

Údržba a měření moderních metalických připojek xDSL

Copper, DSL and Multi-play Testing

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EXFO

Table of Contents

- 1 Market & Technology Trends
- 2 New Technologies in xDSL world
- 3 Testing equipment for xDSL and copper

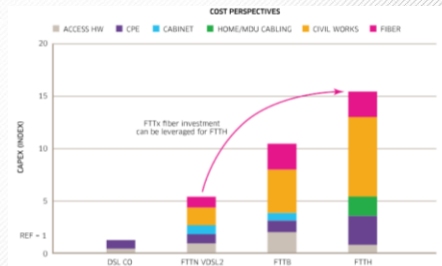
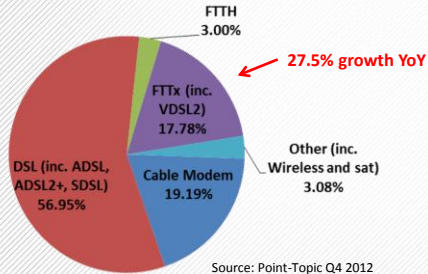
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Market and Technology Trends

Market Trends

VDSL2 and FTTx

Global Market Share by technology Q4 2012

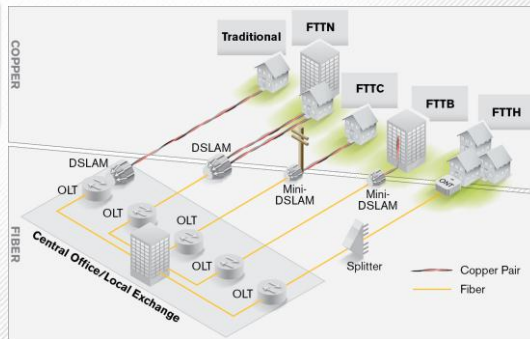


FTTx strategy. Market trends

- › Bring fiber closer to the customer's premises
- › Optimize the use of xDSL technology
- › Compensate current copper limits

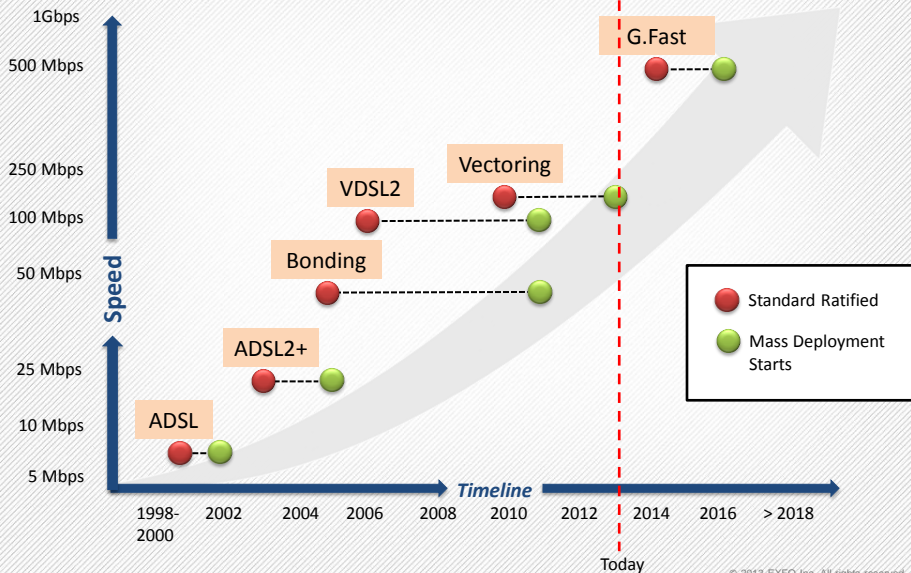
"Deploying VDSL2 vectoring from the street cabinet (FTTN / FTTCab) is a factor of 3 cheaper than FTTH, and FTThp is up to 50% cheaper"

Source: Alcatel-Lucent Bell Labs



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DSL / FTTx Speeds are Increasing

