Anritsu

37100C/37200C/37300C

Vector Network Analyzers

Configuration Guide

Vector Network Analysis up to 65 GHz

VECTOR NETWORK ANALYZER SYSTEMS

The Lightning 37000 family of microwave vector network analyzers (VNAs) are high performance test tools designed to make fast and accurate S-parameter measurements across the 22.5 MHz to 65 GHz frequency range. The Lightning 37000 analyzers integrate a fast sweeping synthesized source, auto-reversing S-parameter test set, and a four channel receiver into a single compact package. All 37000 VNA systems include an Operation Manual, Programming Manual, VNA Utilities CD-ROM, and a three-year factory warranty.

Use this configuration guide to help you choose the instrument model and system options that best suits your application and budget. Select accessories (such as calibration kits, verification kits, cables, adapters, and software) specifically designed for your Lightning VNA to ensure the accuracy and performance of the instrument. Add an extended service option to protect your investment for many years to come.

37100C Direct Access Receiver

The 37100C series is a VNA configured as a multi-purpose receiver with direct access to all four samplers. There is no integrated S-parameter test set. The 37100C series receivers are ideal for making antenna measurements and for testing frequency conversion devices such as mixers, multipliers, upconverters, and downconverters.

- ❑ **37147C,** 22.5 MHz to 20 GHz
- ❑ **37169C,** 22.5 MHz to 40 GHz

37200C Vector Network Analyzer for Passive Devices

The 37200C series is a VNA optimized to measure S-parameters for passive devices.

- ❑ **37225C,** 40 MHz to 13.5 GHz
- ❑ **37247C,** 40 MHz to 20 GHz
- ❑ **37269C,** 40 MHz to 40 GHz
- ❑ **37277C,** 40 MHz to 50 GHz
- ❑ **37297C,** 40 MHz to 65 GHz

37300C Vector Network Analyzer for Active and Passive Devices

The 37300C series is a VNA optimized to measure S-parameters for both active and passive devices. It offers the full suite of Lightning features, including gain compression and power sweep capability.

- ❑ **37325C,** 40 MHz to 13.5 GHz
- ❑ **37347C,** 40 MHz to 20 GHz
- ❑ **37369C,** 40 MHz to 40 GHz
- ❑ **37377C,** 40 MHz to 50 GHz
- ❑ **37397C,** 40 MHz to 65 GHz

SYSTEM OPTIONS

- ❑ **Option 1,** Rack Mount Kit with Slides
  Rack mount kit containing a set of track slides (90˚ tilt capability), mounting ears, and front panel handles to let the instrument be mounted in a standard 19-inch equipment rack.
- ❑ **Option 1A,** Rack Mount Kit with Handles Only (No Slides)
  Rack mount kit containing a set of mounting ears and hardware to permanently mount the instrument in a standard 19-inch equipment rack.
- ❑ **Option 2A,** High Speed Time (Distance) Domain Measurement Capability
  Analyze impedance discontinuities as a function of time or distance with Lightning's high speed time domain capability.
- ❑ **Option 4,** External SCSI-2 Hard Disk Drive Compatibility
  Provides SCSI-2 rear panel connector for connection of an external SCSI HDD. Removes internal HDD.
- ❑ **Option 7A,** Replaces Universal K Connector (Standard) with Universal GPC-7 (for 37200C and 37300C models only).
- ❑ **Option 7N,** Replaces Universal K Connector (Standard) with Universal N(m) (for 37200C and 37300C models only).
- ❑ **Option 7NF,** Replaces Universal K Connector (Standard) with Universal N(f) (for 37200C and 37300C models only.)
- ❑ **Option 7S,** Replaces Universal K Connector (Standard) with Universal 3.5mm-(m) (37200C and 37300C models only).
- ❑ **Option 7K,** Replaces Universal V Connector (Standard) with Universal K(m) (37277C/37297C and 37377C/37397C models only).
- ❑ **Option 11,** Reference Loop Extension Cables (37200C models, except 37277C and 37297C).
  Provides access to the a_1 sampler RF input, allowing the user direct access to this channel.
- ❑ **Option 11A,** Reference Loop Extension Cables (37277C and 37297C).
- ❑ **Option 12,** Rear Panel IF Inputs, Required for upgrade to ME7808A Broadband VNA (37x77C and 37x97C models only).
- ❑ **Option 13A,** Delete Source (37147A only).
- ❑ **Option 13B,** Delete Source (37169A only).
  Removes the internal source for applications where only external sources are required.
- ❑ **Option 98,** Z540/Guide 25 Calibration
- ❑ **Option 99,** Premium Calibration

CALIBRATION KITS

Using Anritsu's precision calibration kits ensures accurate operation of your 37000C series VNA. These kits include precision components required to perform full 12 term calibrations. The AutoCal® modules are automatic precision calibrators that provide fast, repeatable, and accurate coaxial calibrations up to 40 GHz. The AutoCal system includes the module, serial cable, power supply, power cord, software disk, and operation manual.

