GARMIN

GSB 15
USB Database and Charging Hub Installation Manual

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AVIATION LIMITED WARRANTY

GSB 15 warranty information is available at garmin.com/aviationwarranty.

RECORD OF REVISIONS

Revision	Revision Date	Description
1	07/10/19	Initial Release
2	07/18/19	Added mounting kit info

INFORMATION SUBJECT TO EXPORT CONTROL LAWS

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CURRENT REVISION DESCRIPTION

Revision	Page Number	Section Number	Description of Change
2	ii	Front	Added Qualcomm® information
	1-2	1.2.2	Added mounting kit info in Tables 1-4 & 1-5
	1-3	1.2.3	Added mounting weight info to Table 1-7
	1-6	1.5.2	Added Qualcomm® information
	2-1	2.3	Added info regarding mounting kits
	2-3	2.8	Updated Figure 2-1
	3-1	3.2	Added mounting instructions for new mounting kits
	A-2, A-3	Appdx A	Updated figure titles for Figure A-2 and Figure A-3
	A-4–A-6	Appdx A	Added Figure A-4, Figure A-5, and Figure A-6

DEFINITIONS OF WARNINGS, CAUTIONS, AND NOTES

WARNING

A warning means injury or death is possible if the instructions are not obeyed.

CAUTION

A caution means that damage to the equipment is possible.

NOTE

A note gives more information.

WARNING

This product, its packaging, and its components contain chemicals known to the State of California to cause cancer, birth defects, or reproductive harm. This Notice is being provided in accordance with California's Proposition 65. If you have any questions or would like additional information, please refer to our web site at http://www.garmin.com/prop65.

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TABLE OF CONTENTS

1 DECLARATION OF DESIGN AND PERFORMANCE

1.1 Introduction

The Declaration of Design and Performance section contains the definition and statement of compliance of the GSB 15. The section is written in accordance with European Aviation Safety Agency (EASA) Commission Regulation (EU) No 748/2012 date 3 August 2012.

The full manual is intended to provide mechanical and electrical information for use in the planning and design of an installation of the GSB 15 into an aircraft. This manual is not a substitute for an approved airframe-specific maintenance manual, installation design drawing, or complete installation data package. Attempting to install equipment by reference to this manual alone and without first planning or designing an installation specific to your aircraft may compromise your safety and it is not recommended. The content of this manual assumes use by competent and qualified avionics engineering personnel and/or avionics installation specialist using standard maintenance practices in accordance with Title 14 of the Code of Federal Regulation and other relevant accepted practices. This manual is not intended for use by individuals who do not possess the competencies and abilities set forth above.

NOTE

Garmin recommends installation of the GSB 15 by a Garmin-authorized installer. To the extent allowable by law, Garmin will not be liable for damages resulting from improper or negligent installation of the GSB 15. For questions, please contact Garmin Aviation Product Support at 1-888-606-5482.

NOTE

Except where specifically noted, references to GSB 15 apply equally to all GSB 15 variants.

1.2 Description and Identification

The GSB 15 functions as a USB Database and Charging Hub that provides:

- Two (2) - USB Type A charging ports (low-current with data transfer or high-current without data transfer)
- Optional software and database loading to compatible Garmin devices via USB
- Halo backlighting to facilitate nighttime usability

1.2.1 Unit Identification

The GSB 15 can be identified by the part numbers listed in Table 1-1.

Table 1-1 GSB 15 Unit Identification

API	Marketing Label	Garmin P/N (Unit Only)	Garmin P/N (Shipping Level)
GMN-02201	GSB 15	011-04937-0( ) through 011-04937-1( )	010-02201-0( ) through 010-02201-1( )

The GSB 15 is currently available in the following configurations.

Table 1-2 GSB 15 Part Numbers

Model	Unit Only P/N	Unit Only Shipping P/N	Standard P/N [1]
GSB 15 (vertical)	011-04937-00	010-02201-00	010-02201-10
GSB 15 (right angle)	011-04937-01	010-02201-01	010-02201-11

[1] Includes connector kit (011-05044-00)

1.2.2 Accessories

The following accessories are provided separately from the GSB 15.

Table 1-3 Equipment Available

Item	Garmin P/N
GSB 15 2.25” Mounting Kit	011-05043-00
GSB 15 3.125” Mounting Kit	011-05043-01
GSB 15 Connector Kit	011-05044-00

Table 1-4 Contents of 2.25” Mounting Kit (011-05043-00)

Item	Garmin P/N	Quantity
DCP, Adapter Plate, 2.25”	125-00581-02	1
Screw, 4-40 x .250, FLHP 100, SS/BO	211-63304-08	2

Table 1-5 Contents of 3.125” Mounting Kit (011-05043-01)

Item	Garmin P/N	Quantity
DCP, Adapter Plate, 3.125”	125-00581-12	1
Screw, 4-40 x .250, FLHP 100, SS/BO	211-63304-08	2

Table 1-6 Contents of Connector Kit (011-05044-00)

Item	Garmin P/N	Quantity
Screw, 4-40x.125, PHP, SS/P, w/NYL	211-60234-04	1
Screw, 4-40x.250, PHP-STD, SS/BO	211-60304-08	2
Term, Ring, Ins, #4, 22-26 AWG	235-00117-01	1
Conn, Hsg, Rcpt, 3mm P, Single Row, Locking, 6 CKT, Nylon	330-00771-05	1
Contact, Female, Crimp, 20-24 AWG, 15u Gold	336-00065-05	6

1.2.3 Physical Characteristics

Table 1-7 Unit and Accessory Weights

Model	Part Number	Weight
GSB 15, Vertical	011-04937-00	0.16 lbs (0.07 kg)
GSB 15, Right Angle	011-04937-01	0.16 lbs (0.07 kg)
GSB 15 2.25” Mounting Kit	011-05043-00	0.11 lbs (0.05 kg)
GSB 15 3.125” Mounting Kit	011-05043-01	0.20 lbs (0.09 kg)
GSB 15 Connector Kit	011-05044-00	0.01 lbs (0.005 kg)

1.2.4 Mod Level History

The following tables identify hardware modification (Mod) Levels for the GSB 15. Mod Levels are listed with the associated service bulletin number, service bulletin date, and the purpose of the modification. The table is current at the time of publication of this manual (see date on front cover) and is subject to change without notice. Authorized Garmin Sales and Service Centers are encouraged to access the most up-to-date bulletin and advisory information on the Garmin Dealer Resource web site at www.garmin.com using their Garmin-provided user name and password.

Table 1-8. MOD Level History

Applicable LRU Part Number	MOD Level	Service Bulletin Number & Date	Purpose of Modification
011-04937-00	N/A	N/A	N/A
011-04937-01	N/A	N/A	N/A

1.3 Certification Statement

The GSB 15 has been shown to meet compliance with the claimed TSO(s) when interfaced with the equipment defined in this installation manual, and installed in accordance with the requirements and limitations as defined in this installation manual.

