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SCIENTIFIC RADARS

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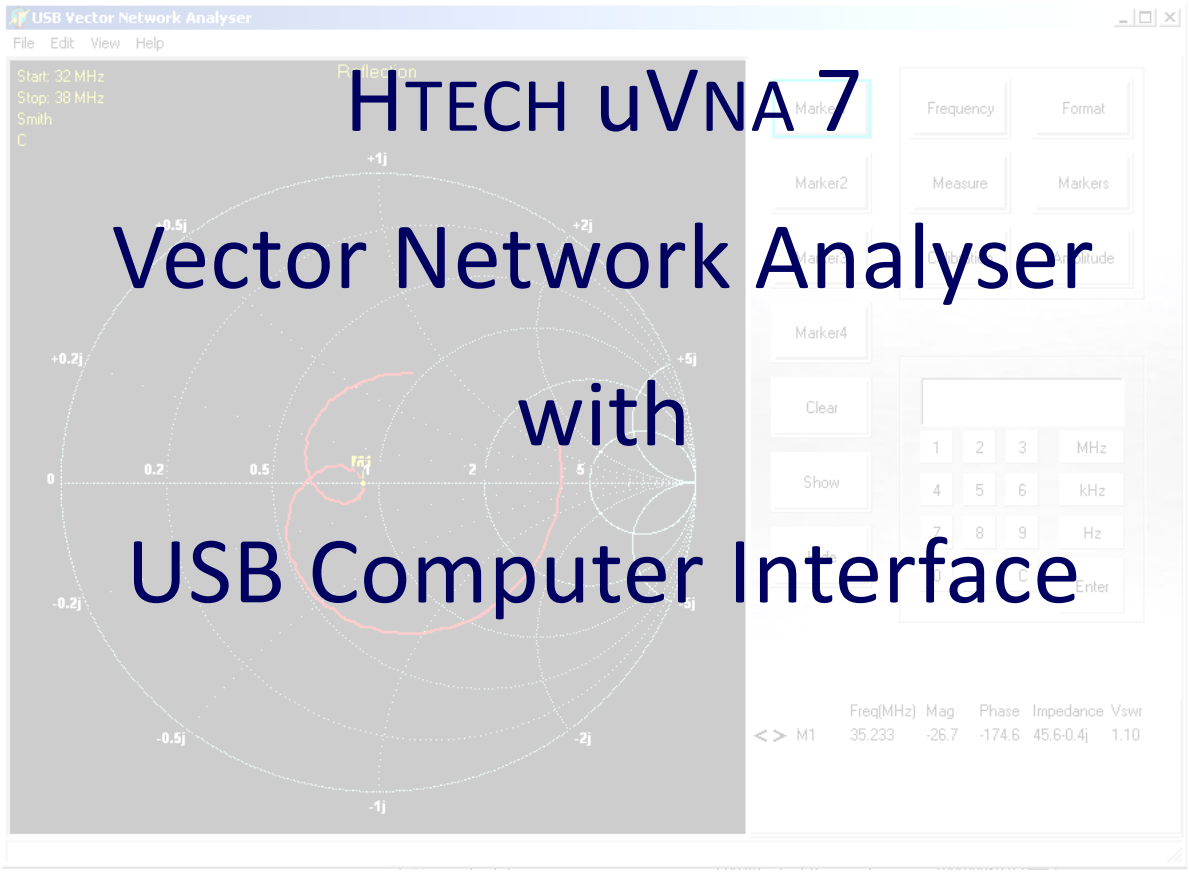

HTECH uVNA 7

Vector Network Analyser

with

USB Computer Interface

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HTECH uVNA 7 Vector Network Analyser
With USB Computer Interface

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The HTECH uVNA 7 USB Vector Network Analyser (uVNA) provides accurate and sophisticated network analysis measurements of antennas and electronic circuits at low cost. It finds application in radar site support; in electronics design, development and test activities; and in electronics teaching environments.

Network analysis is a widely-used technique for measuring the performance of components and circuits. The technique characterises components and circuits by measuring their effect on the amplitude and phase of signals swept in frequency and power injected into the device under test. In a *vector* network analyser (VNA), both magnitude and phase are measured and analysed in comparison to a *scalar* analyser that provides only magnitude information.

In radar systems, evaluating and optimising the performance of antennas and antenna arrays are fundamental requirements and a vector network analyser is an indispensible tool in the development, commissioning and maintenance of radar installations.

In electronics laboratories, the vector network analyser finds wide application in design, development and test measurements, and in fault finding and repair of electronic equipment.

Vector network analysis of circuits is an important aspect of electronic engineering studies and the USB Vector Network Analyser together with a comprehensive suite of course materials and experiments, allows electronics teaching laboratories to be equipped with multiple units for highly effective, hands-on teaching of engineering students.

