



# PowerProbe 6000 & PowerProbe 500 Test Probes

## Measure the Human Perception of Service Quality with Versatile PowerProbes

### Multipurpose PowerProbes Identify a Wide Range of Network Problems



PowerProbe 6000



PowerProbe 500

- Designed for network core, hub, and enterprise installation
- Supports end-to-end testing to PowerProbe test probes and responders
- Supports a wide variety of test objectives: Speech quality/MOS, network performance, service quality, SLA/SLO verification

Tektronix' PowerProbe® 6000 and PowerProbe 500 active service quality test probes are designed for advanced triple-play Quality of Experience (QoE) testing over PSTN and next-generation IP, cellular and wireless broadband networks. With a broad range of interfaces supporting all standard signaling protocols, these PowerProbes provide unparalleled active test access. Based on a flexible Linux and DSP-powered processing core, the PowerProbe supports a growing library of over 40 application-focused software test agents to cover your evolving test needs.

Remotely managed and highly secure, these PowerProbes enable scaleable end-to-end, bi-directional voice, VoIP, fax, video, and IP monitoring that faithfully measures over 330 user-perceived service quality metrics using an array of standards-based and patented algorithms.

Controlled by Tektronix' DirectQuality® active test automation OSS, these PowerProbes can perform on-demand or scheduled tests for monitoring, fault-management, SLA validation, installation, troubleshooting and provisioning applications.

Features & Benefits	Applications
<ul style="list-style-type: none"> <li>■ A single probe for TDM, IP, and analog active testing</li> <li>■ Scalable and secure architecture</li> <li>■ Supports multiple test scenarios: Probe-to-Probe, Single-Ended, Loopback, etc.</li> </ul>	<ul style="list-style-type: none"> <li>■ Proactive End-to-End QoE Monitoring</li> <li>■ VoIP Service Validation</li> <li>■ Remote Troubleshooting</li> <li>■ Carrier / Peering Fabric Benchmarking</li> <li>■ Quality-Aware Least Cost Routing</li> <li>■ SLA Validation</li> <li>■ Trunk Testing</li> </ul>

## All-in-one test platform

Powerful and scalable probe that handles Voice, VoIP, Fax, Internet, Video and Modem testing in a single, compact unit. The PowerProbe 6000 and PowerProbe 500 support the following test layouts.

### Probe-to-Probe Testing

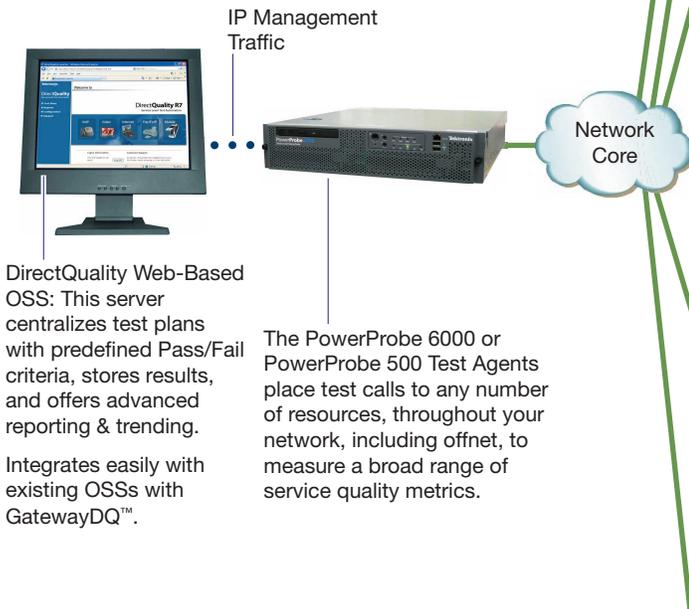


Test network connectivity and availability within and between networks. This is the most thorough way to identify connection issues, one-way audio problems (with PESQ testing among others), and perform network stress-testing to localize bottlenecks.

