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8931

FANOUT DISTRIBUTION AMPLIFIER

Instruction Manual

TP354000
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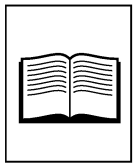

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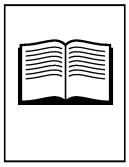

8931 Fanout DA

Introduction

The 8900 Series product line is a family of serial digital Distribution Amplifiers (DA). It consists of a 2 RU frame which holds up to ten modules. A variety of modules are available that can provide fanout, reclocking, monitoring, or error detection and handling capabilities. Modules are selected by the user to suit their particular requirements.

The 8931 module is a serial digital DA with one loopthrough input and eight outputs. It operates with serial digital signals, complying with SMPTE standard 259M or EBU Tech 3267, for both component and composite digital video.

This module is designed as a low-cost fanout DA. It can equalize up to 300 meters of Belden 8218 (or equivalent) at 270 Mb/s.

The 8931 module provides:

- Loopthrough input
- Eight outputs
- Auto-equalization
- Meets SMPTE 259M or EBU Tech 3267 standard
- Health monitoring
  - Input signal present monitoring
  - Input signal monitoring (EQ warning)
  - Power supply monitoring

Functional Description

Refer to the simplified block diagram in Figure 1 while reading the following:

A serial digital input is fed into an Equalizer which automatically equalizes the input signal to compensate for cable loss up to 300 meters of 8281 cable (or equivalent) at 270 Mb/s.

Output Drivers amplify and distribute the equalized serial digital video signal to eight BNC outputs.

The Equalizer also feeds the Input Signal Monitor which lights the EQ warning LED when the EQ circuit reaches its limit of equalization. This is factory adjusted for 310 meters of 8281 cable at 270 Mb/s.

A 5V Linear Regulator provides the + 5V for the module.

Power Supply Monitoring is provided to monitor + 12V, – 12V, and 5V DC signals and alerts the health alarm signal if any voltage drops enough to cause circuit malfunction.

NOTE: *Module health (alarm) monitoring requires that the Controller module be installed in the frame.*

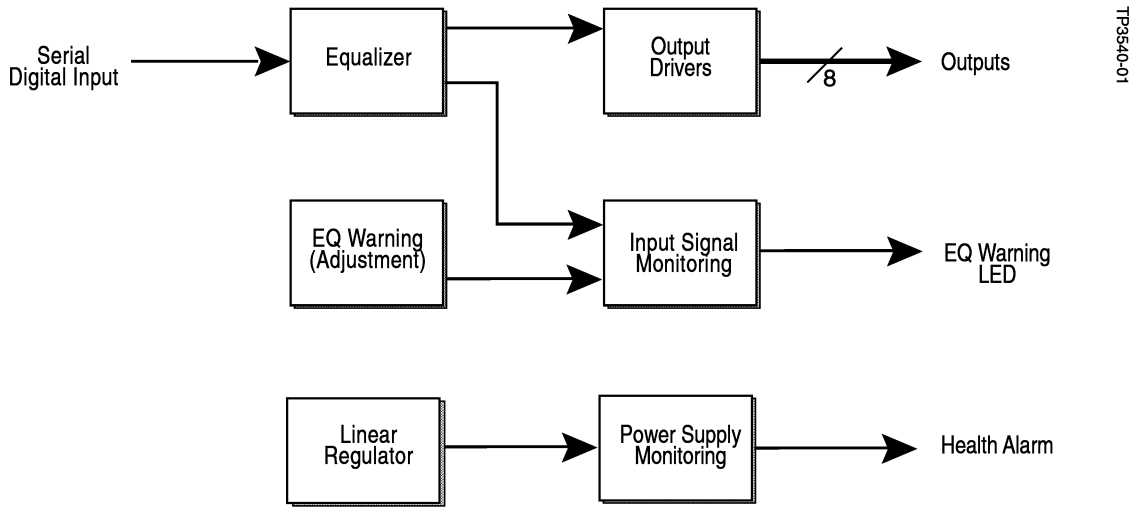

Figure 1. 8931 Simplified Block Diagram

Specifications

See Table 1 for a list of specifications. Specifications are measured with all outputs terminated into 75 ohms and are subject to change without prior notice.

