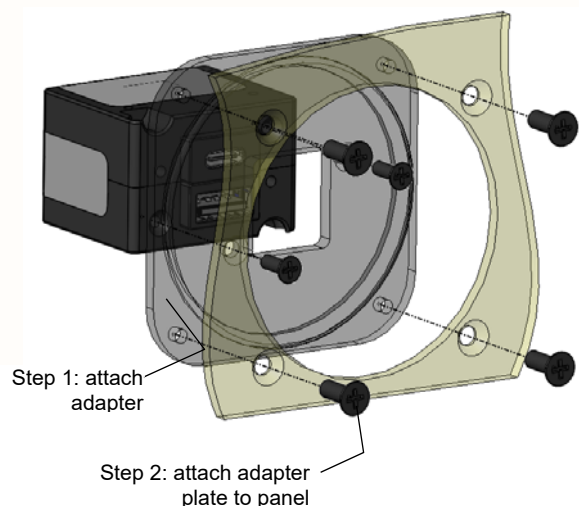
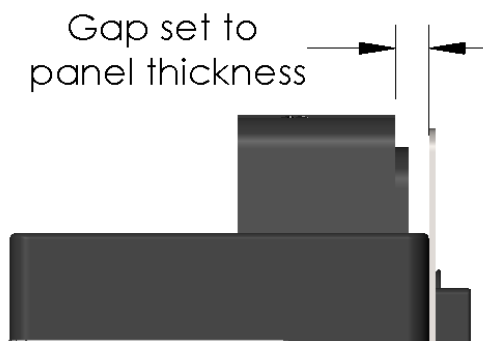
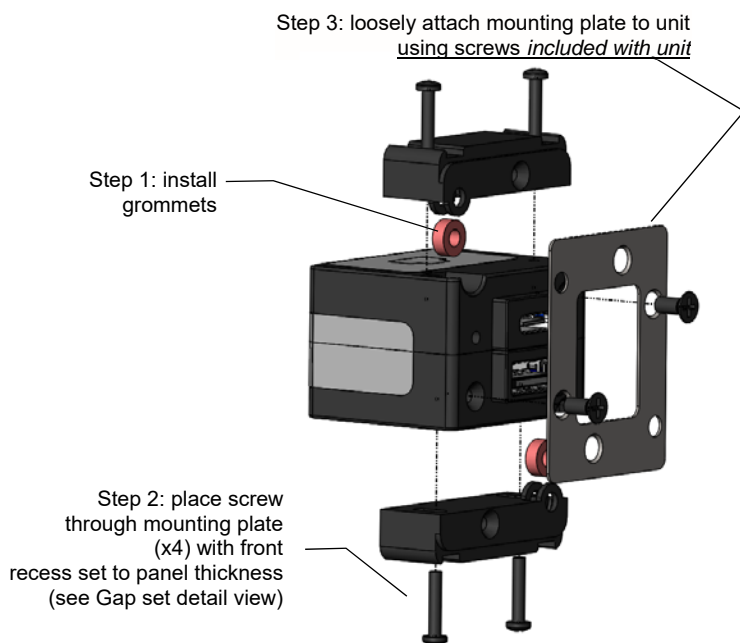


