

NETWORK ANALYZER
Protek A 333 NETWORK ANALYZER 3.2 GHZ

Specifications apply under the following conditions:

- 40 minutes warm-up time at the ambient temperature.
- Environmental temperature of $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, with less than 1°C deviation from the calibration temperature.
- No averaging applied to data.
- Two port calibration is performed.

Measurement accuracy		
Accuracy of transmission measurement (magnitude/phase)		
Specifications are based on a matched DUT, a measurement bandwidth of 1 Hz, and a nominal source power of – 5 dBm	+ 15 to + 5 dB	0.2dB / 2.0°
	+ 5 to - 50 dB	0.1dB / 1.0°
	- 50 to -70 dB	0.2 dB / 2.0°
	- 70 to -90 dB	1.0 dB / 6.0°
Accuracy of reflection measurement (magnitude/phase)		
Specifications are based on a matched DUT, a measurement bandwidth of 1 Hz, and a nominal source power of – 5 dBm	0 to - 15 dB	0.4 dB / 4.0°
	15 to - 25 dB	1.5 dB / 7.0°
	- 25 to -35 dB	4 dB / 22.0°
Trace stability		
Temperature dependence per one degree of the temperature variation	0.02 dB	
Trace noise magnitude IF bandwidth 3 kHz	0.001 dB rms	
Measurement Range		
Frequency range	300kHz to 3.2 GHz	
Impedance	50 Ω (75 Ω)	
Test port Connectors	N-type, female	
Number of test ports	2	
Frequency accuracy	± 5 ppm	
Frequency resolution	1mHz	
Number of test points	2 to 10001	
User-selectable IF bandwidth settings 1/1.5/2/3/5/7/10 step	1.0 Hz to 30 kHz	
Dynamic range IF bandwidth 10 Hz	2 to 3200 MHz > 125 dB typ. 130dB	
Measurement time per point 30 kHz measurement bandwidth	125 μs	
Test port output		
Power range	- 45 to + 10 dBm	
Power accuracy	< 1.0 dB	
Power resolution	0.05 dB	
Harmonic distortion	-30 dBc	
Test port input		
Match without system error correction	> 25 dB	
Damage level	+ 26 dBm	
Damage DC voltage	35 V	

Measurement Capabilities
Number of measurement channels
Up to 16 independent measurement channels. A measurement channel is coupled to stimulus response settings including frequency range and number of points.
Number of Windows
each measurement channel has a display window
Number of traces
Up to 16 display windows (channels) can be displayed. 16 data traces and 16 memory traces per channel.
Measurement parameters
S_{11} , S_{21} , S_{12} , S_{22}
Measurement parameter conversion
Available to convert S-parameters into reflection impedance transmission
Data formats
Impedance, reflection admittance, transmission admittance, and 1/S. Log magnitude, linear magnitude, phase, expanded phase, group delay, SWR, real, imaginary, Smith chart, polar.
Data markers
10 independent markers per trace. Reference marker available for delta marker operation. Smith chart format includes 5 maker formats: linear magnitude / phase, log magnitude / phase, real / imaginary, $R + jX$, and $G + jB$. Polar chart format includes 3 marker formats: linear magnitude /phase, log magnitude / phase, and real / imaginary.
External/Internal reference signal I/O
Frequency :10 Mhz
MARKER FUNCTIONS
Marker search
Max value, Min value, peak, peak left, peak right, target, target left, target right, multi-peak, multi-target, bandwidth parameters with user-defined bandwidth values
Marker to functions
Set start, stop, center to active marker stimulus value; set reference to active marker response value ; set electrical delay to group delay at active marker.
Search range
User definable
Tracking
Performs marker search continuously or on demand

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Time domain functions
Transformation

Selectable transformation type from bandpass, lowpass impulse, lowpass step.

Selectable window from maximum, normal and minimum.

Gated functions

Selectable gated filter type from bandpass, notch,

Selectable gate shape from maximum, normal and wide.

Source control
Sweep type

Linear sweep segment sweep, log sweep and power sweep.

Segment sweep

Define independent sweep segments. Set number of points, test port power levels. if bandwidth, delay time independently for each segment.

Sweep trigger

Set to continuous, hold, or single, sweep

Power

Set source power from -45 dBm to 10 dBm. The power slope function compensates source power level error with internal, external, manual trigger.

Operating environment

Temperature	+ 5 to + 40 °C
Dimensions (WxHxD)	426 x 222 x 270 mm
Weight	10.6 kg
Power supply	100 to 240 VAC/ 47 to 63 Hz

Trace Functions
Display Data

Display current measurement data, memory data, or current measurement and memory data simultaneously

Trace math

Vector addition, subtraction, Multiplication or division of measured complex values and memory data.

Title

Add custom title to each channel window. Titles are printed on hardcopies of displayed measurements.

Autoscale

Automatically selects scale resolution and reference value to vertically center the trace.

Electrical delay

Offset measured phase or group delay by a defined amount of electrical delay, in seconds.

Phase Offset

Offset measured phase or group delay by a defined amount in degrees.

Statistics

Calculates and display mean, standard deviation and peak-to-peak deviation of the data trace.

Programming Function

COM/DCOM Automation

Data accuracy enhancement
Measurement Calibration

Measurement calibration significantly reduces measurement uncertainty due to errors caused by system directivity, source and load match, tracking and crosstalk. Full 2 – port calibration removes all the systematic errors for the related test ports to obtain the most accurate measurements

Response Calibration

Simultaneous magnitude and phase correction of frequency response errors for either reflection or transmission measurements.

Response calibration and Isolation

Compensates for frequency response and crosstalk errors of transmission measurements, and frequency response and directivity errors of reflection measurements.

Enhanced response Calibration

Compensated for frequency response and source match errors.

One port calibration

Compensates for directivity, frequency response and source match errors.

Full 2 port calibration

Compensates for directivity, source match, reflection tracking, load match, transmission tracking and crosstalk, crosstalk calibration can be omitted.

Interpolated error correction

With any type of accuracy enhancement applied, interpolated mode recalculates the error coefficients when the test frequencies are changed. The number of points can be increased or decreased and the start/stop frequencies can be changed.

Reference port extension

Redefine the measurement plane from the plane where the calibration was done.

Other Capabilities
Internal hard disk drive

Store and recall instrument states, calibration data, and trace data on internal hard drive. Trace data can be saved in CSV (comma separated value) format. Instrument states include all control settings, limit lines, segment sweep tables, and memory trace data.

USB

Instrument states, calibration data, and trace data can be stored on an external USB drive.

Screen hardcopy

Printouts of instrument data are directly produced on a printer. The analyzer provides USB and parallel interfaces.

Familiar graphical user Interface

A333 analyzer employs a graphical user interface based on Windows. There are three ways to operate the instrument Manually ; you can use a hardkey interface, a touch screen interface (optional) or a mouse interface.

Limit lines

Define the test limit lines that appear on the display for pass/fail testing. Defined limits may be any combination of horizontal/sloping lines and discrete data points.

Remote Control

LAN, GPIB (optional)

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