

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Advanced Simulation Technology ACU2-04-01* at our website: *Click HERE*

ACU2

Introduction

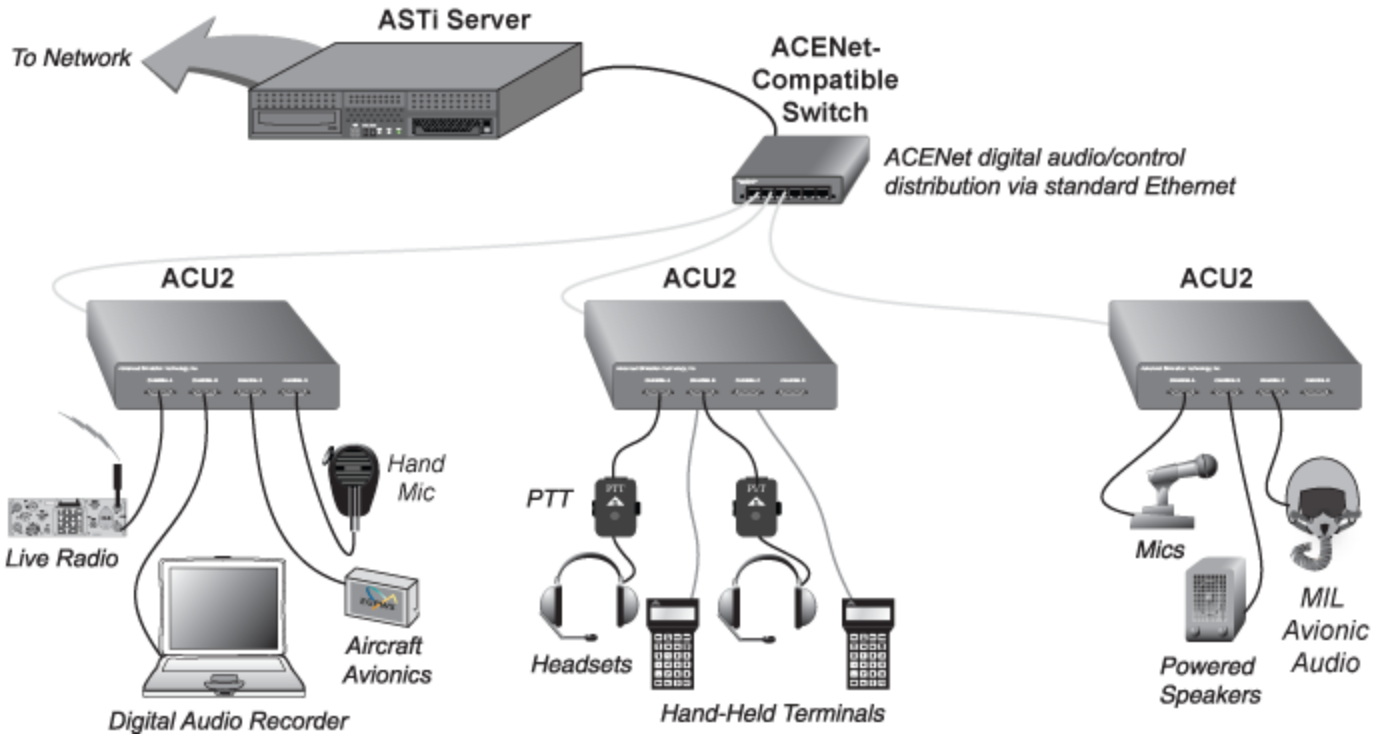
The ACU2 is a compact 48kHz digital and audio distribution module that connects remotely located operator stations and live radios to the ACENet network. The ACU2 is compatible with the Telestra 4 and Voisus platforms. The ACU2 provides low-noise analog-digital conversion and low-latency audio distribution.

The ACU2 integrates PTT units, volume controls, simulated communications panels, Hand-Held Terminals (HHTs), and live radios into the simulated communications environment.

Features

- **Stereo Support:** Stereo operation (independent left and right output) is supported on a single DB-15 connector, which reduces cabling complexity and installation footprint for applications requiring stereo operators.
- **Compact Footprint:** Each device supports four configurable mono/stereo operator positions in a single compact unit, which fits easily on a desktop. Alternatively, you can rackmount two devices side-by-side in 1U 19” rack space.
- **High Fidelity Audio:** 48k digital audio and balanced pro-audio interfaces.
- **Software-based Configuration:** Software-adjustable amp/preamp gains and mic power for easy, direct connection to military and commercial headsets and a wide variety of audio/communications systems and peripherals.
- **Serial Data Ports:** Control interface for ASTi Hand-Held Terminals (HHTs), simulated panels, and live radio control.
- **Integrated I/O:** Configurable digital and analog I/O for direct connection of PTT units, volume controls, switch detection, radio PTT activation, and other control applications.

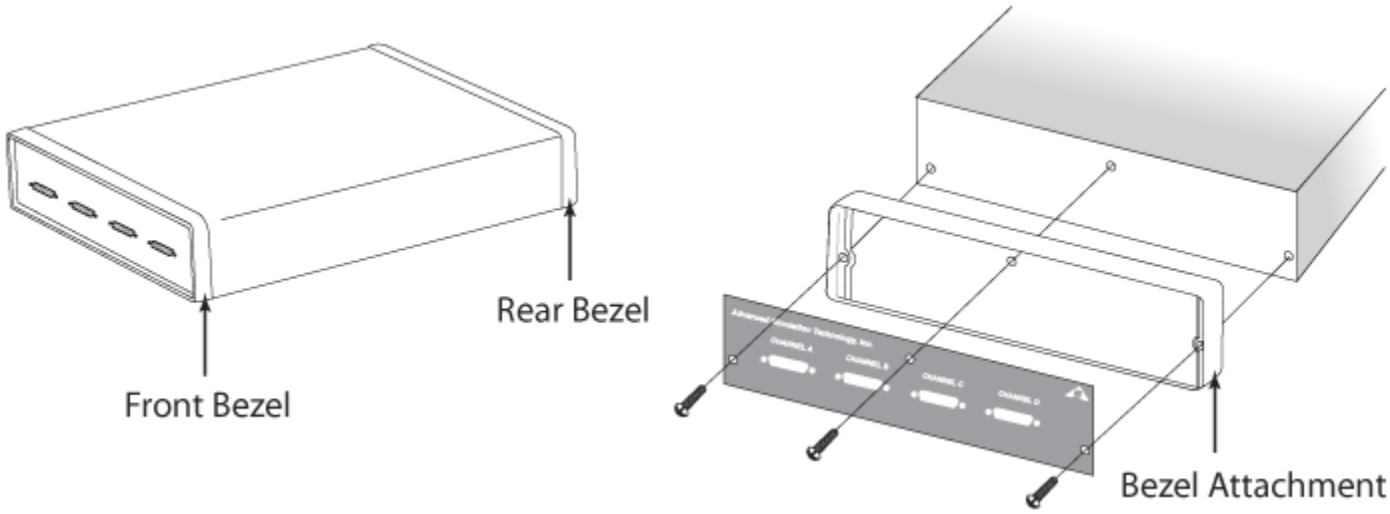
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



