



Series 3000  
Model R-165A  
Audio/Video – IF/RF Relay Panel

## Instruction Manual

CATV Switching and Control

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# Specifications

## **RF Isolation**

> 60 dB @ 950 MHz.

## **Attenuation**

+/- 1 dB 0 to 950 MHz

See Attached Graphs.

## **Power Requirement**

100-240VAC +/- 2%, 50/60Hz  
supplies +12V DC @ <300mA  
(UL approved wall supply included.)

## **Control Inputs**

### **Contact Closure to GND or logic input**

Absolute Maximum Input Voltage	+12 VDC
Logical High Input Voltage	+7 VDC
Logical Low Input Voltage	+2 VDC

## **Max Sink Capability**

<2.4 mA

## **Aux Relays Contact Rating:**

30 VDC max; 1A max

## **Physical**

1.75" H X 19" W X 7" D, 1 RU  
Weight 5 lbs.

## **Accessories Included with Instrument**

Power Supply  
Mating connectors  
Mounting Kit

# General

## **Mounting:**

Digital Alert Systems Model R165A mounts into a 1RU standard 19 inch EIA equipment rack. Slide the unit into the rack frame and secure it, using the 3000R/22M mounting hardware supplied with the unit.

## **Connections:**

1. The Video (or IF/RF) switches are mechanical relays. Connections to them are made through 75 $\Omega$  F connectors on the rear of the unit.

Connect the default signal to the NC (normally closed or primary) connector.  
Connect the alternate signal to the NO (normally open or secondary) connector.  
Connect the modulator, or other destination, to the COM (common or output) connector.

Video connectors may also be used to switch high frequency signals, such as IF or RF. Useable frequencies are shown on the frequency response charts included.

Both inputs must be the same type of signal.

Some relay sets can be used for baseband video and some for high frequency, since all switch modules are isolated.

2. If the signals being switched are baseband video, with audio following, connect the audio signals to screw terminals of the same switch group, ensuring that the left and right channels for the default audio are connected to the L NC + and -, and the R NC + and -, and the signals for the alternate signal are attached to the L NO + and - and the R NO + and - connectors. The L OUT + and - and the R OUT + and - are routed to the modulator or other destination of the audio signals.
3. To actuate a relay section with a contact closure, connect the contacts between each relay control input screw terminals (SW1–SW4) and ground (GND) screw terminal. Refer to the rear panel connections illustration and the applications section of this manual.
4. Connect the +12 VDC lead (white) from the power supply to the +12v terminal on the rear panel, and the black lead to the GND terminal. Plug the power supply into a 90 - 264VAC power outlet, and the unit is ready to function.
5. If wiring balanced stereo audio (or balanced mono audio), and a tie point for the ground wires is required, use the AUX2-COM and AUX1-COM terminals. These points are floating if no connections are made to AUX2-NO and AUX2-NC and the AUX1-NC points.

## **Operation**

When the contact closure for a Relay Unit is closed, the output (Com) connection is switched from the default input (NC) to the alternate input (NO).

