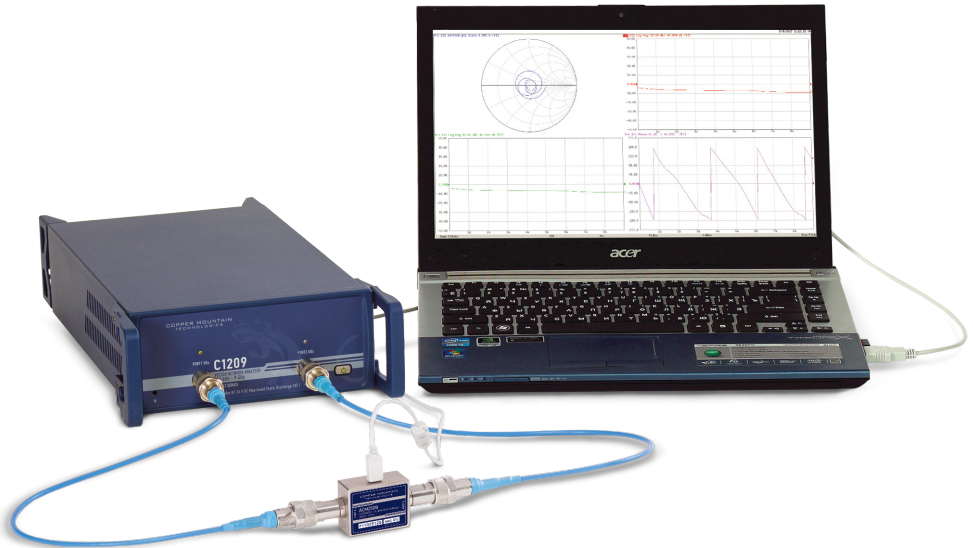




COPPER MOUNTAIN[®]
TECHNOLOGIES



Copper Mountain Technologies' VNAs

- S-parameter measurement solutions from 9 kHz to 110 GHz
- VNAs compatible with third-party extenders up to 330 GHz
- Measured parameters from S_{11} to S_{44}
- 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.

EXTEND YOUR REACH[®]

1-Port VNA Series

Lab-grade performance in a handheld cable and antenna analyzer



R60



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

R140



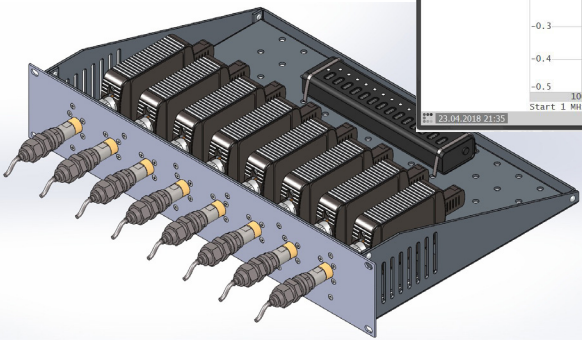
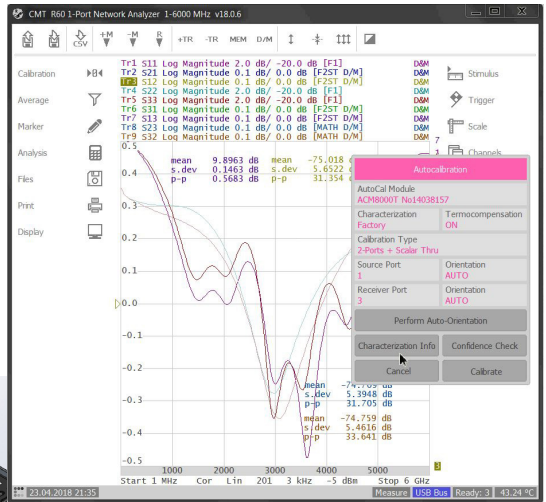
Frequency range: **85 MHz to 14 GHz**
Measurement Points: 2-100,001
Time domain with gating standard