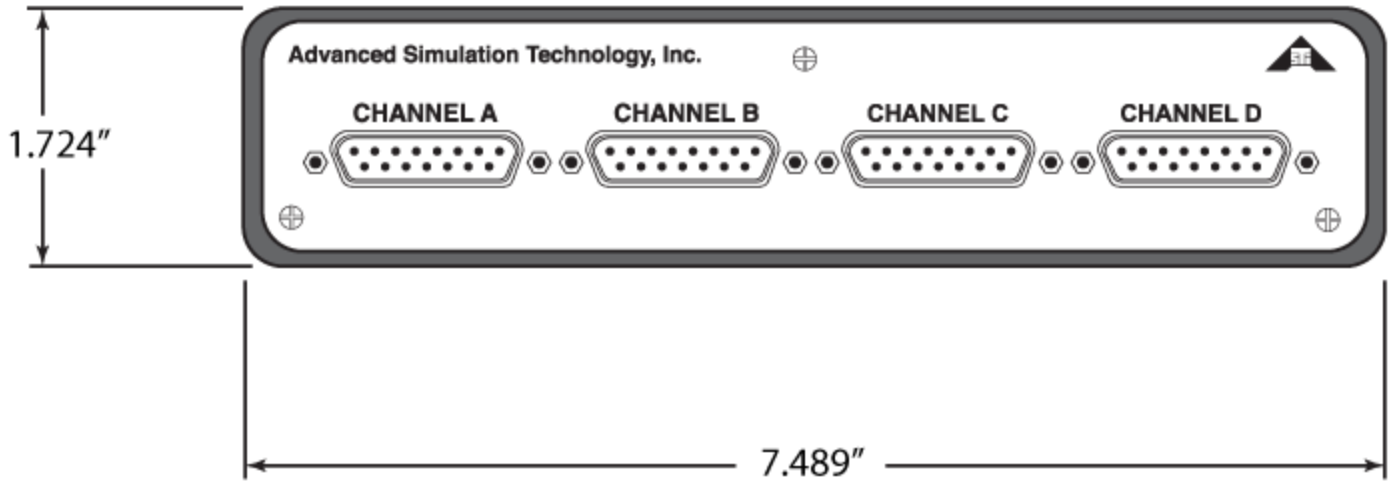
Physical Description

ACU2 With Bezels

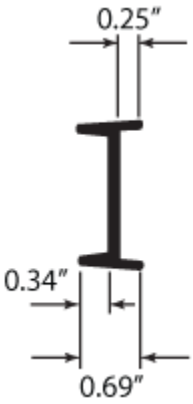
The ACU2 has two bezels, encompassing the front and rear panels. This ACU2 is CE/ROHS certified. Removing the bezels will void the void the CE certification.



Dimensions



Bezel Dimensions



ACU2 Without Bezels

Older versions of the ACU2 do not have bezels. The dimensions without bezels are:

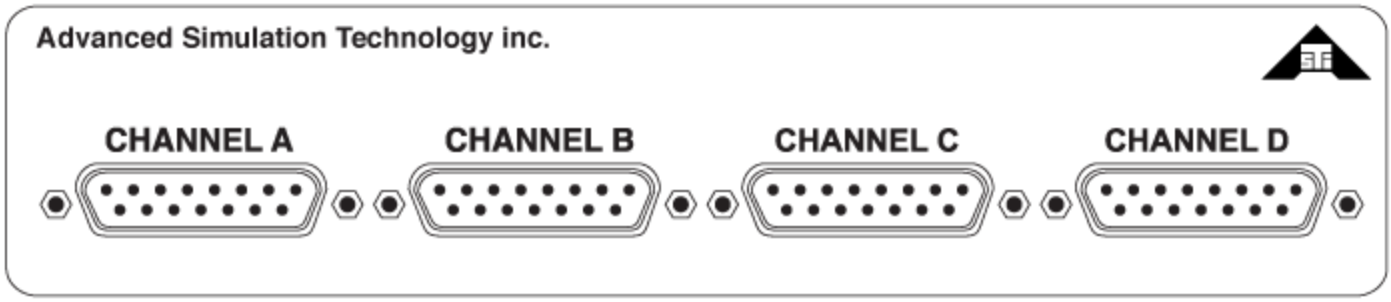
7.5″ long x 7″ wide x 1.55″ tall

Weight

A packaged ACU2 weighs 2 lbs. The power supply included with the ACU2 weighs 0.5 lbs.

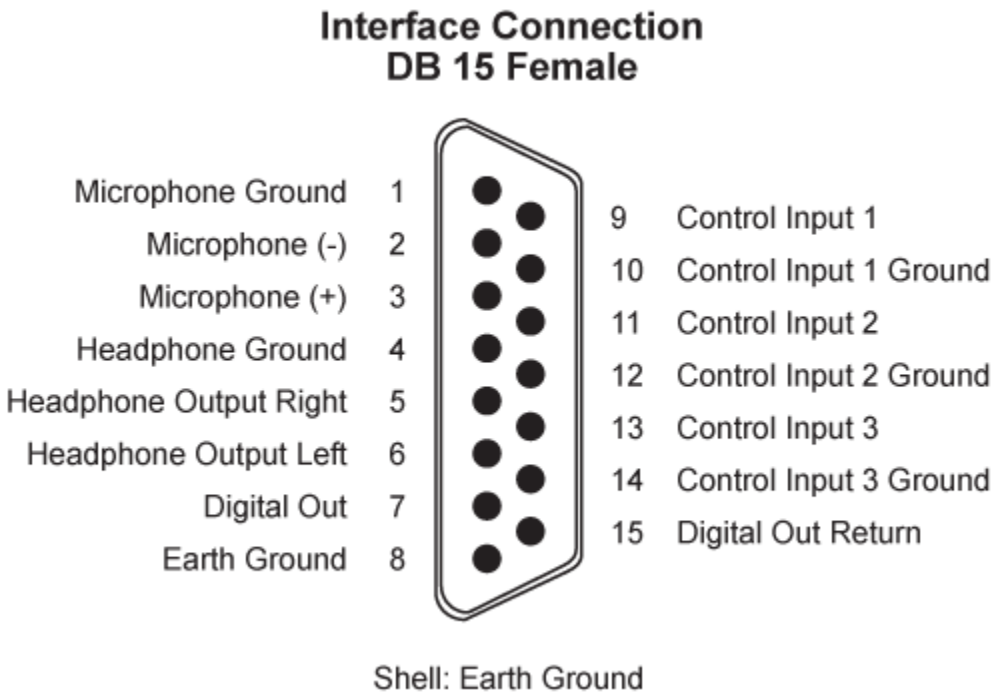
Front Panel

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

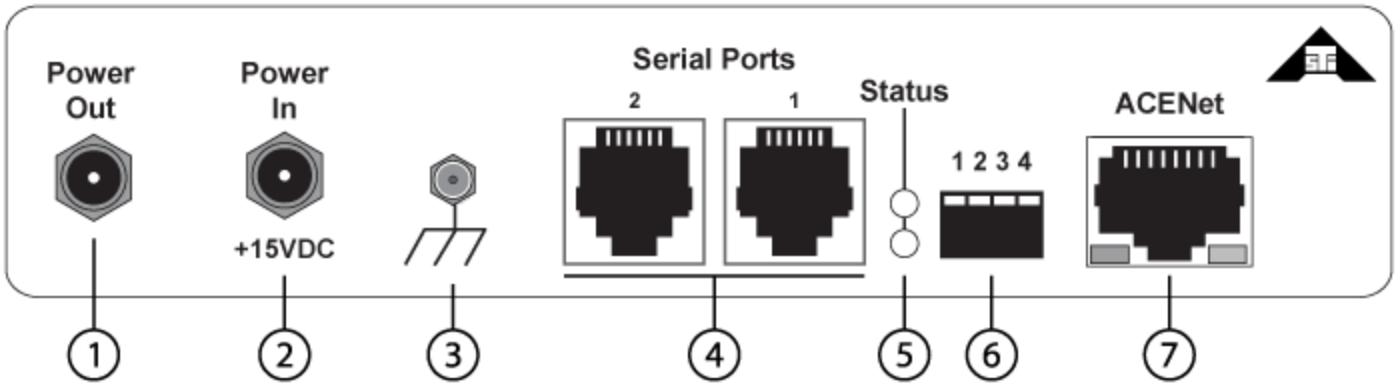


The front panel features (4) DB-15 connectors to connect to a variety of audio and PTT devices.

