

# TPNA-1000

## Triple Play Network Analyzer



- Increase Technician Productivity and Efficiency
- Comprehensive Installation & Service Test Capability
- Cost-Effective Solution
- Automated Tests Improve Consistency and Accuracy
- Embedded Dual Modem (DOCSIS 3.0 and EuroDOCSIS 3.0)
- Color Display, Compact Design

## Overview

The hand-held TPNA-1000™ Triple Play Network Analyzer offers a full complement of analog and digital test functions, an imbedded DOCSIS 3.0 cable modem and highly sought after auto test functionality; The TPNA-1000 Triple Play Network Analyzer provides standard testing tools, previously only available in high-end multi-function meters.

With this full complement of testing capabilities and automated quality assurance tests, a simple user interface, large color screen and a relatively low price point; the new TPNA-1000 is the most cost-effective multi-function analyzer available today and is the ideal solution for all fulfillment techs and contractors.

## Testing Features

The analyzer includes a wide range of analog and digital test functions, including automated testing, as well as a DOCSIS 3.0 modem for testing data transmission capability throughout the network.



The TPNA-1000 measures a comprehensive set of digital signal parameters (Channel Power, MER, BER, Constellation Diagram), as well as analog signal performance characteristics (Single-Frequency Level, Scan, Tilt, HUM, C/N, Depth of Modulation), and Spectrum Analysis. In Level and Fast Spectrum Modes, the Peak-Hold function detects intermittent interference as a troubleshooting aid useful in HFC network construction and maintenance.

The TPNA-1000 has a voltmeter function to enable measurement of line voltage. The analyzer comes with USB and LAN ports for use with a PC. The internal cable modem supports CMTS Registration, CM Statistics, Ping, FTP, and Web Browser.



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## SPECTRUM ANALYSIS

The TPNA-1000 spectrum analyzer function supports two display control modes: center/span and start/stop frequencies. The user can change RBW (Resolution Bandwidth) and averaging to improve the spectrum view at various spans. For interference analysis, the peak-hold marker and double marker functions show the difference between peak spectrum and current spectrum.

## LEVEL MEASUREMENT

The TPNA-1000 measures levels of analog TV, QAM, single frequency signal, and dual audio channels. The level mode provides video level, audio level, V/A, peak-hold level and peak-peak value. More detail is also provided in a single channel spectrum function.

## CHANNEL SCANNING

The TPNA-1000 level displays up to 150 channels in living color. A marker selects any of the signals on the display and associated measurement information is provided at the bottom of the screen. The user can also zoom in/out on the scan in five different ranges.

## TILT MEASUREMENT

The Tilt mode provides a quick check for flatness and amplitude, with support for up to 16 tilt channels.

## AUTO TEST

Automated performance verification tests improve the consistency and accuracy of measurement data. The TPNA-1000 provides a convenient way to automatically test a variety of signals and characteristics in a single operation that performs a series of user prescribed tests, including level, spectrum, limit test, and QAM. The test results will be saved automatically.

## MULTIPLE CHANNEL PLANS

The user can create up to 12 different channel plans and can very quickly and easily switch to any of the plans.

## Reducing Operating Costs

The hand-held TPNA-1000 Triple Play Network Analyzer offers increased technician productivity and efficiency at a relatively low price point. The analyzer includes a wide range of analog and digital test functions, including automated testing, as well as a DOCSIS 3.0 modem for testing data transmission capability throughout the network.

## SPEED

Simple, quick access to measurements are enhanced by the use of a color display, soft keys and a spin knob, providing an especially simple, intuitive user interface. This analyzer performs a variety of user prescribed measurements in automated tests that are initiated with a single key press. This speeds the installation test by performing all of the required test steps without user intervention, and automatically recording the results for submission as a quality certification (assuming they pass).

## RELIABILITY

The analyzer is hand-held and designed for rugged field use. The typical battery life of more than six hours is exceptional for a unit at this price point.

## EFFICIENCY

The instrument's color display makes measurement interpretation easy. Automated tests shorten the test process and automatically record measurement results. Firmware updates can be performed using the USB interface, ensuring that keeping the instrument up-to-date is not a chore.