### Probe-to-Responder Testing

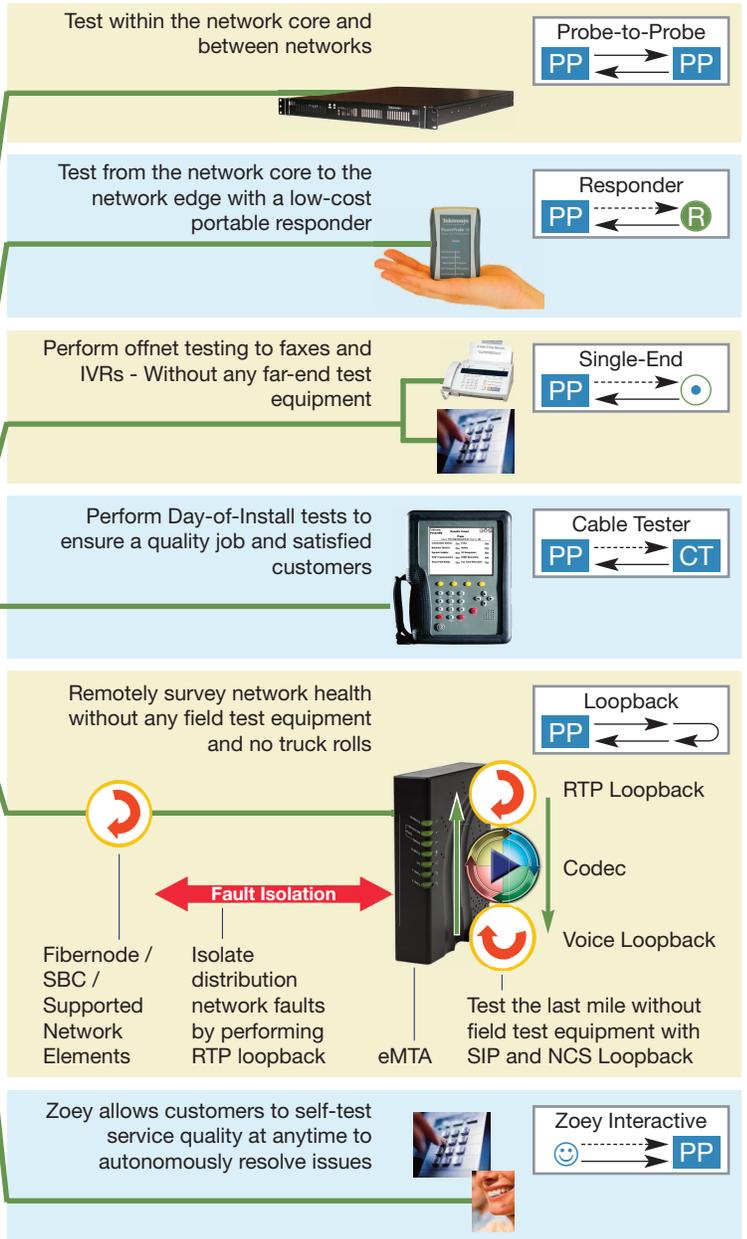


An effective low-cost solution that is typically used in the field to verify QoS and QoE. Responders are small and can be left at the customer's premises or remote sites for ongoing spot testing.

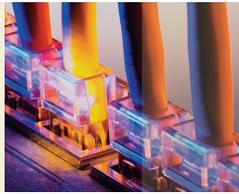


**DirectQuality Web-Based OSS:** This server centralizes test plans with predefined Pass/Fail criteria, stores results, and offers advanced reporting & trending. Integrates easily with existing OSSs with GatewayDQ™.

The PowerProbe 6000 or PowerProbe 500 Test Agents place test calls to any number of resources, throughout your network, including offnet, to measure a broad range of service quality metrics.



**Test Layouts: PowerProbe 6000 and PowerProbe 500 are Versatile Players for Monitoring Quality of Service**



### Single-Ended Testing



Perform voice, fax, and data service and transmission quality measurements to any region worldwide using single-ended test agents with public IVR, faxes, and modems as far-end terminations. There is no need for any far-end test equipment. Verify the SLAs of interconnect partners. Select long-haul routes based on service quality and cost (least cost routing).

### Cable Tester



Perform RTP loopback to SMRP-compliant cable testers to verify connectivity in the field.

### Loopback Testing



Test VoIP service quality to Session Border Controllers (SBCs), DOCSIS Transponders, and VoIP subscribers' telephone adapters from a T1/E1 or IP interface using industry-unique SIP and NCS loopback testing.

In cable networks, remotely isolate network faults by performing loopback tests to the transponder and then to the eMTA to identify where is the failure - without a truck-roll.

### Zoey Interactive Testing



Allow customers to verify service quality anytime with an IVR-based test service that is ideal for self-install customers and technicians to test the quality of the service they are receiving. Measure MOS, echo, noise, DTMF transmission, and Caller ID performance.