Table 1. 8931 Specifications

Parameter	Value
Input	
Type	One 75Ω loopthrough
Signal Type	Serial Digital SMPTE 259M (A, B, C, and D) or EBU Tech 3267
Input Signal Monitoring	LED is illuminated when the input signal has equivalent loss of 310 meters of 8281 cable (or equivalent) at 270 Mb/s
Impedance	High Z
Return Loss	> 18 dB (up to 270 MHz) > 15 dB (up to 360 MHz)
Connector Type	BNC
Maximum Input Cable Length	300 meters at 143 Mb/s, 177 Mb/s, 270 Mb/s 200 meters at 360 Mb/s of 8281 cable (or equivalent)
Output	
Output Quantity	Eight
Signal Type	Serial Digital SMPTE 259M (A, B, C, and D) or EBU Tech 3267
Impedance	75Ω
Return Loss	>18 dB (up to 270 MHz) >15 dB (up to 360 MHz)
Signal Amplitude	800 mV ±10% when terminated in 75Ω
Output DC	0V (AC coupled)
Connector Type	BNC
Electrical Length	3.4 ±1 ns

Table 1. 8931 Specifications - continued

Parameter	Value
Module	
Power Consumption	< 2.5 Watts
Temperature Range	0–50 °C Ambient
Setup Adjustments	EQ Warning Cable Length
LEDs	One EQ warning
Power Supply Monitoring	Alerts SMPTE 269M fault reporting (health alarm) when the +5 power supply voltage falls below 4.3V, +12V fails, or –12V fails

Installation

This section contains:

- Module Installation
- Rear Connector
- Cabling
- SMPTE Alarm
- Module Front View

Module Installation

There are ten cell locations in the frame to accommodate either analog or digital modules. These are the left ten locations. Refer to Figure 2.

The two cells on the right are allocated for the power supplies. For additional information concerning the Power Supply module, refer to the Power Supply data pack.

The third cell from the right is allocated for the Controller module. This module provides the interface for the forced air cover, as well as the SMPTE 269M fault reporting (health alarm) and EDH network. For additional information concerning the Controller module, refer to the Controller data pack.

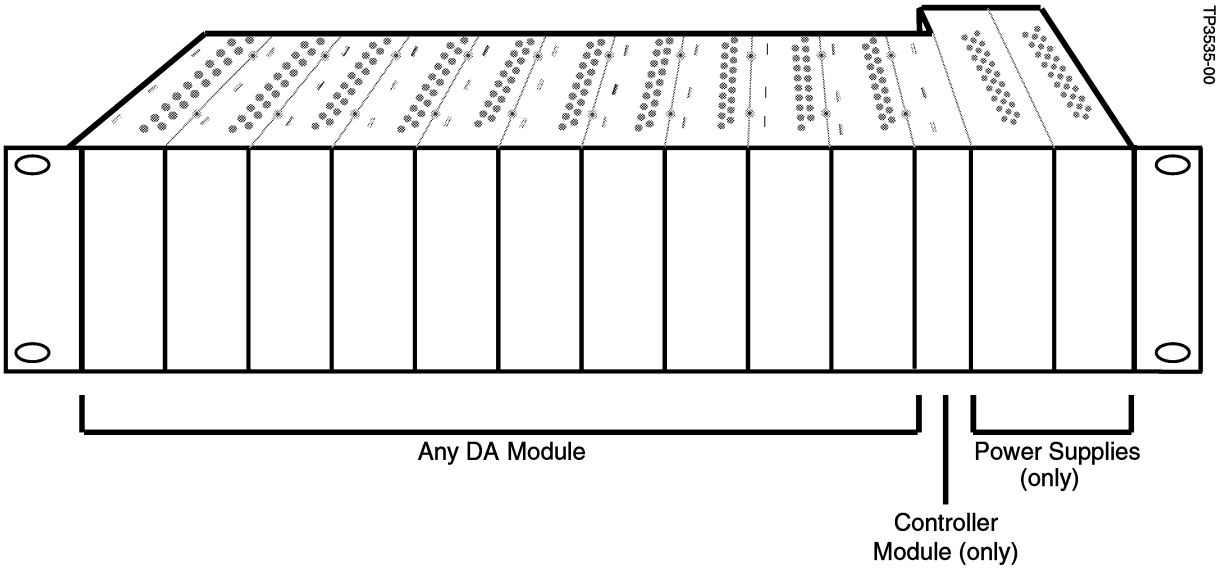

Figure 2. 8900 Series Frame

To install a module into the frame, follow these steps:

1. Insert the module into the frame, connector end first, with component side of the module facing to the right and ejector tab to the top.

