
QUIET POWER

A division of Summit Avionics



Installation and Operation Manual

Quiet Power Dual USB Charger

QP100 Series

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REVISION HISTORY

Date	Revision	Description
7/24/2014	1	Original Release
7/30/2014	2	Corrected wiring reference in section 4 Added available models & options (Section 1.4)
1/7/2015	3	Added circuit breaker value table in Appendix B, revised mechanical installation drawings to include mounting with #4-40 or #6-32 screws. Added section on backlighted models. Changed Series 1xx to 100

1. General Description

1.1 Introduction

This manual is intended to provide information pertinent to the installation and operation of the Quiet Power converter / charger. The product is designed to provide a reliable source for charging devices through USB Type A plugs and, optionally, charging remote electrical or electronic devices through the auxiliary charger port.

Its signature “quiet” EMI / RFI (Electro-Magnetic Interference / Radio Frequency Interference) characteristics permit it to be installed in many applications that could be disturbed by EMI / RFI emissions from other similar devices.



1.2 Equipment Description

The Quiet Power line of USB chargers are engineered for use in aircraft cockpit or cabin applications. They provide regulated, filtered D.C. power to common Portable Electronic Devices (PED) to power these units during flight and charge their internal battery. Devices that plug in to the USB connectors can draw a total of 3 amps. The QP unit signals the PED that up to 2 amps are available on the top connector and 1 amp on the bottom connector. A method referred to as ‘analog negotiation’ is used to signal the PED as to the available power.

An optional auxiliary charging port is available on certain models of QP1xx chargers. This port can supply 5, 9, 11, or 12 volts at 1 amp to a device to provide charging or auxiliary charging current to that device. This port is typically used to power:

- Handheld radios with re-chargeable batteries
- Portable GPS receivers
- Portable standby / backup instrument systems

The auxiliary charger is intended to provide charging capabilities to those devices that might be used intermittently and not otherwise receive a full charge. For example, connecting the auxiliary charger to an emergency hand-held radio ensures that the radio is fully charged at all times.

NOTE: The auxiliary charger is designed as a sacrificial device; if the USB chargers are supplying full load and the temperature is very high the auxiliary charger will cycle on and off.

The Quiet Power unit is shipped in a container that includes the following materials:

- Installation and Operation Manual
- QP1xx Charging Device
- Power Cable / Wire Harness - ~6’ long

An optional connector kit is available from the manufacturer for the auxiliary charging port to connect to common handheld devices.

1.2.1 Lighted Models

All of the QP100 series chargers are available with connector backlighting. These units are ordered with a “-L” designator on the model number (e.g. QP-104-L). The backlighting is on continuously and projects a soft blue light within the USB connector entrance. Intensity is adjusted at the factory for a subtle, low-intensity light suitable for locating the charger connector in darkened cabin conditions.

1.3 Technical Specifications

1.3.1 Physical

The universal charger is housed in an aluminum enclosure.

Dimensions 1.83” high x 1.37” wide x 1.37” deep
 Weight 3.5 oz.

1.3.2 Electrical

Input Voltage Range 10 volts to 36 volts D.C. (QP100 – QP102) or 13.2 to 36 volts D.C. (QP103 – QP104)

Input Current 5 amps absolute maximum, 1 – 2.5 amps average at rated load

Efficiency 87 to 93%

Output Characteristics

USB Top Port 2.1 amps at 4.8 to 5.2 volts

USB Bottom Port 1.1 amps at 4.8 to 5.2 volts

USB Negotiation Analog, Apple Products Standard

Auxiliary Output 1 amp at 5, 9, 11, or 12 volts factory preset

Nominal values shown

1.4 Available Models and Options

Quiet Power units are available in the following configurations:

Model	USB Port	Auxiliary Port
QP-100	Dual 5 VDC	None
QP-101	Dual 5 VDC	5 volts
QP-102	Dual 5 VDC	9 volts
QP-103	Dual 5 VDC	11 volts
QP-104	Dual 5 VDC	12 volts

Consult the installation and operations manual of your auxiliary device (hand-held radio etc.) to confirm charging power requirements.

