

Digital Fiber Optic Audio/Intercom/Data Multiplexer



This full function digital audio/intercom "snake" pre-amplifies, digitizes, multiplexes, and splits up to 64 audio channels on one lightweight fiber optic cable.

The Standard in Broadcasting and Professional Audio

Telecast's Adder™ family represents the highest performance and most mobile Fiber Optic Audio Multiplexers available anywhere. That is why they are the most widely used systems, covering the most prominent events and used in prestigious facilities worldwide. From television sports production to sound reinforcement, our Adder events list includes Winter & Summer Olympics, World Cup Skiing, Super Bowls, Grammy Awards, and ESPN's X-Games. Adder clients include the major American and worldwide TV networks, plus the White House and the Billy Graham Crusades.

Adder System Overview

The top of the line Adder systems are the Adder 162, and its big brother the Adder 322. These systems are identical except for the number of audio channels that can be multiplexed onto a single optical fiber: 32 and 64 channels respectively. Both systems are modular, permitting custom combinations of line or microphone source channels, and return drive lines. Also, both systems include up to six intercom channels, four high speed data lines, and two GPI switch closure interfaces in each direction, all on one optical fiber conductor.

Features

- 24-Bit digital; >100 dB S/N
- Modular; up to 64 audio In/Out
- Six intercom channels (4-wire or Clear-Com®) or 3 dual RTS®
- Four RS422/232 data + 2 closures
One fiber or dual coax in/out
- 4 Laser outputs for 3- or 4-way splits
- Dual hot-standby (diversity) receivers
- Adjustable mic gain preamps
- Phantom mic bias— switchable
- Selectable input impedance
- Activity/Clip LEDs each channel
- Tone generator & signal analyzer
- Optional video channel(s)
- Up to 30 kilometer range (SM)
- Lightweight, durable 19" rack mount
- Internal UPS with remote alarm

Applications

- Outside Broadcasting & Production
- Sound Reinforcement & Lighting
- Remote Recording
- Press Conferences
- Campus & Facility Distribution
- Telecomm & Teleconferencing
- Corporate, Industrial, Government

Similarly, both the Adder 162 and 322 include 3-way optical splits, "hot standby" optical redundancy protection, and a built-in variable tone generator and signal meter as standard features. In addition, both systems allow you to substitute a video module for an 8-pack audio input or output module without sacrificing most other features.

Faster Set Up, Labor Savings

The flagship systems of the Adder snake family

- Two sizes—up to 64 channels (322) or 32 channels (162)
- Intercoms and standard data
- Bi-directional transmission
- Portable 19"-rack mount units
- Automatic UPS power protection

Mic or line audio inputs

Built in preamplifiers allow you to plugin microphones or line inputs.

- Select 0 to 40 dB gain
- Select low (600 ohm) or high impedance (10k ohm) inputs



Adder 162



Phantom Mic Bias & Ground lifton each channel

With the flick of a switch, each input independently provides 48 VDC bias for your condenser microphones. Also, if needed, you can independently isolate any channel input from ground.

Batteries or AC

- Operates on 12 to 24 VDC, such as camera or auto battery
- Uninterruptable Power Supply (UPS)- up to 20 min. backup
- Consumes less than 25 watts fully loaded (Adder 162)
- LEDs & alarms indicate status of local and remote power

Automatic Receiver Protection

For maximum reliability, your Adder is equipped with dual redundant optical receive input ports, with automatic switch-over protection between them. Route your fiber cables along alternate paths, and in the unlikely event that one cable is damaged, the other takes over seamlessly, without

Replace your Mic Splitters

The Adder has four (4) "first generation" digital optical outputs. Each may serve an Adder receiver unit in a different location. These outputs comprise perfectly isolated splits of all 32 to 64 channels. Full quality throughput to your house mix, recording location, and monitor mix—with no degradation.

