

# MaxTester 625

FIRST-TIME-RIGHT TESTING FOR COPPER AND VDSL2/ADSL2+



Your solution to simplify copper and DSL installation and repair jobs.

## KEY FEATURES

Automates closeout testing thanks to test script with configurable pass/fail indication

Supports single-pair and bonded ADSL2+ and VDSL2, including vectoring and G.INP, hence enabling service providers to recover and grow wireline revenues

Fast access to key measurements from the copper main menu

Easy-to-use time-domain reflectometer (TDR) ensures any technician can locate copper faults accurately

Stresses the copper pair to determine if proper balance exists

IPTV and VoIP test suites for automated testing of quality of service (QoS)

Designed with an IEC IP54 rating to face the challenges of the outside plant environment

## APPLICATIONS

Validate ADSL2+ and VDSL2 performance metrics during installation and maintenance

Qualification of twisted copper pairs for voice, ADSL2+, VDSL2 and G.fast deployments

Fault detection and location of shorts, opens and bridge taps

Automate test result upload and archiving to ensure compliance with work processes

## THE MaxTESTER SERIES



MaxTester 600 Series  
G.fast, Copper, VDSL2, Multiplay Test Solutions



MaxTester 700B  
OTDR Series



MaxTester 940  
Fiber Certifier OLTS



## THE MAXTESTER 625

Designed for today's ADSL2+ and VDSL2 installers, the MaxTester 625 (MAX-625) is the perfect tool for any field technician or contractor deploying multiplay services over single-pair or bonded ADSL2+ and VDSL2 circuits. Its small form factor, rugged design and easy-to-use interface make it the ideal tool for installation and repair technicians. Thanks to the MAX-625, the testing process is highly automated: technicians can close their jobs quickly and efficiently while being compliant with company processes.

## COMPREHENSIVE METALLIC TESTING

Verification of copper quality is a snap with the measurement capabilities of the MAX-625. Thanks to its industry standard AC and DC voltage, resistance (shorts), capacitance (opens), power influence, and longitudinal balance measurements, technicians are able to obtain clear graphical results with simple pass/fail indications. A POTS dialer is conveniently integrated into key copper tests for activating quiet terminations or tone generators. The MAX-625 also features optional stressed balance testing to energize otherwise hard-to-detect faults that can create cable imbalance and an optional automatic TDR function for pinpointing the location of loop faults.

## DEMYSTIFYING FTTx TESTING

The DSL capability of the MAX-625 is based on the industry-leading Broadcom DSL chipset. The MAX-625 is a flexible tool for all field technicians qualifying DSL and multiplay services, from the central office or remote terminals to customer-premises equipment (CPE). The MAX-625 also provides powerful troubleshooting applications that can be used in different modes to quickly isolate faults no matter where they are located (network, outside plant, customer equipment or inside wiring). Even in hybrid networks where FTTH is also deployed, the Ethernet ports of the MAX-625 can be used inside the home to test at any point where a LAN connection is available.

## AUTOMATED CONFIDENCE BOOST

The MAX-625 provides technicians of any experience level with the necessary tools to get all the metrics they need while driving compliance with company processes thanks to the integrated autotest function. With clear pass/fail indications, inexperienced technicians can quickly learn the characteristics of a good circuit from the measurements taken. Experienced technicians will like the fact that they don't need to drill down into the results if a pass is presented while still having access to the individual measurements if needed.