Figure 3.5
Dual Port Instrument Mount Adapter Kit



Gap Set Detail

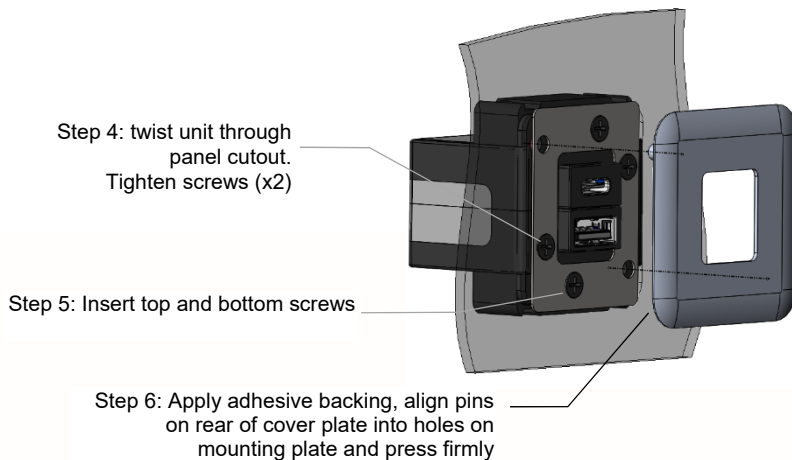
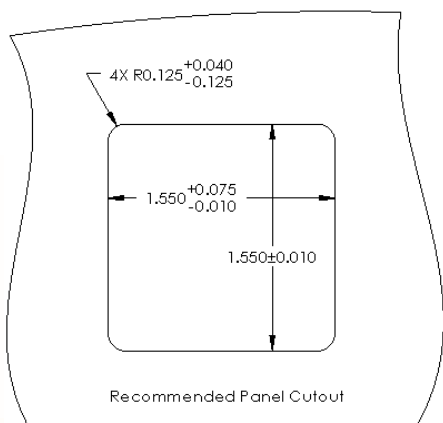
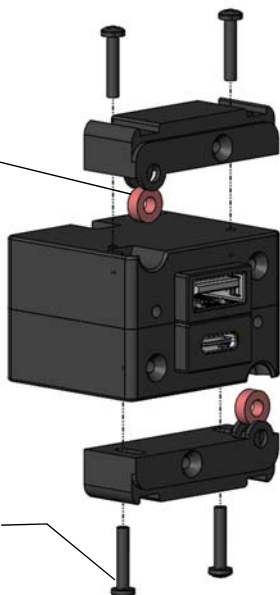
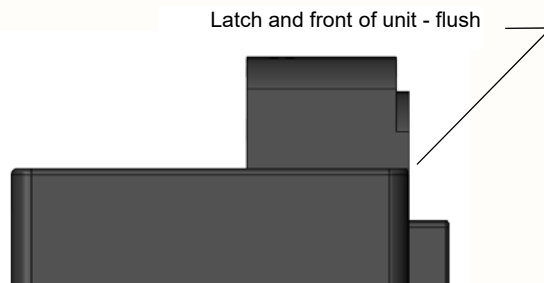


Figure 3.6
Dual Port Front Mount Installation

Step 1: install grommets



Step 2: place screw through mounting plate (x4) with front latches set flush to front of unit (see detail view)

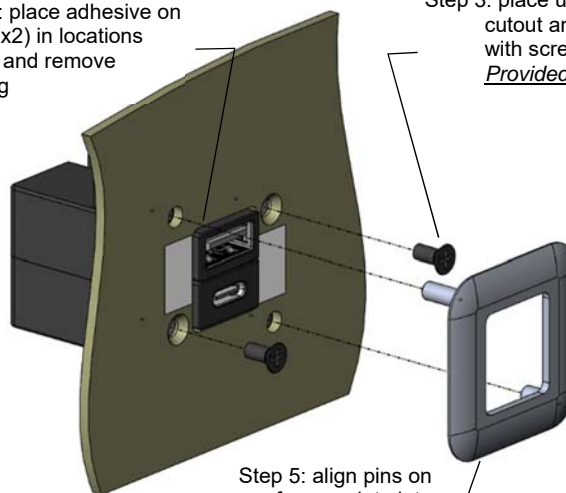


Latch and front of unit - flush

Flush Detail

Step 4: place adhesive on panel (x2) in locations shown and remove backing

Step 3: place unit in panel cutout and secure with screws (x2)
Provided with unit