Traditional portable and benchtop vector network analysers are highly sophisticated instruments that come at a commensurate high cost. Standalone portable instruments still tend to be bulky and weighty whereas the USB VNA is very small and lightweight and makes use of the ubiquitous laptop computer to provide control, processing, measurements display and storage functionality. In this way, it becomes an economical reality to broadly equip field stations, electronics development and test laboratories and teaching facilities with this powerful and sophisticated circuit analysis tool.

The USB Vector Network Analyser has been developed by experienced professional engineers and users to address key areas of radar, electronics design, development and test, and electronics engineering teaching applications.

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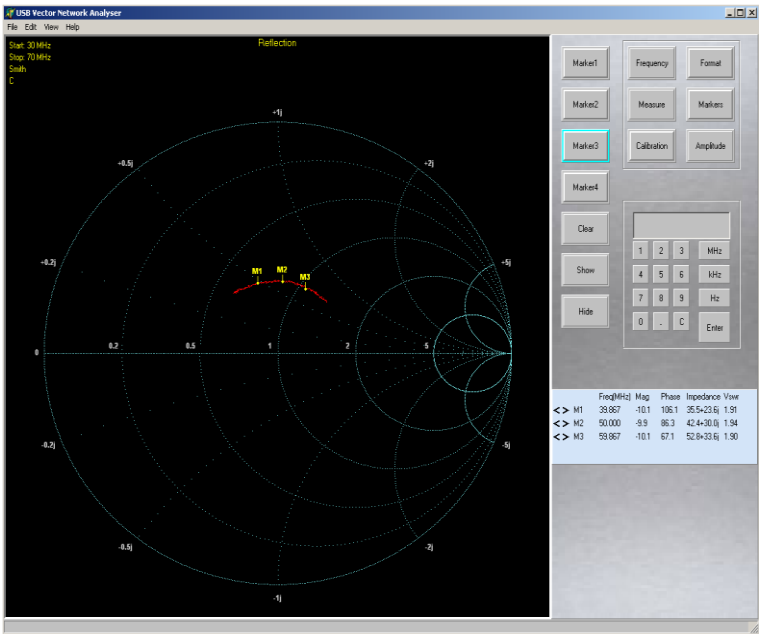
Overview

HTECH uVNA 7 USB Vector Network Analyser Module

The HTECH uVNA is housed in a compact enclosure measuring 160mm x 103mm x 30.5mm and weighs less than 600gms. It is powered by the USB connection to the computer.

The uVNA is a 2-port instrument to provide both reflection and transmission measurement capability. It is a calibratable instrument applying the standard short, open, load calibration procedure.

VNA functionality is demonstrated in the following displays from the uVNA application interface.



Reflection Measurement

This display shows a reflection measurement in Smith Chart format of a coaxial cable terminated in 25 ohms. The cable has an electrical length of 45 degrees at 50 MHz.

The frequency span is 30-70 MHz and markers provide readout of frequency, magnitude, phase, impedance and VSWR.

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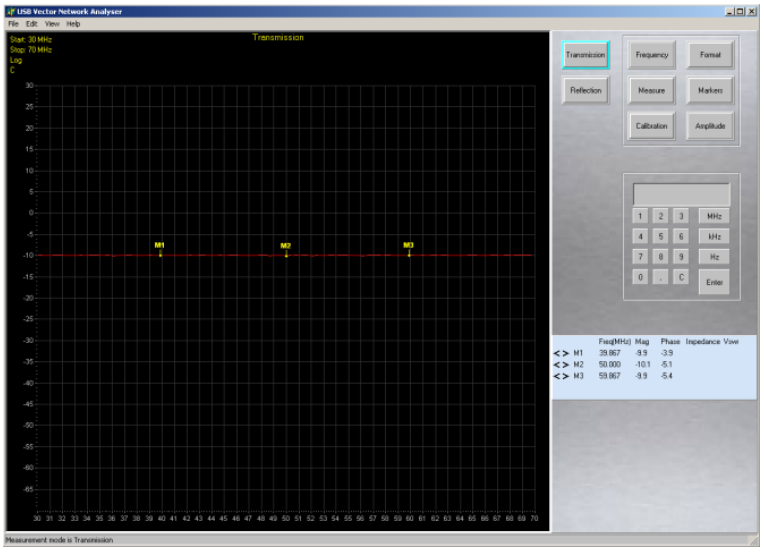

Transmission Measurement

A transmission measurement of a 10 dB attenuator is shown this display. The frequency span is 30 MHz to 70 MHz.

