AI-S Technical User Guide

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Product Name: AI-S

AI-S Technical User Guide

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Revision history

Date	Revision	Version	Comments
3/6/2018	B	0	Converted existing documentation into XML. Update "Status indicator lights."
12/14/2020	C	0	Updated the restricted rights copyright statement in the front matter; updated the manual's cover page, table styles, and section header styles.
3/9/2021	C	1	Fixed minor numbering display error in "Warranty information."
9/27/2021	C	2	In "Specifications," added "IEEE 802.3af ,Class 3" and a note to **Power Source**.
3/9/2022	C	3	Added **Port Speed/Duplex** requirements to "Specifications."
3/21/2022	C	4	Further clarified the RJ-45 Ethernet port and cabling requirements.
6/9/2022	C	5	Fixed incorrect pinout in "Audio interface pinout."
7/8/2022	D	0	Removed duplicate information from "Control inputs." Fixed missing images and made minor changes to grammar and style.

Contents

1.0 ASTi Interface-Single (AI-S)

The AI-S 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.

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

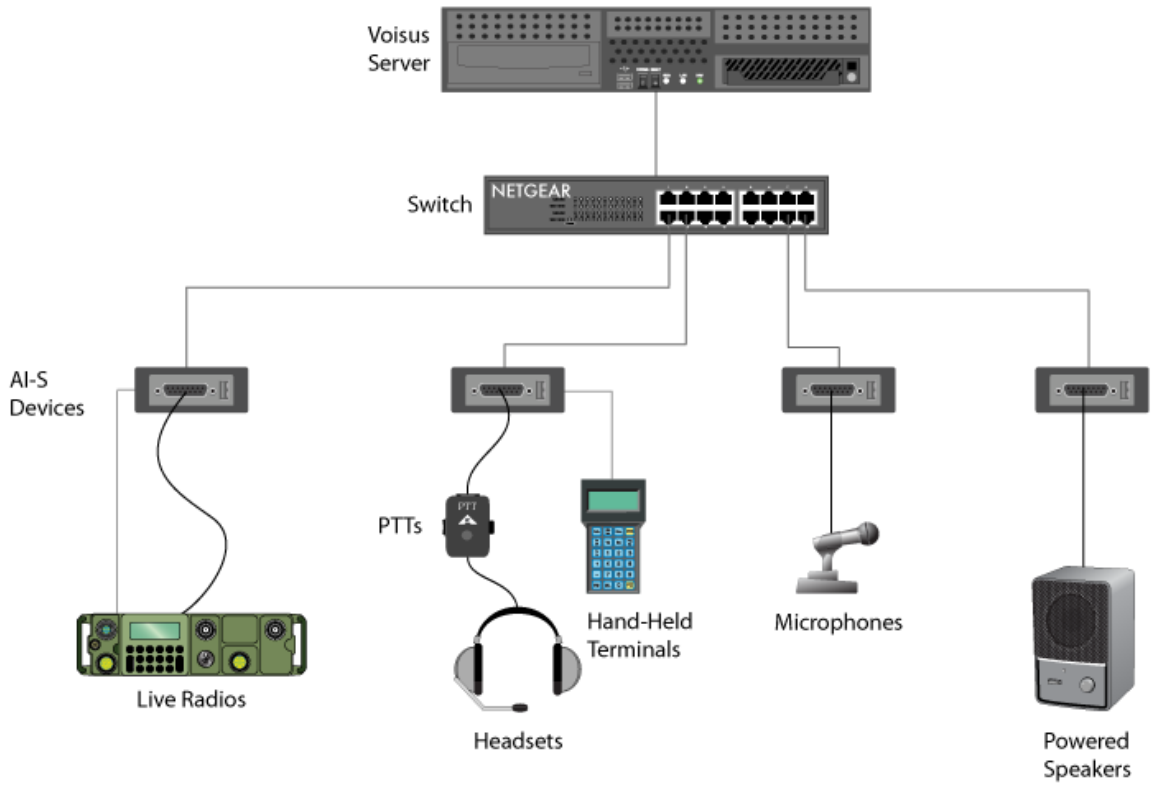


Figure 1: AI-S hardware diagram

The AI-S 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.
- *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.
- *Serial data port*: provides a convenient control interface for ASTi handheld terminals (HHTs), simulated panels, and live radio control.

