SmartClass™ TPS

Includes OneCheck, a fully automated, single-button application that tests DSL, data throughput, VoIP, and video with clear Pass/Fail results

Key Benefits

- Reduce repeat faults, save money with comprehensive testing in an all-in-one tool
- Cut test times in half for xDSL and triple-play services with OneCheck™
- Avoid the complexity of copper testing with one-button CableCheck™
- Save time using SmartIDs™ to troubleshoot an entire multipoint coax network in one test
- Improve overall technician efficiency with mobile apps and simplified, one-button testing

Key Features

- Supports WiFi
- Tests ADSL2+/VDSL2 including bonded and vectored pairs, broadband services (data, VoIP, and IP video), copper, POTS, fiber, WiFi, and coax/HPNA
- Web browser
- OneCheck automates all ADSL2+/VDSL2, data, VoIP, and IP video tests and reports all key quality metrics
- CableCheck verifies copper-pair health with balance testing and ground checks
- SC TPS mobile device application for iPhone/iPad (iOS App) provides remote control, job management, and technical support content including tutorials

Applications

- DSL networks and triple-play services
- WiFi and in-home coax networks
- Broadcast and VoD streams including VMOS
- VoIP packet streams
- IP data connectivity

The JDSU SmartClass TPS handheld helps field technicians rollout broadband access networks and services, delivering a pristine copper access infrastructure that can support triple-play services and meet critical quality-of-service (QoS) and quality-of-experience (QoE) requirements. This all-in-one tool can test copper, fiber, asymmetrical, and very-high-speed digital subscriber lines (ADSL2+/VDSL2, bonding, vectoring), WiFi, coax and HPNA networks, Internet protocol (IP) data, voice over IP (VoIP), and IP video with straightforward Pass/Fail results and detailed analyses of physical- and application-layer-related problems.

To ensure that field technicians have successfully completed installation and repair jobs, the SmartClass TPS verifies the physical health of the access copper loop, digital subscriber line (DSL) performance, QoS/QoE of triple-play services, and home distribution networks. In addition, the CableCheck and OneCheck automated test suites improve technician efficiency by avoiding test configuration and result complexity, cutting test times by more than half. The iOS app expands this efficiency, enabling mobile integration.

Overall, with SmartClass TPS, operators and service providers locate and repair faults more quickly and confidently guarantee service quality.

ADSL	WiFi	Data	OneCheck	Vectoring
VDSL	Coax	IP Video	VideoCheck	Bonding
Copper	HPNA	VoIP	CableCheck	G.INP
Fiber	Ethernet	Web	Mobile App	Hlog

ADSL2+/VDSL2

Technicians commonly run DSL synchronization tests at every dispatch, and the SmartClass TPS supports DSL tests for ADSL2+ (ADSL and ADSL2 included), VDSL2, ADSL2+/VDSL2 bonding, and VDSL2 vectoring. It provides a bits-per-tone graph that is key toward identifying disturbers and profile utilization. Typical ADSL2+/VDSL2 tests that today's field technicians require include:

DSL Test	What it Tests	Why it is Needed
ADSL2+/VDSL2 synchronization test	Synchronization in Auto mode or dedicated profile	Connection and provisioning problems.
Customer data rate upgrade	Maximum DSL rate	Applications such as IP video require more bandwidth.
Margin and attenuation	Signal-to-noise ratio margin (SNRM) and loop attenuation	Copper circuits are exposed to environmental changes. Adequate noise margin maintains the line. Higher attenuation results in lower SNR.
DSL errors	CRC, FEC, LOS, LOF, LOP	DSL errors will transfer to application layers such as IP video.
Bits per tone (BPT)	Number of BPT	Identifies disturbers/interferers.
Hlog	Loop attenuation component of the channel transfer function (during the modem training phase)	Can detect bridged taps, degraded contacts and bad joints
Quiet line noise (QLN)	External noise floor of the DSL line	Shows frequency of potential disturbers/interferers on the DSL line
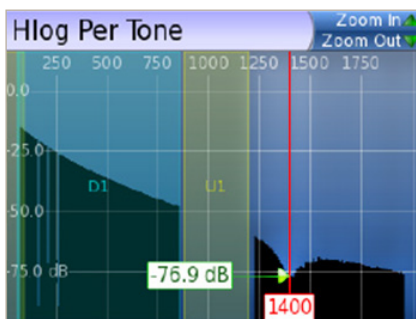
A bridged tap causes a dip on the Hlog graph; this example shows a bridged tap length of approximately 8 m

Hlog

Copper loops that perform well for ADSL2+ may fail dramatically with full VDSL2 performance. Short bridged taps (between 2 – 50 m/5– 150 ft) located in homes can degrade VDSL2 data rates significantly.

The graphical Hlog diagnostic mode on the SmartClass TPS easily detects bridged taps, including their approximate length and frequency areas of noise interference. A bridged tap causes a dip on the Hlog graph, which represents the attenuation per frequency of the line. The Hlog data is assessed during the DSL training phase.

Removing bridged tap faults lets operators provide more reliable DSL lines with higher data rates. And, it's easy to recheck with Hlog to ensure that there's no more dip: meaning no more bridge tap.
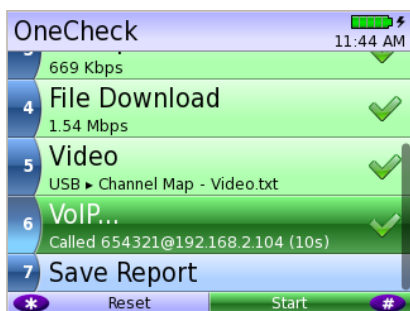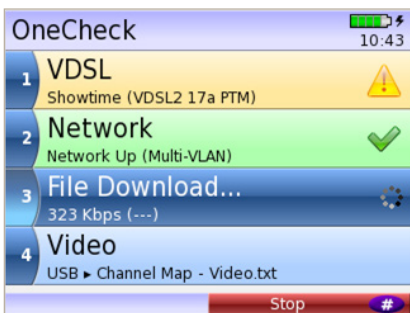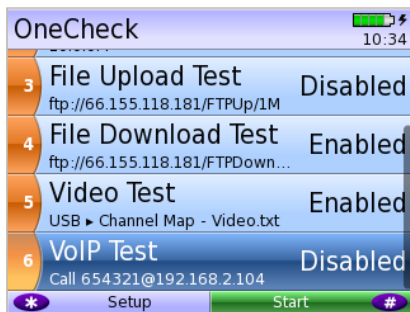