The installer must verify that non-Garmin devices to be interfaced meet the installation requirements identified in this manual to assure the installed system will comply with the Garmin TSO Authorization. Garmin installation requirements will usually specify that the interfaced device has appropriate TSO authorization, and in some cases, such as for TSO-C144 antennas, may also require that the non-Garmin device meet additional Garmin specifications.

The conditions and tests required for TSO approval of this article are minimum performance standards. Those installing this article either on or within a specific type or class of aircraft must determine that the aircraft installation conditions are within the TSO standards which include any accepted integrated non-TSO functions. TSO articles and any accepted integrated non-TSO function(s) 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.

In accordance with the Bilateral Oversight Board, Decision 006, for the Agreement Between the United States of America and the European Union on Cooperation in the Regulation of Civil Aviation Safety, the FAA TSO authorization makes this an approved article within the respective EASA system. This article was tested to additional standards (see section 1.3.4) that may demonstrate additional airworthiness specification performance standards required by the European Aviation Safety Agency (EASA).

The Appliance Project Identifier (API) for the GSB 15 is GMN-02201. The API has been used for project identification with the FAA.

1.3.1 GSB 15 TSO Compliance

Table 1-9 GSB 15 (011-04937-00, -01) TSO Compliance

TSO/MOPS*	Function Design	Class/Type	System SW Part Numbers	Boot Block SW Part Numbers	CLD Part Numbers
TSO-C71	Airborne Static (DC to DC) Electrical Power Converter	N/A	N/A	N/A	N/A

*The Minimum Performance Standards in this table are the conditions and tests used to achieve FAA TSO authorization. See Section 1.3.4 for additional standards.

1.3.2 GSB 15 (011-04937-00, -01) TSO/ETSO Deviations

Table 1-10 GSB 15 (011-04937-00, -01)TSO Standard Deviations

TSO	Deviation
TSO-C71	Garmin was granted a deviation to include only product name, part number, serial number, and this statement on the unit's nameplate label: "TSO-C71 See IM for Add'l Appliance Apprvls".
	Garmin was granted a deviation to use RTCA/DO-160F as the standard for Environmental Qualification and Test Procedures of Airborne Equipment.

1.3.3 Non-TSO Functions

The GSB 15 has no non-TSO functions.

1.3.4 Additional Standards

The GSB 15 has no Additional Standards.

The conditions and tests required for approval of this article are minimum performance standards. Those installing this article either on or within a specific type or class of aircraft must determine that the aircraft installation conditions are within the standards which include any accepted integrated functions not specified by the standard. Articles approved with 14 CFR part 21.8(d) and any accepted integrated function(s) not specified in the standard 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.

1.3.5 Design Assurance Levels

The GSB 15 contains no software or airborne electronic hardware with related design assurance levels.

The GSB 15 COTS module provides no design assurance for pass-through data. Those installing this article with other articles utilizing pass-through data must determine means for detecting misleading or corrupt data.

1.3.6 Database

For information on certification compliance for databases, refer to Garmin Document P/N 190-01999-00 posted at flyGarmin.com.

1.4 Interface Summary

The following list is an interface summary for the GSB 15 unit:

- Two (2) - USB Type A connectors for charging and data transfer
- A USB interface through the rear connector for database/SW loads to compatible Garmin units.

1.5 Performance Technical Specifications

1.5.1 Environmental Qualification Form Reference

It is the responsibility of the installing agency to obtain the latest revision of the GSB 15 Environmental Qualification Form. To obtain a copy of this form, see the dealer/OEM portion of the Garmin web site (www.garmin.com).

This form is available directly from Garmin under the following part number:

GSB 15 Environmental Qualification Form, Garmin part number 005-01380-03

1.5.2 General Specifications

Table 1-11 General Specifications

Characteristic	Specification
Qualcomm® Quick Charge™ Technology	Qualcomm® Quick Charge™ Technology delivers up to 75% faster charging vs. conventional USB charging
Output Voltage	5-12V out (5V nominal)
Output Power (each port)	5.0V/3A, 9.0V/2A, 12V/1.5A (18W MAX)
Operating Temperature Range	-20 to 55 C
Altitude	55,000 ft
Humidity	95% non-condensing

1.5.3 Power Specifications

Maximum power while charging both ports (18W each) and backlight enabled: 40W

28V: 1.43A

14V: 2.86A

Maximum power with no devices connected: 500mW

28V: 17mA

14V: 35mA

1.5.4 Over-Temperature Protection

The GSB 15 is equipped with over-temperature detection and may re-negotiate to 5V, 1.5A (MAX) output current. Once the device has cooled, normal output current will resume.

1.6 Limitations

This article meets the minimum performance and quality control standards required by a technical standard order (TSO). Installation of this article requires separate approval.

1.7 Operating Instructions

The GSB 15 has a configurable backlight. Grounding pin 5 will de-activate the backlight, allowing pin 5 to float enables the backlight.

It is acceptable and preferred to install only the pins that are needed.

CAUTION

Do not apply power to the unit until after the rear connector is completely seated. Connecting the unit while power is applied may cause damage to the device, and to other LRUs that are connected to the data lines.

1.8 License Requirements

There are no license requirements applicable to the GSB 15.

1.9 Reference Documents

There are no applicable reference documents for installation of the GSB 15.

2 INSTALLATION OVERVIEW

2.1 Introduction

This section provides the equipment information for installing the GSB 15 and related optional accessories. Installation of the GSB 15 must follow the data detailed in this manual. Cabling is typically fabricated by the installing agency to fit each particular aircraft. Always follow acceptable avionics installation practices per advisory circulars AC 43.13-1B and AC 43.13-2B or later FAA approved revisions.

2.2 Installation Materials Required but not Supplied

- All wiring required for installation
- Circuit breaker

2.3 Installation Configurations

The GSB 15 can be installed in either a rear connector or side connector configuration. Refer to the outline and installation drawings in Appendix A.

Optional 2.25” and 3.125” mounting kits are also available (see Table 1-3) to mount the GSB 15 in existing instrument panel holes.

NOTE

At least 2 of the 4 provided mounting holes must be used (diagonally from each other) to mount the GSB 15.

