NINE FIVES

USB / ETHERNET

Programmable Attenuator

50Ω 1 to 6000 MHz, 0 - 95.25 dB, 0.25 dB step

POE-ATTEN-6G

HIGHLIGHTS

- Wide attenuation range, 95.25 dB
- Fine attenuation resolution, 0.25 dB
- Power and control via any combination of USB or PoE-enabled Ethernet.
- Touch User Interface supports setting attenuation, IP address, and other device parameters.
- Driverless: WebUI, REST, SCPI, HISLIP services all hosted on attenuator
- Compact size, 4.500 x 2.165 x 1.181”

Parameter	Value
Model No.	POE-ATTEN-6G
Connectors	SMA (female)

APPLICATIONS

- Cellular device testing
- TT&C Radio device testing
- Signal level calibration
- Automated gain control
- Laboratory instrumentation

PRODUCT OVERVIEW

The POE-ATTEN-6G is a general-purpose, single-channel programmable attenuator designed for a wide range of signal level control applications from 1 to 6000 MHz. It provides 0 to 95.25 dB of attenuation in 0.25 dB steps, with a design that maintains linear attenuation per dB even at the highest attenuation settings.

The unit is housed in a compact, rugged enclosure with SMA female connectors on both RF ports, a Power over Ethernet (IEEE 802.3af) port via RJ45, and a USB Type-C port for power and control.

An onboard web interface (WebUI) and REST API are accessible on port 80. A raw socket SCPI server runs on port 5025 and a HiSLIP-SCPI server on port 4880.

KEY FEATURES

Feature	Advantages
95.25 dB attenuation range	High-accuracy attenuation up to 95.25 dB in 0.25 dB steps provides precise level control across a broad attenuation and frequency range.
No software or driver installation required	All control software is hosted directly on the device. A web browser is all that is needed for manual control — no drivers, no installs.
Auto-detects in Keysight Connection Expert	Device uses mDNS and HiSLIP to appear during automatic discovery in commonly used LXI management tools
USB and Ethernet control	USB and Ethernet interfaces with REST, SCPI, and HiSLIP support provide broad compatibility with a wide range of programming environments and test automation frameworks.

ELECTRICAL SPECIFICATIONS

Parameter	Conditions	Freq (MHz)	Min.	Typ.	Max.	Unit
Attenuation range	0.25 dB step	1 - 6000	0	-	95.25	dB
Attenuation accuracy	0.25 - 20 dB	1 - 2000	-	±0.10	±(0.20 + 2.0% of Atten.)	dB
		2000 - 6000	-	±0.35	±(0.30 + 5.0% of Atten.)	
	20.25 - 60 dB	1 - 2000	-	±0.25	±(0.40 + 2.0% of Atten.)	dB
		2000 - 6000	-	±0.90	±(0.50 + 6.0% of Atten.)	
	60.25 - 95.25 dB[1]	1 - 6000	-	±1	±55	
Insertion loss	0 dB	1 - 2000	-	4	6	dB
		2000 - 6000	-	6	9	
Return loss	Any setpoint	1 - 2000	11	21	-	dB
		2000 - 6000	12	22	-	
RF input power	CW, any setpoint	1 - 6000	-	-	+23	dBm
Supply voltage (Vpoe)	Ethernet port (PoE)	-	36	48	57	V_{DC}
Supply current (Ipoe)	Ethernet port (PoE)	-	-	25	35	mA
Supply voltage (Vusb)	USB port	-	4.75	5	5.25	V_{DC}
Supply current (Iusb)	USB port	-	-	-	150	mA

[1] *Attenuation accuracy in this range is expected to improve on next hardware revision.*

ABSOLUTE MAXIMUM RATINGS

Parameter	Value
RF input power (CW)	+23 dBm
Operating temperature	0°C to 50°C
Storage temperature	-20°C to 85°C
DC voltage at RF ports	16 V
V_{USB} MAX	6 V
V_{POE} MAX	57 V

Permanent damage may occur if any of these limits are exceeded.

CONNECTIONS

Port Name	Connector Type
RF in	SMA female
RF out	SMA female
USB	USB type C female
Network (Power Over Ethernet, Ethernet)	RJ45 socket

