DATA SHEET

4-Channel Programmable Attenuator – 0.1 to 8 GHz, 94.5 dB

USB & Ethernet Control Modes

4400 Series
Model 4400-8-95
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 (100ns) and fine attenuation step resolution (0.5dB)
- Four independently programmable channels
- Small form-factor portable unit, 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 Simluation Test Environments

Description

Spectrum Control's Weinschel's 4 Channel Programmable Attenuators are 50 ohm bidirectional units that operate over the 0.1 to 8 GHz frequency range. Model 4400-8-95 offers an attenuation range of 0 to 94.5 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 µsec 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 4400-8-95 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.

4-Channel Programmable Attenuator – 0.1 to 8 GHz, 94.5 dB

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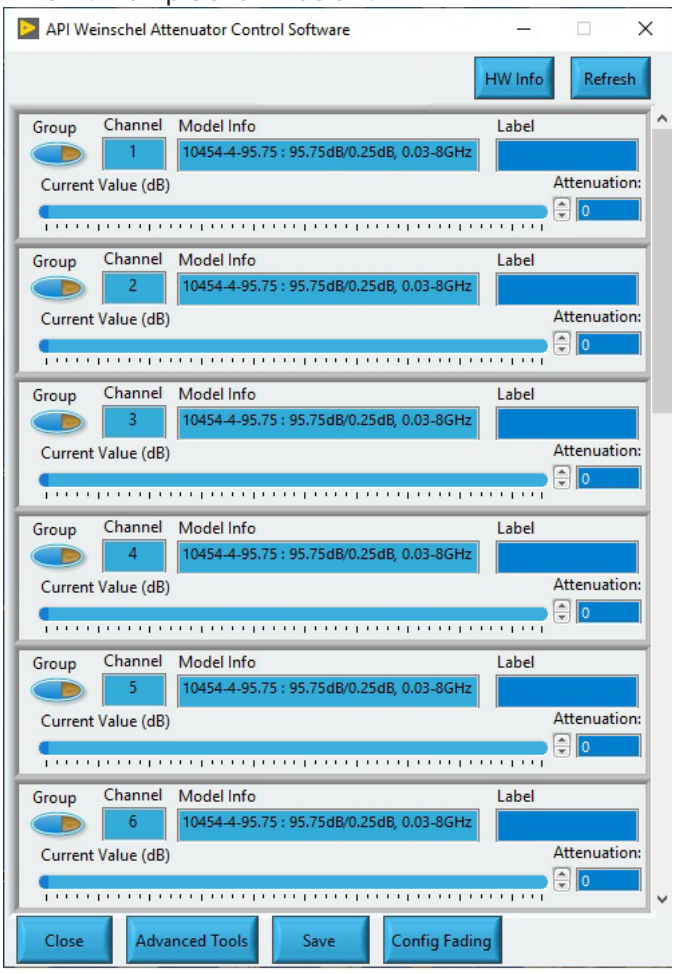
Additional Features

Attenuation Range	94.5 dB in 0.5 dB steps
Switching Speed	100 nsec. (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

Spectrum Control 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. Example shown below.



4-Channel Programmable Attenuator – 0.1 to 8 GHz, 94.5 dB

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Electrical and Environmental Specifications

Parameter	Frequency Range	Condition	Minimum	Typical	Maximum	Units
Operating Frequency	-	-	0.1	-	8	GHz
Nominal Impedance	0.1 - 8 GHz	-	-	50		Ohm
Attenuation Range	0.1 - 8 GHz	0.5 dB Steps	0	-	94.5	dB
Insertion Loss	0.1 - 2.4 GHz	@0 dB	-	4.0	4.5	dB
	2.4 - 6 GHz		-	5.4	5.9	
	6 - 8 GHz		-	6.4	6.9	
VSWR (All Ports)	0.1 - 5.4 GHz	0 - 94.5 dB	-	1.65:1	1.8:1	-
	5.4 - 8 GHz			1.4:1	1.6:1	
Attenuation Accuracy [1]	0.1 - 8 GHz	0 - 94.5 dB	-	±(0.4 + 2.0%)	±(1.0 + 2.5%)	dB
Monotonicity	-	0 - 94.5 dB	-	0.1 - 8	-	GHz
A (RF Input Power, CW)	0.1 - 8 GHz	Steady State	-	-	28	dBm
		Hot Switching	-	-	25	
B (RF Input Power, CW)	0.1 - 8 GHz	Steady State	-	-	19	dBm
		Hot Switching	-	-	16	
Input IP3	0.1 - 8 GHz	0 - 31.5 dB, Input at A	-	50	-	dBm
Supply Voltage (VDC)	-	USB	+4.75	+5	+5.25	Volt
Supply Current	-	USB	-	100	-	mA
	-	USB and Ethernet	-	200	-	mA
Operating Temperature	0.1 - 8 GHz	-	-20	-	85	°C
Storage Temperature	-	-	-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.*

