

# Precision Calibration Solutions

## TNC VNA CAL KITS

From



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### Models:

8650CK10 – Fixed Load Kit  
8650CK11 – Fixed Load Kit Plus Adapters  
8650CK20 – Sliding Load Kit  
8650CK21 – Sliding Load Kit Plus Adapters

Maury Microwave is ISO: 9001:2008/AS9100C Certified.

# TNC VNA Calibration Kits from Maury Microwave

Models 8650CK10/11 and 8650CK20/21

## Features

- ▶ TNC Connectors
- ▶ DC to 18 GHz
- ▶ High Performance
- ▶ Keysight, Rhode & Schwarz and Anritsu VNAs Supported

## Calibration Methods Supported

- ▶ 8650CK10 & 8650CK11
  - Fixed Load SOLT (DC–18.0 GHz)
- ▶ 8650CK20 & 8650CK21
  - Sliding/Fixed Load SOLT (DC–18.0 GHz)

## The Importance of VNA Calibration

Imperfections exist in even the finest test equipment. If uncorrected these systematic imperfections cause the equipment to yield less accurate measurements. The basis of network analyzer error correction is referred to as “calibration” of which multiple methods exist.

## Calibration Methods

SOLT calibration, which uses Short, Open and Load standards, requires precise models of the standards’ electrical performance. Fixed load SOLT uses fixed terminations and is adequate for measuring devices with mid-range reflection coefficients. The lowest return loss is limited by the reflection coefficient of the fixed load standard (typically better than 20 dB return loss\*).

The sliding load SOLT kit can accurately measure lower reflection coefficients due to the improved termination performance provided by the sliding load (typically better than 30 dB return loss).

8650CK10/11/20/21 kits are configured for use in performing one-port SOL (Short-Open-Load) response calibrations (a method used for measuring VSWR/ Return Loss), and full two-port SOLT (Short-Open-Load-Thru) calibration (for performing forward and reverse transmission and reflections measurement).

## Recommended Accessories

### A012E TNC, TNCA, and AFTNC Connector Gage Kit:

Contains Six metrology-grade “push-on” “universal” type, dial indicator style gage for measuring the contact pin and dielectric interface locations of MIL-STD, IEC and commercial TNC connectors. This provides an easy and accurate way to measure these critical linear interface dimensions.

### 2698G1 9/16-inch Torque Wrench – 12.0 Inch lbs:

For proper torquing of TNCA and MP6 connections. Factory preset to 12.0 inch lbs to ensure the precise torque needed for optimum repeatability. Employs a “break” design that makes it impossible to over-torque your connections. These torque wrenches are provided with 8650CK20/21 and are highly recommended for use with 8650CK10/11 kits.

### 8619A & 8619B TNC to 3.5mm NMD test port adapters:

Precision TNC to NMD3.5mm; DC–18.0 GHz. Saves unnecessary wear and tear on your VNA test ports.

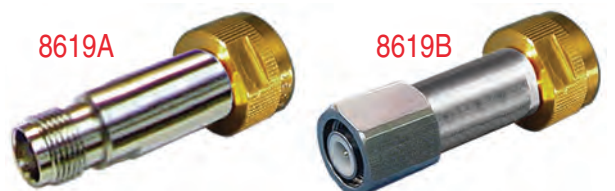
Go to [www.maurymw.com/Precision/Adapters.php](http://www.maurymw.com/Precision/Adapters.php) to see all Maury TNC in-series and between series adapters.



A012E



2698G1



8619A

8619B

## Maury TNC VNA Calibration Kits

Maury precision TNC VNA calibration kits include each of the calibration standards and tools shown in the tables at the right. The 8650CK10/20 kits do not include adapters; the 8650CK11/21 kits include one each of the in-series adapters shown. Other in-series and between-series adapters are sold separately.



