ADX-120 and **ADX-120B**

NETWORKED COMMENTATOR UNIT

(DANTE VERSION)

Installation and Operation Manual

Firmware Version 2.2

(Manual revised August, 2022)

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WARRANTY STATEMENT

This equipment is warranted to be free of defects in materials and workmanship for a period of two years from date of delivery. Any necessary repairs resulting from defects in materials or in manufacture will be made free of charge provided that the equipment has not been subjected to mechanical or electrical abuse, or modification, as determined by Lance Design, and also that the equipment is returned to Lance Design with prior authorization.

No liability whatsoever is assumed for consequential damages resulting from the use or failure of this equipment. This warranty is in lieu of all other warranties, expressed or implied, including any implied warranty of fitness for purpose.

ADX-120 Announce Box Front Panel View

ADX-120 Announce Box Rear Panel View

ADX-2400 (Truck End)

DESCRIPTION

The **ADX-120** Commentary Unit (announce box) is designed to provide an 'all-in-one' facility for live broadcast announce booth requirements, with all audio and control between the mobile unit and the booth being transported by standard Ethernet, on either copper or fiber.

The **ADX-120** is available in both Cobranet and Dante versions. There are several differences in features and operation. This manual is for the Dante version.

There is also available an **ADX-120B** (in Dante format only). The "B" version is identical to the standard ADX120 except that includes a third level control knob on the front panel. This third knob controls the listen level of the AUX 1 spare input.

A single ADX-120 unit provides the following functions:

1) Two high-quality microphone channels; one on a front panel XLR for headset use, and a second on a rear-panel XLR for a stand-up 'stick' mic, or an effects mic. The second input can also be used as a balanced line-level input. Phantom power is available for both microphone inputs.

2) A two-channel dry IFB for the announce headset. Volume controls are provided on the top of the unit for each of these two channels.

3) A two-channel wet (RTS-Format) IFB for the stand-up position. This output has enough DC current available to operate two IFB beltpacks. This output may also be switched to a dry balanced output, selectable to either of the two ifb channels. This is useful for a dry IFB beltpack, or an SA speaker or other purpose. The audio quality is very high, so this path is usable for program audio if required.

4) A two-channel wet (RTS-Format) TW intercom. There are two active hybrids in the unit, one for each channel. The truck-end connections are four-wire, and so this eliminates the need for external 4W to 2W converters. The DC current available is sufficient to operate two BP325-type beltpacks. There are noise gates on the TX side of the hybrids, so that any trans-hybrid leakage is minimized on the truck (4W) end.

5) An illuminated "Mute" button and two talkback buttons are provided for the announcer. The two talkback paths are available in the truck as either discrete outputs or mixed.. The button illumination is provided by RGB leds, and the on and off colors are selectable, allowing for color-coding of the button functions for the announcer's convienence.

Other features include:

1) Power provided by the Ethernet connection. The ADX-120 adheres to the 802.3af POE specifications, but this standard does not allow sufficient power for four RTS beltpacks. Lance Design has available a 1RU Ethernet switch and dual power supply (ADX-8000) which provides robust power for up to eight ADX-120s, with ample reserve for the full beltpack complement. In addition, this supply contains redundant, load-sharing high-efficiency power supplies with fault indication for maximum reliability.

2) The unit is very compact, and simple to implement. In a typical application, a single CAT5E cable connects each announce box to a small enclosure which contains the ethernet switch / power supply (ADX-8000), and perhaps one or more ADX-140 XLR panels or other equipment.

   The fiber link to the mobile unit or studio is typically gigabit fiber. An ADX-120 typically requires on the order of 11 to 15 mb of bandwidth, so a single gigabit link can support a large number of ADX-120s and/or ADX-140s.

3) The audio quality is very high. The microphone preamps are extremely low-noise, transparent designs, and considered to be some of the industry's best. Preamp gain is remotely-controlled over a wide range.

   All audio paths are of the highest quality with 24-bit resolution throughout. All signal switching, routing and gain control is performed in the digital domain in a high-performance 32-bit dsp. Talkback, IFB and PL circuits are all full bandwidth, program-quality channels, so all of these paths are extremely clean, and provide excellent audio quality to the announcers' headsets and the PLs.

4) Dante networking provides complete flexibility in signal routing, with reliable low-latency transmission. In addition many third-party manufacturers also support Dante, and the ADX-series products are all fully-compatible.