Audio Interface: DB-15 Pinout



Rear Panel

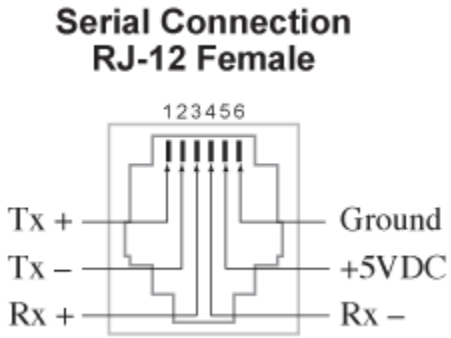


1. Power Out - for use with the Power Daisy Chain
2. Power In - for use with the ACU2 power supply, included
3. Earth Ground
4. Serial Ports
5. Status Indicator Lights
6. Dip Switches
7. ACENet Connection

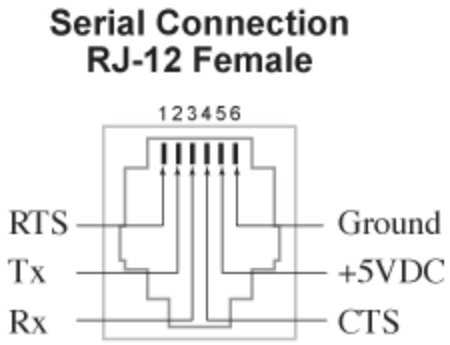
Serial Ports

The ACU2 has two serial ports, which provide a control interface for ASTi Hand-Held Terminals (HHTs), simulated panels, and live radio control.

RJ-12 Pinout: RS-422 Mode



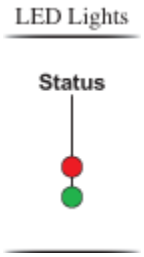
RJ-12 Pinout: RS-232 Mode



Status Indicator Lights

The ACU2 LED indicator lights display ACU2 status.

LED Lights	Status
Flashing Green (bottom)	Normal operation.
Solid Green (bottom)	The ACU2 started up properly but the ACENet connection cannot be found.
Red (top)	Internal board failure.



Dip Switch Positions

The dip switches are used to toggle between normal operation mode and firmware update mode. See Firmware Updates for guidance.



Position Status

Position Status



One down allows for firmware updates.



Default position for normal operation.

ACENet Connection

The ACU2's ACENet port connects to an ACENet-compatible switch via category 5e or better cable.

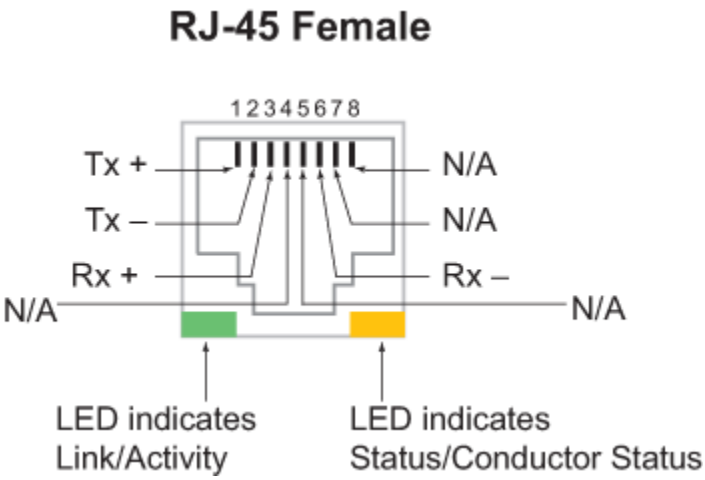
Maximum Cable Length to ACENet Switch

ACU2	100 meters (328 feet)
Telestra or Server	100 meters (328 feet)

Customer-made cables are the primary reason for product failure. ASTi recommends high quality, manufactured Category 5e cables.

Alternatively, the ACU2 can connect directly to the Telestra or Voisus server via crossover cable. The ACU2 does not support daisy chaining to additional units or internal switching across networks.

RJ-45 ACENet Connection Pinout

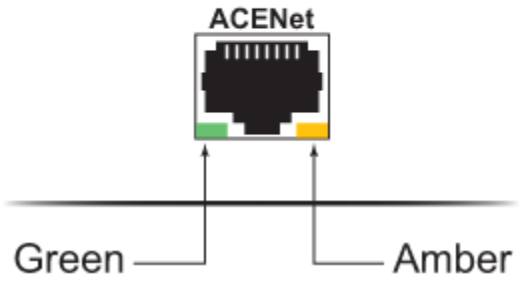


ACENet Indicator Lights

The ACENet LED indicator lights display the port status.

LED Light	Status
Green Solid	Network link.

LED Light	Status
Flashing	Network activity.
Amber Solid/Flashing	One ACENet device per network will function as the ACENet master, and will be identified with a flashing amber light. All other ACENet devices should report a solid amber light.



Audio Input and Audio Output

Audio Input

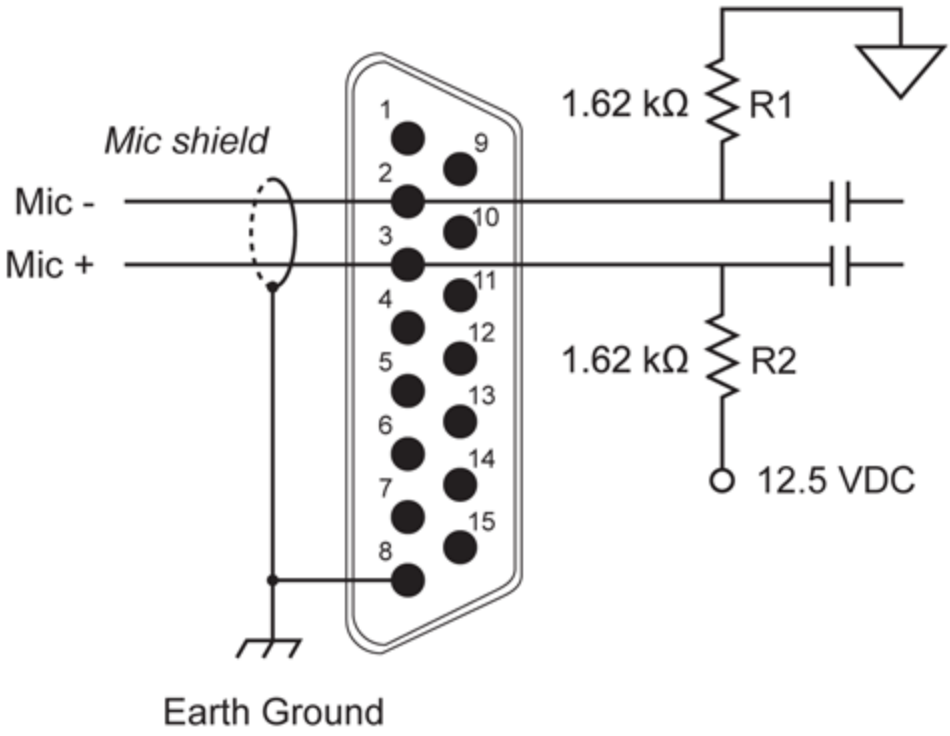
Characteristic	Value
Input Impedance	4.6k
Input Level	3.25 Vpp max (6.5 Vpp differential)
Input Gain	-8dB, +2dB to +57dB, software configurable*
Microphone Power	+12.5 VDC, software enabled
Frequency Response	20 Hz to 20 kHz, +/-1.5dB

