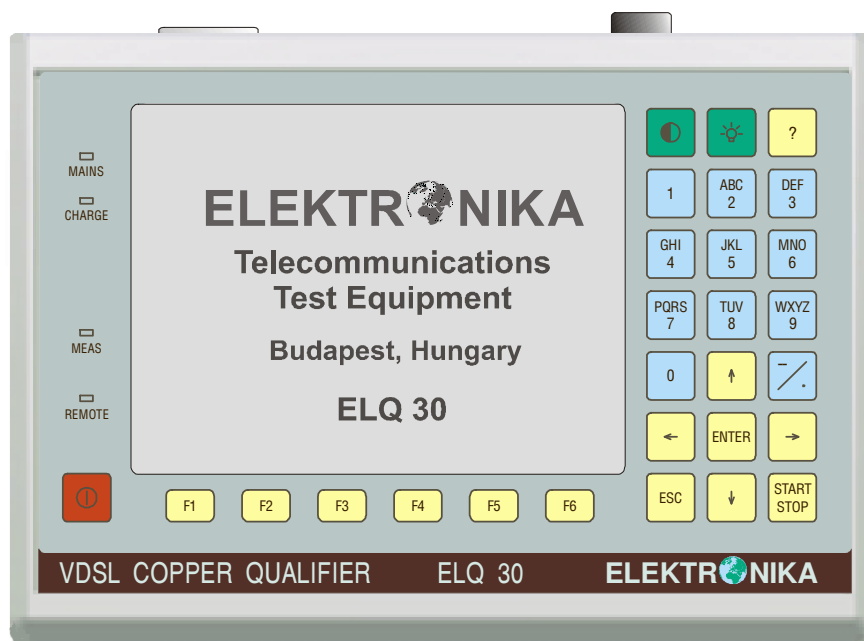


IS THAT PAIR SUITABLE FOR YOUR VDSL SYSTEM ??



THE ELQ 30 VDSL COPPER QUALIFIER ANSWERS !!



APPLICATIONS

The **VDSL COPPER QUALIFIER ELQ 30** is a hand held battery operated, multifunction measuring instrument, intended for pre-qualification, installation, fault location and maintenance of balanced copper pairs.

To qualify a pair, end-to-end measurements with two instruments have to be used in MASTER-SLAVE arrangement. Just one person, thanks to the communication between the two instruments, can perform such measurements. Operation is made extremely simple by means of pre-defined automatic test sequences. ELQ 30 can be programmed as MASTER and SLAVE as well.

Tolerance masks of cable parameters as Loss, LCL, Return Loss Impedance, and the principal system parameters are pre-programmed for numerous VDSL systems.

New user defined template sets can be created with the PARAMETER EDITOR PC PROGRAM.

When the automatic test sequence is ready ELQ 30 provides an immediate PASS/FAIL indication by comparing the test results with the tolerance masks and the required data rate with the calculated theoretically achievable rate.

Detailed test results are available in graphic and numeric forms. In case of FAIL indication the reason of failure is marked with asterisks.

For fault location TDR measurement is provided.

FEATURES

- Physical parameter measurements to pre-qualify copper wire pairs for high bit rate VDSL services before the installation of modems
- Automatic test sequences with preprogrammed or user defined test parameter sets belonging to different VDSL systems
- Bit rate calculation for each VDSL system
- PASS/FAIL indication
- Parameter set edition with PC
- TDR for fault location (option)
- Single end measurements
- 30 MHz frequency range for fix-frequency and spectrum measurements
- The test results can be stored in memory and transferred to PC
- PC program is provided to produce detailed test protocols in Excel format
- 320 x 240 LCD display with back light
- Internal rechargeable battery with an operating time of approx. 8 hours
- Processor controlled battery manager with three hour fast charging facility
- Selectable English, German or Russian language
- Acoustic pair detection facility
- Service telephone facility

MEASUREMENTS

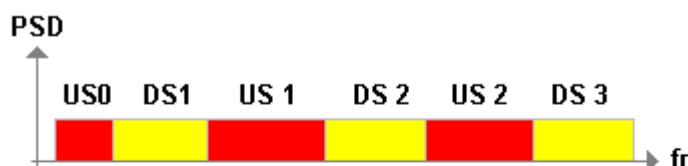
Automatic Measurements with two instruments

- Loss
- Weighted noise
- Spectrum
- Bit load calculation
- Achievable bit rate calculation
- LCL
- Return loss
- Impedance
- NEXT
- FEXT

