

HIGHLIGHTS

- SP4T (Single Pole Four Throw) topology
- Broadband DC to /clea6000 MHz operation
- Power and control via any combination of USB or PoE-enabled Ethernet.
- Touch UI supports RF path selection, IP address, and other device parameters.
- Driverless: WebUI, REST, SCPI, and HiSLIP services are hosted on the switch

APPLICATIONS

- Multi-path RF signal routing and switching
- Antenna switching
- Redundancy and failover systems
- Automated test systems
- Laboratory instrumentation



Parameter	Value
Model No.	POE-SP4T-6G
Connectors	SMA (female)

PRODUCT OVERVIEW

The POE-SP4T-6G is a general-purpose, SP4T (Single Pole Four Throw) programmable RF switch designed for broadband signal routing applications from DC to 6000 MHz. It provides low insertion loss and high isolation while routing the common port to any one of four RF ports.

The unit is housed in a compact, rugged enclosure with SMA female connectors on all five RF ports (Common, RF0, RF1, RF2, RF3), 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
SP4T RF switching	Route RF signals between Common and any of four RF ports with low insertion loss and high isolation across a broad 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.
Auto-detects in Keysight Connection Expert	mDNS and HiSLIP support automatic discovery in commonly used LXI management tools.
USB and Ethernet control	REST, SCPI, and HiSLIP support provide broad compatibility with test automation environments.

ELECTRICAL SPECIFICATIONS

Parameter	Conditions	Freq (MHz)	Min.	Typ.	Max.	Unit
Insertion loss	Selected RF path	DC - 2000	-	1	2	dB
		2000 - 4000	-	1	2	
		4000 - 6000	-	1	3	
Isolation	De-selected RF path	DC - 6000	32	45	-	dB
Return loss	Common port	DC - 2000	17	23	-	dB
Return loss	RF ports	DC - 2000	15	22	-	dB
Return loss	RF ports	2000 - 6000	11	15	-	dB
Switching speed		-	-	15	25	ms
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

ABSOLUTE MAXIMUM RATINGS

Parameter	Value
Operating temperature	0°C to 50°C
Storage temperature	-20°C to 85°C
RF input power	+30 dBm
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
Common	SMA female
RF0	SMA female
RF1	SMA female
RF2	SMA female
RF3	SMA female
USB	USB type C female
Network (Power Over Ethernet, Ethernet)	RJ45 socket