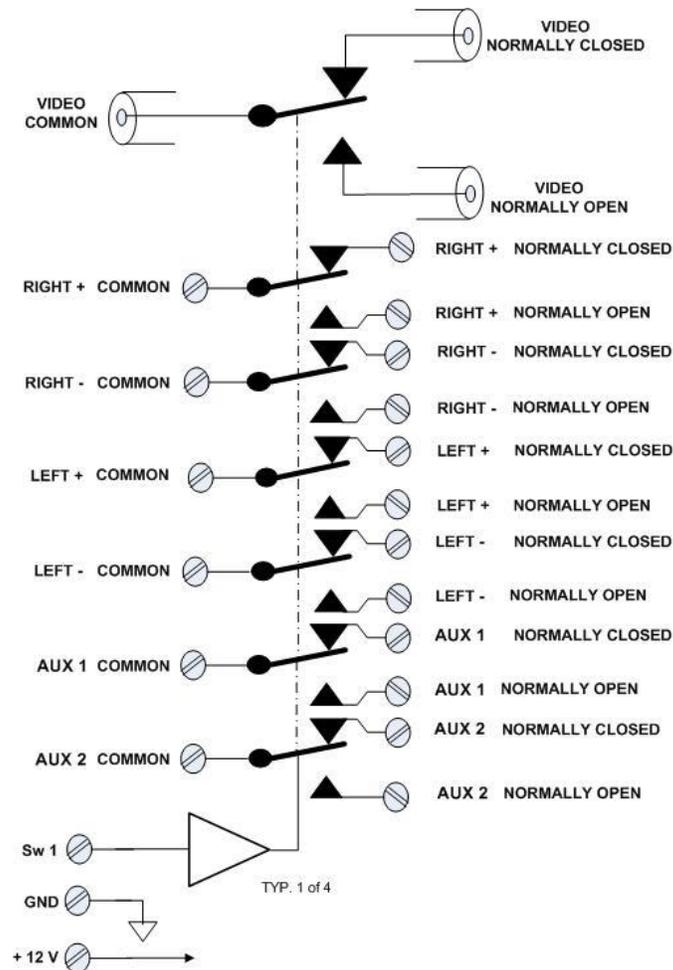
# Application

Digital Alert Systems Model R165A is a multi-contact relay panel capable of switching away from signal A and connecting to signal B. Each R165A has 4 independent relay sections.

All sections of the relay are mechanical with no active circuitry involved in the signal path. Each relay in the R165A is internally divided into 2 sections – video and audio.

The video section is constructed so that its reference impedance is 75 ohms. The relay is a high quality RF type so that the video section can also be used for switching RF signals up to 950 MHz (see specifications). Note that the non-selected input into the video section is terminated into 75 ohms.

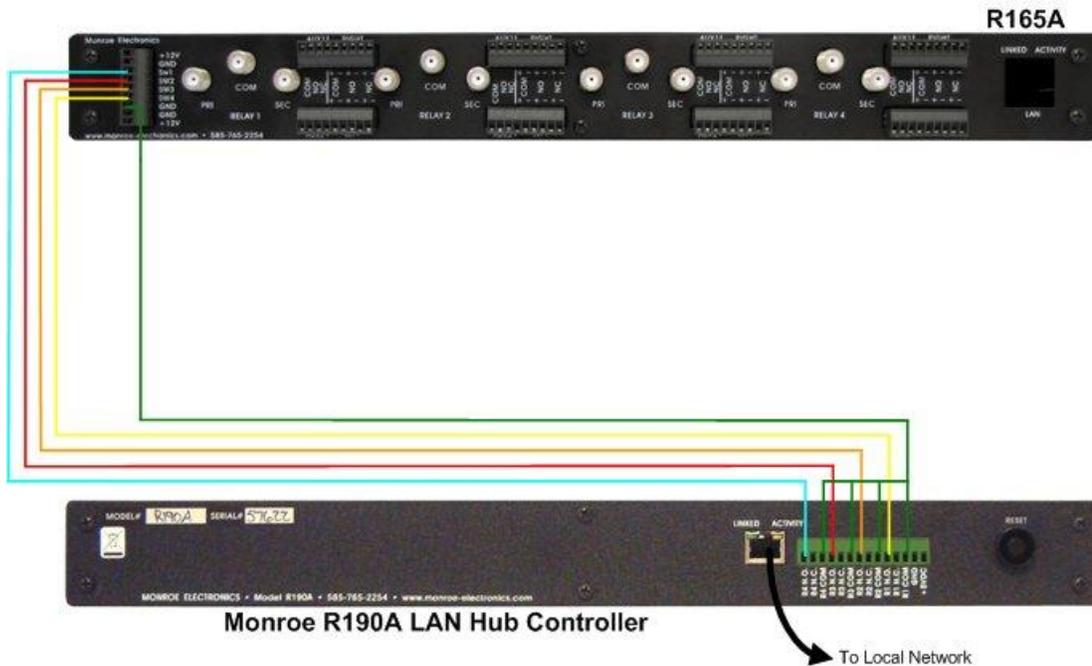
The audio section has contacts enough to provide full balanced stereo audio. There are 2 sets of auxiliary contacts for switching additional signals such as SAP or various tally indicators. A basic schematic of one of the four relays is shown in the following graphic.



Activation of any of the 4 relays can be accomplished by external contact closure, open collector transistor or logic signal. In most applications, the R165A is connected to other devices that provide the activation signal.

