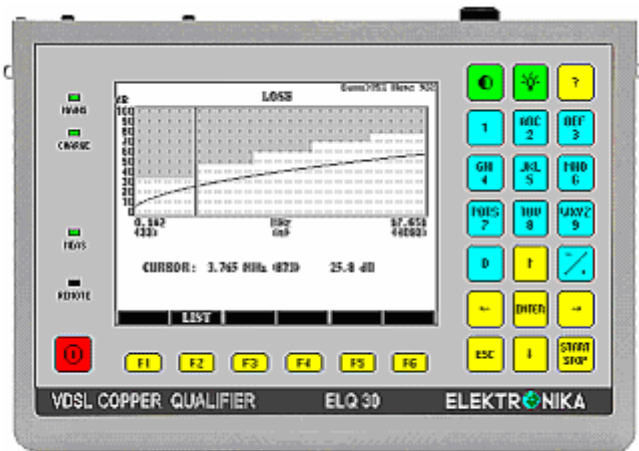


IS THIS PAIR SUITABLE FOR YOUR SYSTEM?  
  
 ELQ 30 VDSL COPPER QUALIFIER GIVES THE ANSWER!



#### FIVE INSTRUMENTS IN ONE

- **200 Hz to 30 MHz Transmitter**  
Generating Sinus and MTTs test signals.
- **200 Hz to 30 MHz Receiver**  
For selective and wideband measurements.
- **Spectrum Analyzer**  
For disturbing noise and PSD measurement
- **High Resolution TDR**  
For the location of bridged taps, splits etc.
- **AC bridge for the measurement of**  
Impedance, Return Loss and LCL Balance

#### MAIN FEATURES

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

- **Pre-qualification in Master Slave mode**

Just one person, thanks to the communication between the two instruments, can perform such measurements. Operation is made extremely simple by means of predefined automatic test sequences. ELQ 30 can be programmed as MASTER and SLAVE as well.

- **Pre-programmed Tolerance Masks**

Tolerance masks of cable parameters as Loss, LCL, Return Loss, Impedance, and the principal system parameters are pre-programmed for several ADSL and VDSL systems. User defined template sets can be created with the parameter editor of ELQ 30 without PC.

- **Automatic Data Rate Calculation**
- **Immediate PASS/FAIL indication**

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. The test results can be stored in memory and transferred to PC.

- **Single Sided Measurements**

ELQ 30 provides numerous single sided measuring modes like: Transmitter, Receiver, Spectrum Analyzer, Wide Band Noise, Impulsive Noise, Impedance, Return Loss, Balance and NEXT (Loss) measurements.

- **Service Telephone Function**

With built in microphone and loud speaker.

- TDR Option

- **New !! ESEL Measurement up to 120 dB**

The Exchange Side Electrical Length (ESEL) measurement is a useful tool for the programming of local DSLAM-s when power shaping is required.

- **New !! DPBO Dependent Templates**

ELQ 30 provides ESEL, MUS dependent templates and achievable rate calculation for the local subscriber lines when the local DSLAM is working with reduced transmit power

- **New !! UPBO Dependent Templates**

For the qualification of VDSL2 lines when the modems are working with distance dependent transmit power

- **New !! Measurement beside Vectored Groups**

ELQ 30 provides special non-disturbing Master-Slave test for Cables Containing Vectored Groups.

- **PC Supported Spectrogram**

The purpose of Spectrogram PC program is to discover the disturbers causing considerable service impairment to communication systems. In this mode ELQ 30 performs spectrum measurements in every second for a long time up to 72 hours. The PC displays the results on "water-fall" diagram.

- **Long Time Micro Interruption Measurement**

ELQ 30 detects the micro interruptions according to ITU O.62 and provides detailed information about the number and relative duration of interruptions

- **Long Time Impulse Noise Measurement**

ELQ 30A displays the counted impulses in histogram form with 60 time slots providing information about the time distribution.

- **High Impedance Active Test Probe**

For PSD spectrum measurement on xDSL lines without disturbing the operation

- **PC Control Program**

Provided for result and setup transfer to PC

PRE-PROGRAMMED STANDARD PARAMETER SETS

VDSL

- VDSL 2 (ITU-T G.993.2) Over ISDN**
  - 998-M2x-B8
  - 998-M1x-B
  - 998-M2x-B
  - 998-M2x-B-17
  - 998-M2x-B-17V (For cables with vectored groups)
- VDSL 2 (ITU-T G.993.2) Over ISDN without US0**
  - 998-M1x-NUS0
  - 998-M2x-NUS0
  - 998-E17-M2x-NUS0
- VDSL 2 (ITU-T G.993.2) Over POTS**
  - 997-M1c-A7
  - 997-M2x-A
  - 998-M1x-A
  - 998-M2x-A
- VDSL 2 (ITU-T G.993.2) Over POTS, extended US0**
  - 998-M2x-M8
  - 997-M1x-M8
  - 997-M2x-M8
  - 997-M1x-M
  - 997-M2x-M
  - 998-M2x-M
  - 998-M2x-M-17V (For cables with vectored groups)
- VDSL 1 (ITU-T G.993.1)**
  - 997-P1.M2
  - 998-P1.M2
  - 997-P2.M2
  - 998-P2.M2

ADSL

- ADSL2+ Over ISDN (ITU-T G.992.5 Annex B)**
  - Spectrum: FDD/EC
- ADSL2+ Over POTS (ITU-T G.992.5 Annex A)**
  - Spectrum: FDD/EC
- ADSL2+ Over POTS (ITU-T G.992.5 Annex M)**
  - Spectrum: FDD/EC , ADLU selectable 32 to 64
- ADSL2+ ALL DIGITAL (ITU-T G.992.5 Annex I)**
  - Spectrum: FDD/EC
- ADSL2+ Over POTS (ITU-T G.992.5 Annex J)**
  - Spectrum: FDD/EC , ADLU selectable 32 to 64
- ADSL2+ Over ISDN (ITU-T G.992.3 Annex B)**
  - Spectrum: FDD/EC
- ADSL2+ Over POTS (ITU-T G.992.3 Annex A)**
  - Spectrum: FDD/EC
- ADSL2+ Over POTS (ITU-T G.992.3 Annex M)**
  - Spectrum: FDD/EC , ADLU selectable 32 to 64
- ADSL2+ ALL DIGITAL (ITU-T G.992.3 Annex I)**
  - Spectrum: FDD/EC
- ADSL2+ Over POTS (ITU-T G.992.3 Annex J)**
  - Spectrum: FDD/EC , ADLU selectable 32 to 64
- ADSL (ITU-T G.992.1 Annex A, B)**
  - Spectrum: FDD/EC
- ADSL G.LITE2 (ITU-T G.992.4 Annex A, I)**
  - Spectrum: FDD/EC
- READSL2 (ITU-T G.992.3 Annex L)**
  - Spectrum: FDD/EC Up band: wide/narrow

SYSTEM INDEPENDENT TEST SEQUENCES

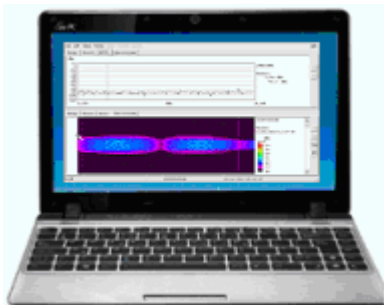
ELQ 30 provides system independent test sequences to measure selected cable parameters:

- Over pre-programmed frequency ranges (10 selectable ranges are available)
- With a user defined fix frequency
- ESEL measurement up to 120 dB (option)

LONG TIME SPECTROGRAM MEASUREMENT

The **Spectrogram PC Program** is an excellent tool of ELQ 30 to discover the disturbers causing considerable service impairment to communication systems. The trouble shooting is usually very difficult because:

- **The disturbing signals appear in unpredictable times**
- **They appear in unpredictable frequency ranges**



In **Spectrogram** mode ELQ 30 performs spectrum measurements in every second. The results are directly transferred to PC via USB port or indirectly by means of a memory stick when the measurement is completed.

