

Copper Mountain Technologies Product Catalog



COPPER MOUNTAIN®
TECHNOLOGIES



EXTEND YOUR REACH®  WWW.COPPERMOUNTAINTECH.COM

Copper Mountain Technologies' VNAs



- S-parameter measurement solutions from 9 kHz to 1 THz
- VNAs compatible with third-party extenders up to 1 THz
- Measured S-parameters from S_{11} to S_{1616}
- Dynamic range as high as 152 dB typ. (10 Hz IF bandwidth)
- Measurement speeds as fast as 10 μ s per point
- Windows® and Linux® OS

Linux® is the registered trademark of Linus Torvalds in the U.S. and other countries.

Copper Mountain Technologies' VNA Product Line

Maximum Frequency Limit									
CMT VNAs	1.5 GHz	3.5 GHz	4.5 GHz	6 GHz	6.5 GHz	9 GHz	14 GHz	18 GHz	22 GHz
1-Port				□			□		
2-Ports	Standard	□*	□		□	□		□	□
	DRA								□
	Fx								□
4+ Ports						□			
Legend: * - 75 Ohm VNA, DRA — Direct Receiver Access; Fx — Frequency Extension Compatible									

Frequency Extension Modules									
	1.85mm NMD	WR15 (V Band)	WR12 (E Band)	WR10 (W Band)	WR8 (F Band)	WR6.5 (D Band)	WR5.1 (G Band)	WR4.3	WR3.4 +
	20 to 55 GHz	50 to 75 GHz	60 to 90 GHz	75 to 110 GHz	90 to 140 GHz	110 to 170 GHz	140 to 220 GHz	170 to 260 GHz	220 to 1 THz
9 GHz VNA Compatible		□	□	□	□	□			
Third-Party Extenders*	□	□	□	□	□	□	□	□	□

*Only compatible with BFX-02 or 22 GHz VNAs

Software Features of CMT VNAs

Our software can be downloaded free from our website, used on an unlimited number of PCs using either Windows or, for certain models, Linux operating systems, and enables easy VNA integration with other software applications and automation.

Included software features:

- Time domain and gating conversion
- Frequency offset mode
- Vector mixer calibration measurements
- Embedding and de-embedding
- Limit testing
- Power scanning
- Compression point recognition

**Value Series VNAs do not include time domain, mixer measurements, or advanced calibration*



Learn more about the demo software version you can download on any computer for free at any time from the Copper Mountain Technologies' website

Software Plug-ins

The VNA software is extended by many plug-ins that increase the functionality. There are a number of plug-ins that you can download for free on the CMT website, like the third Order Intercept plug-in, to help characterize the linearity of the device under test.

Paid software plug-ins like Automatic Fixture Removal (AFR) and Manufacturing Test plug-in are also available to simplify measurement workflows.

Automatic Fixture Removal (AFR) VNA software plug-in enables the measurement of a wide range of components through comprehensive methods tailored to specific fixture properties. It can simplify measurements made on fixtures by de-embedding the fixture effects.

The **Manufacturing Plug-in** provides consistency for test settings and consistency in measurement processes. Automatically archive tests into a network folder for reporting and analysis. The plug-in template can be used, or it is easily and readily customizable.



Learn more about the software plug-ins on page 4 of the catalog or see more information about all of them on our website

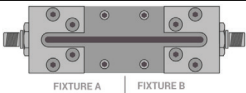
VNA Software Plug-Ins

Automatic Fixture Removal Plug-in

Automatic Fixture Removal (AFR) is an intuitive software plug-in that is used to accurately measure hard to access devices, such as SMD sized components mounted on a fixture by de-embedding the fixture effects.

The AFR VNA software plug-in enables the measurement of a wide range of components through comprehensive methods tailored to specific fixture properties.

The wizard-like interface is easy to use and is compatible with all CMT full 2-port VNAs.



Manufacturing Test Plug-in

Manufacturing Test Plug-in supports incorporating VNA software into automated manufacturing process.