### True User-Perceived MOS

Highly repeatable, accurate MOS scores and quality metrics calculated using leading standards-based algorithms from a complete array of analog and IP measurements.

### Network Performance

Automatically analyze network status during call progress using an E.180-based database of worldwide tones and Call Disposition Codes (CDC) to perform detailed connectivity analysis including ASR, ABR, CCR, and NER.

### Automated Resource Scheduling

PowerProbe test port and resource availability are automatically managed by the DirectQuality test automation OSS.

Active tests between probes can be configured and scheduled in one-to-one or one-to-many layouts for simplified network-wide service monitoring – DirectQuality manages scheduling conflicts and automatically executes tests when requested ports become available.

The DirectQuality OSS also knows the test agents installed on each probe, simplify test automation by displaying only valid probe / test combinations.

### Remote Management

The DirectQuality test OSS allows you to configure any PowerProbe 6000 or PowerProbe 500 remotely from any web browser - assess probe and test port status, upload and activate new test agents, backup probe configuration, change IP address and probe name, and load international dialing tones – all within a DISA-approved security framework.

DirectQuality automates probe maintenance, and can perform required updates and backups within predefined maintenance windows, maximizing test system performance and availability.

## Active Test Capabilities

### Voice/VoIP Transmission Quality

- Voice Impairments (Delay, Echo, Noise, etc.)
- Quality Metrics (MOS, R-factor, etc.)
- IP Impairments (Packet loss, jitter, etc.)
- Legacy Trunk Testing (BERT)

### Streaming Media Quality (RTP)

- VoIP, HDTV, IPTV, Mobile & Internet Video
- Quality Metrics (Jitter, Packet Loss, Delay)
- Full RTPC-XR support

### Call Connectivity

- Network Timers, Call Disposition Codes
- Performance Ratios, Billing Verification
- Standardized results over PSTN, Wireless & IP networks

### Fax/Modem Transmission Quality

- Negotiated Parameters (ex: Baud Rate)
- Page transmission Performance
- T.30 standard fax testing



## Network Implementations

The PowerProbe 6000 and PowerProbe 500 can be deployed network-wide in main switching centers and at the edge of the network.

**Core to Hub (mesh) Testing:** A variety of advanced tests including VoIP stress testing, RTP streaming, and Fax validation enable thorough service quality and SLA monitoring of the core network.

**Hub to edge testing:** Automate tests to the last mile to evaluate the impact of network changes on your customers before your customers experience a glitch.

**Industry-unique single-ended testing:** Provides off-net coverage and standardized quality testing for:

- Least-cost routing applications over IP Peering and PSTN partner carrier routes.
- SLA/SLO enforcement.

**Day-of-Install testing and field troubleshooting:** With inexpensive responders, field technicians can test over 60 service level measurements in less than a minute on demand. Pass or fail results are instantly returned on a mobile phone or Web-enabled PDA.

