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# REVISION HISTORY

| **REVISION** | **DESCRIPTION** | **DATE** |
|---|---|---|
| 1.0 | First version | Feb 07 |

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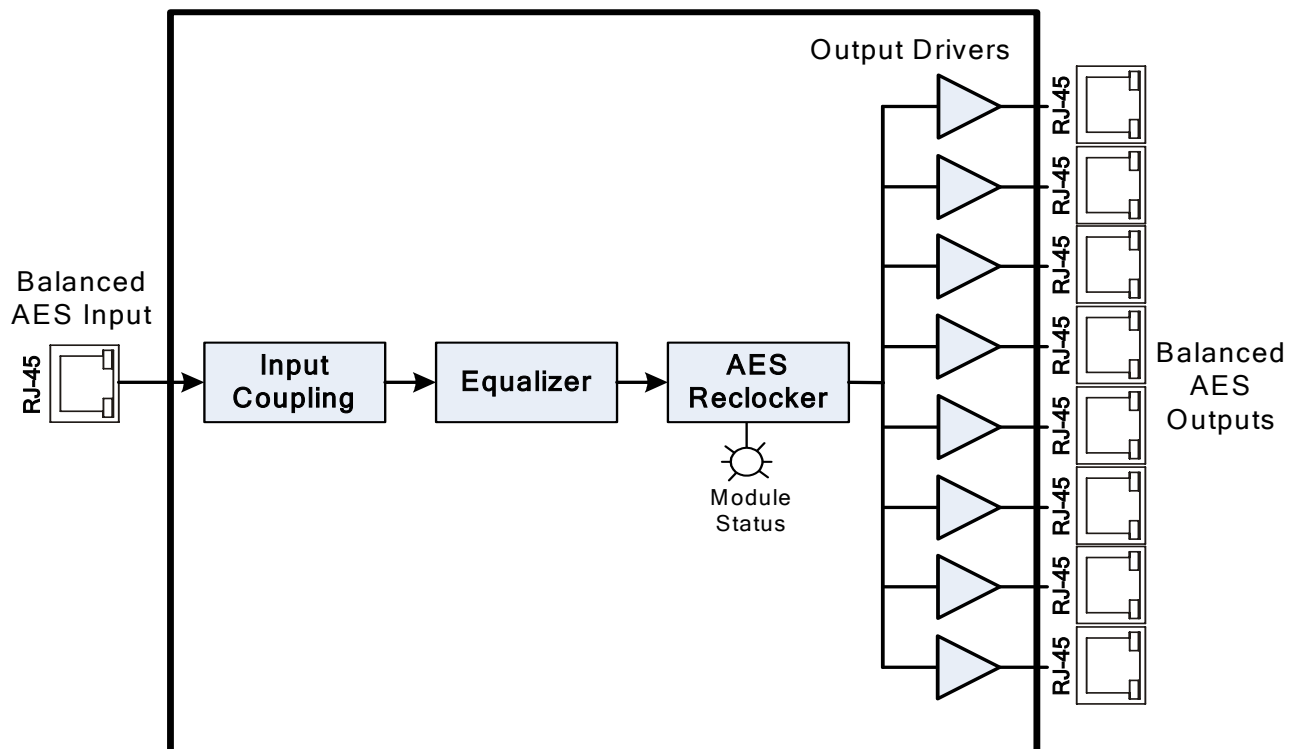
# 1.  OVERVIEW

The 7700DA-AES-RJ is an eight-output distribution amplifier with auto equalizing inputs and reclocking for 110Ω balanced AES signals.  The DA will automatically equalize a single balanced AES signal delivered over standard CAT5 or CAT6 type cables with RJ-45 head connector.  The DA will reclock the data with sampling frequencies of 32 kHz, 44.1kHz, 48kHz and 96kHz.  The 7700DA-AES-RJ modules are equipped with card edge LED indicators that are used to provide quick and accurate assessment of the incoming signal integrity.

The 7700DA-AES-RJ occupies one card slot and can be housed in either a 1RU frame, which will hold up to three modules, or a 3 RU frame, which will hold up to 7 modules.