No more bridge tap

DSL Test	What it Tests	Why it is Needed
Hlog	Loop attenuation component of the channel transfer function (during the modem training phase)	Can detect bridged taps, degraded contacts and bad joints
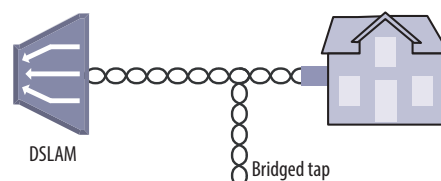
Bridged taps can impact DSL performance

OneCheck

OneCheck is a fully automated, single-button application that tests DSL, data throughput, VoIP, and video with clear Pass/Fail results.

This application lets technicians overcome the complexity of testing all technologies simultaneously. OneCheck significantly reduces test times and lets technicians test all services with minimal training. Consistently following test methods and procedures, operators also reduce working CPE swap outs, second customer visits to solve problems, and repeats; all services are checked before closing a job. OneCheck results also provide insightful test data from the field which can help improve network design and overall QoS.

Technicians choose which OneCheck tests to run, stop/resume/reset, and receive clear Pass/Fail results in CSV, HTML, or PDF file format

Test	What it tests	Why is it needed?
Physical link[*]	DSL with pass/fail on connection rate, maximum rate, noise margin, and attenuation	High data rates achieved with VDSL and/or DSL bonding are more susceptible to impairments due to a higher transmission frequency range and complex protocols. Good QoS on data, VoIP, and video services requires a pristine physical link.
Network authentication	Network authentication using IPoE/IPoE6 or PPPoE, with user login status information	Certifying the network during customer service turn-up.
IP ping	Connectivity and delay time through the network with pass/fail results for receiving a successful ping reply within set timing thresholds (average or maximum ping time)	Network delay is crucial, especially with high-interaction applications such as gaming.
File upload	File upload rates using FTP or HTTP protocol with pass/fail results for targeted rates	DSL profile parameters, such as impulse noise protection (INP) and delay and network aggregation issues, determine user-experienced data speeds.
File download	File download rate using FTP or HTTP protocol with pass/fail results for targeted rates	DSL profile parameters, such as INP and delay and network aggregation issues, determine user-experienced data speeds.
Video	Verifies that all video channels based on a loaded channel list are available and perform according to QoS thresholds (latency, jitter, loss) with pass/fail results	Verify video channel availability and quality to meet customer expectations.
VoIP	Registration at the gateway by placing an automated or manual call with call quality according to QoS thresholds (loss, jitter, delay) with pass/fail results and includes an MOS result.	Ensure that service setup and provisioning match the customer profile. Verify connectivity beyond the signaling gateway and ensure user-perceived premium call quality.

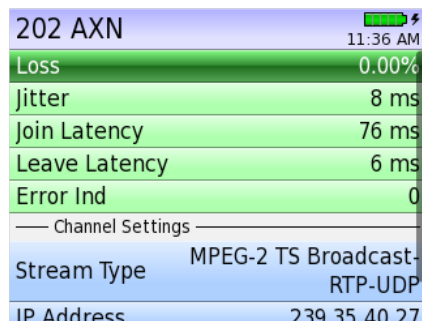[*]The physical link can be ADSL2+/VDSL, Ethernet 10/100 Mbps, or Wifi.
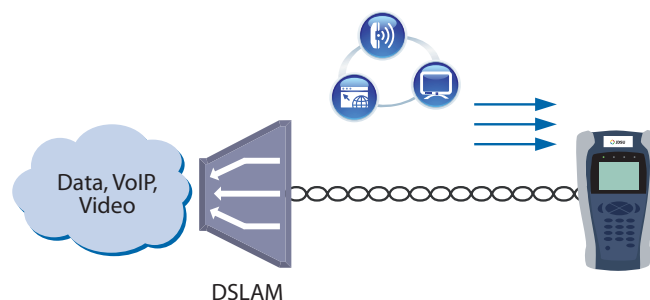
SmartClass TPS OneCheck automates DSL, data, VoIP, and video testing with pass/fail results to significantly reduce test time

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The SmartClass TPS VideoCheck channel summary shows each channel's availability as well as the QoS

Detailed QoS results for each channel tested in the SmartClass TPS VideoCheck

IP Video

The SmartClass TPS can test multiple standard- (SDTV) and high-definition television (HDTV) streams regardless of compression format (Motion Picture Experts Group 2 [MPEG-2], MPEG-4p10/H.264 or VC-1, and others) and automatically detects the stream type with the Broadcast Auto feature.

The SmartClass TPS IP Video application allows for termination of the IP video stream anywhere in the access network using the DSL or Ethernet terminal equipment (TE) interface. The Monitor and Through mode of the SmartClass TPS also allows for identification of faulty equipment.

