

Adder II

High-performance scalable fiber audio multiplexer



The Adder II is a powerful audio multiplexer over fiber solution that can handle all of your audio needs. It's the latest version of the popular Telecast Adder series that have been connecting audio signals for over ten years

For stadium and arena interconnections, mobile trucks, live audio, studio to control room audio trunking, or across-campus facility interconnections, the Adder II delivers all of audio signals you need using only one or two fibers.

KEY FEATURES AND BENEFITS

Unmatched flexibility

- Up to 64 digital audio channels in each direction over 1 or 2 fibers
- Customizable with a wide range of frames and modules
- Interconnect frames with redundant fiber and/or coax
- Long optical range, up to 20 km (25 dB budget) with no loss of audio quality
- Teleport and Telethon compatible for high-density CWDM fiber multiplexing
- Fast and easy setup

Unsurpassed audio quality

- Analog mic/line audio inputs
- Mic audio gain control (0 to 50 dB in 10 dB steps)
- Mic phantom power control (off, 12 V, 48 V)
- Remote mic gain and phantom power control standard
- Full 24-bit audio performance and 95 dB S/N
- THD <0.05 %, from 20 Hz to 20 kHz
- Extremely low latency, under 1 ms, ideal for live audio applications
- Automatic conversion between analog and AES audio

Advanced capabilities

- 8 Intercom channels: Up to 4 dual-channel systems, 4W, Clear-Com and RTS compatible
- 6 serial data ports (2 RS-232, 2 RS-422, and 2 RS-485) and 2 GPI/O all with status LEDs
- Optional redundant optical I/O and power
- Wide operating range: -10 °C to 50 °C operation
- Built-in test signal generator and analyzer

Applications

- Stadiums and arenas
- Mobile trucks and OBs
- Pro audio – front of house mixer
- Convention facilities
- Campus-wide facilities
- Broadcast centers and studios
- Government, military and security

TECHNICAL SPECIFICATIONS

GENERAL

Data transmission method:	Digital Time Division Multiplexing (TDM)
Aggregate data rate:	75 or 125 Mbps (selectable)
Latency:	~1 ms plus 5 ms per km of fiber
Interchannel phase delay:	<1° at 1 kHz

OPTICAL FIBER CONNECTIVITY

Operating wavelength:	1310 nm and 1550 nm
Fiber connector:	ST type
Recommended fiber type:	Single mode
Recommended distance limit:	Singlemode: 20 km Multimode 5 km
2-fiber system	
	TX Output into cable: -7 dBm RX sensitivity: -32 dBm Link budget (maximum): 25 dB
1-fiber (WDM) system	
	TX Output into cable: -8 dBm RX sensitivity: -31 dBm Link budget (maximum): 23 dB

COAX CONNECTIVITY

Impedance:	75 ohm
Recommended cable:	Belden 1694A
Connector:	BNC
Distance limitation:	305 m (1000 ft)

AUDIO, ANALOG

Analog audio connectors:	3-pin XLR (female on TX and male on RX)
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Transmission method:	Digital, 24-bit, 48 kS/s
Input impedance, analog:	10 kohm balanced
Output impedance:	30 ohm balanced
Line input setting:	24 dBm (peak)
Maximum input level:	
Unity gain (0 dB):	18/24 dBm peak (selectable)
10 dBm input setting:	8/14 dBm peak
20 dBm input setting:	-2/4 dBm peak
30 dBm input setting:	-12/-6 dBm peak
40 dBm input setting:	-22/-16 dBm peak
50 dBm input setting:	-32/-26 dBm peak
Maximum output level (from 30 ohm balanced):	18 dBm at 1 kHz, 600 ohm, switchable to 24 dBm
Frequency response (at 8 dBm):	±0.2 dB from 20 Hz to 20 kHz
Total harmonic distortion + noise:	<0.05% from 20 Hz to 20 kHz (at 8 dBm) <0.01% at 1 kHz (at 18 dBm)
Intermodulation distortion (SMPTE):	<0.04%, 60 Hz + 3 kHz mixed 4:1 at +8 dBm
Signal to noise ratio (A-weighted):	>95 dB, 20 Hz -20 kHz, ref. to 18 dBm

AUDIO, DIGITAL

AES/EBU I/O:	unbalanced, 75 ohm BNC
Transmission method:	AES/EBU digital audio pair conforming to AES3 specifications

External sync:	BNC, rear panel
Sample rate:	48 kHz
User bits:	Not supported

SERIAL DATA TRANSMISSION

Data connector:	9-pin female "D"
RS-232:	±8 Vp-p level, 20 kbps max.
RS-422/R-S485:	Balanced TTL levels, 150 kbps max.
Jitter:	<330 ns (3.07 MS/s)
Latency:	~ 0.90 µs plus 5 µs per km of fiber

INTERCOM (882I MODULE)

Total intercom channels:	8
Intercom compatibility (per module):	
4-Wire:	2 balanced, non-powered, 5-pin XLR-M
Clear-Com:	2 unbalanced, powered, 3-pin XLR-M
RTS:	1 unbalanced, powered, dual-channel, 3-pin XLR-M
Signal-to-noise ratio (A-weighted):	>90 dB
Frequency response:	1/-3 dB, 80 Hz-20 kHz, 8 dBm

CONTACT CLOSURE / GPIO

Connector:	Two 9-pin female "D" connectors
Input contacts:	Normally high TTL 1 level (remote contact open/open circuit) Short to ground TTL 0 (remote contact closed/triggered)
Output contacts:	Form 1A SPST, "normally open" isolated contacts

Switch voltage rating:	50 V AC/DC
Switch current rating:	500 mA
Maximum carry current rating:	500 mA
Contact resistance:	< 0.5 ohm

MECHANICAL/ELECTRICAL/ENVIRONMENTAL (W X H X D)

2RU:	19 x 3.5 x 7.75 in, 8 lb (3.5 kg)
3RU:	19 x 5.25 x 7.75 in, 9 lb (3.5 kg)
4RU:	19 x 7.0 x 7.75 in, 10 lb (3.5 kg)
5RU:	19 x 8.75 x 7.75 in, 11 lb (3.5 kg)
6RU:	19 x 10.5 x 7.75 in, 12 lb (3.5 kg)
7RU:	19 x 12.25 x 7.75 in, 13 lb (3.5 kg)
Power connector:	4-pin XLR (male) x2, screw terminals
Input voltage range:	12 to 18 VDC, 4.5 A max
Power consumption (per end, all channels at full level):	45 W maximum
Temperature range:	-40° to 60 °C
Humidity range:	0 to 90 % non-condensing

WARRANTY

Two-year standard Miranda parts and labor warranty.
Specifications subject to change without notice.
Made in USA and Canada.

Customize your Adder II to your application

Your Adder II system is created by selecting a desired frame size and then one or several 1RU input/output (I/O) modules to complete the system. The frame includes a common control and fiber module and a backplane that connects to the I/O modules. You can build symmetrical (i.e. 32x32) or asymmetrical (i.e. 64x8) systems to match your requirements. Individual analog and AES TX and RX modules can be combined with an intercom module to create an audio system that is perfectly suited to your particular application. Your system can even convert between analog and AES digital audio. The Adder II gives you the most flexibility and convenience of any audio fiber system available.

Analog and digital conversion

Analog modules come in rows of 16 while AES modules are in row of 8. In this way, an AES TX can interface to an analog RX thus bypassing the need for expensive external D-A and A-D converters. And with ultra-low latency delay is never an issue.

Convenience and control

Analog TX modules feature preamps that allow 40 dB of gain adjustments plus 12/48 V phantom power via a convenient switch and LED display. The Adder II is equipped for remote control of these functions as standard.

The fiber I/O delivers 25 db of optical budget, the Adder II can operate across the theater or across town. Front panel numeric display indicates optical signal strength for both ends of the link assuring adequate optical margin. Dual-wavelength fiber outputs facilitate easy WDM single-fiber operation.

The Adder II includes six serial data paths standard: two each of RS-232, RS-242 and RS-485, plus two GPI's via convenient DB9-type connectors. Additional serial ports can be added using the A2-DATA-8 modules.

An Analog and AES tone generator has three different tone frequencies with three level choices. The signal analyzer includes an improved LED bar graph and the ability to meter both analog and AES signals and monitor them through an internal speaker or ¼ in headphone jack.

Compatibility

The Adder II can be used with Teleport and Telethon, allowing several devices to be multiplexed down a single fiber. With the Teleport, up to 8 Adder II systems can be multiplexed over a single singlemode fiber, providing 512 channels of audio in each direction.

The Adder II can also be configured up to 32x32 to be compatible with the previous Telecast Diamondback products.

The Adder II supports either 18 dBu or 24 dBu (selectable) to match your facility standards.

Robust and reliable

The Adder II can operate on one or two fibers or 2 coax (up to 300 meters). The Adder II supports optional redundant connections over two fiber links and over fiber and coax simultaneously, with automatic failover. Optional redundant power supplies further increase reliability for the most demanding applications.

ORDERING INFORMATION

A2-Bx-MD-RG-SW_y Adder II Base system including mux/demux engine and remote gain control.

USE THE VARIABLES IN GREEN BELOW TO BUILD YOUR ORDER CODE

Bx, x = 2,3,4,5,6,7 Specify base system size from 2RU (B2) to 7RU (B7)
Each system uses 1 RU for base control system, so a B6 would have 5 slots available for I/O modules

SW_y, y = 1 or 2 SW1: Redundant single fiber I/O with WDM (not Teleport/Telethon compatible). Allows Adder II to operate over a single singlemode fiber (two for redundant connections).
SW2: 1310 nm and 1550 nm redundant optical transmitters. Uses two fibers in each direction for each redundant path (4 fibers for full redundancy). Teleport and Telethon .

I/O modules	Analog audio I/O LED indicators for presence and overload on all analog modules	A2-882i-0	8-channel intercom transceiver I/O module; houses 4 ea. ADDR-AUX modules (unpowered – dry, for intercom systems with external power)
A2-AM8x8-0	Analog transceiver; 8 XLR line in and 8 line out module	A2-882i-0-30Vf	8-channel intercom transceiver I/O module; houses 4 ea. ADDR-AUX modules (powered – wet, powers up to 4 Clear-Com or 5 RTS beltacks per ADDR-AUX module). Includes 4 ADAP-AC30V power supplies. Intercom modules, up to 4 per A2-882i module
A2-ARX-16-0	Analog receiver; 16 XLR output module	ADDR-AUX-4W	Intercom module 4-Wire each end
A2-ATXM-16-0	Analog transmitter, 16 XLR mic/line input module with remote gain and phantom control and third LED to indicate when gain or phantom settings are being remotely controlled	ADDR-AUX-CC	Intercom module Clear-Com
AES digital audio I/O	Use an AES module at both ends for an all-digital link, or use AES module at one end and an analog module at the other for automatic analog-AES conversion. Note that an 8 channel AES unit maps directly to a 16 channel analog module. LEDs indicate signal presence.	ADDR-AUX-RTS	Intercom module RTS 2W
A2-DATA-8	Adder II data transceiver, 8 serial ports; I/O strip	ADAP-AC-04	Adder II power supply, up to 2 per frame (for redundancy)
A2-DRX-8-0	AES digital receiver 8 BNC output module	ADAP-AC30V-X4	Adder II Intercom power supply, required for A2-882i-0-30V
A2-DTX-8-0	AES digital transmitter; 8 BNC input module	A2-BP-1	Adder II 1RU blank plate strip filler (1 per unused slot)
Intercom I/O	The 882i Intercom Unit allows easy two and four wire communication between the Adder II frames. Only one 882i unit can be supported in each frame. This unit accepts up to four Adder-AUX modules that support industry standard 4-Wire plus Clear-Com and RTS 2-wire intercom systems. The module above shows an 882i panel with 2 RTS, 1 Clear-Com and 1 4-Wire interface installed.		

Note: All Adder II systems start with a base unit. From here you have complete control over your audio system including the tone generator and analyzer (analog and AES), monitoring of optical and data paths, remote gain and phantom voltage assignment, and power. The intuitive user interface makes monitoring and modifying your system as easy as punching a few buttons.