Measurements may be displayed in all the familiar VNA formats. The uVNA provides very high speed measurement capability which coupled with high speed USB data transfer rates, results in very response display updates of measured data.

The uVNA includes unique capabilities such as the ability to sweep input power level and phase – capabilities that are particularly useful for investigating the linearity of devices such as amplifiers, modulators and phase detectors.

In addition, the uVNA is designed to be upgradable for enhanced functionality such spectrum analyser measurements, noise figure measurements, and so on.

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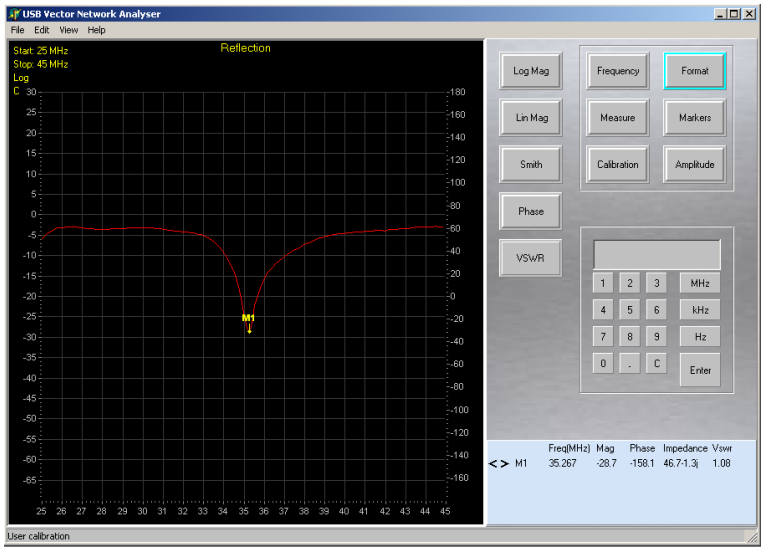
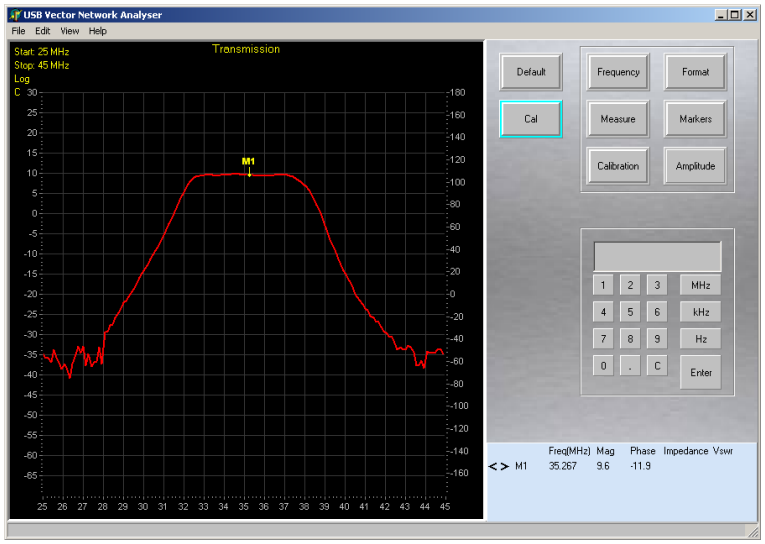
Applications



Antenna Reflection Measurement

A common requirement in radar applications is antenna tuning and maintenance. The uVNA provides ease of set up for accurate and responsive measurements when tuning antennas and for checking antenna impedance during periodic maintenance.

The displays shows a reflection measurement of a 2-element yagi antenna tuned to 35.24 MHz



Amplifier Pass Band Response

The frequency response of a receiver front end amplifier is shown in this display. The amplifier has band pass filtering centred around 35.24 MHz.

Rapid display updates facilitate the tuning procedure and markers may be used to display key performance characteristics

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Specifications

Technical	
Frequency Range	300 kHz to 150 MHz
Frequency Resolution	0.12 Hz
Number of Data Points	200 (user selectable)
Sweep Time	15ms for 200 points
RF Output	+3 dBm (10-bit amplitude control)
Directivity	-40dB calibrated
1-Port Measurements	Smith chart, VSWR, return loss, phase, distance to fault
2-Port Measurements	Gain / Loss (amplifier, filter)
Calibration Loads	Short / Open / Load
Interface	
Computer connection	USB full speed
Power	
Power Source	USB bus power
Mechanical	
Enclosure Dimensions	160mm x 103mm x 30.5mm
Weight	600g

The HTECH UVNA 7 Vector Network Analyser is designed and developed by The Heights Technology, South Australia, and is exclusively distributed by Genesis Software Pty Ltd.