TYPICAL PERFORMANCE CURVES

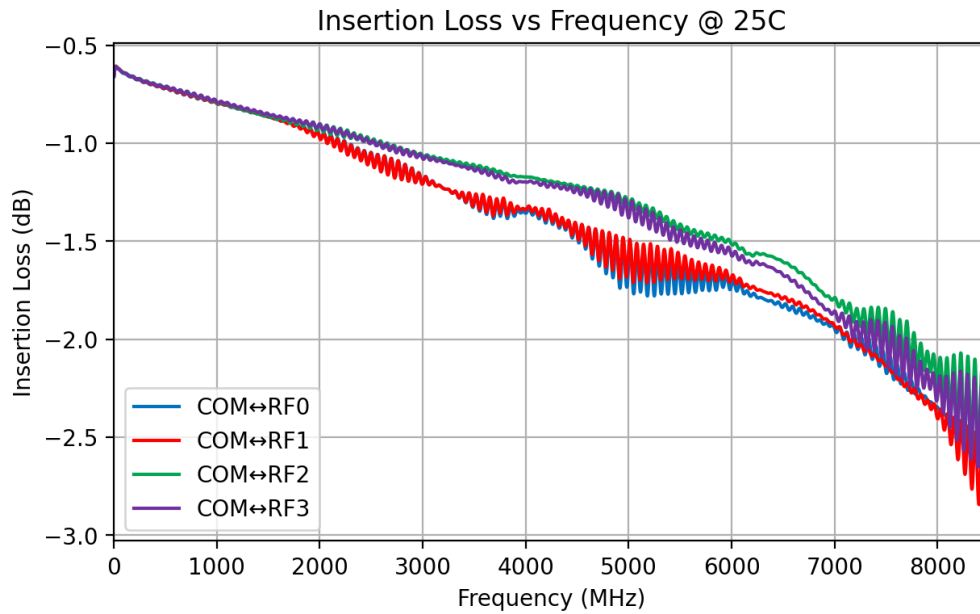


Figure 1: Insertion Loss vs. Frequency

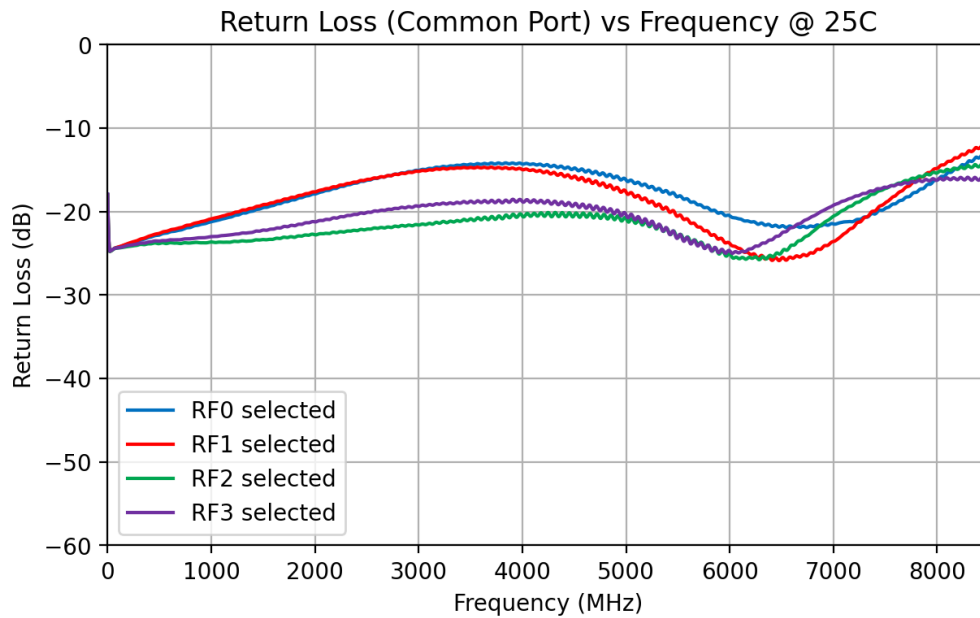