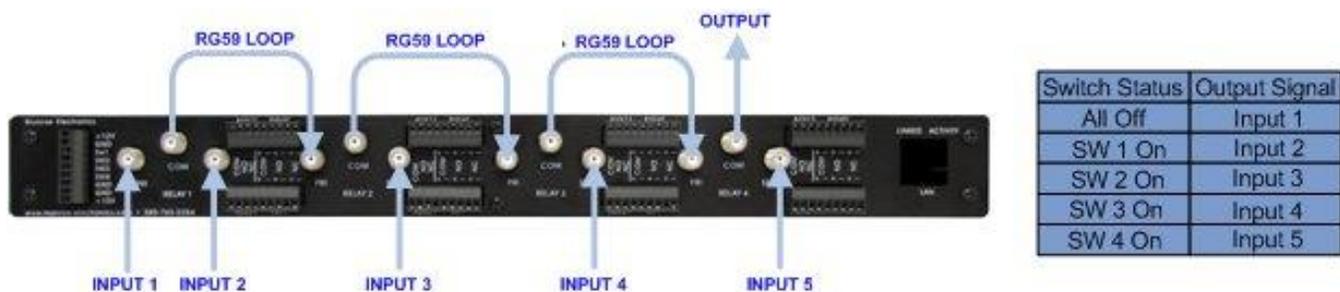
## Control by LAN

The R165A can be easily controlled by anyone on a local network with a web browser. This application requires interfacing the R165A with a network remote control, like Digital Alert Systems model R190A.



## Matrix Configuration

The four sections of the R165A can also be wired to provide matrix switching capability from 1 X 3 to 1 X 5. Triggering of each section connects a specific input to the matrix output. Video connections are shown in the following graphic. Audio connections would be made in a similar fashion.