**Features:**
- AES audio on 110Ω twisted pair CAT5e cable
- Transformer coupled 110Ω balanced input (selectable Hi-Z)
- Data reclocking provides jitter reduction
- Automatic equalization
- Equalization and reclocking provides extended cable length compensation
- Eight 110Ω balanced outputs
- Error LED indication for input PLL out of lock, parity error or bi-phase coding error



**Figure 1-1: 7700DA-AES-RJ Functional Block Diagram**

**7700 MultiFrame Manual**
**7700DA-AES-RJ Auto Equalizing Balanced**
**AES/EBU Distribution Amplifier over CAT5 Cable**

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## 2.    INSTALLATION

The 7700DA-AES-RJ comes with a companion rear plate that has 1 AES input RJ-45 connection and 8 AES output RJ-45 connections.  For information on mounting the rear plate and inserting the module into the frame see section 3 of the 7700FR chapter.
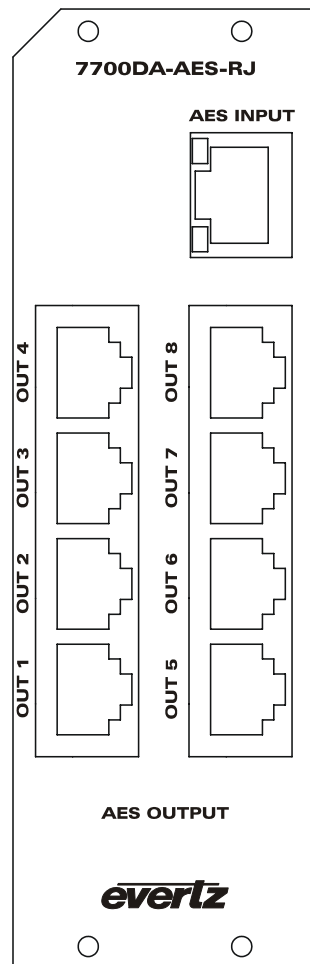
**Figure 2-1: 7700DA-AES-RJ Rear IO Modules**


### 2.1.    AUDIO CONNECTIONS

**BALANCED AES INPUT**    The single balanced AES input can be found towards the upper section of the rear plate.  This input connector is an RJ-45 female connector.  For pin out assignments refer to section 4.  The termination jumper, located near the rear of the module, determines whether the input signal will be high impedance or terminated with 110Ω.  Refer to Figure 6-1 for the location of the termination jumper.

**BALANCED AES OUTPUTS**  There are eight balanced AES reclocked outputs compatible with SMPTE 276M.

# 3. SPECIFICATIONS

## 3.1. BALANCED AES INPUT

**Standard:** AES3-1992
**Number of Inputs:** 1
**Connector:** RJ-45
**Input Level:** 2 to 7V p-p
**Coupling:** Transformer
**Input Impedance:** 110Ω or Hi-Z (2.5Ω)
**Equalization:** Automatic to 300m with CAT5 (or equivalent) @ 48kHz AES signal
**Return Loss:** > 15dB 100kHz to 6MHz
**Sampling Frequency:** 32kHz, 44.1kHz, 48kHz, and 96kHz

## 3.2. BALANCED AES OUTPUTS

**Number of Outputs:** 8 reclocked
**Connector:** RJ-45
**Output Level:** 5V p-p
**Output Impedance:** 110Ω
**Return Loss:** 30dB 100kHz to 6MHz
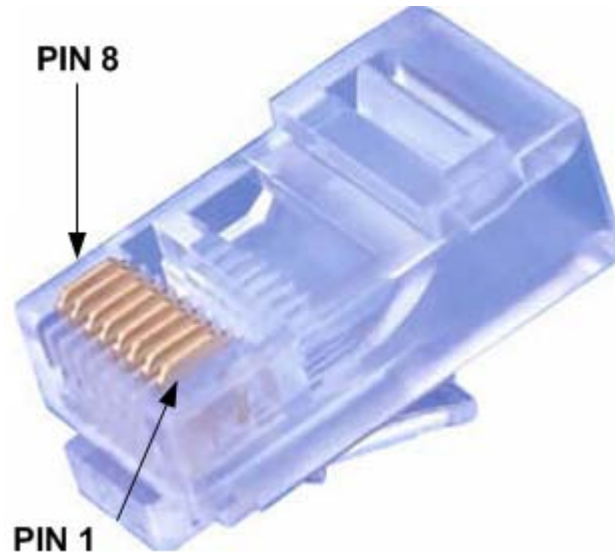
## 3.3. ELECTRICAL

**Voltage:** +12 VDC
**Safety:** ETL Listed, complies with EU low voltage directive
**Power:** < 2.5 Watts
**EMI/RFI:** Complies with FCC Part 15, Class A
EU EMC Directive

## 3.4. PHYSICAL

**Number of slots:** 2

# 4. PIN ASSIGNMENTS

The pin assignments for the audio connections are defined in Table 4-1.  Also refer to Figure 4-1 for the RJ-45 pin positions.