Coaxial

Standard

- ❑ **3650,** SMA/3.5 mm Calibration Kit
- ❑ **3650-1,** SMA/3.5 mm Calibration Kit with Sliding Terminations
- ❑ **3651,** GPC-7 Calibration Kit
- ❑ **3651-1,** GPC-7 Calibration Kit with Sliding Terminations
- ❑ **3652,** K Connector Calibration Kit
- ❑ **3652-1,** K Connector Calibration Kit with Sliding Terminations
- ❑ **3653,** Type N Calibration Kit
- ❑ **3654B,** V Connector Calibration Kit with Sliding Terminations

AutoCal®

- ❑ **36581NNF**, N(m) to N(f), 40 MHz to 18 GHz
- ❑ **36581KKF,** K(m) to K(f), 40 MHz to 20 GHz
- ❑ **36582KKF**, K(m) to K(f), 40 MHz to 40 GHz
- ❑ **760-208,** Transit Case for AutoCal

Test Port Cable Converters

Test port cable converters are high precision, phase equal adapters, which can be used with K Connector AutoCal to adapt to either SMA or 3.5 mm connectors. Each set consists of four adapters, two of each sex that can be substituted for each other without affecting calibration accuracy.

- ❑ **36583S,** Test Port Cable Converter Set, SMA type
- ❑ **36583L,** Test Port Cable Converter Set, 3.5 mm type
- ❑ **36583K,** Test Port Cable Converter Set, K type

Waveguide

- ❑ **3655Q**, WR-22 Waveguide Calibration Kit
- ❑ **3655Q-1**, WR-22 Waveguide Calibration Kit with sliding terminations
- ❑ **3655V**, WR-15 Waveguide Calibration Kit
- ❑ **3655V-1**, WR-15 Waveguide Calibration Kit with sliding terminations
- ❑ **3655E**, WR-12 Waveguide Calibration Kit
- ❑ **3655E-1**, WR-12 Waveguide Calibration Kit with sliding terminations
- ❑ **3655W**, WR-10 Waveguide Calibration Kit
- ❑ **3655W-1**, WR-10 Waveguide Calibration Kit with sliding terminations
- ❑ **3655F**, WR-8 Waveguide Calibration Kit
- ❑ **3655F-1**, WR-8 Waveguide Calibration Kit with sliding terminations

VERIFICATION KITS

Anritsu offers a complete line of coaxial verification kits to confirm your system's performance. All verification kits contain precision components with characteristics traceable to the US National Institute of Standards and Technology (NIST).

- ❑ **3663,** Type N Verification Kit
- ❑ **3666,** SMA/3.5 mm Verification Kit
- ❑ **3667,** GPC-7 Verification Kit
- ❑ **3668,** K Connector Verification Kit
- ❑ **3669B,** V Connector Verification Kit

TEST PORT CABLES

Flexible, High Performance, Phase Stable

- ❑ **3671A50-1,** K(f) - GPC-7 Cables, 63.5 cm (25 in.), one pair
- ❑ **3671A50-2,** K(f) - GPC-7 Cable, 96.5 cm (38 in.)
- ❑ **3671S50-1,** K(f) - 3.5 mm(m) Cables, 63.5 cm (25 in.), one pair
- ❑ **3671S50-2,** K(f) - 3.5 mm(m) Cable, 96.5 cm (38 in.)
- ❑ **3671K50-1,** K(f) - K(m) Cables, 63.5 cm (25 in.), one pair
- ❑ **3671K50-2,** K(f) - K(m) Cable, 96.5 cm (38 in.)
- ❑ **3671K50-3,** K(f) - K(f) Cable and K(f) - K(m) Cable, 63.5 cm (25 in.)
- ❑ **3671V50-3,** V(f) - V(m) Cable, 63.5 cm (25 in.), one pair
- ❑ **3671V50-4,** V(f) - V(m) Cable, 96.5 cm (38 in.)

Semi-Rigid, Economy

- ❑ **3670A50-1,** GPC-7 Cable, 1 ft.
- ❑ **3670A50-2,** GPC-7 Cable, 2 ft.
- ❑ **3670N50-1,** N(f) - N(m) Cable, 1 ft.
- ❑ **3670N50-2,** N(f) - N(m) Cable, 2 ft.
- ❑ **3670NN50-1,** N(m) - N(m) Cable, 1 ft.
- ❑ **3670NN50-2,** N(m) - N(m) Cable, 2 ft.
- ❑ **3670K50-1,** K(f) - K(m) Cable, 1 ft.
- ❑ **3670K50-2,** K(f) - K(m) Cable, 2 ft.
- ❑ **3670KF50-1,** K(f) - K(f) Cable, 1 ft.
- ❑ **3670KF50-2,** K(f) - K(f) Cable, 2 ft.
- ❑ **3670V50-1,** V(f) - V(m) Cable, 1 ft.
- ❑ **3670V50-2,** V(f) - V(m) Cable, 2 ft.

GPIB CABLES

- ❑ **2100-5,** GPIB Cable, 0.5 m (1.6 ft.)
- ❑ **2100-1,** GPIB Cable, 1 m (3.3 ft.)
- ❑ **2100-2,** GPIB Cable, 2 m (6.6 ft.)
- ❑ **2100-4,** GPIB Cable, 4 m (13.2 ft.)

TEST PORT CONVERTERS

Test port converters allow you to change the connector type on the VNA test ports.

13.5, 20, and 40 GHz Test Sets

- ❑ **34UA50,** Universal Test Port Connector to GPC-7 Converter
- ❑ **34UK50,** Universal Test Port Connector to K(m) Converter
- ❑ **34UN50,** Universal Test Port Connector to N(m) Converter
- ❑ **34UNF50,** Universal Test Port Connector to N(f) Converter
- ❑ **34US50,** Universal Test Port Connector to 3.5 mm(m) Converter

50 and 65 GHz Test Sets

- ❑ **34YA50,** Universal Test Port Connector to GPC-7 Converter
- ❑ **34YK50B,** Universal Test Port Connector to K(m) Converter
- ❑ **34YSS50,** Universal Test Port Connector to SSMA(m) Converter
- ❑ **34YV50B,** Universal Test Port Connector to V(m) Converter

UNIVERSAL TEST FIXTURE (UTF)

Anritsu's UTF accommodates measurements in microstrip and coplanar waveguide. An optional MMIC attachment and substrate launchers help you test integrated circuits.

- ❑ **3680-20,** 20 GHz Universal Test Fixture
- ❑ **3680K,** 40 GHz Universal Test Fixture
- ❑ **3680V,** 60 GHz Universal Test Fixture

UTF Accessories

- ❑ **36801K,** 40 GHz Right-Angle Launcher
- ❑ **36801V,** 60 GHz Right-Angle Launcher
- ❑ **36802,** MMIC Attachment
- ❑ **36803,** Bias Probe
- ❑ **36805-10M,** Four 10 mil Substrate Launchers for the 36802 MMIC Attachment
- ❑ **36805-15M,** Four 15 mil Substrate Launchers for the 36802 MMIC Attachment
- ❑ **36805-25M,** Four 25 mil Substrate Launchers for the 36802 MMIC Attachment

UTF Calibration/Verification Kits

- ❑ **36804B-10M,** 10 mil Microstrip Calibration/Verification Kit, DC to 60 GHz
- ❑ **36804B-15M,** 15 mil Microstrip Calibration/Verification Kit, DC to 40 GHz
- ❑ **36804B-25M,** 25 mil Microstrip Calibration/Verification Kit, DC to 20 GHz
- ❑ **36804B-25C,** 25 mil Coplanar Waveguide (CPW) Calibration/Verification Kit (Includes CPW Jaws for UTF), DC to 20 GHz

PRECISION ADAPTERS

Coaxial

- ❑ **K220B,** Adapter, DC to 40 GHz, 50Ω, K(m) to K(m)
- ❑ **K222B,** Adapter, DC to 40 GHz, 50Ω, K(f) to K(f)
- ❑ **K224B,** Adapter, DC to 40 GHz, 50Ω, K(m) to K(f)
- ❑ **34VK50,** Adapter, DC to 46 GHz, 50Ω, V(m) to K(m)
- ❑ **34VKF50,** Adapter, DC to 46 GHz, 50Ω, V(m) to K(f)
- ❑ **34VFK50,** Adapter, DC to 46 GHz, 50Ω, V(f) to K(m)
- ❑ **34VFKF50** Adapter, DC to 46 GHz, 50Ω, V(f) to K(f)
- ❑ **34VV50,** Adapter, DC to 65 GHz, 50Ω, V(m) to V(m)
- ❑ **34VVF50,** Adapter, DC to 65 GHz, 50Ω, V(m) to V(f)
- ❑ **34VFVF50,** Adapter, DC to 65 GHz, 50Ω, V(f) to V(f)

Waveguide to Coax

- ❑ **35WR15V,** Waveguide to Coax Adapter, 50 to 65 GHz (Usable to 67 GHz), WR15-V(m)
- ❑ **35WR15VF,** Waveguide to Coax Adapter, 50 to 65 GHz (Usable to 67 GHz), WR15-V(f)
- ❑ **35WR19K,** Waveguide to Coax Adapter, 40 to 50 GHz (Usable to 54 GHz), WR19-K(m)
- ❑ **35WR19KF,** Waveguide to Coax Adapter, 40 to 50 GHz, (Usable to 54 GHz),WR19-K(f)
- ❑ **35WR19V,** Waveguide to Coax Adapter, 40 to 60 GHz, WR19-V(m)
- ❑ **35WR19VF,** Waveguide to Coax Adapter, 40 to 60 GHz, WR19-V(f)
- ❑ **35WR22K,** Waveguide to Coax Adapter, 33 to 50 GHz, WR22-K(m)
- ❑ **35WR22KF,** Waveguide to Coax Adapter, 33 to 50 GHz, WR22-K(f)
- ❑ **35WR22V,** Waveguide to Coax Adapter, 33 to 50 GHz, WR22-V(m)
- ❑ **35WR22VF,** Waveguide to Coax Adapter, 33 to 50 GHz, WR22-V(f)
- ❑ **35WR28K,** Waveguide to Coax Adapter, 26.5 to 40 GHz, WR28-K(m)
- ❑ **35WR28KF,** Waveguide to Coax Adapter, 26.5 to 40 GHz, WR28-K(f)
- ❑ **35WR42K,** Waveguide to Coax Adapter, 18 to 26.5 GHz, WR42-K(m)
- ❑ **35WR42KF,** Waveguide to Coax Adapter, 18 to 26.5 GHz, WR42-K(f)
- ❑ **35WRD180K,** Waveguide to Coax Adapter, 18 to 40 GHz, WRD180 (Double Ridge Waveguide) to K(m)
- ❑ **35WRD180KF,** Waveguide to Coax Adapter, 18 to 40 GHz, WRD180 (Double Ridge Waveguide) to K(f)

FIXED ATTENUATORS

Precision

- ❑ **41KB-3,** Fixed Attenuator, 3 dB, DC to 26.5 GHz, 50Ω, K(m) to K(f)
- ❑ **41KB-6,** Fixed Attenuator, 6 dB, DC to 26.5 GHz, 50Ω, K(m) to K(f)
- ❑ **41KB-10,** Fixed Attenuator, 10 dB, DC to 26.5 GHz, 50Ω, K(m) to K(f)
- ❑ **41KB-20,** Fixed Attenuator, 20 dB, DC to 26.5 GHz, 50Ω, K(m) to K(f)
- ❑ **41KC-3,** Fixed Attenuator, 3 dB, DC to 40 GHz, 50Ω, K(m) to K(f)
- ❑ **41KC-6,** Fixed Attenuator, 6 dB, DC to 40 GHz, 50Ω, K(m) to K(f)
- ❑ **41KC-10,** Fixed Attenuator, 10 dB, DC to 40 GHz, 50Ω, K(m) to K(f)
- ❑ **41KC-20,** Fixed Attenuator, 20 dB, DC to 40 GHz, 50Ω, K(m) to K(f)
- ❑ **41V-3,** Fixed Attenuator, 3 dB, DC to 60 GHz, 50Ω, V(m) to V(f)
- ❑ **41V-6,** Fixed Attenuator, 6 dB, DC to 60 GHz, 50Ω, V(m) to V(f)
- ❑ **41V-10,** Fixed Attenuator, 10 dB, DC to 60 GHz, 50Ω, V(m) to V(f)
- ❑ **41V-20,** Fixed Attenuator, 20 dB, DC to 60 GHz, 50Ω, V(m) to V(f)

Economy

- ❑ **43KB-3,** Fixed Attenuator, 3 dB, DC to 26.5 GHz, 50Ω, K(m) to K(f)
- ❑ **43KB-6,** Fixed Attenuator, 6 dB, DC to 26.5 GHz, 50Ω, K(m) to K(f)
- ❑ **43KB-10,** Fixed Attenuator, 10 dB, DC to 26.5 GHz, 50Ω, K(m) to K(f)
- ❑ **43KB-20,** Fixed Attenuator, 20 dB, DC to 26.5 GHz, 50Ω, K(m) to K(f)
- ❑ **43KC-3,** Fixed Attenuator, 3 dB, DC to 40 GHz, 50Ω, K(m) to K(f)
- ❑ **43KC-6,** Fixed Attenuator, 6 dB, DC to 40 GHz, 50Ω, K(m) to K(f)
- ❑ **43KC-10,** Fixed Attenuator, 10 dB, DC to 40 GHz, 50Ω, K(m) to K(f)
- ❑ **43KC-20,** Fixed Attenuator, 20 dB, DC to 40 GHz, 50Ω, K(m) to K(f)

SOFTWARE

- ❑ **2300-232,** Mixer Measurement Assistant (N x N)

PRINTER

- ❑ **2000-1214,** Desk Jet Printer (Includes Printer Cable, 2000-1229 Cable Adapter for Lightning, 2000-1216 Black Print Cartridge, 2000-1215 Color Print Cartridge, and US Power Cord)
- ❑ **2000-1229,** Cable Adapter for Lightning
- ❑ **2000-1228,** Printer Extension Cable, 6 ft.
- ❑ **2000-1216,** Black Print Cartridge
- ❑ **2000-1215,** Color Print Cartridge
- ❑ **2000-1217,** Rechargeable Battery for Desk Jet Printer
- ❑ **2000-663,** Power Cord for Desk Jet Printer (Europe)
- ❑ **2000-664,** Power Cord for Desk Jet Printer (Australia)
- ❑ **2000-1218,** Power Cord for Desk Jet Printer (UK)
- ❑ **2000-666,** Power Cord for Desk Jet Printer (Japan)
- ❑ **2000-667,** Power Cord for Desk Jet Printer (South Africa)

OTHER ACCESSORIES AND TOOLS

- ❑ **760-185,** Lightning Transit Case
- ❑ **2000-1066,** 104 Key AT Connector Keyboard
- ❑ **01-201,** 5/16" Torque Wrench, 8 ft-lbs, for SMA, 3.5 mm, and K Connectors
- ❑ **01-202,** Universal Test Port Connector Wrench
- ❑ **01-204,** Anritsu Stainless Steel Connector Wrench

EXTENDED SERVICE OPTIONS

On-Site Support Plans

- ❑ **Option ES31,** 3 Year On-Site Repair
- ❑ **Option ES37,** 3 Year On-Site Standard Calibration
- ❑ **Option ES38,** 3 Year On-Site Premium Calibration

Return-to-Service Center Support Plans

- ❑ **Option ES32,** 3 Year Return-to-Service Center Standard Calibration
- ❑ **Option ES34,** 3 Year Return-to-Service Center Premium Calibration
- ❑ **Option ES50,** 5 Year Return-to-Service Center Repair Only
- ❑ **Option ES52,** 5 Year Return-to-Service Center Standard Calibration
- ❑ **Option ES54,** 5 Year Return-to-Service Center Premium Calibration
- ❑ **Option ES55,** 5 Year Return-to-Service Center Repair plus Standard Calibration
- ❑ **Option ES56,** 5 Year Return-to-Service Center Repair plus Premium Calibration

UPGRADE OPTIONS*

- ❑ **37100C to a Higher Frequency 37100C**
- ❑ **37100C to an Equivalent or Higher Frequency 37200C**
- ❑ **37100C to an Equivalent or Higher Frequency 37300C**
- ❑ **37200C to a Higher Frequency 37200C**
- ❑ **37200C to an Equivalent or Higher Frequency 37300C**
- ❑ **37300C to a Higher Frequency 37300C**

*Please contact your Anritsu representative for upgrades to the 37000A/B models.

Sales Centers:
United States (800) ANRITSU
Canada (800) ANRITSU
South America 55 (21) 286-9141

Anritsu
Discover What's Possible®

Sales Centers:
Europe 44 (0) 1582-433433
Japan 81 (03) 3446-1111
Asia-Pacific 65-2822400

Microwave Measurements Division • 490 Jarvis Drive • Morgan Hill, CA 95037-2809
http://www.us.anritsu.com • FAX (408) 778-0239