2.4 Special Tools Required

A crimp tool is required for the GSB 15 installation. Recommended and optional crimp tools are as follows:

Recommended Crimp tool:

- Molex Hand Crimp Tool, P/N 638190000

Optional:

- Molex Insertion Tool for Micro-Fit 3.0 and CRC Male and Female Crimp Terminals, 20-30 AWG, P/N 638120800
- Molex Extraction Tool, P/N 11030043

2.5 Cabling and Wiring

Wiring must be installed in accordance with AC 43.13-1B Chapter 11, Sections 8 through 13. The following issues must be addressed:

- Do not expose cabling and wiring to chafing
- Do not route cabling and wiring harnesses near flight cables
- Do not route cabling and wiring near high-energy sources. (e.g. DC motors, high heat sources)
- Wiring indicated as shielded in Appendix B must be shielded
- Pigtail lengths must be less than 3.0 inches.
- Use 22 AWG or larger for power and ground wires, 25 ft max.

2.6 Shielding and Electrical Bonding Considerations

Electrical equipment, supporting brackets, and racks must be electrically bonded to the aircraft's main structure or a designated aircraft groundplane. Refer to the following documents for applicable bonding techniques:

- AC 43.13-1B CHG 1, "Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair", Chapter 11, "Aircraft Electrical Systems"
- SAE ARP 1870A, "Aerospace Systems Electrical Bonding and Grounding for Electromagnetic Compatibility and Safety"
- A bonding procedure developed and supplied by the aircraft manufacturer (if available)

The electrical bond must achieve direct current (DC) resistance less than or equal to 2.5 milliohms to local structure where the equipment is mounted. Compliance must be verified by inspection using a calibrated milliohm meter.

2.7 Cooling Requirements or Considerations

The GSB 15 has no cooling requirements or considerations. Forced air cooling will reduce the internal temperature of the unit and prolong the life of the product.

The GSB 15 is equipped with over-temperature detection that may reduce output current to 1.5A (max) . After the device has cooled, normal output current 3A (max) will resume.

2.8 Mounting Requirements

The small size of the GSB 15 allows it to be installed in many places. It is intended to be installed to the instrument panel or other suitable cabin surface. There are no special requirements for viewing, reach, or proximity. See drawings in Appendix A for details.

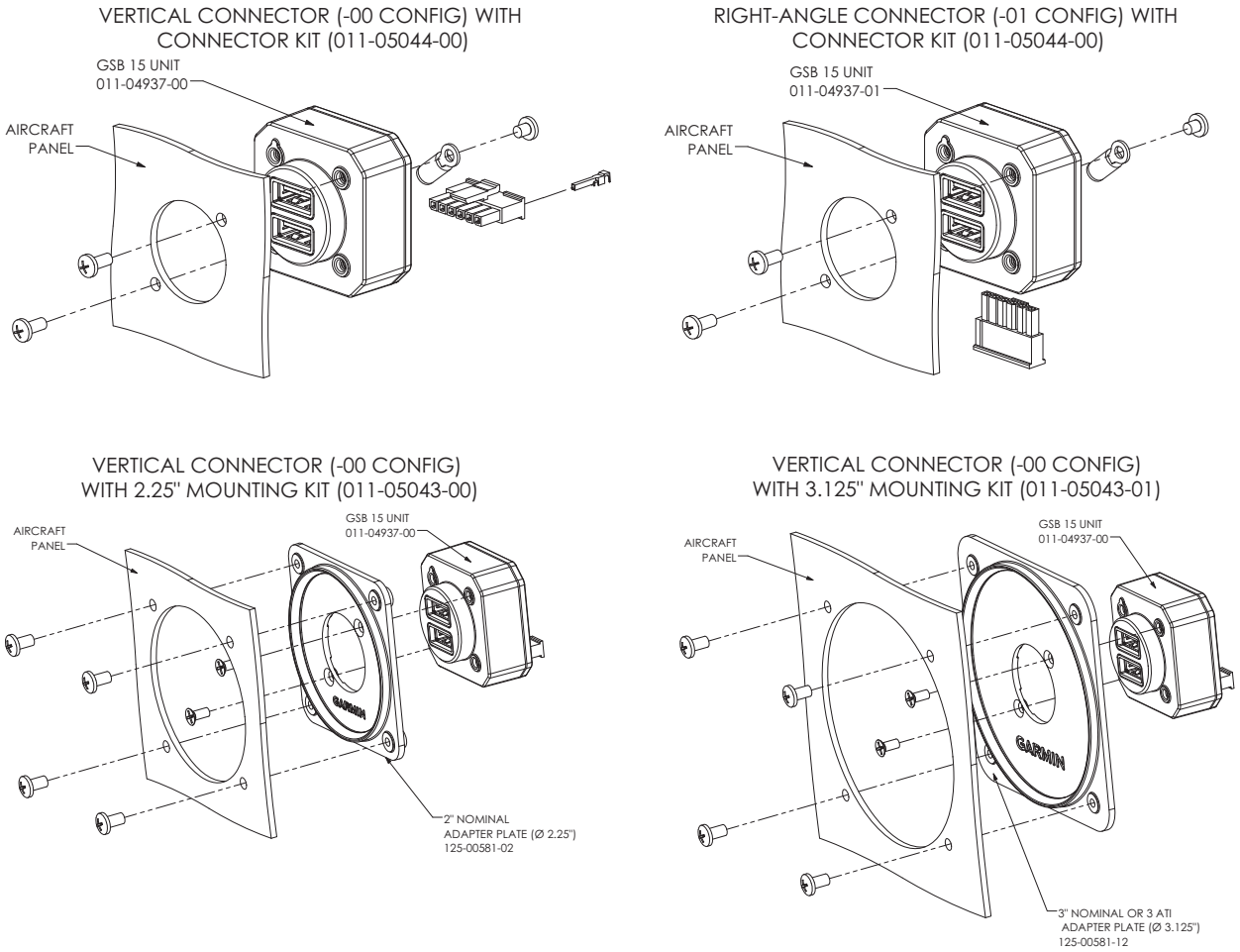


Figure 2-1. GSB 15 Mounting Examples

3 INSTALLATION PROCEDURE

3.1 Wiring Harness Installation

Allow adequate space for installation of cables and connectors. The installer shall supply and fabricate all of the cables. All electrical connections are made through a single connector.

Section 6 defines the electrical characteristics of all input and output signals. Required connectors and associated hardware are provided in the connector kit (Section 1.2.2).

CAUTION

Do not apply power to the unit until after the rear connector is completely seated. Connecting the unit while power is applied may cause damage to the device, and to other LRUs that are connected to the data lines.

NOTE

For data transfer installations, the ring terminal is required. If used, torque the ring terminal screw to 4-6 in-lbs.

3.2 Equipment Mounting

For final installation and assembly, refer to the outline and installation drawings shown in Appendix A of this manual.