## CAPACITY

The unit operates over the complete 5MHz to 1 GHz frequency range, has an impressive level measurement range, includes simple return path tests for ingress, and has an impressive set of QAM analysis/troubleshooting tools.



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## DIAGNOSTIC ABILITY

The analyzer performs all of the test functions needed to certify a home network, in addition to providing important troubleshooting assistance through QAM constellations and error vector spectrum displays that enable seeing the spectrum within the QAM channel.

## Cost Effective Deployment

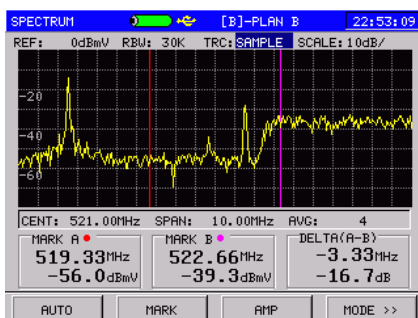
Fleet-wide deployment of TPNA 1000s for installation crews and contractors can lead to improved reliability that eliminates call-back truck rolls and leads to higher customer satisfaction.

Accountability and quality assurance is enhanced by the use of automated pass/fail tests with data collection and the ability to attach printed measurement results to work orders.

The learning curve for new installers is shortened by the use of preprogrammed automated tests and an extremely simple and intuitive user interface.

## Spectrum Analysis

- Full Featured Spectrum Analysis from 5 to 1000 MHz
- Center/Span or Start/Stop Frequency Tuning
- Adjustable Reference Level, RBW, Scale and Averaging
- Hold, Trace and Marker Functions



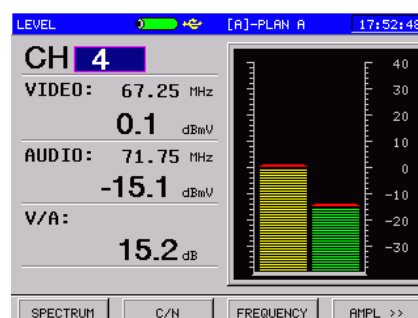
## QAM Measurement

- Displays QAM Modulated Channels
- Measures Pre-BER, Post-BER, and MER
- Displays Constellation, BER, and MER Views
- EVS View (Spectrum Under QAM)



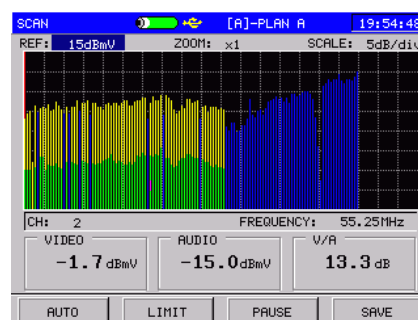
## Level Measurement

- Measures Analog Video and Audio, Delta V/A, and Dual Audio Carrier Levels
- Measures Digital Power



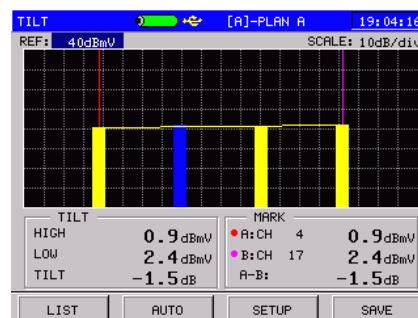
## Channel Scanning

- Video and Audio Frequency Levels
- Up to 150 Channels
- Zoom and Marker Functions



## Tilt Measurement

- Supports up to 16 Channels
- Checks for Flatness and Amplitude



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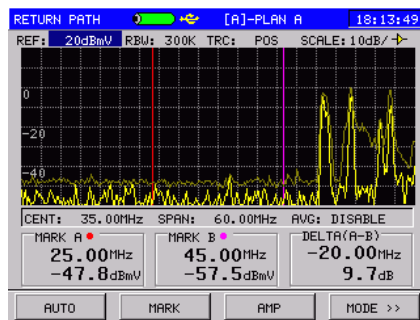
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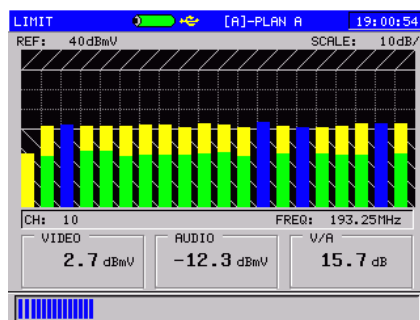
## Return Path Measurement