Utilizing the large memory capacity and large display of PC the spectrogram program shows the results in form of "Waterfall" diagram in which:

- **The time is displayed on the vertical axis**
- **The frequency is displayed on the horizontal axis**
- **The level is interpreted in form of colors**

SPECIFICATIONS

**Transmitter**

Frequency range ..... 25 kHz to 30 MHz  
 Resolution ..... 4.3125 or 5 kHz  
 Impedance ..... 100, 120, 135 or 150 Ohm  
 Transmitting modes:  
 Generation of 1 single frequency  
 Generation of 30 frequencies at the same time  
 Output level  
 In 1 frequency mode ..... -10 to +10 dBm  
 In 30 frequency mode ..... -12 dBm/fr  
 Accuracy at 0 dBm  
 25 kHz to 100 kHz ..... ±1 dB  
 100 kHz to 5 MHz ..... ±0.3 dB  
 5 MHz to 30 MHz ..... ±1 dB

**Receiver**

Frequency range ..... 25 kHz to 30 MHz  
 Resolution ..... 4.3125 or 5 kHz  
 Impedance ..... 100, 120, 135, 150 Ohm  
 Receiving modes:  
 Receiving of 1 single frequency  
 Receiving of 30 frequencies at the same time  
 Measuring range ..... +10 to -100 dBm  
 Accuracy at 0 dBm  
 25 kHz to 100 kHz ..... ±1 dB  
 100 kHz to 5 MHz ..... ±0.3 dB  
 5 MHz to 30 MHz ..... ±1 dB

**LCL Measurement**

Frequency range ..... 25 kHz to 30 MHz  
 Impedance ..... 100, 120, 135 or 150 Ohm  
 Display range ..... 0 to 70 dB  
 Accuracy at 35 dB with special balanced cable  
 25 kHz to 100 kHz ..... ±2 dB  
 100 kHz to 5 MHz ..... ±1 dB  
 5 MHz to 30 MHz ..... ±2 dB

**Impedance Measurement**

Frequency range ..... 25 kHz to 30 MHz  
 Measuring range ..... 50 Ohm to 400 Ohm  
 Accuracy  
 100 kHz to 30 MHz ..... 5% ±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  
 Accuracy at 20 dB  
 100 kHz to 5 MHz ..... ±1 dB  
 5 MHz to 18 MHz ..... ±2 dB

**Next / Loss Measurement**

Frequency range ..... 25 kHz to 30 MHz  
 Resolution ..... 4.3125 or 5 kHz  
 Impedance ..... 100, 120, 135 or 150 Ohm  
 Measuring range  
 NEXT ..... up to 80 dB  
 LOSS ..... up to 90 dB

**Spectrum Analyzer**

Frequency range ..... 25 kHz to 30 MHz  
 Display range ..... down to -140 dBm/Hz  
 Impedance ..... 100, 120, 135, 150 Ohm or  
 5kOhm // 5pF with high impedance probe

Bandwidth/ frequency step

Range MHz	Bandwidth / frequency step kHz					
	100/100	50/50	20/20	10/10	5/5	5/2.5
30	100/100	50/50	20/20	10/10	5/5	5/2.5
18	60/60	20/20	10/10	5/5	5/2.5	
12	40/40	20/20	10/10	5/5	5/2.5	
9	30/30	15/15	10/10	5/5	5/2.5	
3	10/10	5/5	5/2.5			
1.5	5/5	5/2.5				

Number of Displayed frequencies ..... 300  
 Saving of result ..... the actual content of display  
 Evaluation ..... Normal, Peak, Average  
 Units ..... dBm, dBm/Hz

**Wideband Noise Measurement**

Frequency range ..... 25 kHz to 30 MHz  
 Impedance ..... 100, 120, 135, 150 Ohm  
 Filters for noise measurement ..... ADSL  
 ADSL 2+  
 VDSL, VDSL2-8, VDSL2-17, VDSL2-30  
 Measurement times ..... 1sec to 72 hours  
 Evaluation  
 For 1 sec to 1 min ..... Quasi analog  
 Over 1 min ..... Histogram with 60 time slots

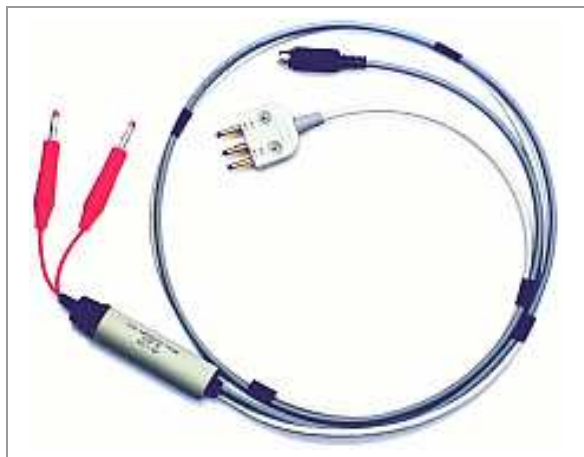
**Impulse Noise Measurement**

Impedance ..... 100, 120, 135, 150 Ohm  
 Pulse width ..... >500 ns  
 Interval size ..... 10 ms  
 Threshold range ..... 0 to -60 dBm  
 Maximum count ..... 65000  
 Measurement times ..... 1sec to 72 hours  
 Evaluation  
 For 1 to 30 sec ..... Numeric  
 Over 30 sec ..... Histogram with 60 time slots

