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AI-Bravo Technical User Guide

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AI-Bravo Technical User Guide

ASTi

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Revision history

Date	Revision	Version	Comments
11/18/2019	A	0	Baseline version.
1/27/2020	B	0	Updated figure labels in "I/O interface pinout." Added diagram of mounting plate and instructions for installing the mounting plate.

Contents

1.0 ASTi Interface-Bravo (AI-Bravo)

The AI-Bravo is a compact audio and I/O distribution device that connects local or remote operator headsets, speakers, control panels, and other peripherals to the network via Ethernet. The ASTi server routes audio, control, and I/O data to and from each AI-Bravo over a local area network (LAN) or wide area network (WAN). Depending on the user's or program's needs, the AI-Bravo can connect to a variety of endpoints:

- Simulated radio panels
- Live radios
- Press-to-talk (PTT) devices and headsets
- Microphones
- Powered speakers

Figure 1, "AI-Bravo hardware diagram" below shows an example of an AI-Bravo network configuration:

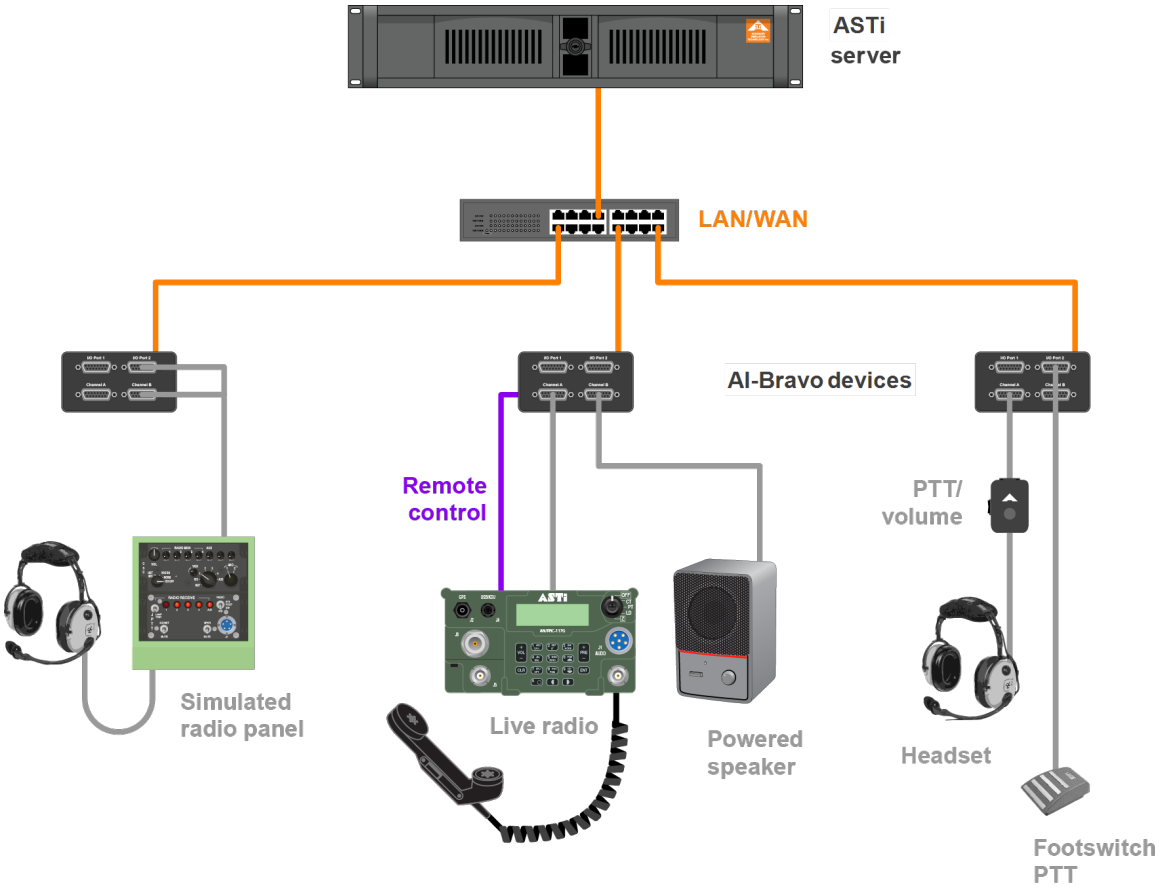

Figure 1: AI-Bravo hardware diagram

The AI-Bravo includes the following features:

- *Stereo support*: supports stereo operation (i.e., independent left and right output) on a single connector, reducing cabling complexity.
- *Reduced footprint*: takes up little space and fits easily on a desktop.
- *Software-configurable*: includes adjustable preamplifier gains and sidetone for easy, direct connection to a variety of audio or communications systems and peripherals.
- *Routable*: supports IPv4 and IPv6 LAN and WAN topologies.
- *Integrated I/O*: includes configurable digital and analog I/O for direct connection of PTT units, volume controls, switch detection, radio PTT activation, and other control applications.
- *Dual USB ports*: provides ability to connect USB peripherals based on need (e.g., USB headset and foot switch).

2.0 Specifications

The AI-Bravo has the following specifications:

Compatible With	Voisus
Weight	1 lb., 3 oz.
Power Source	Ethernet port via Power over Ethernet (PoE) IEEE 802.3af
Power Consumption	<12.5 w @ 56 VDC

Figure 2: AI-Bravo specifications

On the front panel, the AI-Bravo has four DB-15 connectors (i.e., two for audio and two for I/O):

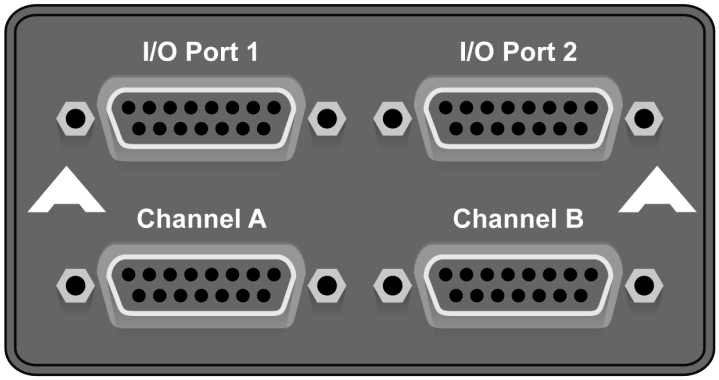

Figure 3: AI-Bravo front panel

On the rear panel, the AI-Bravo has two USB ports, two additional DB-15 connectors for I/O, and a Power over Ethernet (PoE) port:

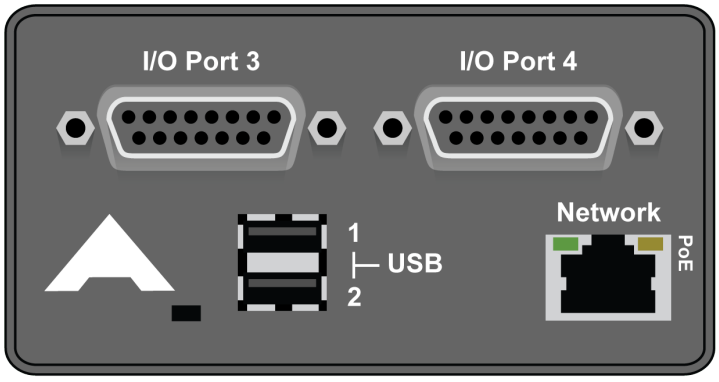

Figure 4: AI-Bravo rear panel

The AI-Bravo's dimensions are 6.63" L × 4" W × 2.13" H, as shown in Figure 5, "AI-Bravo dimensions" below:

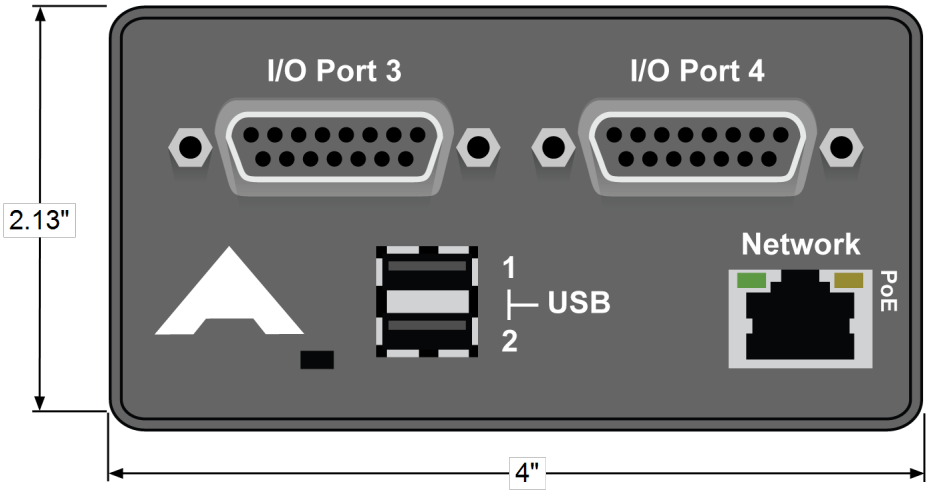

Figure 5: AI-Bravo dimensions

3.0 Audio input and output

The AI-Bravo supports two types of audio I/O:

- 2 USB ports
- 2 DB-15 connectors (i.e., Channel A and Channel B)

Table 1, "Audio input values" below shows the audio input values for Channels A and B:

Characteristic	Value
Input impedance	1.65 kΩ
Input level	4.5 Vpp max (2.2 V_{PP} differential)
Input gain	0 dB, +10 dB to +65 dB, software configurable (go to note below)

Table 1: Audio input values

***Note**: The AI-Bravo gain covers a total range of 65 dB. You can set the range of 10–65 dB in 1 dB steps; however, you cannot choose the range of 1–9 dB as a function of design.*

Table 2, "Audio output values" below shows the audio output values for Channels A and B:

Characteristic	Value
Impedance	10 Ω
Max. power	150 mW at 32 Ω
Max. output signal	3.75 V_{PP} at 150 Ω 2.4 V_{PP} at 8 Ω
Frequency response	20 Hz to 20 kHz

Table 2: Audio output values

3.1 Audio interface pinout

Figure 6, "Channels A and B pinout" below shows the audio interface pinout for Channels A and B:

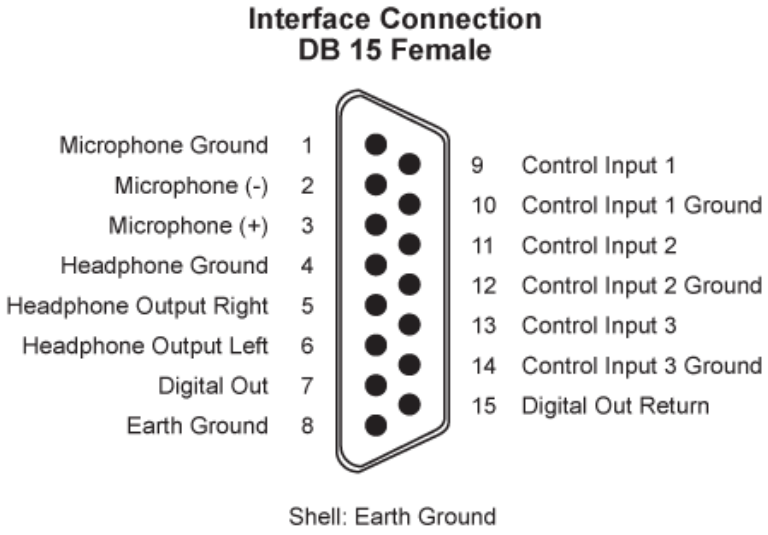

Figure 6: Channels A and B pinout

3.2 I/O interface pinout

Figure 7, "AI-Bravo I/O interface pinout" below shows the DB-15 connector pinout for the AI-Bravo:

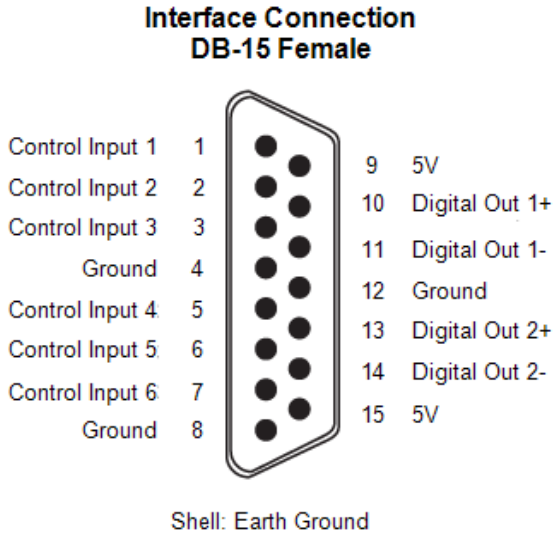

Figure 7: AI-Bravo I/O interface pinout

***Note**: Pins 9 and 15 are fused to 150 ma MAX.*

3.3 Status indicator lights

The LED status indicator light displays the AI-Bravo's status:

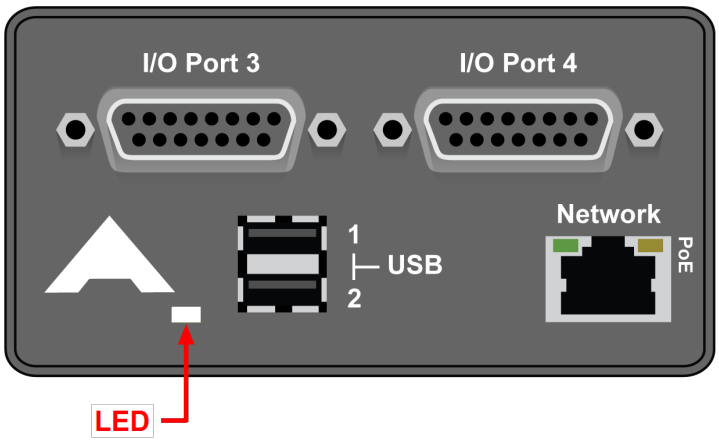

Figure 8: AI-Bravo status indicator lights

Table 3, "AI-Bravo status indicator lights" below defines each status indicator light for the AI-Bravo:

LED Light	Status
White solid	This LED represents the AI-Bravo's default “Power On” state.
Yellow flash	The AI-Bravo is updating. Do not turn off the device.
Red solid	Hardware Error #1: failed to find audio device; remove and reapply power, or contact support@asti-usa.com.
Red flash	Hardware Error #2: analog-to-digital converter (ADC) chip not found; remove and reapply power, or contact support@asti-usa.com.
Purple flash	This LED displays when **Find Me** is enabled. This feature can identify an AI-Bravo during setup.
Blue solid	No network link exists.
Blue flash 5x/second	The AI-Bravo cannot find any Voisus server(s) on the network.
Blue flash 1x/second	The AI-Bravo has detected Voisus server(s) on the network, but a server is not actively using it.
Green flash	A Voisus server is actively using the AI-Bravo.
Teal solid	Firmware Error #1: remove and reapply power, or contact support@asti-usa.-com.
Off	Firmware Error #2: remove and reapply power, or contact support@asti-usa.-com.

Table 3: AI-Bravo status indicator lights

4.0 Control inputs and digital outputs

The AI-Bravo's DB-15 connectors (i.e., Channels A and B) also function as control inputs. The following sections describe the AI-Bravo's control inputs and digital outputs, explaining how to use the control input as a digital input, an analog input, or a digital output.

4.1 Control inputs

The control inputs are contact-sensing; no voltage is required. Simply connect the control input and control input ground lines together using a switch or other suitable device, such as a press-to-talk (PTT) device. The control input can logically function as either a digital or an analog input.