Using the manufacturing test plug-in can streamline production test processes, ensure consistency of test process across multiple operators and workstations, easily create and manage pass/fail limits across multiple workstations, organize test results for subsequent retrieval and analysis, and adapt to any specific production test process and QMS requirements.

VNA Series Comparison

1-Port VNAs/Reflectometers

Handheld cable and antenna analyzers up to 14 GHz that connect directly to the DUT without test cables and are easily integrated into existing test systems. These VNAs are a great fit for materials measurement applications and several 1-Port embedded module variants are available to integrate into sensing and materials measurement systems.

TR Series VNAs

Lightweight, affordable, and portable 2-port 1-path VNAs up to 3.5 GHz, ideal for field measurements and lab or production environments.

Value Series VNAs

High-performance 2-port VNAs up to 18 GHz, optimized for production and materials measurement. Unlike most CMT VNAs that come with a wide range of advanced software features, these models include only the essential functionalities tailored for production and materials testing, resulting in a more cost-effective solution.

Select Series VNAs

Portable, full-featured VNAs for R&D, production, and materials measurement with 2-port options available up to 18 GHz and multiport configurations from 6- to 16-ports up to 9 GHz. These VNAs include all the advanced software features and functionality, like time domain and gating.

Advanced Series VNAs

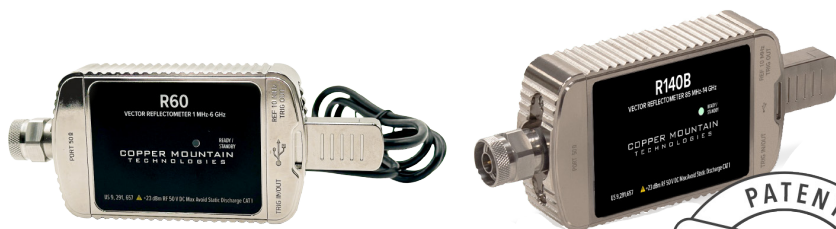
High-performance 2-port VNAs up to 22 GHz suitable for advanced applications like radar, satellite communications, and high-speed digital systems with direct receiver access and frequency extension compatible options available.

75 Ohm Measurement Solutions

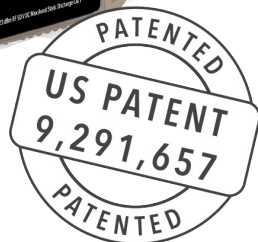
CMT offers the only native 75 Ohm VNA—for 2-port 4 GHz measurements, which can be paired with a 12-port 3 GHz Port Extender for multiport testing in broadband, telecom, cable, and RF applications. Matching pads and adapters enable 75 Ohm measurements with 50 Ohm VNAs.

1-Port VNA Series

Handheld cable and antenna analyzers up to 14 GHz that connect directly to the DUT without test cables.



**Directly connect the DUT to
a VNA without test cables**



R60

\$4,725



Frequency range: **1 MHz to 6 GHz**
Measurement Points: **2-100,001**
Time domain with gating standard

R140B

\$7,345



Frequency range: **85 MHz to 14 GHz**
Measurement Points: **2-100,001**
Time domain with gating standard

TR Series VNAs

Lightweight, affordable, and portable 2-port 1-path VNAs up to 3.5 GHz, ideal for field measurements and lab or production environments.



VTR0102

\$3,145



Frequency range: **50 MHz to 1.5 GHz**
Dynamic Range: **120 dB typ.** (10 Hz IFBW)
Measured parameters: **S11, S21**

VTR0302

\$4,195



Frequency range: **50 MHz to 3.5 GHz**
Dynamic Range: **120 dB typ.** (10 Hz IFBW)
Measured parameters: **S11, S21**

Value Series VNAs

High-performance 2-port VNAs up to 18 GHz, optimized for production and materials measurement and include only the essential functionalities tailored for production and materials testing.