Typical booth system with the ADX-8000 switch/power supply and an ADX-140 XLR Interface unit.

System Overview

The ADX announce system consists of the following elements:

- One or more ADX-2400 or ADX-3200 frames which serve as the 'head end' or truck end of the system, and provide all inputs and and outputs for the truck or control room, as well as remote control of connected ADX-120s and ADX-140s.

- One or more ADX-120 Announce Boxes or ADX-140 Interface Frames which function as the remote units in the booth or other remote location.

- ADX-8000 Ethernet switch / power supply for the ADX-120 units. This unit provides the power and network interface for the ADX-120 and ADX-140 remote devices.

- Other network infrastructure as required, consisting of standard Ethernet switches, fiber optic elements, media converters, fiber and copper interconnects, etc.

Each ADX-2400 or ADX-3200 unit provides 24 or 32 receive channels and 24 or 32 transmit channels. These channels may be used in any way desired by the user,

Audio to/from the ADX-120s may also be routed to any Dante-enabled device, such as consoles, intercom systems, etc.

Routing is controlled by the Audinate "Dante Controller" application running on Windows or Mac. This application may be obtained from the Audinate website:

https://www.audinate.com/products/software/dante-controller

Once the application is installed, connect the computer to the Dante network and run the application. All of the Dante devices on the network should be visible, and can be routed as desired. Routing configurations are stored in each unit, and overall system configurations may be stored as files using Dante Controller.

The ADX remote devices (ADX-120, 140, etc.) are uniquely identified by a **SYSTEM ID** number, which is set by a two-digit rotary switch on the remote device (rear panel of the ADX-120, front panel of the ADX-140). **Each device must be set to a unique system ID (01-98)**. With version 2.0 and higher firmware, ID=99 is reserved to enable the bootloader.

This system ID number is not related to the Dante names. The Dante names may be changed to anything desired by the users via the Dante Controller application.

The ADX-120s and 140s have internal setup menus to configure several features. The descriptions of the menu items later in this manual describe these remote control functions in more detail.

ADX-120 Network (Dante) Input and Output Channels

These are the signal names which will appear in the Dante Controller application. There are eight network inputs and eight network outputs.

Network Outputs (Transmitted to the Network)

- **MIC 1** - The headset mic (front XLR), after mute and talkback switching
- **MIC 1 UNSW** - The headset mic pre mute or talkback switching (hot mic)
- **MIC 2 / LINE** - The rear panel Mic2/Line input
- **TALKBACK 1** - The headset mic when the 'Talkback 1' button is pressed
- **TALKBACK 2** - The headset mic when the 'Talkback 2' button is pressed
- **TALKBACK MIX** - The headset mic when either talkback button is pressed
- **PL 1 TX** - The talk side of the rear panel wet PL, channel 1
- **PL 2 TX** - The talk side of the rear panel wet PL, channel 2

Network Inputs (Received from the network)

- **IFB 1** - The interrupt side of the front panel 1/4" TRS jack
- **PGM 1** - The non-interrupt side of the front panel TRS jack
- **IFB 2** - The interrupt side of the rear panel XLR IFB output
- **PGM 2** - The non-interrupt side of the rear panel XLR IFB output
- **AUX 1** - Spare input which may be mixed into the headset jack (1/4")
- **AUX 2** - Spare input which may be mixed into the headset jack (1/4")
- **PL 1 RX** - The listen side of the rear panel wet PL, channel 1
- **PL 2 RX** - The listen side of the rear panel wet PL, channel 2

Note that any of the inputs or outputs may be left unused. Only the signals required for a particular application need be routed.

Use the 'Dante Controller' application from Audinate to route the audio signals to and from other Dante devices as desired. Dante Controller is available from:

https://www.audinate.com/products/software/dante-controller

Remote Control

Each remote device (ADX-120/140) has an internal menu which may be accessed remotely via the ADX-2400 or ADX-3200, or from the ADX Remote Control Windows application.

These menus configure the hardware of the remote device itself, and are specific to the particular model, i.e. the ADX-120 has different options from the ADX-140 because of differences in their hardware capabilities.

- Microphone preamp gains for both mic preamps.
- Selection of Headphone mode (stereo, mono, etc.)
- Selection of mic or line input for the mic 2 input
- Selection of phantom power for each mic
- Selection of headphone volume range (to adjust for high or low headphone impedance)
- Selection of wet or dry mode and source for the rear-panel IFB 2 connector
- Optional sidetone mixed to headset
- Optional Aux inputs mixed to headset
- Selection of button illumination color for the panel buttons
- Selection of button mode; either momentary or 'smart' latching
- Status reporting of PL and IFB currents and voltages, and internal temperature
- Enabling or Disabling of the “Network Alarm” which flashes the MUTE button red if the 120 doesn’t see the heartbeat signal from the ADX-2400 / 3200, or from the Remote Control Windows application.

These remote menu settings are saved in the remote devices themselves, and will remain associated with a particular device, even if it is moved or has its system ID reassigned. These settings are not stored in the ADX-2400/3200 at the truck.

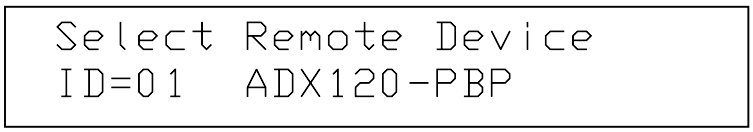
Status of many of the remote configuration items is displayed by LEDs on the remote devices (rear panel on the ADX-120s, front panel on the ADX-140s).

Accessing Remote Menus from the ADX-2400 or ADX-3200

The configuration items for the ADX-120 and ADX-140 units are accessible from the front panel of the ADX-2400/3200.

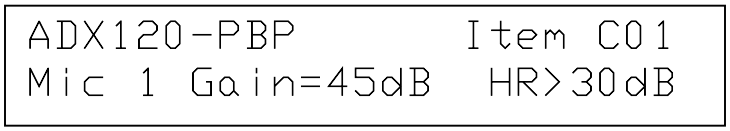
To access these remote unit menus, ***double-click*** the **MENU** button on the ADX2400/3200. The display will say: SELECT REMOTE DEVICE. The **MENU** button will be flashing to indicate that a remote device is being accessed.

The menu display will look similar to this:



Use the knob to select the desired remote device. The Device Name displayed to the right of the ID number will be the Dante Name, as entered by the user via Dante Controller. If there is no device name displayed to the right of the ID number, then there is no active device at this ID.

When the desired device is selected, press **MENU** again. This will access the menu of the remote device, and the menu might look like this (depending on the type of device and the selected item):



The configuration and status items may be selected using the knob. Once the desired item is selected, press the **MENU SET** button to allow changing that item's setting. Settings are saved automatically after about 10 seconds of inactivity.

Press either **MENU SET** or **MENU** to go back to the item select mode.

When you're done, the easiest way out of any of the menu modes is to just press the **OUTPUT SELECT** button. This will cancel all menu modes, and you won't have to step backwards out of them.

Using the ADX-120 without an ADX-2400 or ADX-3200

The ADX-120 may be used without the ADX-2400 or ADX-3200 at the mobile unit by routing the Dante audio channels directly to/from a Dante-equipped audio console, intercom matrix, etc.

Any Dante-equipped device may be interconnected on the network to the ADX-120 inputs and outputs.

Without an ADX-2400 or ADX-3200 there are a few considerations:

1) Remote control for preamp gains and other configuration settings may be done using the ADX Remote Control application.

   This Windows application allows full access to all ADX-120 menu functions from a laptop residing on the Dante network, for example the same laptop which might be running Dante Controller.

2) Remote control is also available via the 'Remote' RS-232 port on the rear panel of the ADX-120. To access these settings connect a standard RS-232 terminal (laptop running 'Tera-term' or other terminal program), and press <Return>. You will see the ADX-120 menu items.

   Use the '>' and '<' keys to scroll through the items. The space bar will toggle between item select, and parameter change modes.

   RS232 Remote port is 38.4K Baud, One Stop Bit, No Parity

3) Another consideration is that normally the ADX-2400/3200 transmits a 'heartbeat' signal, which is used to verify network connectivity. This is what stops the buttons from flashing. The ADX Remote Control software also transmits this 'heartbeat' signal.

   If you're not using a 2400 or 3200, and don't want to leave the Remote Control application running to be a source for the heartbeat, you can disable the network alarm (flashing button) in the 120 menu (as of version 2.2 firmware)

   For versions prior to 2.2, setting the System ID switch to 00 will disable the network alarm, but a system ID of 00 will not permit remote control from either the 2400/3200 or the Remote Control application. In this case, we suggest updating the firmware to version 2.2. Contact Lance Design for more information.

ADX-120 Remote Menu Items

The ADX-120 menu items for firmware version 2.2 are listed below.