4-Channel Programmable Attenuator – 0.1 to 8 GHz, 94.5 dB

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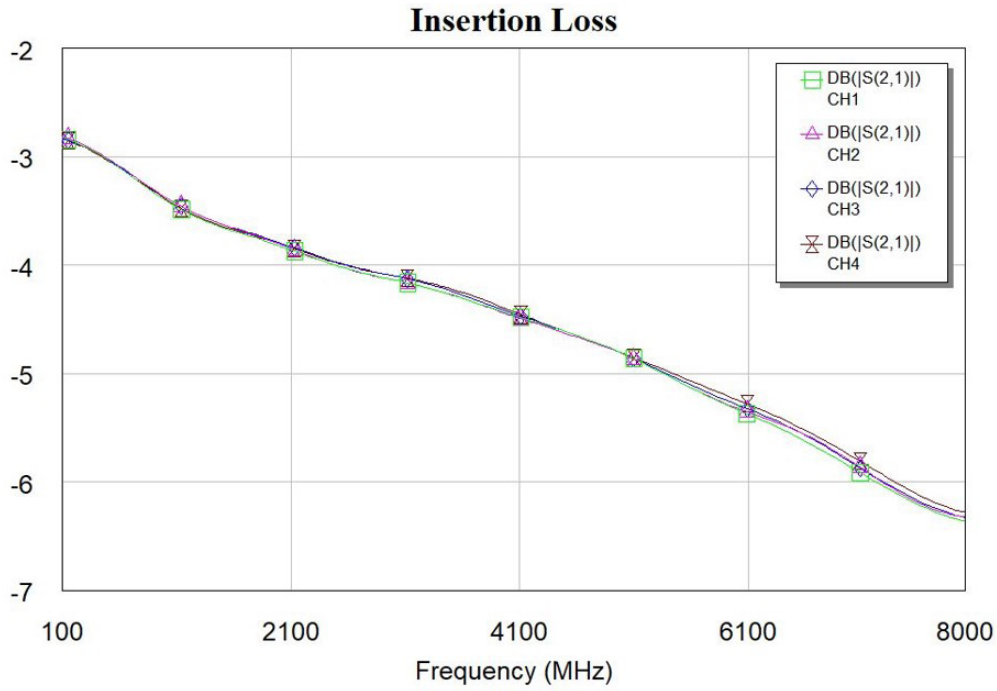
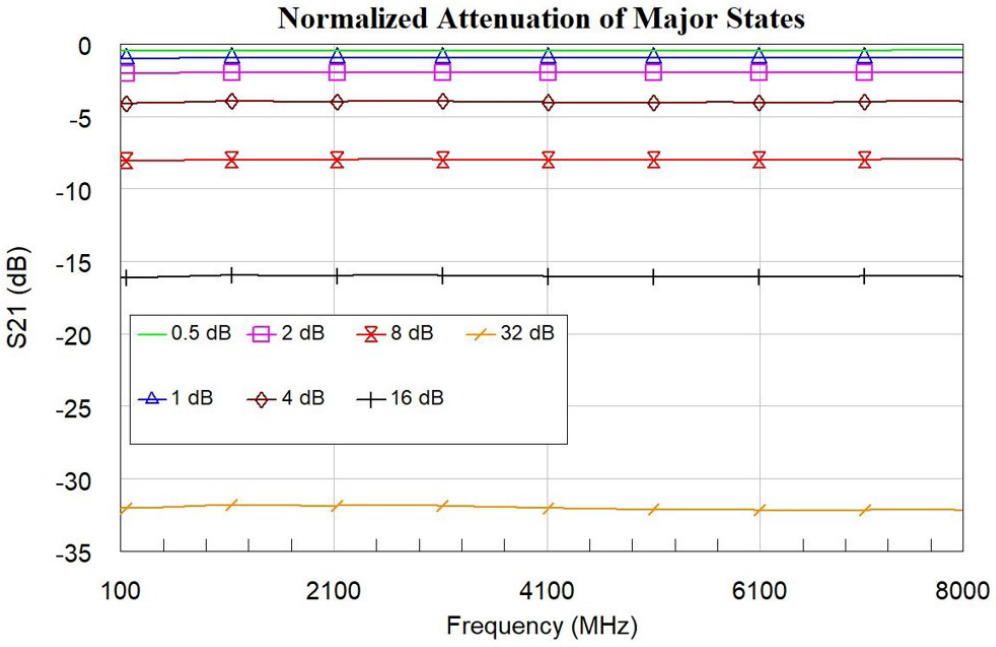
Typical RF Performance