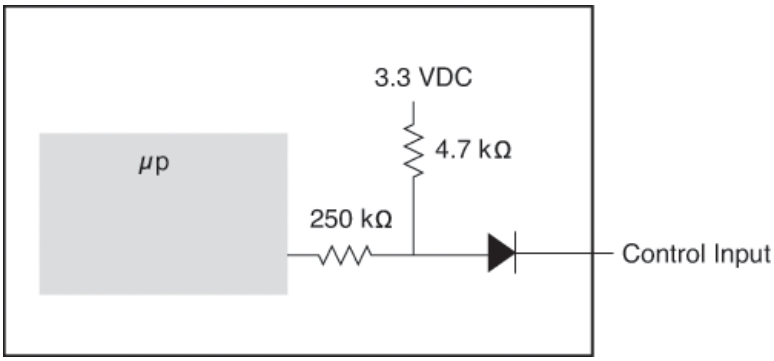

Figure 9: Control input circuitry

4.1.1 Control input as digital input

To use the control input as a digital input, simply short or open the required pins. For example, if you short Pins 9 and 10, Control Input 1 is True. If the pins are open, Control Input 1 is False. In this example, the control input acts like an on and off switch.

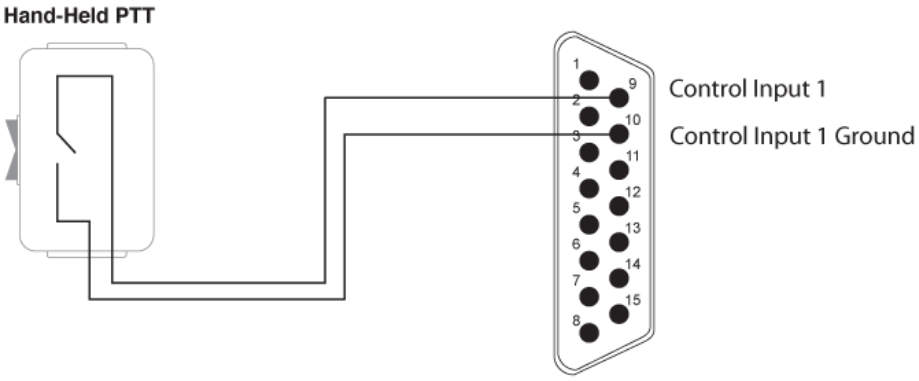

Figure 10: Digital In

4.1.2 Control input as analog input

To use the control input as an analog input, insert a resistance between the control input and control input ground pins. The four-channel selector knob, for example, contains a switch that changes the resistance between the control input and control input ground pins.

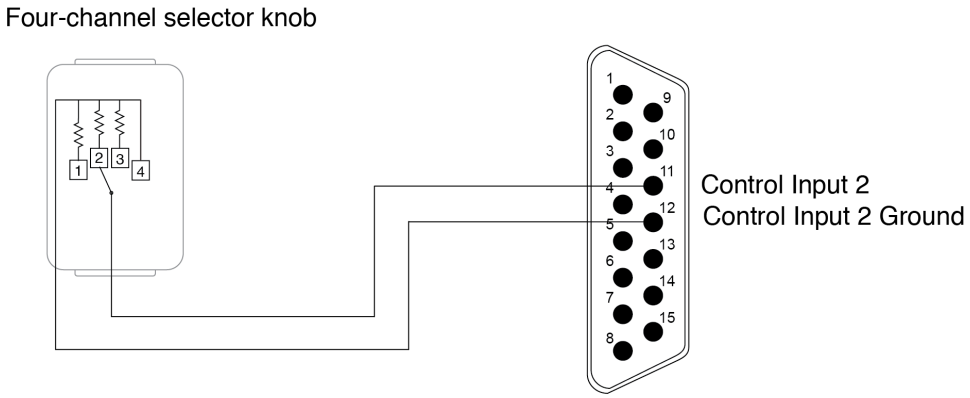

Figure 11: Analog In

4.2 Digital output

The digital output circuitry consists of an opto-isolated, solid-state relay for switching power to external loads. Table 4, "Digital output rating and dissipation" below summarizes the AI-Bravo's digital output opto-isolated field effect transistor (FET) values:

Type	Opto-isolated FET
Maximum continuous current rating	120 mA
Maximum power dissipation	300 mW

Table 4: Digital output rating and dissipation

Figure 12, "Digital output circuitry" below shows the AI-Bravo's digital output circuitry:

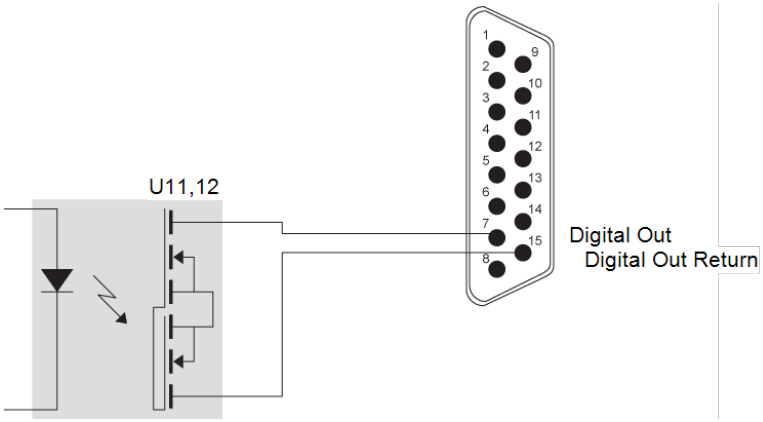

Figure 12: Digital output circuitry

5.0 Memory devices

Table 5, "AI-Bravo memory" below summarizes AI-Bravo devices with volatile and nonvolatile memory. Volatile memory is erased when you unplug the device, while nonvolatile memory is retained.

Type	Size	User Modifiable	Function	Process to Clear
Volatile				
CPU internal cache	512 KB	No	Internal cache for CPU	Remove Power Count to 30 Restore Power
Internal cache	128 KB	No	Internal cache	Remove Power Count to 30 Restore Power
RAM	1 GB	No	RAM	Remove Power Count to 30 Restore Power
Nonvolatile				
eMMC	4 GB	Yes	Application	Contact ASTi for more information.
EEPROM	2 x 32 KB	No	Device identification	None

Table 5: AI-Bravo memory

6.0 Environmental ranges

Table 6, "AI-Bravo environmental ranges" below summarizes the AI-Bravo's environmental ranges:

Range Type	Suggested Range
Operating temperature	0°C to +32°C (32°F to 90°F)
Operating max. temperature gradient	20°C (68°F) per hour
Operating humidity	10–70 percent noncondensing
Storage temperature	-10°C to 55°C (14°F to 135°F)
Storage max temperature gradient	30°C (86°F) per hour
Storage humidity	5–95 percent
Max altitude	2,000 meters

Table 6: AI-Bravo environmental ranges

7.0 Typical headset settings

The AI-Bravo supports a mono or stereo headset connection for the DB-15 connector (i.e., Channels A and B). Figure 13, "Mono headset connection" below shows a typical mono headset connection for the AI-Bravo:

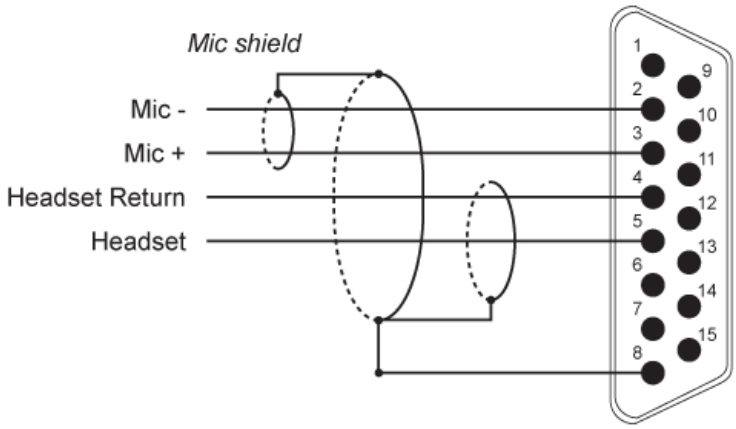

Figure 13: Mono headset connection

Figure 14, "Stereo headset connection" below shows a typical stereo headset connection for the AI-Bravo:

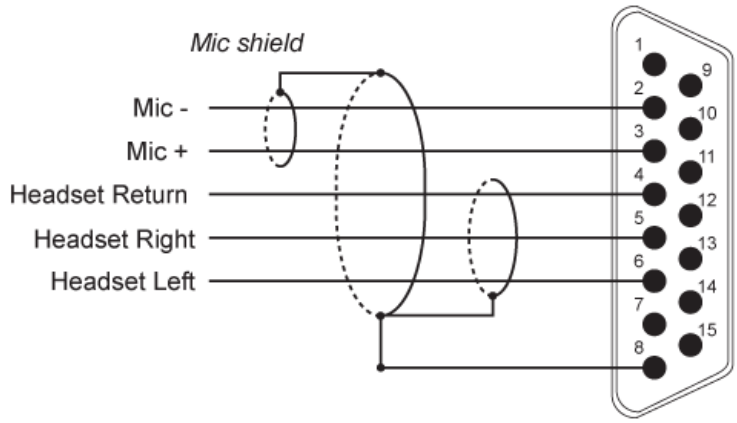

Figure 14: Stereo headset connection

8.0 Mounting plate

Figure 15, "AI-Bravo mounting plate diagram" below shows AI-Bravo mounting dimensions:

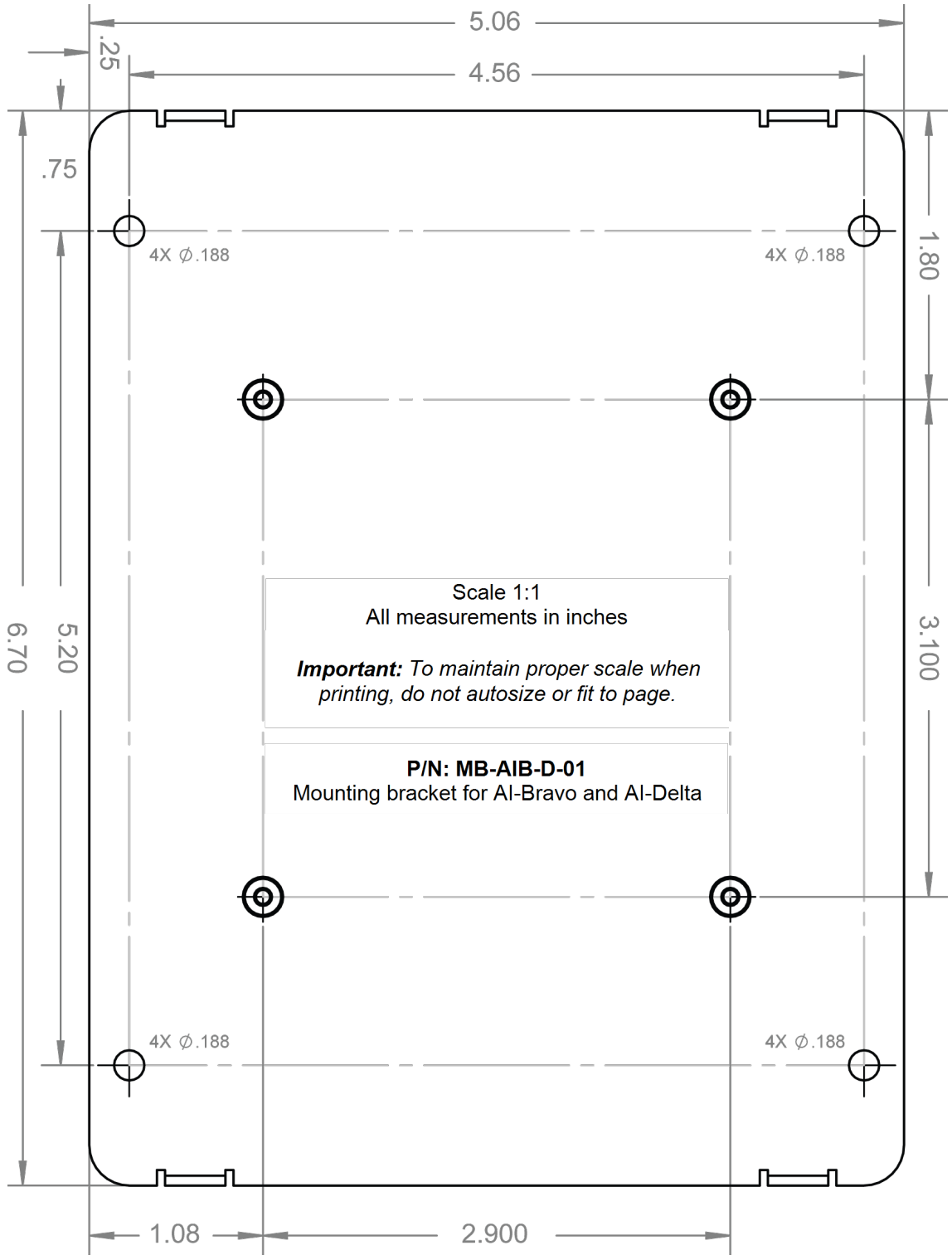

Figure 15: AI-Bravo mounting plate diagram

8.1 Install the AI-Bravo's mounting plate

To attach the mounting plate to the AI-Bravo, follow these steps:

1. Using a Phillips-head screwdriver, remove the AI-Bravo's four bottom screws.
2. Place the AI-Bravo on top of the plate.

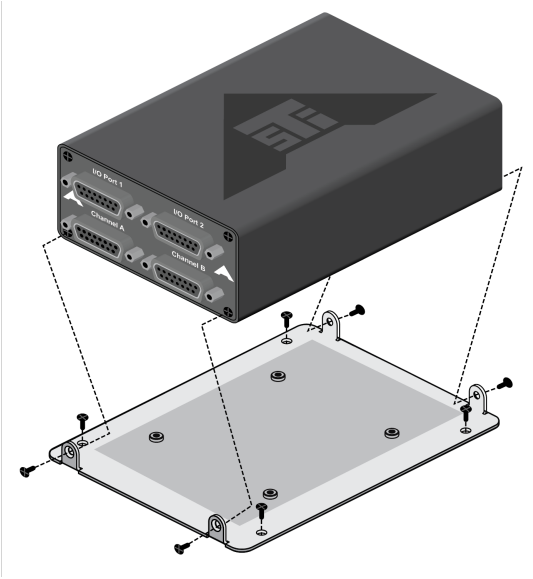

Figure 16: Mounting plate installation

3. To secure the device to the plate, insert the screws that you removed in Step 1, and tighten them.

Figure 17: Mounting plate screws

Appendix 3: Warranty information

To view ASTi's warranty, go to “Standard Terms and Conditions” at www.asti-usa.-com/legal/terms.html.

3-1 Repairs and returns

To return equipment to ASTi, observe the following procedures:

1. Request a Return Material Authorization (RMA) number through the form on the RMA User Account at rma.asti-usa.com/rma. ASTi's Production department cannot receive a repair without an RMA number. The shipping label must also include the RMA number. Any items received from customers without RMA numbers or appropriate contact information will not be tested. After 60 days, ASTi reserves the right to scrap all hardware received in this condition.
2. When packaging the equipment in question, make sure it is well-protected. Failure to properly package the equipment during shipping could void the warranty.
   - Always double-box the device.