**Value Series VNAs do not include time domain, mixer measurements, or advanced calibration*

V0402

\$9,995



Frequency range: **100 kHz to 4.5 GHz**
Dynamic Range: **135 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **25 μ s min. typ**
Power Range: **-50 dBm to +5 dBm**

V0602

\$10,995



Frequency range: **100 kHz to 6.5 GHz**
Dynamic Range: **130 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **25 μ s min. typ**
Power Range: **-50 dBm to +5 dBm**

V0902

\$13,645



Frequency range: **100 kHz to 9 GHz**
Dynamic Range: **130 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **25 μ s min. typ**
Power Range: **-50 dBm to +5 dBm**

M5180

\$21,995



Frequency range: **300 kHz to 18 GHz**
Dynamic Range: **135 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **30 μ s min. typ**

Select Series VNAs - 2- and 4-ports

Portable, full-featured VNAs for R&D, production, and materials measurement that include all the advanced software features and functionality, like time domain and gating.



SC0402

\$14,695



Frequency range: **9 kHz to 4.5 GHz**
Dynamic Range: **130 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **25 μ s min. typ**
Power Range: **-50 dBm to +5 dBm**

SC0602

\$16,795



Frequency range: **9 kHz to 6.5 GHz**
Dynamic Range: **130 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **25 μ s min. typ**
Power Range: **-50 dBm to +5 dBm**

SC0902

\$18,895



Frequency range: **9 kHz to 9 GHz**
Dynamic Range: **130 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **25 μ s min. typ**
Power Range: **-50 dBm to +5 dBm**

S5180B

\$29,395



Frequency range: **100 kHz to 18 GHz**
Dynamic Range: **133 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **24 μ s min. typ**
Available Software Option: Pulse Modulation

S5180B Pulse Modulation Software Option

\$2,635

SN0904

\$29,995



Frequency range: **300 kHz to 9 GHz**
Dynamic Range: **125-140 dB typ.** (depending on freq. range)
Measurement Time per Point: **24 μ s per point**
Power Range: **-45 dBm to +10dBm**

Select Series VNAs - 6+ Ports



- First true multiport USB VNA
- Organic extension of Standard Series without bulky RF switch
- Better calibration, easier automation, and faster measurement speed
- Fits into the standard 19" test bay

SN0906

\$45,675

Frequency range: **300 kHz to 9 GHz**
Number of Ports: **6**
Dynamic Range: **140 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **24 μ s min. typ**

SN0908

\$60,895

Frequency range: **300 kHz to 9 GHz**
Number of Ports: **8**
Dynamic Range: **140 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **24 μ s min. typ**

SN0910

\$73,496

Frequency range: **300 kHz to 9 GHz**
Number of Ports: **10**
Dynamic Range: **140 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **24 μ s min. typ**

SN0912

\$83,995

Frequency range: **300 kHz to 9 GHz**
Number of Ports: **12**
Dynamic Range: **140 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **24 μ s min. typ**

SN0914

\$88,195

Frequency range: **300 kHz to 9 GHz**
Number of Ports: **14**
Dynamic Range: **140 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **24 μ s min. typ**

SN0916

\$94,495

Frequency range: **300 kHz to 9 GHz**
Number of Ports: **16**
Dynamic Range: **140 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **24 μ s min. typ**

Advanced Series VNAs: 22 GHz

Advanced VNAs for R&D that offer capabilities beyond standard software options

A2202	<i>Base Model</i>	\$49,870
	Frequency Range: 100 kHz to 22 GHz Dynamic Range: 135 dB typ. (10 Hz IFBW) Measured Parameters: S11, S21, S12, S22 Measurement Time per Point: 12 µs typ	
A2202-D	<i>Direct Receiver Access</i>	\$54,595
	Frequency Range: 100 kHz to 22 GHz Dynamic Range: 135 dB typ. (10 Hz IFBW) Measured Parameters: S11, S21, S12, S22 Measurement Time per Point: 12 µs typ	
A2202-Fx	<i>Frequency Extension Compatible</i>	\$56,695
	Frequency Range: 100 kHz to 22 GHz Dynamic Range: 135 dB typ. (10 Hz IFBW) Measured Parameters: S11, S21, S12, S22 Measurement Time per Point: 12 µs typ	
A2202-DFx	<i>Direct Receiver Access and Frequency Extension Compatible</i>	\$58,795
	Frequency Range: 100 kHz to 22 GHz Dynamic Range: 135 dB typ. (10 Hz IFBW) Measured Parameters: S11, S21, S12, S22 Measurement Time per Point: 12 µs. typ	