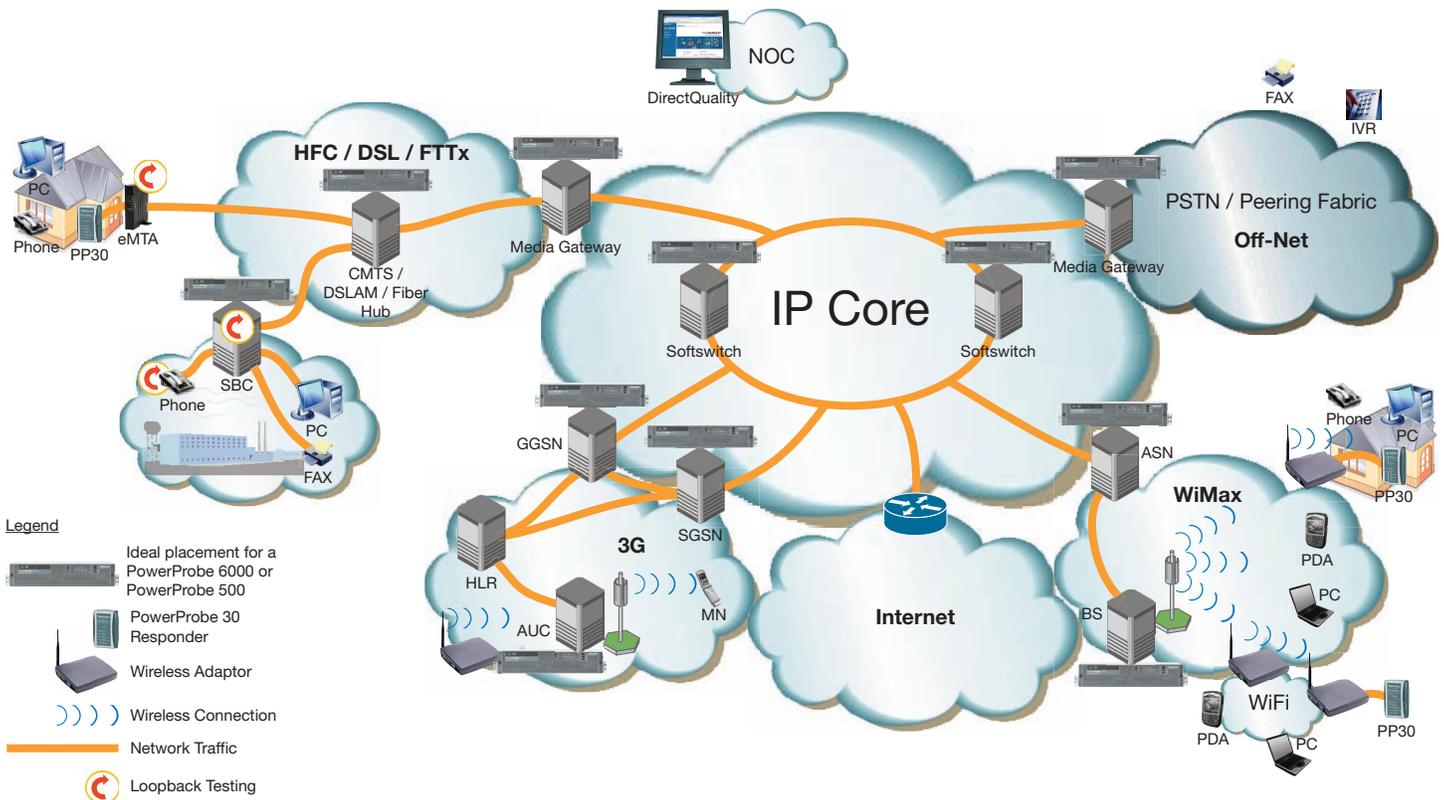
**Long-term monitoring and proactive fault detection:** Use loopback testing or leave an inexpensive

responder in a data closet or at an interconnect partner's office to troubleshoot transient issues.

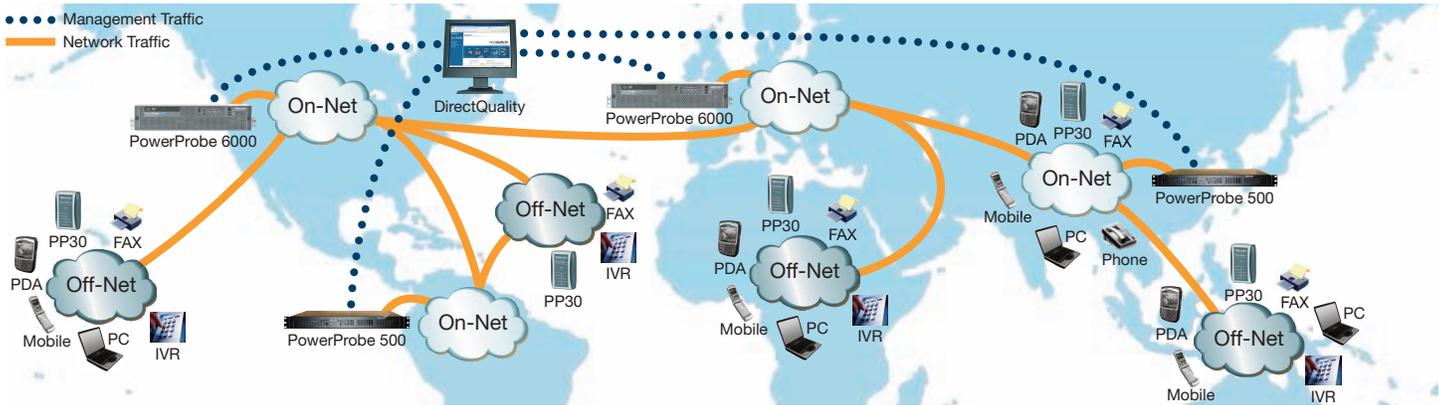
**Test network features:** Verify the availability of your 800 toll-free service number, test IVR systems, measure customer's Message Waiting Indicator (MWI) signal delays, and validate Vertical Service code availability.