1. Assemble connector per instructions in Section 2.
2. Install the unit from the back side of the desired installation surface with the circular surface protruding through the hole.
3. Attach the unit to the installation surface using a minimum of two screws (oriented diagonally). Rotation orientation of the unit within the mounting location is at the installer's discretion.
4. Attach the cable harness to the connector, paying attention to the keying and latching features of the connector.
5. If using mounting kit 011-05043-00 or 011-05043-01, mount adapter plate to desired mounting surface using specified screws (see Figure A-4) and attach unit to adapter plate using included screws.

CAUTION

Be careful to not damage the unit or connector during installation. Avoid over torquing mounting screws.

NOTE

For vertical unit (011-04937-00) installations, ensure the portion of the panel that mates to the GSB 15 is electrically conductive to ensure proper grounding.

3.2.1 Unit Replacement

Make sure that power is removed before removing the GSB 15.

4 POST INSTALLATION CONFIGURATION & CHECKOUT

4.1 Mounting, Wiring, and Power Checks

Verify all cables are properly secured and shields are connected to the ground lug located on the back of the unit. Check the movement of the flight and engine controls to verify there is no interference between the cabling and control systems. Verify all wiring is installed as described in this manual. Prior to installing and powering up the GSB 15, the wiring harness must be checked for proper connections to the aircraft systems and other avionics equipment. Point to Point continuity must be checked to expose any faults such as shorting to ground or wiring discrepancies. Any faults or discrepancies must be corrected before proceeding. After accomplishing a continuity check, perform power and ground checks to verify proper power distribution to the GSB 15. Any faults or discrepancies must be corrected at this time. The GSB 15 can be installed after completion of the continuity and power checks.

4.2 Configuration Setup

Not applicable.

4.3 Diagnostic Information

Not applicable.

4.4 Ground Checks

Not applicable.

4.5 Software Loading Procedure

The GSB 15 does not use or load its own operating software.

5 CONTINUED AIRWORTHINESS

Maintenance of the GSB 15 is “on condition” only.

6 CONNECTOR PINOUT INFORMATION

6.1 Pin Function List

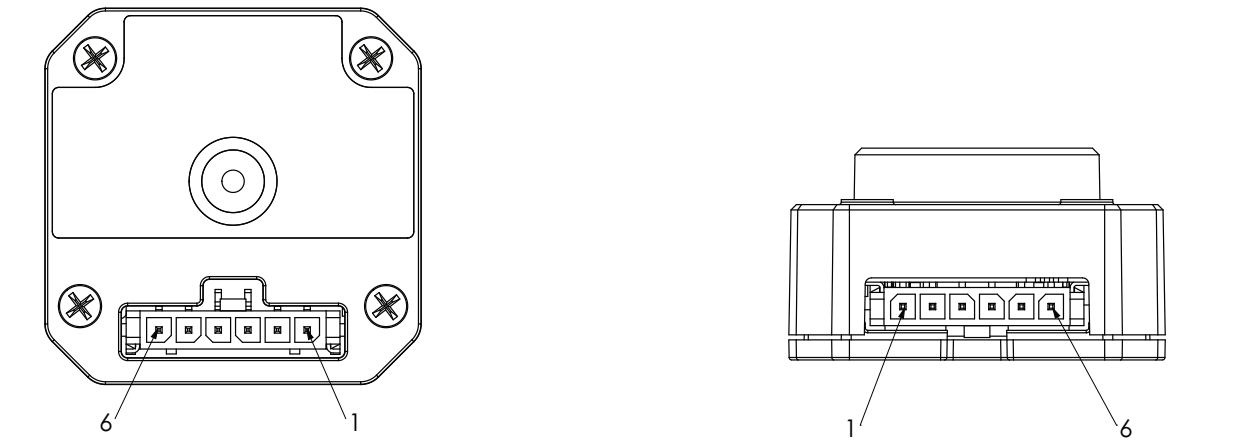
6.1.1 P201/202 Connector

NOTE

P201 is the rear connector designation for the GSB 15 (vertical) part number 011-04937-00.

NOTE

P202 is the rear connector designation for the GSB 15 (right angle) part number 011-04937-01.



P201, GSB 15 Vertical (011-04937-00) Unit

P202, GSB 15 Right Angle (011-04937-01) Unit

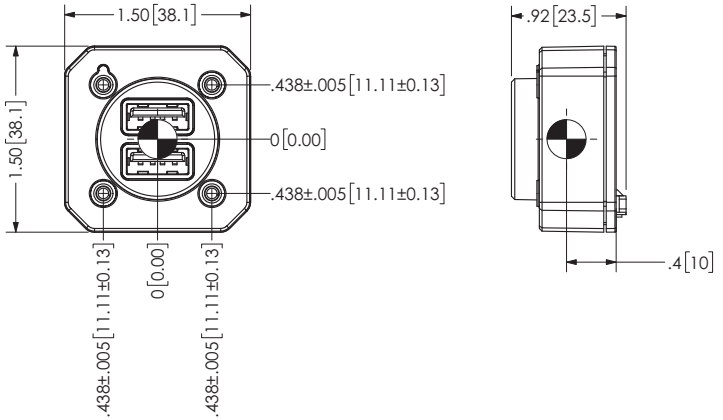
Figure 6-1. Unit View of P201/P202.

Table 6-1 J201/J202 Connector

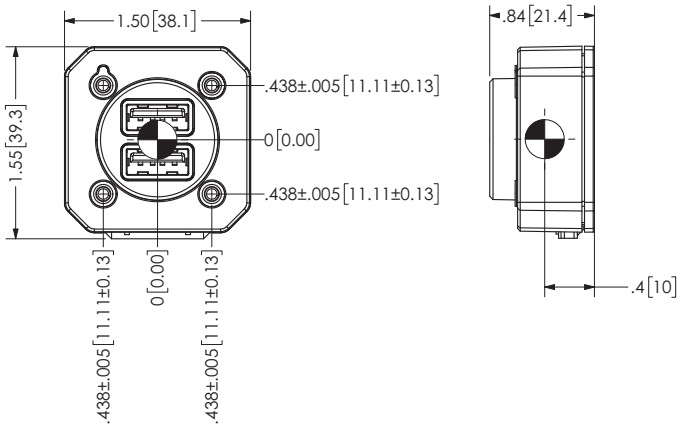
Pin	Pin Name	I/O	COMMENTS
1	AIRCRAFT POWER	IN	14V/28V Aircraft Power Input
2	USB DN	I/O	May use shielded CAT-5 ethernet cable.
3	USB DP	I/O	May use shielded CAT-5 ethernet cable.
4	USB GND	--	May use shielded CAT-5 ethernet cable.
5	BACKLIGHT ENABLE	IN	Deactivated-Low configuration strap. Do not connect for backlight ON. Ground connection for backlight OFF.
6	POWER GROUND	--	Ground