Step 5: align pins on rear of cover plate into holes on panel and press firmly

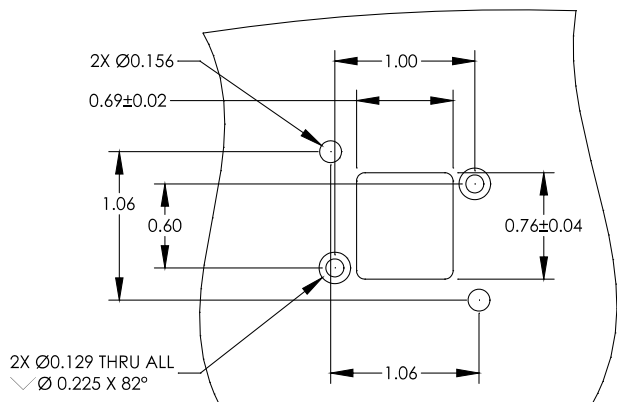


Figure 3.7
Dual Port Rear Mount Faceplate Kit

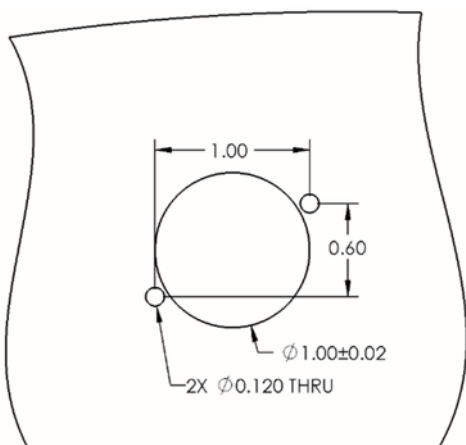
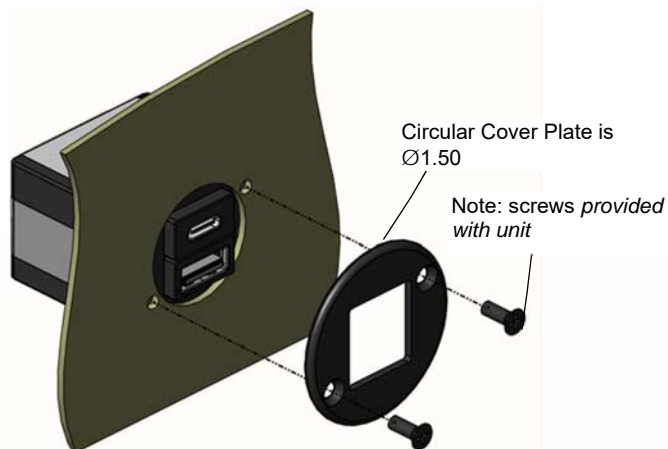
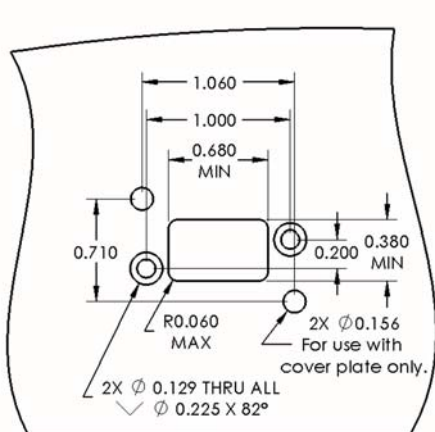