Config Item 01 – Mic 1 Gain (25-70dB)

This is the preamp gain for microphone input 1 (the front-panel headset input). It would typically run around 35 to 45 dB for normal sports use with dynamic mics. A peak-reading headroom indication is provided in the lower right corner.

Config Item 02 – Mic 2 Gain (25-70dB)

Same as above for microphone input 2 (rear-panel XLR). When this input is in the 'Line In' mode, the gain is fixed, and Item 02 will indicate that the input is in line mode.

Config Item 03 – Channel 2 Input (Mic or Line)

This selects either mic or line input mode for the rear-panel XLR input. When in Mic mode, Item 02 sets preamp gain. When in Line mode, the gain is fixed through at unity through the system. The nominal 0VU level is +4dBm. Line input mode is indicated by a yellow LED on the rear panel.

Config Item 04 – Mic 1 Phantom (On / Off)

Turns on phantom power for Mic 1. Indicated by a green LED on the rear panel.

Config Item 05 – Mic 2 Phantom (On / Off)

Turns on phantom power for Mic 2. Indicated by a green LED on the rear panel. Phantom power for Mic 2 will automatically be turned off when Line In mode is selected.

Config Item 06 – IFB 1 Mode

Controls the signal routing for the IFB 1 output (front-panel headset). The selections are as follows:

Normal 2 Ch -	IFB1 is routed to one side , PGM1 is routed to the other side
IFB to Both -	IFB1 is routed to both sides of stereo headphones
PGM to Both -	PGM1 is routed to both sides of stereo headphones
MIX to Both -	IFB1 and PGM1 are mixed and routed to both sides. Volume knobs control the mix.
IFB to Mono -	IFB1 is routed to the tip only of the 1/4" TRS jack
PGM to Mono -	PGM1 is routed to the tip only
MIX to Mono -	(see above)

Note: if you're using a mono headphone with a tip-sleeve plug select one of the mono modes to avoid signal current from the other amplifier being shorted into ground.

Config Item 07 – IFB 2 Mode

Configures the IFB 2 (rear-panel XLR) output. The selections are as follows:

Wet 2 Ch - Configured as 2-ch RTS-format. IFB2 on Ch1, PGM2 on Ch2.
Dry - IFB - Configured as dry balanced +4 output of IFB 2.
Dry - PGM - Configured as dry balanced +4 output of PGM 2.
Dry - Mic 1 - Configured as dry balanced +4 output of Mic 1 (headset Mic)*

*Note: The 'Dry-Mic 1' configuration uses the IFB2 connector as a direct line-level output of the mic 1 preamp. The purpose of this is to make that signal available as a redundant output to be fed to the truck via some other backup system.

Config Item 08 – Hdst Volume (Normal, High)

This controls the range of the signals feeding the headphones (front-panel jack). It is really an adjustment for headphone impedance; e.g., it matches the range of the volume control knobs to the impedance of the headphones. Normal should be used unless high-impedance headphones cause the volume to be inadequate. The High setting provides a 8dB increase in signal level.

Config Item 09 - Sidetone

This adds the local Mic 1 output to the headphones, either left, right, or both. This might be useful if a mix-minus were being returned to the commentator instead of a full mix.

Config Item 10 - Sidetone Level

Controls the level of the added sidetone

Config Item 11 - Aux Input 1

This allows the source routed to the Aux 1 network input to be added to the headphone mix, either left, right, or both. The level is controlled by the third panel knob on the ADX-120B, and controlled by menu item 13, 'Aux Level' on the ADX-120

Config Item 12 - Aux Input 2

This allows the source routed to the Aux 2 network input to be added to the headphone mix, either left, right, or both. . The level is controlled by the third panel knob on the ADX-120B, and controlled by menu item 13, 'Aux Level' on the ADX-120

Config Item 13 - Aux Level

Controls the level of both Aux 1 and Aux 2 sources in the headphone mix on the ADX-120. Non-functional on the ADX-120B.

Config Item 14 – Mute Off Clr

This sets the color of the illumination for the Mute button when it's in the off state (not depressed).

Config Item 15 – Mute On Clr

This sets the color of the illumination for the Mute button when it's in the on state. (depressed)

Config Item 16 –TB 1 Off Clr
Config Item 17 –TB 1 On Clr
Config Item 18 –TB 2 Off Clr
Config Item 19 –TB 2 On Clr

Illumination colors for on and off states of the Talkback buttons (as above).