2.0 Specifications

The AI-S includes the following specifications:

Weight	An AI-S weighs 5 oz.
Power Source	Ethernet port via Power over Ethernet (PoE) IEEE 802.3af, Class 3 ***Note:*** *Some 802.3at switches may treat the AI-S as a Type 2, Class 4 device.*
Power Consumption	<10 W at 56 VDC
Mean Time Between Failure (MTBF)	1,970,288.06 hours
Ethernet Port Speed/Duplex	100 megabits per second (Mbps), full duplex; RJ-45 port; CAT5e or better cabling requirement

Figure 2: AI-S specifications

On the front panel, the AI-S has one DB-15 connector and a USB port:

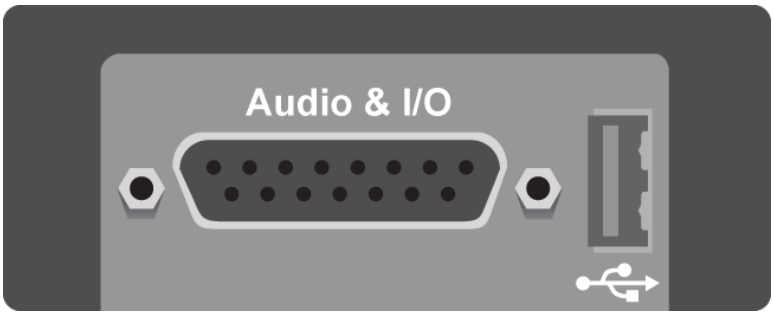


Figure 3: AI-S front panel

On the rear panel, the AI-S has a serial port and a Power over Ethernet (PoE) port:

Figure 4: AI-S rear panel

The AI-S's dimensions are 4.86" L × 2.965" W × 1.17" H, as shown in Figure 5, "AI-S dimensions" below:

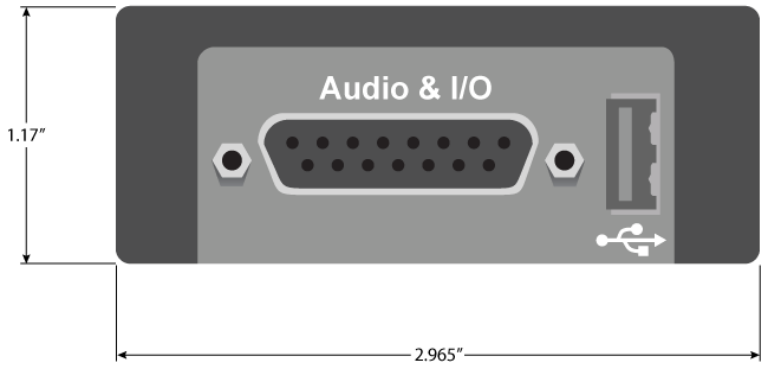
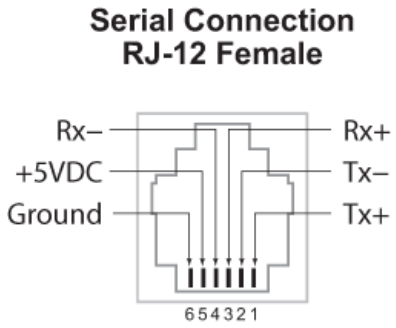


Figure 5: AI-S dimensions

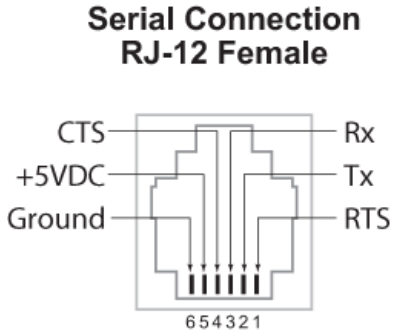
2.1 Serial connections

The AI-S includes the following serial connections:

- *RJ-12 pinout for RS-422 mode:*



- *RJ-12 pinout for RS-232 mode:*



2.2 Audio input and output

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

Characteristic	Value
Input impedance	4.6 kΩ
Input level	3.25 V_{PP} max (6.5 V_{PP} differential)
Input gain	0 dB, +9 dB to 60 dB, software configurable (go to note below)

Table 1: Audio input values

***Note**: The AI-S gain covers a total range of 60 dB. You can set the range of 9–60 dB in 3 dB steps; however, you cannot choose the range of 0–9 dB as a function of design.*

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

Characteristic	Value
Max. power	150 mW per channel at 16
Max. output signal	5 V_{PP}

Table 2: Audio output values

2.2.1 Audio interface pinout

Figure 6, "Interface connection DB-15 female" below shows a DB-15 pinout for the AI-S audio interface:

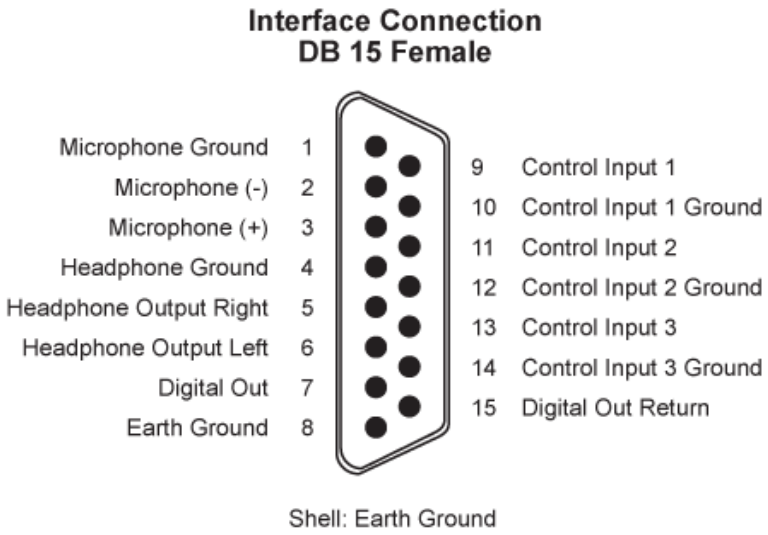


Figure 6: Interface connection DB-15 female

2.3 Status indicator lights

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

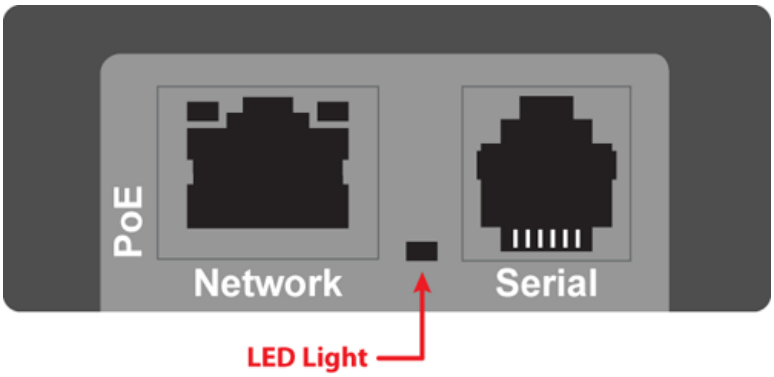


Figure 7: AI-S status indicator lights

Figure 8, "AI-S status indicator lights" below defines each status indicator light for the AI-S:

LED Light	Status
Blue solid	The AI-S is in boot mode.
Blue flashing	The AI-S is in boot mode and is not connected to the server.
Green flashing	Normal operation.

Figure 8: AI-S status indicator lights

3.0 Control inputs and digital outputs

The following sections describe the AI-S's control inputs and digital outputs, explaining how to use the control input as a digital input, an analog input, or a digital output.

3.1 Control inputs

Figure 9, "Control input circuitry" below shows the AI-S's control input circuitry. The control input can logically function as either a digital or an analog input.