* The ACU2 gain covers a total range of 65dB. Between +2dB and +57dB, the gain can be set in 1dB steps. -8dB is available for input signals greater than line-level. The range -8dB to +2dB CANNOT be selected as a function of design.

Microphone Power

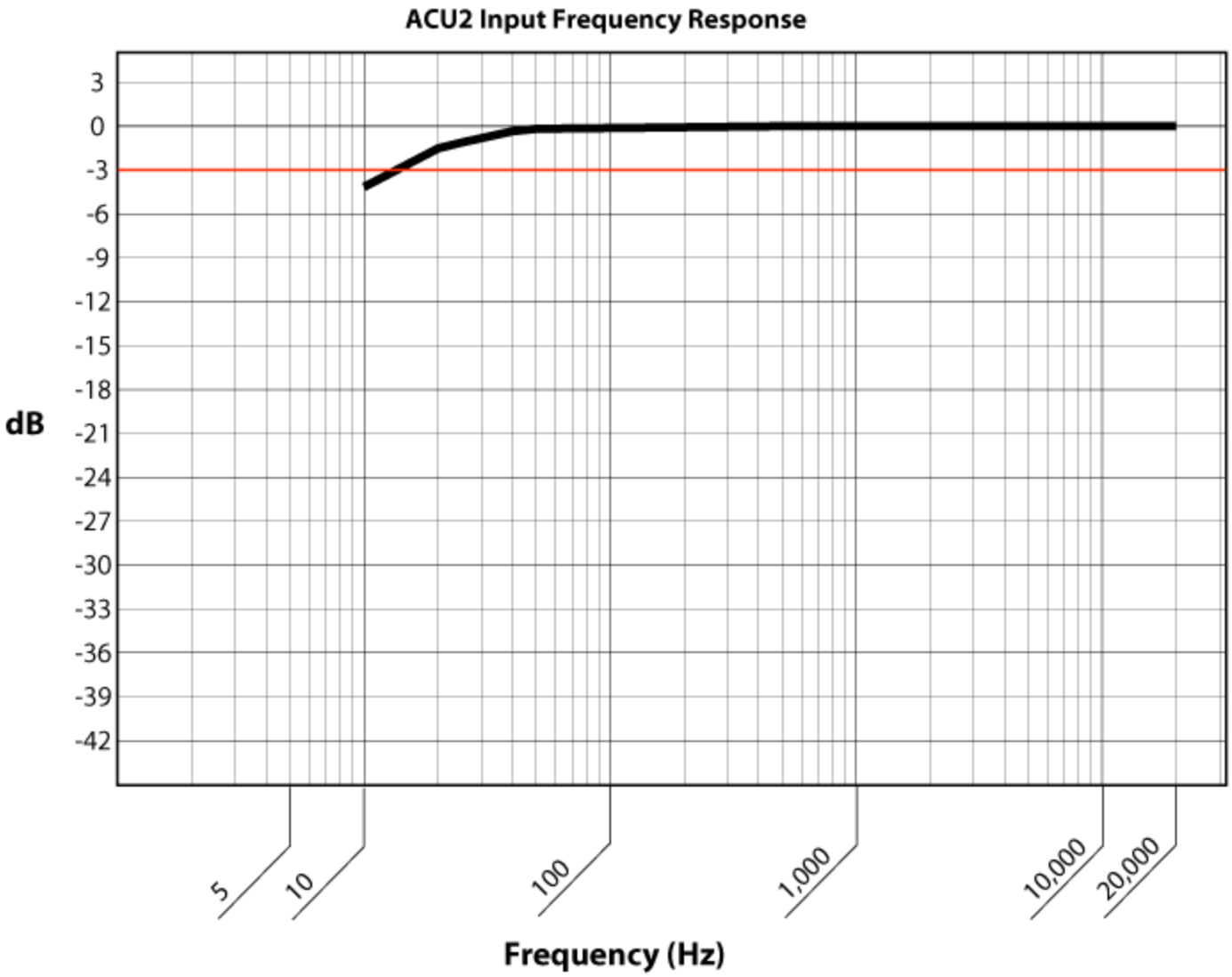
In T4 systems, microphone power is configured in RMS. Input levels can be adjusted in RMS to accommodate line level signals as well as microphone level signals. R1 and R2 connections are only active when power mode is enabled in the software.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



WARNING: Do not connect a microphone requiring phantom power to an ACU2 device, as this will damage the microphone. If you are unsure of the difference between mic-power and phantom power, please contact the microphone manufacturer or ASTi before connecting equipment. Most military headsets use mic-power.