BFx Frequency Extension Base

Base for running frequency extension measurements



BFx-02-330

\$24,995



Pair with frequency extenders up to 330 GHz
RF Output power: +16 dBm

BFx-02-500

\$32,495



Pair with frequency extenders up to 500 GHz
RF Output power: +16 dBm

BFx-02-750

\$39,995



Pair with frequency extenders up to 750GHz
RF Output power: +16 dBm

BFx-02-1000

\$47,495



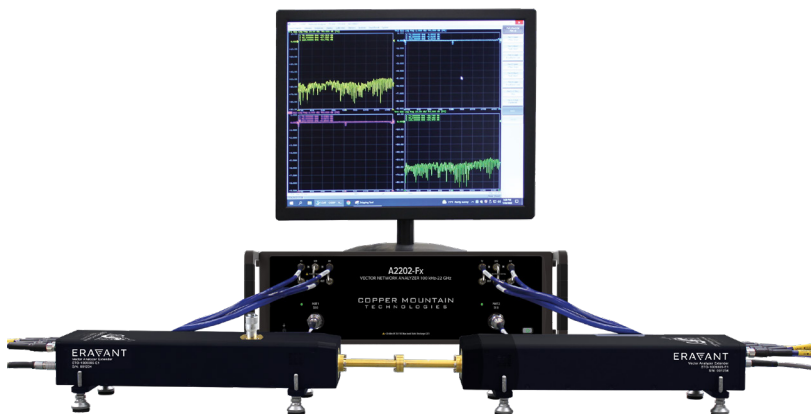
Pair with frequency extenders up to 1 THz
RF Output power: +16 dBm

Can be used with extenders of your choice.

BFx-02 Frequency Extension Base provides mmWave measurements without a stand-alone VNA. It's a significantly more affordable, purpose-built solution optimized for testing environments that require repeat measurements with high throughput.

mmWave Solutions

Cost-effective millimeter wave frequency extension system

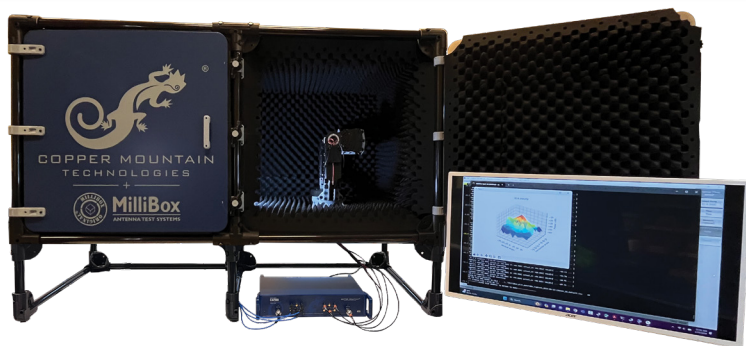


Copper Mountain Technologies' mmWave measurement systems deliver unmatched adaptability, combining affordable prices with reliable performance. We have mmWave testing solutions engineered for a full breadth of applications in R&D, production, automated test equipment (ATE), and OEM integration. Our high frequency measurement options include **Advanced Series VNA models with frequency extension compatibility** and our patent pending **BFx-02 Frequency Extension base for S-Parameters measurement**.

- Compatible with ANY third-party extenders.
- Highly accurate, reliable, and stable metrology-grade measurements.
- No onboard computer, avoiding software obsolescence for reliable long-term use.
- License-free software included with purchase.
- Manufacturing Test software plug-in available for integration into production test systems.
- Commonly used for non-destructive testing (NDT) applications.