   - The inner container should employ some semi-rigid, contour-fitting foam, while the exterior container should use a more pliant, shock-absorbing material, such as styrofoam peanuts.
   - To prevent possible Electrostatic Discharge (ESD) damage, properly enclose the device in an antistatic bag.
3. Do not send accessory pieces, such as rack mount kits, power supplies, or software. Only include items that do not work.
4. Describe the problem, noting the following information:
   - Serial number for the unit in question
   - Point of contact information (i.e., name, telephone number, and equipment return address)

   Failure to include this information could extensively delay the return of equipment.
5. If you are an international customer, include the correct product value on all shipping documents. For proper harmonized tariff codes, contact ASTi. The customer is responsible for duties, taxes, and fees incurred during shipment.

ASTi evaluates equipment free of charge and will not start work without prior customer approval.

You are responsible for shipping charges to ASTi for warranty and non-warranty repairs. If equipment is not under warranty, a purchase order is required to cover any repairs. ASTi will provide a quote for all nonwarranty items, including return shipping. The customer is responsible for return shipping charges on nonwarranty equipment. ASTi ships equipment still under warranty back to the customer via FedEx, unless otherwise directed. ASTi is responsible for return shipping charges on domestic items under warranty.

If ASTi does not receive the equipment 30 days after the RMA was issued, ASTi closes the RMA and designates it as unused.