SmartClass™ IW-1000

Inside Wiring and Networks Service Meter

Key Features

- Easy-to-use, accurate, and economical handheld test instrument
- Coax Mapping with splitter identification and location
- Noise Immunity Test measures coax shield isolation
- Coax cable identification through splitters and other coax network elements
- Physical layer testing for coax, Cat3/Cat5/Cat5e/Cat6 cables
- Ethernet testing, including port identification and ping
- POTS butt-set with diagnostics and loudspeaker
- Optional 802.11b/g wireless signal testing
- 320x240 high brightness color graphical LCD

Applications

- Verify residential, MDU, and SMB internal wiring
- Eliminate carrying multiple wiring and internal network test devices
- Perform accurate tests to locate and troubleshoot disruptions for internal network data, voice, and video service
- Verify Ethernet, POTS, and 802.11b/g wireless functionality to ensure troublefree services

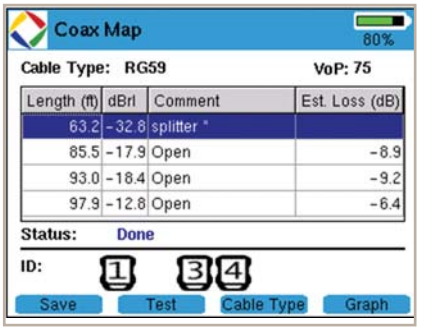
The SmartClass IW-1000 handheld service meter enables verification of internal wiring at the customer premises for proper operation of voice, video, and data services. The IW-1000 is used to test the coax and twisted pair wiring inside the home, in multiple dwelling units (MDUs), and in small-to-medium-sized businesses (SMBs), providing an easy-to-use, accurate, and economical measurement tool for service technicians installing or troubleshooting triple-play services over existing or new networks.

The IW-1000 includes a unique set of features to completely qualify the physical media used to deliver triple-play services throughout the site. The Coax Map feature and the Noise Immunity Test can be used to assess quality and troubleshooting issues in a coax network. The Active ID can delineate multiple runs of coax in the building even through coaxial splitters. The integrated wiring tools can also be used to qualify twisted pair, including Cat3, Cat5, Cat5e, and Cat6 cables. The IW-1000 saves time and effort in verifying and troubleshooting inside wiring problems before the subscriber notices them.

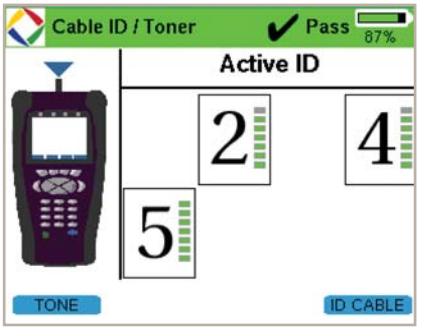
The IW-1000 also includes a unique feature set for testing Ethernet data networks in residential and SMB locations. An optional 802.11b/g wireless feature can be added to ensure correct WiFi functionality in and around the subscriber locations.

Additional features include a fully functional built-in butt-set, which can be used to test POTS voice delivery along with wiring identification and toning to locate and identify cables.

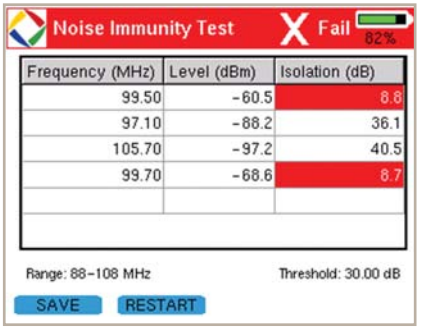
Combined with an easy-to-use menu structure, the features of the IW-1000 represent the best all-in-one service and wiring tester available.



The Coax Map test lets technicians locate and troubleshoot problematic segment of coaxial cable



Cable ID mode with Active IDs lets technicians identify connections for each segment of coaxial cable



The NIT helps users locate isolation issues in coax cable to identify which legs contain faults that could allow ingress into the coax network

Coaxial Cable Testing

Coax is gaining popularity as the medium of choice for transferring communications in and around customer premises. Whether the technology is broadcast or IP video, data over coax technologies, or whole-home digital video recorder (DVR) services, the IW-1000 can ensure that the inside coaxial plant is properly connected. The IW-1000 also helps technicians detect and eliminate unwanted coaxial elements such as hidden splitters, bad barrels, and damaged cables.

Coax Map

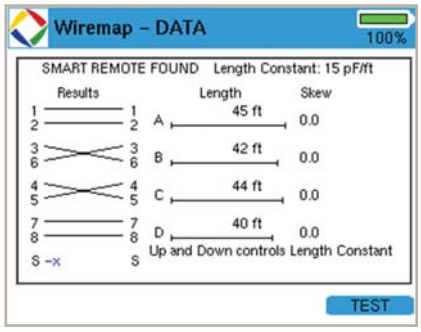
The Coax Map feature of the IW-1000 is a single-ended coax physical layer test based on frequency domain reflectometry (FDR), a powerful technique used in analyzing RF transmission lines. The Coax Map test measures signal quality as it passes through the transmission line by identifying impairments that cause standing waves.

Coax Active Identification

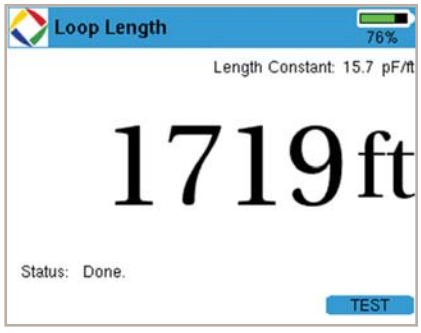
The IW-1000 helps technicians quickly identify which cable goes to which room in a house. Using the Cable ID mode, technicians can determine coax wire endings for each room with a coax run. A common problem occurs when an unexpected splitter exists in the middle of the coax run. However, the Active IDs of the IW-1000 work through splitters to display multiple IDs, which helps to locate the wall outlet or outlets that are connected via a splitter network.

Noise Immunity Test

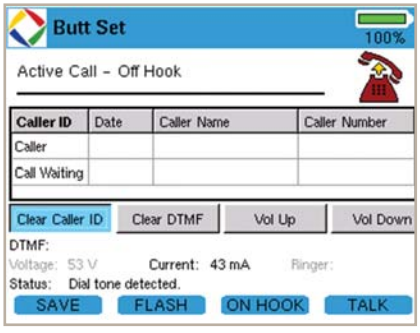
The Noise Immunity Test (NIT) provides good indications of coaxial cable shielding issues. Problems arise when the inside coax has staples, sheared jacketing, an exposed stinger, or an unterminated end present. The NIT gives technicians a better chance of catching impairments before subscribers experience service degradation. The NIT measures the signal strength of local FM carriers and compares them to the same measurement on the cable to determine the isolation of the coax to off-air ingress.



Twisted Pair Wire Map helps technicians find impairments and incorrect wiring in phone and Ethernet cables



Loop Length test measures the length of unterminated twisted pair cables



The built-in butt-set allows techs to verify and troubleshoot POTS voice issues

Twisted Pair Testing

The IW-1000 provides a suite of twisted pair measurements to ensure the correct connections and wiring of POTS and Ethernet cables.

Twisted Pair Wire Mapping

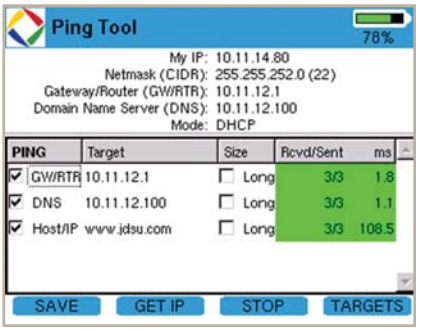
The Twisted Pair Wire Map provides details about the cable length, distance to opens and shorts, skew, and the connection mapping of each wire when used with the SmartRemote. This information lets technicians quickly locate improper wire connections and the presence of physical layer issues. The IW-1000 can map twisted pairs on Ethernet, Cat5/6, or phone wiring, straight, or Cat3.

Loop Length

The Loop Length test is an open capacitance test that calculates the length of the twisted pair cable. Intended more for lengthy twisted pair runs the Loop Length test lets technicians easily verify cable run lengths.

Butt-Set

The IW-1000 has a built-in butt-set with speaker phone that helps technicians quickly verify voice communications and troubleshoot POTS issues. The results indicate voltage and current on the line as well as the number dialed and the status of the POTS line. Technicians can store a list of frequently called numbers for easy dialing. The butt-set provides call waiting and displays the caller ID for incoming calls. The speaker phone lets technicians listen for dial tone or voice and talk during calls without a separate headset.



Ping mode lets technicians verify connectivity around and outside the customer premises

Ethernet

The SmartClass IW-1000 includes a suite of Ethernet connectivity tests.

Port Discovery

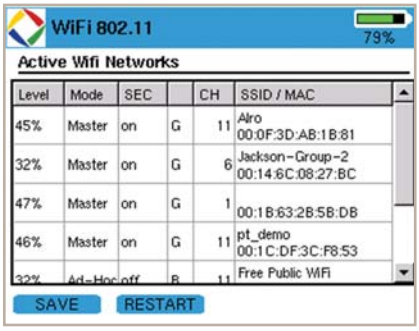
The Port discovery test displays the established link rate on the Ethernet connection between the IW-1000 and a router. It also displays the available rates and the signal-to-noise ratios (SNR) of each active twisted pair. This information helps technicians pinpoint connection issues between the customer premises equipment (CPE) devices and the premises router.

Ping

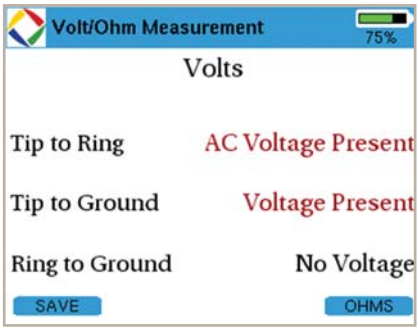
Ping tests let technicians verify network connectivity to a particular IP or URL address. They can also verify that a particular location is capable of reaching either the Internet or a specific server on the network, which lets technicians avoid using customer equipment or a laptop to perform simple connectivity tests.

Hub Flash

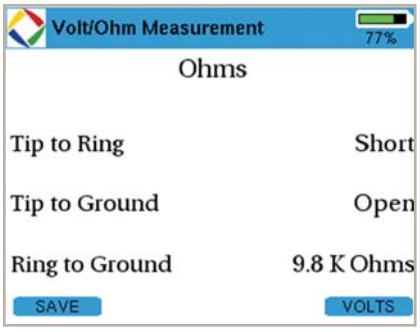
The Hub Flash test is an additional Ethernet test available on the IW-1000 intended for locations with multiple Ethernet connections running to a central device. The Hub Flash will cause the port light to flash on the hub/switch/router indicating that the SmartClass is connected. This simple identification method lets technicians quickly determine which port is connected to a particular run.



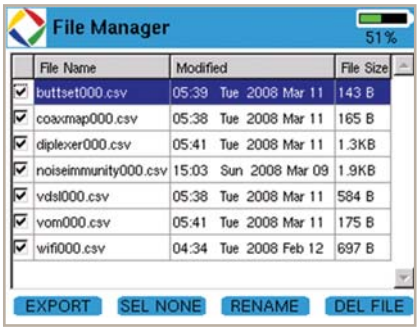
Wireless 802.11b/g test lets users verify that the subscriber's wireless network will work at a particular location or troubleshoot wireless 802.11b/g connectivity issues



Indicates AC and DC voltages via the Volt/Ohm mode



The Volt/Ohm mode identifies the presence of an open, short, or resistance on a line



File Manager is used to rename, delete, or export result files from the SmartClass unit

Wireless 802.11b/g

The IW-1000 provides optional WiFi wireless 802.11b/g testing capabilities to show the secure set identification (SSID), configured channel, 802.11 modulation, mode, and signal strength at the test location of each wireless 802.11b/g network in the area. It also indicates whether the network is secure or vulnerable to security threats. This capability lets technicians properly set up the subscriber's network and troubleshoot wireless connectivity or issues with web-surfing speed.

Volt/Ohm Measurement

The IW-1000 will indicate the presence of voltages on a line prior to connecting sensitive CPE devices. Measurements can be performed on either coax or twisted pair and indicates the presence of AC or DC voltages. The IW-1000 also has a quick ohm measurement test that can be used to verify opens, shorts, or resistances between 100 W and 400 kW, which eliminates the need for technicians to carry separate tools to perform quick voltage or resistance checks.

File Manager

Users can save the results for almost all tests for archival and future review. The unit saves the results in the common .csv format which can be opened using various spreadsheet and other applications. The files are exported via a common universal storage bus (USB) flash storage device. The IW-1000 can hold thousands of result files that can be removed, renamed, and exported from the unit easily using the built-in File Manager application.

Specifications and Features

Available Configurations

Physcial layer testing (coax and twisted pair), Ethernet, Butt-Set
Optional wireless 802.11b/g WiFi

Physical Test Interfaces

Coax F-connector for coax mapping, NIT
RJ11 for POTS testing
RJ11 for phone wiring and dry pair testing
RJ45 for Cat5/6 wiring and Ethernet testing
Connector LEDs for easy connector identification

Cable ID and Toning Specifications

Cable ID Features

Supports coax, Cat3/Cat5/Cat6 cable
Test via F-connector, RJ11, or RJ45
Supports 8 ID devices on each interface

Timing Features

Sends four types of tones on all leads
Constant High pitch (976 Hz)
Constant Low pitch (651 Hz)
High pitch then a low pitch
Low pitch with a short high pitch

Coax Mapping Specifications

Settings

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

Features

Measures cable length in feet (up to 500 ft at ±5 ft)
Measures return loss in dBrl (up to 20 dBrl at ±2 dB)

