

# 4-Channel Programmable Attenuator – 0.1 to 8 GHz, 31.5 dB

USB & Ethernet Control Modes

**4400 Series**  
**Model 4400-8-31.5**

**RoHS**

## Features

- Excellent solid-state repeatability and performance
- Uninterrupted RF when changing attenuation values
- AUX connector provides a logic-level SYNC output signal
- Extremely fast attenuation switching (50ns) and fine attenuation step resolution (0.5dB)
- Four independently programmable channels
- Small form-factor portable unit, directly powered via USB

## Applications

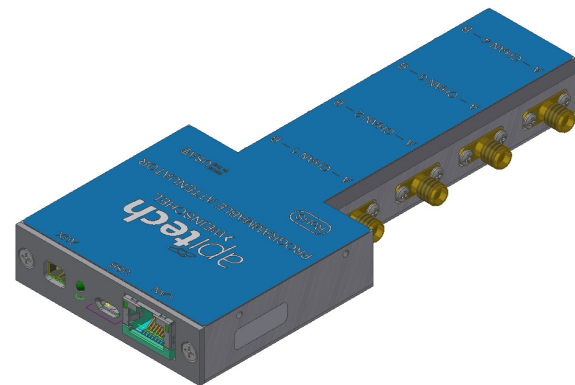
- Ideal for Automated Test Equipment (ATE)
- 3G/4G LTE/5G / DVB Fading Test simulation
- MU-MIMO, WiMax, Wi-Fi Testing
- Mobile Handover and Traffic Simulation Test Environments

## Description

API Tech Weinschel's 4 Channel Programmable Attenuators are 50 ohm bidirectional units that operate over the 0.1 to 8 GHz frequency range. Model 4400-8-31/5 offers an attenuation range of 0 to 31.5 dB in 0.5 dB step size. These units can be controlled using USB & Ethernet interfaces. The AUX connector provides a logic-level SYNC output signal that is pulsed high for 100  $\mu$ sec whenever an attenuation value is changed. A Programmable TTL trigger is available through the AUX port.

## Control Configuration

The USB-LAN attenuator provides four channels of attenuation controllable via either USB 2.0 or 10/100Base-T Ethernet interfaces. The attenuation channels can be operated independently or in a synchronized fashion where all attenuators change simultaneously.



**10/100BaseT Ethernet:** The Ethernet port supports 10/100BaseT operation, with auto-negotiation of the interface speed and duplex mode. LED indicators are provided to indicate network LINK status (green) and TX/RX activity (YELLOW). Supported network protocols include: IP, UDP, TCP, ICMP (ARP and PING), DHCP, AUTOIP, TELNET, and HTTP.

The TCP and UDP servers allow connections to be established for general programming purposes. A TELNET server is provided for a command-line interface that implements many of the functions of the serial console CLI, and an HTTP server that allows control via a browser.

**USB Control:** In USB mode, the attenuator is controlled and powered via a standard USB 2.0 connection to a USB host. The 4400-8-31/5 operates as a USB CDC device (USB VID=25EA, PID=106D), so it may be controlled via any software that can communicate to a standard virtual COM port. Programming is done via simple ASCII text-based message strings to control the device.

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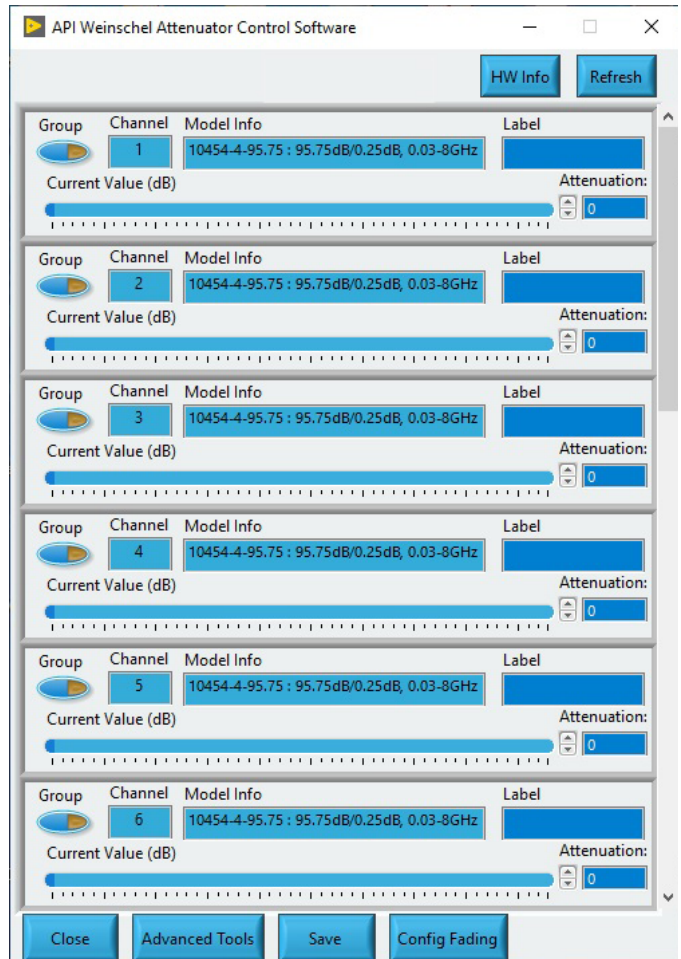
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## Additional Features

Attenuation Range	31.5 dB in 0.5 dB steps
Switching Speed	50 ns (10% RF to 90% RF)
Control Logic	USB & Ethernet
Operating Voltage	Through USB +5V
Temperature Range	-20°C to +85°C
RF Connectors	SMA Female input/output
Weight	330 g (11.7 oz.) Typical
Test Data	Test data available upon request

## Control Software Included

APITech Weinschel's Control Software can also be used in the operation of this series of digital attenuators. The Control Software will allow the user to setup, control, and perform test and measurements over a standard USB 2.0 communication interface. Additional information is available in the Operating & Installation Manual, IM-611.



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## Electrical and Environmental Specifications

Parameter	Frequency Range	Condition	Minimum	Typical	Maximum	Units
<b>Operating Frequency</b>	-	-	0.1	-	8	GHz
<b>Nominal Impedance</b>	0.1 - 8 GHz	-	-	50		Ohm
<b>Attenuation Range</b>	0.1 - 8 GHz	0.5 dB Steps	0	-	31.5	dB
<b>Insertion Loss</b>	0.1 - 2.4 GHz	@0 dB	-	1.4	1.6	dB
	2.4 - 6 GHz		-	1.8	2.0	
	6 - 8 GHz		-	1.9	2.2	
<b>VSWR (All Ports)</b>	0.1 - 8 GHz	0 - 31.5 dB	-	1.7:1	1.9:1	-
<b>Attenuation Accuracy <sup>1</sup></b>	0.1 - 8 GHz	0 - 31.5 dB	-	±(0.4 + 2.0%)	±(1.0 + 2.5%)	dB
<b>Monotonicity</b>	-	0 - 31.5 dB	-	0.1 - 8	-	GHz
<b>A (RF Input Power, CW)</b>	0.1 - 8 GHz	Steady State	-	-	28	dBm
		Hot Switching	-	-	25	
<b>B (RF Input Power, CW)</b>	0.1 - 8 GHz	Steady State	-	-	19	dBm
		Hot Switching	-	-	16	
<b>Input IP3</b>	0.1 - 8 GHz	0 - 31.5 dB, Input at A	-	50		dBm
<b>Supply Voltage (VDC)</b>	-	USB	+4.4	+5	+5.25	Volt
<b>Supply Current</b>	-	USB	-	100	-	mA
		USB and Ethernet	-	200	-	
<b>Operating Temperature</b>	0.1 - 8 GHz	-	-20	-	85	°C
<b>Storage Temperature</b>	-	-	-55	-	125	°C

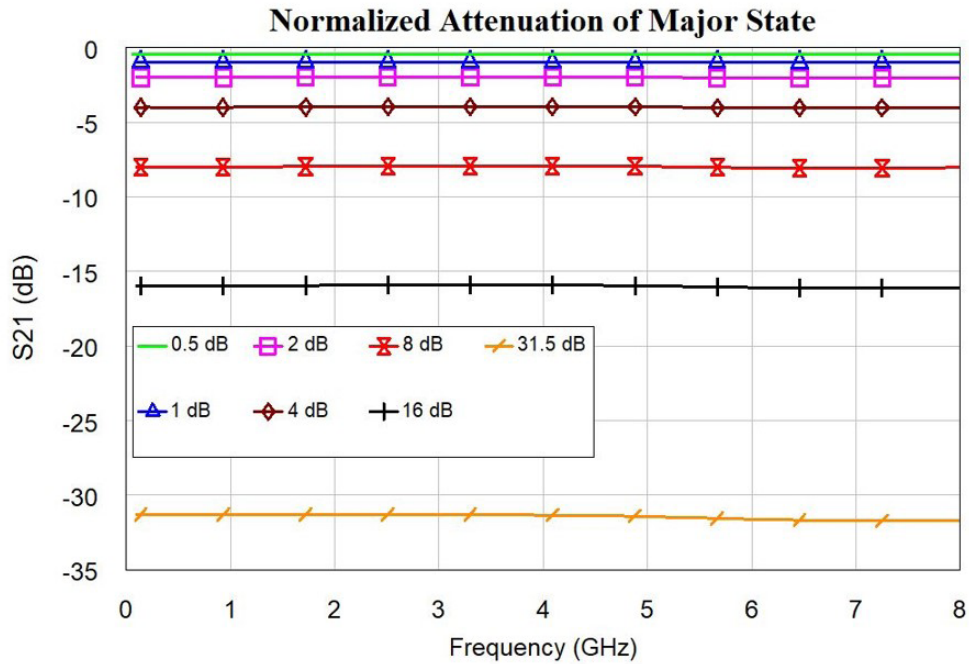
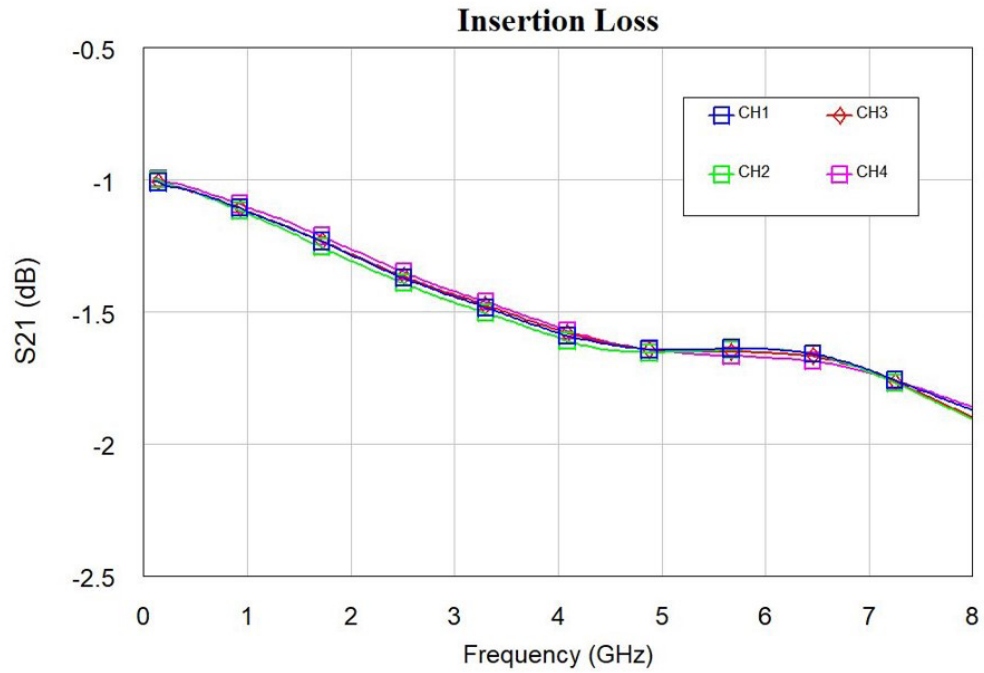
1. X% is the percentage of the nominal attenuation setting. For example the accuracy of 30 dB @ 8 GHz is ± (1.0+0.025x30) dB. This equates to ±1.75 dB which means when setting the attenuator at 30 dB, the actual measured normalized value would be between 28.25 dB and 31.75 dB.
2. The values in the table apply at room temperature unless otherwise specified.
3. DC blocking is required when the RF input or output DC line is not 0V.

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## Typical RF Performance

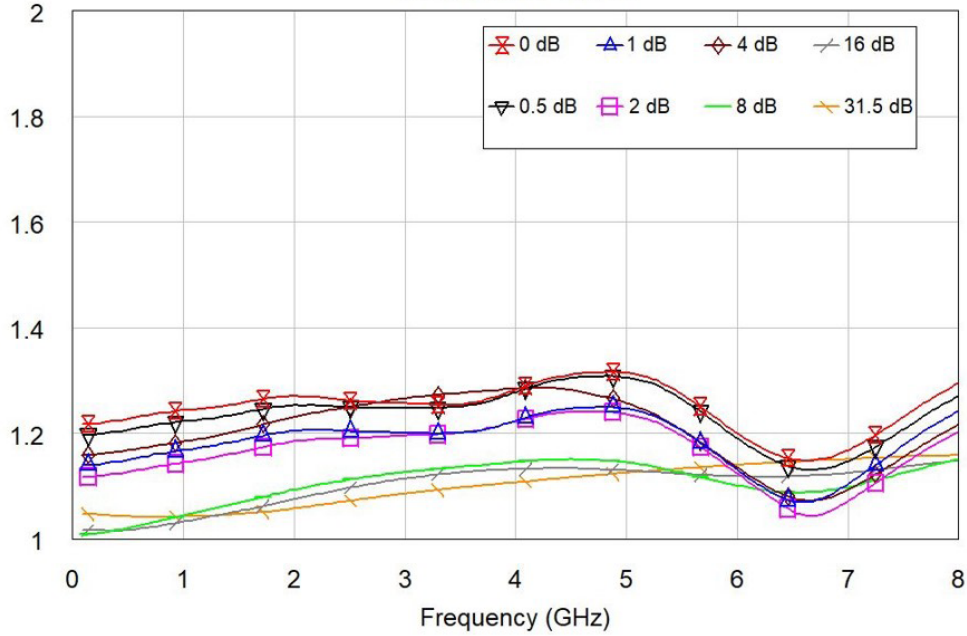


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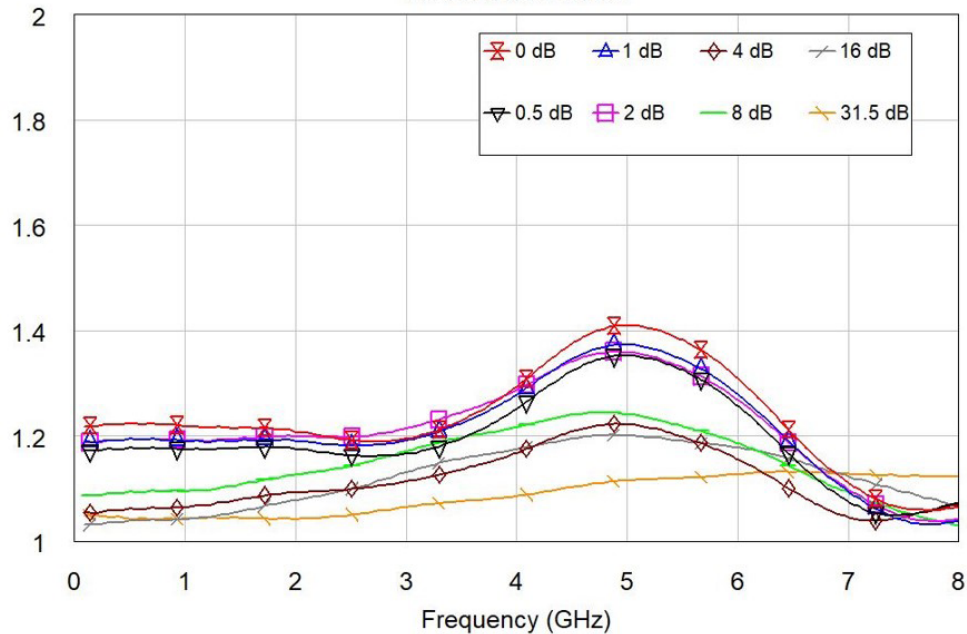
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**VSWR at Port A**