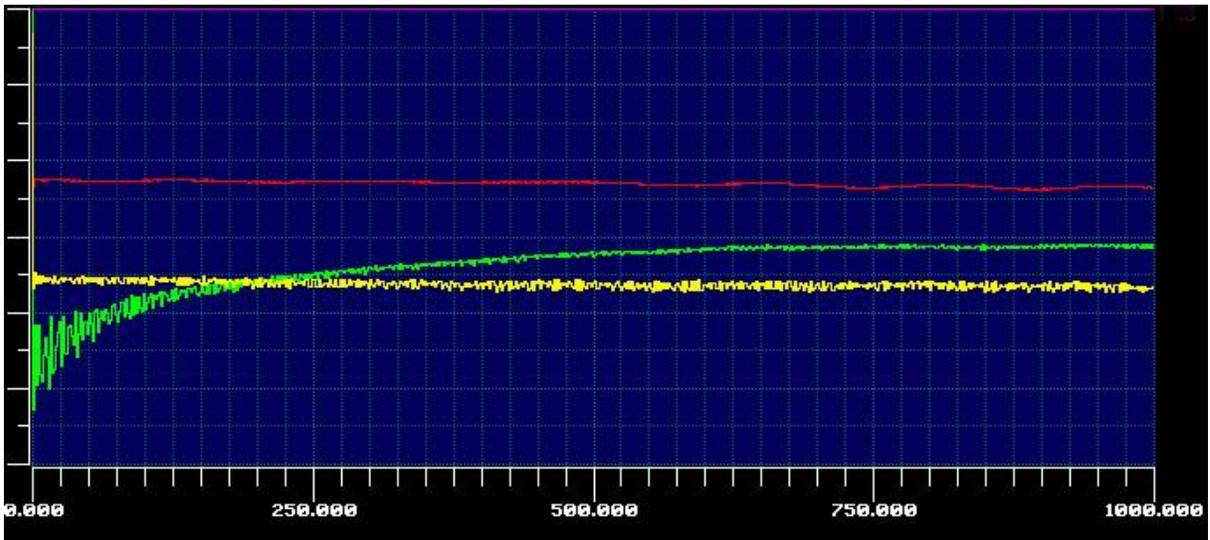
Front Panel View



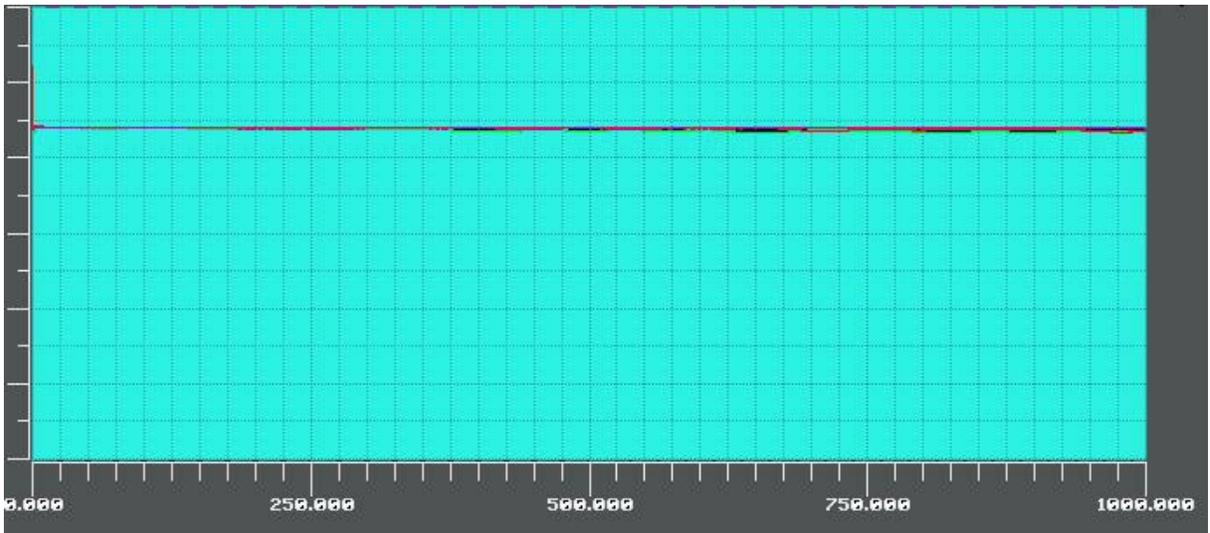
Rear Panel View



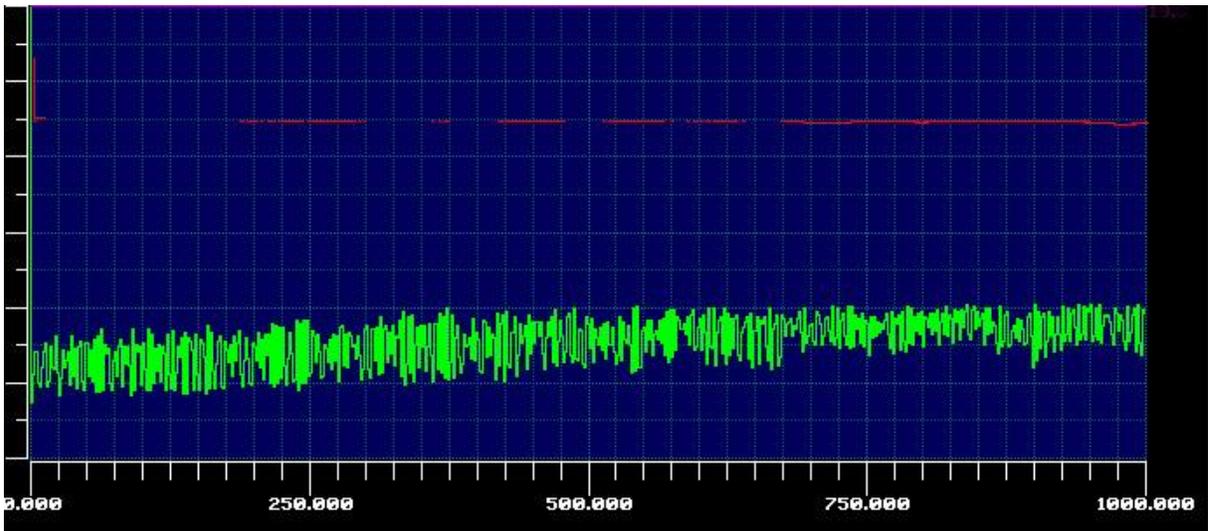
Section View



This graph demonstrates the Return Loss of a typical switch input. Red shows the signal through the Bridge with no connection. The yellow shows the signal when the bridge is terminated with a  $-26$  dB Loss load, and the green shows the return loss when the bridge output is connected to the normally Closed switch input with a 75 ohm load on the output.



This graph shows attenuation of the signal from a switch that is ON to the output. [10 db per division, 0 to 1000 MHz]



This graph demonstrates the isolation from a switch that is OFF to the output. [10 db per division, 0 to 1000 MHz]