3 GHz Full S-Parameter Vector Network Analyser

- 3 MHz – 3 GHz range
- 100 Hz resolution
- 80 dB dynamic range
- Full s-parameter test set
- De-embedding capability
- Time domain facility
- P_{1dB} and AM-PM measurements
- Light weight and small footprint
- Low cost

The LA19-13-02 is a PC-driven Vector Network Analyser suitable for measuring a wide range of devices from 3 MHz to 3 GHz with 100 Hz resolution. Its full s-parameter test set includes bias-Ts for biasing active devices. 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, de-embedding, 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.

LA Techniques Ltd

http://www.latechniques.com

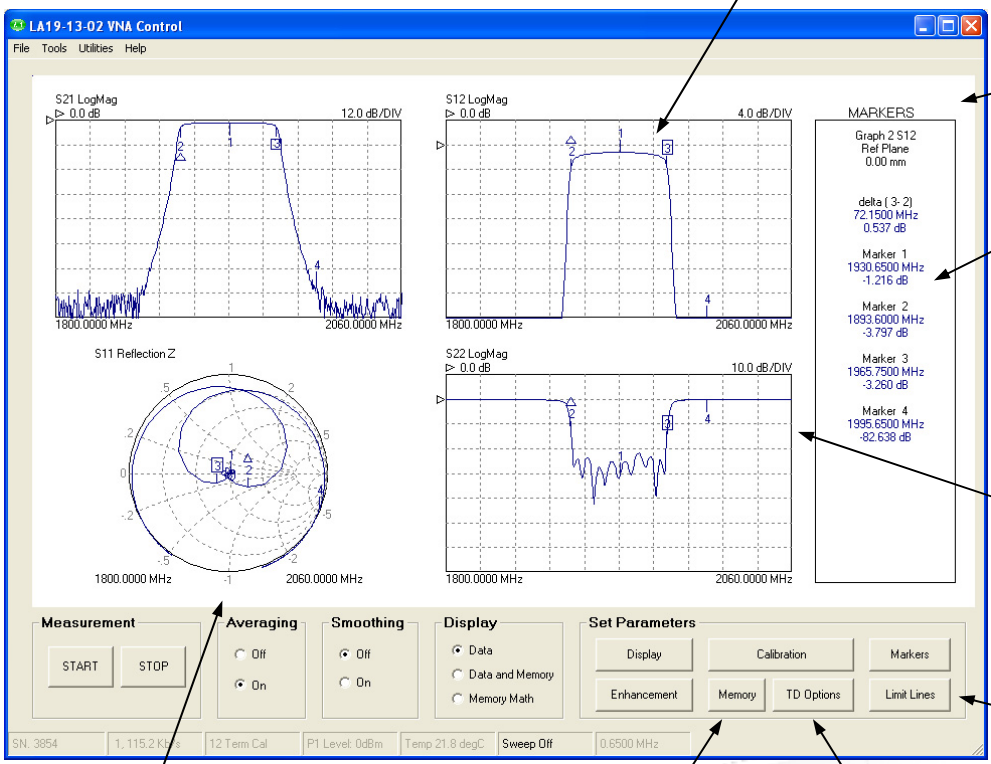
Easy to follow user interface based on familiar Windows® form

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

Low trace noise typically 0.001 dB rms thanks to innovative architecture

Calibration and status can easily be saved and recalled



Familiar, easy to use Windows® interface

Multiple markers including delta, fixed, peak/min find 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

User-defined colour scheme for the graphics display to suit individual preferences

Memory facility includes vector math functions

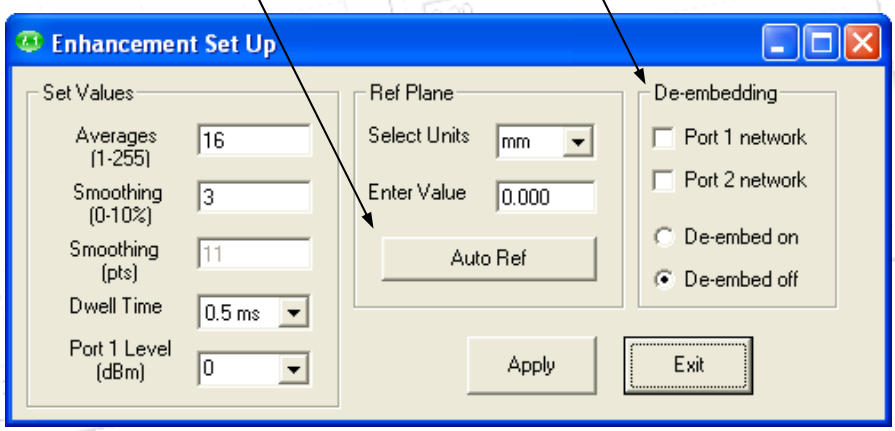
Time domain facility can be used for fault finding

