Automatic low frequency measuring system for telecom cables

- ☞ **High accuracy**
- ☞ **Certified ISO 17025**
- ☞ **Fast measurements**
- ☞ **State of the art software package**
- ☞ **Integrated data storage and management system**
- ☞ **Highly modular to fit any requirement**
- ☞ **Remote maintenance facility (TeamViewer)**
- ☞ **Very easy to operate**
- ☞ **Can be upgraded with options such as ISO 17025 certified LF calibration standards**

ISO 17025 ACCREDITED

Delivery package	- One automatic RCKE tester, including the low frequency kit BF9100 (bridge technology) for accurate measurements on both short and long length cables - One embedded computer PC, 17" flat LCD monitor - Operating Windows system - Optitest as measurement and result management software - Power supplies, interfaces and connecting cables
Article No:	18.9100.0001.0

1. System specifications

The measuring technology is designed to test pairs and quads. The internal measuring bridges are self-calibrated. The capacitance bridge includes 3 measuring frequencies and is available in two versions: 12.5Hz / 125Hz / 800Hz or 12.5Hz / 125Hz / 1'000Hz. Please specify the version on the order.

Description	Designation for pairs	Designation for quads	Accuracy	Scale
Conductor resistance	Ra, Rb	Ra, Rb Rc, Rd	± 0,1% + 10 mΩ	0 - 20,000 kΩ
Loop resistance	R	R1, R2		
Resistance unbalance	DR	DR1, DR2, DR3	Computed	%, Ω
Capacitance	C	C1, C2, C3	± 0,25% ± 10pF à 800 Hz ± 0,25% ± 10pF à 125 Hz ± 0,25% ± 50pF à 12,5Hz	0 - 600nF 0 – 2000nF 0 – 5000nF
Capacitance unbalance	K	K1 – K12	± 1% ± 6pF à 800 Hz ± 1% ± 3pF à 125 Hz ± 1% ± 30pF à 12,5 Hz	0 – 20nF 0 – 20nF 0 – 200nF
Capacitance unbalance to ground	Ei, Ea, E	Ei1-Ei3 Ea1-Ea3 E1-E3		

Notice:The given accuracies are worst cases. Typical accuracy is twice better as specified.

Calculated parameters at 800Hz / 1'000Hz

- LF Attenuation
- LF Phase
- LF Characteristic Impedance
- LF Velocity of propagation (VOP)
- LF Crosstalk

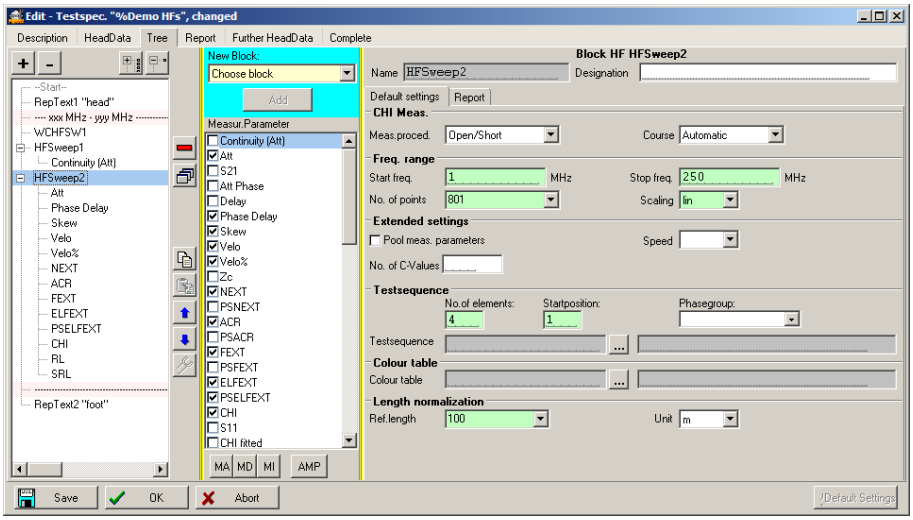
Statistical parameters

- Maximum measured value
- Absolute maximum measured value
- Minimum measured value
- Absolute minimum measured value
- Average value
- Absolute average value
- Standard deviation
- RMS
- Upper quality factor
- Lower quality factor
- Quality factor
- Lower quality factor
- Variance

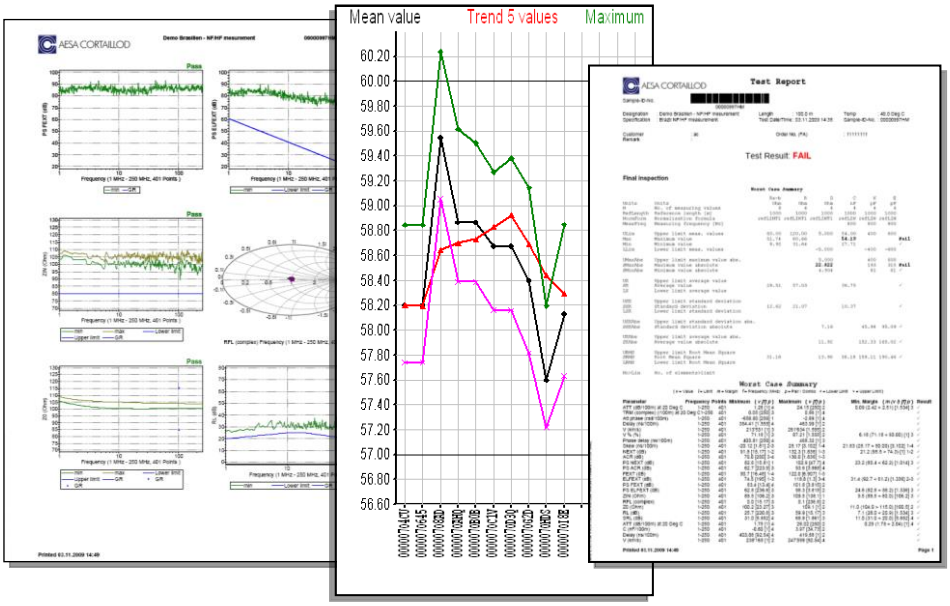
2. Main software features of Optitest XL (Part of CIQ 3.0)

- The software has been developed in the Microsoft® Windows™ environment.
- Very user-friendly Optitest XL software package, to be operated easily with a mouse or the keyboard.
- Optitest is a part of AESA CIQ 3.0 Quality management system, all data achieved during the test can be used for further statistical evaluations
- No high frequency skills required, ideal for shop floor integration.
- Driver for the implemented Network Analyzer.
- Full automatic measurements.
- The measurements can be performed in the sweep mode and/or by using frequency tables.
- Open choice for start and stop frequencies.
- Choice of logarithmic or linear scales.
- Fully self-configurable reports.
- Fully automatic calibration management including driven calibration procedure, calibration validity supervision and calibration availability management depending on parameters to be measured.
- Possibility to create an unlimited number of cable specifications and test sequences.
  This “test specifications” will be stored with an individual customized name and is used for the call up of the specific cable type to be tested, easily by the operator.

Possibility to generate complex limit curves. All the limits, formulas given by the international standards are integrated. Their variables are programmable to enable the preparation of special specifications.



Example of selecting the Parameters to be measured (and printed)



Examples of test and statistical reports with AESA Optitest

Options

➢ *Connecting frames*

AESA has developed a wide range of connecting frames, giving the customer the possibility to connect up to 128 pairs simultaneously.

The connecting frames are equipped with self-cutting knives, able to handle copper diameters between 0.4mm and up to 2.5mm.

Remarks: Two connecting frames are required to make 100% automatic measurements. Other fixture sizes or designs are available on request.

Name	*Number of pairs*	*Reference*
LFT8	8 pairs	15.9208.0001.0
LFT16	16 pairs	15.9216.0001.0
LFT32	32 pairs	15.9232.0001.0
LFT56	56 pairs	15.9256.0001.0
LFT104	104 pairs	15.9214.0001.0
LFT128	128 pairs	15.9218.0001.0

LFT32

LFT56

➢ *Set of 5 standards (resist. & capacit.) type AESA 9000*

Article No: 45.9000.0001.0

Complete ISO 17025 certified LF calibration standards.

The kit of certified LF calibration standards is composed of:

- **Standard type 9001**
  C1,2 with 19,20 nF ± 0,1 % ± 30 ppM/°C
- **Standard type 9002**
  C1,2 with 192,0 nF ± 0,1 % ± 30 ppM/°C
- **Standard type 9003**
  C3 with 16,00 nF ± 0,1 % ± 30 ppM/°C
  K1, K2, K3 with 16000 pF ± 0,1 % ± 30 ppM/°C
- **Standard type 9004**
  E1, E2, E3 with 12000 pF ± 0,1 % ± 30 ppM/°C
- **Standard type 9005**
  RA, RD with 192 Ω ± 0,01 % ± 2 ppM/°C
  RB, RC with 1920 Ω ± 0,01 % ± 2 ppM/°C

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➢ *RC knives Monoplier 2 m with start*

Article No: 50.0001.0007.0

The simplest way to connect a cable is the use of mechanical monopliers.
2 or 4 monopliers can be connected to the PUMA system, depending on which parameters need to be measured. Two are sufficient if "K" parameters between pairs or quads are not necessary. Otherwise, 4 monopliers are required. In any case, these monopliers are mainly used with low pair/quad count cables. As soon as the cable structure exceeds 10 pairs, connecting frames are highly recommended.

➢ *Spare parts*

Article No: 50.0900.0004.0

AESA recommends following set of spare parts for an operation safety of two years

- 1 KM measuring bridge 9100.02
- 1 RM measuring bridge 9100.03
- 1 AZU relay matrix board 9100.05
- 1 CPU board 9100.00
- 1 set of different hardware
- 1x10 pairs self-cutting knives block
- 10 knives
- 1 set of relays
- 1 set of fuses

➢ *Printer*

Article No: 55.0500.0012.0

LaserJet printer