TYPICAL PERFORMANCE CURVES

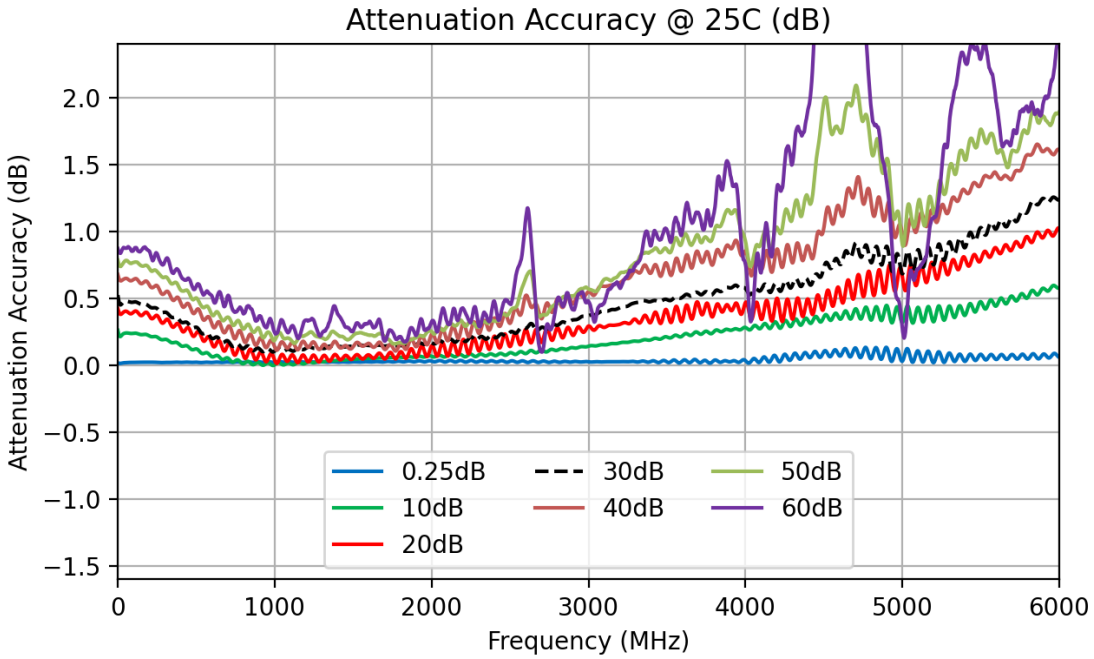

Figure 1: Attenuation Accuracy vs. Frequency

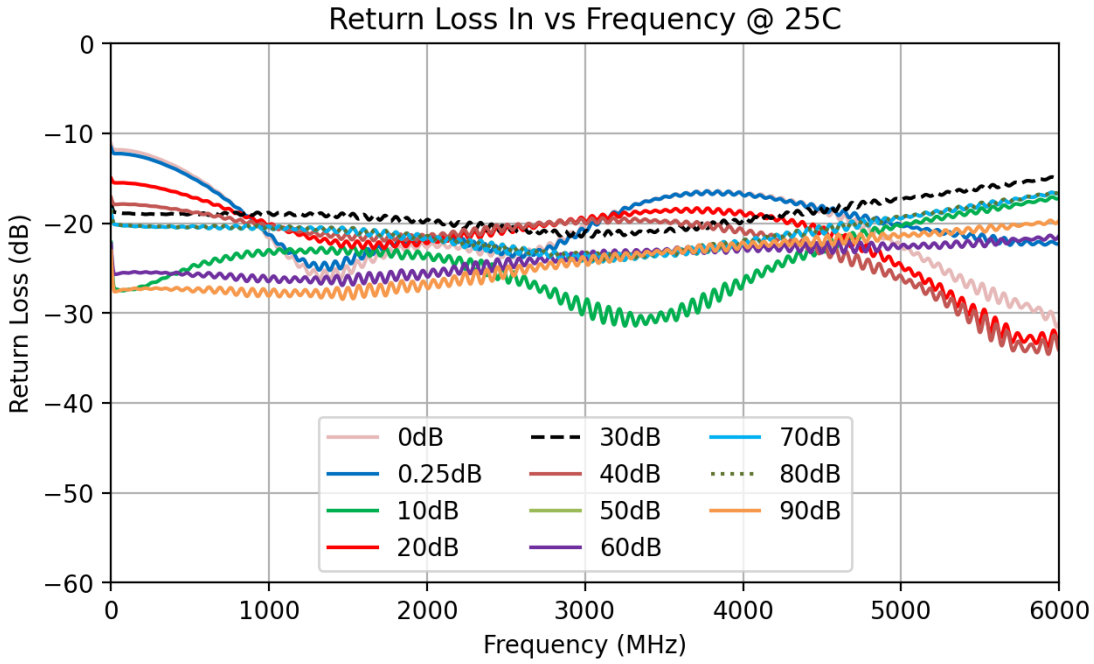

Figure 2: Return Loss (Input) vs. Frequency