- Analyzes Return Path Signals
- 0 to 65 MHz Frequency Range



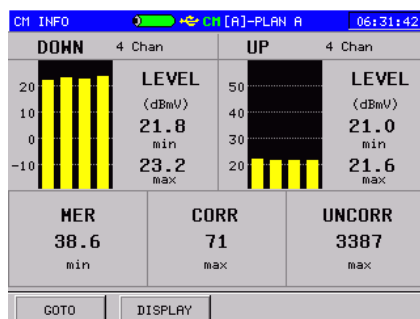
## Limit Measurement

- Tests Audio and Video Levels of Enabled Analog Channels
- User Adjustable Limits
- Displays Pass / Fail Status



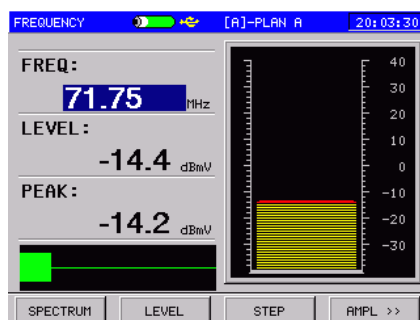
## DOCSIS 3.0 Testing

- Includes DOCSIS 3.0 Modem
- Tests Upstream and Downstream Cable Modem Connections
- Includes FTP, Ping, and Web Browser



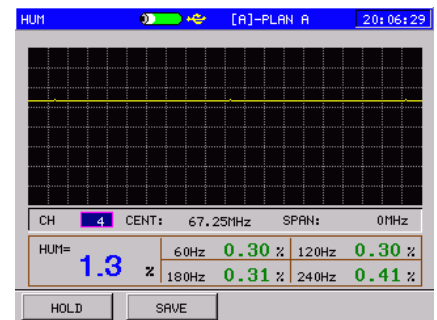
## Frequency Measurement

- Displays the Level and Peak Level for a single Frequency
- Five User Adjustable Frequency Steps
- Adjustable Reference Level and Scale



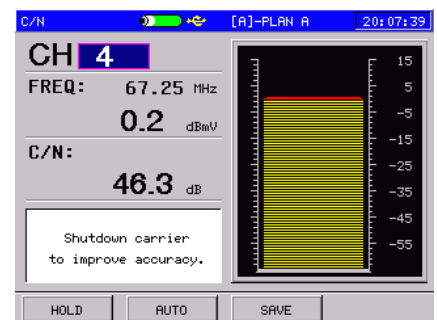
## HUM Measurement

- Displays the Amplitude of the 60, 120, 180, and 240 Hz Interference Present on the Video Carrier
- Tunable by Channel or Frequency
- Hold Function



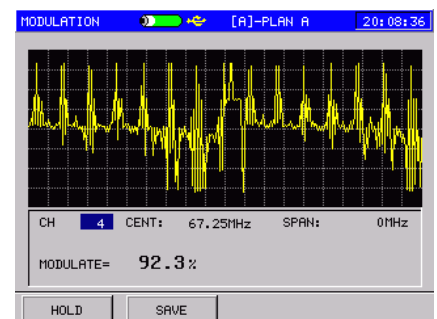
## C/N Measurement

- Displays the Ratio of the Amplitudes of the Visual Carrier and Noise
- Tunable by Channel or Frequency
- Auto Scale Function



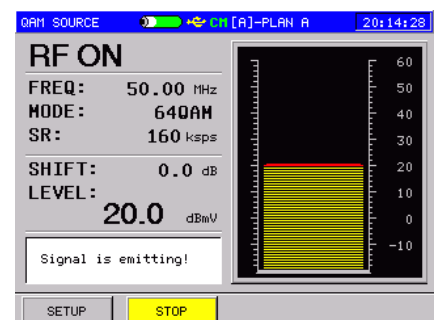
## Modulation Measurement

- Displays Percentage of Video Modulation for the Visual Carrier
- Tunable by Channel or Frequency
- Hold Function



