

# 3 GHz Vector Network Analyser



- 3 MHz – 3 GHz range
- 100 Hz resolution
- 80 dB dynamic range
- Time domain facility
- P1dB measurements
- AM-PM measurements
- Light weight and small footprint
- Low cost



The LA19-13-01 is a PC-driven Vector Network Analyser suitable for measuring reflection and transmission characteristics of a wide range of devices. It has a built-in transmission and reflection test set and provides operation from 3 MHz to 3 GHz with 100 Hz resolution. It is housed in a small lightweight package making it very portable. The user interface control software provides many useful features including memory functions, limit lines, time-domain and reference plane extension. Also, utilities such as measurement of power at the 1 dB gain compression point and AM to PM conversion factor add versatility to the instrument.

Unique features include OSL calibration that does not require a precision load and importing of data files into memory traces for live comparison with measurements.



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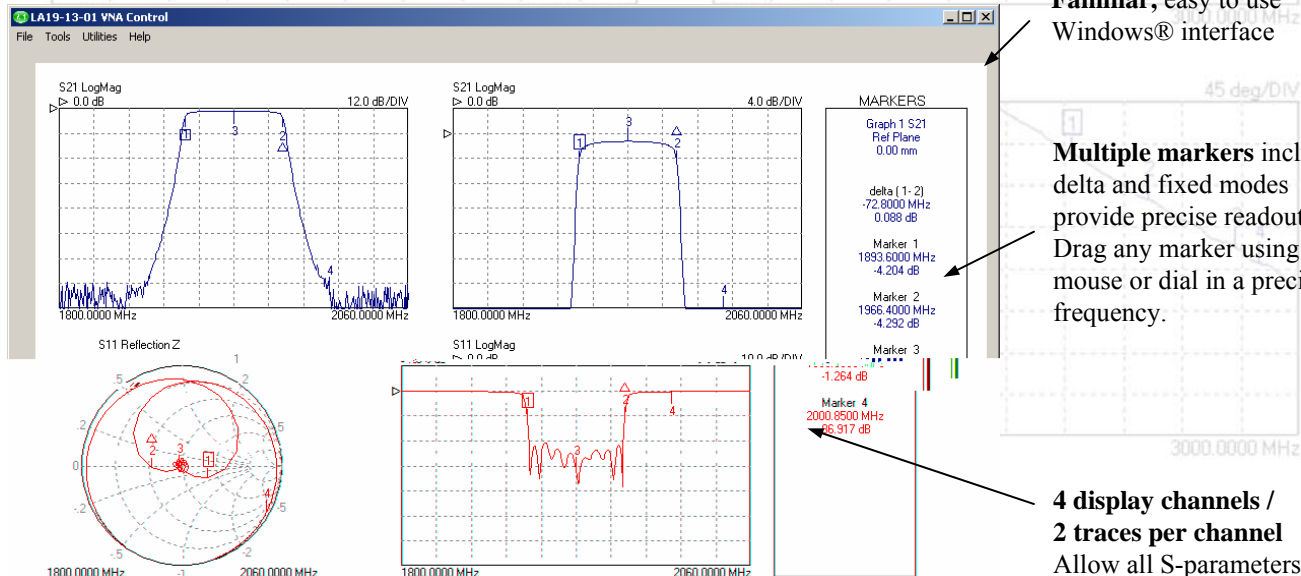
# Easy to follow user interface based on familiar Windows® form

**Wide selection of sweep points** from 51 to 1024 with 100 Hz resolution. -20 dBm to 0 dBm test level

**Measurements** can be saved in several formats to support most simulators

**Calibration and status** can easily be saved and recalled

**Familiar, easy to use** Windows® interface



**Multiple markers** including delta and fixed modes provide precise readouts. Drag any marker using the mouse or dial in a precise frequency.

**4 display channels / 2 traces per channel** Allow all S-parameters to be displayed.

**Limit lines** are easy to set up and support up to 4 segments

**Reverse measurement** function helps to present and document S12 and S22 parameters correctly

**Memory facility** includes vector math functions

**Time domain** facility can be used for fault finding

## Reference plane extension

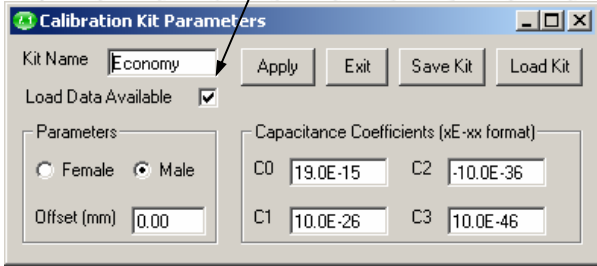
**Measurement enhancement** includes averaging, smoothing and reference plane extension. The latter is particularly useful when evaluating devices mounted on microstrip line, located away from the calibration plane