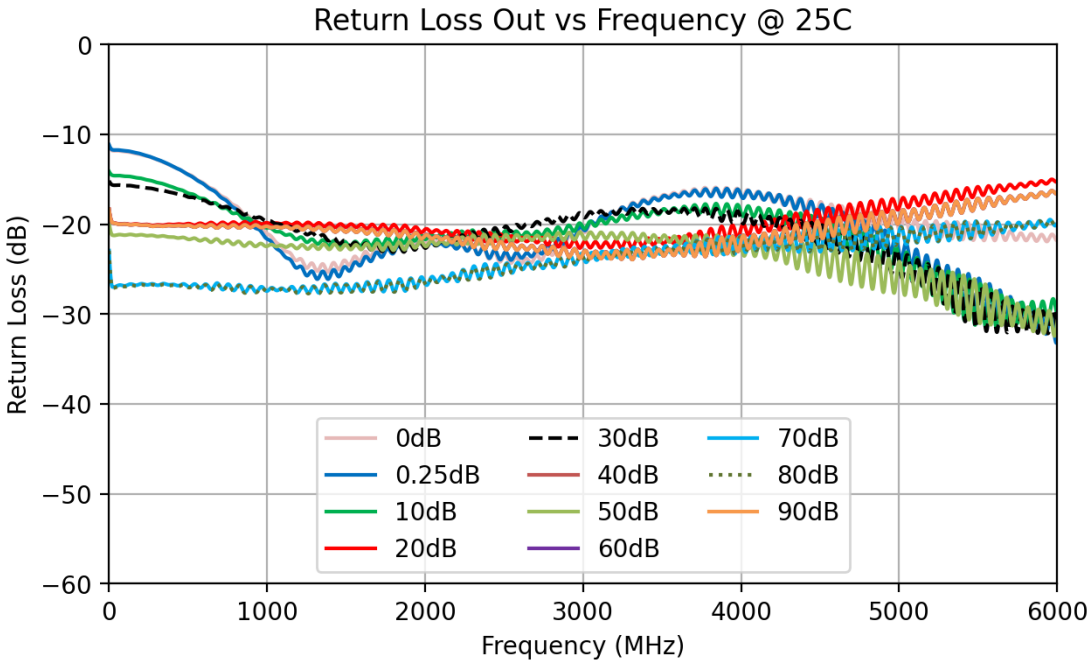

Figure 3: Return Loss (Output) vs. Frequency

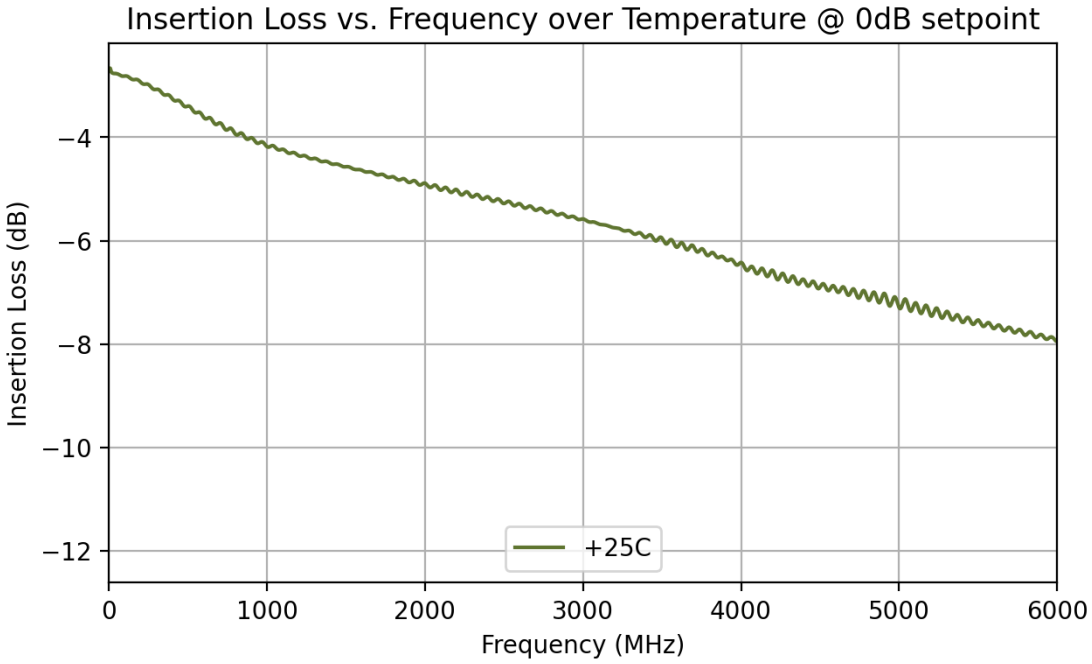

Figure 4: Insertion Loss vs. Frequency @ 0 dB