Input Frequency Response



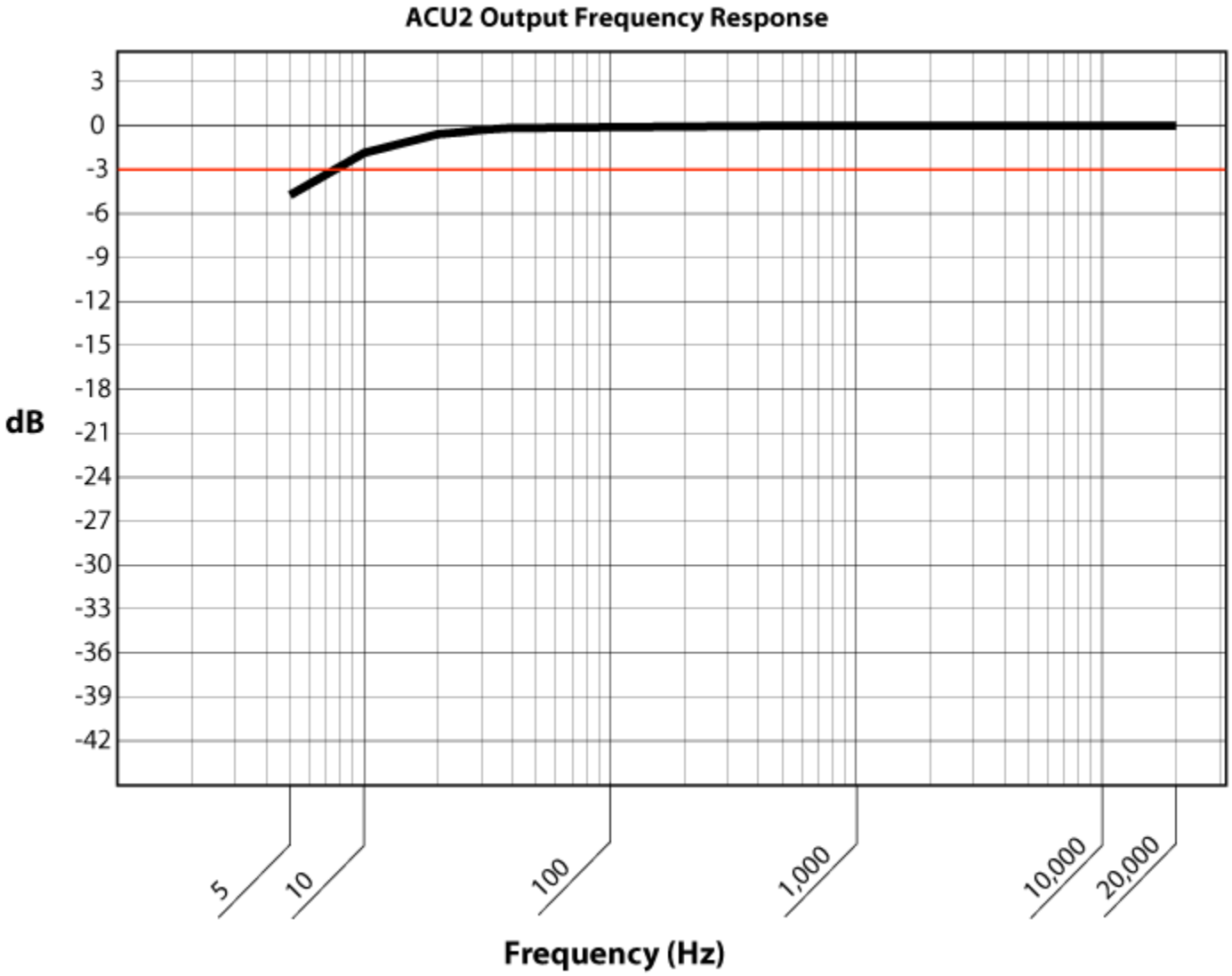
Audio Output

Characteristic	Value
Output Impedance	10 Ohms
Output Current	0.201 A at 8 Ohms
Output Gain	-25dB to +10dB
Output Level	1.61 VAC runs 8 Ohms
Output Power	0.32 W at 8 Ohms
Frequency Response	20 Hz to 20 kHz
Max. Output Signal	10 Vpp

Audio Isolation Characteristics

Between	Isolation	Frequency
Ch. 1 left to Ch. 1 right output channels	-81dB at +4dBu	20Hz to 20kHz
Ch. 1 to Ch. 2 output channels	-77dB at +4dBu	20Hz to 20kHz
Ch. 1 output to Ch. 1 input	> -100dB at +4dBu	20Hz to 20kHz
Ch. 1 output to Ch. 2 input	> -100dB at +4dBu	20Hz to 20kHz
Ch. 1 input to Ch. 2 input	> -100dB at +4dBu	20Hz to 20kHz

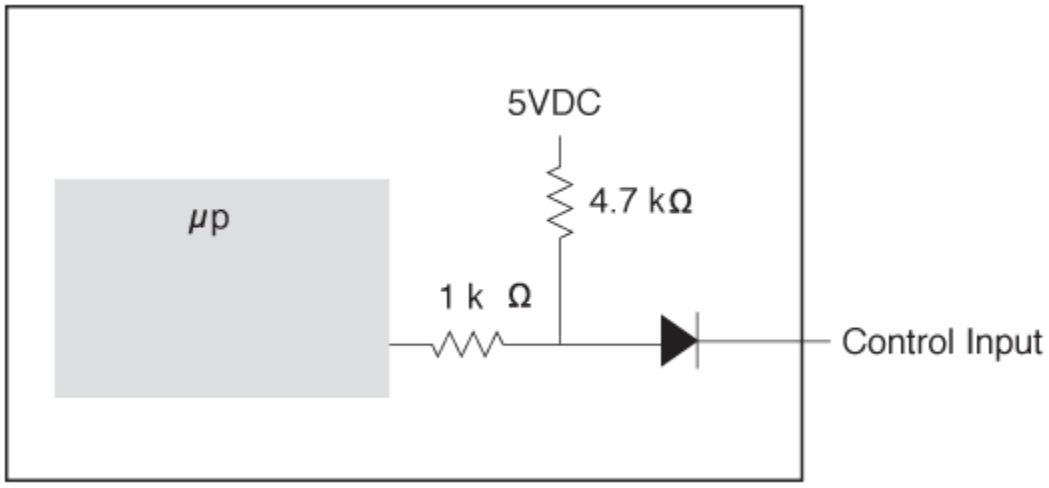
Output Frequency Response



Control Input and Digital Output

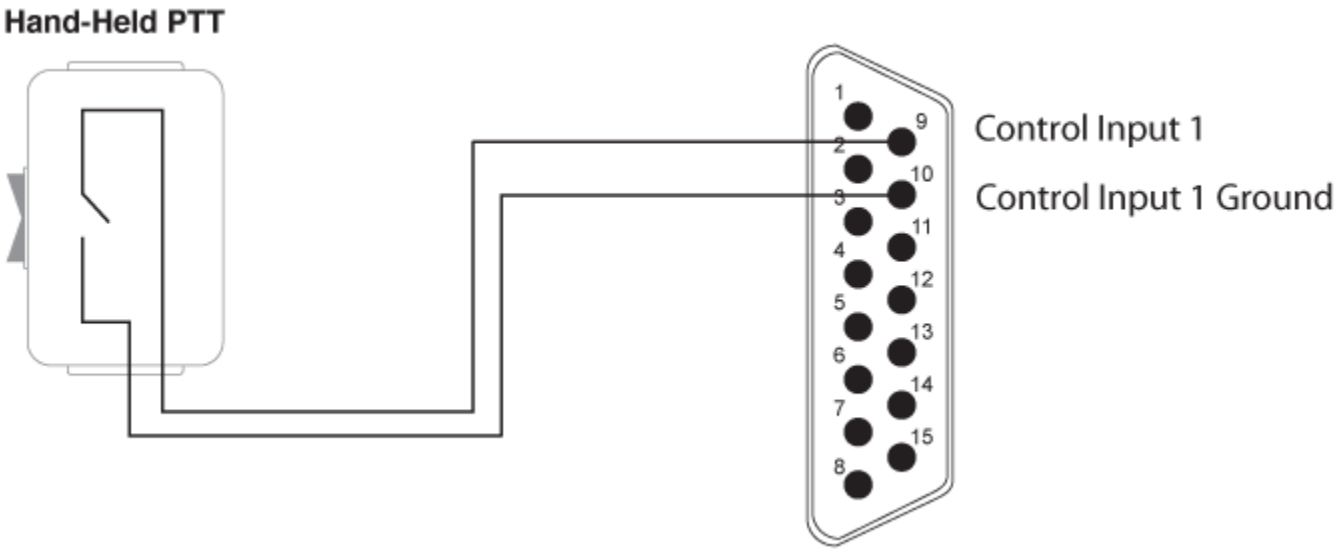
Control Input

The control inputs are contact sensing; no voltage is required. 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 function as a digital input or an analog input. In both cases, the ACU2 component in the model will be able to read the control input value and use this value as required for the application.