Key performance indicators for real-time protocol (RTP), the correlation to DSL errors, along with an optional video mean opinion score (VMOS) test gives the SmartClass TPS the ability to truly measure network QoS and QoE.
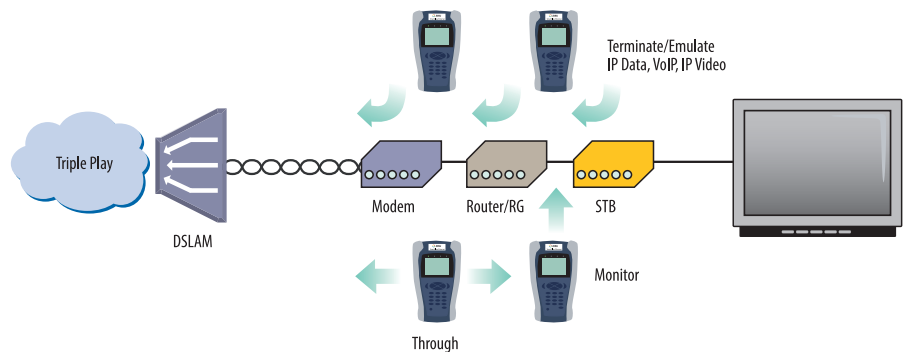
Through, Monitor, and Emulation modes

5
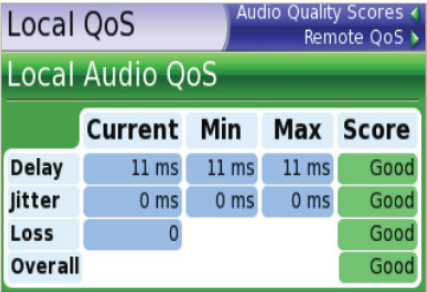
VoIP

VoIP Audio QoS screen

The SmartClass TPS is the ideal test tool to quickly place VoIP calls and verify QoS via mean opinion score (MOS) values.

A DSL, Ethernet TE, or WiFi interface allows for testing VoIP anywhere in the access network, replacing either the DSL modem, VoIP phone, or both. The SmartClass TPS also includes an Auto Answer mode in which the unit automatically responds to an incoming call.

JDSU provides a wide range of signaling protocols including SIP, H.323, MGCP and SCCP, and voice decoding (G.711, G.722, G.723, G.726, and G.729).

Typical VoIP tests that today's field technicians require include:

VoIP Test	What it Tests	Why it is Needed
Service setup/provisioning	Registration with gateway: SIP, H.323, MGCP, SCCP	User setup and server availability. VoIP clients and servers allow complex setups.
Connectivity beyond signaling gateway	Placing test calls on and off network	Call connection from VoIP-to-VoIP and VoIP-to-Public Switched Telephone Network (PSTN).
Call quality	MOS, near- and far-end QoS with packet loss, jitter, delay, and R-Factor	Tests how VoIP calls are transferred through the network and received at the customer premises.
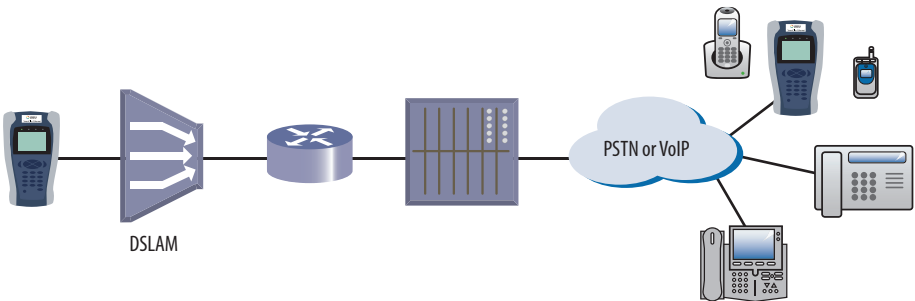
The SmartClass TPS tests VoIP throughout the IP network registration with gateway, test calls on and off the network, and measures near- and far-end IP QoS and MoS

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WiFi scan summary

WiFi histogram

Endpoint results

WiFi

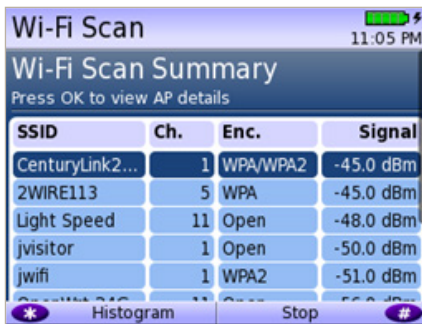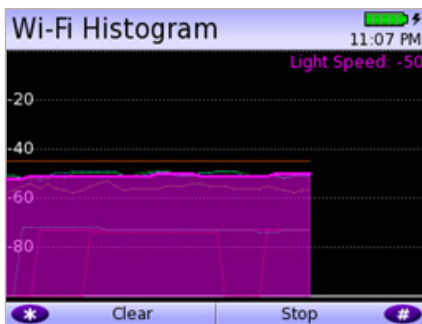The use of wireless devices and wireless networks is becoming a common part of every household. With the addition of WiFi in the SmartClass TPS, technicians are equipped with wireless 802.11b/g/n (2.4Ghz) testing capability to show the signal strength, secure set identification (SSID), configured channel, security, MAC address, and 802.11 protocol at the test location of each wireless 802.11b/g/n network in the area. It also indicates whether a network is secure or vulnerable to security threats. This capability lets technicians properly set up the subscriber's network to find optimal wireless router placement and troubleshoot wireless connectivity or issues with web-surfing speed.

SmartClass TPS WiFi tests and configurations include:

WiFi Tests	What it Tests	Why it is Needed
WiFi Scan	WiFi access point (AP) station scan	Discover potential interfering networks (which could cause slow surfing/data transfer speeds), and locate weak spots in the WiFi signal to suggest a better location of the router
WiFi Network	Connect SC-TPS wirelessly to a WiFi AP as an endpoint	Understand wireless network quality by viewing connection statistics or running tests such as OneCheck, IP Data, and Web Browser
WiFi AP	Connect SC-TPS via Ethernet cable to a router or residential gateway to configure as a WiFi AP (Ethernet bridge to WiFi)	Verify internet connectivity, configure CPE, and run tests from mobile devices.
DSL Bridge to WiFi	After normal DSL synchronization, then can enable SC-TPS as WiFi AP (DSL bridge to WiFi)	Verify internet connectivity and run tests from mobile devices
Remote Access WiFi Interface	Enable SC-TPS for wireless remote access	Use the JDSU mobile device application to remotely control the SC-TPS to improve efficiency
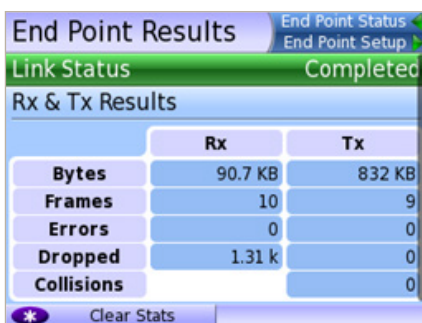
Coax

SmartID coax probe

SmartID test mode is a standard feature in SmartClass TPS meters with hardware type of "CPU Gen 2" or later, which was released with software version 3.0.4. The SmartID test works with optional SmartID coax probes to quickly display and certify subscriber coax topology. It identifies and locates physical-layer impairments that affect both triple-play and multiroom DVR services which use HPNA communication.

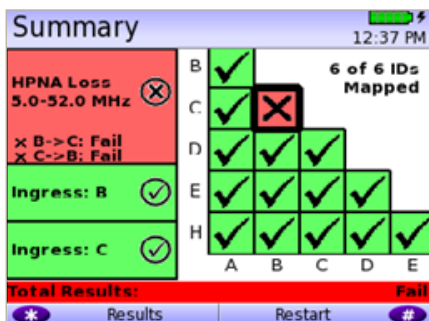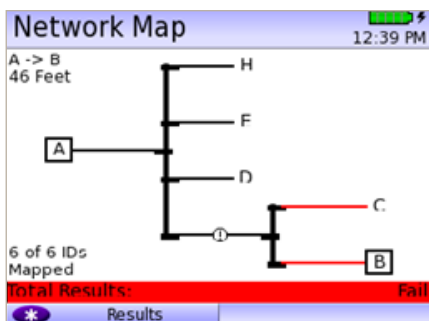Testing with a SmartID probe at each outlet that will supply customer premise equipment (CPE), such as a set-top box (STB) or residential gateway (RG), lets a technician verify that each coax path can handle all planned services.

SmartID test summary results screen
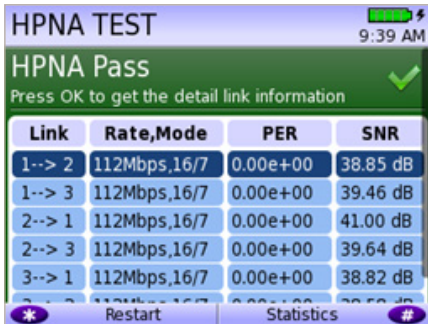
Coax home network under test with SmartIDs

SmartID network map screen

The SmartID system saves troubleshooting time by showing technicians impairment locations immediately. Technicians don't have to repeatedly segment the network, make a change, and then retest. Often, when technicians determine that a coax cable is faulty, they simply replace it when it could be easily fixed. Time and money wasted to re-run, bury, or hang a new drop adds up quickly. SmartIDs provide information to the technicians so they can determine whether they can quickly fix the drop, need to replace it with a new one, or use an alternative means to supply service to the desired location.

Drilling down, the technician can determine exactly how far the impairment is from the outlet, simplifying and speeding the process of locating and fixing the problem. SmartID probes are available in kits that let a technician test the whole home network in one test that typically takes less than two minutes.

After completing physical-layer testing with SmartIDs, a technician can verify the coax network with the CPE using the HPNA Test.

SmartID detailed view screen

HPNA

HPNA test results summary screen

HPNA, a technology standard developed by the Home Phoneline Network Alliance (HomePNA™), builds on Ethernet and allows all the components of a home network to connect and integrate over an unpredictable wiring topology. The HPNA communication is used to pass information around a home to other HPNA-connected devices.

In the HPNA test, the SmartClass TPS connects to the HPNA network via CPE and communicates with the HPNA host of the network to initiate the test. Each communication path between all HPNA nodes will be tested on the network, letting users segment problem node paths, node-to-node communication issues, and verify correct functionality of the whole network. The SmartClass TPS lets users verify that HPNA networks are operating within expected service quality metrics and set up Pass/Fail limits to help simplify testing.

Mobile Device Application

The SC TPS mobile device application is available for iOS devices and enables quicker, more efficient testing with immediate access to technical support information. Now, the SmartClass TPS can remain plugged into one location in the house while technicians move easily and quickly to remote locations simply using the app via a wireless connection back to the SmartClass TPS tester. The app also lets technicians see all test results screens from SmartID measurements on one screen, saving time and eliminating the need to switch test results, as well easily managing job files and exporting completed jobs to a server.
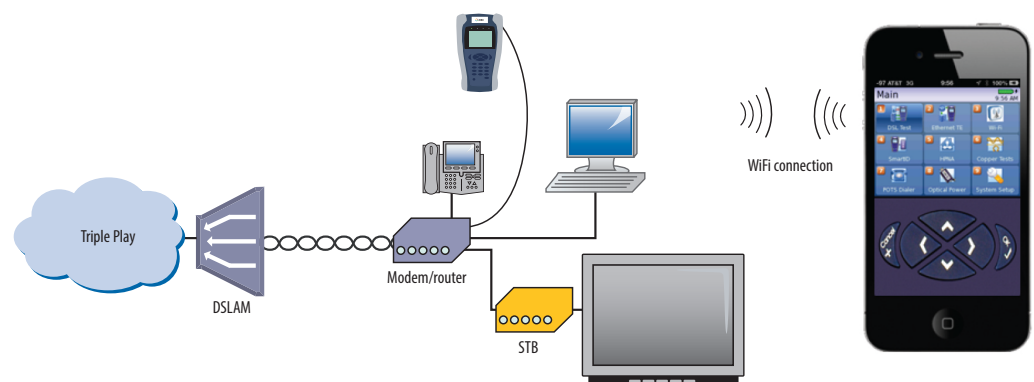
Remote access to SmartClass TPS from mobile device
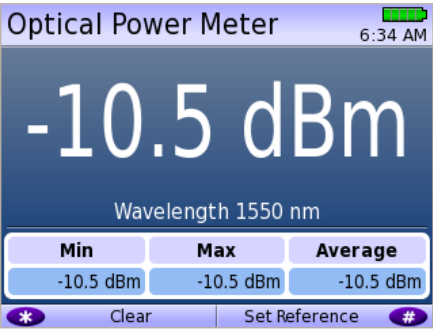
Optical Power Meter screen

Fiber

Broadband DSL networks and broadband triple-play services often rely on fiber networks. An example is fiber-to-the-cabinet (FTTC) that brings the DSLAM closer to the customer for greater VDSL bandwidth. The DSLAM is served with a fiber back to the exchange to carry broadband signals. Another example is business customers connected to their service providers via ADSL2+/VDSL and via fiber. This drives the need for field technicians who work in these environments to have both DSL and fiber test capabilities.

For point-to-point fiber installation such as FTTC or business connections, field technicians can use the SmartClass TPS together with the JDSU MP-60/MP-80 USB Optical Power Meter (OPM) to ensure that fiber cable attenuation meets system requirement performance and is ready to survive network aging and environmental impacts.

In combination with a JDSU SmartPocket OLS (optical laser source), the SmartClass TPS equipped with a MP-60/-80 OPM can automatically perform optical link loss measurement at different wavelengths—resulting in a faster and more comprehensive fiber test.

Fiber Test	What it Tests	Why it is Needed
Optical power level	Optical power level with Pass/Fail and reference values	Optical loss must be within budget at ONU site

MP-60/MP-80 USB OPM (optical power meter)

SmartPocket OLS (optical laser source)
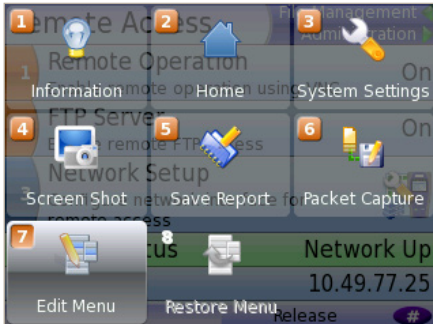
Utility screen
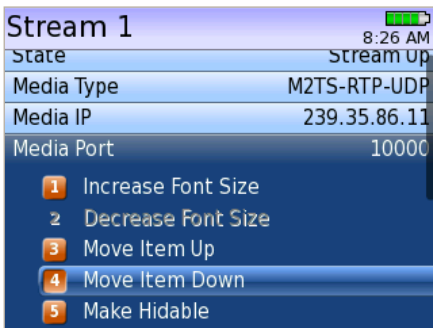
Customizable features

Navigating the SmartClass TPS

The SmartClass TPS adopts a new navigation concept with a user interface that offers a wide range of personalization features, letting users customize it based on job task and preferences. They can increase or decrease the font size, move menu items up or down, hide or highlight specific menu selections, and change language options.

With remote operation included, training users becomes easy and also provides additional value when coaching users remotely or performing onsite troubleshooting.

Instrument Handling

The SmartClass TPS makes transferring results and test configuration files easy using a USB memory device or directly accessing the file manager on the test instrument through the embedded FTP server. Result files are available in .pdf, .csv, and .html file formats.

Technicians can also easily add new features and functions to units while in the field using a USB or FTP.

Specifications

Configurations

ADSL1/2/2+ and VDSL2
Copper/POTS Dialer − ADSL1/2/2+ and VDSL2

DSL Modem

Test Interface
ADSL2+/VDSL2, RJ45 (single and bonded)
Modem Chipset
Broadcom 6368
VDSL Standard Compliance
ITU-T- G.993.2
VDSL2 Annex A, B
ITU-T-G.998.1 ATM bonding
ITU-T-G.998.2 PTM bonding
ITU-T-G.993.5 self-FEXT cancellation (vectoring)
Profiles: 8a/8b/8c/8d, 12a/12b, (17a for single only)
Band Plan 997 and 998, U0 band
ADSL Standard Compliance
ITU-T G.992.1
Annex A (G.DMT)
ITU-T G.992.3 Annex A, L (ADSL2)
ITU-T G.992.5 Annex A, M (ADSL2+)
ITU-T-G.998.1 ATM bonding
ITU-T-G.998.2 PTM bonding
ANSI T1.413-1998, Issue 2
ITU-T G.992.5 INP Amendment 3
General Settings and Features
Auto sync
Auto or manual framing mode
PTM mode for ADSL2+ and VDSL2
ATM mode for ADSL2+ and VDSL2
Dual latency path support in VDSL2
G.INP support for ADSL2+ and VDSL2
Vectoring support for VDSL2
SOS mode support in VDSL2 and VDSL bonded
Modem Summary Results
Modem state
ADSL mode, VDSL profile
Actual and maximum attainable bit rate (payload)
Capacity
SNR margin
1 MHz attenuation
Group rate for DSL bonded
Group maximum attainable bit rate for DSL bonded
DSL Signal
Sync counter
Trained path
Loop length
Vectoring status
SATN (signal attenuation)
LATN (line attenuation)
1 MHz attenuation
TX power
Interleave delay
Actual INP

DSL Errors

FEC (forward error correction)
CRC (cyclic redundancy check)
HEC (in ATM mode)
ES (errored seconds)
SES (severely errored seconds)
UAS (unavailable seconds)
DSL Alarm Seconds
LOF (loss of frame) seconds
LOS (loss of sync) seconds
LOM (loss of margin) seconds
Band Statistics
LATN per band (line attenuation)
SATN per band (signal attenuation)
TX power per band
Graphical Results
SNR (signal to noise ratio-per-tone)
BPT (bits-per-tone)
QLN (quiet line noise-per-tone)
Hlog (including bridged tap length conversion)
DSL Identity
Vendor code
Vendor revision
Vendor SW revision
Vendor PHY revision
Data Mode Selection
PTM, ATM, auto
ATM Results
Cell count user (RX/TX), OAM (RX/TX), bad (RX), dropped (RX)
HEC, OCD, LCD Errors
G.INP Statistics (upstream/downstream)
Status
Retransmitted DTUs
Corrected DTUs
Uncorrected DTUs
INP Rein
Vectoring Status
V-not configured, V-running, V-full, F-friendly

Network

Data Modes
Bridged Ethernet
IPoE
PPPoE
Multi-VLAN
IPv6oE
IPv6 multi-VLAN
VLAN for DSL Bridge Mode
Tag on/off
VLAN interface count 1,2,3
ID selection 0-4095
Priority selection 0-7

MAC Setting
Factory default, user-defined
IP Setup and Status
WAN/LAN status
Gateway/DNS
Static or DHCP
DHCP server on LAN
DHCP user class
DHCP vendor class
IP release/renew
DNS support WAN and LAN
IPV6 Mode manual, stateless, DHCPv6 stateful
DHCPv6 option None, IA_PD
IPv6 global address
Local address mode: manual, automatic
Local IPv6 address
Subnet prefix length
IPv6 gateway
DNS Server
WAN/LAN Results
IP address, net mask, gateway, DNS, MAC address
PPP/IP Connectivity
BRAS: PAP/CHAP IPCP
NAT
PPPoA, PPPoE, IPoA, IPoE, bridged
RFCs 2364, 2516, 1483, 2684
DSL Bridge to WiFi
Configure SSID over 802.11b/g/n (2.4 Ghz)
Optional security using WEP, WPA, WPA2

10/100 Ethernet TE

Test Interface
10/100 Ethernet, RJ45
Data Modes
IPoE, PPPoE, data off
MAC Setting
Factory default, user-defined
IP Setup and Status
LAN status
Gateway/DNS
Static or DHCP
DHCP user class
DHCP vendor class
IP release/renew
DNS support
IPV6 mode manual, stateless, DHSPv6 stateful
DHCPv6 option, None, IA_PD
IPv6 global address
Local address mode: manual, automatic
Local IPv6 address
Subnet prefix length
IPv6 gateway
DNS server

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Specifications (cont'd.)

LAN Results
IP address, net mask, gateway, DNS, MAC address
VLAN (on Ethernet 10/100)
Tag on/off

VLAN interface count 1, 2, 3
ID selection 0 – 4095
Priority selection 0 – 7

Ethernet Results
Link status, RX/TX bytes, RX/TX frames, RX/TX errors

IP Data

Test Interface
10/100 Ethernet, RJ45
ADSL2+/VDSL2, RJ45

Ping and UDP Statistics
IP ping mode: IPv4, IPv6
Echoes sent/received, Ping delay (cur/ave/max/min),
Lost count/percentage, packet size
Supports IP address or DNS name destination

Traceroute ICMP and UDP Statistics
Hop count, name lookup, and IP address of hops
Supports IP address and DNS address destination

File Transfer Throughput Test

Transfer protocols	FTP, HTTP
Transfer direction	download, upload
HTTP authentication type	none, basic, digist
Save downloaded file	yes, no
Concurrent download	disabled, 1, 2, 3
Auto repeat	disabled, enabled

Results on status, byte transferred, total transfer rate, total transfer time, pretransfer time, start transfer time, nake lookup time, connection time, redirection count, HTTP code, header size, request size

Additional IP Data Test Software Option
Web connectivity through browser
Proxy server

VoIP

Test Interface
10/100 Ethernet, RJ45
ADSL2+/VDSL2, RJ45

Supported Signaling Protocols
H.323 ITU-T H.323 version 3 fast connect
H.323 ITU-T H.323 version 3 full connect
SIP RFS 3621

MGCP

Supported Codec Configuration
ITU-T G.711 u-law/A-law (PCM/64 kbps)
ITU-T G.722 64 K
ITU-T G.723.1 (ACELP/5.3, 6.3 kbps)
ITU-T G.726 (ADPCM/32 kbps)
ITU-T G.729a (GS-ACELP/8 kbps)
User-selectable silence suppression, jitter buffer
User-selectable transmit source (live voice conversation, tone transmit, IP voice announcement)
DTMF in-band

General VoIP Settings
User-selectable calling alias
User-selectable or default MAC address
STUN server

Gateway Settings
User-selectable static or no gatekeeper direct connect mode
Supports inbound and outbound calls, with or without gatekeeper support

Reported Results – VoIP
Call stats: full incoming call statistics, including IP address, far-end alias, far-end name, RTCP availability/ports, codec and rate, call signaling support, silence suppression enabled, and call duration

Throughput audio: sent/received in bytes and packets, out-of-sequence packets, remote packets

Audio Delay: network, encoding, packetization, buffering, and total delay

Local QoS: audio packets lost, audio overall QoS current/ Min/Max/QoS

Voice Stream: packet delay, packet jitter, packet loss, overall QoS

Additional VoIP Software Options

MOS Software Option (requires VoIP) — Audio Quality
Call quality R-factor current/min/max/average
Line quality R-factor current/min/max/average
R-factor G.107 current/min/max/average
R-factor burst current/min/max/average
R-factor gap current/min/max/average
CQ MOS current/min/max/average
LQ MOS current/min/max/average
PQ MOS current/min/max/average
Voice and video quality rating based on packet metrics thresholds set by user
MOS rating and R-factor

Signaling Software Option (requires VoIP)

skinny Cisco client protocol (SCCP)

IP Video

Test Interface
10/100 Ethernet, RJ45
ADSL2+/VDSL2, RJ45

Modes
Terminate, monitor

Set Top Box Emulation
IGMPv2 and v3 emulation client
IGMP message status/decode status/error message
RTSP emulation client