Config Item 20 – Button Mode (Momentary / Latch Mute / Latch TB / Latch All)
Modes of Mute and Talkback buttons. Latching is 'smart' latching - tap to latch.

Config Item 21 – GPI Inputs (Disabled / Enabled)
Enables operation of the three GPI inputs on the rear panel (D9 connector). The inputs are available for hand-held or footswitches, and operate the Mute, Talkback 1 and Talkback 2 functions respectively.

Config Item 22 – Network Alarm (Disabled / Enabled)
Enables flashing mute button reporting of a loss of ADX 'heartbeat' signal.

The remaining menu items are status items

Status Item 01 – PCB Temperature
This item displays internal temperature of the ADX-120 in degrees Centigrade. Nominal operating temperature is in the 35 - 45 degree range.

Status Item 02 – PL Current
DC Current drawn by the external PL beltpacks. This should be less than 100 milliamps. The PL power supply will go into a shutdown condition if current is greater than 140 ma.

Status Item 03 – PL Voltage
DC Voltage of PL power supply. Nominally 25 volts.

Status Item 04 – IFB Current
DC Current drawn by the external IFB beltpacks. This should be less than 100 milliamps. The IFB power supply will go into a shutdown condition if current is greater than 140 ma.

Status Item 05 – IFB Voltage
DC Voltage of IFB power supply. Nominally 25 volts. Note that if a dry mode is selected for IFB2, the power supply will be turned off and voltage will read zero.

Status Item 06 – Dflt Name (Default Name)
This name is the default Dante name if the device is reset to default configuration via the Dante Controller. The six-digit hexidecimal number at the end of the name is a portion of the MAC address, and is unique to each device.

Status Item 07 – Firmware Version
Display of the version number of the firmware installed in the ADX-120.

Resetting the ADX-120 Menu Variables to a Standard Configuration

The menu variables in the ADX-120 may be reset to a known standard configuration by holding down any of the front-panel buttons during the boot-up period. (Hold one of the buttons down and apply power. After the unit initializes the menus will be reset).

The standard configuration is:

Both Phantoms Off
Channel 2 set for Mic Input
IFB2 set to Dry IFB mode
Sidetone Off
All Buttons = Green
GPI Inputs = Disabled
Both Preamp Gains = 40dB
IFB1 set to Normal 2 Channel mode
Headset Volume set to Normal
Aux Inputs Off
Button Mode = Momentary
Network Alarm = Enabled

Naming the ADX-120 (User-friendly Dante Name)

The Dante Name is a user-friendly name which appears in the Dante Controller application. This name may be entered for each device using the Device View of the Dante Controller application.

The first 15 characters will be displayed on the ADX-2400 when accessing the remote device menus, and the full name will be displayed in Dante Controller.

Note that audio routing is defined based on these names. If you change names, you may have to re-route some of your signal paths using the new name. It's best to set all names first, then do routing.

To enter user-friendly names from Dante Controller, do the following steps:

1. Identify the unit that you wish to rename. From the ADX-2400 you can access the remote device number for which the System ID switches are set on the desired device. The current name will be displayed on the ADX-2400. This device can then be selected in the Dante Controller application, and a new name entered.

   Alternatively, from Device View in Dante Controller, a device may be identified by clicking on the 'eye' identify icon. This will cause all four of the LEDs on RJ45 connectors of the device to blink at about a 1Hz rate.

   (Note that you can enter Device View mode by pressing the Cntl-D shortcut, selecting 'Device View' from the Device menu at the top of the screen, or by simply double-clicking on one of the device names from the Routing or other screen.)

2. From the Device View in Dante Controller, select the Device Config tab and the desired device. You can then enter a new name in the box provided.

Powering the Dante ADX-120s

The ADX-120s are intended to be powered via the Cat5 Ethernet cable. They can be powered by the Lance Design ADX-8000 switches, or the ADX-800 power inserters.

They may also be powered by standard POE switches, which support the IEEE 802.3af specification.

There is a small 2-pin jumper inside the ADX-120, just to the right of the network board. This jumper inhibits POE negotiation when installed. For use with standard POE switches, this jumper must be removed.

There are two methods for providing power over the Ethernet cables. One method puts the power on pins 1 and 2 (paralleled) and pins 3 and 6 (paralleled). This is typically used in POE switches.