**Figure 4-1: RJ-45 Connector Pin Positions**

| PIN # | Connection |
|-------|------------|
| 1 | AES+ |
| 2 | AES- |
| 3 | No Connect |
| 4 | GND |
| 5 | No Connect |
| 6 | No Connect |
| 7 | No Connect |
| 8 | No Connect |

**Table 4-1: RJ-45 Connector Pin Assignments**

# 5.    STATUS INDICATORS

The 7700DA-AES-RJ modules have three status LED indicators to show operational status of the card at a glance.  Two status LEDs can be found on the front edge of the circuit board and a third LED can be found on the input connector located on the rear plate, (refer to Figure 5-1 and Figure 6-1)

**Figure 5-1: LED Status Indicators**

The two large LEDs on the front of the circuit board indicate the general health of the module.

**LOCAL FAULT:**    This red LED indicates poor module health and will be ON when a valid AES input is not detected.  The **LOCAL FAULT** indication can also be reported to the frame through the **FRAME STATUS** jumper J1 (refer to Figure 6-1).

**MODULE OK:**    This green LED indicates good module health. It will be ON when a valid AES signal has been detected.

**VALID AES:**    This LED is found on the input connector located on the rear plate of the module.  If a valid AES signal is detected this LED will be ON, otherwise it will remain OFF.

> **There is also a yellow LED on the input connector.  This LED is not connected to any status circuitry and will always remain OFF.**

# 6.    LOCATION OF JUMPERS
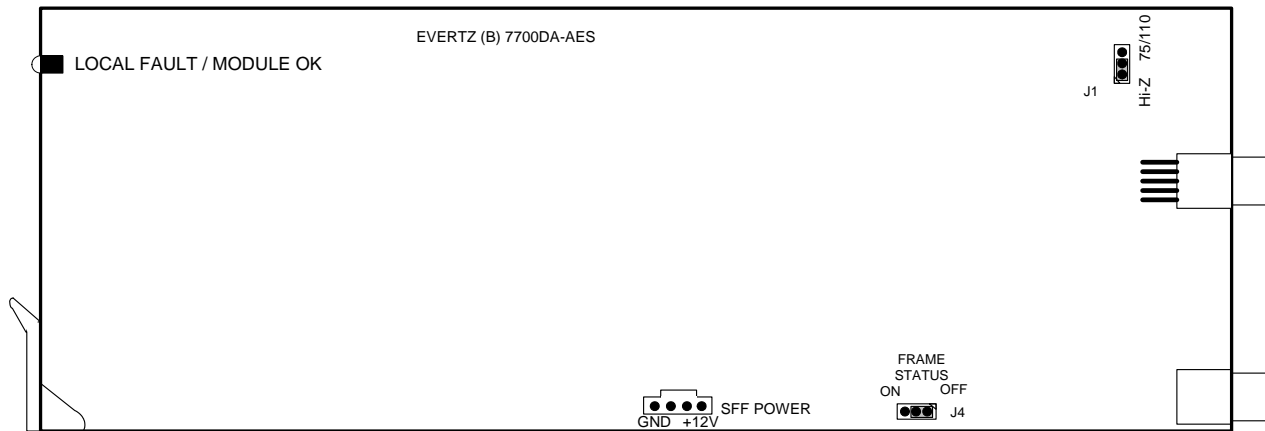


**Figure 6-1: Jumper Locations**

## 6.1.    SELECTING WHETHER LOCAL FAULTS WILL BE MONITORED BY THE GLOBAL FRAME STATUS

The FRAME STATUS jumper J4, located near the rear of the module, determines whether local faults (as shown by the Local Fault indicator) will be connected to the 7700FR frame's global status bus.

**FRAME STATUS**    To monitor faults on this module with the frame status indicators (on the power supply's FRAME STATUS LEDs and on the Frame's Fault Tally output), install this jumper in the ON position.

When this jumper is installed in the Off position local faults on this module will not be monitored.

## 6.2.    TERMINATION JUMPER

The TERMINATION jumper J1, located at the rear of the module, determines whether the input signal will be terminated or not.

When set in the "75/110" position, (default) the input impedance is set to 110Ω. Use this position when the cable stops at this card. It will provide the proper impedance to eliminate electrical reflections.

If set to "Hi-Z", the input will be high impedance. Use this position when the signal does NOT stop at this card.

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