R180



Frequency range: **1 MHz to 18 GHz**
Measurement Points: 2-100,001
Time domain with gating standard
Optional: IP54 Rating

Multiport Network Analysis Solution



RNVNA

The innovative RNVNA software allows for multiport use with the 1-Port CMT network analyzers. The RNVNA software application runs on a user's desktop, laptop, or tablet PC and links multiple reflectometers together into a customizable multiport network analysis solution. Utilizing the portability, versatility, and low cost of existing USB reflectometers and taking advantage of the convenience and ubiquity of USB connections, RNVNA allows a user access to a portable, modular multiport network analysis solution without the need for external RF switches or other hardware. Users can use just two reflectometers for two-port solutions or up to 16 reflectometers for a 16-port network analysis solution. The RNVNA software application is compatible with Copper Mountain Technologies' line of existing single-port USB VNAs, allowing for a frequency range from 1 MHz up to 18 GHz. All models being used for RNVNA must be the same. RNVNA uses existing USB reflectometer functionality to take vector reflection parameters and scalar transmission parameters.

Compact VNA Comparison

TR Series

The TR Series Compact VNAs deliver lab grade performance in a compact package and perform 2-port 1-path measurements. The software includes all the features engineers have come to expect included: time domain and gating conversion, segmented frequency sweeps, linear/logarithmic sweeps, power sweeps, multiple trace formats, 16 channels max. with up to 16 traces each, marker math, and limit tests.

M Series

The M Series Compact VNAs deliver metrology-grade performance in a more economical package that excludes a number of advanced features: Vector Mixer Calibration, TRL Calibration, Frequency Offset mode, and Time Domain.

S Series

The S Series Compact VNAs deliver lab grade performance in a compact package and perform 2-port 2-path measurements. The software includes all the features engineers have come to expect included: time domain and gating conversion, segmented frequency sweeps, linear/logarithmic sweeps, power sweeps, multiple trace formats, 16 channels max. with up to 16 traces each, marker math, and limit tests.

SC Series

The SC Series Compact VNAs deliver lab grade performance with higher speed, more dynamic range, and higher output power in a compact package. These instruments perform 2-port 2-path measurements. The software includes all the features engineers have come to expect included: time domain and gating conversion, segmented frequency sweeps, linear/logarithmic sweeps, power sweeps, multiple trace formats, 16 channels max. with up to 16 traces each, marker math, and limit tests.

Compact VNA - TR Series

Full feature performance in a compact package for 2-port 1-path measurements

TR1300/1



Frequency range: **300 kHz to 1.3 GHz**
Dynamic Range: **135 dB typ.** (10 Hz IFBW)
Measured parameters: S_{11} , S_{21}

Compact VNA - M Series

Economy VNAs for 2-port 2-path measurements



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

M5045



Frequency range: **300 kHz to 4.5 GHz**
Dynamic Range: **130 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **70 µs min. typ**

M5065



Frequency range: **300 kHz to 6.5 GHz**
Dynamic Range: **130 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **70 µs min. typ**

M5090



Frequency range: **300 kHz to 8.5 GHz**
Dynamic Range: **130 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **70 µs min. typ**

M5180



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

Compact VNA - S Series

Full feature performance in a compact package for 2-port 2-path measurements

S5045



Frequency range: **9 kHz to 4.5 GHz**
Dynamic Range: **130 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **70 μ s min. typ**

S5065



Frequency range: **9 kHz to 6.5 GHz**
Dynamic Range: **130 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **70 μ s min. typ**

S5085



Frequency range: **9 kHz to 8.5 GHz**
Dynamic Range: **130 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **70 μ s min. typ**

S5180



Frequency range: **100 kHz to 18 GHz**
Dynamic Range: **135 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **30 μ s min. typ**

S5243



Frequency range: **10 MHz to 43.5 GHz**
Dynamic Range: **140 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **15 μ s min. typ**