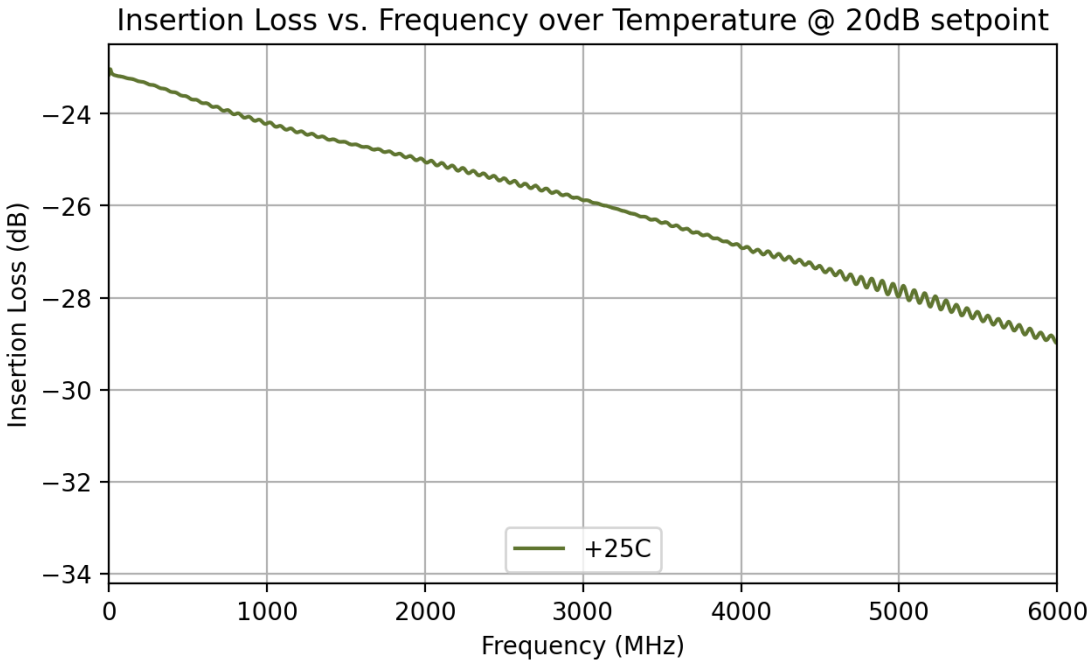

Figure 5: Insertion Loss vs. Frequency @ 20 dB

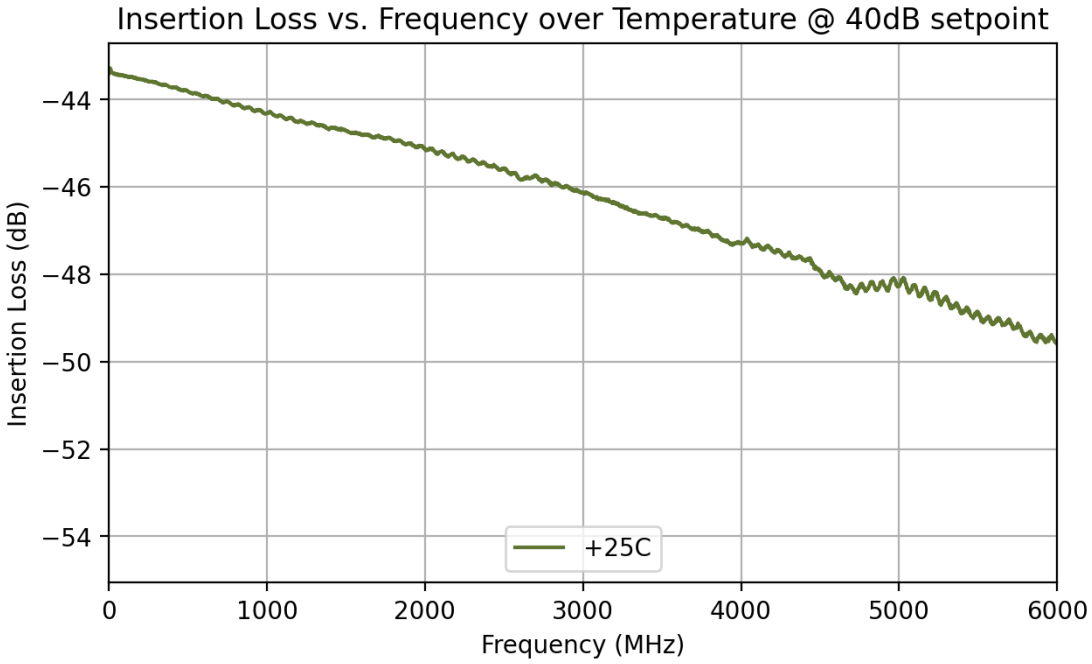

Figure 6: Insertion Loss vs. Frequency @ 40 dB

