Mini-HDMI-AD Series

Miniature Multimode Fiber Optic HDMI Transmission System

BROADATA COMMUNICATIONS, INC.

SAFETY INSTRUCTIONS AND COMPLIANCE DECLARATIONS

PLEASE OBSERVE THE FOLLOWING SAFETY PRECAUTIONS AS OUR PRODUCTS CONTAIN

CLASS I LASER PRODUCTS

WARNING

Do not disconnect the fiber optic connector while the unit is powered up. Exposure to laser radiation is possible when the laser fiber optic connector is disconnected while the unit is powered up.

Although the fiber optic connectors in this product emit only Class 1 energy that is below the levels considered to be hazardous, one should never stare directly into a fiber optic connector or an unconnected fiber end unless one can be certain that no exposure to laser energy could occur.

CAUTION

This manual is intended for use by trained service personnel. The use of controls, making adjustments, or performing operations other than those specified may result in hazardous radiation exposure.

The following label or equivalent is located on the surface of laser products. This label indicates that the product is classified as a CLASS 1 LASER PRODUCT.

SURGE PROTECTION DEVICE RECOMMENDED

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

TABLE OF CONTENTS

1.0 PRODUCT DESCRIPTION

The Mini-HDMI-AD Series is a high performance, low cost, miniature, Fiber Optic HDMI Transmission System. It carries one (1) unidirectional HDMI video, one (1) bi-directional stereo audio and two (2) RS-232 through one multimode fiber. This unique fiber optic transmission system lets your digital flat panel display extend up to 400m at WUXGA (1920x1200 @ 60Hz) resolution. DVI video is also available through a DVI-to-HDMI adapter cable.

No user adjustment is required for the Mini-HDMI-AD system due to the use of advanced digital fiber optic transmission system technology with zero compression and zero bit reduction. This allows for a quick and easy setup, offering trouble-free operation for many years to come. In addition, the Mini-HDMI-AD transmitter (or receiver) is compatible with our Mini-RGB-AD or Mini-DVI-AD receiver (or transmitter). This makes both fiber transmission and HDMI-to-RGB/DVI conversion in one single setup. The Mini-HDMI-AD supports video resolution up to WUXGA (1920 x 1200 @ 60 Hz) or 720p/1080i/1080p HDTV video resolution. Remote IR control or rack-mountable card chassis option is also available.

Figure 1-1 illustrates the front and rear panels of the Mini-HDMI-AD model.

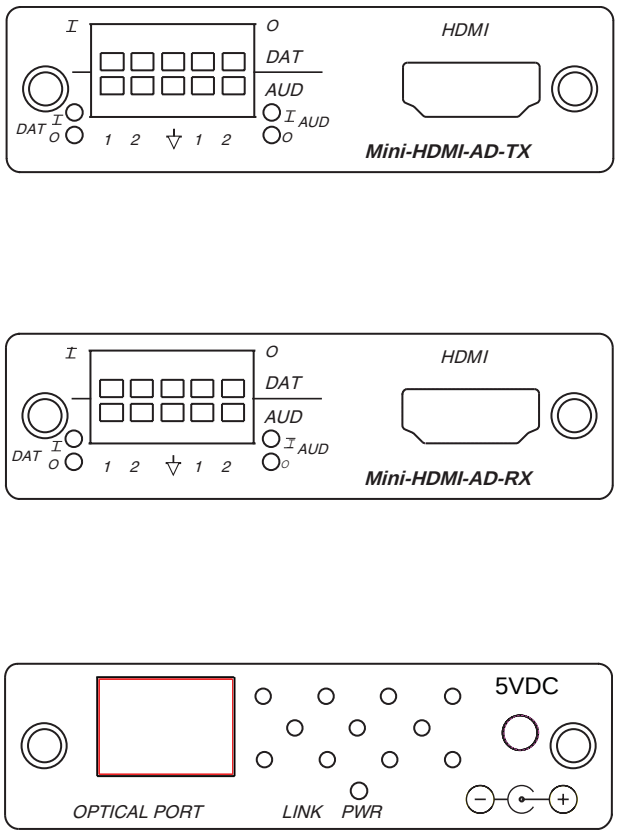


Figure 1-1
Mini-HDMI-AD Front and Rear Panels

2.0 SETUP

The BCI Mini-HDMI-AD Series units are used in pairs. One Mini-HDMI-AD-T transmitter unit is located at the near-end and connected through one optical fiber, to the Mini-HDMI-AD-R receiver located at the far-end of the link. Figure 2-1 depicts a typical installation for the Mini-HDMI-AD-T/R.

