# Programmable Attenuators

**AEROFLEX**
**WEINSCHEL**

## Model 8312
## High Power Programmable Attenuator

**IEEE-488**

**RS232\RS422**

### *100 Watt Hot Switching Capability*
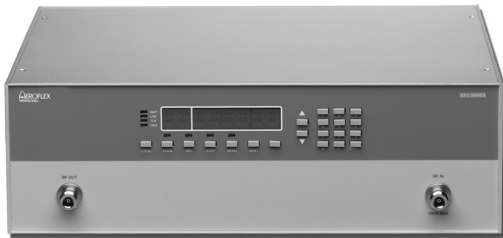
## Description

Aeroflex / Weinschel's design approach uses a highly adaptable platform that allows configuration of the step attenuator to the customers requirements. When the controller requests a new attenuation level the input switch terminates the input signal into a 50 Ohm load. (See Figure 1) This input switch is **hot switchable at 100 Watts** of input power. This will remove the high power signal from the main signal path.  With no signal connected to the attenuator path the controller then commands the series of relays to configure the attenuator for the requested attenuation value. Then the input switch re-connects the input signal to the attenuator path. The system can be operated with either a remote controller (IEEE-488 or RS-232) or through front panel control.

## Features

⫽ Available in 0-15 dB or 0-31 dB Configurations.

⫽ Provides a flexible, easy to program, low cost solution for your bench test/calibration setups and subsystem applications.

⫽ Relative vs. Nominal attenuation step function.

⫽ DC to 13.0 GHz Operation.

⫽ High Accuracy & Repeatability.

⫽ Power Handling up to 100 Watts average

⫽ Designed to interface with industry standard communication interfaces:

- GPIB/IEEE-488 (HS-488 ready)
- RS-232, RS-422

⫽ Built-in monitoring for switching input power into the load in case of fan failure.

⫽ **Rack Configurable:** A Rack Mounting Kit is included for easily mounting the Model 8312 into any rack or cabinet that is designed per EIA RS-310 or MIL-STD-189.
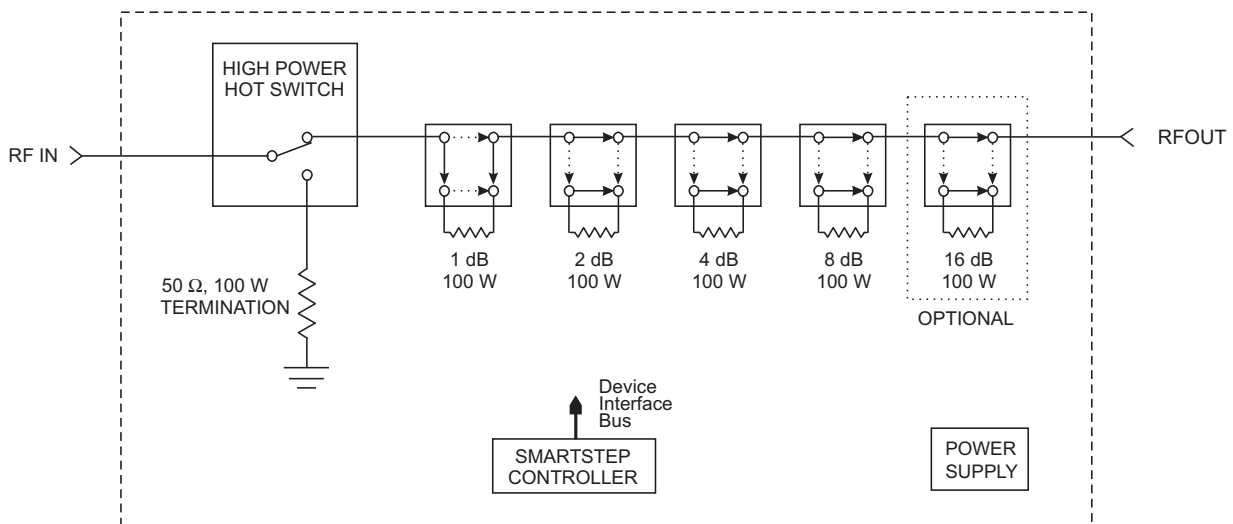


Note: If power failure should occur, the unit will remain in the last selected attenuation state.