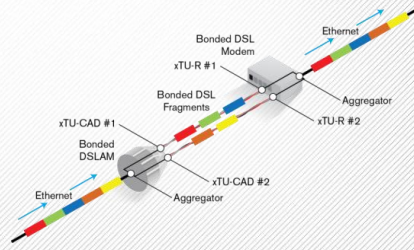


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Bonding

Optimize the use of xDSL technology

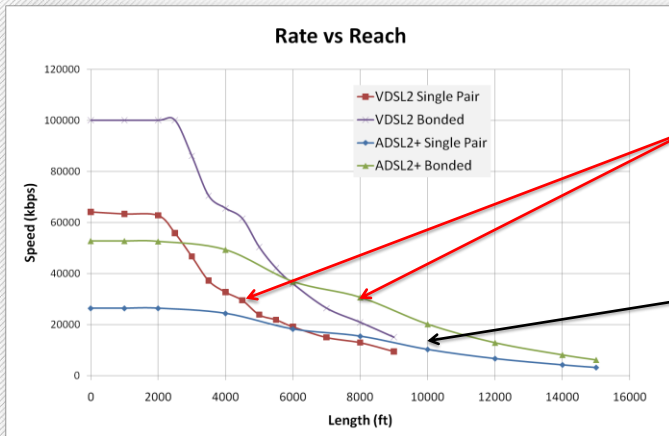
- › Defined in ITU-T G.998.1 and G.998.2
- › Supports both ADSL2+ and VDSL2
- › **Combines 2 wire pairs** to: Increase capacity and extend reach
- › Deliver from CO/LE (MDF) as well as from street cabinet/remote (FTTx)



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Bonding

Optimize the use of xDSL technology



Premium Package
 3 HD: 21 Mbps
 3 SD: 4 Mbps
 HSI: 5 Mbps

 30 Mbps

Basic Package
 1 HD: 7 Mbps
 2 SD: 4 Mbps
 HSI: 3 Mbps

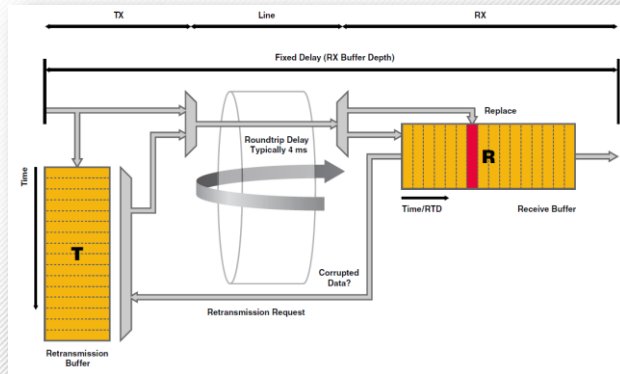
 14 Mbps

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G.INP

Improved Impulse Noise Protection per pair

- › Mitigation of impulse noise by what of physical layer retransmission
- › Performed at the DSL physical layer resulting in low latency
- › Compensate about up to 10ms of noise burst

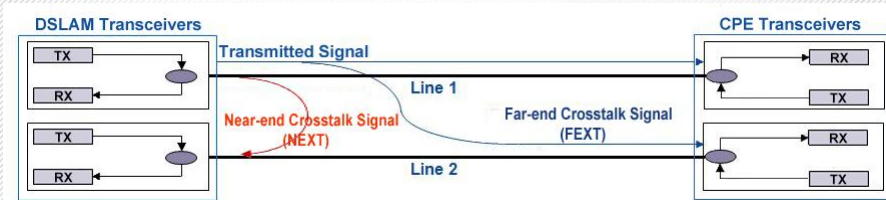
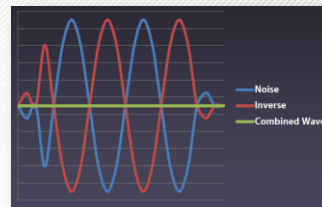


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G.Vectoring

Compensate current copper limits

- › Defined in ITU-T G.993.5
- › **Self-FEXT** (far-end crosstalk) **cancellation** in both directions
- › Measures FEXT noise on every line of the binder
- › Increases performance up to 90%
- › Shorter cable length, higher performance




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Value Proposition

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Value Proposition

MaxTester 600 and FTB-600



Adherence to latest DSL standards	Consolidated multi-layer testing approach	Increase deployment efficiency (OPEX)
<ul style="list-style-type: none"> › ADSL2+ and VDSL2 Bonding with Broadcom chipset › G.Vector and G.INP compliant › Supports ADSL2+ ATM/PTM and VDSL2 single-pair testing for hybrid networks › Member of Broadband Forum, ITU-T, and UNH IOL DSL Consortium 	<ul style="list-style-type: none"> › All key testing needs—DSL, copper and triple-play › Simple graphical view and fault diagnosis for copper and DSL › IPTV analysis with MS Mediaroom support › VoIP call generation & with MOS/R-factor measurement 	<ul style="list-style-type: none"> › SmartR™ test suite makes everyone a copper test expert › Automated test profiles – reduced training required › Pass/Fail indicators– eliminate guesswork and reduce install time › Integrated Web Browser – quick access to link verification › FTB-600 supports EXFOConnect 

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Simplifying Copper Testing

Smarter testing really!