## QAM Source

- Continuous Wave, QPSK, 8/16/32/64 QAM Signal Source
- Single Frequency or Sweep Operation
- Source Output Level of up to 60 dBmV
- Adjustable Symbol Rate and Level Shift



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## Standard Features

### ANALOG TESTS

- Single-Frequency Level
- Channel Scan
- Tilt
- C/N & HUM
- Tilt/Level Test
- Depth of Modulation
- Spectrum Scanning Analysis

### DIGITAL TESTS

- Channel Power
- MER & BER
- QAM, QPSK, COFDM
- Return Path Noise

### EMBEDDED DUAL MODEM

- CMTS Registration
- CM Statistics
- PING
- FTP
- Web Browser

### OTHER FEATURES

- Multiple Channel Plans
- Auto Tests
- Limit Tests
- Voltage Measurement
- Dual Sound Channel Test

## Specifications

### Digital Signal Measurement

Frequency	Range: 5 MHz to 1 GHz Accuracy: $\pm 10 \text{ ppm} \times 10^{-6}$ Resolution: 10 kHz
Power Level Measurement	-30 dBmV ~ 50 dBmV (30 dB $\mu$ V ~ 110 dB $\mu$ V)
Level	Resolution: 0.1 dB Accuracy: $\pm 1.5 \text{ dB}$ (C/N > 20 dB)
Input Impedance	75 $\Omega$
MER	~ 40 dB Accuracy: $\pm 2 \text{ dB}$
BER	1E-3 ~ 1E-9 (Pre/Post RS)
Modulation Type	16/32/64/128/256 QAM ITU-T J.83 ANNEX A/B/C
Constellation	Yes
Digital Statistics	Yes

### Analog TV Measurement

Frequency	Range: 5 MHz to 1 GHz Accuracy: $\pm 10 \text{ ppm} \times 10^{-6}$ Resolution: 10 kHz
Level	Range: -30 dBmV ~ 60 dBmV (30 dB $\mu$ V ~ 120 dB $\mu$ V) Accuracy: $\pm 1.5 \text{ dB}$ Resolution: 0.1 dB
Input Impedance	75 $\Omega$
Other Functions	C/N, V/A, Tilt, Limit Test, Channel Scan/Management, Auto Test, Trunk Volt



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## Specifications

### Spectrum Analysis

Frequency	Range: 5 MHz to 1 GHz Accuracy: $\pm 10$ ppm $\times 10^{-6}$ Resolution: 100 kHz
Power Level Range	-50 dBmV ~ +60 dBmV (10 dB $\mu$ V ~ 120 dB $\mu$ V)
Level	Accuracy: $\pm 1.5$ dB Resolution: 0.1 dB
Dynamic Range	60 dB
Input Impedance	75 $\Omega$
RBW	30 KHz / 100 KHz / 300 KHz / 1 MHz / 3 MHz (Self-adapt)
Sweep Time	300 ms/field (8 MHz)
Measurement Bandwidth	995 MHz MAX
Return Path Noise Testing	Yes
Cable Modem	
Main Function	DOCSIS 3.0 (4x4), EuroDOCSIS 3.0 (4x4) CM Statistics Function, Ping, FTP, Traceroute, Web Browser

### QAM Source

Frequency Range	Range: 5 MHz to 65 MHz
MER	>38 dB $\pm$ 2 dB
Modulation Type	QPSK; QAM (8/16/32/64); CW(Modulation Close)
Symbol Rate	160/320/640/1280/2560/5120 KSym/s
Level Output	8dBmV ~60dBmV (68 dBuV~120dBuV)
Other	
Dimensions H x W x D	9.65" x 5.12" x 2.36" 245 mm x 130 mm x 60 mm
Weight	2.5 lbs (About 1160g)
Power Supply	14.8V 2.1AH Lithium battery (Chargeable)
Charge Time	4 ~ 5 hours
Work Time	> 6 hours (Fully Charged)
Ports	USB, LAN
Software	TPNA Worx

### INCLUDES THE FOLLOWING:

Protective rubber bumper	AC battery charger
Carrying case	User's manual
Shoulder strap	

### ACCESSORIES:

TPNAworx software  
(includes Ethernet cable)  
P/N 0930171000