*Figure 1.  Model 8312 Block Diagram*

***For additional information on the Model 8312, visit our website @ www.aeroflex.com/AW/8312.htm***

## Specifications

| SPECIFICATION | DESCRIPTION | |
|---|---|---|
| **Input Power Requirements** | AC | 100 to 240 Vac, 50/60 Hz, 50 Watts |
| **Environmental** | Operating Temperature<br>Storage Temperature:<br>Humidity:<br>Altitude: | 0 to +50°C<br>67° to +167 °F (-55° to +75°C)<br>96%<br>40,000' (12,192M) |
| **IEEE-488 Bus** | Connector:<br>Protocols:<br>Indicators: | 24-pin per IEEE-488.1<br>per IEEE-488.2<br>Remote (RMT), Listen (LSN), Talk (TLK), SRQ (SRQ) |
| **RS-232 Bus** | Connector:<br>Signals:<br>Baud Rates:<br>Data Bits:<br>Handshaking:<br>Parity:<br>Indicators: | 9-pin male D<br>TXD, RXD, RTS, CTS, DTR, GND<br>2400, 9600, 19200, and 38400<br>8<br>None, RTS/CTS, XON/XOFF<br>None, Odd, Even<br>Tx (Transmit) and Rx (Receive) |
| **RS-422 BUS**[3] | Connector:<br>Signals:<br>Baud Rates:<br>Data Bits:<br>Handshaking:<br>Parity:<br>Indicators: | 9-pin male D<br>TXD+, TDX-, RXD+, RTX-, RTS+, RTS-, CTS+, CTS- and signal GND<br>2400, 9600, 19200, and 38400<br>8<br>None, RTS/CTS, XON/XOFF<br>None, Odd, Even<br>Tx (Transmit) and Rx (Receive) |

**RF Characteristics**[4]

| | |
|---|---|
| Connectors: | Type N, Female |
| Frequency Range: | dc - 13 GHz |
| Impedance: | 50 Ω |

| SWR: | | |
|---|---|---|
| 50 MHz - 5 GHz: | 1.60 (Maximum) | |
| 5 GHz - 13 GHz: | 2.30 (Maximun) | |

| Attenuation Range: | |
|---|---|
| 15 dB/1 dB steps (8312-15-F) | |
| 31 dB/1 dB steps (8312-31-F) | |

| RF Power Rating: | | |
|---|---|---|
| 50 MHz - 5 GHz: | 100 Watts (Maximum) | |
| 5 GHz - 13 GHz: | 50 Watts (Maximum) | |

Attenuation Settings: 100, 000 selections (minimum)

Attenuation Update Rate: 1 second (Typical)

| Incremental Accuracy: | Frequency | 1-15 dB | 16-31 dB |
|---|---|---|---|
| | 50 MHz - 3 GHz: | +0.6 dB | +0.8 dB |
| | 3 GHz - 5 GHz: | +0.6 dB | +0.8 dB |
| | 5 GHz - 13 GHz: | +2.5 dB | +3.0 dB |

| Insertion Loss (dB): | Frequency Range | 8312-15-X | 8312-31-X |
|---|---|---|---|
| | 50 MHz - 3 GHz: | 3.0 | 3.5 |
| | 3 GHz - 5 GHz: | 4.0 | 4.5 |
| | 5 GHz - 13 GHz: | 7.0 | 8.0 |