Working smarter, not harder.

Speeds up interpretation

Eliminate guesswork

Test beyond prior skill level

Less training and expertise required

Easier, yet much more powerful Copper testing.

Pair Detective

- Optimized **fault identification** through automated analysis
- Guidance on probable issues for faster and comprehensive interpretation

FaultMapper

- Automated copper pair analysis with **fault location**
- Intuitive schematic/graphical presentation of the copper loop

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MaxTester 600 Series

For Copper, DSL, and Triple-play Installations

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MaxTester 600 Family

Copper, DSL, and Copper/DSL

Dedicated Point Solution

Perfect for the tier-1 technician performing installation and service turn-up.



MaxTester

Installation & Repair

- Large 6" color and sunlight viewable display
- IP 54 rated against dust and water ingress
- Solid, reliable test set

MAX-610 Copper



- › Innovative wideband tests for VDSL2 pairs with Pair Detective & Fault Mapper. Single ended testing plus traditional multi-meter, narrowband tests
- › Ease of use, simple GUI, field ruggedness

MAX-630 DSL

- › New features available to support new generation xDSL technologies (Bonding, Vectoring, G.INP, PTM)
- › Market leading Broadcom chipset

MAX-635 Copper/DSL



- › DSL & Copper testing brought to the Maxtester – Perfect fit for all Copper & DSL testing needs at a cost effective price.
- › SmartR intelligent and automated copper testing

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MaxTester 600 DSL / Triple Play Capabilities

Latest DSL chipset inside



MAX-630
MAX-635

- › ADSL2+ & VDSL2 single pair
- › Up to VDSL2 17a bonding
- › PTM and ATM transport support
- › INP & G.INP support for noise mitigation
- › G.Vector compliant



DSL Testing

- › Bits/Bin, Hlog/Bin, SNR/Bin, QLN/Bin

Data Testing over DSL and Ethernet

- › Login, Ping, Traceroute, FTP
- › Web browser

IPTV Testing over DSL and Ethernet

- › STB Emulation (Join/Leave)
- › Multiple channel analysis

VoIP Testing over DSL and Ethernet

- › SIP G.711 call generation/analysis
- › MOS/R-factor scoring



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MaxTester 600 Copper Capabilities



Copper testing made "smarter"



MAX-610
MAX-635

Traditional 'basic' Features:

- > Multimeter (DMM) - Voltage, Resistance/Shorts, Capacitance/Opens, Current
- > Voiceband testing – Metallic Noise, Balance, TX/RX Tone
- > POTS dialer

SmartR™

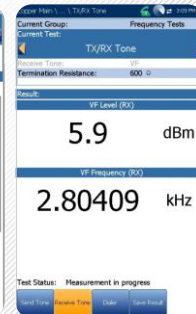
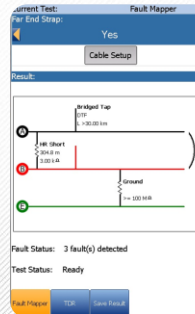
- > Automated loop diagnostics
- > Graphical Fault Locator

Fault-Finding Features:

- > Automatic TDR
- > Resistive Fault Locator (RFL)

Wideband Noise / Frequency tests:

- > PSD Noise
- > Impulse Noise
- > Longitudinal Balance



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FTB-600 Series

Advanced Modular Test Solution

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FTB-600 Series

Copper, DSL, and Copper/DSL

Advanced Troubleshooting

Perfect for the expert Engineer or Technician performing troubleshooting of copper, DSL, and triple play issues



FTB-600

Advanced Troubleshooting

- Large 7" color touch screen and sunlight viewable display
- FTB-1 platform supports optical and transport/ datacom modules
- FTB-1 platform supports GigE, Wi-Fi, Bluetooth, GPS, 3G/Aircard

FTB-610 Copper



- › Innovative wideband tests for VDSL2 pairs with Pair Detective & Fault Mapper. Single ended testing.
- › Auto-TDR and Manual TDR for new and advanced troubleshooters alike