APPENDIX A OUTLINE AND INSTALLATION DRAWINGS

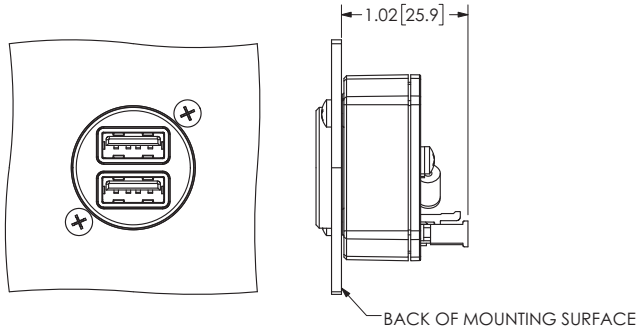
VERTICAL CONNECTOR (-00 CONFIG), UNIT ONLY



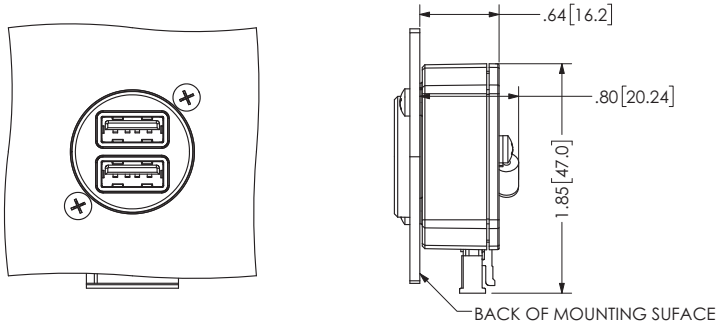
RIGHT-ANGLE CONNECTOR (-00 CONFIG), UNIT ONLY



VERTICAL CONNECTOR (-00 CONFIG), WITH CONNECTOR KIT (011-05044-00)



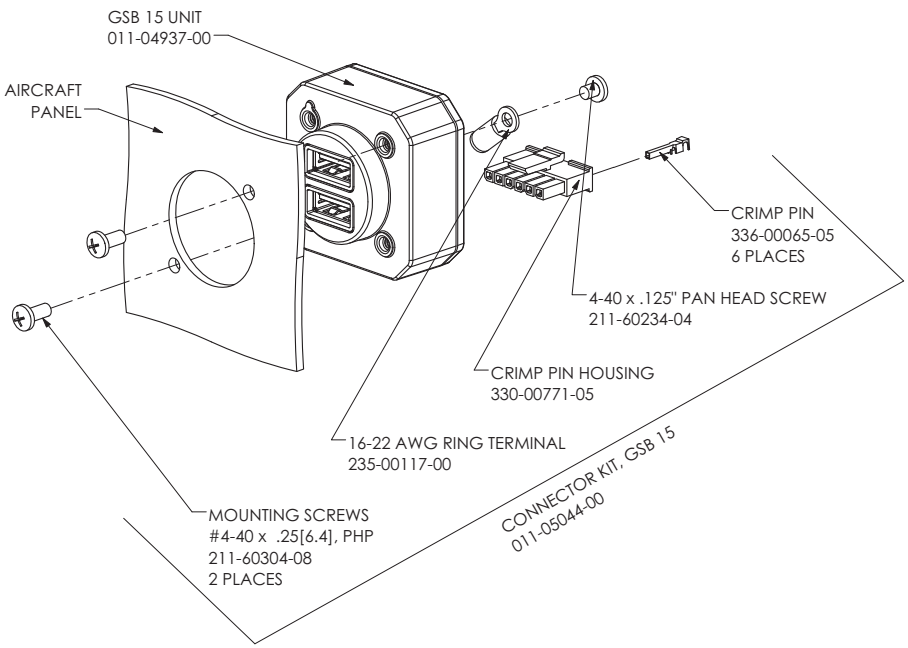
RIGHT-ANGLE CONNECTOR (-00 CONFIG), WITH CONNECTOR KIT (011-05044-00)



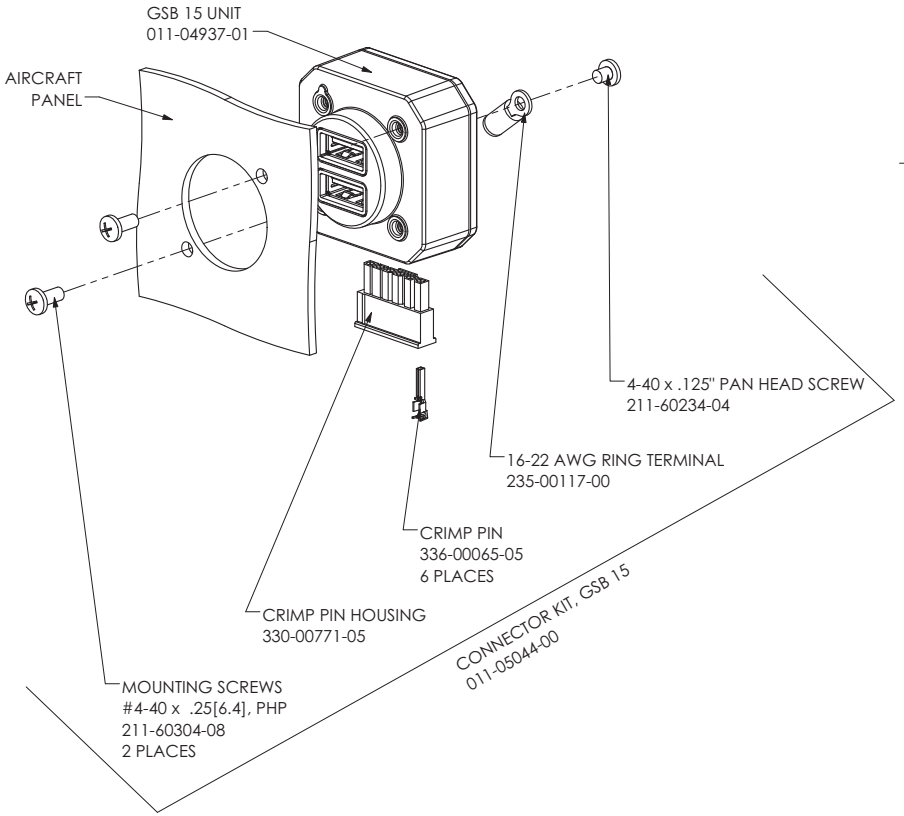
NOTES:
1. DIMENSIONS: INCHES[mm]. METRIC VALUES ARE FOR REFERENCE ONLY.
2. DIMENSIONS ARE NOMINAL AND TOLERANCES ARE NOT IMPLIED UNLESS SPECIFICALLY STATED.