## MAXTESTER 625 TEST LOCATIONS

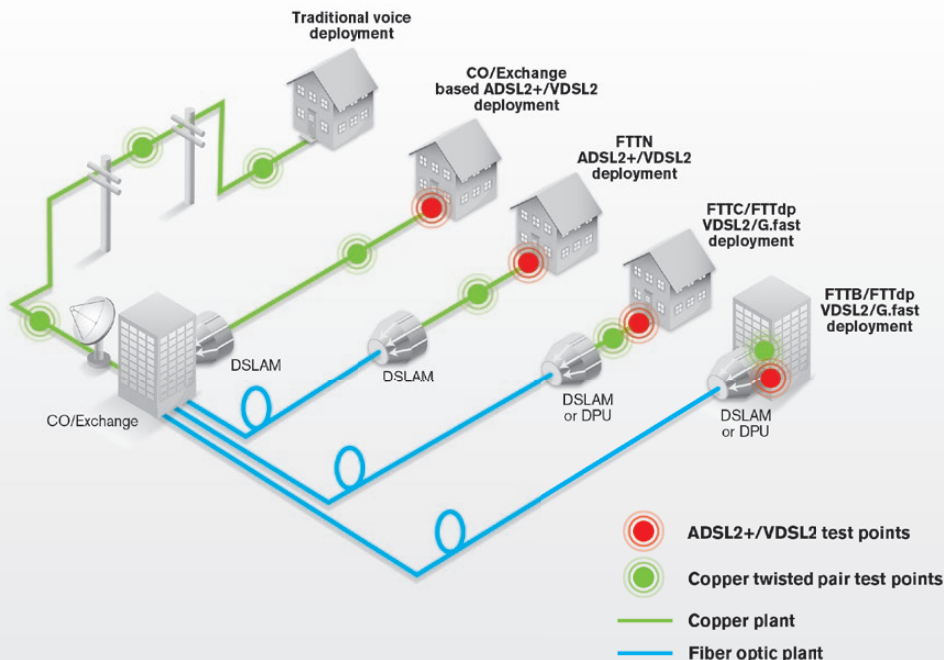


Figure 2. Network locations to use the MAX-625

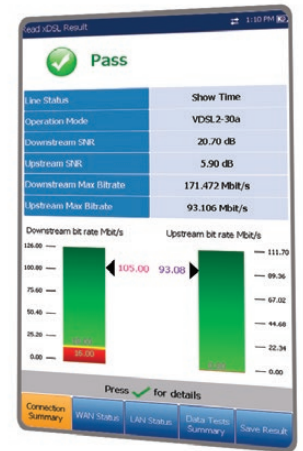


Figure 1. User-friendly interface with clear display of results

## KEY CHARACTERISTICS



EXFO Sync

## REAL-TIME COPPER AND DSL TEST RESULTS UPLOAD—STRAIGHT FROM THE FIELD

Working in the field with an Android device?

**Download the EXFO Sync Application for Your Android\***

EXFO Sync is an Android application that operates together with EXFO's MAX-625 copper and VDSL2/ADSL2+ field test set. This application provides a fully automatic DSL or copper test script and Wi-Fi transfer of the results files to a phone or tablet for upload to the customer's server.

With the EXFO Sync application, your copper and DSL test results can be uploaded in real-time to a central location for access and further analysis to identify trouble patterns, assess technician performance or target customers for upsell to higher revenue services.

- › Copper and DSL test results are uploaded, live from the site
- › GPS tagging gives visibility of location of test for mapping of test history and network performance
- › Ensure compliance to service provider workflow process
- › Flexibility to upload test results to an FTP server
- › Secure, password-protected connection to upload and access results

\* Upload to Android devices is supported only over Wi-Fi and only for the copper and DSL autotests.