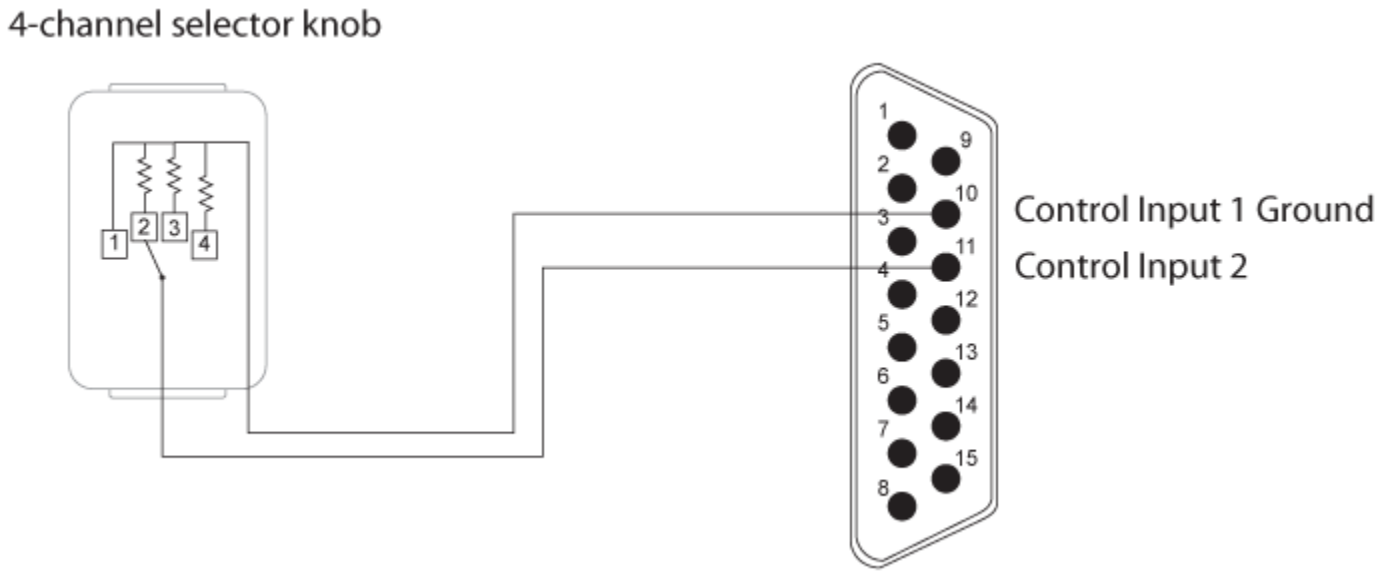
Control Input Used as a Digital Input

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



Control Input Used as an Analog Input

The control input can be used as an analog input by inserting a resistance between the control input and control input ground pins. With this configuration the ACU2 component in the model will map the voltage to an uint8 value that can be used in modeling your application. The 4-channel selector knob, for example, contains a switch that is used to change the resistance between the control input and control input ground pins. The uint8 number read in the ACU2 software component will vary by a given percentage based on the tolerances of all of the components involved.

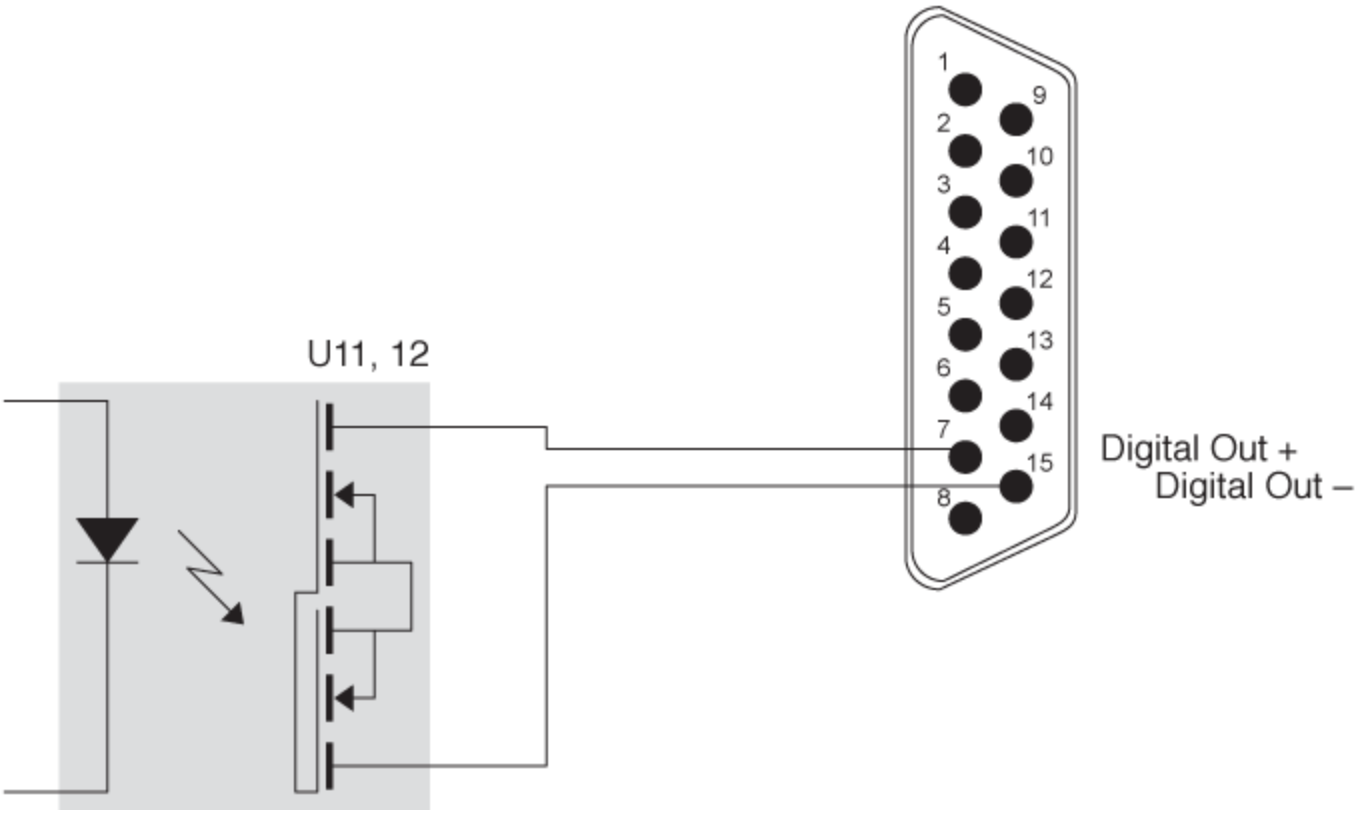


Digital Output

The digital output circuitry consists of an opto-isolated, solid-state relay for switching power to external loads.