2. Regulatory Compliance

The QP1xx series products have been qualified to RTCA Standard DO-160G for temperature, altitude, voltage spikes, power input, and radio frequency emissions / interference for cockpit devices. The installing agency shall determine the regulatory basis against which to install this device.

Installations have been performed as a Minor Alteration with appropriate logbook entry in accordance with guidance provided by the FAA.

3. Limitations

None

4. Installation Procedures

4.1 Planning

The USB connector protrudes from the face of the unit approximately 0.14". A standard installation utilizes an aluminum instrument panel thickness of 0.060" to 0.090". Should the installation call for placement in a panel thicker than 0.14" or if it is desired to install the device in a recessed area, care should be taken to determine the space required about the perimeter of the USB connectors. Consider the PED devices that will be charged and allow adequate clearance between the Quiet Power unit and adjacent equipment.

The USB connector requires a square hole through the instrument panel and two mounting screw holes. Refer to Section 7.3 Appendix C Mechanical Drawings for detailed panel information. You may also install the device in a standard 2 ¼" or 3 ⅛" instrument panel opening using either an optional Quiet Power panel or a fabricated panel.

You may choose to install the Quiet Power device using either #6-32 screws or #4-40 screws. The #6-32 screws are aligned along the device vertical centerline and the #4-40 screws are adjacent to the connector. It is not necessary to install the device with more than 2 screws (i.e. two #6-32 or two #4-40).

If you select #4-40 mounting screws, choose the engagement length such that it will not penetrate deeper than 0.330" / 8.2mm into the body of the Quiet Power unit. Minimum engagement is 0.260" from the face of the unit to the end of the screw. The following table is presented for reference.

Panel Thickness	Screw Length	Penetration Depth
0.060 / 1.5mm	0.375 / 9.3mm	0.315 / 7.9mm
0.090 / 2.3mm	0.375 / 9.3mm	0.285 / 7mm

Electrical installation of the unit requires a dedicated protective device, either circuit breaker or fuse. Refer to Appendix B for sizing and wiring information. Installation shall be performed using acceptable methods, practices, and techniques as specified in FAA Advisory Circular 43.13-1B and 43.13-2B.

Additional materials or special tools may be needed:

Mounting screws MS35206 (or equivalent),
Circuit protection device,
Wire MS22759 26-22 gauge (or equivalent),
Shrink tubing, lug connectors, soldering iron, heat gun

4.2 Unit Installation

Install the unit in the instrument panel by cutting or punching an opening in accordance with Appendix C. Install the Quiet Power unit from the rear and secure with the chosen screws.

Wire the harness in to the aircraft electrical system per the diagram shown in Section 7.2 (Red wire to the protective device, White to aircraft ground). If the device is equipped with an optional auxiliary charging capability, wire the additional two harness wires (black and white) to the desired load or refer to Section 4.3.1 below. Plug the Quiet Power harness connector into the Quiet Power unit.

Install a placard near the USB connector with the statement “5V 3A” or “Charging Port 5V 3A”.

4.3 Optional Accessories

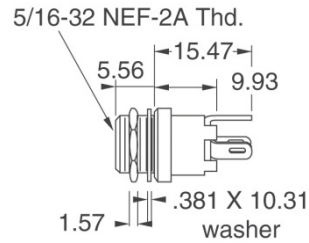
4.3.1 Auxiliary Charger Panel Connector

The auxiliary charger port supplies power to the auxiliary device through an optional panel connector and cable assembly. Power from the main power unit is supplied to the panel connector from the cable assembly provided with the unit. A barrel power jack (5.5mm OD, 2.5mm ID) is provided in the optional auxiliary charger kit (QPC-xxx below). If the supplied power jack is used, the following instructions apply:

1. Prepare the wire harness by installing a 1" / 2.5mm heat-shrink sleeve over the white and black wires after they have been trimmed to the appropriate length.
2. Solder the harness wires to the connector by connecting aircraft ground (white) to the sleeve and power (black) to the pin. Do not make any connection to the sleeve shunt terminal on the connector.
3. Slide the heat-shrink sleeve over the connector terminals / wire and heat / secure in place.
4. Drill or punch a 0.33" / 8.4mm diameter hole in the panel. Panel thickness may be up to 0.125" / 3mm.
5. Insert the connector through the panel and install the supplied washer and nut from the front. Tighten the nut and make sure that the connector body is secure and will not rotate.



Figure 1 - Charger Power Connector



Decimal dimensions shown in metric units

Install a placard near the connector with one of the following statements, depending on the model and auxiliary charger output voltage:

- “5 volts 1 amp”
- “9 volts 1 amp”
- “11 volts 1 amp”
- “12 volts 1 amp”

4.3.1.2 Connector / Cable Kits

The following Cable / Connector Kits are available from the manufacturer.

Each cable assembly includes a panel jack (5.5mm ID, 2.5mm Pin Dia.) and a 4' / 1.3 M cable consisting of a mating panel plug, 4' power cord and mating plug (male) per the following table:

Part Number	Model	Mating Plug	Sample Application
66-790003	QPC-001	2.5X5.5	
66-790004	QPC-002	2.1X5.5	
66-790005	QPC-003	1.3X3.5	ICOM A6, A24 (11 volt / QP-103)
66-790006	QPC-004	1.7X4.0	
66-790007	QPC-005	1.7X4.75	
66-790008	QPC-006	0.9X3.2	
66-790009	QPC-007	3.3X5.5	

Order the optional connector / cable kit by Model. For updated Sample Application information please visit the quietpower.aero website.

5. Documentation

5.1 Instructions for Continued Airworthiness

None required.

5.2 Logbook Entry

Complete an aircraft / airframe logbook entry detailing the installation and post installation tests performed, Note the tests performed by referencing Section 6 Post-Installation Tests (e.g. Tested to installation manual P/N 98-790002 Rev 2 Sections 6.2 (Compass) and 6.3 (Operational) – all tests normal).

6. Post-Installation Tests

6.1 EMI / RFI Test Procedure and Log

After installation of the Quiet Power unit and confirmation of normal operation on aircraft battery power, an EMI / RFI check may be performed in accordance with the following ground test procedure. Note that this device has been qualified to DO-160G Section 21.0 Emission of Radio Frequency Energy, Category M (Cockpit equipment). Consult AC 43.13-1B Section 8, Paragraph 11-107 or other regulatory guidance to confirm compliance with applicable regulations. Should the installer determine that EMI / RFI testing is not required, notate the test log.

6.1.1 VOR/LOC/ILS (if equipped)

Verify normal operation of the Navigation receiver(s) and VOR indicator(s) and audio output while tuning the receiver from 108.00 MHz to 117 MHz at 1 MHz increments. Turn the Quiet Power unit off and on at 108.00, 112.00 and 116.00 and note whether any anomalies exist in the VOR/LOC/ILS indicator or whether there is interference detected in the received audio.

Test	Interference / Anomalies Yes / No
Sweep Results – 108.00 to 117.00 mHz	
Anomalies 108 mHz	
Anomalies 112 mHz	
Anomalies 116 mHz	

Comments:

6.1.2 Marker Beacon (if equipped)

Turn on the Marker Beacon receiver and set it to its most sensitive receive configuration. Confirm that the Marker Beacon receiver does not trigger or break squelch when the Quiet Power unit is turned on and off.

Test	MB Indication / Audio Output Yes / No
Quiet Power unit turned on and off	

Comments:

6.1.3 GPS

After moving the aircraft to a location in which the GPS receiver is in view of the required number of satellites for proper operation, check GPS receiver for proper operation while the Quiet Power unit is powered on.