Download from  
 Google play



COPPER SPECIFICATIONS<sup>a, b, c</sup>

Measurement	Range	Resolution	Uncertainty (Accuracy)	Termination Impedance
AC voltage	0 to 280 Vrms	0.1 VAC for range 0 to 99.9 VAC; otherwise 1 VAC	$\pm(1\% + 0.5 \text{ Vrms})$ at $\leq 60 \text{ Hz}$ $\pm(2\% + 0.5 \text{ Vrms})$ at $> 60 \text{ Hz}$	100 k $\Omega$ , 10 M $\Omega$
DC voltage	$\pm 400 \text{ VDC}$	0.1 VDC for 0 to 99.9 VDC 1 VDC for 100 VDC to 400 VDC	$\pm( 1\%  + 0.5 \text{ VDC})$	100 k $\Omega$ , 10 M $\Omega$
DC current <sup>d</sup>	0 to 110 mA	0.1 mA	$\pm( 2\%  + 1 \text{ mA})$	
AC current <sup>d</sup>	0 to 110 mA	0.1 mA	$\pm(2\% + 1 \text{ mA})$	
Resistance	0 to 100 M $\Omega$	3 significant digits	$\pm(1\% + 5 \Omega)$ for range 0 to 999 $\Omega$ $\pm 2\%$ for range 1 k $\Omega$ to 100 M $\Omega$	
Isolation resistance	0 to 1 G $\Omega$	3 significant digits	$\pm(3\% + 1 \text{ digit})$ for 1 k $\Omega$ to 99 M $\Omega$ , soak voltage 135 VDC $\pm(5\% + 1 \text{ digit})$ for 100 M $\Omega$ to 1 G $\Omega$ , soak voltage 135 VDC Soak voltage range: 50 VDC to 135 VDC (safety current limited to 2 mA) Soak timer: 1 s to 60 s	
Capacitance (opens)	0.1 nF to 2 $\mu\text{F}$	4 significant digits	$\pm(2\% + 50 \text{ pF})$	
Station ground	0 to 1 M $\Omega$	Up to 3 significant digits	$\pm(1\% + 3 \Omega)$ for 0 to 999 $\Omega$ $\pm(2\% + 1 \text{ digit})$ for 1 k $\Omega$ to 1 M $\Omega$	
Load coils	Maximum load coil count		4	
	Detection range		Up to 5500 m	
Tone receiver <sup>e</sup>	Frequency range		200 Hz to 20 kHz	
	Frequency resolution		0.1 Hz	
	Frequency uncertainty (accuracy)		$\pm(50 \text{ ppm} + 1 \text{ Hz})$	
	Signal level range		-90 dBm to 15 dBm	
	Signal level resolution		0.1 dB	
	Signal level uncertainty (accuracy)		$\pm 1 \text{ dB}$ for -50 dBm to 15 dBm, otherwise $\pm 2 \text{ dB}$	
Tone transmitter <sup>e</sup>	Transmit frequency		200 Hz to 20 kHz	
	Frequency resolution		1 Hz	
	Frequency uncertainty (accuracy)		$\pm(50 \text{ ppm} + 1 \text{ Hz})$	
	Transmit level		-10 dBm to 10 dBm	
	Transmit level resolution		0.1 dB	
	Transmit level uncertainty (accuracy)		$\pm 1 \text{ dB}$	
VF longitudinal balance <sup>e</sup>	Level range		0 to 100 dB	
	Level resolution		0.1 dB	
	Level uncertainty (accuracy)		$\pm 1 \text{ dB}$	
	Frequency		1004 Hz	
VF noise <sup>e</sup>	Bandwidth		200 Hz to 20 kHz	
	Signal level		-90 dBm to 15 dBm	
	Signal level resolution		0.1 dBm	
	Signal level uncertainty (accuracy)		$\pm 1 \text{ dB}$ for -50 dBm to 15 dBm, otherwise $\pm 2 \text{ dB}$	
Power influence (PI) <sup>e</sup>	Noise range		-60 dBm to 10 dBm	
	Noise uncertainty (accuracy)		$\pm 1 \text{ dB}$ for range -50 dBm to 10 dBm, otherwise $\pm 2 \text{ dB}$	
	Noise level resolution		0.1 dB	
	Frequency range (odd harmonics)		50 Hz to 4 kHz for ITU 60 Hz to 4 kHz for ANSI	
Stress balance	Level range		0 to 82 dBmC	
	Longitudinal excitation		135 VDC, Frequency: 1004 Hz	
	Reproducibility		$\pm 1 \text{ dB}$	
TDR <sup>f</sup>	Mode		Automatic	
	Range		0 to 4800 m (0 to 16 000 ft)	
	Pulse width		20 ns to 1.8 $\mu\text{s}$	
	Velocity of propagation (VOP)		0.4000 to 0.999	
	Distance uncertainty (accuracy) <sup>f</sup>		$\pm(0.5 \text{ m} + 1\% \times \text{distance})$	
POTS dialer	DTMF. Integrated into copper tests. Phonebook		0-9, #, * 25 entries	

**Notes**

- a. Subject to change without notice.  
b. Typical, at 23 °C  $\pm$  3 °C, on batteries, with no type-B USB connection.  
c. Specifications based on 24 AWG (PE 0.5 mm) cabling.  
d. 430  $\Omega$  impedance.  
e. 600  $\Omega$  impedance.  
f. Qualified up to 300 m (1000 ft). Does not include uncertainty due to VOP.