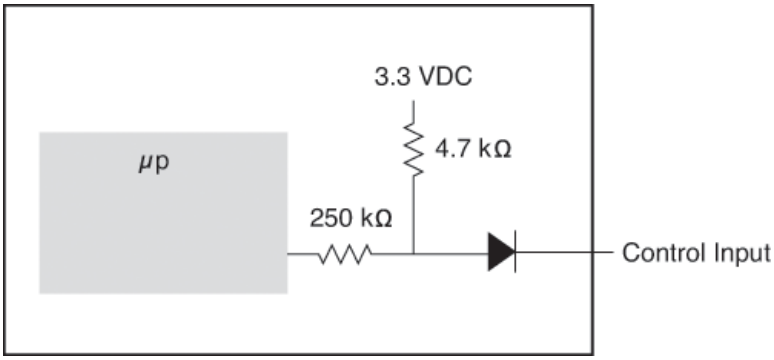


Figure 9: Control input circuitry

3.1.1 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 , 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.

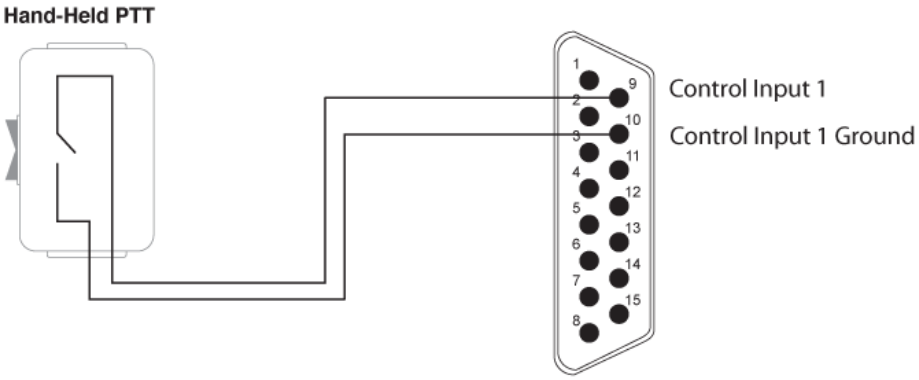


Figure 10: Digital In

3.1.2 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.

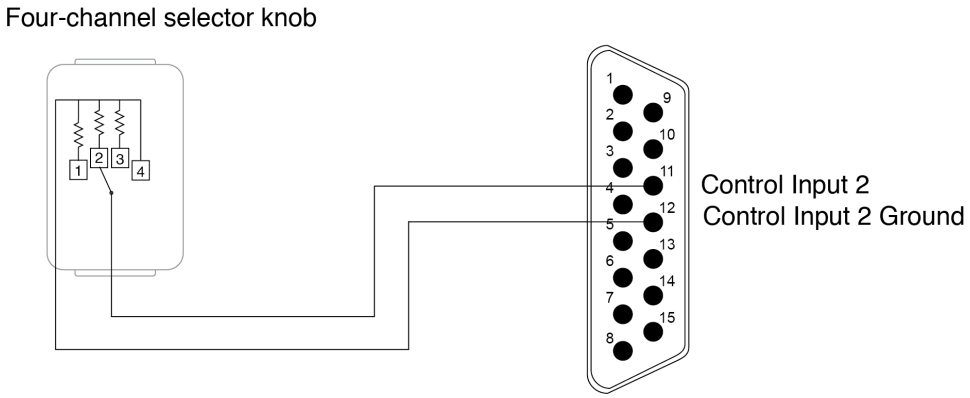


Figure 11: Analog In

3.2 Digital output

The digital output circuitry consists of an opto-isolated, solid-state relay for switching power to external loads. Table 3, "Digital output rating and dissipation" below summarizes the AI-S'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 3: Digital output rating and dissipation