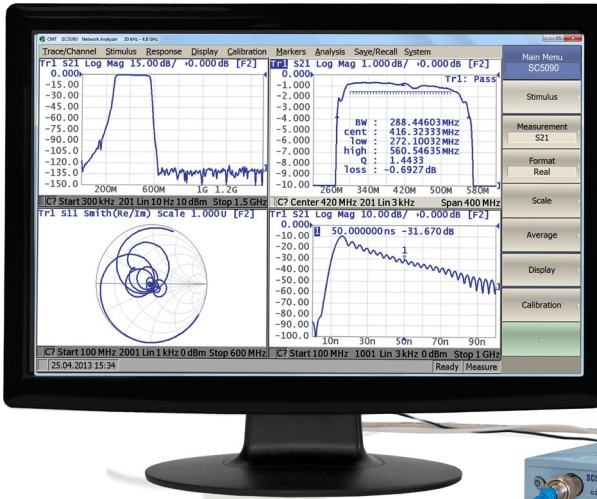
S7530



75 Ohm Impedance
Frequency range: **20 kHz to 3.0 GHz**
Dynamic Range: **123 dB typ.** (10 Hz IFBW)
Measurement Time per Point: **250 μ s min. typ**

Compact VNA - SC Series

Compact lab grade VNA with higher performance



SC5065



Frequency range: **300 kHz to 6.5 GHz**
Dynamic Range: **140 dB typ.** (10 Hz IFBW)
Measured parameters: $S_{11}, S_{21}, S_{12}, S_{22}$
Measurement Time per Point: **16 μ s min. typ**

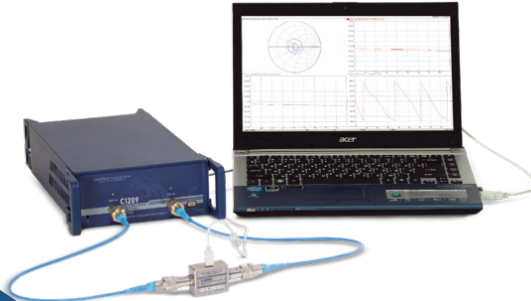
SC5090



Frequency range: **300 kHz to 9 GHz**
Dynamic Range: **140 dB typ.** (10 Hz IFBW)
Measured parameters: $S_{11}, S_{21}, S_{12}, S_{22}$
Measurement Time per Point: **16 μ s min. typ**

Cobalt Series - 9 GHz

Industry-leading dynamic range and sweep speed



C1209

Base Model



Frequency Range: **100 kHz to 9 GHz**
Dynamic Range: **152 dB typ.** (10 Hz IFBW)
Measured Parameters: $S_{11}, S_{21}, S_{12}, S_{22}$
Measurement Time per Point: **10 μ s min. typ**

C2209

Direct Receiver Access



Frequency Range: **100 kHz to 9 GHz**
Dynamic Range: **152 dB typ.** (10 Hz IFBW)
Measured Parameters: $S_{11}, S_{21}, S_{12}, S_{22}$
Measurement Time per Point: **10 μ s min. typ**

C1409

Base Model



Frequency Range: **100 kHz to 9 GHz**
Dynamic Range: **152 dB typ.** (10 Hz IFBW)
Measured Parameters: S_{11}, \dots, S_{44}
Measurement Time per Point: **10 μ s min. typ**

C2409

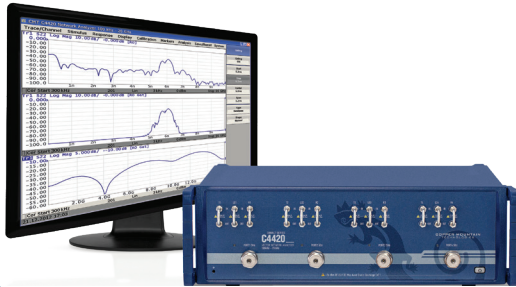
Direct Receiver Access



Frequency Range: **100 kHz to 9 GHz**
Dynamic Range: **152 dB typ.** (10 Hz IFBW)
Measured Parameters: S_{11}, \dots, S_{44}
Measurement Time per Point: **10 μ s min. typ**