As with all CMT solutions, mmWave measurement systems are backed by expert engineers who can help you design and perform unique and complex measurements.

mmWave OTA Antenna Test System



Over-the-Air Antenna Measurement Chamber Solution from 50 GHz to 220 GHz

A turnkey solution for customers needing to make far-field antenna measurements for bands from WR-15 to WR-05. The over-the-air (OTA) antenna measurement chamber solution features a wide array of configurations depending on the user's anechoic chamber requirements, antenna size, desired frequency range, and antenna positioner functionality.

CMT has partnered with MilliBox and Eravant to offer a complete OTA antenna measurement chamber solution for engineers needing to make measurements from 50 to 220 GHz. Each OTA bundle can be configured with a set of 2, 3, or 4 mmWave anechoic chamber cubes.

- 2 chamber cubes, up to 80 cm far field
- 3 chamber cubes, up to 158 cm far field
- 4 chamber cubes, up to 235 cm far field

Each system includes a 3D antenna positioner (Gimbal), sophisticated but intuitive measurement software, and other necessary accessories to fully set up a chamber for far field antenna measurements.

The measurement system is anchored by CMT's Fx compatible VNAs and a set of (1) Tx Frequency Extender and (1) Rx Frequency Extender in collaboration with Eravant. The extenders are available in the following frequencies:

- WR-15: 50 to 75 GHz
- WR-12: 60 to 90 GHz
- WR-10: 75 to 110 GHz
- WR-08: 90 to 140 GHz
- WR-06: 110 to 170 GHz
- WR-05: 150 to 220 GHz

These comprehensive mmWave solution bundles provide a low-cost, space-saving solution that is ideal for millimeter wave antenna testing applications across automotive radar, aerospace, satellite communication, and similar industries.

The OTA bundle is an all-in-one solution that provides everything needed to accurately test a large number of mmWave antennas. The combination of affordability and portability will enable multiple systems in a single lab environment for users to simultaneously test multiple antennas."

75 Ohm VNA Solutions

Native 75 Ohm measurement solutions up to 4 GHz and 12-ports



SC7540

\$13,645



Frequency range: **100 kHz to 4 GHz**
Dynamic Range: **137 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **24 μ s min. typ**
Power Range: **-50 dBm to +10 dBm**

PE0312-75 Port Extender

\$20,995



Frequency range: **3 MHz to 3 GHz**
Number of Ports: **12**
Switching time: **5 μ s**
Port to port isolation: **85 dB (95 dB typ.)**
Insertion loss: **<5 dB**
Compatible with 75 Ohm VNAs and 50 Ohm VNAs with Adapters/
Matching Pads
Includes frame to mount SC7540 VNA and (2) 1 ft interconnect cables

Embeddable Modules



Copper Mountain Technologies' embeddable modules are a solution for integrating precise S-Parameter measurement directly into your product. Rather than offering hardware with fixed housing and specifications, we collaborate with you to design a module tailored to your exact application needs.

Traditional VNAs are too large and expensive to embed in volume production, but the scalability of these modules delivers a much more optimized and cost-effective solution. Our embeddable modules deliver only the features you need, making them practical for volume integration. Whether you require a narrow frequency range, a single repeatable measurement, or operation in a challenging environment, our solution adapts to your requirements.

With flexible form factors, embedded modules are designed to fit seamlessly into your system, while rapid, standardized data transmission ensures easy integration with your existing software. Designed to scale and adapt, Copper Mountain Technologies' embeddable modules give you reliable S-Parameter integration that is affordable, accurate, and built to fit your vision and your budget.

Application Solutions

Materials Measurement Solutions

Copper Mountain Technologies strives to support customers using vector network analyzers outside of traditional uses for the instruments. That includes many customers using a VNA for materials measurements.

We have identified two partner companies that are experts in materials measurements, Compass Technology Group and Swissto12. CMT can work together with these partners to find the best solution for engineers needing to make materials measurements.



Compass Technology Group has a range of measurement solutions from focused beam to resonate measurements to specialized probes and more.



Swissto12 is a company with a solution called MCK, or Materials Characterization Kit. This system can measure dielectric properties between 25 and 1100 GHz. The MCK can measure solids, or even liquids or powders with the optional case.



