Overview

The DTV-TX01-DVB-T Transmitter is one component of an AMX TDS Television Delivery System. The AMX TDS system delivers digital TV and video signals across a privately provided IP network infrastructure. The DTV-TX01-DVB-T Transmitter (**FG1410-01**) supports DVB-T (terrestrial) signals, and features RF 1/2 OUT output connectors to allow multiple streams for maximum channel coverage (FIG. 1).
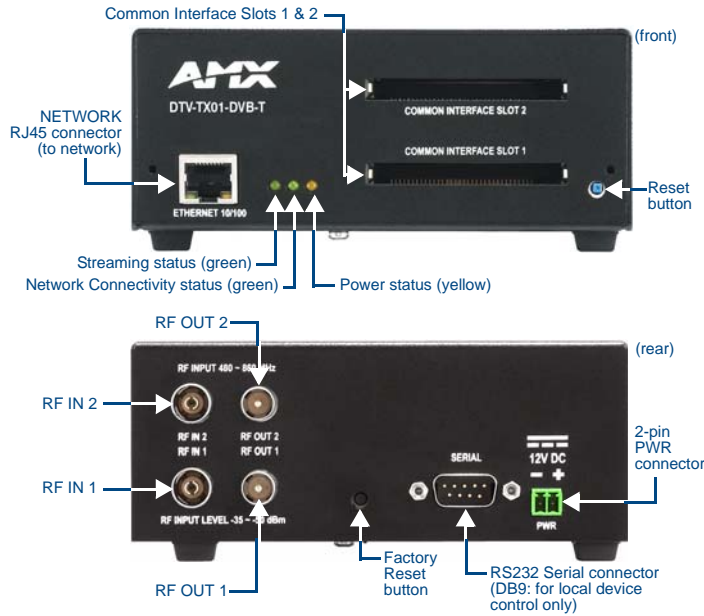

FIG. 1 DTV-TX01-DVB-T Transmitter

Product Specifications

DTV-TX01-DVB-T Transmitter	
Dimensions (HWD):	2.18" x 5.41" x 7.60" (5.56cm x13.74cm x 19.30cm)
Weight:	2.75 lbs (1.25 kg)
Power Requirements:	• Power Consumption: 6W • Voltage rating: nominal 12 to 13.5V DC • Current draw at 12V: 0.5A
Tuners:	2 internal tuners
RF Input Level:	• 480 ˜ 860 MHz • -35 ˜ -50 dBm
Front Panel Components	
• NETWORK Connector:	Standard RJ45 connector.
• LEDs:	Three LEDs indicate the status of the Transmitter: • Streaming LED (*green*) • Network Connectivity LED (*green*) • Power status LED (*yellow*)
• Common Interface Slots 1 & 2:	Dual Common Interface Slots enable the Transmitter to select encrypted channels in cases where this is supported by the broadcaster. *Note: Before de-scrambling content using the Common Interface Slots, ensure that you have the appropriate authority/rights to transmit the de-scrambled content on your network.*
• RESET button:	Press to reboot the Transmitter.
Rear Panel Components:	
• RF INPUTS:	Two TV aerial plug/Belling-Lee connectors accept incoming terrestrial signals.
• RF OUTPUTs:	Two RF aerial plug/Belling-Lee connectors allow you to daisy chain DTV-TX01-DVB Transmitters together. *Note: There is a 3db signal loss on RF output relative to the RF input.*
• Factory Reset Button:	The recessed Factory Reset button on the rear panel allows you to perform a full factory reset (resets flash and reboots the Transmitter in DHCP mode): • Press and hold the recessed Factory Reset button while simultaneously pressing the Reset button on the front panel. • Continue to hold the Factory Reset button while the unit is rebooting. • Release when the Streaming Status LED begins to flash.
• SERIAL (RS232):	DB9 serial connector for local command line interface (RS232 only).
• PWR:	2-pin mini-phoenix connector provides 12VDC power from the power supply. *Note: A 12VDC Power Supply is required (not included)*

DTV-TX01-DVB-T Transmitter (Cont.)	
Environment:	• Operating Temperature: 32°F - 122°F (0°C to 50°C) • Operating Humidity: Max. relative humidity - 85% (non-condensing)
Certifications:	• CE • FCC part 15 Class A
Other AMX Equipment:	• DTV-MA01 TDS Management Appliance (FG1412-01) • DTV-RX01-SD Receiver (FG1411-01) • DTV-TX02-DVB-S Transmitter (FG1410-02) • DTV-RK, Rack Mount Kit for DVB-T/S Transmitters (FG1410-60) • CC-232 Serial Communication Cable (FG10-752-04) • 12V Power Supply

AMX TDS System Description

The AMX TDS system can be deployed in any installation where digital A/V broadcast over IP is desired, and delivers Digital TV and other encoded A/V signals to a number of TV sets, or desktop PC's.

System Components

The AMX TDS system consists of several components, including a DTV-MA01 TDS Management Appliance, Receiver (and IR Remote Controller), and Transmitter modules. There are two Transmitter units available, to accommodate Terrestrial and Satellite digital TV broadcasts. See the *AMX TDS Operation/Reference Guide* for details.

Network Considerations

Because of the high bandwidth associated with A/V distribution, the TDS system is typically managed via a separate IT infrastructure. However, content may be streamed over the main network if desired. Consult your IT representative to determine the proper network configuration for the TDS system.

The AMX TDS system transmits audio/video using IP multicast. In order for this to work satisfactorily, it is vital that the network switches are multicast-enabled in order to prevent unwanted flooding of traffic on the network.

- Within the context of AMX TDS documentation. the term "Multicast-enabled" means that all network switches carry out IGMP snooping, and one switch must function as the IGMP querier.
- AMX Digital TV supports version 2 of IGMP.

Front Panel Components

ETHERNET 10/100 Port

The ETHERNET 10/100 (RJ45) port on the front panel provides 10/100 BaseT network connectivity.

Network Port Pinouts and Signals

The following table lists the pinouts, signals, and pairing for the NETWORK port.

RJ45 Network Port Pinouts and Signals				
Pin	Signals	Connections	Pairing	Color
1	TX +	1 --------- 1	1 --------- 2	Orange-White
2	TX -	2 --------- 2		Orange
3	RX +	3 --------- 3	3 --------- 6	Green-White
4	no connection	4 --------- 4		Blue
5	no connection	5 --------- 5		Blue-White
6	RX -	6 --------- 6		Green
7	no connection	7 --------- 7		Brown-White
8	no connection	8 --------- 8		Brown

Consult the Network Administrator for correct cabling from the DTV-TX Transmitter onto the network. For remote connectivity, the Firewall may have to be configured to open port **2008** for remote connectivity over UDP. Ports **5000** and **5001** are required for the Transmitters as well as any ports used for the TDS Multicast stream.Ports **5002** and **5003** are fixed as the multicast stream output ports.
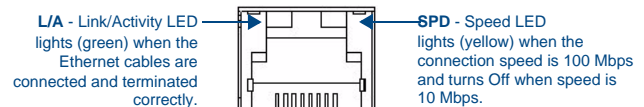
Ethernet LEDs

FIG. 2 Ethernet LEDs

Status LEDs

There are three LEDs on the front panel to indicate various types of device status:

- **Power Status** (*yellow*): Lights to indicate that the Transmitter is receiving power and is functional. If the LED fails to light, check your 12VDC Power connection.
- **Network Connectivity Status** (*green*): Lights to indicate that the Transmitter is connected to the network.
- **Streaming Status** (*yellow*): Flashes if only one tuner is streaming. Steady on if both tuners are streaming.

Default IP Address

By default, DTV Transmitters are set to **DHCP**. See the *Setting the Transmitter's IP Address via the CONSOLE Port* section (below).

Common Interface Slots

DTV-TX Transmitters provide two Common Interface Slots on the front panel to enable decryption of channels where this is supported by the broadcaster (such as in the case of Top Up TV).

Note: *Only a single channel per stream can be decoded per tuner.*

Reset Button

Press to reboot the Transmitter.

Rear Panel Components

RF IN (1 &2)

The RF IN 1 & 2 connectors accept incoming terrestrial TV signals via TV aerial plug/Belling-Lee connectors.

FIG. 3 RF IN 1/2

These connectors can also be used to accept incoming signals from another upstream Transmitter, in installations with multiple Transmitters (see RF OUT 1 & 2 below).

RF OUT (1 & 2)

The RF OUT 1 & 2 aerial plug/Belling-Lee connectors allow you to daisy chain DTV-TX01-DVB-T Transmitters together. Use these connectors to send the TV signal coming into the RF IN 1 & 2 connectors to other downstream DTV-TX01-DVB-T Transmitters.
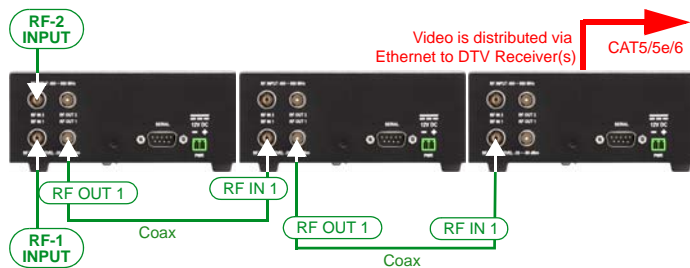

FIG. 4 RF OUT 1/2

Note: Each time an RF feed is output from a Transmitter and fed back into another downstream Transmitter (as an RF input), the signal strength will be lower - approximately a 3dB drop in signal level for each split in signal.

Recommended Signal Levels

AMX Digital TV Transmitters require good quality input signals. The recommended signal levels are specified below.

- Signal level: > 45 dBìV and < 70 dBìV
- Signal to noise ratio (SNR): > 26dB
- Bit Error Rate (BER): < 2E-04

Factory RESET Button

The recessed Factory Reset button allows you to perform a full factory reset (resets flash and reboots the Transmitter in DHCP mode):

1. Press and hold the recessed Factory Reset button while simultaneously pressing the Reset button on the front panel.
2. Continue to hold the Factory Reset button while the unit is rebooting.
3. Release when the Streaming Status LED (see FIG. 1) begins to flash.

SERIAL Port

The SERIAL Port on the rear panel provides a RS232 serial interface for local device control, as well as diagnostic and troubleshooting purposes, via a standard DB9 connector.

- Use a standard DB9 programming cable such as the CC-232 (FG10-752-04, not included) to connect to a PC for Terminal control.
- Supported terminal commands are listed in the *AMX TDS Operation/Reference Guide.*

Note: *While the Serial port can be used for many of the same configuration options and control/diagnostics/troubleshooting functions, in most cases it is preferable to use the **Digital TV Configuration Manager** to perform these tasks.*

Setting the Transmitter's IP Address via the CONSOLE Port

In most cases, all setup and configuration for both Transmitters and Receivers is done via the Digital TV Configuration Manager. However, the Transmitter's IP Address can also be specified using a local command line interface, accessible via the CONSOLE (RJ12) port.

Note: *The default baud rate is **115200**.*

In order to configure the network settings on the Transmitters, the Transmitter must be placed in Command mode (via the **IPTVsetup** serial command):

```
IPTVsetup<LF><CR>
```

Use the following command to configure the network settings:

`DHCP,i.i.i.i,gw.gw.gw.gw,nm.nm.nm.nm`	Sets IP details: • **d** = 1: DHCP on, 0, DHCP off • **i** = ip • **gw** = gateway • **nm** = network mask

Note: *All DTV Transmitters and Receivers must have an assigned **IP Address**, **Network Mask**, and **Gateway Address** in order for the DTV system to work correctly. This applies to units that utilize DHCP and to units that have been assigned Static IP addresses. If you are using DHCP, verify that these address assignments are provided by the DHCP Server.*

12VDC PWR Connector

Note: A 12VDC Power Supply is required (not included)

To use the 2-pin 3.5 mm mini-Phoenix connector with a 12 VDC-compliant power supply, the incoming PWR and GND cables from the external source must be connected to their corresponding locations on connector (FIG. 5).

1. Insert the PWR and GND wires on the terminal end of the 2-pin 3.5 mm mini-Phoenix cable. *Match the wiring locations of the +/- on both the power supply and the terminal connector.*
2. Tighten the clamp to secure the two wires. *Do not tighten the screws excessively; doing so may strip the threads and damage the connector.*
3. Verify the connection of the 2-pin 3.5 mm mini-Phoenix to the external 12 VDC compliant power supply.

FIG. 5 2-pin mini-Phoenix connector wiring diagram (direct power)

Configuring DTV-TX01-DVB-T Transmitters

DTV Transmitters are configured via the Digital TV Configuration Manager (see below).

Digital TV Configuration Manager

The DTV-MA01 TDS Management Appliance features a built-in web console called the *Digital TV Configuration Manager*. The Digital TV Configuration Manager allows you to configure the Receiver and all Transmitters in the TDS solution via a web browser on any PC that has access to the DTV-MA01 in the TDS system.

These instructions assume that the TDS System has been installed, and that the DTV-MA01 and a PC is connected to the LAN.

Accessing the Digital TV Configuration Manager

1. On any PC that has access to the LAN to which the DTV-MA01 is connected, open a web browser and enter the following default URL to access the TDS Configuration Pages (on the DTV-MA01):

    http://*<IP Address assigned to the DTV-MA01>*:8080/TDS/web/TxNetworkPage.xml

2. Press enter to be prompted for the default *User Name* and *Password* for the DTV-MA01:
- Default *User Name*: "**amxdtv**" (case-sensitive, no quotes)
- Default *Password*: "**Admin**" (case-sensitive, no quotes)

    Note: The User Name and Password can be changed via options in the System Setup page (in the Digital TV Configuration Manager). See the AMX TDS Operation Reference Guide for details.

3. Press **OK** to proceed to the Digital TV Configuration Manager. The initial view is of the *Transmitter Setup* page (FIG. 6). .
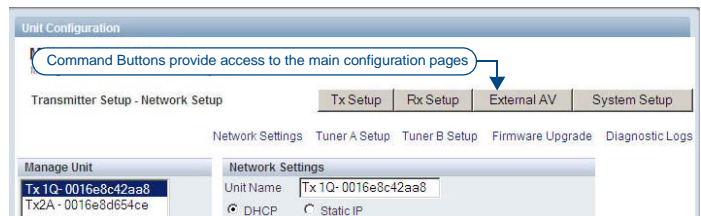

FIG. 6 Digital TV Configuration Manager

The command buttons along the top of the page provide access to the main areas of the Digital TV Configuration Manager:

- **Tx Setup** - Click to configure DTV Transmitters
- **Rx Setup** - Click to configure DTV Receivers
- **External AV** - Click to add and configure external AV devices to be included in the TDS system
- **System Setup** - Click to configure the TDS System

The links directly below the three command buttons (*Network Settings*, *Channel Setup*, *IR Settings*, *Firmware Upgrade* & *Diagnostics Logs*) provide access to configuration options specific to the current area of the Configuration Manager

Additional Documentation

Refer to the *AMX TDS Operation/Reference Guide* (available online at www.amx.com) for additional product information, details on connecting the AMX TDS system, using the Digital TV Configuration Manager, upgrading firmware and descriptions of all supported NetLinx commands.

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