Cobalt Series - 20 GHz

Industry-leading dynamic range and sweep speed



C1220

Base Model



Frequency Range: **100 kHz to 20 GHz**
Dynamic Range: **135 dB typ.** (10 Hz IFBW)
Measured Parameters: $S_{11}, S_{21}, S_{12}, S_{22}$
Measurement Time per Point: **12 μ s min. typ**

C2220

Direct Receiver Access



Frequency Range: **100 kHz to 20 GHz**
Dynamic Range: **135 dB typ.** (10 Hz IFBW)
Measured Parameters: $S_{11}, S_{21}, S_{12}, S_{22}$
Measurement Time per Point: **12 μ s min. typ**

C1420

Base Model



Frequency Range: **100 kHz to 20 GHz**
Dynamic Range: **133 dB typ.** (10 Hz IFBW)
Measured Parameters: $S_{11} \dots S_{44}$
Measurement Time per Point: **12 μ s min. typ**

C2420

Direct Receiver Access



Frequency Range: **100 kHz to 20 GHz**
Dynamic Range: **135 dB typ.** (10 Hz IFBW)
Measured Parameters: $S_{11} \dots S_{44}$
Measurement Time per Point: **12 μ s min. typ**

Cobalt Series - Frequency Extension Compatible

Base VNAs for a cost-effective, scalable frequency extension solution

20 GHz Cobalt instruments can be used with many different frequency extension modules. Copper Mountain Technologies offers a Booster Set in cases when frequency extenders are located at a distance from the VNA or require amplification of the RF, LO and IF signals, for example with third party frequency extenders. Booster Set can be used with 9 GHz and 20 GHz instruments. It increases the upper limit of RF and LO signals' output power to 13 dBm. Booster Set includes module, external amplifiers, and adapters. Connecting cables depend on required length and are not a part of the set.

C4209



Frequency Range: **100 kHz to 9 GHz**
Dynamic Range: **152 dB typ.** (10 Hz IFBW)
Measured Parameters: $S_{11}, S_{21}, S_{12}, S_{22}$
Measurement Time per Point: **10 μ s min. typ**

C4220



Frequency Range: **100 kHz to 20 GHz**
Dynamic Range: **135 dB typ.** (10 Hz IFBW)
Measured Parameters: $S_{11}, S_{21}, S_{12}, S_{22}$
Measurement Time per Point: **12 μ s min. typ**

C4409



Frequency Range: **100 kHz to 9 GHz**
Dynamic Range: **152 dB typ.** (10 Hz IFBW)
Measured Parameters: S_{11}, \dots, S_{44}
Measurement Time per Point: **10 μ s min. typ**

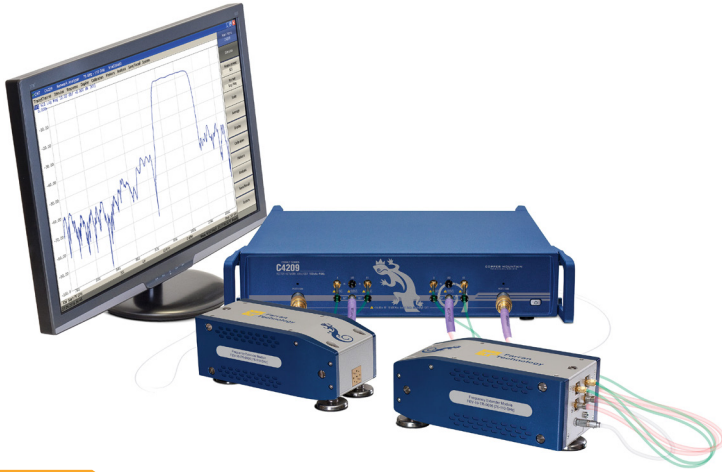
C4420



Frequency Range: **100 kHz to 20 GHz**
Dynamic Range: **135 dB typ.** (10 Hz IFBW)
Measured Parameters: S_{11}, \dots, S_{44}
Measurement Time per Point: **12 μ s min. typ**