FTB-635 Copper/DSL



- › DSL & Copper testing brought to the FTB-600 – Perfect fit for all Copper & DSL testing needs at a cost effective price.
- › SmartR™ intelligent and automated copper testing

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FTB-600 DSL+ Capabilities

Latest DSL chipset inside



FTB-635



- › ADSL2+ & VDSL2 single pair
- › Up to VDSL2 17a bonding
- › PTM and ATM transport support
- › INP & G.INP support for noise mitigation
- › G.Vector compliant



DSL Testing

- › Bits/Bin, Hlog/Bin, SNR/Bin, QLN/Bin

Data Testing over DSL and Ethernet

- › Login, Ping, Traceroute, FTP
- › Web browser

IPTV Testing over DSL and Ethernet

- › STB Emulation (Join/Leave)
- › Multiple channel analysis
- › Live video preview

VoIP Testing over DSL and Ethernet

- › SIP G.711 call generation/analysis
- › MOS/R-factor scoring



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FTB-600 Copper Capabilities



Navigate/View Copper results in great clarity and accuracy



FTB-610
FTB-635



Traditional 'basic' Features:

- › Multimeter (DMM) - Voltage, Resistance/Shorts, Capacitance/Opens, Current
- › Voiceband testing – Metallic Noise, Balance, TX/RX Tone
- › POTS dialer

SmartR™

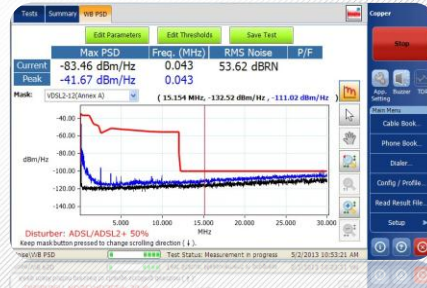
- › Automated loop diagnostics
- › Graphical Fault Locator

Fault-Finding Features:

- › Manual, Automatic, & XTALK TDR
- › Resistive Fault Locator (RFL), K-test
- › 500V Isolation Resistance/Leakage

Wideband Testing:

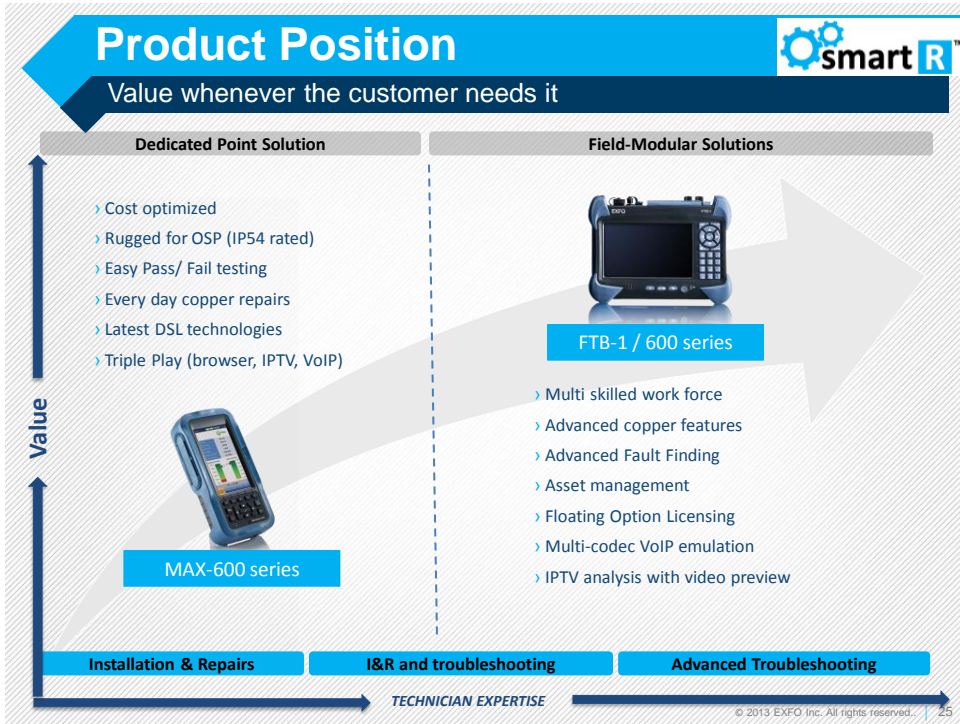

- › PSD Noise w/mask overlay and disturber ID
- › Impulse Noise Count & Histogram
- › Longitudinal Balance to 30 MHz



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Product Positioning

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Thank You !

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