Reference plane extension

Measurement enhancement includes averaging, smoothing, reference plane extension and de-embedding. The latter is particularly useful when evaluating devices mounted on test jigs, requiring interfacing networks to be removed from the measurements.

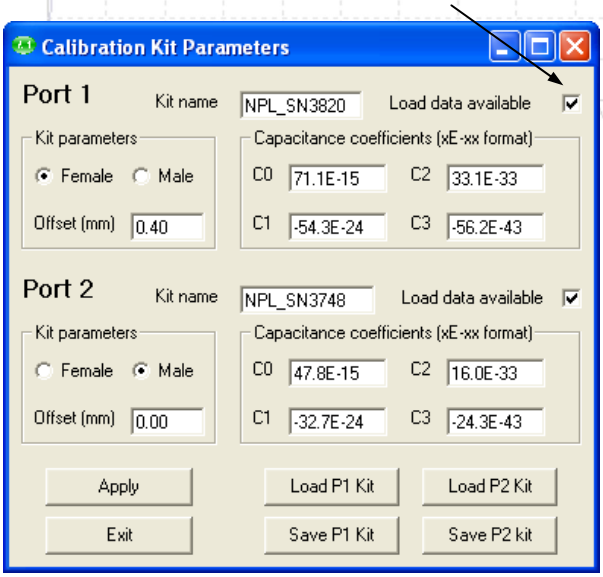
Auto Ref quickly extends the reference plane

De-embedding facility can be used to remove test jig effects in real time



Easy calibration using low cost calibration kit

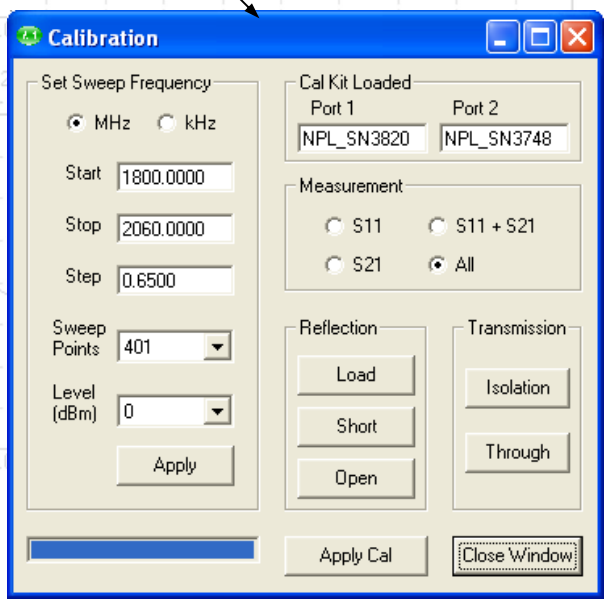
No need for precision load. Use calibration data provided instead



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

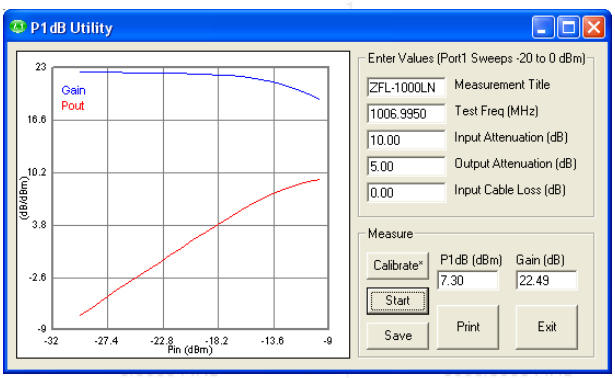
By using the calibration data provided with each economy calibration kit, the need for an expensive precision load is removed without loss of accuracy.