Figure A-1 GSB 15 Outline Drawing

VERTICAL CONNECTOR (-00 CONFIG) WITH CONNECTOR KIT (011-05044-00)



RIGHT-ANGLE CONNECTOR (-01 CONFIG) WITH CONNECTOR KIT (011-05044-00)



Panel Thickness	Recommended Screw Length	Included in Connector Kit (011-05044-00)?
.000-.050[0.00-1.27]	.188[4.76]	No
.050-.125[1.27-3.18]	.250[6.35]	Yes, Qty. 2
.125-.188[3.18-4.76]	.313[7.95]	No

Figure A-2 GSB 15 Installation Drawing (011-05044-00 Mounting Kit)

RECOMMENDED PANEL CUTOUT DIMENSIONS FOR UNIT

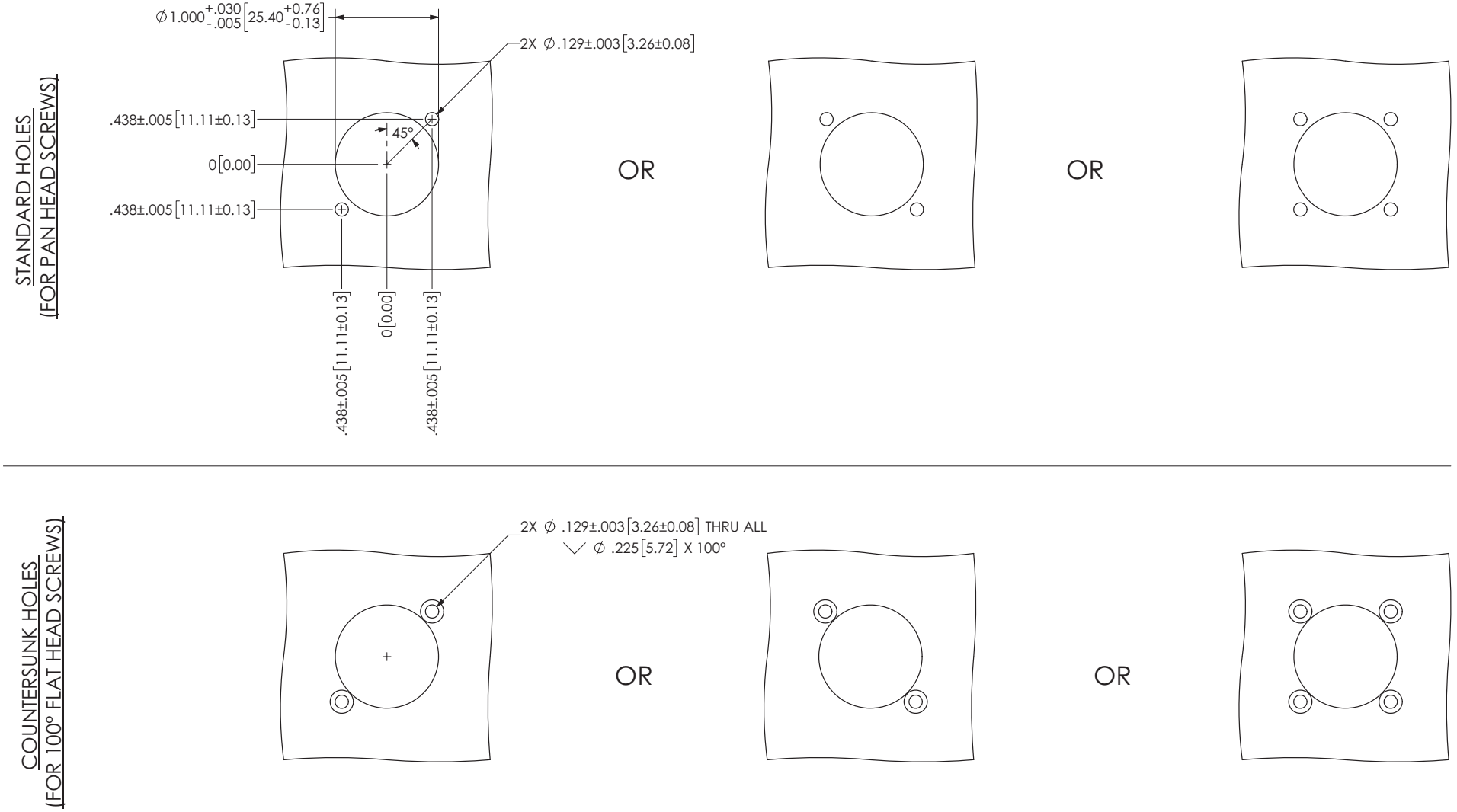
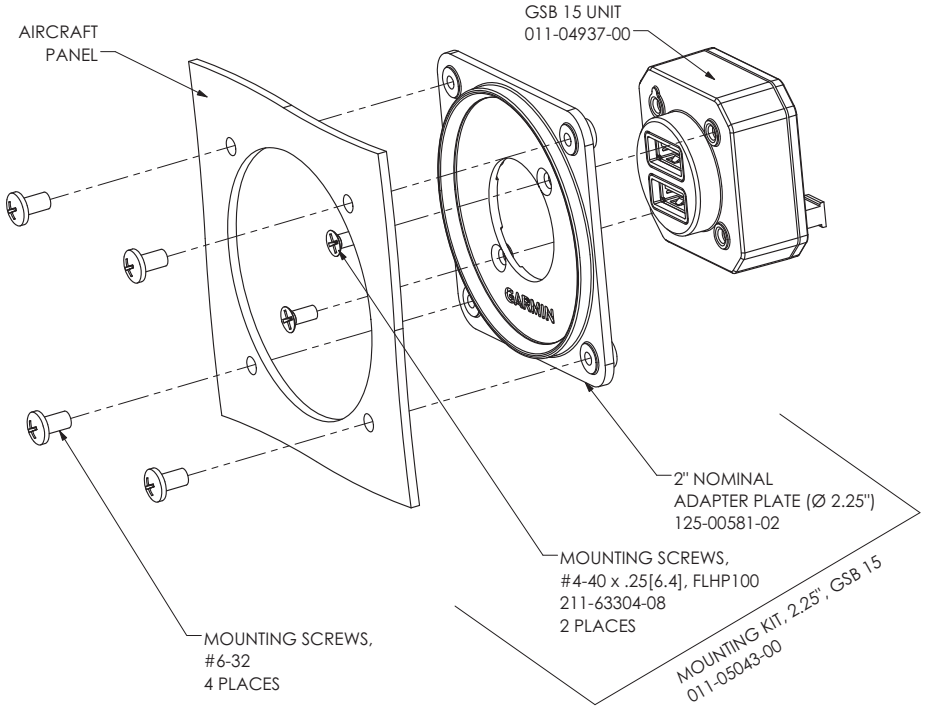