Figure 2: Return Loss (Common Port) vs. Frequency

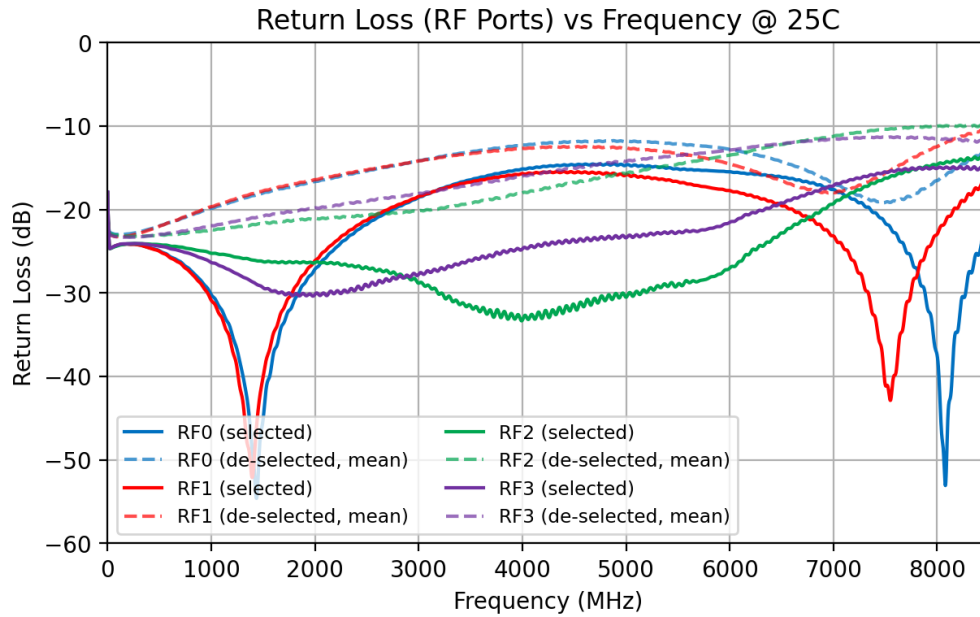


Figure 3: Return Loss (RF Ports) vs. Frequency

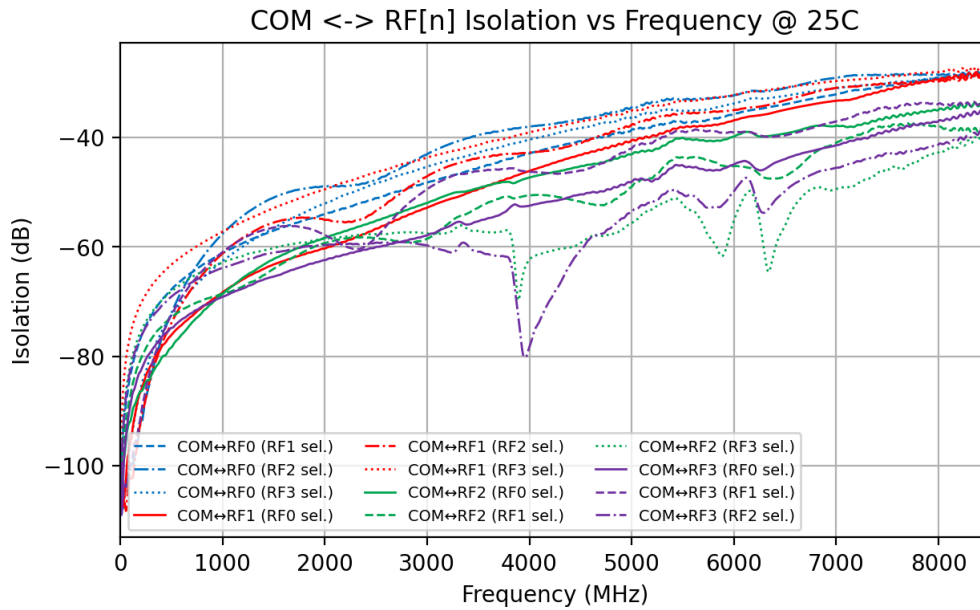