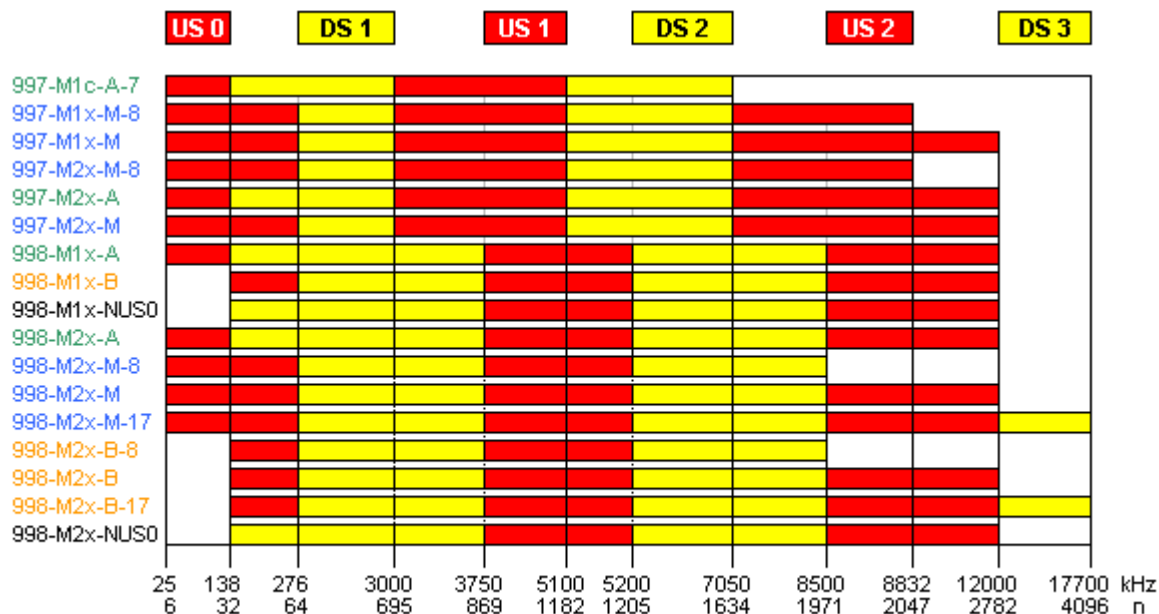
Manual Measuring Modes

- Transmitting
- Receiving
- NEXT
- LCL
- Impedance
- Return loss
- Weighted noise
- Spectrum
- Impulse noise
- Fault Location with TDR (option)

PREPROGRAMMED VDSL 2 PARAMETER SETS



A=OVER POTS
B=OVER ISDN
M= EXTENDED US0
NUS0=WITHOUT US0



VDSL COPPER QUALIFIER

SPECIFICATIONS

Transmitter

Frequency range 25 kHz to 30 MHz
 Transmitting modes 1 or 30 frequency
 Resolution 4.3125 or 5 kHz
 Impedance 100, 120, 135 or 150 Ohm
 Level
 In 1 frequency mode -10, 0 or +10 dBm
 In 30 frequency mode -12 dBm/tone
 Accuracy at 0 dBm
 25 kHz to 138 kHz ± 1 dB
 138 kHz to 12 MHz ± 0.5 dB
 12 MHz to 30 MHz ± 1 dB

Receiver

Frequency range 25 kHz to 30 MHz
 Receiving modes 1 or 30 frequency
 Resolution 4.3125 or 5 kHz
 Impedance 100, 120, 135, 150 Ohm or
 5kOhm // 5pF with high impedance probe
 Measuring range +10 to -90 dBm
 Accuracy at 0 dBm
 25 kHz to 138 kHz ± 1 dB
 138 kHz to 12 MHz ± 0.5 dB
 12 MHz to 30 MHz ± 1 dB

LCL Measurement

Frequency range 25 kHz to 30 MHz
 Impedance 100, 120, 135 or 150 Ohm
 Measuring range 0 to 50 dB
 Accuracy at 35 dB with special balanced cable
 25 kHz to 5 MHz ± 1 dB
 5 MHz to 12 MHz ± 2 dB
 12 MHz to 30 MHz ± 3 dB

Impedance Measurement

Frequency range 25 kHz to 30 MHz
 Measuring range up to 400 Ohm
 Accuracy
 138 kHz to 5 MHz $\pm 5\%$ ± 5 Ohm
 5 MHz to 30 MHz $\pm 10\%$ ± 5 Ohm