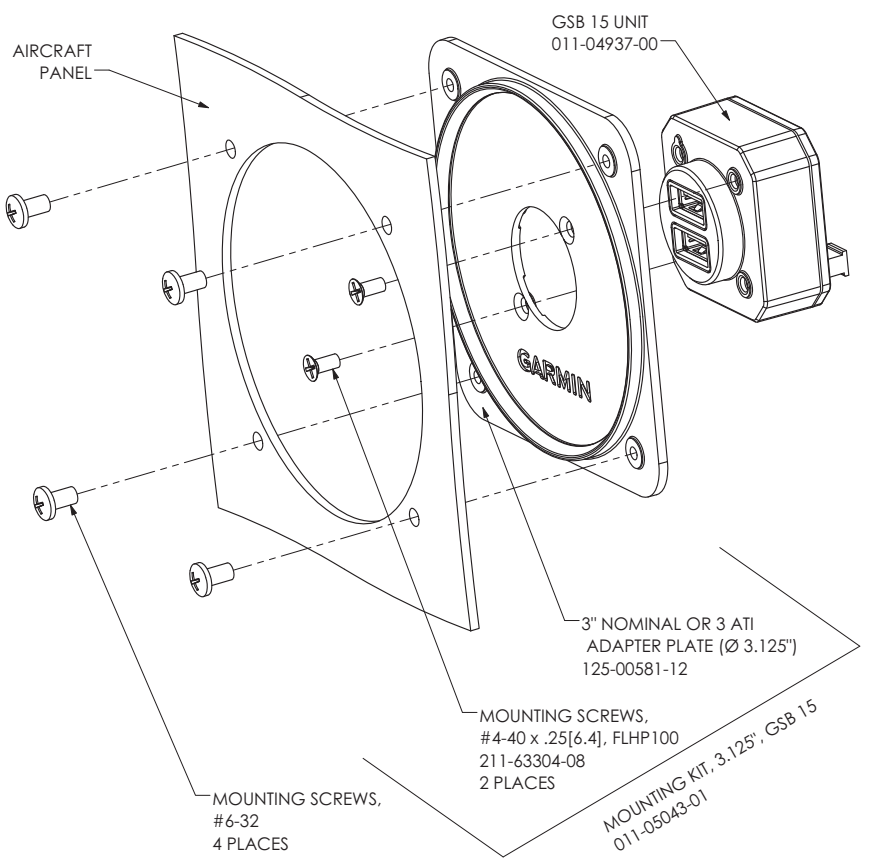
Figure A-3 GSB 15 Panel Cutout Drawing (Pan Head and Flat Head Screws)

VERTICAL CONNECTOR (-00 CONFIG) WITH 2.25" MOUNTING KIT (011-05043-00)



Panel Thickness	Recommended Screw Length
.000-.050[0.00-1.27]	.188[4.76] Minimum
.050-.125[1.27-3.18]	.250[6.35] Minimum
.125-.188[3.18-4.76]	.313[7.95] Minimum

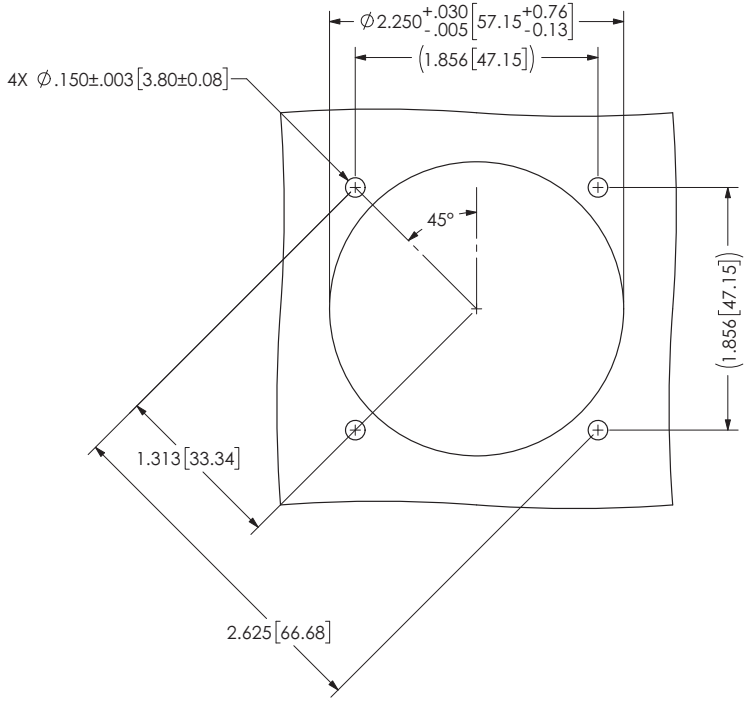
VERTICAL CONNECTOR (-00 CONFIG)WITH 3.125" MOUNTING KIT (011-05043-01)



Panel Thickness	Recommended Screw Length
.000-.050[0.00-1.27]	.188[4.76] Minimum
.050-.125[1.27-3.18]	.250[6.35] Minimum
.125-.188[3.18-4.76]	.313[7.95] Minimum

Figure A-4 GSB 15 Assembly Drawing (011-05043-00 and -01 Mounting Kits)

011-05043-00 STANDARD HOLES (FOR PAN HEAD SCREWS)



011-05043-01 STANDARD HOLES (FOR PAN HEAD SCREWS)