The other method applies power to pins 7 and 8 and pins 4 and 5. This method is typically used in 'mid-span inserters', and also in the Lance Design ADX-8000 and ADX-800.

The Dante versions of the ADX-120 will work with either method.

(Cobranet versions will not. Please see the manual for those units for more information)

One word of caution: the IEEE 802.3af specification only allows 15 watts of power to be drawn from a given port. The ADX-120 itself uses about 9.5 watts. If more than one or two RTS beltpacks are being powered from the ADX-120, it is suggested that you use the ADX-8000 switch, which can supply higher current.

Reliability Considerations

Since the commentary microphones and communications are typically provided by this system, reliability is of primary concern. The ADX-series products are designed with highest-quality components and conservative ratings so as to be as reliable as possible.

In addition, after manufacture, the ADX products undergo an extensive burn-in process which includes power and thermal cycling to attempt to precipitate out any early-life failures.

Even with these precautions failures are not impossible, and in addition there are other components to the system such as Ethernet switches which must also be considered in evaluating the overall reliability question.

Here are some thoughts on insuring a reliable on-air system:

- Provide a spare announce box and headset. This practice has been going on for decades with analog systems, and it's still a good idea. It protects against failure of the ADX-120 and the headset.

- Use the ADX-8000 to provide power for the ADX-120s. This unit contains redundant power supplies and will provide highly-reliable power, even in the event of the failure of one of the supplies.

- Insure a reliable AC power source in the remote location for the ADX units and for the Ethernet switch. If there is any question about the reliability of the AC supply you might consider using a small UPS power supply to provide battery backup. A small 500 watt unit intended for personal computer use will provide an hour or more of operation in the event of power failure.

- Use reliable Ethernet hardware such as switches, fiber SFPs, etc. Burn in new switches for a few days before putting them on the air. Keep all Ethernet cables and fiber in good condition.

- Many switches have two or more fiber ports available. Use redundant fibers, either by using link aggregation, or the ADX-8000's A/B mode.

- Although the Dante audio data may share a network with other Ethernet traffic, we suggest keeping the critical audio data on its own separate network in order to avoid unexpected and unpredictable data loads and possible bandwidth loss.

ADX-120 Specifications (Dante version)

Microphone Inputs	2 low-impedance balanced. Phantom power available
Preamp Gain (total path)	+25dB to +70dB
Freq Response	20-20KHz, +/- 0.5 dB
Microphone Channel EIN	125 dB, bandwidth-limited to 25KHz
System Signal/Noise	>100 dB below peak level, bandwidth-limited to 25KHz
Distortion	<0.05% for Mic/Line and Dry IFB. <0.1% for PL / Wet IFB
Microphone Preamps	THAT Corporation 1570 / 5171
A-D and D-A Conversion	24-bit
Digital Processing	32-bit fixed-point DSP
Dante Transmission	24-bit uncompressed
Sample Frequency	48 kHz
Path Latency	Approx 1.5 Milliseconds on all paths (analog to analog)
IFB 1 Outputs	2 channel dry unbalanced. Max power in 600 ohms is 120mw.
IFB 2 Outputs	2 channel wet RTS-format or single-channel dry +4dB nom.
PL Interface (Booth End)	2 channel wet RTS-format. DC current to support 2 beltpacks
PL Interface (Truck End)	4-wire via ADX-2400 or other Dante device
PL Trans-hybrid Loss	Greater than 55 dB
Remote Control	From ADX-2400
Front Panel Switches	Three; Mute, Talkback 1, Talkback 2. RGB Illumination
System Addressing	Rear panel two-digit rotary switches. Address 01-99
Power Source	48V on Cat5 cable
Power Requirements	48 Volts DC, 195 ma. 320 ma with four RTS/Telex beltpacks.
Ethernet Interface	1000/100baseT Ethernet (RJ45)
Dimensions	9” wide x 5.5” deep x 2.5” high Weight approx. 2.5 pounds

Remote / GPI Connector Pinout

Pin #	Function
1	Ground
2	RS232 Data Out (TX)
3	RS232 Data In (RX)
4	(no connection)
5	Ground
6	GPI 1 In (Mute)
7	GPI 2 In (Talkback 1)
8	GPI 3 In (Talkback 2)
9	Ground

GPI inputs are TTL-compatible inputs, pulled up to +5 volts with a 5K resistor. They should be pulled to ground with a dry switch closure to activate.

RS232 Remote port is 38.4K Baud, One Stop Bit, No Parity

Notes: