

990DSL CopperPro™

Copper Loop Qualification Tester

16 test sets in one

CopperPro packs all the test, analysis and troubleshooting capabilities an OSP technician needs into one integrated handheld tool for a new view of your local loop:

1. **Digital Multimeter** — AC/DC Voltage, Resistance
2. **Opens Meter** — measure capacitive length of pair
3. **RFL Meter** — locate shorts, crosses or grounds
4. **Noise Meter** — VF & WB, Gaussian & Impulse
5. **Time Domain Reflectometer** — precisely locate and identify faults
6. **Dial Set** — set up or monitor calls
7. **Leakage Tester** — “punch” through resistance faults not detected by other tests
8. **Ammeter** — test DC loop current
9. **Loss Meter** — VF & WB. Measure signal loss over a pair in voice or wideband frequency ranges
10. **VF & WB Precision Signal Generator** — generate precisely controlled signals in single tones, swept sets or composite signals
11. **Tracing Tone Generator** — identify pairs
12. **ANI & CID Tester** — identify telephone numbers and verify proper Caller ID operation
13. **ADSL Connectivity Tester** — verify DSLAM and customer modem functionality
14. **ADSL and Special Services Pair Qualification Set** — prequalify pairs for up to 12 digital services
15. **VF and WB Longitudinal Balance Meter** — identify and prevent noise problems
16. **Power Harmonics Analyzer** — quickly track down tough noise problems

The CopperPro family of loop testers from Fluke Networks provides all technicians working in the outside plant a full complement of testing, fault locating and qualification capabilities in a single, rugged, handheld test set. CopperPro is easy to use. Fast. And it offers more capability than any other single loop test set.

Installation and maintenance

CopperPro makes fast work of installing and maintaining service. The one-button POTS AutoTest helps you quickly document status before and after work is complete. And all the basic tests you expect are there, as well – AC and DC voltage, loop current, circuit noise, balance, leakage and Caller ID/ANI. Verify DSLAM and modem on ADSL lines. Make fast work of loss and slope tests with its automated dial-up tests. Even a dial set with phone number storage is built in.

Cable construction and repair

Use CopperPro’s unique TDR AutoTest to both locate and identify faults. But that’s not all. Find shorted or open pairs fast. Count and locate load coils. Locate high-resistance faults precisely, no matter the cable make up. Step-by-step instructions make set up a breeze.



Pair up with Terminator for fast, easy, one-tech-out terminating testing

With the companion Terminator, qualifying pairs for voice or data services is easy. In fact, it’s the only solution that meets manufacturers’ requirements for HDSL2 and HDSL4 qualification – including loop attenuation – with one technician in less than two minutes. Together, they’re a proven way to reduce failure frequency, wasted dispatches and rebates.





The next generation in subscriber line test sets

The image shows a handheld device with a screen displaying test options: POTS Auto-Test, ADSL Auto-Test, ADSL Verify Test, and TDR Auto-Test. Below the screen are buttons for POTS, ADSL, TDR, and Setup. The device has a keypad with a TEST button, navigation arrows, and a numeric keypad. Callout boxes highlight various features:

- Integrates today's top OSP testing and troubleshooting tasks in one tool; less to buy, maintain and train on** (points to the screen)
- Large graphic interface is fast and easy to read — whether your frontline tech is up a telephone pole or down a manhole** (points to the screen)
- Configurable one-button auto-test "toolboxes" support techs of all skill levels for higher productivity and consistency** (points to the screen)
- Serial interface for downloading software and uploading or printing reports quickly and easily** (points to the side of the device)
- More than 16 hours typical battery life** (points to the side of the device)
- Single test modes support the needs of more expert techs** (points to the screen)
- Power or charge from mains (100-240V) or 12V auto lighter (cable included)** (points to the side of the device)
- On-line help** (points to a button on the right side)
- Built tough for rugged field use and low cost of ownership: sealed to resist moisture, drop tested 1 meter** (points to the bottom of the device)
- Handheld - weighs in at less than 4 lbs. (1.8 kg)** (points to the bottom of the device)

13 Reasons the 990 is the *better* test set

- Test Call Waiting Caller ID, as well as standard CID and ANI
- Longer TDR range thanks to 2,500 and 5,000 nS pulse
- Built-in stress test
- Bridge unobtrusively on to active circuits (ADSL and Specials) and see level and noise at all frequencies
- Find intermittent problems with bargraphs, monitor modes and min/max peak recording
- Shoot TDRs in the presence of up to 250V
- Zero in on the source of tough circuit noise problems with the built-in power harmonics analyzer
- Quickly identify crosstalk source with built-in disturber masks
- Pinpoint noise spikes that knock down specials with wideband impulse noise test
- Verify longitudinal balance at high frequencies. Identify problems that don't show up at lower frequencies
- Verify DSLAM provisioning and presence of customer modem with ADSL Verify Test
- ADSL and xDSL service qualification (with rate prediction for ADSL)
- Identify the type of fault, as well as distance to it with the unique, one-button TDR AutoTest