Communicate with Intercoms, Datas, & Switch Closures

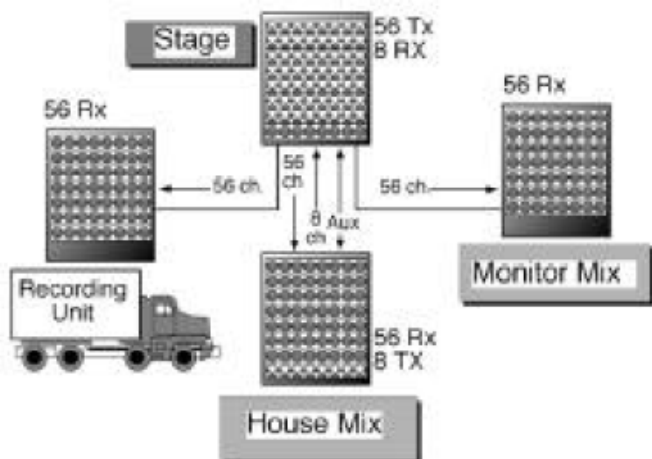
The Adder includes six (6) high quality digital intercom channels. You can plug in any mix of dual channel 4-wire (top right) modules, Clear-Com® (center) or RTS® (bottom). Plus, your Adder can translate between intercom types used on either end.

Your Adder also comes with four (4) bidirectional channels of high speed RS422 (or RS232) data for machine control, lighting, etc., and two GPI switch closure interfaces in each direction for signaling or control.



Built-in Generator and Analyzer

No need to bring test equipment. The Adder comes equipped with its own tone generator, including selectable frequency and output level; and with its own analyzer, including LED VU meter, 1/4" headset jack, and volume control.



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Improves Performance, Lowers Costs

24-bit digital and fiber optics bring you flawless audio

- No electromagnetic interference
- No radio frequency interference
- No crosstalk between channels
- No grounding problems or "hum"
- No signal loss
- No high frequency rolloff
- No radiation of signals

TACTical Fiber Cable

Telecast's TAC-series cables are designed for military battlefield use, and are similarly ideal for field event conditions. These rugged cables have brought you coverage of worldwide news, sports—including international championship golf, skiing and auto racing—and televised entertainment—ranging from Garth Brooks concerts to Disney movie premiers.

Tougher than Copper Cables

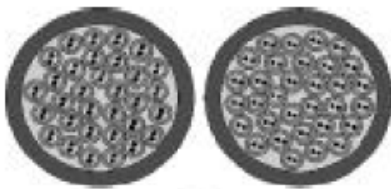
Our TAC-series cables withstand temperature extremes, vehicle traffic and flexing far better than coaxial or wire cables. There's no copper to corrode. No copper to pick up noise. And no copper to short, spark or shock.

Telecast's rugged "TAC" cables bring you coverage of the highest profile events, including Super Bowls, Olympics and X-Games

The small outside diameter makes them less of a safety hazard, and also less susceptible to damage from forklifts, carts and human traffic. The optical conductors are stronger than steel for their weight, and the entire cable is protected by the incredible strength of Kevlar.

Go from this...

64 shielded audio pairs



to this... Tac 1

Coaxial Trunk Ports, too

In addition, for your convenience, coaxial input and output ports are available as an occasional alternative to fiber cable. These ports may be used for links up to and beyond 1,000 feet (305 meters) when 75 coaxial or triaxial cable is the only existing feed into a facility, such as a stadium or arena.

ECONOMIC CONSIDERATIONS

Acquisition Savings

- Fiber cable is only 5% to 10% as expensive as multipair
- Fiber connectors are also much less expensive than multipins
- Save the cost of breakout boxes
- Save the cost of preamplifiers
- Save the cost of mic splitters
- Save the cost of line drivers
- Save the cost of isolation transformers

Installation Savings

- Fiber cable is lightweight, and pulls in fast and easy
- Fiber cable is quick and easy to verify with a flashlight
- Fiber cable can be laid anywhere, even with show lighting
- Fiber cable is small and rugged, less easy to damage

Personnel Safety

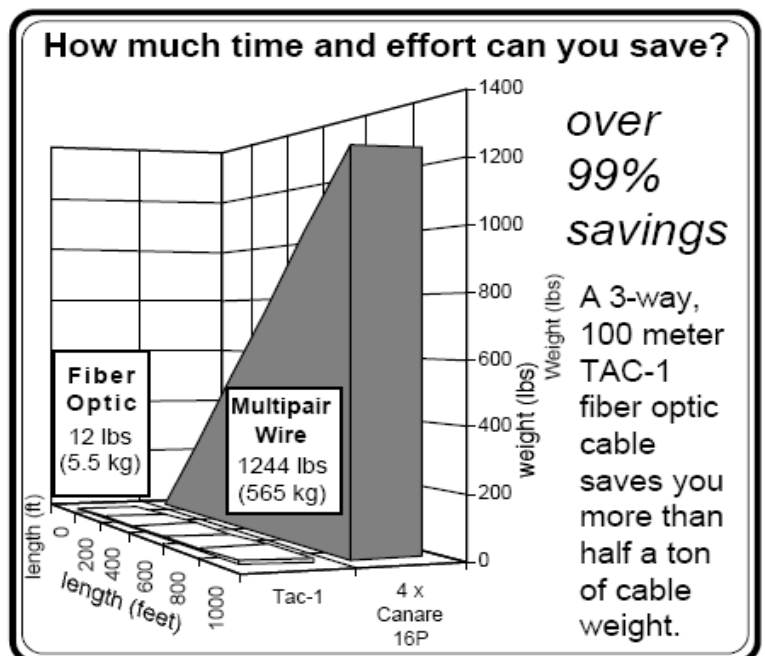
- Small fiber cable poses less tripping hazard to the public
- Fiber optics do not short, spark or shock
- Lightweight fiber cable reduces the risk of back injury
- Nonmetallic fiber protects against lightning and ground faults

Troubleshooting Savings

- Fiber cable is not prone to clicks, pops and hum, as mults are
- Fiber cables eliminate noise pick up and grounding problems
- The Adder has on-board diagnostics and intercoms
- The Adder is equipped with a tone generator and analyzer
- The Adder is equipped with automatic switchover protection

Repair and Replacement Savings

- Fiber cable is less prone to damage and corrosion
- Fiber cable can be repaired easier and faster than multipair
- Fiber cable costs only 5% to 10% as much to replace
- Fiber cable spares are low cost, small and easy to stock
- The Adder comes with a 1 year limited warranty



Specifications

Audio

| | |
|--|--|
| Transmission Method..... | Digital, TDM, 24-bit, 48 ksamples/sec |
| Input Impedance.... | 600 Ohms bal. or 10 k Ohms bal. (switchable) |
| Output Impedance..... | 30 Ohms balanced |
| Maximum Input Level (600 balanced mode "Low Z _{in} " setting) | |
| Unity Gain Setting..... | +18 dBm (peak) |
| +10 dB Gain Setting..... | +8 dBm (peak) |
| +20 dB Gain Setting..... | -2 dBm (peak) |
| +30 dB Gain Setting..... | -12 dBm (peak) |
| +40 dB Gain Setting..... | -22 dBm (peak) |
| Maximum Input Level (10 k balanced mode "High Z _{in} " setting) | |
| Unity Gain Setting..... | +16 dBV (peak) |
| +10 dB Gain Setting..... | +6 dBV (peak) |
| +20 dB Gain Setting..... | -4 dBV (peak) |
| +30 dB Gain Setting..... | -14 dBV (peak) |
| +40 dB Gain Setting..... | -24 dBV (peak) |
| Maximum Output Level (from 30 Ohms balanced) | |
| Unity Gain Setting (@1kHz)..... | + 18 dBm into 600 Ohms |
| Frequency Response (@ +8 dBm) | |
| from 20 to 22 kHz..... | ±0.2 dB |
| Total Harmonic Distortion + Noise | |
| from 20 Hz to 20 kHz (@ +8 dBm)..... | <0.05% |
| at 1 kHz (@ +18 dBm)..... | <0.01% |
| Intermodulation Distortion (SMPTE), | |
| 60 Hz + 3 kHz mixed 4:1 @ +8 dBm..... | <0.04% |
| Signal to Noise Ratio, unweighted, | |
| 20 Hz -20 kHz, ref. to +18 dBm clip level..... | >102 dB |
| Aggregate Digital Data Rate..... | 147 Mbaud |

Intercom Interfaces (optional)

| | |
|--|---|
| Number of channels per module..... | 2 |
| Number of modules per Adder frame..... | 3 |
| Number of duplex intercom channels per Adder frame..... | 6 |
| Compatibility (4-wire modules standard; 2-wire modules optional) | |
| 4-wire..... | balanced; non-powered; on two 5-pin XLR connectors |
| 2-wire..... | Powered trunk to belt pack, on 3-pin XLR connectors |
| • Clear-Com..... | unbalanced; 2-ch on 2 XLR connectors |
| • RTS..... | unbalanced; 2-ch on 1 XLR connector |
| Transmission..... | Digital, TDM, 16-bit, 48 ksamples/sec |
| Signal to Noise Ratio (meas. 4-wire)..... | 80 dB |
| Frequency Response (meas. 4-wire)..... | ±3 dB, 20Hz to 20 kHz |

High Speed Data Options

| | |
|---|--|
| Number of channels..... | 4 |
| RS232..... | ±8 Vp-p level.....0 to 19.2 kBits/sec |
| RS422..... | Balanced TTL levels.....0 to 150 kBits/sec |
| RS423..... | TTL level.....0 to 150 kBits/sec |
| *Higher data rates possible dependent on user jitter tolerance. | |
| Jitter..... | 1.12 µsec |

Contact Closure Ports

| | |
|--|---|
| Input..... | Normally High TTL level |
| Logic 1 to open remote contacts; ground (Logic 0) to actuate | |
| Output..... | Form 1A SPST, "Normally Open" isolated contacts |
| Switch Voltage Rating..... | 200 VDC |
| Switch Current Rating..... | 500 mA |
| Carry Current Rating..... | 1.2 A |
| Contact Resistance..... | 200 m Ohms |

System Margin Data

| | | | |
|---------------------------------------|------------------------------------|------------------------|-------------|
| Unit Suffix (see ordering info) | <u>-LS2</u> | <u>-LW1</u> | <u>-SW1</u> |
| Fiber Type | MM or SM | multimode | singlemode |
| No. fibers needed for 2-way operation | 2 | 1 | 1 |
| Wavelength(s) (nm) | 1300 | 1300/1550 | 1300/1550 |
| TX Output into cable (dBm) | -8 | -10 | -10 |
| RX Sensitivity (dBm) | -28 | -26 | -26 |
| Resultant Link Margin (dB) | 20 | 16 | 16 |
| Recommended Max. Distance (km) | 5(MM),30(SM) | 20 | 20 |
| <u>Dual Coaxial cable I/O.</u> | | | |
| | 75 Ohms, Belden 8281 or equivalent | 305 meters (1,000 ft.) | |

Mechanical/Electrical/Environmental

| | | |
|---|---|-----------------------|
| Dimensions (WxLxD) | <u>ADDR-162</u> | <u>ADDR-322</u> |
| 19-inch Rack Mount..... | 10.5" x 16.75" x 6.0"..... | 17.5" x 16.75" x 6.0" |
| Weight (fully loaded with modules) | 7 kg (15.4 lbs) | 9.7 kg (21.4 lbs) |
| Audio Connectors..... | 3-pin XLR (female on AI-820 & male on AO-820) | |
| Auxiliary Data/Closure Connectors..... | 9-pin D (female) | |
| Optical Connector(s)..... | ST-type | |
| Input Power Connectors (main and aux)..... | 4-pin XLR (male) | |
| Input Voltage Range..... | 12 to 18 VDC | |
| Power Consumption (Adder 162, all channels full level, no intercom) | | |
| | | < 25 watts |
| Temperature Range..... | -40° to +60°C | |
| Humidity Range..... | 0 to 95% non-condensing | |

Ordering Information

1. Order the Adder mainframe enclosure

| Model Number | Capacity | Main Fiber Paths | Fiber Type |
|----------------|---------------|---------------------------|-------------|
| ADDR-162-LS232 | channel frame | 2 ways on two fibers | All Types |
| ADDR-162-LW132 | channel frame | 2 ways on one fiber | Multimode |
| ADDR-162-SW132 | channel frame | 2 ways on one fiber | Single mode |
| ADDR-162-RO32 | channel frame | Receive Only, No Intercom | All Types |
| | | | |
| ADDR-322-LS264 | channel frame | 2 ways on two fibers | All Types |
| ADDR-322-LW164 | channel frame | 2 ways on one fiber | Multimode |
| ADDR-322-SW164 | channel frame | 2 ways on one fiber | Single mode |
| ADDR-322-RO64 | channel frame | Receive Only, No Intercom | All Types |

Available Options

| Model Number | Description |
|--|--|
| ADDR-AUX-4W | Plug-in Intercom module, 2 ch. 4-wire, no phantom |
| ADDR-AUX-RTS | Plug-in Intercom module, phantom, dual RTS (1 XLR) |
| ADDR-AUX-C/C | Plug-in Intercom module, phantom, dual Clear-Com |
| (note: intercoms require one module per dual channel end) | |
| VMK-103 | Mounting kit for TX103 or RX103 video modules |
| (note: installing video TX or RX displaces one AI-820 or AO-820) | |

2. Order the "8-Pack" Audio Interface Modules

- **AI-820** Includes 8 analog audio inputs, 20 bit A/D converters
- **AO-820** Includes 8 analog audio outputs, 20 bit D/A converters