4-Channel Programmable Attenuator – 0.1 to 8 GHz, 94.5 dB

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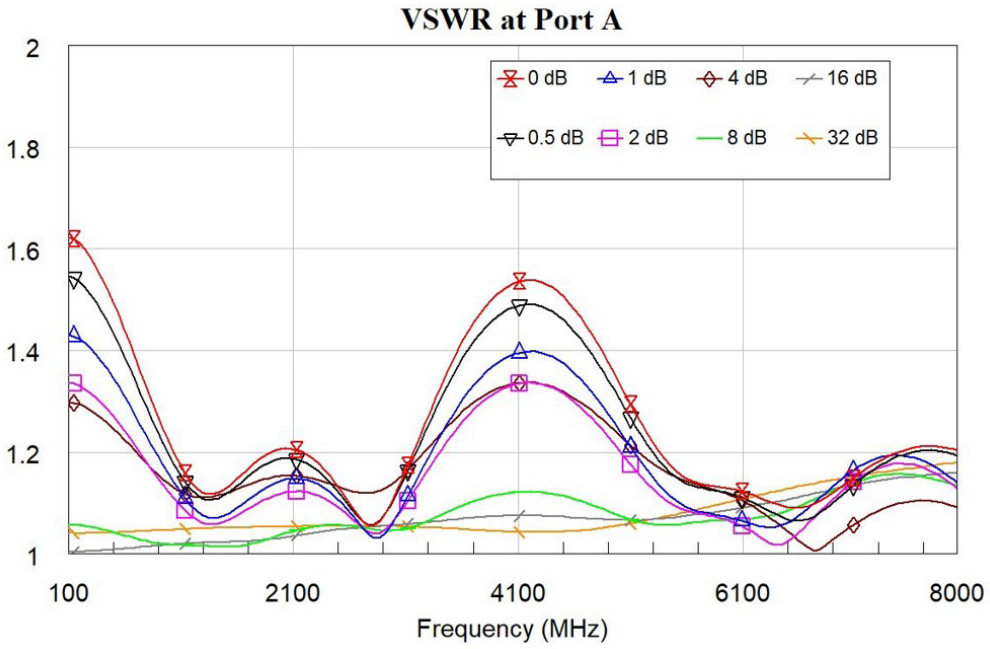