8650CK10



8650CK11



8650CK20



8650CK21



## Components Included in 8650CK10/11 Kits

QUANTITY	DESCRIPTION	MODEL
1	TNC female fixed short circuit	8615A
1	TNC male fixed short circuit	8615B
1	TNC female open circuit	8609B
1	TNC male open circuit	8610B
1	TNC female fixed termination	332E
1	TNC male fixed termination	332F
1*	TNC female to TNC female adapter	232A11
1*	TNC male to TNC male adapter	232B11
1*	TNC female to TNC male adapter	232C11
1	Foam-lined wood instrument case	—

\* These adapters are provided in the 8650CK11 kits, but are not included in the 8650CK10 kits.

## Components Included in 8650CK20/21 Kits

QUANTITY	DESCRIPTION	MODEL
1	TNC female fixed short circuit	8615A
1	TNC male fixed short circuit	8615B
1	TNC female open circuit	8609B
1	TNC male open circuit	8610B
1	TNC female fixed termination	332E
1	TNC male fixed termination	332F
1*	TNC female to TNC female adapter	232A11
1*	TNC male to TNC male adapter	232B11
1*	TNC female to TNC male adapter	232C11
1	TNC female sliding termination	452A1
1	TNC male sliding termination	452B1
1	9/16-inch torque wrench — 12 in. lbs.	2698G1
1	7/16-inch open end wrench	8770Z7
1	Foam-lined wood instrument case	—

\* These adapters are provided in the 8650CK21 kits, but are not included in the 8650CK20 kits.

**COMPONENT SPECIFICATIONS**

**Sliding Terminations - Models 452A1 & 452B1**



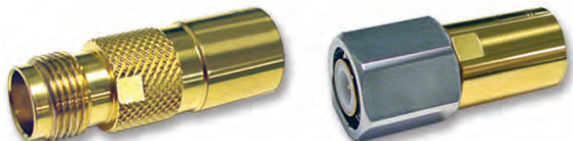
Frequency Range . . . . . 1.8 to 18.0 GHz  
 Maximum VSWR of Terminating Element . . . . . 1.05  
 Air Line Accuracy . . . . . 56 dB min return loss  
 (equivalent return loss of air line impedance)  
 Nominal Impedance . . . . . 50 ohm  
 Power Handling . . . . . 5.0 watt CW, 1.0 kW peak  
 Travel . . . . . Greater than 1/2 wavelength at 2.0 GHz

**Fixed Terminations - Models 332E & 332F**



Frequency Range . . . . . DC — 18.0 GHz  
 Maximum VSWR:  
 DC — 4.0 GHz . . . . . 1.06  
 4.0 — 12.0 GHz . . . . . 1.10  
 12.0 — 18.0 GHz . . . . . 1.15  
 Nominal Impedance . . . . . 50 ohm  
 Power Handling . . . . . 1.0 watt CW 1.0 kW peak

**Fixed Short - Models 8615A & 8615B**



Frequency Range . . . . . DC to 18.0 GHz  
 Minimum Reflection Coefficient . . . . . 0.98  
 Phase Accuracy . . . . . ±5.0°  
 Nominal Impedance . . . . . 50 ohm

**Open Circuits - Models 8609B & 8610B**



Frequency Range . . . . . DC to 18.0 GHz  
 Minimum Reflection Coefficient . . . . . 0.98  
 Phase Accuracy . . . . . ±5.0°  
 Nominal Impedance . . . . . 50 ohm

**Precision TNC Adapters - Models 232A11, 232B11 & 232C11**



Frequency Range . . . . . DC to 18.0 GHz  
 Maximum VSWR:  
 DC to 4.0 GHz . . . . . 1.06  
 4.0 to 7.0 GHz . . . . . 1.10  
 7.0 to 18.0 GHz . . . . . 1.14  
 Nominal Impedance . . . . . 50 ohm

(Note: These adapters are included in the 8650CK11/21 kits, but are not included in the 8650CK10/20 kits.)

**Connector Description**

The TNC connectors (MPC/TNC) on the components in this kit are precision stainless steel connectors that mate with most commercially available TNC connectors, and especially with those conforming to MIL-C-39012 and MIL-T-81490. They are low VSWR connectors rated from DC to 18.0 GHz.

For interface specifications see Maury data sheet 5E-053.