Cable Events Identified

Open, splitter, low-quality splitter, barrel/splice

Noise Immunity Test Specifications

Features

Measures cable shield isolation vs. settable threshold (def 30 dB)

Specifications

Test frequency of 88 to 108 MHz

Active Identification Specifications

Features

Identifies coax cables through most coax network elements
Identifies multiple IDs attached to the branch of coax being tested

Specifications

IDs with up to 15 dB of signal loss between unit and ID

Wiring Tool Specifications

General Features

Supports Cat3, Cat5/6, coax cable
Detects power present on cables being tested
Measures cable length based on capacitance setting
Detects opens, shorts, and crossed pairs and display wires mapping

Dry Pair Specifications

General Features

Identifies resistive opens and shorts on dry twisted pair
Reports AC voltage presence or DC voltage presence on dry twisted pair (up to 120 VDC, 120 Vrms AC)

Ethernet Testing Specifications

Features

Supports 10/100 Mbps testing over RJ45 interface

Port Discovery

Identifies Ethernet setting on port
Displays link rate
Reports pair skew
Reports frequency offset in ppm

Ping Test

Supports manual or DHCP IP configuration
Reports packets sent and received
Reports average test packet delay

Butt-Set Specifications

North American POTS Butt-Set Only

Features

Supports loop start dial tone POTS testing on twisted pair
Supports receiving a call
Supports line monitor mode with DTMF decode
Supports caller ID, call waiting, with caller ID errors
Microphone and speakerphone support
Measures voltage from 0 to 105 V, ±4%
Measures loop current from 14 to 108 mA ±4%

General Specifications

Power Supply

Field replaceable, rechargeable lithium ion battery
Operating time approximately 4.5 hrs continuous (typical)
Charging time, internal 4-5 hrs from empty to full charge
DC input 12 V, 1.25 A
100/240 V, 50 Hz/60 Hz auto-sensing AC adapter for line operation and charging

Possible Ambient Temperature

Nominal range of use	−5 to +50°C (23 to +120°F)
Storage and transport	−30 to +60°C (−22 to ±140°F)

Humidity

Operating humidity	10 to 80% RHNC

Physical Specifications

4 in 320x240 high visibility color display
USB 2.0 interface for upgrades and data transfer
Full telephone keypad for fast access and dialing

Optional WiFi Specifications

Features

Detects all available WiFi (802.11 b/g) networks
Reports power level, operating mode, security setting, 802.11 version, channel, SSID, and MAC

Ordering Information

Model	Part Number	Description
IW-1000	SCIW1000	Inside wiring test tool for coax and twisted pair with included butt-set and Ethernet verification tools
Option		
Wireless 802.11	SCIWWIFI	Wireless 802.11 option for the IW-1000 enables users to see wireless networks in the area
Accessory Package		
Complete Accessory Pack	SCIWACCPK	All-inclusive accessory package includes Active IDs 1-8, large carrying case, and the full suite of other accessories and cables
Accessories		
Active IDs 1-8	SCHMACTIVEIDS	Active IDs 1-8 for identifying single or multiple coax run locations. Works through splitters.
Bed of Nails—Alligator Clips	SCHMBEDNAILS	Bed of Nails—Alligator clip to RJ11 cable
Coax Resistive IDs	SCHMCOAXRESID	Coax resistive IDs 1-8 for locating single coax runs
Ethernet Resistive IDs	SCHMRJ45RESID	RJ45 resistive IDs 1-8 for locating single Ethernet runs
Phone Resistive IDs	SCHMRJ11RESID	RJ11 resistive IDs 1-8 for locating single POTS runs
Phone Patch Cable	SCHMRJ11 PATCH	RJ11 8-in patch cable
Ethernet Patch Cable	SCHMRJ45PATCH	RJ45 12-in patch cable
Phone to Coax Adapter	SCHMRJ11TOCOAX	RJ11-to-coax adapter cable for toning
Strand Hook	SCHMSTRANDHOOK	Stand Hook—Clip to Hold or hang unit
Smart Remote	SCHMSMARTREMOTE	SmartRemote—Yellow RJ11 and RJ45 used to map out twisted pair connections
NIT Antenna	SCHMANTENNA	Antenna for NIT calibrating off-air FM frequencies
Large Carrying Case	SCHMCARRYCASE	Large carrying case for unit and accessories
6-pin Banjo	SCHM6PINADAPTER	6-pin adapter—6-pin banjo—Breaks out POTS connection for use with alligator clips
Toning Wand	SCHMTONERTRACER	Tone Tracer wand TT100
Vehicle Charger	SCHMCARCHGR	12 VDC vehicle charger adapter
Replacement Battery	SCHMLIONBATT4	Standard lithium ion battery for replacement or spare
Replacement Sleeve	SCHMSLEEVE	Protective canvas sleeve to cover the unit

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