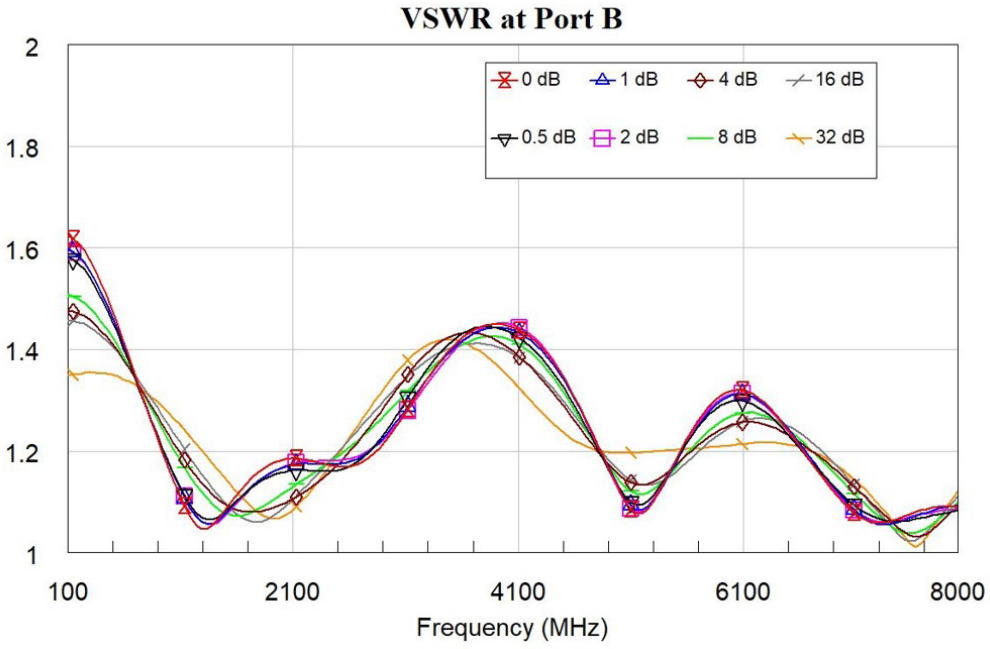

4-Channel Programmable Attenuator – 0.1 to 8 GHz, 94.5 dB

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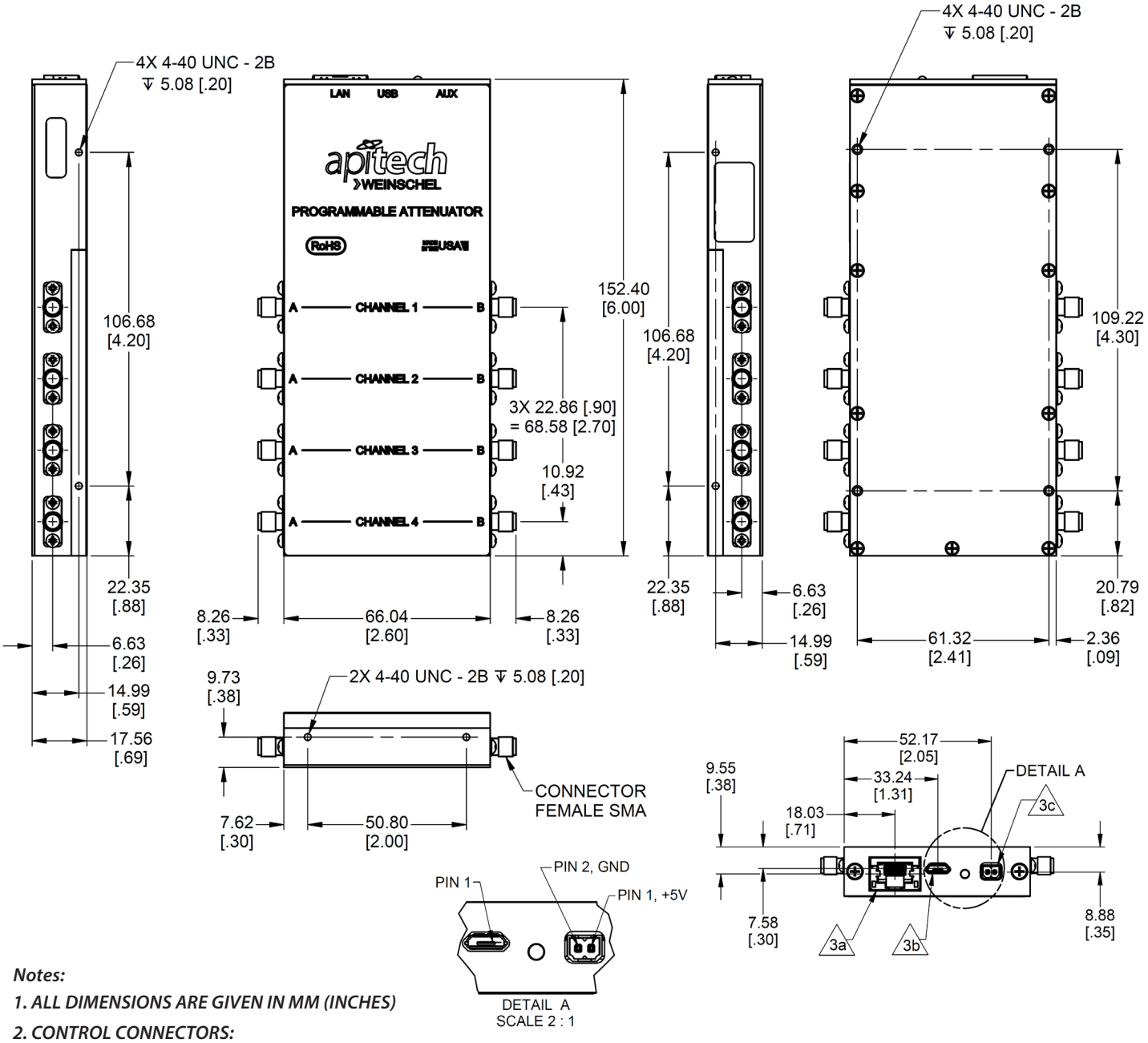
Mechanical Dimensions



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