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:

True Blue Power  
c/o Mid-Continent Instrument Co., Inc.  
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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 reference and the page number. Send your comments to:

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## REVISION HISTORY

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<th>Approved</th>
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<td>A</td>
<td>03/14/16</td>
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<td>04/25/16</td>
<td>CAS</td>
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<td>C</td>
<td>05/10/16</td>
<td>BAW</td>
<td>Added single port unit mounting options, removed configurations table.</td>
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<tr>
<td>D</td>
<td>06/23/16</td>
<td>ScH</td>
<td>Added two screws (1/4&quot;) to included connector kit.</td>
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<td>E</td>
<td>01/04/17</td>
<td>BAW</td>
<td>Updated to include new mounting option. Added 1.2.4.</td>
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<td>F</td>
<td>05/07/19</td>
<td>VAA</td>
<td>Added single rear mount with cover plate option.</td>
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<tr>
<td>G</td>
<td>06/06/19</td>
<td>VAA</td>
<td>Updated figure 3.9 and added rear mount with circular cover plate options.</td>
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SECTION 1 GENERAL DESCRIPTION

1.1 INTRODUCTION

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

1.2.1 Electrical Attributes

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<tr>
<td>Input Voltage</td>
<td>10-32 VDC</td>
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<tr>
<td>Input Power</td>
<td>35 watts max; 2.5 amps @ 14 VDC / 1.25 amps @ 28 VDC</td>
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<tr>
<td>Output Voltage</td>
<td>5 VDC ±0.25 per port</td>
</tr>
<tr>
<td>Output Power</td>
<td>3.0 amps max per port</td>
</tr>
<tr>
<td>Efficiency</td>
<td>~90% nominal</td>
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Table 1.1

1.2.2 Physical Attributes

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<tr>
<td>Weight</td>
<td>1.3 oz. (38 g) (dual port), 0.8 oz. (23 g) (single port)</td>
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<tr>
<td>Dimensions (Dual Port Units): (not including connector)</td>
<td>1.50 inches wide x 1.03 inches high x 1.25 inches deep</td>
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<tr>
<td>Dimensions (Single Port Units): (not including connector)</td>
<td>1.50 inches wide x 0.52 inches high x 1.25 inches deep</td>
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<td>Charging Ports Type</td>
<td>USB Standard-A or USB Standard-C</td>
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<tr>
<td>Connector Kit</td>
<td>MCIA P/N 9017960</td>
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<td>Mounting</td>
<td>Panel mount; rear or front</td>
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Table 1.2

1.2.3 Qualifications

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Table 1.3

1.2.4 Versions

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<th>Lighted</th>
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<th>USB Connector</th>
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<tr>
<td>Port Numbers</td>
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<td>Rear</td>
<td>Dual: Type A+Type C</td>
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<tr>
<td></td>
<td>6430202-2</td>
<td>6430202-12</td>
<td>Bottom</td>
<td>Dual: Type C+Type C</td>
</tr>
<tr>
<td></td>
<td>6430202-3</td>
<td>6430202-13</td>
<td>Rear</td>
<td>Dual: Type A+Type A</td>
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<tr>
<td></td>
<td>6430202-4</td>
<td>6430202-14</td>
<td>Bottom</td>
<td>Single: Type C</td>
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<td></td>
<td>6430202-5</td>
<td>6430202-15</td>
<td>Rear</td>
<td>Single: Type A</td>
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<tr>
<td></td>
<td>6430202-6</td>
<td>6430202-16</td>
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<tr>
<td></td>
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<td>6430202-17</td>
<td>Rear</td>
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<td></td>
<td>6430202-8</td>
<td>6430202-18</td>
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<td></td>
<td>6430202-9</td>
<td>6430202-19</td>
<td>Rear</td>
<td></td>
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<td></td>
<td>6430202-10</td>
<td>6430202-20</td>
<td>Bottom</td>
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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

Each TA202 series High Power USB Charging Port (part number 6430202-) has a nameplate that identifies the manufacturer, model, part number, description, certifications and technical specifications of the unit. The nameplate also includes the “MOD” or modification status representing notable changes in the design of the unit. The following identifies each “MOD” or modification.