CobaltFx Extender Modules

Cost-effective millimeter wave frequency extension system



FET1854



Frequency range: **18 GHz to 54 GHz**
Measured parameters: $S_{11}, S_{21}, S_{12}, S_{22}$
System Dynamic Range: **113 dB typ.** (10 Hz IFBW)

FEV - 15



Frequency range: **50 GHz to 75 GHz**
Measured parameters: $S_{11}, S_{21}, S_{12}, S_{22}$
System Dynamic Range: **120 dB typ.** (10 Hz IFBW)

FEV - 12



Frequency range: **60 GHz to 90 GHz**
Measured parameters: $S_{11}, S_{21}, S_{12}, S_{22}$
System Dynamic Range: **110 dB typ.** (10 Hz IFBW)

FEV - 10



Frequency range: **75 GHz to 110 GHz**
Measured parameters: $S_{11}, S_{21}, S_{12}, S_{22}$
System Dynamic Range: **110 dB typ.** (10 Hz IFBW)

Application Solutions

Extend Your Reach™ Beyond the Box



UNIVERSITY KIT

Copper Mountain Technologies' University Kit is a complete solution designed to assist educational institutions as they teach RF skills to engineering students. The kit has three options of vector network analyzer models and includes the calibration module, a few devices under test (DUTs), and accessories necessary for an array of common VNA measurements. CMT's University Kit is an affordable way to outfit your lab with RF measurement equipment, providing a practical introduction to vector network analysis. It combines RF theory with a robust hands-on VNA experience.

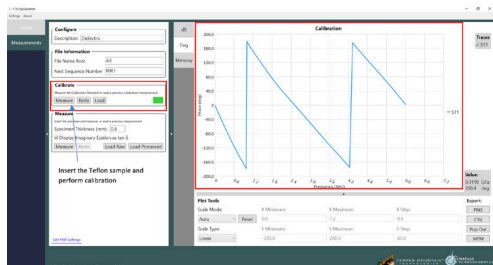


SMD TEST SOLUTION

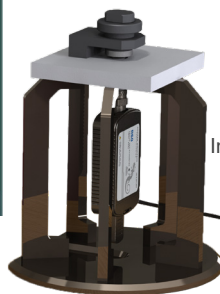
SMD Test Solution allows for measurement of SMD components over a wide frequency range from 100 kHz to 20 GHz. The solution unites hardware (VNA, fixtures, tools) and software in a coherent and understandable way to make an intricate RF measurement with metrological quality and precision. SMD Test Solution uses fixtures with established topology to measure discreet resistors, capacitors, or inductors. The test doesn't require soldering of components to make measurements, which saves time and is non-destructive. It is useful for design and test of components used in 5G communications and smart IoT devices.

Application Solutions

Extend Your Reach™ Beyond the Box



Simple one step calibration using a Teflon sample



In collaboration with

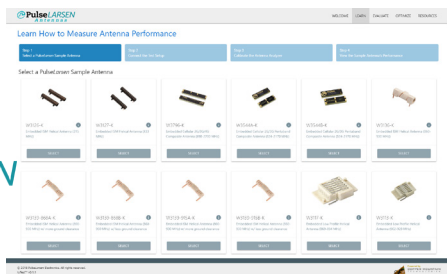


EPSILOMETER

This solution was developed in collaboration with the leading provider of materials measurement solutions and systems, Compass Technology Group. It represents a new measurement method based on the parallel plate capacitor concept, which determines complex permittivity of dielectric sheets with thicknesses up to about 3 mm. Unlike the conventional capacitive measurement devices, this new method uses a greatly simplified calibration procedure. It solves the parasitic impedance limitations in conventional capacitor methods by explicitly modeling the fixture with a full-wave computational electromagnetic code.