**Fault Location with TDR (Option)**

Measuring Modes  
 Single pair  
 Single pair long time  
 Comparison to memory  
 XTALK  
 Measuring ranges ..... 100 m to 5 km  
 Accuracy ..... ±1% ±1m  
 Zoom ..... 1 to 4  
 Propagation velocity (V/2) ..... 45 to 150 m/μs  
 Gain range ..... 0 to 60 dB  
 Measuring pulse  
 Amplitude ..... ~3V into 100 Ohm  
 Width ..... 10 ns to 2.5 μs

HIGH IMPEDANCE PROBE ELQP 30 (HW option)



**Purpose**

The ELQP 30 active probe is intended for PSD spectrum measurement on working lines when test instrument should be connected parallel with the operating modems and the regular measuring cables can not be used because the digital systems are extremely sensitive for the capacitive load

**Specifications**

Frequency range.....	5 kHz to 30 MHz
Attenuation.....	15 dB
Input Impedance .....	5 kOhm    5pF
Accuracy	
5 kHz to 25 kHz .....	±1dB
25 kHz to 5 MHz .....	±0.3 dB
5 MHz to 30 MHz .....	±1dB
Powered .....	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 battery ..... with car adapter  
 Fast charging time ..... less than 3 hours

**Display** ..... 320 x 240 LCD -TFT

**Connectors**

For mains or 12V car adapter .....2.1/5.5 mm coaxial  
 Power supply for active probe .....Mini-din-4P  
 Line connectors.....4 mm banana sockets  
 USB A ..... USB 1.1 host port for USB stick  
 USB B ..... USB 1.1 device port to connect PC

**Over voltage protection**

Between a and b or ground ..... 500V DC  
 Longitudinal voltage.....60V AC

**Ambient temperature ranges**

Reference ..... 23±5°C  
 Rel. humidity 45% to 75%  
 Normal operation ..... 0 to +40°C  
 Rel. humidity 30% to 75% \*( $<25g/m^3$ )  
 Limits of operation ..... -5 to +45°C  
 Rel. humidity 5% to 95% \*( $<29g/m^3$ )  
 Storage and transport ..... -40 to +70°C  
 Rel. humidity 95% at +45°C \*( $<35g/m^3$ )  
 \* without condensation

**Dimensions**..... 224 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 instructions
- Calibration Certificate
- CD (xxx version)
- Test result transfer PC SW
- Ground connecting cable (2m)
- 2 Special Balanced Measuring Cables
- USB cable and USB stick
- Mains adapter
- Carrying case

**HW Options**

- High Impedance Probe ELQ P30 ..... 410-000-000
- TDR measuring unit (built in)..... 409-210-000
- Car lighter power adapter EAA 10 ..... 367-000-000
- ER20 Directional coupler 4-2200 kHz .430-000-000
- ER30 Directional coupler 0,05-18MHz 431-000-000

**SW Options**

- Interruption measurement . .....SW 409-530-000
- SW Set for Spectrogram ..... SW 409-570-000
- Spectral Trace as Reference ..... SW-409-550-000
- ESEL Measurement..... SW-409-600-000
- ADSL ESEL Dependent TemplateSW 409-610-000
- ADSL DPBOMUS Template. .... SW 409-620-000
- ADSL Annex J. ....SW 409-700-000
- VDSL DPBO Template. .... SW-409-810-000
- VDSL MUS Template. .... SW-409-820-000
- VDSL UPBO Template. .... SW-409-900-000
- VDSL Vectoring. .... SW-409-910-000

**Others**

Calibration Report for ELQ 30 .....CR 409-000-000 E

ELEKTRONIKA reserves the right to change specifications without prior notice !

03.12.2016