Modification (MOD) 0 is the initial release of the TA202 series High Power USB Charging Port 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.

For additional details regarding design changes to the TA202 series High Power USB Charging Port, refer to individual Service Bulletins associated with each MOD.

![Figure 2.1 Nameplate and MOD Status Examples](image-url)
SECTION 3 INSTALLATION PROCEDURES

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. Front Mount Installation Kit MCIA P/N 9017897
b. Instrument Mount Adapter Kit MCIA P/N 9017947
c. Dual Rear Mount Installation Kit MCIA P/N 9017958
d. Single Rear Mount Installation Kit MCIA P/N 9019351-1
e. Dual Rear Mount Circular Cover Plate MCIA P/N 9019384-2
f. Single Rear Mount Circular Cover Plate MCIA P/N 9019384-1

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.

<table>
<thead>
<tr>
<th>Wire Gauge</th>
<th>Wire Length</th>
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<tbody>
<tr>
<td>20 AWG stranded wire</td>
<td>35 ft</td>
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<tr>
<td>22 AWG stranded wire</td>
<td>22 ft</td>
</tr>
<tr>
<td>24 AWG stranded wire</td>
<td>14 ft</td>
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Table 3.1

| Wire Gauge and Length |

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.
3.3.2 Pin Assignment Information

**INPUT POWER:**
- **Pin A (keyed)** – Positive DC input +10 to 32 VDC power
- **Pin B** – Negative DC input / ground

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.

3.4 MOUNTING

The TA202 can be installed in one of five ways:

- rear mount, rectangular
- instrument mount \(^1\) \(^2\) \(^3\)
- front mount, decorative cover plate \(^1\) \(^2\) \(^4\)
- rear mount, decorative cover plate \(^1\) \(^4\)
- rear mount, circular cover plate \(^1\) \(^3\)

\(^1\) 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
(dual port, rear input version shown)

Figure 3.3
TA202 Outline Drawing
(single port, rear input version shown)

Figure 3.4
Dual Port Rear Mount Installation
Figure 3.5  
Dual Port Instrument Mount Installation

Step 1: install grommets

Step 2: place screw through mounting plate (x4) with front recess set to panel thickness (see Gap Set detail view)

Step 3: loosely attach mounting plate to unit using screws included with unit

Step 4: twist unit through panel cutout. Tighten screws (x2)

Step 5: Insert top and bottom screws

Step 6: Apply adhesive backing, align pins on rear of cover plate into holes on mounting plate and press firmly

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

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

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

Figure 3.7
Dual Port Rear Mount Installation with Cover Plate

Figure 3.8
Dual Port Rear Mount Installation with Circular Cover Plate

2X Ø0.129 THRU ALL
Ø 0.225 X 82°

Circular Cover Plate is Ø1.50

Note: screws provided with unit
Step 1: Insert grommets

Step 2: Place mounting plate over port protrusion

Step 3: Place unit in panel cutout and secure with screws (x2) provided with unit

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

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

Circular Cover Plate is Ø1.35

Note: Screws provided with unit

Figure 3.9
Single Port Rear Mount Installation

Figure 3.10
Single Port Rear Mount Installation with Cover Plate

Figure 3.11
Single Port Rear Mount Installation with Circular Cover Plate
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 CONTINUED AIRWORTHINESS STATEMENT

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

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<td>MANUFACTURER:</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>ADDRESS:</td>
<td>9400 E. 34th St. North, Wichita, KS 67226, USA.</td>
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MANUFACTURERS SPECIFICATIONS:

Minimum Performance Specifications:  
Qualification Test Reports: QTR2604-2608, QTR2615-2618, QTR2621, QTR2625  
RTCA DO-160: Rev G, dated 12/08/10  
DATES TESTED: 02/2016-03/2016

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<td>Fire, Flammability</td>
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REMARKS:

Sections 4: Normal operating low temperature was tested to and complies with -40°C. (Category F1 Continuous Operating Low Temperature requirement is -20°C.)