## Security

DirectQuality management traffic is ssh encrypted to prevent snooping or probe hijacking. As always, NOC traffic should pass through your private WAN, separate from other network traffic.



## Service Provider Network-Wide Implementation



### Global Network Implementation

#### PowerProbe 6000 Characteristics

##### Typical Network Locations

- Softswitch Sites
- Core Network
- Service Providers

##### Processing Unit

- Processor: Dual Intel Xeon
- Memory: 4 GB RAM
- Hard Disk: 300 GB
- Voltage: 120/240 VAC/-48VDC

##### Physical Dimensions

- Type: Carrier-grade chassis
- Form Factor: 2U, 19 inch Rackmount
- Weight: 40 LBS (18.2 Kg)

##### IP Interfaces

- 1 x GigE – Management
- 1 or 5 x GigE – Testing (VQM1000)

##### VoIP Signaling

- MGCP – Up to 12 Endpoints
- SIP – Up to 16 Endpoints

##### Module Support

- 3 x TDM Modules PLUS 1 or 2 VoIP Modules

##### TDM Modules

- 2 x Analog ports (VQM4)
- 6 x Analog ports (VQM12)
- 1 x Analog Fax/Modem (VQM38/92)
- Single or Dual T1 (VQM24/VQM224)
- Single or Dual E1 (VQM30/VQM230)

##### VoIP Module

- 2 x SIP endpoints (VQM188)
- 2 x H.323 endpoints (VQM188)
- 2 x MGCP endpoints (VQM188)

#### PowerProbe 500 Characteristics

##### Typical Network Locations

- Hub Sites
- Access Networks
- Enterprise

##### Processing Unit

- Processor: Intel Celeron
- Memory: 1GB RAM
- Hard Disk: 80 GB
- Voltage: 120/240 VAC

##### Physical Dimensions

- Type: Enterprise-grade chassis
- Form Factor: 1U, 19 inch Rackmount
- Weight: 19.4 LBS (8.8 Kg)

##### IP Interfaces

- 1 x GigE – Management
- 1 or 5 x GigE – Testing (VQM1000)

##### VoIP Signaling

- MGCP – Up to 4 Endpoints
- SIP – Up to 4 Endpoints

##### Module Support

- 2 x TDM Modules OR 1 TDM Module + 1 VoIP Module

##### TDM Modules

- 2 x Analog ports (VQM4)
- 6 x Analog ports (VQM12)
- 1 x Analog Fax/Modem (VQM38/92)
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##### VoIP Module

- 2 x SIP endpoints (VQM188)
- 2 x H.323 endpoints (VQM188)
- 2 x MGCP endpoints (VQM188)

## DirectQuality® Integration

DirectQuality provides complete service level test automation from test call generation to Quality of Service (QoS) troubleshooting. Our Web-based OSS features color-coded service level thresholds for reporting, alarming and analysis. With DirectQuality, users can schedule tests at any hour or initiate on-demand testing at customer premises.

### Business-level QoS Reports

DirectQuality provides a set of business-driven report templates with high-level and drill-down views.



## PocketDQ™ Integration

When you have PocketDQ software running on the DirectQuality server, it allows you to remotely initiate an automated test call to the PowerProbe 30 through a wireless Web-enabled device such as a PDA or cell phone. PocketDQ presents results in a meaningful and simple Web report format. Eliminate guess work and accelerate troubleshooting by drilling down from QoS indexes to accurately and effectively troubleshoot network issues.



## SMSDQ™ Integration

When you have SMSDQ software running on the DirectQuality server, it allows you to remotely initiate a test call to the PowerProbe 30 using SMS text messages. Simple Pass/Fail test results are sent in a return SMS text message.

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## About Tektronix:

Tektronix Communications provides network operators and equipment manufacturers around the world an unparalleled suite of network diagnostics and management solutions for fixed, mobile, IP and converged multi-service networks.

This comprehensive set of solutions support a range of architectures and applications such as LTE, fixed mobile convergence, IMS, broadband wireless access, WiMAX, VoIP and triple play, including IPTV.

## For Further Information:

Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology.

Please visit [www.tektronixcommunications.com](http://www.tektronixcommunications.com)

## Contact Tektronix:

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