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

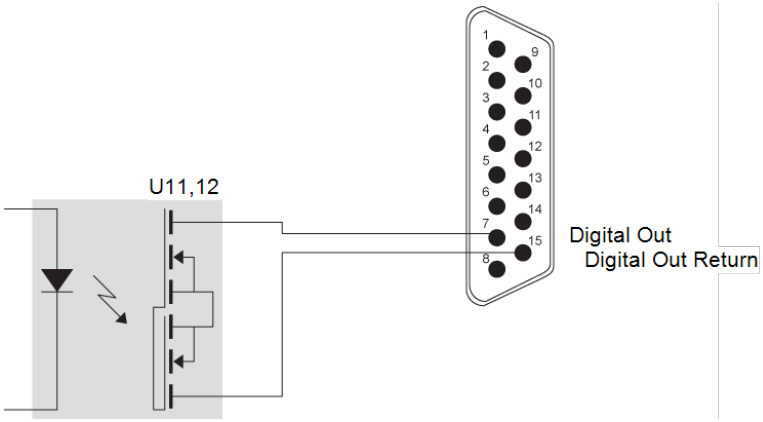


Figure 12: Digital output circuitry

4.0 Memory devices

Table 4, "AI-S memory" below summarizes AI-S devices with volatile and nonvolatile memory. Volatile memory is erased when you unplug the device, while nonvolatile memory is retained.

Type	Size
Volatile	
MCU Internal SRAM	96 kB SRAM
SDRAM	8 MB
Nonvolatile	
MCU Internal	512 kB

Table 4: AI-S memory

5.0 Temperature and humidity ranges

Table 5, "AI-S temperature and humidity ranges" below summarizes the AI-S's temperature and humidity ranges:

Range Type	Suggested Range
Operating temperature	+10°C to +32°C (50°F to 90°F)
Operating maximum temperature gradient	20°C (68°F) per hour
Operating humidity	10–70 percent noncondensing
Storage temperature	0°C to 55°C (32°F to 135°F)
Storage maximum temperature gradient	30°C (86°F) per hour
Storage humidity	5–95 percent
Maximum altitude	2,000 meters

Table 5: AI-S temperature and humidity ranges

6.0 Typical headset settings

The AI-S supports a mono or stereo headset connection for the DB-15 connector. Figure 13, "Mono headset connection" below shows a typical mono headset connection for the AI-S:

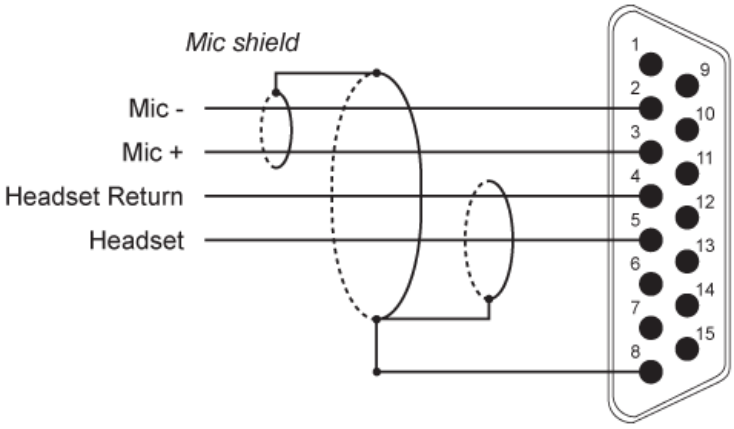


Figure 13: Mono headset connection

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

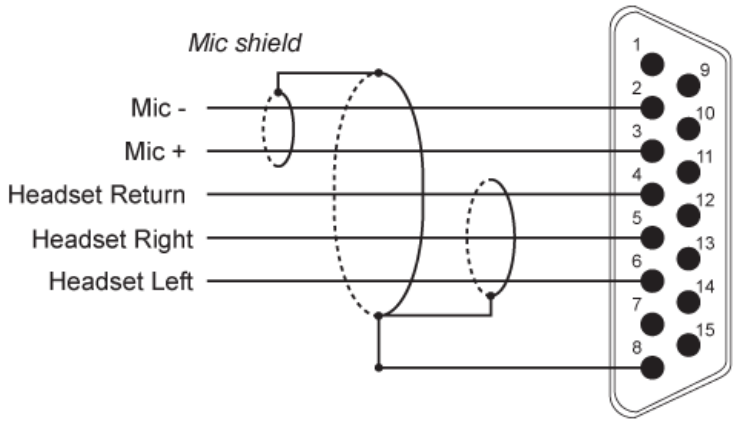


Figure 14: Stereo headset connection

Appendix A: Warranty information

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

***Important**: This device does not contain any user-serviceable components. Opening the Telestra Target chassis voids the warranty. ASTi does not support board-level repair; therefore fuses in the device are not user replaceable.*

A-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.