**VSWR at Port B**

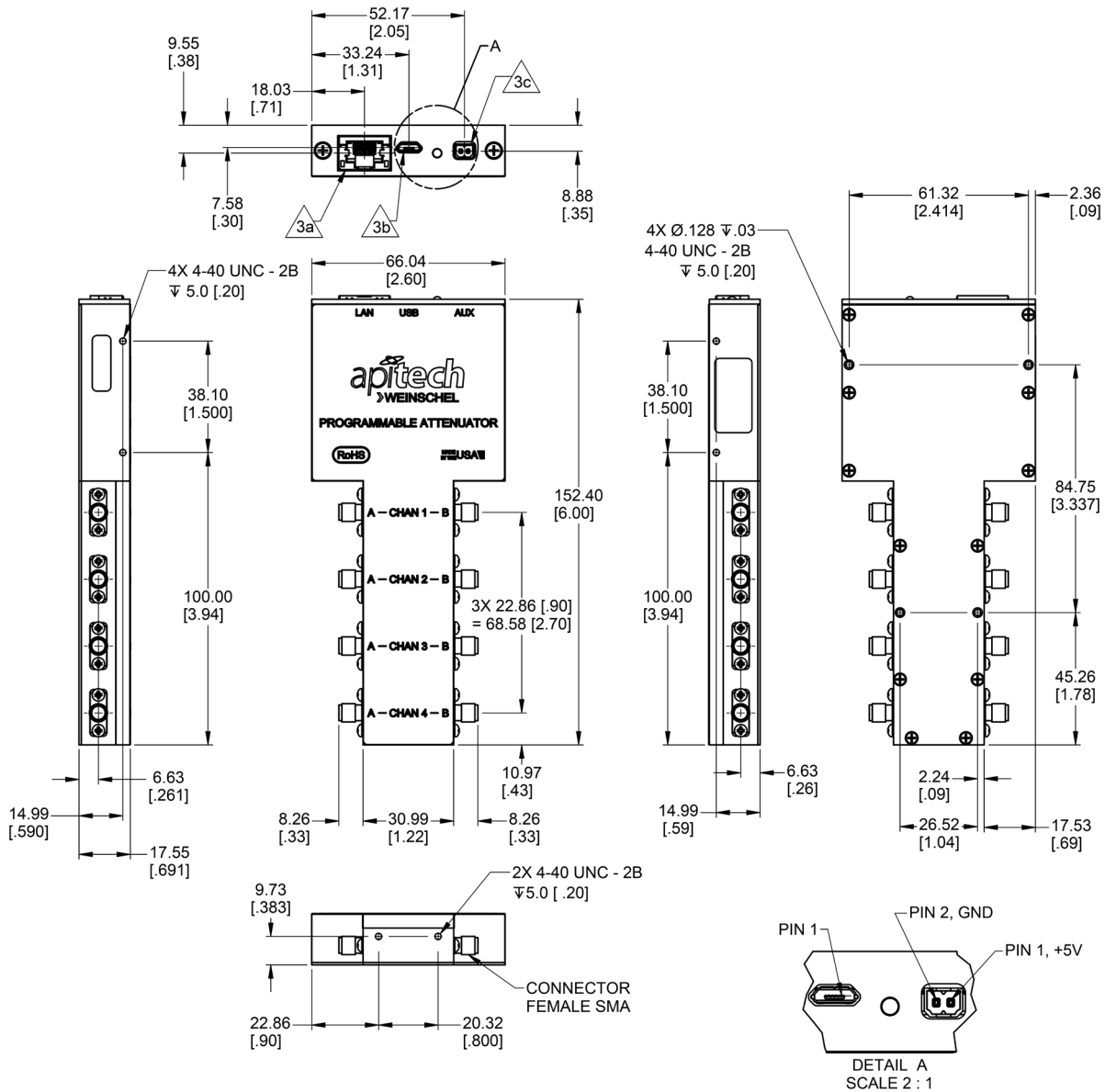


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## Mechanical Dimensions



**Notes:**

1. ALL DIMENSIONS ARE GIVEN IN MM (INCHES)

2. CONTROL CONNECTORS:

- a.** ETHERNET, RJ45
- b.** USB - MICRO-B
- c.** POWER, PHOENIX CONTACT, 2.5MM, MATES WITH PHOENIX CONTACT P/N PTSM 0.5/2-P-2, 5-1778832

AUX Port (3c)		
PIN#	SIGNAL	DESCRIPTION
1	SYNC	Out, 5V CMOS
1	GND	Signal Ground