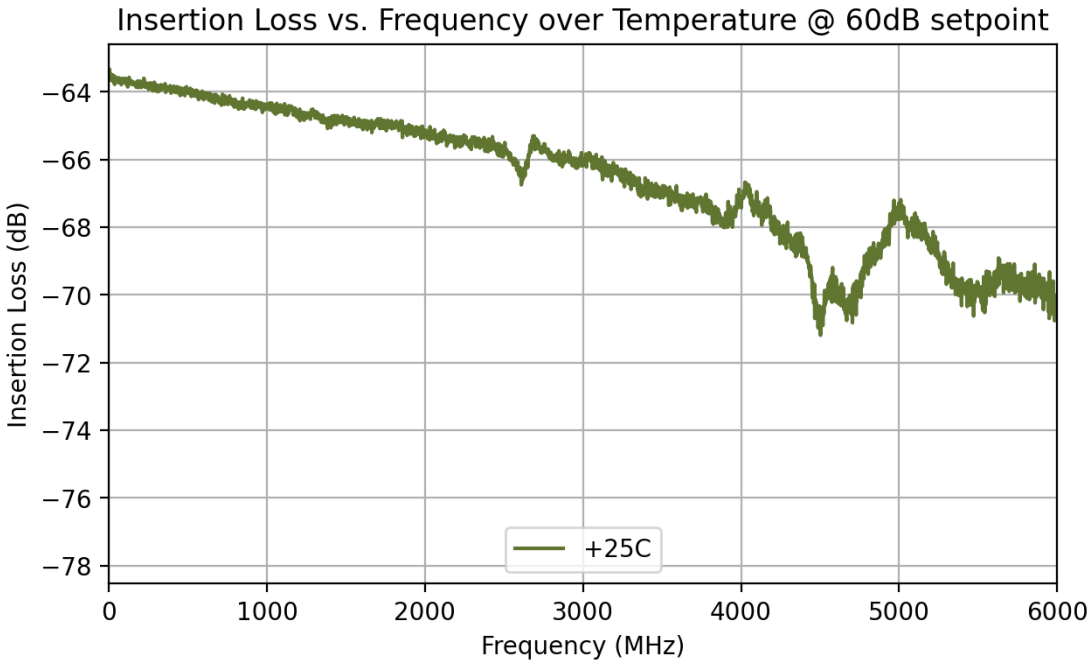

Figure 7: Insertion Loss vs. Frequency @ 60 dB

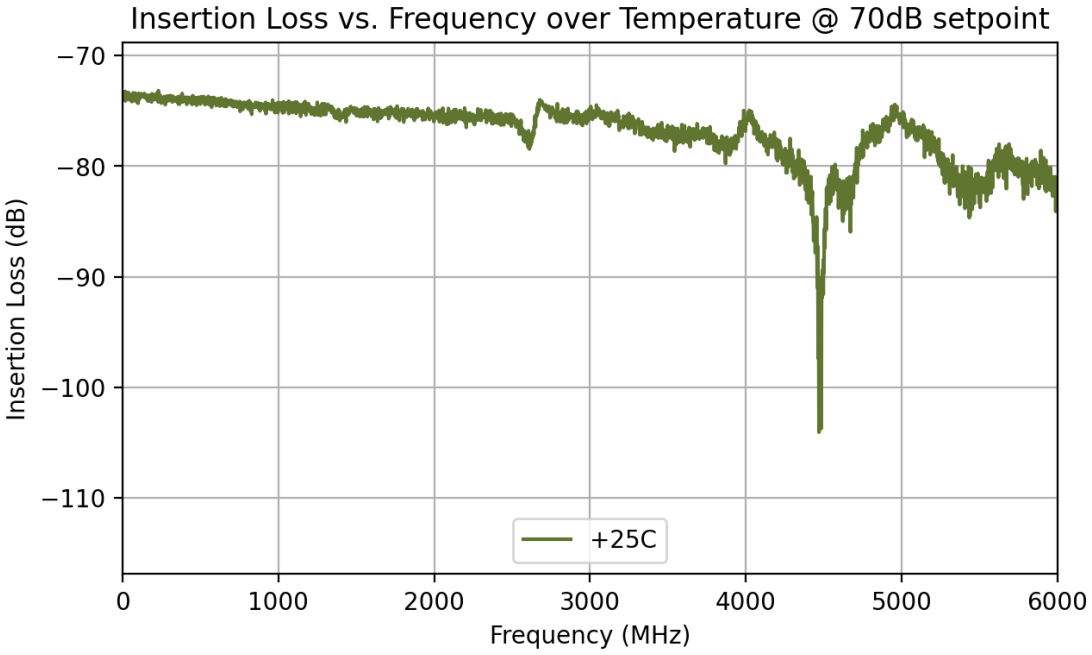

Figure 8: Insertion Loss vs. Frequency @ 70 dB