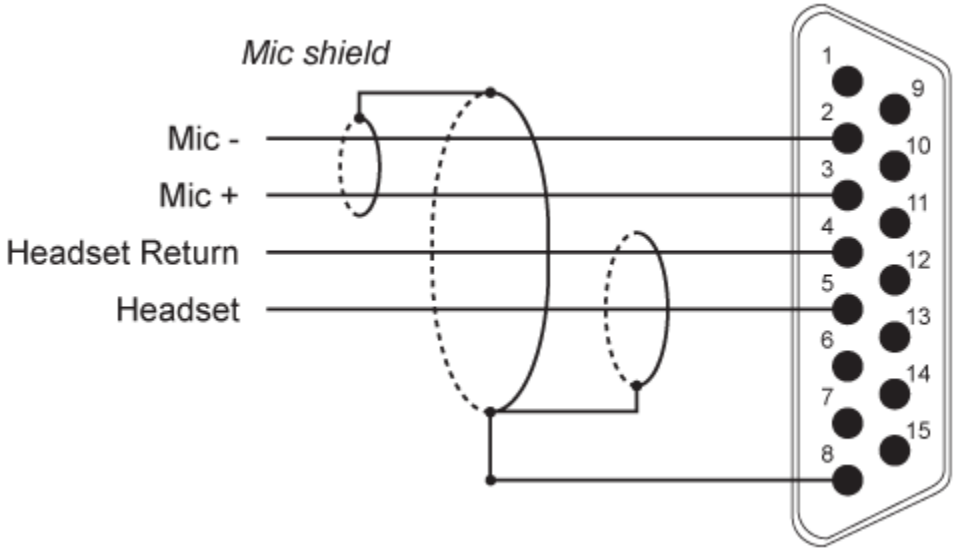
Type	**Opto-Isolated FET**
Maximum Continuous Current Rating	120mA
Maximum Power Dissipation	180mW
Maximum Frequency Responses	500Hz

Digital Output Circuitry

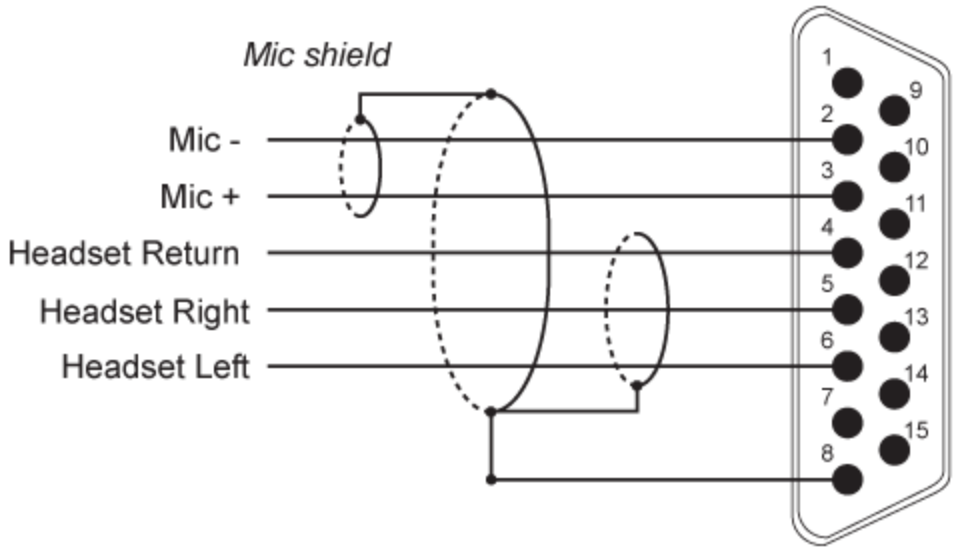


Typical Headset Settings

Mono Headset Connection



Stereo Headset Connection



Software Configuration

Telestra 4

Refer to the Telestra 4 Remote Management System 4 User Guide (DOC-01-TEL4-RMS4-UG-4) for software configuration instructions.

Voisus

Refer to Voisus Hardware Clients in the Voisus Client User Guide to learn more about ACU2 software configuration in Voisus.

Earth Ground

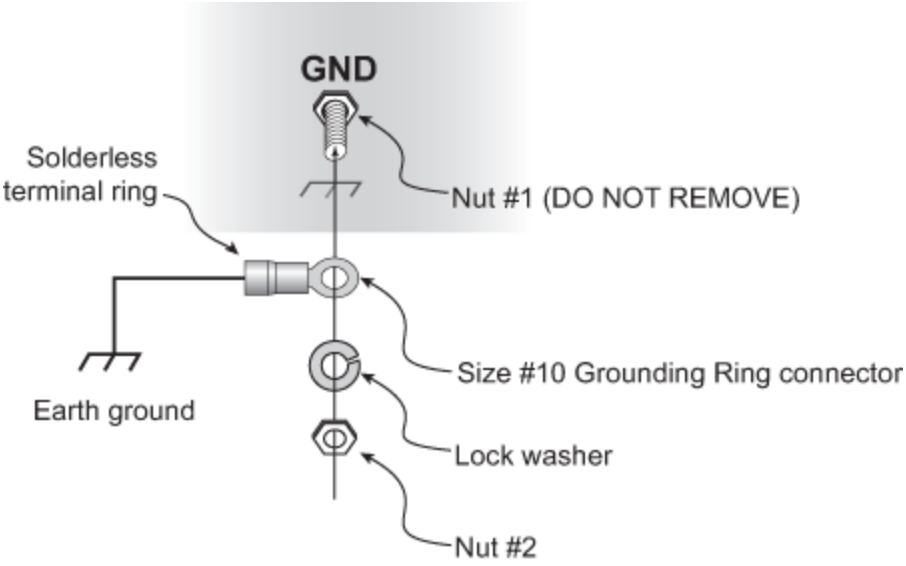
ASTi does not require the ACU2 to be grounded. However, it was designed to accommodate customers with strict grounding policies and requirements.

You should generally keep your grounding wire as short as possible to reduce resistance. This will most effectively dissipate the unwanted electrical charge.

Equipment

- #10 grounding ring connector
- Ground wire (stranded, braided, or strap wire; 18 gauge AWG minimum)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



Note: Do not remove nut #1 from the screw as it will cause the screw to fall inside the ACU2 chassis.

Procedure

1. Remove nut #2.
2. Slip the grounding ring connector onto the threaded end of the jackscrew.
3. Insert nut #2 onto the threaded end of jackscrew. Take care not to cross-thread or over-tighten the nut when reattaching.

Firmware Updates

Telestra 4

Refer to the Telestra 4 Remote Management System 4 User Guide (DOC-01-TEL4-RMS4-UG-4) for instructions on updating ACU2 firmware.

Voisus

1. In the Voisus web interface, navigate to the Configure Hardware page.
2. Select the ACU2 tab. The interface will inform you if any connected ACU2s are in need of a firmware update. Follow the on-screen instructions to complete the procedure.