CopperPro Testing Capabilities

Standard Features (990DSL and 990DSLWT)

- DCV and ACV measurement
- Shorts, grounds and loop resistance with distance conversion
- Resistive fault location (Wheatstone and K-Test)
- Load coil counter with estimated distance to fault and impedance vs. frequency graph
- Leakage stress test
- Loop device counter
- Tracing tone with four modes
- Voice frequency noise – metallic and power influence
- Voice frequency loss
- Voice frequency longitudinal balance
- Voice frequency tone generator
- Automated POTS AutoTest
- Dial set and non-intrusive line monitor
- Voice frequency terminated and dial-up test macros (SmartStrap, MyHelper, FED, SASS, DATU, SmartPro)

Optional Features – Wideband TDR (990DSLWT only)

- Wideband noise and level spectral analysis with interference masks
- Wideband loss
- Wideband longitudinal balance
- Wideband tone generator
- ADSL and XDSL AutoTest for pair qualification
- ADSL verification test for connectivity testing
- Wideband terminated test macros (SmartStrap, MyHelper, FED)
- TDR AutoTest
- TDR pair 1 test
- TDR compare pair 1 and 2
- TDR difference between pair 1 and 2
- TDR pair 1 monitor
- TDR pair 2 to pair 1 crosstalk
- TDR compare pair 1 to stored trace

Specifications

Physical

Size	(H x W x D): approximately 24.9 cm x 13.5 cm x 8.1 cm (9.8" x 5.3" x 3.2")
Weight	1.81 kg (4.0 lb.)
Display	320 x 240 pixel graphic LCD with backlight and adjustable contrast
LED Indicator	Charging status indicator (located on side connector panel)
Communication Port	RS-232 PC/Printer port (DB-9)

Power

AC Operation	Operates from an external AC and 12V vehicle adapter/chargers
Battery Type	Operates from an internal removable NiMH rechargeable battery pack (installed)
Battery Life	A fully charged battery provides approximately 16 hours of normal use
Battery Recharge Time	2 to 3 hours (in the tester) for a fully discharged battery pack

Environmental

Operating Temperature	-20° to 60°C (-4° to 140°F)
Storage Temperature	-40° to 70°C (-40° to 158°F)
Humidity Tolerance	95% (operation without condensation)
Rain Resistance	IEC60529 1P02, international protection water dripping
Vibration	Random, 2 g, 5-500 Hz
Shock	1 Meter Drop Test (3 ft.)
Altitude	4500 m (15,000 ft.)

Standards Compliance

Analog Transmission Parameter Measurement	IEEE 743-1995
ADSL Metallic Interface	ANSI T1.413-1998

Regulatory Compliance

Safety	CSA C22.2 No.1010.1
CE	EN 61326 Emissions and immunity Class A; En 61010-1 + 2nd Amendment

Specifications: Basic 990DSL

Function	Range	Accuracy
AC Voltage	0 to 250V	1% ± 0.5V
DC Voltage	0 to ±150V	1% ± 0.5V
($R_{IN} = 100\text{ k}\Omega, 10\text{ M}\Omega$)	150 to 300V	2%
DC Loop Current	0 to 120 mA	2% ± 0.3 mA
(430Ω)		
Resistance	0 to 100Ω	0.1% ± 0.10Ω
(shorts & grounds)	100Ω to 4 kΩ	0.3% ± 0.10Ω
	4 kΩ to 100 MΩ	3%
Leakage Stress	2 kΩ to 100 MΩ	3%
Opens	0 to 3000 ft. (0 to 9144m)	1% ± 5 ft. (1.5m)
	3 to 50 kf (914.4 to 15240m)	3%
	50 to 80 kf (15240 to 24384m)	5%
Splits	0 to 50 kf (0 to 15240m)	10% of Cable Length
RFL		
Fault Resistance	0 to 30 MΩ	=
Loop Resistance	0 to 4000Ω	=
Resistance to Fault	0 to 100Ω	0.1% RTS ± 0.10Ω
(at rf = 100 kΩ)	100Ω to 4 kΩ	0.3% RTS ± 0.10Ω
K-Test	Same as RFL	± 1% ± 1Ω
(RTS = Res.To Strap)		
Load Coils		
Count	0 to 6	± 1
Distance to first	0 to 12,000 feet (0 to 3,658 meters)	±10% ±500 feet (152 meters)
Tracing Tone		
Frequency	577.5 Hz	0.1%
Level	>3.5 Vpp	10%
VF Noise		
Impedance	600Ω, 900Ω, Bridged	1%
Filters	C, CN, 3k, 15k, Psophometric	=
Metallic Noise	0 to 10 dBm	± 2 dB
	10 to 100 dBm	± 1 dB
Power Influence	40 to 120 dBm	± 2 dB
VF Loss		
Signal Level	-40 to +10 dBm	± 0.5 dB (dryline) ± 1.0 dB (dial up single tone) ± 2.0 dB (dial up Smart Tone)
Frequency	100 Hz to 20 kHz	0.1% ± 2 Hz