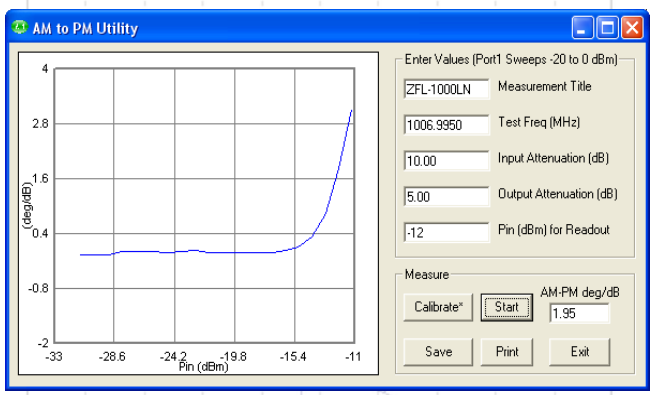
Setting up the calibration is easy and can be completed in very little time



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

LA19-13-02 VNA Specification

Measuring Functions	
Measuring parameters	S11,S21, S22, S12 P_{1dB} (Power at 1 dB gain compression) AM-PM conversion factor
Error correction	12 terms, 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) de-embed (2 embedding networks may be specified)
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, peak/min find, 3 dB and 6 dB bandwidth

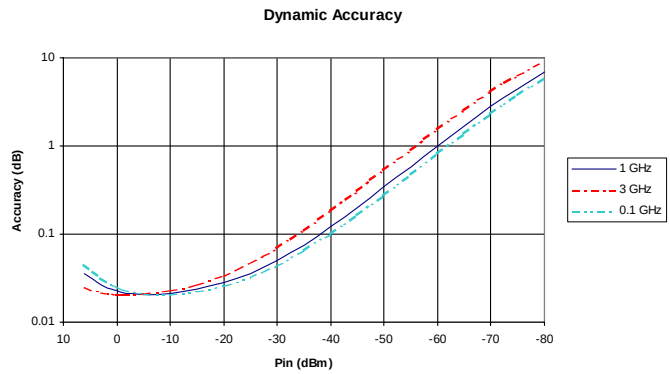
Signal Source Characteristics	
Frequency range	3 MHz to 3.08 GHz
Frequency setting resolution	100 Hz
Frequency accuracy	±10 ppm (23 ± 3°C)
Frequency temperature stability	± 0.5 ppm/°C (15 to 35°C)
Harmonics	-20 dBc
Non-harmonic spurious	-35 dBc
Phase noise (10 kHz)	-65 dBc/Hz (3 MHz to 800 MHz) -72 dBc/Hz (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

Receiver Characteristics	
Resolution bandwidth	3 kHz
Averaged displayed noise floor	-80 dBm max (-90 dBm typical)
Dynamic range	80 dB min (90 dB typical)
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)

Miscellaneous	
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	5.9 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
Accessories Coaxial calibration kit Coaxial adaptor kit	 Female (DW96635), Male (DW96634) Equal electrical length set (DW96636)

Data Handling	
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]



Sweep Functions	
Sweep type	Linear frequency sweep Power sweep (P_{1dB} Utility)
Sweep Speed 12 term calibration 3 term calibration	 6 ms / point 2 ms / point
Number of points	51, 101, 201, 401, 801, 1024

Test Port Characteristics	
Load match (uncorrected)	14 dB (24 dB typical)
Source match (uncorrected)	14 dB (24 dB typical)
Directivity (corrected)	40 dB min (50 dB typical)
Crosstalk (corrected)	75 dB min (86 dB typical)
Maximum input level	+6 dBm
Maximum input level (no damage)	+23 dBm
Connectors (RF / dc)	Type N (female) / BNC (female)
Bias-T dc voltage, current (max)	±25V, 250mA

LA Techniques Ltd
Chancerygate Business Centre, Unit 5
Red Lion Road, Surrey KT6 7RA, UK
Tel +44 208 397 3150 Fax +44 208 397 5372
E-mail: info@latechniques.com
Web Site:www.latechniques.com