



Měření v přístupových sítích

Broadband access – „návrat ke kořenům“

Z historie modularity měřicí techniky



MTTplus – SHDSL modul 260

Most of legacy modules supported:

- 19A, -51, -48 > DSL Stuff
- 8 > T1
- 9 > Datacom
- 45 > C37 and some
- 6B > VF Tims
- 16A > TDR/DMM
- 38 > SDH
- 24 > T1/T3
- 14B > SHDSL
- 50 > Ethernet
- 27 > E1



Standardní SHDSL testy + novinky

SHDSL: Symmetrical High Speed DSL, based on ITU G.991.2

Ideal for Business Class Services, Enterprise Networks and Industrial Communications that rely on legacy copper based networks where FTTx is cost prohibitive

Multiple Pair Bonding application enables robust data transmission over long copper lines.

Standard SHDSL.bis line rates is symmetrical 5.7 Mbps per pair

4 Pair EFM mode yields > 22 Mbps.

Proprietary extended line rates is possible, up to 15 Mbps per pair.

Based on best-in-class **Lantiq SOCRATES** 4e SHDSL chipset

CPE Emulation

CO emulation

EFM and ATM support, with bonding up to 4 pairs

Legacy 4-Wire/2-Wire SHDSL support

ATM OAM F4/F5 Tx/Rx Connectivity

IP Connectivity, ATM IMA mode



Důležitá měření

MTT SHDSL

PAIR1 PAIR3 ERROR
PAIR2 PAIR4 ALARM

Setup Summary Line Status Errors Alarms Events

Retrain

Reset

Summary	
Configured Mode	STU-R
Start Time	10:05:17
Elapsed Time	00:02:18
Number of Pairs	1
Bonding Type	EFM

	OP State	Retrains
Pair 1	Data	0
Pair 2	N/A	0
Pair 3	N/A	0
Pair 4	N/A	0

Total Rate	
Line (kbps)	5704
Payload (kbps)	5696

MTT SHDSL

PAIR1 PAIR3 ERROR
PAIR2 PAIR4 ALARM

Setup Summary Line Status Errors Alarms Events

Pair 1 Pair 2 Pair 3 Pair 4

Retrain

Reset

Near End		Far End	
CUR SNR Margin (dB)	10	CUR SNR Margin (dB)	10
MAX SNR Margin (dB)	10	MAX SNR Margin (dB)	12
MIN SNR Margin (dB)	10	MIN SNR Margin (dB)	7
Attenuation (dB)	0	Attenuation (dB)	0
Raw SNR (dB)	39	Raw SNR (dB)	39
Tx Power (dBm)	10.5	Tx Power (dBm)	14.5

Rate Per Pair	
Line (kbps)	5704
Payload (kbps)	5696
TCPAM	32-TCPAM

192.168.0.114 Remote/CLI

MTT SHDSL

PAIR1 PAIR3 ERROR
PAIR2 PAIR4 ALARM

Setup Summary Line Status Errors Alarms Events

Pair 1 Pair 2 Pair 3 Pair 4

Retrain

Reset

Near End Error Status		Far End Error Status	
CRC Errors	0	CRC Errors	0
Error Seconds	0	Error Seconds	0
Severe Error Seconds	0	Severe Error Seconds	0
Unavailable Seconds	0	Unavailable Seconds	0
LOSW Seconds	0	LOSW Seconds	0

192.168.0.114 Remote/CLI 2015-10-22 10:07:56

...a teď něco extra: AnyDSL module

XTU-R CPE Mode, Universal DSL support

VDSL2:

Supports ITU-T G.993.2 (8, 12, 17, 30 MHz + var. band plans)

Supports ITU-T G.993.5, G.vector (Vectoring)

Supports ITU-T G.998.4, G.INP (Retransmission)

Display of Bits, SNR, QLN and Hlog / tone and stream graphs

ADSLX:

Supports ITU-T G.992.5 et al: Annex A+B+J,+L+M; INP, SRA - Supports ITU-T G.998.4, G.INP (Retransmission)

Bonded or regular

Display of Bits, SNR, QLN and Hlog / tone graphs

Triple Play Services applications

Pass Through Mode

G.Fast option

Speed targets of 150 Mbps to 1 Gbps for copper loops up to 250 meters.

100 Mbps demonstrated at 500 meters in early trials

ITU-T G.9700 and G.9701

DMT based with Vectoring (far-end crosstalk cancellation).

Spectrum: 106 MHz profile for the initial versions; 212 MHz profile planned for the future.

Uses time-division duplexing (TDD), while traditional ADSLx / VDSL2 uses FDD

GPON option

LTE Offload