## DSL SPECIFICATIONS

<b>DSL chipset</b>	Broadcom	
<b>Standards compliance</b>	ADSL1/2/2+	<p>ITU-T G.992.5 (ADSL2+ including Annex A, B, J, M)</p> <p>ITU-T G.992.3 (ADSL2 including Annex A, B, J, L)</p> <p>ITU-T G.992.1 (G.DMT including Annex A, B)</p> <p>ITU-T G.994.1</p> <p>ATIS/ANSI T1.413 Issue 2</p> <p>IEEE 802.3ah (PTM)</p> <p>ITU-T G.998.x (ATM, Ethernet bonding)</p> <p>ITU-T G.998.4 (G.INP)</p> <p>DT 1 TR 112 U-R2</p>
	VDSL2	<p>ITU-T G.993.2 Annex A, B, Y</p> <p>Profiles: 8a/b/c/d, 12a/b, 17a, 30a</p> <p>Band Plan: 997, 998, US0</p> <p>IEEE 802.3ah (PTM)</p> <p>ITU-T G.998.2 (Ethernet bonding)</p> <p>ITU-T G.998.4 (G.INP)</p> <p>ITU-T G.993.5 (G.Vector)</p> <p>DT 1 TR 112 U-R2 (U-RV2)</p>
<b>DSL parameters</b>	<p>Maximum attainable bit rates</p> <p>Actual achieved bit rates</p> <p>Actual bonded achieved rates</p> <p>Latency modes: fast, interleaved</p> <p>Data modes: ATM, PTM</p> <p>Capacity (%)</p> <p>Signal-to-noise ratio (SNR) margin</p> <p>Output power</p> <p>Attenuation</p> <p>Bits/bin</p> <p>Attenuation/bin (Hlog/bin)</p> <p>QLN/bin</p> <p>SNR/bin</p> <p>Vendor code, revision</p>	<p>Interleave depth</p> <p>Interleave delay</p> <p>Trellis coding</p> <p>Bit swapping</p> <p>INP</p> <p>Nitro</p> <p>PhyR, G.INP state, performance counters</p> <p>Vectoring state, performance counters</p> <p>Modes: PTM, ATM, Nitro</p> <p>LOS, FEC, CRC, HEC</p> <p>LATN per band</p> <p>SATN per band</p> <p>EWL</p> <p>KLO</p>

## MULTIPLAY TESTING SPECIFICATIONS

<b>Test interfaces</b>	VDSL2 ADSL1/2/2+ Ethernet 10/100 BT	
<b>Encapsulation methods</b>	RFC 2684/Bridged Ethernet/IPoE (IPv4 and IPv6) IPoA (RFC 1577)	PPPoE (RFC 2516) PPPoA/LLC and PPPoA/VC-MUX (RFC 2364)
<b>Operating modes</b>	DSL Terminate Modem Replacement (DSL to Ethernet) Pass Through	Ethernet Terminate
<b>Login format</b>	User name and password using PAP/CHAP	
<b>Connectivity support</b>	IPv4 and IPv6 LAN/WAN status IPv4 and IPv6 DNS, gateway IPv4 DHCP client/server, DHCP vendor class IPv6 DHCP client NAT	VLAN ID, VLAN tagging VPI/VC1 IP release Multi-VLAN support
<b>Ping test</b>	Ping destination Number of pings Packet size Timeout Results	Gateway, IPv4 address or URL 1 to 99 32 to 1200 bytes (32 is default) 1 to 10 seconds Packets sent/received, average round-trip delay (ms)
<b>Traceroute test</b>	Traceroute destination Timeout Packet size Number of hops Results	Gateway or, IPv4 or IPv6 address, or URL In seconds, default is 1 s, maximum is 10 s 32 bytes 1 to 32 (default is 30) Indicates IPv4 address of hop and round-trip time in milliseconds (ms)
<b>FTP test</b>	Address Direction Results	IPv4 address or URL Upload and/or download Time, kB transferred, bit rate in kbit/s
<b>Web browser (software option)</b>	Address Bookmarks	IPv4 address or URL User-definable
<b>VoIP testing (software option)</b>	Protocol support Codecs Interface support Parameter/functionality	SIP (IPv4) G.711 $\mu$ -Law, G.711 A-Law ADSL1/2/2+, VDSL2, Ethernet Test duration timer MOS (current, average) R-Factor (current, average) Latency (current, average, maximum) Jitter (current, average, maximum) Packets (lost, total)
<b>IPTV testing (software option)</b>	Supported video standards Operating modes  IPTV parameters/functionality	MPEG2, MPEG4 part 2 and 10 (H.264/AVC), Microsoft Mediaroom/WM9/VC1 DSL Terminate Ethernet Terminate IGMP (IPv4) join/leave requests with STB emulation Automatic tests to join/leave and analyze up to five simultaneous streams Programmable channel list for storage of commonly used channels Bandwidth usage per channel IGMP (IPv4) packet and rate information per line and channel Multicast/unicast RTP/UDP IP stream support Key IP video QoS parameters, packet loss, zap time, PID statistics Graphical results Transport