2. Verify that the module connector seats properly against the backplane.

3. Press the ejector tab in to seat the module in place.

Rear Connector

All DA module slots are interchangeable within the frame, with a maximum of ten modules. Figure 3 illustrates the rear connector plate for an 8900 Series frame.

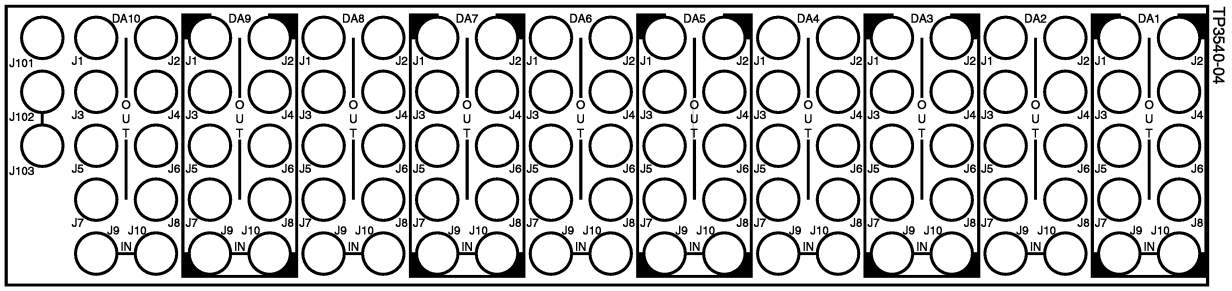

Figure 3. 8900 Series Frame Rear Connector

Each DA module has a 75Ω loopthrough input, J9 and J10. There are eight outputs per module, J1 through J8.

There are three additional BNCs on the rear connector plate, J101, J102 and J103. J101 is used for the SMPTE 269M fault reporting (health alarm). In order for this function to be operational, the Controller module must be installed in the frame.

NOTE: *Refer to the Controller data pack for additional information concerning the SMPTE 269M fault reporting.*

J102 and J103 are used for the Error Detection and Handling (EDH) network. This will provide monitoring of:

- Video errors
- Module health
- Power supply health
- Fan health
- Over temperature

In order for this function to be operational, the Controller module must be installed in the frame.

NOTE: *Refer to the Controller and 8950 data packs for additional information concerning the EDH network.*

Cabling

Refer to Figure 4 when cabling your 8931 module. This illustration shows the typical input and outputs for an 8900 Series module.

Loopthrough Input

Connect an input source to one of the loopthrough input connectors, J9 or J10.

NOTE: *It is recommended that no more than five* ***digital*** *modules be looped, using cables less than two meters in length, and with an input cable less than 200 meters of Belden 8281 (or equivalent).*

This loopthrough input must be terminated. The recommended termination for serial digital signals is CONARE BCP-TA (or equivalent).

Performance of looping inputs to equipment other than 8900 modules has not been verified; therefore, care should be taken if this is required.

Outputs

There are eight outputs for the 8931 module, J1 through J8. The destination equipment should have an input impedance of 75Ω unless it has loopthrough inputs, in which case the loopthrough inputs must be terminated in 75Ω.

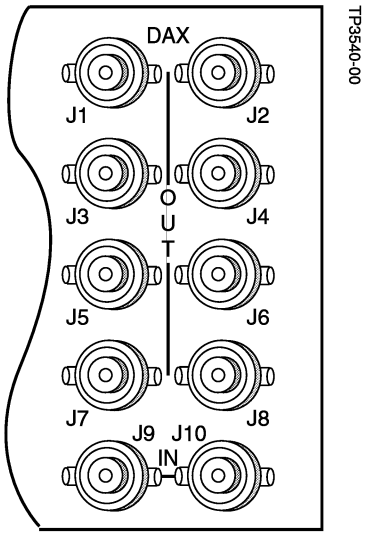

Figure 4. Typical Module Input and Outputs

SMPTE Alarm

NOTE: *The SMPTE alarm can function only if the Controller module is installed.*

Refer to Table 2 for the SMPTE alarm function activated by the 8931.