Test	Proper GPS Operation Yes / No
Quiet Power unit turned on and off	

Comments:

6.1.4 VHF Communications Receiver(s)

For each communication receiver, set the squelch to the normal level with the Quiet Power unit powered off. Check each receiver for interference at 1 MHz increments from 118.00 to 136.00 MHz. In the table below, place a checkmark in the Interference column if interference is noted at the designated frequency; if no interference is identified initial the No Interference entry below the table.

Frequency	Interference		Frequency	Interference
118.00			127.00	
119.00			128.00	
120.00			129.00	
121.00			130.00	
122.00			131.00	
123.00			132.00	
124.00			133.00	
125.00			134.00	
126.00			135.00	
			136.00	

No Interference identified: _____

Comments:

6.2 Compass Check

Perform a Compass Swing Check in accordance with AC 43.13-1B Chapter 12, Section 3, Paragraph 12-37 and log this check in the aircraft logbooks.

6.3 Operational Checks

Connect the desired loads to the Quiet Power unit, either through the USB connector(s) or through the auxiliary charging port. Confirm proper operation of the load device and that the Quiet Power unit is supplying power to the device.

Tests performed by: _____
Name (print): _____
Signature: _____
Certificate Type: _____
Certificate Number: _____
Date: _____

7. Appendices

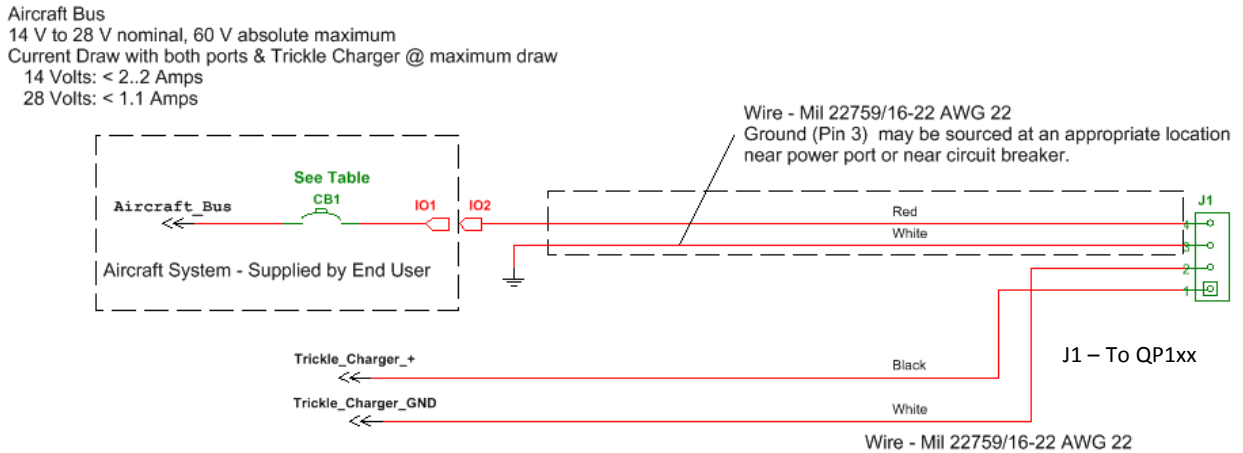
7.1 Appendix A Environmental Qualification Form

DO-160G Section	Description	Qualification
Section 4.0	Temperature and Altitude	A1
Section 5.0	Temperature Variation	C
Section 6.0	Humidity	X
Section 7.0	Operational Shocks and Crash Safety	X
Section 8.0	Vibration	X
Section 9.0	Explosion Proofness	X
Section 10.0	Waterproofness	X
Section 11.0	Fluids Susceptibility	X
Section 12.0	Sand and Dust	X
Section 13.0	Fungus Resistance	X
Section 14.0	Salt Spray	X
Section 15.0	Magnetic Effect	X
Section 16.0	Power Input	B(XX)
Section 17.0	Voltage Spike	X
Section 18.0	Audio Frequency Conducted Susceptibility -Power Inputs	X
Section 19.0	Induced Signal Susceptibility	X
Section 20.0	Radio Frequency Susceptibility (Radiated and Conducted)	X
Section 21.0	Emission of Radio Frequency Energy	M
Section 22.0	Lightning Induced Transient Susceptibility	X
Section 23.0	Lightning Direct Effects	X
Section 24.0	Icing	X
Section 25.0	Electrostatic Discharge	X
Section 26.0	Fire, Flammability	X