## GENERAL SPECIFICATIONS

Display	Color TFT LCD with backlight 152 mm (6 in) diagonal 800 x 480 resolution, WVGA
Test connections	RJ11 for ADSL2+/VDSL2 Three-color banana connector for T/A, R/B, G RJ45 for Ethernet 10/100 WAN RJ45 for Ethernet 10/100 LAN
Results management	> 2 GB internal memory Single and bulk file export to USB memory devices FTP upload
Temperature range operating storage	0 °C to 40 °C (32 °F to 104 °F) -20 °C to 60 °C (-4 °F to 140 °F)
Humidity	5 % to 95 % relative, non-condensing
Shock	1 m (39 in) drop per GR-196-CORE
Altitude	3000 m (9842 ft)
Input power	9-24 VDC, 2 A, 18 W via 90-220 VAC adapter or 12 V vehicle adapter
Battery	Internal rechargeable lithium polymer, with battery-state and level indications, adjustable auto-power down
Safety	CE and CSA marked
Size (H x W x D)	254 mm x 124 mm x 62 mm (10 in x 4 <sup>7</sup> / <sub>8</sub> in x 2 <sup>7</sup> / <sub>16</sub> in)
Weight (with battery)	1.8 kg (4 lb)
Water/dust ingress	Designed to comply with IP54
Self-test	Routine on power-up
Connectivity	Two USB 2.0 client ports One USB type-B host port Optional Wi-Fi support
Languages	English, French, Spanish

## STANDARD ACCESSORIES

- DSL test cables: RJ14 to RJ11 and telco clip with bed of nails (ACC-RJ11-TC), or  
RJ14 to RJ11 and 4-mm plugs with crocodile clips (ACC-RJ11-4MM)
- Copper test cable: Three-color (black, red, green) 4-mm banana plugs terminated with telco clips (ACC-M3COLR), or  
Three-color (black, red, green) 4-mm banana plugs terminated with shrouded crocodile clips (ACC-M4MM)
- AC adapter (GP-2146)
- Soft carrying case (GP-10-061)

## OPTIONAL ACCESSORIES

DSL bonded test cables: RJ14 to dual RJ11 (ACC-BD-RJ) and RJ14 to four telco clips with bed of nails (ACC-BD-TC), or RJ14 to four 4-mm plugs with crocodile clips (ACC-BD-4MM)

RJ45 Ethernet cable (ACC-RJRJ-UTP)

USB host/client cable (GP-2053)

12 V vehicle charger (GP-2205)

Form fitting, protective soft glove with shoulder strap (ACC-GLOVE)

16 GB USB memory stick (GP-2144)

Wi-Fi pico adapter (GP-2223)

## ORDERING INFORMATION

### MAX-625-XX-XX-XX-XX

#### Model

MAX-625 = Copper and ADSL2+ test set

#### DSL Version

V2XAA = ADSL2+ Annex A

V2XAB = ADSL2+ Annex B

#### Platform Options

00 = Without software options

FTPUPLD = Result upload via FTP over Wi-Fi, Ethernet or DSL

#### DSL Software Options

00 = Without software options

BOND = ADSL2+ and VDSL2 bonding support <sup>a, b</sup>

BROWSER = Web browser

IPTV = IPTV analysis

IPV6 = IPv6 support for LAN/WAN connectivity

MOS = MOS/R-factor for VoIP calls <sup>c</sup>

VDSL2MOD = VDSL2 modem emulation

VOIP = VoIP Emulation support (Ethernet and DSL ports)

#### Copper Software Options

00 = Without software options

SBAL = Stressed balance

TDR = Time-domain reflectometry

Example: MAX-625-V2XAA-FTPUPLD-VDSL2MOD-BOND-IPTV-SBAL-TDR

#### Notes

a. VDSL2 bonding requires VDSL2MOD option.

b. ADSL2+ bonding or ATM bonding not available with V2XAB.

c. VoIP option required.

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EXFO serves over 2000 customers in more than 100 countries. To find your local office contact details, please go to [www.EXFO.com/contact](http://www.EXFO.com/contact).

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