Section	Parameter	Value
Set Values	Averages (1-255)	1
	Smoothing (0-10%)	6
	Smoothing (pts)	5
	Dwell Time	0.9 ms
	Port 1 Level	0
Ref Plane	Select Units	mm
	Enter Value	0.000

**Auto Ref** quickly extends the reference plane.

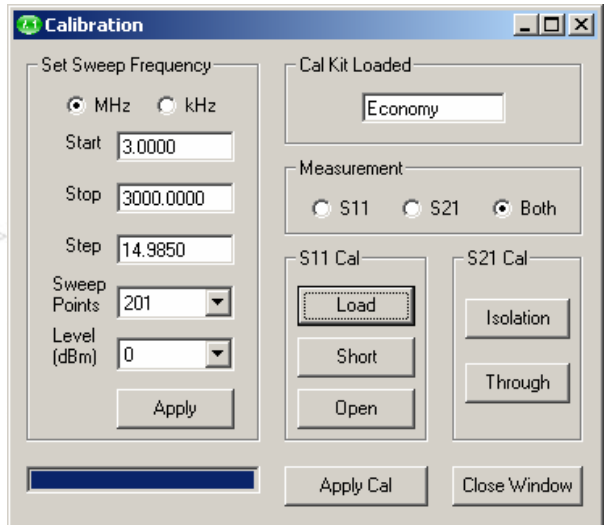
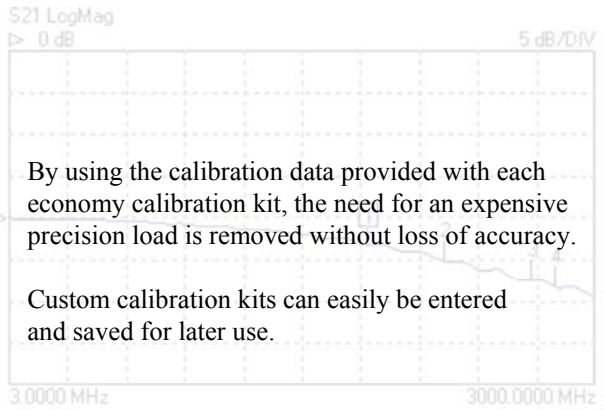
# Easy calibration using low cost calibration kit

No need for precision load. Use calibration data provided instead



Reference plane offset and open circuit capacitance coefficients allow a **tailor made kit** to be built

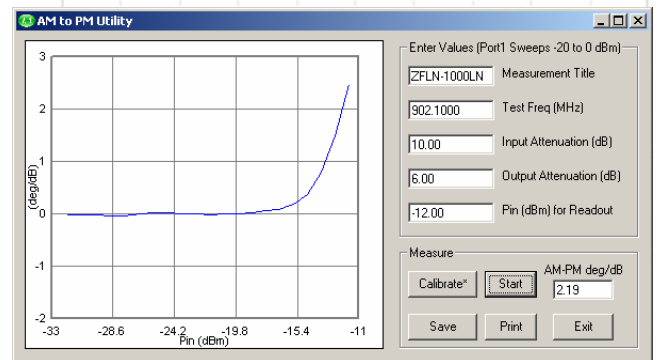
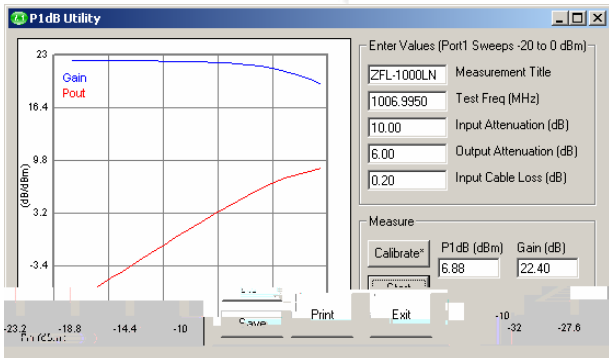
Setting up the calibration is easy and can be completed in very little time



Calibrations supported are S11 (3 term error correction), S21 (frequency response), frequency response + isolation, and frequency response + isolation + source match

# Useful utilities to help evaluate active devices

Utilities provided include power at the 1 dB gain compression point and AM to PM conversion. These help to characterise active devices such as amplifiers easily. In addition to these, a further utility allows the instrument to be configured as a simple synthesised signal source.