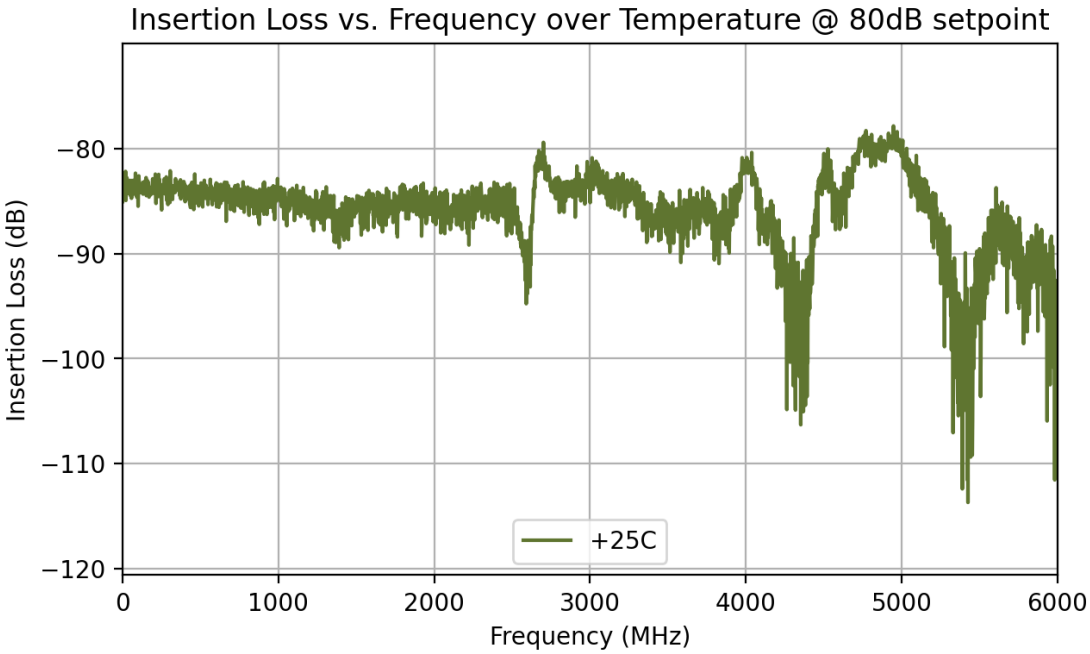

Figure 9: Insertion Loss vs. Frequency @ 80 dB

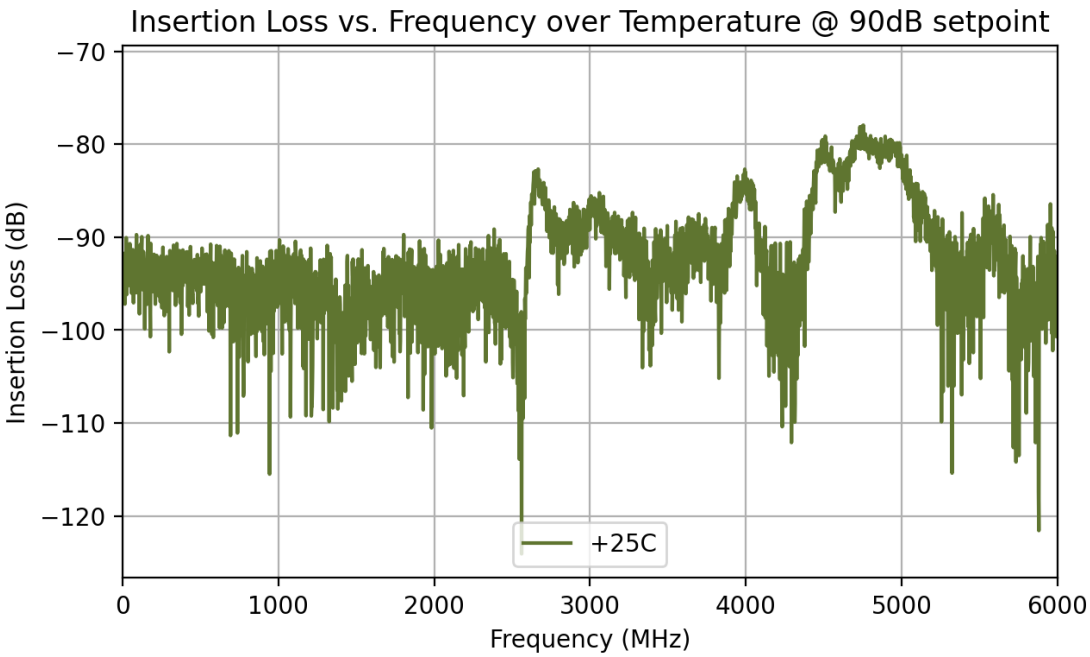

Figure 10: Insertion Loss vs. Frequency @ 90 dB

DEVICE DISCOVERY VIA MDNS