Figure 4: Isolation vs. Frequency

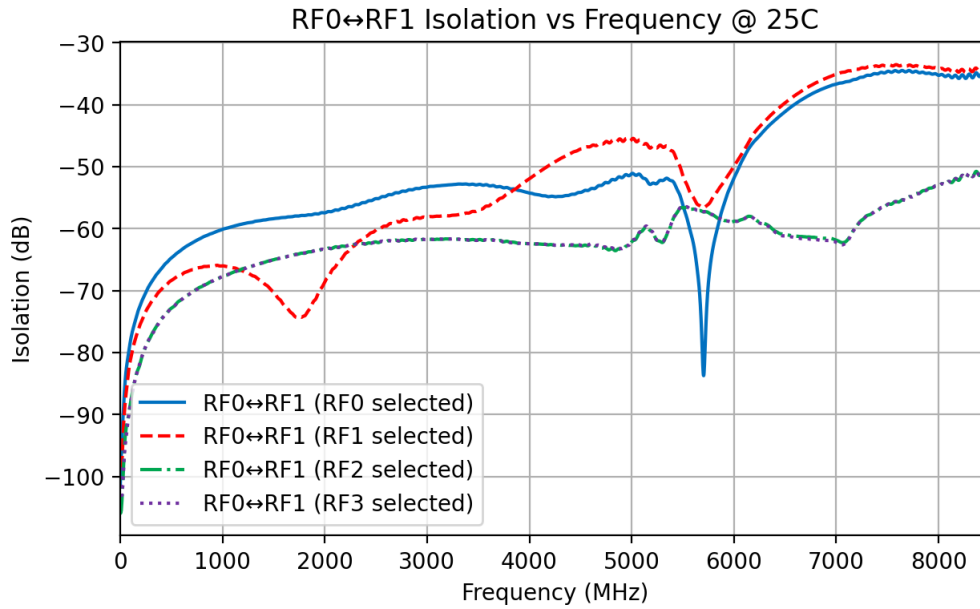


Figure 5: RF0→RF1 Isolation vs. Frequency

DEVICE DISCOVERY VIA MDNS