Measure AM to PM conversion factor quickly

Measure output power at the 1 dB gain compression easily

# LA19-13-01 VNA Specification

Specifications	
<b>Measuring Functions</b>	
Measuring parameters	S11, S21 S22, S12 (manual reverse of DUT) P <sub>1dB</sub> (Power at 1 dB gain compression) AM-PM conversion factor
Error correction	S11 (1 port correction) S21 (normalise, normalise + isolation) S21 (source match correction + normalise + isolation) Averaging, Smoothing Hanning and Kaiser Bessel filtering on time domain measurements Electrical length compensation (manual) Electrical length compensation (auto)
Display channels	4 channels (CH1, CH2, CH3, CH4)
Traces	2 traces / channel
Display formats	Amplitude (logarithmic and linear) Phase, Group Delay, VSWR, Real, Imaginary, Smith Chart, Time domain
Memory trace	1 per channel
Limit lines	4 segments
Markers	4 markers
Marker functions	Normal, Δ marker, fixed marker

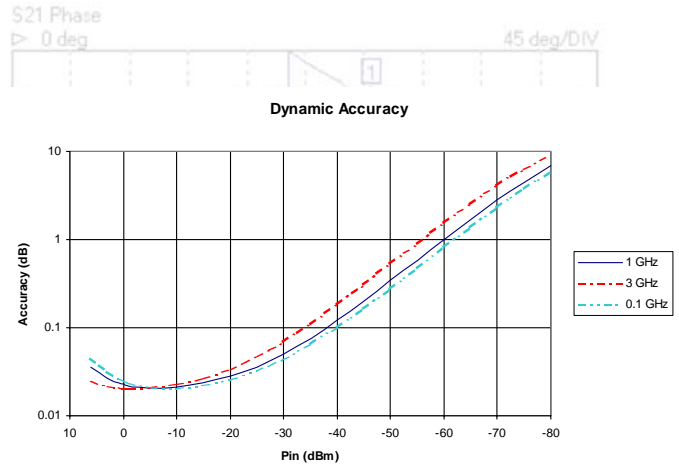
Specifications	
<b>Signal Source Characteristics</b>	
Frequency range	3 MHz to 3.08 GHz
Frequency setting resolution	100 Hz
Frequency accuracy	+10 ppm (23 + 3°C)
Frequency temperature stability	± 0.5 ppm/°C (15 to 35°C)
Harmonics	-20 dBc
Non-harmonic spurious	-35 dBc
Phase noise (10 kHz)	-65 dBc/Hz (3 MHz to 800 MHz) -72 dBc/Hz (800 MHz to 1600 MHz) -68 dBc/Hz (>1600 MHz)
Output power	0 to -20 dBm
Power setting resolution	1 dB (nominal)
Output power accuracy	+/- 1.5 dB

Specifications	
<b>Receiver Characteristics</b>	
Resolution bandwidth	3 kHz
Averaged displayed noise floor	-80 dBm (-90 dBm typical)
Dynamic range	80 dB
Temperature stability	0.02 dB/°C (typical, after S21 calibration)
Dynamic accuracy	See plot
Trace noise	0.002 dBrms (S21 calibration, 3 MHz – 3 GHz, 401 points, 128 averages)

Specifications	
<b>Miscellaneous</b>	
Controlling PC data interface	RS232, CTS/RTS handshake, 115.2 kb/s (or USB with optional adaptor)
Remote control support	ActiveX DLL to support third party applications
External dimensions	316 x 140 x 319 mm
Weight	5.8 kg
Temperature range (operating)	5°C to 35°C
Temperature range (storage)	-10°C to 60°C
Humidity	80% max (non-condensing)
Power source	AC, 90 – 250 V
Power consumption	30 VA, max
Fuses	2 x 20mm, F1.6A, quick blow, IEC127

Specifications	
<b>Data Handling</b>	
Calibration data	Store / recall on hard disk / floppy disk
Calibration kit data	Store / recall on hard disk / floppy disk
Print measured data (graphics)	To any installed printer on host PC
Measured data and graphics	Store on hard disk / floppy disk
Measured data (Touchstone® format)	Store on hard disk / floppy disk
Measured data (Touchstone® format)	Recall to memory trace from hard disk / floppy

[Touchstone® is a Trade Mark of Agilent Corporation]



Specifications	
<b>Sweep Functions</b>	
Sweep type	Linear frequency sweep Power sweep (P <sub>1dB</sub> Utility)
Sweep Speed	3 ms / point
Number of points	51, 101, 201, 401, 801, 1024

Specifications	
<b>Test Port Characteristics</b>	
Load match	24 dB (30 dB typical)
Source match (uncorrected)	22 dB (28 dB typical)
Directivity (corrected)	40 dB min
Crosstalk (uncorrected)	65 dB min (80 dB typical)
Maximum input level	+6 dBm
Maximum input level (no damage)	+23 dBm
Connectors	Type N (female)



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