Figure 3.8
Dual Port Rear Mount Circular Faceplate



Circular Cover Plate is Ø1.50

Note: screws provided with unit



Port protrusion toward top

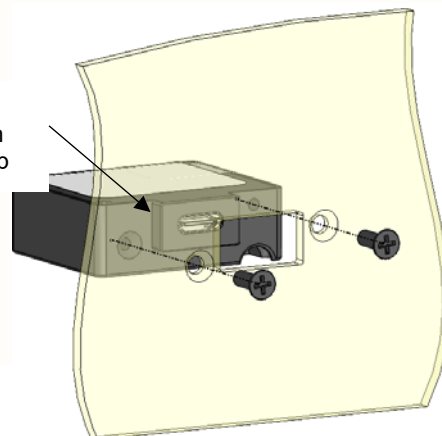


Figure 3.9

Single Port Rear Mount Installation

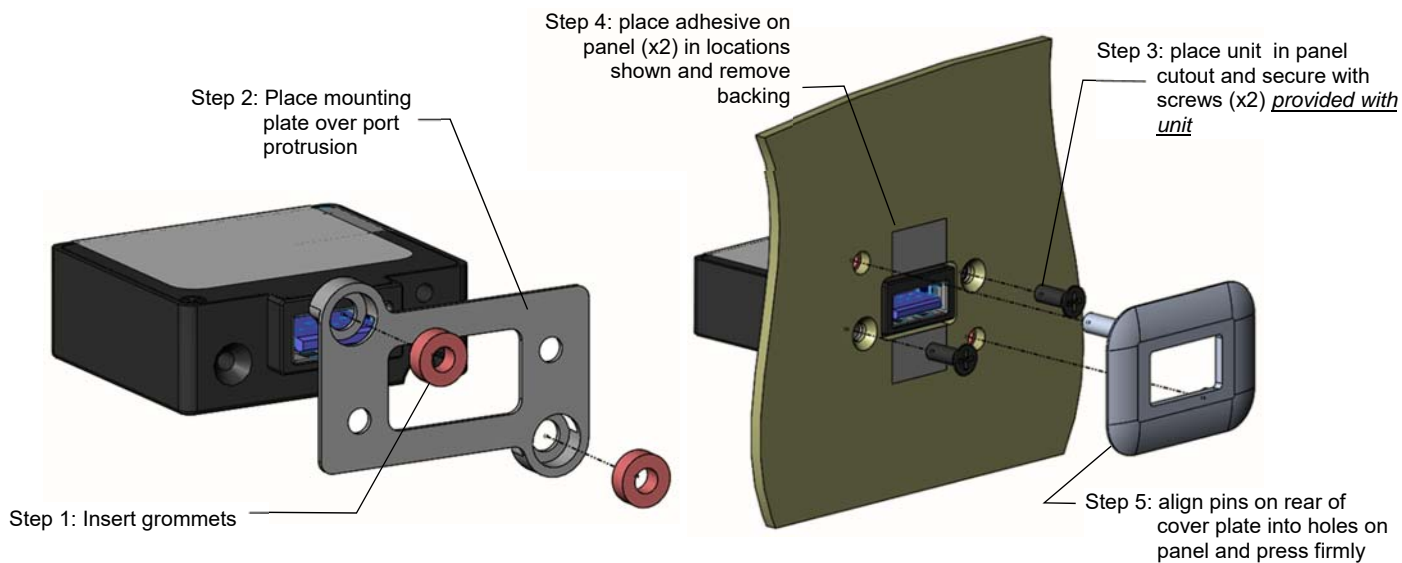


Figure 3.10

Single Port Rear Mount Faceplate Kit

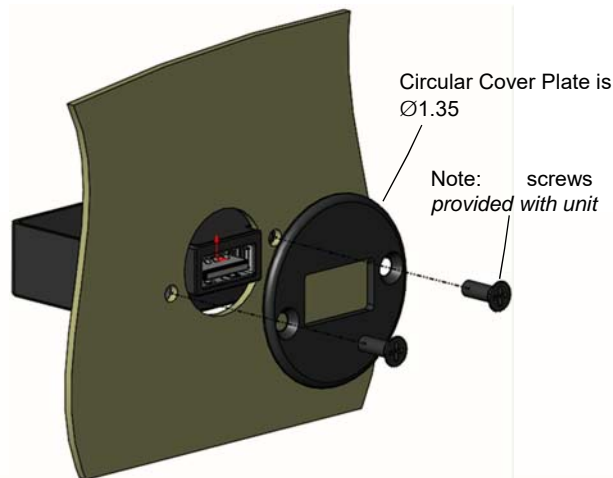
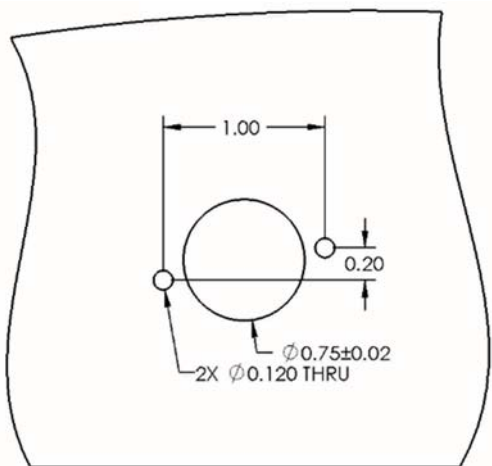


Figure 3.11

Single Port Rear Mount Circular Faceplate

SECTION 4 OPERATION

4.1 ELECTRICAL PERFORMANCE

The TA202 Series High Power USB Charging Port converts an aircraft (DC) input voltage within the range specified to a 5V (DC) output. This output power is applied to a single or dual USB-A or USB-C connector in accordance with the *USB Implementers Forum*.