Service Selection
Broadcast auto
Broadcast MPEG2-TS/UDP
Broadcast MPEG2-TS/RTP/UDP
Broadcast RTP/UDP
Broadcast rolling stream
Broadcast TTS/UDP
Broadcast TTS/RTP/UDP
RTSP MPEG2-TS/(RTP)/UDP
RTSP MPEG2-TS/(RTP)/TCP
RTSP RTP/UDP
RTSP RTP/TCP

Video Source Address Selection
IP address and port number
IP address, port number, and VoD URL extension
RTSP port select
RTSP vendor select

Video Analysis is Per Video Stream

Simultaneous Stream Support
3 terminate, 3 monitor

Packet Loss Statistics
Loss QoS threshold selection, current/history
Continuity errors count
Continuity errors current/max count %
RTP packets lost count
RTP packets lost current/max count %
RTP loss distance errors current/max/total
RTP loss period errors current/max/total
Minimum RTP loss distance
Maximum RTP loss period
Total RTP OOS count
Total RTP headers errors count

Packet Jitter Statistics
Jitter QoS threshold selection, current/history
PCR jitter current/average/max

Specifications (cont'd.)

RTP jitter current/max

Latency Results
Latency threshold selection, current/history
IGMP latency ms
RTSP latency ms
Maximum latency ms

Video Stream Data Results
Total current/min/max/average
IP current/min/max/average
Video current/min/max/average
Audio current/min/max/average
Data current/min/max/average
Unknown current/min/max/average

Stream Quality
Error indicator QoS
Error indicator count
Sync errors count
PAT errors count
PMT errors count
PID timeouts count
Service name
Program name

PID Analysis (each stream)
PID number
PID type (video, audio, data, unknown)
PID description

Signaling Protocol Message Decode
IGMP messages
RTSP messages

Standards
RFS 2236, IGMP
RFC 2326, RTSP
ISO (IEC 13818), video transport stream and analysis
ETSI TR 10-290 V2.1, video measurements
TFC 1483; 2684, ATM AAL5
RFC 2364, PPPoAAL5

Layer Correlation
Combined result view for DSL LOS, DN (downstream) CRC, DN FEC, Ethernet RX errors, RX dropped, video continuity error, video RTP lost, video loss distance total, video loss period total

Additional IP Video Software Options
VMOS software option (requires IP video)
Video relative MOS PID/class
Video absolute MOS PID/class
Audio MOS PID/class
AV MOS PID/class

WiFi

Modes
WiFi Scan, WiFi Network Test, WiFi Access Point

WiFi Scan Features
Detects all available 802.11b/g/n 2.4Ghz WiFi networks
Reports SSID, channel, security setting, power level, MAC address, 802.11 protocol
Histogram to view all WiFi network signal strengths over time

WiFi Network Features
Connect to a WiFi station as an endpoint to view connection results and run tests such OneCheck or Web Browser
Endpoint results reported: Rx and Tx bytes, frames, errors, dropped, collisions

WiFi Access Point (AP) Features
Configure the meter as a WiFi AP (Ethernet to WiFi bridge)

Coaxial Cable Testing

SmartIDs
Now supported on SmartClass TPS mainframe BN numbers CSC-TPSVW and CSC-TPSVW-CU

Settings
Supports any cable coax type with configurable velocity of propagation (VOP) and cable compensation

Tests

Locate SmartIDs	identify cable runs
VDSL home run check	test coax home runs to be used for VDSL service
Whole home check	test entire coax network at physical layer prior to HPNA test

Features

Test summary	Pass/Fail results of noise ingress and frequency sweep
Network Map	visual overview of coax network
Detailed View	view cable lengths, faults, splitters, etc.
Sweep Data	graph of frequency sweep data

HPNA Network Test

Features
Supports testing over RJ45 interface
Quick and chronic test available

Settings

Configurable minimum PHY rate	12-256
Configurable SNR	0-40
Configurable max packet loss	0-99 (quick)
	0-9,999 (chronic)
Payload length size	6-1482

Number of packets to send	0-5,000 (quick)
	0-500,000 (chronic)

General Connection Status
Station list including indication of the host
Device ID number
Device MAC address
Device HPNA CopperGate chipset firmware and version identification

HPNA Network Results
Segment specific rate, constellation, and baud
Segment specific packet error rate (PER)
Segment specific SNR
Segment specific receive power
Segment MAC addresses

Fiber Test

Optical Power Meter

USB optical power meter	MP-60, MP-80
Min/max/average optical power level	dBm, mW
Selectable Pass/Fail threshold	
Reference value	

Copper Test

	Range	Resolution	Accuracy
AC Volts			
	0 – 300 Peak	1 V	2% ±1 V
DC Volts			
	0 – 300	1 V	2% ±1 V
Resistance			
	0 – 999 Ω	1	2% ±2.5 Ω
	1 – 9.99 Kω	10	2%
	10 – 99.9 kΩ	100	2%
	100 – 999 kΩ	1 k	2%
	1.0 – 9.9 MΩ	10 k	6.5%
	10.0 – 100 MΩ	100 k	10%
Leakage			
	0 – 49.99 Ω	1	2% ±2.5 Ω
	50 – 999 kΩ	1	5% ±2.5 Ω
	1.0 – 9.99 kΩ	10	5%
	10.0 – 99.9 kΩ	100	5%
	100 – 999 kΩ	1 k	5%
	1.0 – 9.9 MΩ	10 k	10%
	10 – 100 MΩ	100 k	15%
Distance to Short			
	0 – 3 k ft (0 – 999 m)	30 ft (9 m)	
	3 – 30 k ft (1 – 10 km)	100 ft (30.5 m)	

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Specifications (cont'd.)

Capacitance/Opens

0 – 44.9 nF	3% ±45 pF
45 nF – 1.04 µF	3%
0 – 2,999 ft (0 – 999 m)	1 ft (0.1 m)
3 – 66 k ft (1 – 20 km)	1 ft (0.1 m)

DC Current

0 – 110 mA	1 mA	±2% ±1 mA

Longitudinal Balance

35 – 70 dB	1 dB	2 dB

Good ground check to verify longitudinal balance results

Load Coil Counter

0 – 27 k ft (8230 m)	up to 5	±1

POTS Dialer

DTMF or pulse dial mode

Job Manager and Test Results

Features

Create a job to save test results in a XML file to be uploaded to FTP server

Settings

Each job file consists of: circuit ID, work ticket, tech ID

Configurable FTP server address, directory, username, and password

Mobile Device Application

Features

Available for iOS devices (iPad, iPhone, iPod touch)

Remote control SmartClass TPS over 802.11 wireless connection

Access to technician support content such as the user manual, quick cards, training videos, and accessory guide

General

Power Supply

Battery	Li ion internal rechargeable, field replaceable 4400 mAh
Operating time	greater than 4 hours
Auto power down (adjustable)	
Charging time	approx. 6 hours
AC line operation	via external adapter/car charger

Connector

DSL	8-pin modular (RJ45)
Ethernet	8-pin modular (RJ45)
T/A, R/B, Ground	2 mm recessed banana
POTS	8-pin modular (RJ45)
USB	USB 2.0

SmartClass TPS mainframe BN numbers CSC-TPSVW and CSC-TPSVW-CU (with hardware type "CPU Gen 2") supports USB high power <=500 mA; previous hardware supported USB low power <=100 mA only

Connectivity

USB flash drive

Remote access through FTP

Remote operation	Ethernet, DSL, and WiFi (SW option required for WiFi)

Mobile Device Application
(used with Mobile App Connectivity SW option)

Bluetooth (not yet supported in SW)

Permissible Ambient Temperature

Nominal range of use	±0 to +40°C (±32 to 122°F)
Storage and transport	−30 to +60°C (−22 to 140°F)

Humidity

Operating humidity 10 to 90%

Physical

Size (H x W x D)	230 x 120 x 70 mm (9.05 x 4.72 x 2.75 in)
Weight, including batteries	<2.5 lb (1.1 kg)
Display	320 x 240 LCD color
CE marked	

Ordering Information

Available Packages

The SmartClass TPS can be ordered in full configuration for high-end triple-play test demands, or it can be scaled down for specific needs and applications. All packages include IP data support for FTP/HTTP throughput, traceroute, and IP ping test. The unit is delivered in a carrying case with test leads.

Packages

Package #	Description	ADSL2+	VDSL2	Bonded ADSL	Bonded VDSL	WiFi	Copper	Web	VoIP	MOS	IPTV	VMOS
Non-Copper Mainframe Packages												
SCTP-V-P0	SmartClass TPS ADSL Best Value Package	■				SW option						
SCTP-V-P1	SmartClass TPS VDSL Silver Package	■	■			SW option						
SCTP-V-P3	SmartClass TPS Web Silver Package	■	■			SW option		■				
SCTP-V-P8	SmartClass TPS Web and Video Silver Package	■	■			SW option		■			■	■
SCTP-V-P11	SmartClass Triple Play Silver Package	■	■			SW option		■	■	■	■	■
SCTP-V-P31	SmartClass TPS Bonded ADSL/VDSL Silver Package	■	■	■	■	SW option						
SCTP-V-P33	SmartClass TPS Bonded ADSL/VDSL and Web Silver Package	■	■	■	■	SW option		■				
SCTP-V-P38	SmartClass TPS Bonded ADSL/VDSL, Web, and Video Silver Package	■	■	■	■	SW option		■			■	■
SCTP-V-P311	SmartClass Triple-Play with Bonded ADSL/VDSL Silver Package	■	■	■	■	SW option		■	■	■	■	■
Copper Mainframe Packages												
SCTPC-V-P0	SmartClass TPS ADSL Gold Package	■				SW option	■					
SCTPC-V-P1	SmartClass TPS VDSL Gold Package	■	■			SW option	■					
SCTPC-V-P3	SmartClass TPS Web Gold Package	■	■			SW option	■	■				
SCTPC-V-P8	SmartClass TPS Web and Video Gold Package	■	■			SW option	■	■			■	■
SCTPC-V-P11	SmartClass Triple Play Gold Package	■	■			SW option	■	■	■	■	■	■
SCTPC-V-P31	SmartClass TPS Bonded ADSL/VDSL Gold Package	■	■	■	■	SW option						
SCTPC-V-P33	SmartClass TPS Bonded ADSL/VDSL and Web Gold Package	■	■	■	■	SW option	■	■				
SCTPC-V-P38	SmartClass TPS Bonded ADSL/VDSL, Web, and Video Gold Package	■	■	■	■	SW option	■	■			■	■
SCTPC-V-P311	SmartClass Triple-Play with Bonded ADSL/VDSL Gold Package	■	■	■	■	SW option	■	■	■	■	■	■

Software Options*

Part #	Description
SCTP-VDSL	VDSL (single)
SCTP-ADSL-BONDED	ADSL (bonded)
SCTP-VDSL-BONDED	VDSL (bonded)
SCTP-WEB	Web browser
SCTP-VOIP	VoIP includes SIP, H.323, and MGCP signaling
SCTP-SCCP	SCCP signaling (requires VoIP option)
SCTP-MOS	MOS for VoIP (requires VoIP option)
SCTP-IPVIDEO	IP video
SCTP-VMOS	VMOS for IPTV (requires IP Video option)
SCTP-WIFI	WiFi test
SCTP-HPNA	HPNA test
SCTP-APP-REV01	Mobile app connectivity (revision 1)

* Software options are factory installed with day of initial delivery or are field upgradable on installed units. To order as a field upgrade, use the same catalog order no. for the software options as seen above and add "-U1" to the end.

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