Return Loss Measurement

Frequency range 25 kHz to 30 MHz
 Impedance 100, 120, 135 or 150 Ohm
 Measuring range up to 40 dB
 Impedance range Z/2 to 2Z
 Accuracy at 20 dB
 138 kHz to 12 MHz ± 1 dB
 12 MHz to 30 MHz ± 2 dB

NEXT, FEXT, Loss Measurement

Frequency range 25 kHz to 30 MHz
 Resolution 4.3125 or 5 kHz
 Impedance 100, 120, 135 or 150 Ohm
 NEXT measuring range
 25 kHz to 12 MHz up to 80 dB
 12 MHz to 30 MHz up to 70 dB
 FEXT, Loss measuring range
 25 kHz to 30 MHz up to 90 dB

Spectrum Analyzer

Frequency range 25 kHz to 30 MHz
 Measuring range down to -130 dBm/Hz
 Impedance 100, 120, 135, 150 Ohm or
 5kOhm // 5pF with high impedance probe
 Resolution & bandwidth

Range	Zoom / resolution & bandwidth [kHz]				
30 MHz	1/100	2/50	5/20	10/10	20/5
18 MHz	1/60	3/20	6/10	12/5	
12 MHz	1/40	2/20	4/10	8/5	
9 MHz	1/30	2/15	3/10	6/5	
3 MHz	1/10	2/5			
1.5 MHz	1/5				

Number of Displayed frequencies 300
 Saving of result the actual content of display

Noise Measurement

Frequency range 25 kHz to 30 MHz
 Filters for noise measurement ADSL
 ADSL 2+
 VDSL
 VDSL 2
 Measurement times 1, 5, 10, 15, 30 s
 1, 5, 10, 15, 30 min

Impulse Noise Measurement

Pulse width >500 ns
 Interval size 10 ms
 Threshold range 0 to -60 dBm
 Maximum count 65000
 Measurement times 1, 5, 10, 15, 30 s
 1, 5, 10, 15, 30 min

Fault Location with TDR (option)

Measuring Modes
 Single pair
 Single pair long time
 Comparison to memory
 XTALK
 Measuring ranges 50m to 1 km
 Resolution 1m
 Accuracy $\pm 1\%$ ± 1 m
 Propagation velocity (V/2) 45 to 150 m/ μ s
 Gain range 0 to 36 dB
 Measuring pulse
 Amplitude 1 V
 Width 10 to 100ns

High Impedance Probe (option)

Frequency range 25 kHz to 30 MHz
 Measuring range +10 to -70 dBm
 Attenuation 10 dB
 Input Impedance: 5 kOhm // 5pF
 Accuracy
 25 kHz to 12 MHz ± 0.5 dB
 12 MHz to 30 MHz ± 1 dB
 Power supply from ELQ 30

GENERAL SPECIFICATIONS**Power supply**

Internal rechargeable NIMH battery pack
 Operation time.....approx. 8 hours
 (Without backlight)

Charging

(Without taking the battery pack out)
 From 230V mains.....with mains adapter
 From 12V car batterywith car adapter
 Fast charging time.....less than 3 hours

Over voltage protection

Between a and b or ground.....500 V dc

Longitudinal voltage60 V ac

Display.....320 x 240 LCD with backlight

Connectors

PC interface.....USB
 Line connectors.....2 pcs of 3 pol CF sockets
 Ground connector.....4mm banana socket

Ambient temperature ranges

Reference23±5°C
 Rel. humidity 45% to 75%
 Normal operation.....0 to +40°C
 Rel. humidity 30% to 75% *(<25g/m³)
 Limits of operation-5 to +45°C
 Rel. humidity 5% to 95% *(<29g/m³)
 Storage and transport-40 to +70°C
 Rel. humidity 5% to 95% *(<29g/m³)

Dimensions224 x 160 x 44 mm

Weight.....approx. 1.5 kg

ORDERING INFORMATION

VDSL Copper Qualifier ELQ 30 409-000-000

Including:
 Operating manual
 Short form operation instruction
 Demo program
 2 balanced measuring cables
 Mains adapter
 Cable for PC connection
 Carrying case

Options**PC software**

For result transferSW 409-510-000
 For parameter set editionSW-409-520-000

Others

High Impedance Probe.....410-000-000
 Special Balanced CableY 107-420
 TDR measuring unit.....409-210
 North American Systems.....SW 409-530-000
 Japanese Systems.....SW-409-540-000
 Calibration Report.....CR 409-000-000E