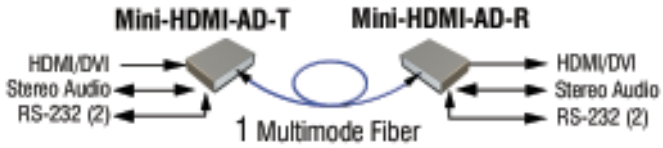


Figure 2-1
Mini-HDMI-AD Setup

2.1 Mounting

Before installing the units into your housing, make sure there is enough space to pull and connect both the electrical and optical cables without stressing them beyond the manufacturer's limitations (also known as the minimum bend radius).

2.2 Cabling and Connectors

In order to setup the BCI Mini-HDMI-AD properly, make sure to observe the following instructions when installing the proper cables. The Mini-HDMI-AD requires two parts to the cabling setup: the electrical and the optical.

2.2.1 Electrical Cable Connection

The three available cable connections on the electrical side are for HDMI video, audio and data connections. Follow the proceeding instructions in order to properly install your electrical connections.

2.2.1.1 HDMI Video Interface

The HDMI video connection is the HDMI plug connectors for video input and output ports. Use the following instructions to properly connect your component video as illustrated in Figure 2-2.

1. Connect the Mini-HDMI-AD-T (Transmitter) unit's HDMI video input port to the user's HDMI video source with the appropriate HDMI cables.
2. For the receive unit, connect the Mini-HDMI-AD-R (Receiver) HDMI video output ports to the user's HDMI video receivers with the appropriate HDMI cables respectively, as illustrated in Step 1.

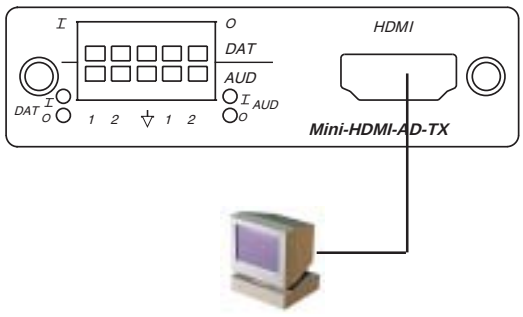


Figure 2-2
Electrical Connection

2.2.1.2 Audio Interface

The audio interface supports two channel high fidelity transmissions. Two separate mono channels or one stereo channel is transmitted in each direction. Line-level audio signals are connected to the Mini-HDMI-AD units. The following steps illustrate the installation procedures for audio devices.

To send audio signals, label and connect two cables to the "AUDIO OUTPUT" connectors of the line level audio source. On the Mini-HDMI-AD, connect the other end of the cables to the front panel terminal block connectors labeled "AUDIO IN". For stereo channels, be sure to match the cables at both ends (L to L, R to R). (See Figure 2-3a).

To receive audio signals, at the far-end location, label and connect two twisted shielded pair cables to the "AUDIO INPUT" connectors of the line level audio receiver. On the Mini-HDMI-AD, connect the other end of the cables to the front panel terminal block connectors labeled "AUDIO OUT". If using stereo channels, be sure to match the cables at both ends (L to L, R to R). (See Figure 2-3b).

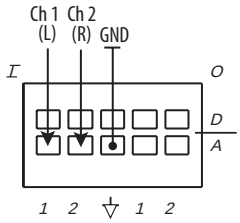


Figure 2-3a
Audio terminal block pinout for audio input to Mini-HDMI-AD.

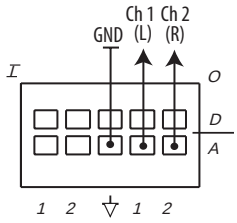


Figure 2-3b
Audio terminal block pinout for audio output for Mini-HDMI-AD.

2.2.1.3 Serial Data Interface

Each Mini-HDMI-AD unit can be used for RS-232 interface.

RS-232 unbalanced data
The Mini-HDMI-AD transmits two channels of unbalanced data signals. Follow the procedures for installing data terminal devices.

1. Label and connect one serial computer data cable to the user's RS-232 device.
2. Connect the other end of this cable to the front panel data terminal block connector on the Mini-HDMI-AD (see Figure 2-4).

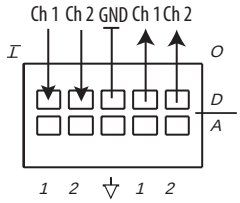


Figure 2-4
RS-232 Terminal block pinout.

RS-422 differential serial data

The Mini-HDMI-AD transmits one (1) channel of differential data signals compatible with Full Duplex RS-422 electrical signals. ***Note that RS-422 option is factory set and is not a standard configuration. The RS-422 does not support handshaking control signals.*** Use the following steps for RS-422 transmission.

1. For the near-end, label and connect one data cable to the user's RS-422 device.

2. Connect the other end of this cable to the front panel RS-422 terminal block connector on the Mini-HDMI-AD (see Figure 2-5).

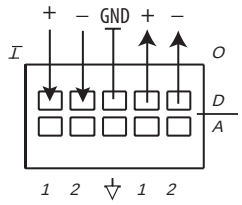


Figure 2-5
RS-422 Terminal block pinout

2.2.1.4 Remote IR Control

The Mini-HDMI-AD has an optional configuration for remote IR cotnrol (Mini-HDMI-AD-IR). In this option, one external IR emitter and one external IR receiver are included (see Figure 2-6). To activate the remote IR control, plug the IR emitter and IR receiver into the IR port of the Mini-HDMI-AD-R-IR unit and Mini-HDMI-AD-T-IR unit, respectively. Please note that once the IR emitter/receiver is plugged into the Mini-HDMI-AD unit, the channel 2 of the RS-232 serial data (refer to Section 2.2.1.3) will be de-activated and the RS-422 will no longer operate.

IR Emitter IR Receiver

Figure 2-6
IR Emitter and one External IR Receiver

2.2.2 Optical Fiber Connection

Most cable manufacturers identify individual fibers in the fiber cable. Select an appropriate terminated fiber. Each unit's optical ports in the system are specified for use with Multimode (62.5/125 micron) fiber. Follow the ensuing instructions on installing and connecting the fiber optic links:

1. Ensure the power is off before proceeding with the fiber optic cable installation.

2. Prior to connecting the fiber optic cables, remove and save the dust caps from the optical port of both the Mini-HDMI-AD units. Clean the fiber optic connector and use a lint-free cloth dampened with alcohol to thoroughly wipe the side and end of the ferrule.

3. Connect the fiber from one unit to the other connecting the near end Mini-HDMI-AD-T unit's optical port to the far end of the Mini-HDMI-AD-R unit's optical RX port as illustrated in Figure 2-7.

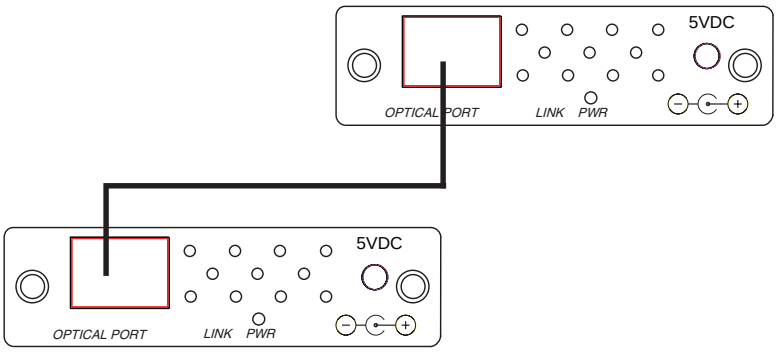


Figure 2-7
Fiber Optic Connection

2.3 DC Power Connection

Congratulations! You are now ready to power up the Mini-HDMI-AD and set up your network connection. In order to make sure that you have a proper installation, please observe the following:

1. Your AC jack has power.
2. The 5VDC power supply is working.
3. Your electrical system has proper grounding (this ensures that your power supply does not suffer from voltage variations).
4. **Power Surge Protection. This is optional**, but highly recommended. A UPS system provides voltage regularity as well as prevents spikes from occurring, thus protecting your Mini-HDMI-AD from sensitive voltage conditions.

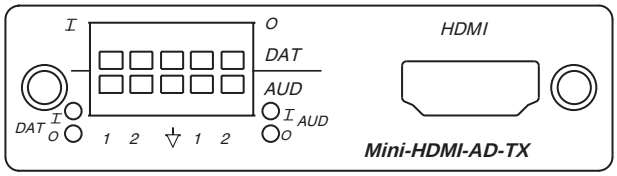
The Mini-HDMI-AD derives power from an external 5VDC power supply. This power supply is a wall mounted AC/DC adapter, 100-240 VAC, 50-60 Hz, at 1.0A. This power supply comes standard for the Mini-HDMI-AD unless otherwise specified.

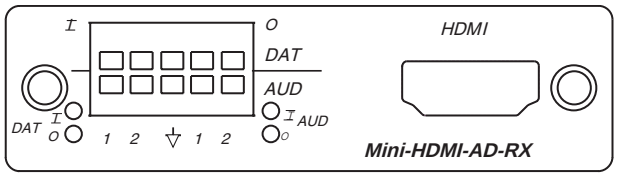
To provide power to the Mini-HDMI-AD, simply connect the power cord, already provided with the units, and connect it to the wall jack. (You will find one power cord per unit). Once the power cord has been connected to the wall jack, connect 5VDC to the unit and the unit should power up immediately.

If you have any problems or concerns, regarding the installation, make sure that you have taken the proper steps to ensure a proper power connection. Otherwise, feel free to contact us for any questions you may have.

3.0 OPERATION

After the installation procedure is completed, the units are ready for operation. To operate the BCI Mini-HDMI-AD units, simply apply power as indicated in the previous step. Note that the front panel link status indicator, shown in Table 1, will be activated.





Label	Function	Description
AUD(io) I(n)	Audio-IN	This GREEN LED indicates L/R-channel input audio activity
AUD(io) O(ut)	Audio-OUT	This GREEN LED indicates L/R-channel output audio activity
DAT(a) I(n)	Data-IN	This GREEN LED indicates input data activity
DAT(a) O(ut)	Data-OUT	This GREEN LED indicates output data activity
LINK	Link	This GREEN LED indicates optical link and power are present and established
PWR	Power	The RED LED indicates that power is present

Table 1
Status Indicators

4.0 MAINTENANCE AND TROUBLESHOOTING

4.1 Maintenance

There is no operator maintenance other then keeping the units clean. However, observe the following light indicators to make sure that the unit is working properly:

4.2 Troubleshooting

If the BCI Mini-HDMI-AD units do not operate properly after installation, check for: possible cable breaks, loose connections, and incorrect cable connections. If a problem exists on the fiber link, please check your fiber connectors for improperly cleaned fiber cables and connectors. If problems persist that may be fiber related, contact BCI at 1-800-214-0222 for further assistance.

For electrical problems, perform the following troubleshooting procedures:

1. **If the POWER indicator is OFF, check for the following:**
   a. The line cord is plugged into the unit and your outlet has power.
2. **If the POWER indicator is ON, but the Optical Link indicator is OFF, check for the following:**
   a. Make sure the appropriate (Multimode) fibers are being used.
   b. Fiber and fiber connectors are not broken.
   c. For each unit, the transmit (TX) fiber is connected to the other unit's receiver (RX).

3. If the POWER indicator and Optical Link indicator are ON, but the audio/video channels are not operating, then:

a. Check to see that the attached user equipment is turned on.

b. Both ends of the link are connected to the corresponding equipment and to the same corresponding channel port.

c. Cable connections at both the video/audio channels are securely fastened to each connector. Turn the power off, then back on to reset the link.

5.0 SPECIFICATIONS

Video

Resolution	Up to 1080p@60Hz or 1620x1200@60Hz
Connector	HDMI Female Plug
Protocol	HDCP/DDC/CEC Capable

Audio

Channel Capacity	2
Operating Mode	Unbalanced (Stereo Audio), Bi-directional
Input/Output Impedance	10k/50 Ohms (Stereo Audio)
Max. Input/Output Level	5 dBu/4Vpp (Stereo Audio)
Magnitude Freq. Response	20Hz to 20kHz @ -3dB
THD+N	>70 @ 1k Hz (Stereo Audio)
Connector	Terminal Block

Serial Data

Channel Capacity	2
Signal Format	RS-232
Data Rate	Up to 57.6kbaud
Connector	Terminal Block

Optical

Fiber Type	Multimode
Number of Fibers	1
Connector	SC

Physical

Dimension (H x W x D)	0.75" x 2.75" x 3.0"
Power Level (max.)	+5VDC @ 1.0A
Operating Temperature	0 to +50°C
Humidity	0 to 95% RH, non-condensing

6.0 SERVICE PROCEDURE

6.1 Replacement Policy

Standard products found defective on arrival (DOA) will be replaced, based on availability, within 24 to 48 hours anywhere in the U.S. Please call Customer Service at **800-214-0222** for information.

6.2 Return/Repair Service

The BCI Mini-HDMI-AD System contains no user serviceable components. If you have a problem with your unit, please contact the Customer Service Department. To facilitate our return/repair processing please contact Broadata Communications, Inc. to obtain a Return Material Authorization (RMA). Please include the following information:

- Product model number
- Serial Number
- Complete description of problem
- Hardware installation description

Broadata Communications, Inc.
2545 West 237th Street, Suite K
Torrance, CA 90505
1-800-214-0222
(310) 530-1416
(310) 530-5958 (Facsimile)
e-mail: CustomerService@Broadatacom.com
Website: www.broadatacom.com

7.0 LIMITED WARRANTY

Broadata Communications, Inc. (BCI) warrants, for a period of one year from date of shipment, each product sold shall be free from defects in material and workmanship. BCI will correct, either by repair, or at BCI's election, by replacement, any said products that in our sole discretion prove to be defective and are returned to the manufacturing location within 30 days after such defect is ascertained. All warranties are limited to defects arising under normal use and do not include malfunctions or failure resulting from misuse, abuse, neglect, alterations, electrical power problems, usage not in accordance with product instructions, improper installation, or damage determined by BCI to have been caused by the Buyer or repair made by a third party. Limited warranties granted on products are to the initial customer end-user and are not transferable. OUR LIABILITY UNDER THIS WARRANTY SHALL IN ANY CASE BE LIMITED TO THE INVOICE VALUE OF THE PRODUCT SOLD AND BCI SHALL NOT BE LIABLE TO ANYONE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES ARISING FROM THE USE OF ITS PRODUCTS OR THE SALE THEREOF. We make NO WARRANTY AS TO THE MERCHANTABILITY OF ANY GOODS, OR THAT THEY ARE FIT FOR ANY PARTICULAR PURPOSE OR END APPLICATION NOR DO WE MAKE ANY WARRANTY, EXPRESSED OR IMPLIED OTHER THAN AS STATED ABOVE.

Broadata Communications, Inc.
2545 West 237th Street, Suite K
Torrance, CA 90505
1-800-214-0222
(310) 530-1416
(310) 530-5958 (Facsimile)
e-mail: CustomerService@Broadatacom.com
Website: www.broadatacom.com

60000-MiniHDMIAD-A$_1$