

uCal™ Universal VNA Calibration Modules

Automated VNA Calibration

Accurate VNA calibration ensures reliable measurements by correcting systematic errors introduced by the measurement system, cables, and connectors.

Maury Microwave Universal VNA Calibration Modules (uCal) simplify and expedite VNA calibration by automating the use of calibration standards, reducing human error, and enabling accurate, repeatable results without manual intervention.



uCal integrates defined calibration standards, each individually characterized and stored in the onboard memory. Electronic switching allows rapid transitions between standards without disconnecting cables, minimizing human-induced errors like improper torque or connector wear.

uCal Advantages

- > **Speed:** Calibration is faster with no need to manually connect and disconnect standards.
- > **Accuracy:** Eliminates handling errors like connector inconsistencies and improper torquing.
- > **Ease of Use:** Requires minimal user interaction, making calibration simpler and accessible.
- > **Reliability:** Reduces wear and tear on VNA ports and connectors, prolonging their lifespan.
- > **Consistency:** Provides repeatable results across multiple calibration sessions and users.

VNA Communication & User Interface

uCal connects to the VNA via USB control interfaces. Calibration coefficients for each standard are pre-programmed into uCal and communicated to the VNA, either directly or through Maury Insight VNA calibration and measurement software.

The calibration process is controlled through Insight, providing a guided and user-friendly calibration routine, compatible with most VNA makes and models. Users only need to connect the uCal to the VNA ports, and the rest is handled automatically.

Calibration Process

Using Insight, the uCal performs the calibration in several automated steps:

- > **Step 1:** The VNA directs the uCal to switch to the open standard and measures the response.
- > **Step 2:** It then switches to the short standard and measures the response.
- > **Step 3:** Next, it switches to the load standard and performs another measurement.
- > **Step 4:** Finally, it connects the through standard to measure the transmission response.
- > **Step 5:** Based on these measurements and the known parameters of the standards, the VNA, or Insight, calculates and applies error correction to the measurement system.



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UC26-35 26.5 GHz uCal with 3.5mm connectors

- > **Frequency:** 50 MHz to 26.5 GHz
- > **Connectors:** 3.5mm
- > **Configuration:** UCFF-CC-GG
- FF: 26 (26.5 GHz) CC: 35 (3.5mm)
- GG: MM (male-male) MF (male-female)
- FF (female-female)

	50 MHz to 500 MHz	0.5 GHz to 2 GHz	2 GHz to 20 GHz	20 GHz to 26.5 GHz
Directivity	40 dB	41 dB	38 dB	38 dB
Source Match	38 dB	38 dB	38 dB	35 dB
Tracking	0.08 dB	0.08 dB	0.1 dB	0.1 dB



UC18-7 18 GHz uCal with 7mm connectors

- > **Frequency:** 50 MHz to 18 GHz
- > **Connectors:** 7mm
- > **Configuration:** UCFF-CC-GG
- FF: 18 (18 GHz) CC: 7 (7mm)
- GG: XX (genderless)

	50 MHz to 500 MHz	0.5 GHz to 2 GHz	2 GHz to 18 GHz
Directivity	40 dB	41 dB	35 dB
Source Match	38 dB	38 dB	38 dB
Tracking	0.08 dB	0.08 dB	0.1 dB



UC18-N 18 GHz uCal with Type N connectors

- > **Frequency:** 50 MHz to 18 GHz
- > **Connectors:** Type N
- > **Configuration:** UCFF-CC-GG
- FF: 18 (18 GHz) CC: N (Type N)
- GG: MM (male-male) MF (male-female)
- FF (female-female)

	50 MHz to 500 MHz	0.5 GHz to 2 GHz	2 GHz to 18 GHz
Directivity	40 dB	41 dB	38 dB
Source Match	38 dB	38 dB	38 dB
Tracking	0.08 dB	0.08 dB	0.1 dB

Recommended Accessories

- > Insight software suite that empowers confidence in every measurement
- > Verification kits to protect test process integrity
- > Torque wrenches
- > Connector gage kits for ensuring connectors meet mechanical tolerances before mating
- > Metrology adapters