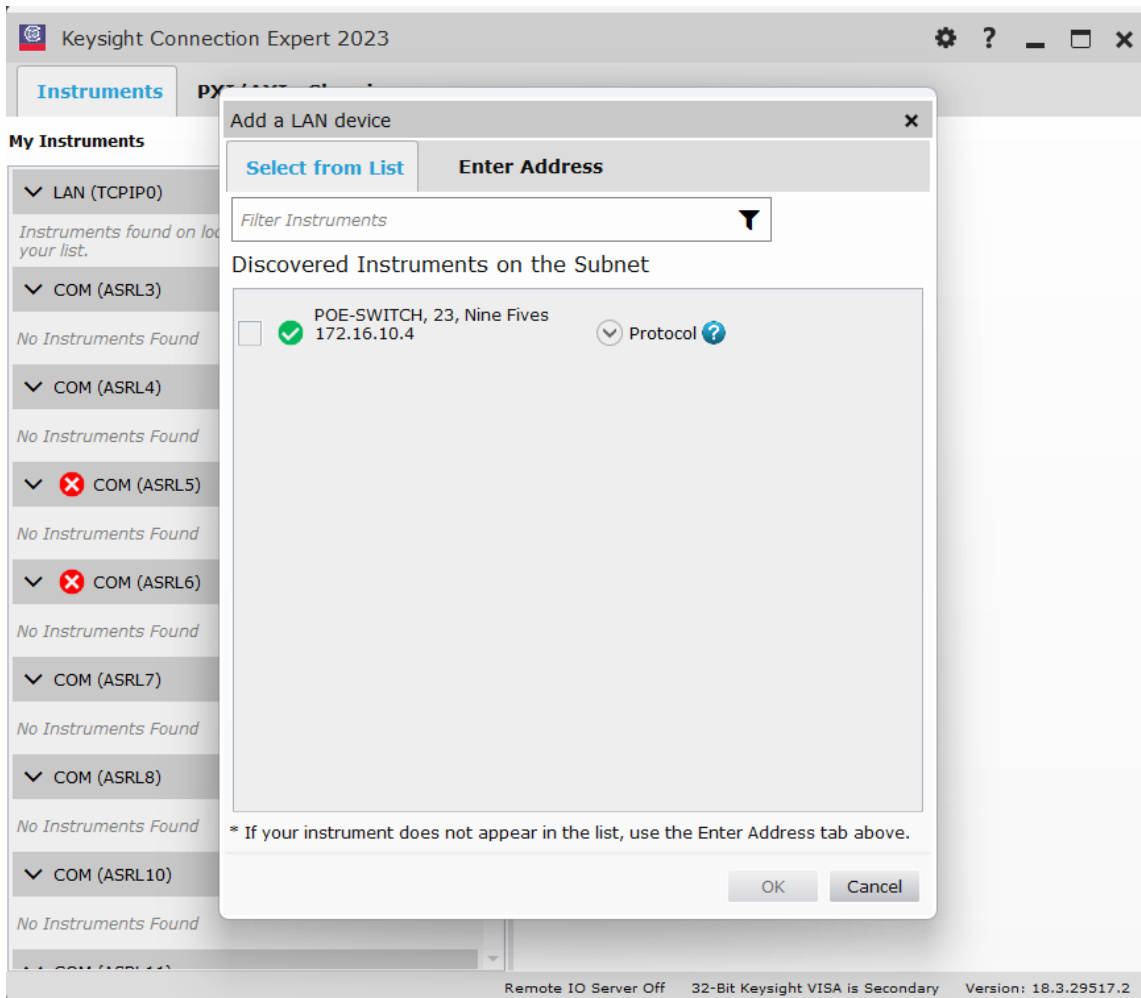


Figure 6: Device Discovery via mDNS

HTTP WEB INTERFACE (WEBUI)

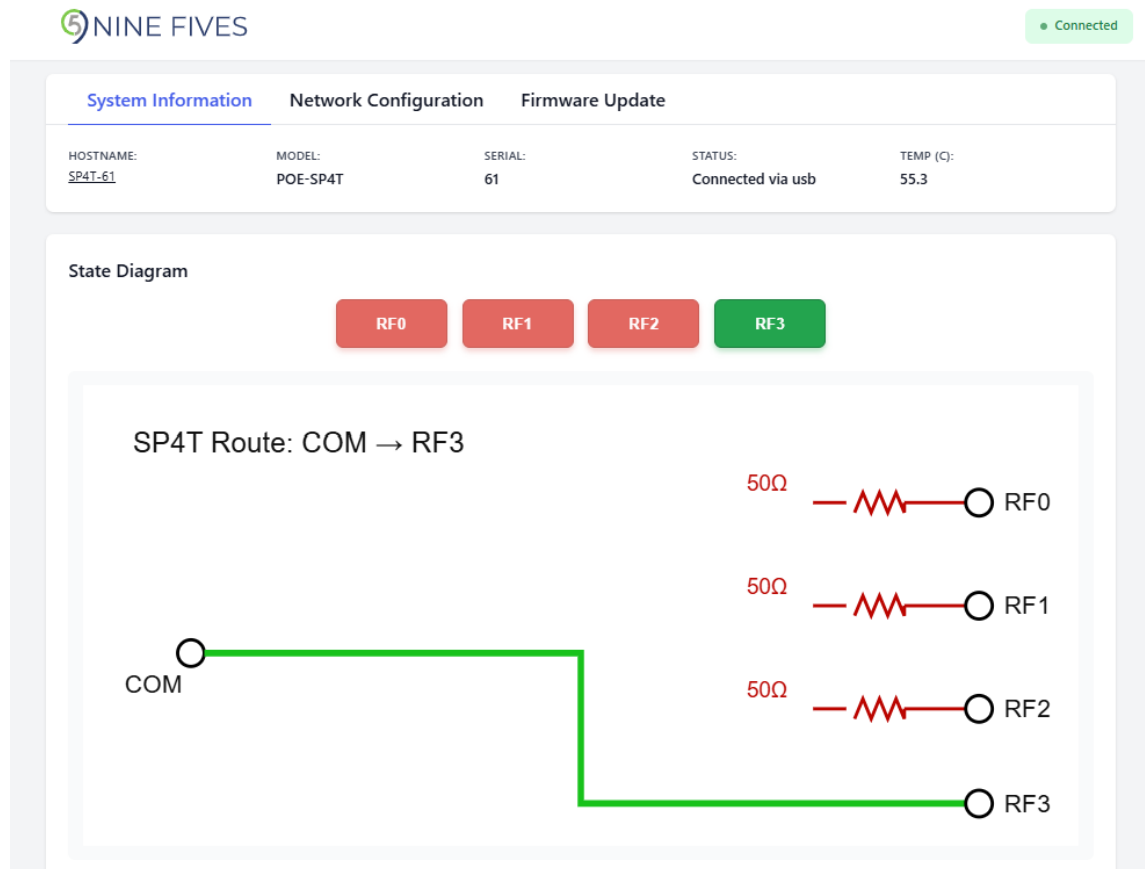


Figure 7: Web Interface (WebUI)