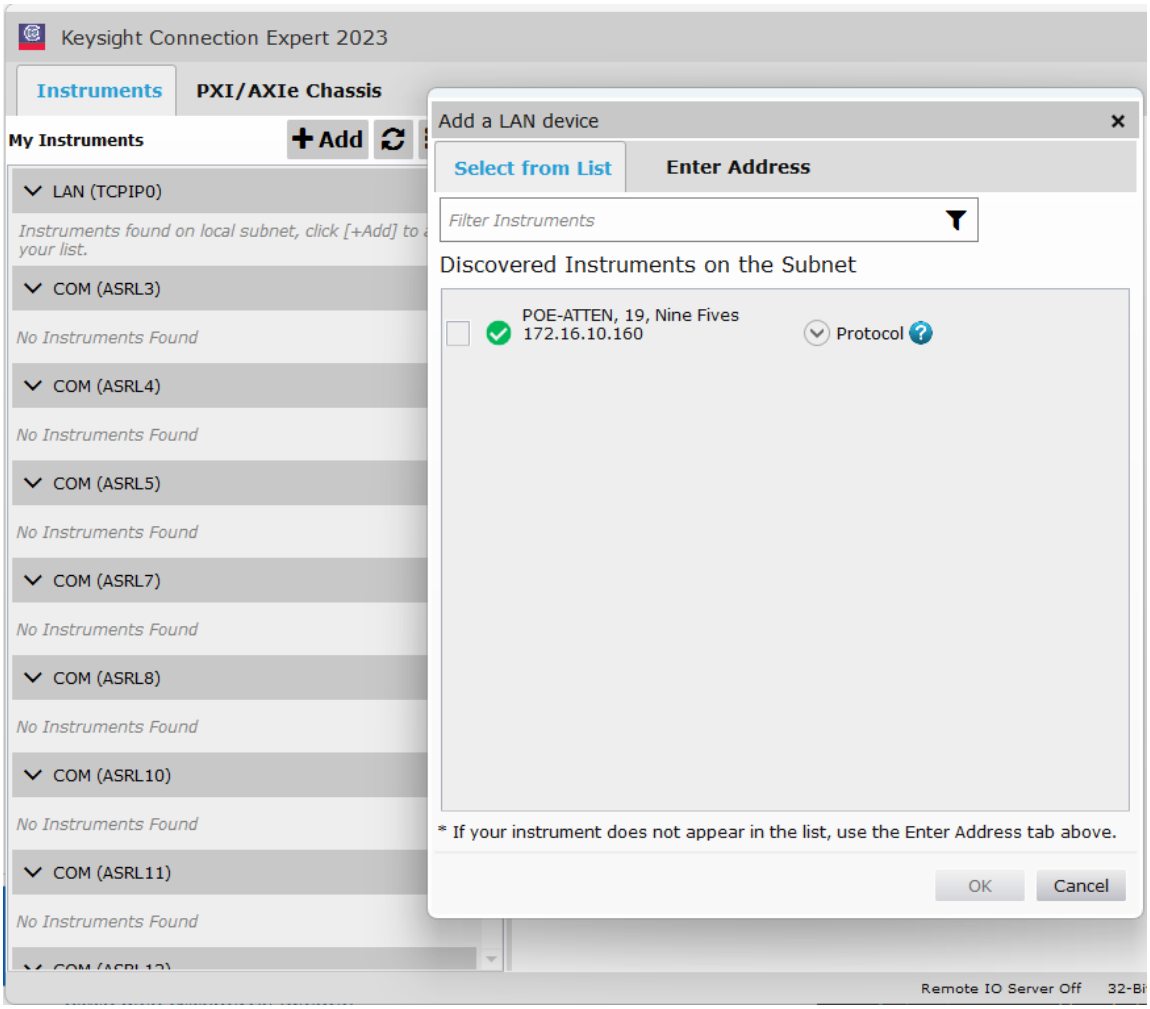

Figure 11: Device Discovery via mDNS

HTTP WEB INTERFACE (WEBUI)

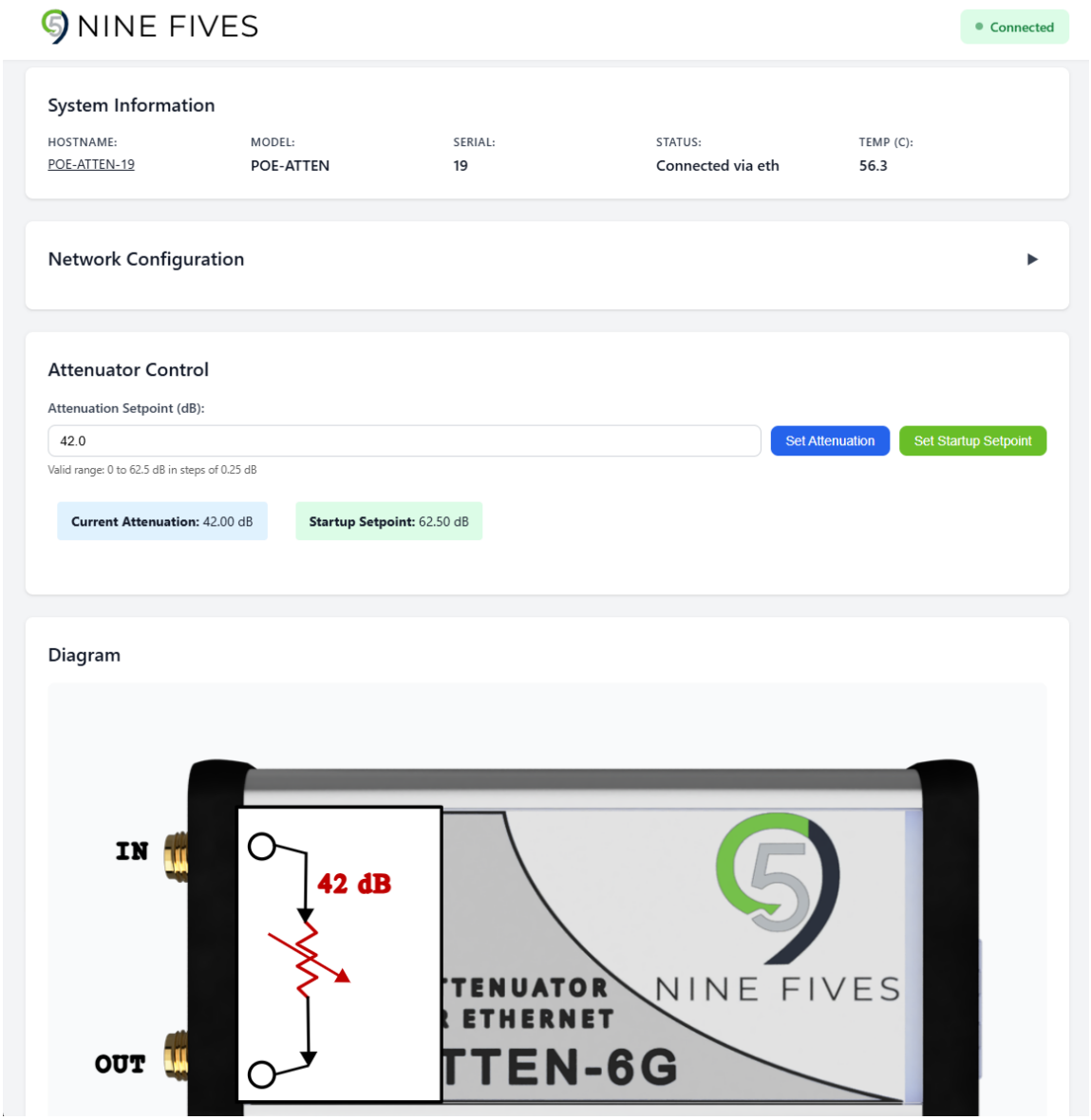

Figure 12: Web Interface (WebUI)