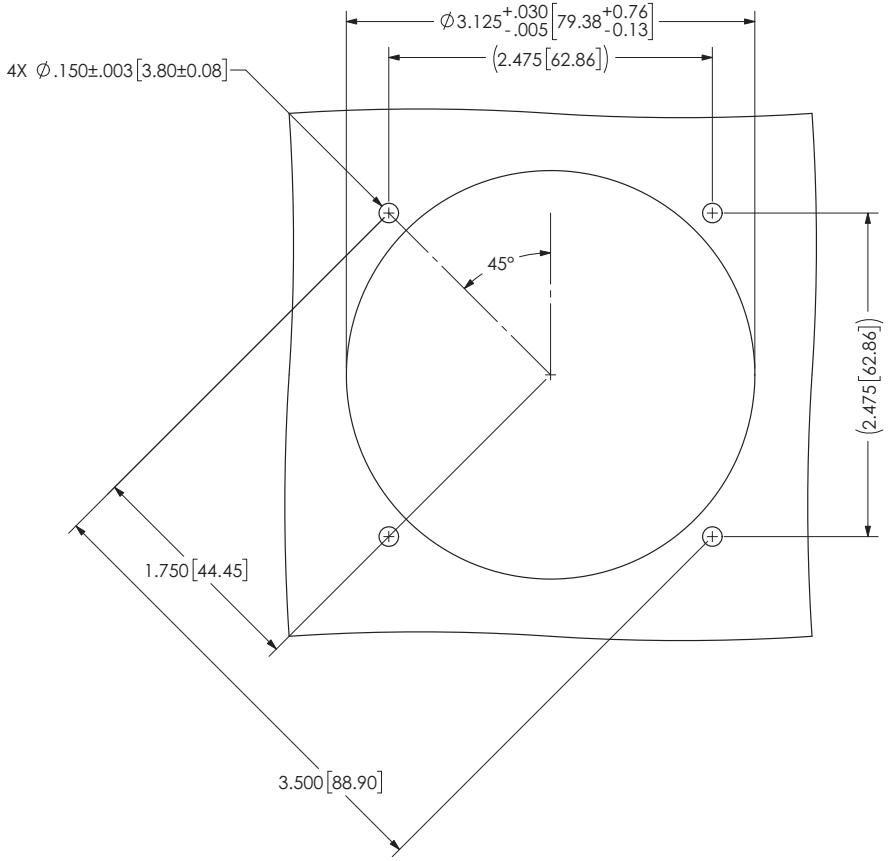
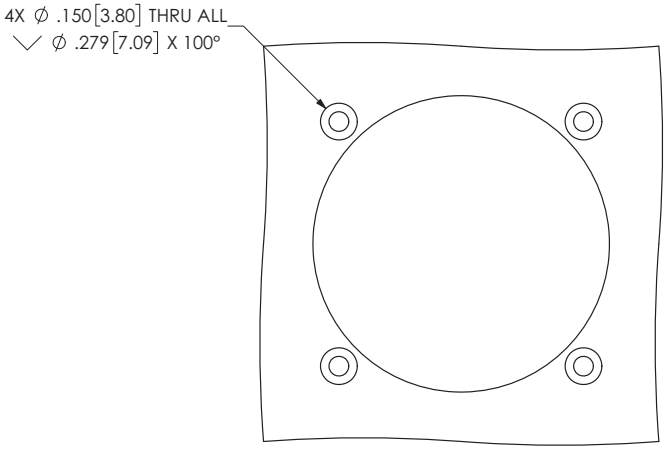


Figure A-5 GSB 15 Panel Cutout Drawing w/Pan Head Screws (011-05043-00 and -01 Mounting Kits)

011-05043-00 COUNTERSUNK HOLES (FOR 100° FLAT HEAD SCREWS)



011-05043-01 COUNTERSUNK HOLES (FOR 100° FLAT HEAD SCREWS)

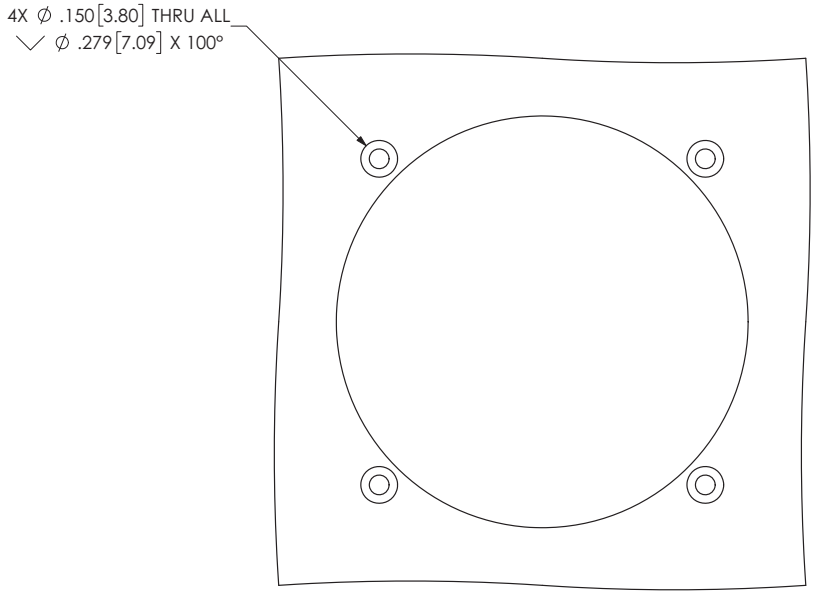


Figure A-6 GSB 15 Panel Cutout Drawing w/Flat Head Screws (011-05043-00 and -01 Mounting Kits)

APPENDIX B INTERCONNECT DRAWINGS

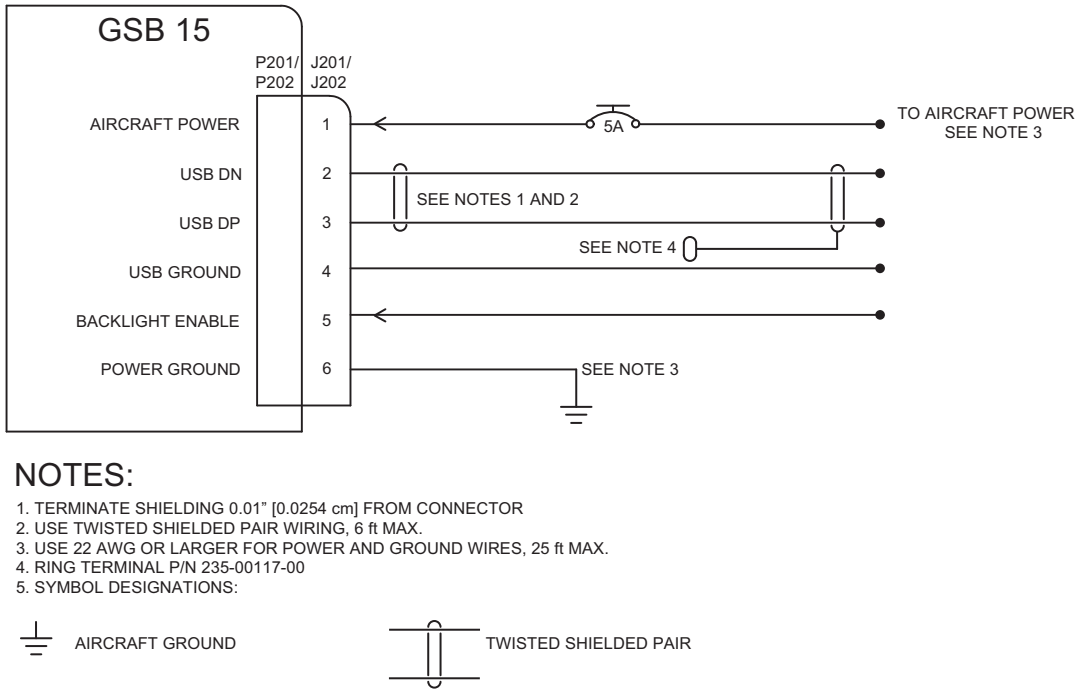


Figure B-1 GSB 15 Example Interconnect