Specifications: Basic 990DSL (continued)

Function	Range	Accuracy
VF Longitudinal Balance	0 to 70 dB	± 2 dB
Disturbing Frequency	200 to 2500 Hz	0.1%
Impedance	600Ω	1%
Filters	C, Psophometric	
Send VF Tone		
Frequency	100 Hz to 20 kHz	0.1%
Amplitude (Settable)	-20 to 3 dBm (1 dB increments)	± 0.5 dB
Impedance	600Ω, 900Ω	1%

Specifications: 990DSL Wideband Features

Function	Range	Accuracy
WB Noise/Level		
Impedance	100Ω, 135Ω, Bridged	1%
Filters	E, F, G, None	=
Frequency	10 kHz to 1200 kHz	0.1% ± 508 Hz
Amplitude	-50 to 3 dBm	± 1 dB @ 135Ω
	-90 to -50 dBm	± 3 dB @ 135Ω
Weighted WB Noise		
Impedance	100Ω, 135Ω, Bridged	
Filters	E, F, G, None	
Frequency	10 to 1200 kHz	
Amplitude	0 to 30 dBm	± 5 dB
	30 to 120 dBm	± 3 dB
WB Loss		
Impedance	135Ω	1%
Frequency	10 to 1200 kHz	0.1% ± 508 Hz
Magnitude	0 to 50 dB	± 1 dB
	50 to 70 dB	± 2 dB
WB Longitudinal Balance	0 to 70 dB	± 2 dB
Disturbing Frequency	20 kHz to 1104 kHz	0.1%
Impedance	100 Ω, 135Ω	1%
Filters	E, F, G, None	=
Send WB Tone		
Frequency	10 to 1200 kHz	0.1% ± 508 Hz
Amplitude (fixed)	0.0 dBm	± 0.5 dB
Impedance	100Ω, 135Ω	1%

WB Impulse Noise		
Impedance	100Ω, 135Ω, Bridged	1%
Filters	E, F, G, None	=
Test Time	1 to 1440 Minutes	1%
Impulse Counter	0 to 9999	=
Counter Threshold	-40 to 0 dBm	± 1 dB
ADSL Auto-Test		
Impedance	100Ω	=
Noise Filters	E, F, G, None	=
ADSL Standard	ANSI Full, G, Lite	=
Data Rate Prediction		
Resolution	32 kb/s	
Downstream Rate	0 to 8192 kb/s	± 96 kb/s (3 units of resolution)
Upstream Rate	0 to 1024 kb/s	± 64 kb/s (2 units of resolution)

Specifications: 990DSL TDR Feature

Function	Range	Accuracy
Impedance	135Ω	1%
Pulse-width	20, 100, 500, 1000, 2500, 5000 ns	10% ± 5 ns
Vop Selection	0.300 to 0.999	=
Range (Vop = 0.64)	30,000 ft. (9144m)	=
Range Selection (Auto.)	10 ft. to 48 kf (3 to 14630m)	=
Horizontal Resolution	0.5 to 156 ft. (0.1524 to 47.5m)	=
Distance to Reflect.	0 to 30,000 ft. (0 to 9144m)	1% ± Vop uncertainty
Vertical Gain	80 dB	2 dB
Power Filter	5 kHz Highpass	=
Averaging Filter	4x Waveform Avg.	=
Input Protection	± 400 Vp	=

Each set includes:

- Extensive on-line help
- Internal results storage, both text and graphical
- RS-232 Serial interface for printing, uploading results to a PC, and downloading firmware for the test set
- Rugged weather-resistant handheld design
- High-resolution, backlit LCD display
- Graphical operator prompts and tests results
- Typical 16-hour battery life, with easy-change NiMH battery and user settable power save feature
- Protective bag with shoulder strap and strand hook
- Rubber shock absorbing holster
- AC power supply
- 12 Volt vehicle charger
- Wire gauge
- Users guide

For More Information

For more information or to contact your local Fluke Networks Representative, call (800) 283-5853. Or send email to copperpro@flukenetworks.com.

Ordering Information

Model	Description
990DSL	Loop Tester
990DSLWT	Loop Tester with Wideband and TDR
TN2000	Basic Terminator
TN2100	Enhanced Terminator
990TL-N	Test Lead Set (Plain)
990TL-S	Test Lead Set (Spike)
990TL-B	Test Lead Set (Bed of Nails)
990TL-SB	Test Lead Set (Spike and Bed of Nails)
990-Printer	990DSL Serial Graphics Printer (Seiko DPU-414)
990-CASE	Deluxe Transport Bag
GOLD	Extended Warranty and Service Option

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Fluke Networks operates in more than 50 countries worldwide. To find your local office contact details, go to www.flukenetworks.com/contact.

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Printed in U.S.A. 6/2004 1626640 B-ENG-N Rev D