The USB D+ and D- data lines communicate with the USB portable device to tell the device it is a dedicated charging port (DCP), capable of a higher current than a standard USB port. This allows the USB portable device to draw up to 3.0 Amps.

The unit is designed as a DC-to-DC converter with a series switch on each output to regulate current applied to that output. Each series switch independently reduces the output current to a safe level if the USB portable device draws excess current, is shorted or has a fault.

If the temperature of the TA202 becomes elevated due to a fault or excessive load, the device will seamlessly communicate with the USB portable device to lower the charge current. This allows the device to continue charging while the unit returns to a temperature within designed limits. When the temperature returns to a safe level the TA202 will automatically reestablish the higher charge current level with the device and continue charging.

4.2 PROTECTIVE FEATURES

4.2.1 Short Circuit Protection

The TA202 is capable of surviving a short circuit event without permanent damage. The unit goes into an over-current condition so that the average current is significantly reduced and the device is protected.

4.2.2 Over-Current Protection

The TA202 monitors the current draw individually on each port. During an over-current condition the voltage is reduced. If the voltage falls below 3.8 VDC the output is turned off for a period of 12 seconds. The output is then checked for continued over-current conditions every 16 milliseconds. This condition is referred to as a hiccup mode. The device stays in this mode until the over-current condition is removed, then returns to normal operation.

4.2.3 Low Input voltage Shutdown

If the input voltage applied to the TA202 drops below 10 VDC the unit will shut down until the applied voltage returns to a level within range.

4.2.4 Over-Temperature

When the internal temperature of the TA202 exceeds designed thresholds, the unit will shut down and stop providing power. When the temperature returns to an acceptable level the unit will automatically begin providing power as required, up to a full charge of 3.0 amps.

SECTION 5 CONFORMANCE

5.1 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

No periodic scheduled maintenance or calibration is necessary for continued airworthiness of the TA202 series Single and Dual USB Charger. If the unit fails to perform to specifications, the unit must be removed and serviced by Mid-Continent Instruments and Avionics or their authorized designee.

5.2 ENVIRONMENTAL QUALIFICATION STATEMENT

MODEL NUMBER: TA202 Series **PART NUMBER:** 6430202-()
DESCRIPTION: Single and Dual USB Charger **CERTIFICATION:** FAA TSO-C71
MANUFACTURER: True Blue Power, a division of Mid-Continent Instrument Co., Inc.
ADDRESS: 9400 E. 34th St. North, Wichita, KS 67226, USA.
SPECIFICATION: Test Specification (TS) 365 Test Data Sheet (TDS) 365
STANDARD: RTCA DO-160, Rev G, dated 12/08/10; MIL-STD-810E, dated 7/14/1989

CONDITIONS	SECTION	DESCRIPTION OF TEST
Temperature and Altitude	4	Category F1
Temperature Variation	5	Category S2
Humidity	6	Category B
Operational Shock and Crash Safety	7	Category B
Vibration	8	DO-160: Category R; Curves C, C1 MIL-STD810E: See Remarks
Explosion	9	Category E
Waterproofness	10	Category W
Fluids	11	Category X
Sand and Dust	12	Category S
Fungus	13	Category F
Salt Spray	14	Category S
Magnetic Effect	15	Category Z
Power Input	16	Category B(XX)
Voltage Spike	17	Category B
Audio Frequency Conducted Susceptibility	18	Category R
Induced Signal Susceptibility	19	Category X
Radio Frequency Susceptibility	20	Category X
Emission of Radio Frequency Energy	21	Category M
Lightning Induced Transient Susceptibility	22	Category X
Lightning Direct Effects	23	Category X
Icing	24	Category X
ESD	25	Category A
Fire, Flammability	26	Category C

REMARKS:

Section 4: Category F1 with excursions as declared by the manufacturer:
 • 4.6.2: Decompression +8,000 to 50,000 feet
 Section 7: Crash Safety Impulse: 11ms, 40g Shock Wave
 Section 8: Vibration per MIL-STD-810E: Sine-On-Random, Method 514.4, Cat. 4, Procedure 1