X – Not Tested

7.2 Appendix B Interconnect Diagrams

The interconnect diagram shown below includes the auxiliary power connections. QP100 units do not include auxiliary power. All variants of the dual-USB connector version, including



Standard Factory Cable Harness Shown

those with auxiliary power ports, utilize the same protection device rating.

Aircraft Bus Voltage	Protection Device Rating
14 Volts	3 Amps
28 Volts	2 or 3 Amps

Table – CB1 Rating

A fuse or circuit breaker may be used to protect the device and wiring from overcurrent conditions. The preferred device is a slow-blow or equivalent or standard circuit breaker

7.3 Appendix C Mechanical Drawings

7.3.1 Panel Cutout, Direct Panel Mount

Two mounting methods are supported – mounting with #6-32 screws or #4-40 screws. #6-32 screws are recommended,

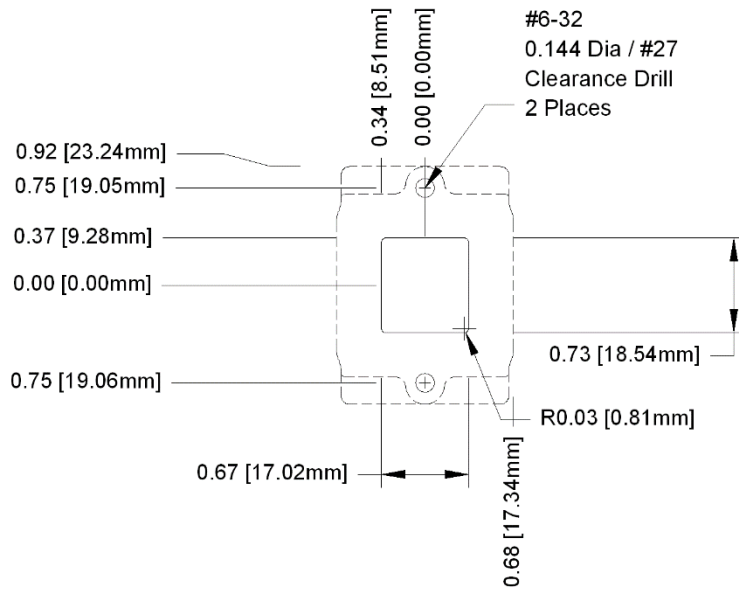


Figure 2 - Panel Cutout, #6-32 Mounting Screws

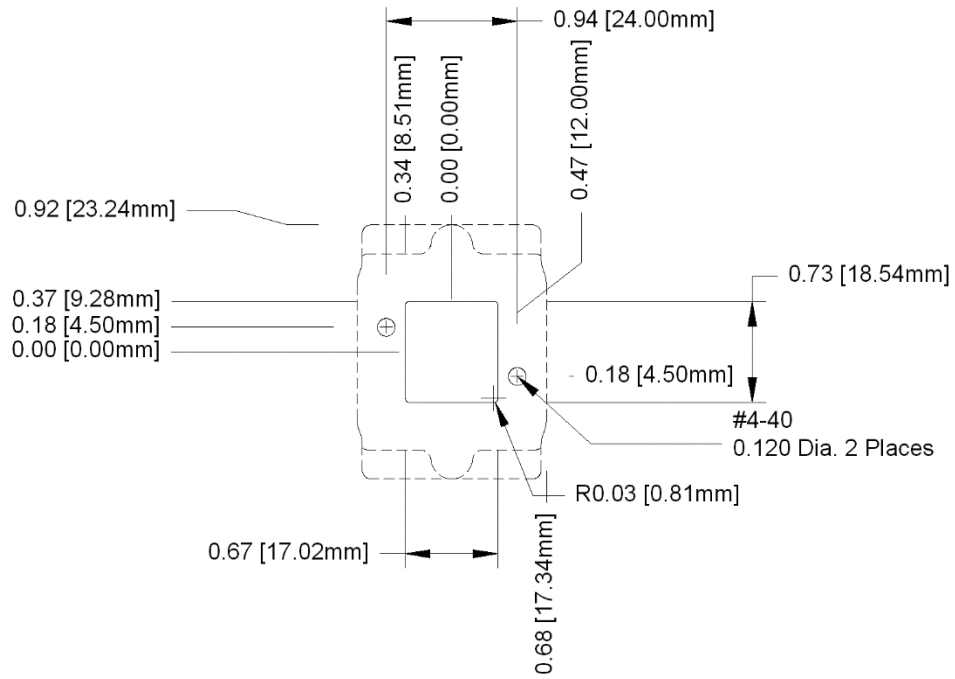
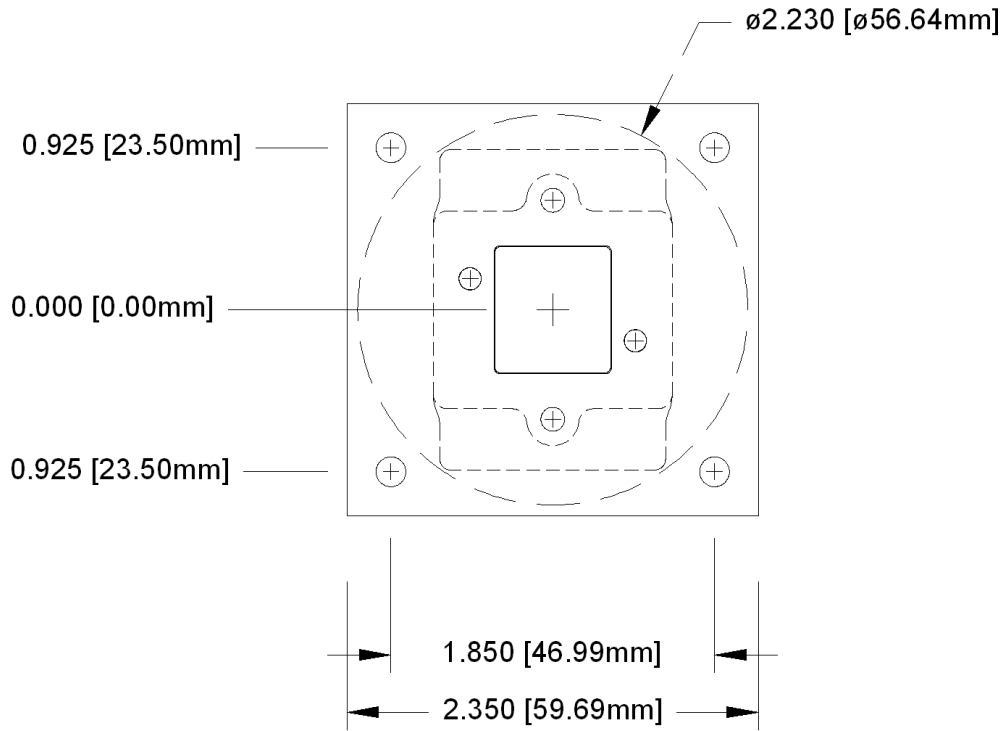


Figure 3 - Panel Cutout, #4-40 Mounting Screws

7.3.2 2 1/4" Panel Mount Adapter Plate



7.3.3 3 1/8" Panel Mount Adapter Plate

