



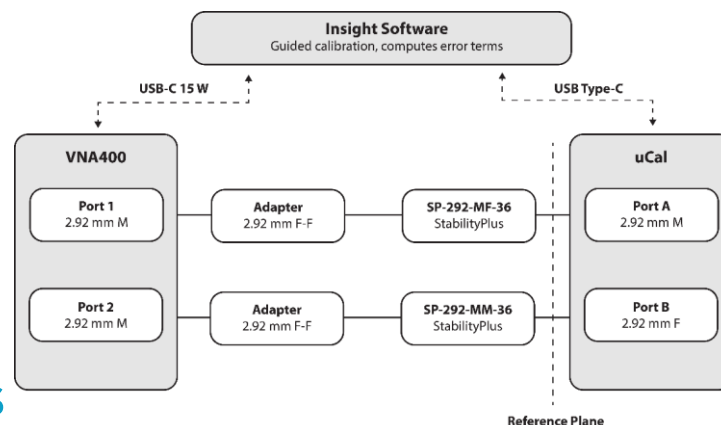
Accelerating VNA Calibration and Improving Measurement Integrity

Accurate VNA calibration ensures reliable measurements by correcting systematic errors introduced by the measurement system, cables, and connectors. When using individual calibration standards, users must manually connect and disconnect each standard throughout the calibration process, increasing calibration time and introducing opportunities for handling errors such as connector inconsistencies and improper torquing.

Maury Microwave Universal VNA Calibration Modules (uCal) simplify and expedite VNA calibration by automating the use of calibration standards, enabling accurate, repeatable results with minimal user interaction. uCal integrates precisely defined calibration standards, each individually characterized and stored in onboard memory. Electronic switching enables rapid transitions between standards without physically disconnecting or reconnecting cables.

In this demonstration, two ports of a VNA400 are connected to a Maury UC40-292 uCal through 2.92 mm adapters and Maury StabilityPlus phase-stable cable assemblies. Maury Insight VNA calibration and measurement software manages the calibration and measurement process, communicating with both the VNA and uCal and guiding the user through the workflow. During calibration, the uCal electronically switches between the integrated Short, Open, Load, and Thru (SOLT) standards. Based on these measurements and the known parameters of the standards, Insight computes and applies error correction to the measurement system. Insight also combines uncertainty data associated with the uCal standards with system-level uncertainty contributions to quantify measurement uncertainty and display uncertainty boundaries alongside the final measurement results.

Demo Setup



Target Users

Target users include RF/microwave R&D, test, validation, and production engineers performing VNA calibration and measurements, particularly across different VNA makes, models, and generations.

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Product Overview

uCal Universal VNA Calibration Module

The uCal modules are an electronically controlled calibration solution designed to simplify and improve the accuracy of VNA measurements. uCal employs an SOLT calibration methodology, with all calibration standards fully integrated within the uCal module. These standards are internally switched using high-performance electronic switching, eliminating the need for manual reconnections and significantly reducing the potential for user-induced variability. Available models include the UC40-292 (50 MHz–40 GHz, 2.92 mm), UC26-35 (50 MHz–26.5 GHz, 3.5 mm), UC18-7 (50 MHz–18 GHz, 7 mm), and UC18-N (50 MHz–18 GHz, Type N).

KEY SPECIFICATIONS AND FEATURES:

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

Insight VNA Calibration & Measurement Software

Insight is a VNA calibration and measurement software suite designed to empower VNA users and help them make better decisions by simplifying VNA calibration, validation, measurement, visualization, and analysis. It provides a consistent, user-friendly interface across VNAs from different manufacturers and generations, streamlining instrument control and workflow. Used with uCal, Insight provides a guided calibration process and serves as the primary interface between uCal and commercial VNAs that do not directly support it. By consolidating calibration, measurement, uncertainty quantification, and data analysis into a single platform, Insight helps users improve measurement process accuracy and efficiency.

KEY SPECIFICATIONS AND FEATURES:

- Define mechanical calibration standards from any vendor and use with all VNAs
- Avoid common errors with a simplified calibration process and intuitive GUI and wizard
- Validate VNA calibration using airlines and individually characterized verification kits
- Understand measurement results better with advanced visualization and analysis tools
- Identify and quantify the individual contributions of uncertainty
- Display uncertainty boundaries alongside measurement results

More Resources

Visit maurymw.com/info/eumw-2026 to learn more about Maury Microwave solutions.

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