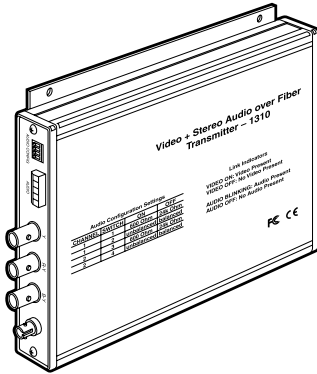




# BLACK BOX<sup>®</sup>

## NETWORK SERVICES

### UNIVERSAL VIDEO/STEREO AUDIO FIBER EXTENDERS



***Use one fiber to transmit one video signal and two audio signals.***

#### Key Features

- ▶ **All-digital processing and transmission!**
- ▶ **Support component, composite, or S-Video connections plus stereo audio.**
- ▶ **Work over a single multimode or single-mode fiber.**
- ▶ **Easy to set up—video and audio cables are included.**
- ▶ **Extend video/audio more than 35 miles over single-mode fiber.**
- ▶ **Ideal for advanced A/V or security applications.**
- ▶ **LEDs show presence of power, video, and audio signals.**

Analog systems aren't always ideal when trying to extend the latest advanced video and audio systems. For enhanced video quality and the highest audio fidelity, you need a digital system.

That's what you get with the Universal Video/Stereo Audio Fiber Extenders: crystal-clear *digital* transmission. Unlike traditional fiber optic extender systems that use analog processing and transmission technology—which frequently results in a less-than-optimal image—the Universal Extenders use *all-digital* processing and transmission.

This digital encoding results in superior, noise-free signal quality with no crosstalk or drifting, and there's no adjustment over the usable length of the fiber required.

The standalone Universal Video/Stereo Audio Fiber Extender is a "universal" one because it works with composite, S-Video, or component video, and it ships with cables for making those types of connections. It supports all component video formats, including Y-P<sub>B</sub>-P<sub>R</sub>, Y-C<sub>B</sub>-C<sub>R</sub>, YUV,

and Y/R-Y/B-Y, and is compatible with NTSC, PAL, and SECAM video formats.

For a proper mix of brightness and clarity in colors, the extenders feature 15-MHz bandwidth luminance and 7.5-MHz chrominance bandwidth.

The extenders also feature independent audio channels, which can be configured for either balanced or unbalanced inputs and outputs. By default, each extender is set for balanced 600-ohm input impedance and balanced audio output. But it can be changed by simply adjusting DIP switches on its back panel.

LEDs indicate the presence of power and video and audio signals at all times on each extender.

The Universal Video/Stereo Fiber Extenders are ideal for numerous applications, such security systems, point-of-sale displays, and professional video A/V setups. Because the fiber extenders support today's more-sophisticated DVD players with progressive scan as well as 480p

HDTV signals, they're a great fit for advanced A/V systems.

#### **The advantages of fiber.**

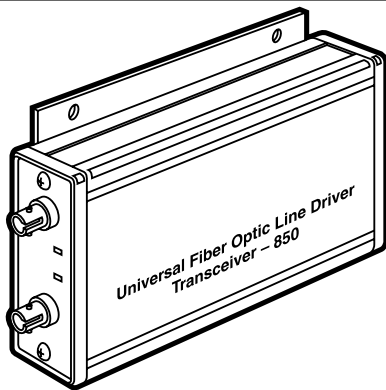
Fiber optics also offers uniform performance and superior signal-to-noise ratio in the transmission medium as well as a higher degree of reliability and security. Fiber also is a great medium for long-distance applications. And, unlike coax and twisted-pair media, there's no bulky cable connections to deal with.

Fiber is also great for shorter distances in which you need to send many signals. With the extenders, you can use a single fiber to send such signals point to point, eliminating the need for extra coax or shielded twisted-pair cabling.

The extenders work with both multimode and single-mode fiber. Data can be sent over 1310-nm multimode at distances up to 2 km (1.2 mi.). For greater distance, use 1310-nm single-mode fiber and get distances up to 60 km (37.2 mi.).

You'll need to order both a transmitter (AC300A-TX) and a receiver (AC300A-RX) for the system to work.

# UNIVERSAL FIBER OPTIC LINE DRIVER TRANSCEIVERS



***Protocol conversion through one device—plus the benefits of fiber optics!***

## Key Features

- ▶ ***Compatible with RS-232, RS-422, and RS-485 (2- or 4-wire).***
- ▶ ***Data rates up to 10 Mbps for RS-422 and RS-485.***
- ▶ ***Use in both point-to-point and drop-and-repeat networks.***
- ▶ ***Available in 850- and 1310-nm operating wavelength versions.***
- ▶ ***Internal circuitry performs all specified conversions.***
- ▶ ***Easy to configure modes using DIP switches.***
- ▶ ***LEDs continuously monitor operation for power and data.***
- ▶ ***ST connectors.***
- ▶ ***Use the RTS signal or data to enable the RS-485 transmitter.***

Converting from one type of protocol to another shouldn't complicate your job when trying to extend data over fiber optic transmission systems. Why spend the time and money to mount external RS-232, RS-422, or RS-485 converters alongside fiber transmitters and receivers and complicate the installation further?

To avoid the hassle, order a pair of standalone BLACK BOX® Universal Fiber Optic Line Driver Transceivers. These economical and reliable devices perform the necessary protocol conversions so different types of equipment can talk to another—and they extend your data over fiber.

The transmitting transceiver converts all signals passing through it into pulses of light on its optical connectors' LED. Because the devices' internal circuitry reduces RS-232, RS-422, and RS-485 protocols to this common denominator, converting one protocol to another is simple. You get the input and output protocol that you need—automatically. The receiving transceiver outputs the light it receives in the selected protocol via a photodiode at its optical connector.

You can use the transceivers in both simplex and full-duplex asynchronous applications for both point-to-point and drop-and-repeat data networks. For instance, you can set them up to work in a ring (or loop-type) data bus. In this mode, any location linked via the transceivers can receive or insert data into the ring/loop, but only one station at a time can insert data.

The Universal Fiber Optic Line Driver Transceivers can also perform RS-485 two-wire conversions to and from RS-232 or RS-422. To do this, they use the same two signal leads for both transmitting and receiving data, with each unit alternating between a transmit and receive state. You can instruct the transceivers to switch this way either by sensing an external RTS (Request to Send) signal, or by having it internally sense the actual data that's being transmitted.

To set the transceivers either for external or internal operation, simply adjust their internal DIP switches. You only have to pay attention to the polarity of the different protocols and be sure that software you're using on the overall system allows for turnaround times when switching between protocols, as well as for

the number of times a master will "poll" the local unit before an error is detected.

Installation of the transceivers is simple because there are no operating controls on the units. Other than setting the protocol, speed, and mode of operation with the internal DIP switches, you need only to connect the signal, power supply, and fiber optic cables between the transmitter and receiver transceiver units. By default, the Universal Fiber Optic Line Driver Transceivers are set to operate in RS-232 protocol, point-to-point, and in low speed.

For diagnostic purposes, each Universal Fiber Optic Line Driver Transceiver has three LED indicators that continuously monitor operation and power. The Tx (Transmit) and RX (Receive) LEDs light when the transmitted or received data is in "high" or off when it's in the "low" state and blink at the corresponding data rate.

***For specifications and ordering information, see page 3.***

# UNIVERSAL VIDEO/STEREO AUDIO FIBER EXTENDERS

## Specifications

**Approvals:** FCC, CE  
**Audio Bandwidth:** 20 Hz to 20 kHz  
**Channels:** Video: (1);  
 Audio: (2)  
**Distance (Maximum):**  
 1310-nm multimode:  
 2 km (1.2 mi.);  
 1310-nm single-mode:  
 60 km (37.2 mi.)  
**Fiber Requirement:** Multimode or  
 single-mode  
**Protocol:** Asynchronous  
**Video Bandwidth:** Luma/Chroma:  
 14 MHz/7 MHz, -3 dB  
**Video Differential Gain:** 1%  
**Video Differential Phase:** 0.5°

**Video Formats:** Y-P<sub>B</sub>-P<sub>R</sub>, Y-C<sub>B</sub>-C<sub>R</sub>,  
 YUV, and Y/R-Y/B-Y; composite;  
 S-Video  
**Indicators:** (3) LEDs: Power, Video,  
 Audio  
**Connectors:** Video: (3) BNC;  
 Audio: (1) screw terminal block;  
 Fiber: (1) ST®;  
 Power: (1) terminal block  
**Temperature Tolerance:**  
 Operating: -31 to +165°F  
 (-35 to +74°C)  
**Power:** 100–250 VAC, 50–60 Hz,  
 12 VDC, external  
**Size:** 1"H x 5.5"W x 8"D  
 (2.5 x 14 x 20.3 cm)

## What's Included

Both the Transmitter and Receiver include:

- (1) 12-ft. (3.6-m) composite video cable, BNC/BNC
- (1) 6-ft. (1.8-m) S-Video cable, 4-pin mini-DIN male to (2) BNC
- (1) 10-ft. (3-m) component video cable, (3) BNC to (3) RCA® plugs
- (1) 10-ft. (3-m) stereo audio cable, (4) tin lead shielded twisted pairs to (2) RCA plugs
- (1) BNC female to RCA male adapter
- (1) universal power supply
- (1) U.S. power cord
- (1) users' manual

*NOTE:* A transmitter and receiver are both required for operation. Also, distance specifications list approximate distances only and are not guaranteed. Operating loss budget must not be exceeded.

## Ordering Information

ITEM	CODE
Universal Video/Stereo Audio Fiber Extender	
Transmitter .....	AC300A-TX
Receiver .....	AC300A-RX

# UNIVERSAL FIBER OPTIC LINE DRIVER TRANSCEIVERS

## Specifications

**Approvals:** FCC, CE  
**Distance (Maximum):**  
 MD650A-85: 3.5 mi. (5.6 km);  
 MD650A-13: 50 mi. (80.5 km)  
**Operation:** Simplex, full-duplex,  
 point-to-point or multipoint  
**Operating Wavelength:**  
 MD650A-85: Multimode 850 nm;  
 MD650A-13: Single-mode  
 1310 nm  
**Protocol:** Asynchronous

**Signal Interface:** RS-232, RS-422,  
 RS-485 (2- or 4-wire)  
**Speed (Maximum):** 200 kbps  
**Connectors:** (1) terminal block,  
 (1) pair of ST  
**Operating Temperature Tolerance:**  
 -31 to +167°F (-35 to +75°C)  
**Power:** 100–250 VAC, 50–60 Hz,  
 10–18 VDC at 150 mA peak  
**Size:** 1.3"H x 3.5"W x 4"D  
 (3.3 x 8.9 x 10.2 cm)

## What's Included:

- (1) Universal Fiber Optic Line Driver Transceiver
- (1) universal power supply
- (1) U.S. power cord
- (1) users' manual

*NOTE:* Must be ordered and used in pairs. Also, distance specifications list approximate distances only and are not guaranteed.

## Ordering Information

ITEM	CODE
Universal Fiber Optic Line Driver Transceiver	
850-nm Multimode .....	MD650A-85
1310-nm Single-Mode .....	MD650A-13