Table 2. SMPTE Alarm

Function	Alarm
No + 5V	Full alarm
No +12V	Full alarm
No –12V	Full alarm

Module Front View

The front edge of the 8931 module is shown in Figure 5.

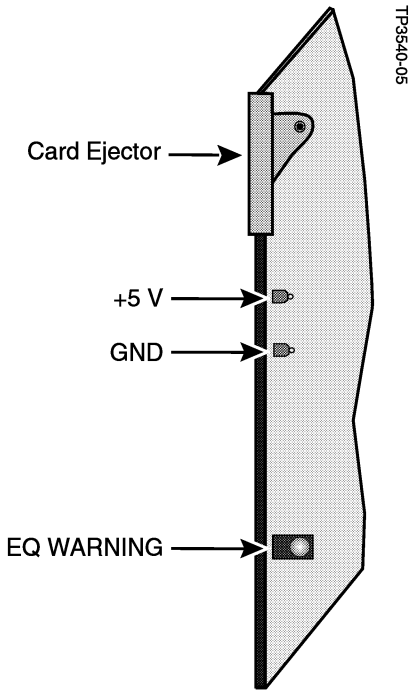

Figure 5. 8931 Front View

Module Alignment

This section contains:

- Alignment Equipment
- EQ Warning Adjustment

Alignment Equipment

The 8931 module is fully aligned at the factory and normally requires no adjustment in the field. If adjustments are necessary, they should be attempted only by qualified technicians using, at a minimum, the following equipment (or equivalents):

- Screwdriver
- 270 Mb/s serial digital video test signal source
- 300 meters Belden 8281 cable (or equivalent)

EQ Warning Adjustment

A variable resistor (R26) allows the user to adjust the corresponding cable length at which the EQ warning LED illuminates.

When R26 is turned counterclockwise, the EQ warning LED will turn on at shorter cable lengths. The EQ warning LED comes on at longer cable lengths when R26 is turned clockwise.

Follow the steps listed to adjust the EQ warning:

1. Connect a length of cable, approximately 10 meters longer than the desired length at which the EQ warning LED should turn on, to the input. The factory default is set for 300 meters. Terminate the loopthrough input with a 75Ω termination.

2. Turn R26 clockwise until it stops. Refer to Figure 6 for the location of R26.

3. Connect a 270 Mb/s serial digital video signal to the selected cable. Verify that a signal is present.

4. Turn R26 counterclockwise slowly until the EQ warning LED just turns on. The module is now set.

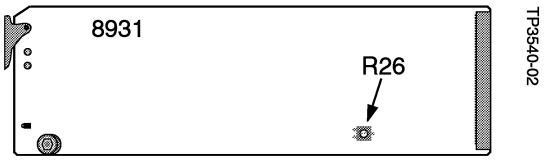

Figure 6. R26 Location

Service

The 8931 Serial Digital DA modules make extensive use of surface-mount technology and programmed parts to achieve compact size and adherence to demanding technical specifications. Circuit modules should not be serviced in the field.

If your module is not operating correctly, proceed as follows:

- Check input signals
- Check cables and connections
- Verify that source equipment is operating correctly
- Check output connections

Refer to Figure 7 for test points and LEDs that are located on the 8931 module.

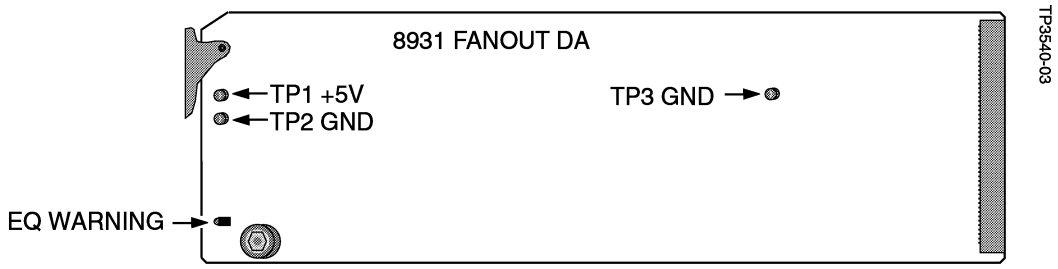

Figure 7. Test points and LED Locations

If the module is still not operating correctly, replace it with a known-good spare and return the faulty module to a designated Grass Valley repair depot. Call your Grass Valley representative for depot location.

Refer to the copyright page for the Grass Valley Customer Service Information number.