SCPI COMMANDING

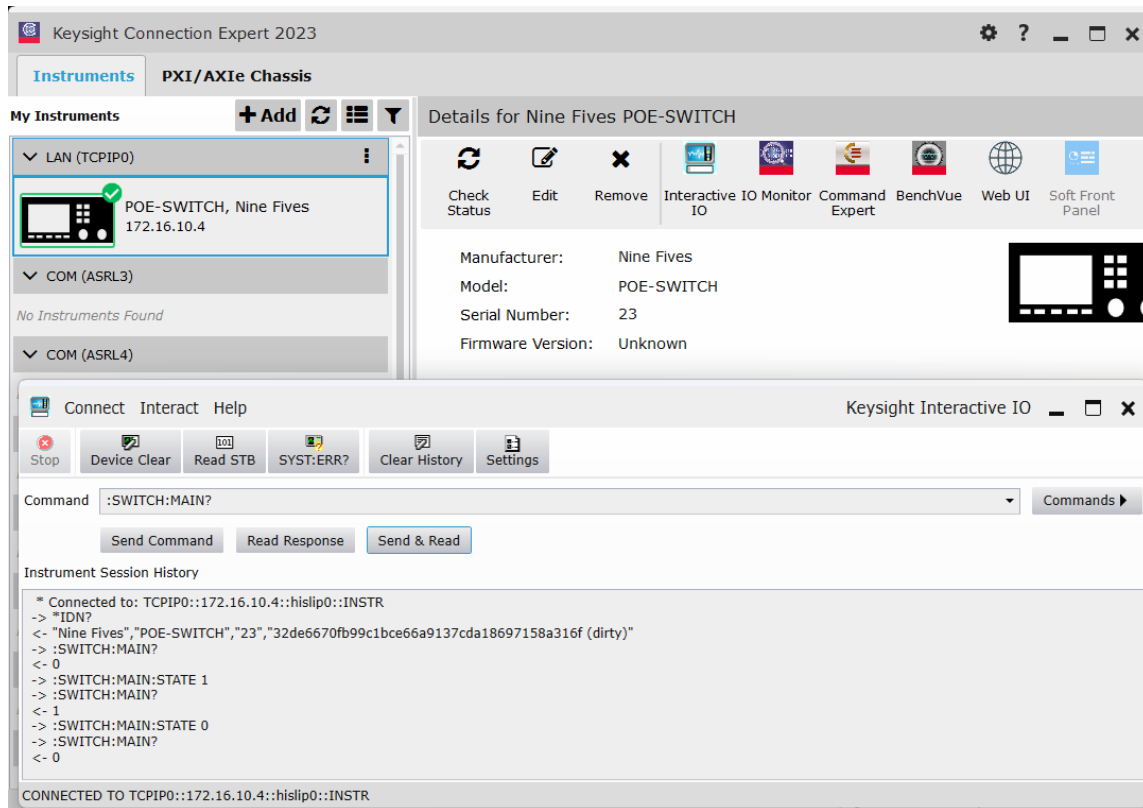


Figure 8: SCPI Commanding

COMPATIBLE WITH PYTHON

SCPI via PyVISA

```

>>> import pyvisa; rm = pyvisa.ResourceManager()
>>> sw = rm.open_resource(rm.list_resources()[0])
>>> sw.query('*IDN?')
'"Nine Fives","POE-SP4T","61",...\\n'
>>> sw.write('SWITCH:MAIN:STATE 3')
>>> sw.query('SWITCH:MAIN:STATE?')
'3\\n'
  
```

REST API via Requests

```

>>> import requests
>>> url = 'http://poe-sp4t-61.local/api/switch'
>>> requests.get(url).json()
{'state': 0}
>>> requests.post(url, json={'state': 3})
<Response [200]>
>>> requests.get(url).json()
{'state': 3}
  
```