1. GPIB/IEEE-488 model allows user-selectable addresses.
2. RS-232 can be used with standard PC serial port for short and medium distances (up to approximately 50 ft).
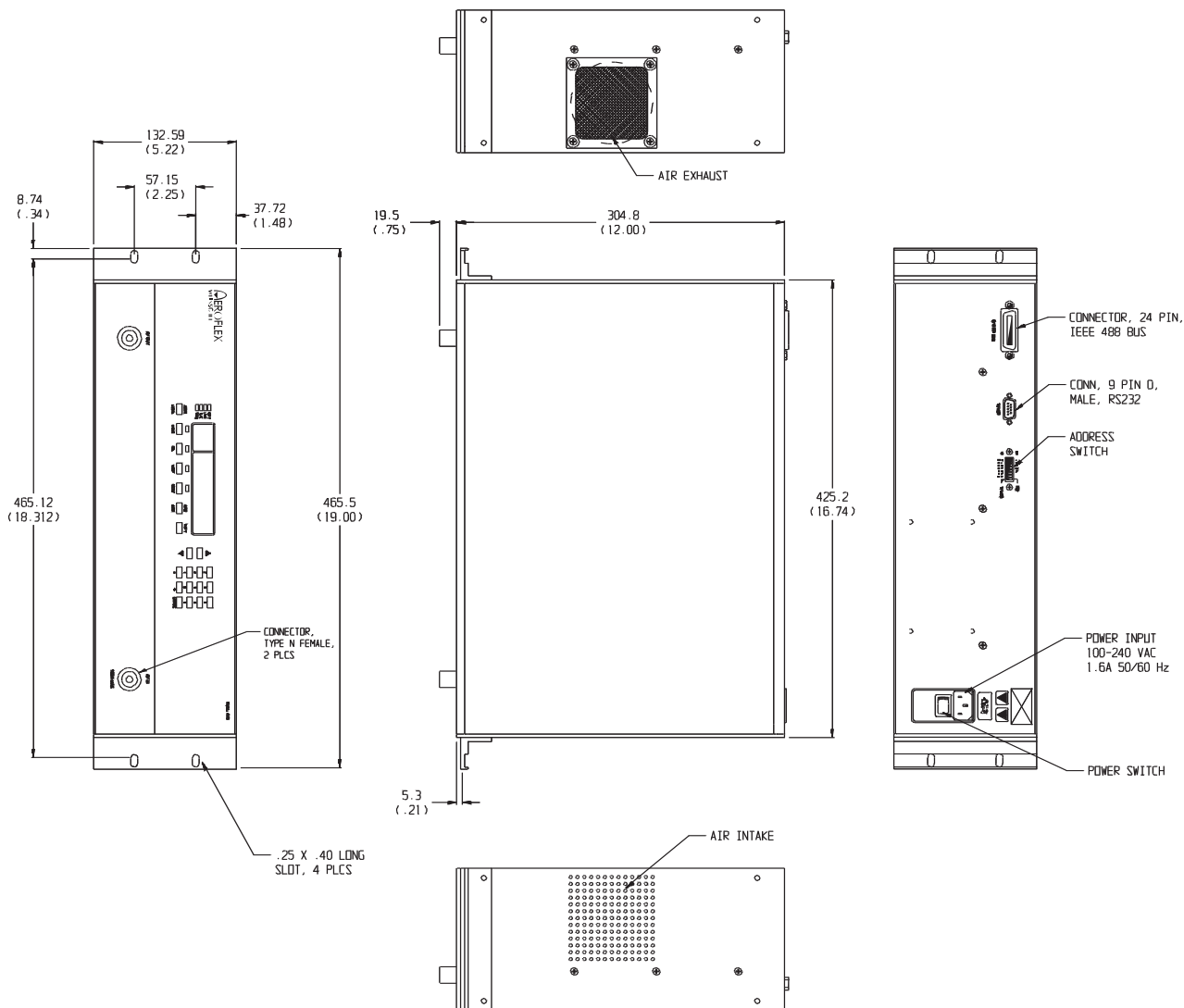3. RS-422, designed for very long distance communications (4000 ft) and & optimized as a single node protocol, typically with one device connected to a single port.
4. Refer to Individual data sheet for detailed specifications on internal programmables.

# Programmable Attenuators

## Physical Dimensions



NOTE:   All dimensions are given in mm (inches) and  are maximum, unless otherwise specified.

**MODEL NUMBER DESCRIPTION:**

**Example:**

**8312 - XX - X**

Basic Model Number

Attenuation Value (dB)*

Connector Location
F = Front
R = Rear

* Available in 0-15 dB and 0-31 dB configurations only!