Contact a Copper Mountain Technologies representative to discuss the best options for each unique materials measurement solution.

Calibration Kits and Accessories

Automatic Calibration Modules

ACM2506 \$3,675



50 Ohm
Frequency range:
20 kHz to 6.5 GHz

ACM2509 \$4,195



50 Ohm
Frequency range:
20 kHz to 9 GHz

ACM2202 \$7,875



50 Ohm
Frequency range:
100 kHz to 22 GHz

ACM2543 \$15,745



50 Ohm
Frequency range:
10 MHz to 44 GHz

ACM4509 \$8,605



50 Ohm
Frequency range:
100 kHz to 9 GHz

ACM4520 \$15,225



50 Ohm
Frequency range:
100 kHz to 20 GHz

ACM2708 \$4,195



75 Ohm
Frequency range:
20 kHz to 8 GHz

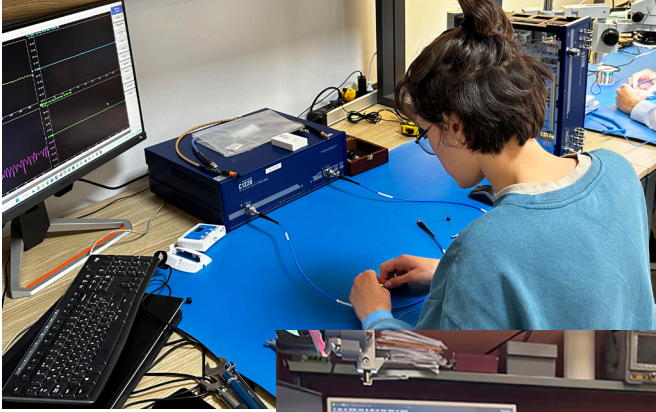
Mechanical Calibration Kits

CMT Mechanical Calibration Kits are available from DC to 50 GHz in SOL and SOLT models.

Accessories

Copper Mountain Technologies also offers an extensive range of 50 Ohm and 75 Ohm accessories, including cables, matching pads, adapters, and other items to complete your test setup.

Accredited Calibration Labs



Cyprus Calibration Laboratory



Indianapolis Calibration Laboratory

Periodic verification is used to check the instrument to ensure that it is operating within its specifications. The interval should be determined by your organization's quality policy.

Our Indianapolis and Cyprus calibration laboratories are accredited in accordance with the recognized international standard ISO/IEC 17025 (2017) and meets the requirements of ANSI/NCSL Z540-1994-1.



Alternatively, our network analyzers and calibration kits can be calibrated by any ISO17025-accredited and Z540-1 compliant calibration lab worldwide. The VNA Performance Test (VNAPT) software application is not required but is available for third-party laboratories without restriction.





Copper Mountain Technologies develops innovative and robust RF test and measurement solutions for engineers all over the world. The company was created in 2011 and is based in Indianapolis, IN with R&D center and service center in Cyprus, and with sales offices in Singapore, United Kingdom, and Miami. Copper Mountain Technologies' world-class metrology and engineering resources work as an extension of your team.

Copper Mountain Technologies' VNAs include an RF measurement module and a software application that runs on an external Windows or Linux PC, laptop, or tablet, connecting to the measurement hardware via USB interface. The result is a faster, more effective test process that fits into the modern workspace.

The engineers at Copper Mountain Technologies extend their reach by using the latest available technologies and components, and continuously improving product selection and service. The goal is to help engineers and developers extend their reach by equipping them with cutting-edge test instruments that are small but accurate, lightweight, and affordable.

 ***We're creative. We're problem solvers.***



HEADQUARTERS:
631 E. New York Street
Indianapolis, IN 46202

United States/Canada: +1.317.222.5400
info@coppermountaintech.com

CMTEUSupport/CalibrationFacility: +357.26.221441
info@coppermountaintech.com

Latin America Sales: +1.954.495.3459
info-la@coppermountaintech.com

APAC Sales: +65.68.66.3339
info-asia@coppermountaintech.com

EMEA Sales: +44 75 03 69 21 13
info-emea@coppermountaintech.com