SCPI COMMANDING

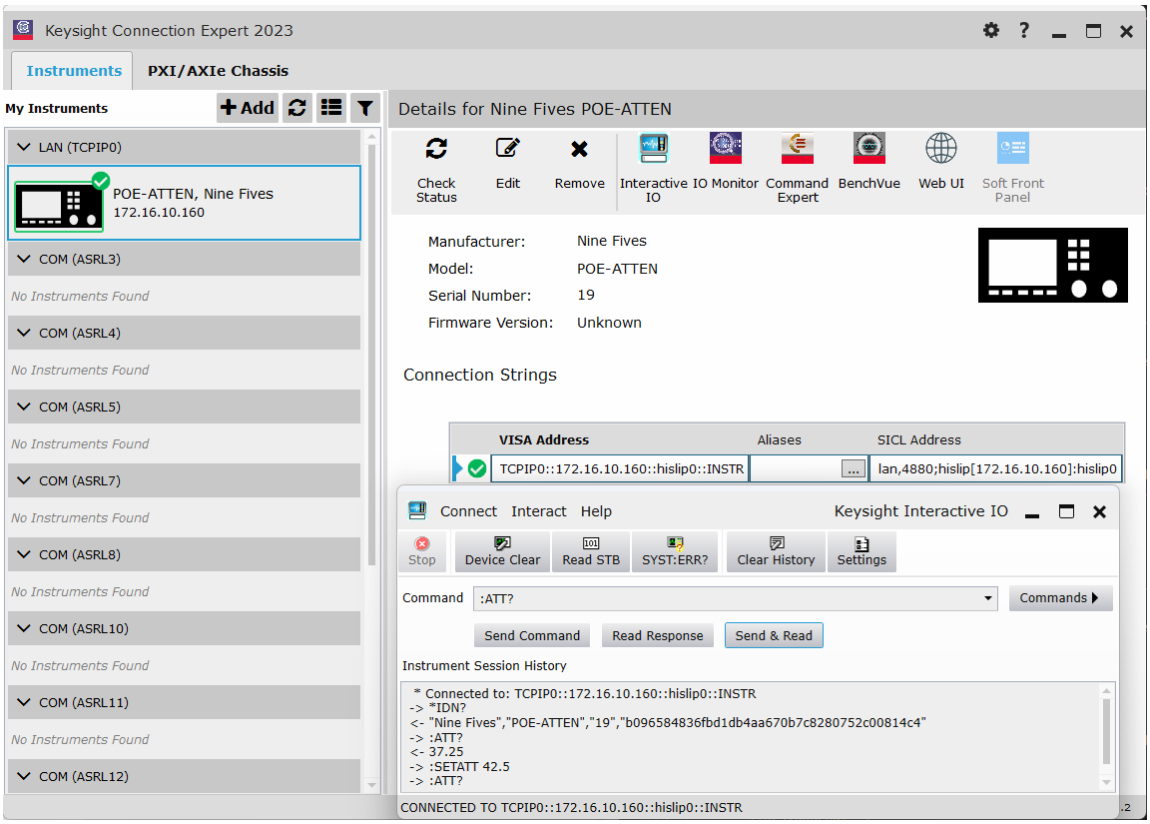

Figure 13: SCPI Commanding

COMPATIBLE WITH PYTHON

SCPI via PyVISA

```
>>> import pyvisa; rm = pyvisa.ResourceManager()
>>> rm.list_resources()
('TCPIP::172.16.10.160::hislip0,4880::INSTR',)
>>> atten = rm.open_resource(rm.list_resources()[0])
>>> atten.query('*IDN?')
'"Nine Fives","POE-ATTEN","19",...\n'
>>> atten.write(':SETATT 0')
>>> atten.query(':ATT?')
'0\n'
>>> atten.write(':SETATT 22.25')
>>> atten.query(':ATT?')
'22.25\n'
```

REST API via Requests

```
>>> import requests
>>> requests.get('http://172.16.10.160/api/system/status').
json()
{'device': 'Nine Fives Switch Controller',
 'hostname': 'POE-ATTEN-19',
 'model': 'POE-ATTEN',
 'serial': '19',
 'status': 'Connected via eth',
 'temperature': 55.628,
 'connectedIface': 'eth0'}
>>> requests.post('http://172.16.10.160/api/attenuator',
...     json={'setpoint': 0})
<Response [200]>
>>> requests.get('http://172.16.10.160/api/attenuator').json()
{'setpoint': 0}
>>> requests.post('http://172.16.10.160/api/attenuator',
...     json={'setpoint': 22.25})
<Response [200]>
>>> requests.get('http://172.16.10.160/api/attenuator').json()
{'setpoint': 22.25}
```