In collaboration with



IoTTEST™

IoTtest™ Antenna Testing Kit helps designers of IoT devices select and test the right antenna for the project. The IoTtest™ kit includes an R60 Antenna Analyzer, antenna testing software, sample antennas, and cable assembly to connect antennas to the R60 Analyzer. IoTtest™ software is easy to use and walks you step-by-step through connecting the antenna, calibrating the R60 Analyzer, testing sample antennas in the kit, and comparing your test results with memory traces for each sample antenna saved in the software.

Calibration Kits

Automatic Calibration Modules

Copper Mountain Technologies' **Automatic Calibration Modules** deliver fast and accurate electronic VNA calibration. ACMs are available in 2- and 4-port configurations from 20 kHz to 20 GHz and a 75 Ω 2-port model to 4 GHz.

ACM2506



50 Ohm
Frequency range:
20 kHz to 6.5 GHz

ACM4000T



75 Ohm
Frequency range:
20 kHz to 4 GHz

ACM2509



50 Ohm
Frequency range:
20 kHz to 9 GHz

ACM4509



50 Ohm
Frequency range:
100 kHz to 9 GHz

ACM2520



50 Ohm
Frequency range:
100 kHz to 20 GHz

ACM4520



50 Ohm
Frequency range:
100 kHz to 20 GHz

ICM1520



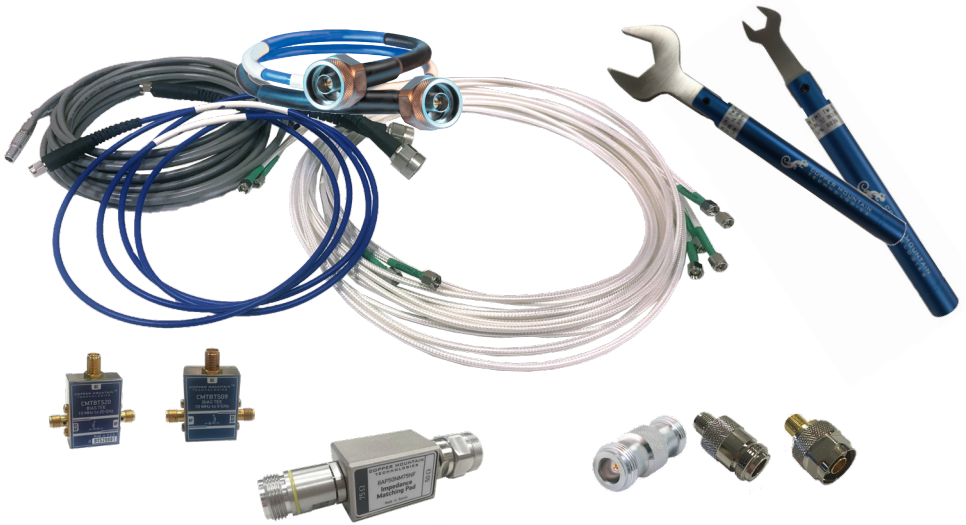
**In-Line Calibration
Module**
Frequency range:
100 kHz to 20 GHz

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 accessories, including **cables, matching pads, adapters, bias tees** and other items to complete your test setup.



Customization

When your system includes network analysis and requires a custom VNA, our engineers will work with you to find the right solution:

- Ultra-compact, rack mountable or special size analyzer that would fit in your system
- Utilizes an external computer for data processing and analysis, storage and software integration with other systems
- Purpose-built software that integrates the VNA with other system components.

We have designed our analyzers for ease of customization, so we can deliver a high performing custom VNA solution at a lower cost than any other provider.

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 based in Indianapolis, IN 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.

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