Rackmounting ACU2s

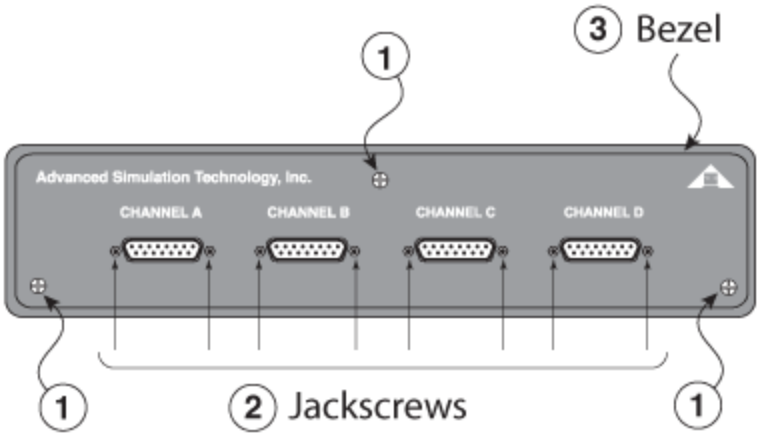
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

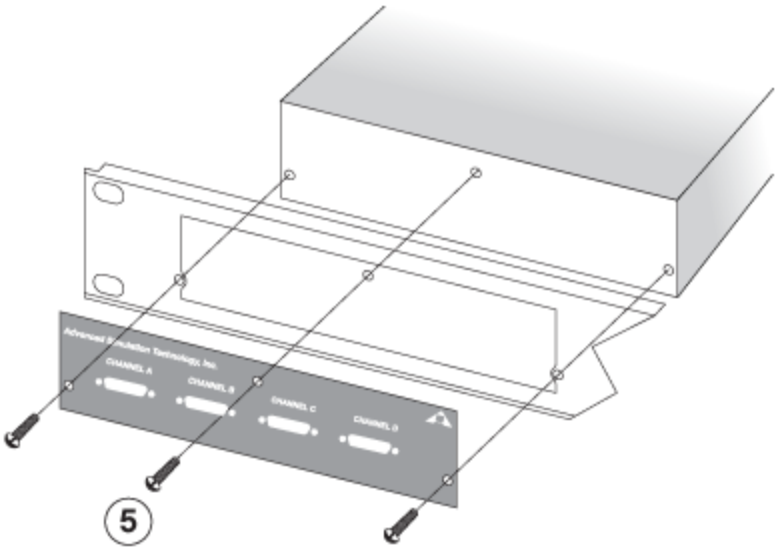
A rackmounting bracket is available. It will accomodate two ACU2s side-by-side and measures 1U high and 19" wide.

Rackmount Installation

1. Remove the two bottom corner screws and the top middle screw on the front of the ACU2.
2. Use a nut driver (3/16 inch) to remove the two jackscrews from each side of the four connectors.
3. Remove the faceplate with the white lettering and the bezel. Save the bezel for when you remove the ACU2 from the rackmount.
4. Place the ACU2 into the backside of the rackmount. The rackmount fits in place of the bezel.
5. Place the faceplate on the front side of the rackmount. Install the three black screws, starting with the top middle screw first for proper alignment.
6. Install the jackscrews on each side of the four connectors.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com





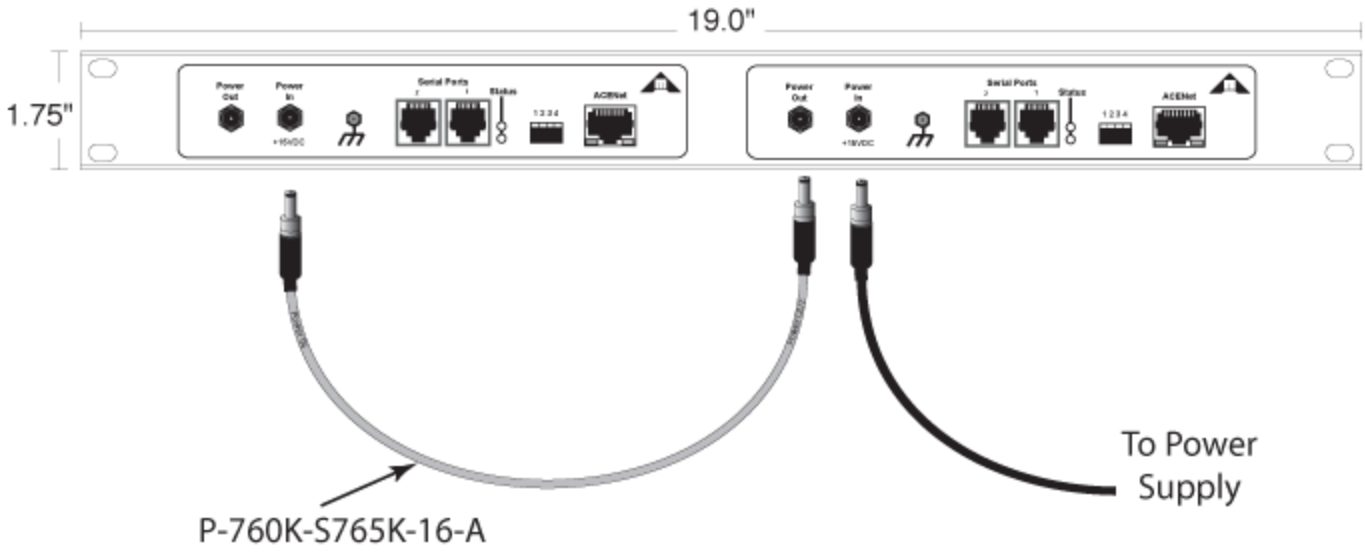
Power Daisy Chain

The power daisy chain connection enables operation of two rackmounted ACU2 units from a single-power supply. Daisy chaining ACU2 power requires an upgraded power supply (model number TR7 A15 from CINCON Electronic Co. LTD). Contact ASTi for details. The daisy chain cable (P-760K-S765K-16-A) is included with the upgraded power supply.

Power Daisy Chain Connections

Power In Connector (Black)	Switchcraft 760K
Power Out Connector (Black)	Switchcraft S765K

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



Specifications

Power Requirements

The ACU2 is shipped with a standard power supply, which provides power to one ACU2. The power supply should only be connected to a grounded outlet.

If you wish to rackmount the ACU2s, you may wish to purchase an upgraded Power Daisy Chain.

Input to PSL-UM-001	100-240 VAC, 50-60Hz, 1.5A_{RMS} (120VAC),	0.75A_{RMS} (240VAC)
Power In Connector	Inside Diameter 0.100″, Outside Diameter 0.218″, locking, center positive	
	Connector Part #	Switchcraft 712RA supplied with P2439 Hex Nut (5/16-32) and P2441 Washer
	Mating Connector Part #	Switchcraft 760k
Power Out Connector	Inside Diameter 0.080″, Outside Diameter 0.218″, locking, center positive	
	Connector Part #	Switchcraft 722RA supplied with P2439 Hex Nut (5/16-32) and P2441 Washer
	Mating Connector Part #	Switchcraft S765k
Power Consumption	+15 VDC, 2A (plug-in AC/DC converter supplied with each unit)	

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The power adapter inlet connector is an IEC320 type C14 or C8, requiring a matching cordset equipped with an IEC320 C13 or C7 connector (female line cord). Country-specific power connectors must be acquired separately for international use.

Memory Devices

The ACU2 memory devices are summarized in the table below.

Volatile

MCU Internal SRAM 69kb

Non-Volatile

MCU Internal 256kb

Flash 8 Mb

Temperature and Humidity Ranges

Type	Suggested Range
Operating Temperature Range	+10°C to +32°C (50°F to 90°F)
Operating Max. Temperature Gradient	20°C (68°F) per hour
Operating Humidity Range	10% to 70% non-condensing
Storage Temperature Range	0°C to 55°C (32°F to 135°F)
Storage Max. Temperature Gradient	30°C (86°F) per hour
Storage Humidity Range	5% to 95%

Reliability

Typical System Mean Time Between Failure (MTBF)

COTS 108,100.75 hours

MIL 48,390.23 hours

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP