


# COMMUNICATION CABLE MEASUREMENT



MEASURE HF/LF /HV  
PARAMETERS OF INCREASINGLY  
COMPLEX COPPER  
COMMUNICATION CABLES IN A  
TRANSPARENT AND EFFICIENT  
WAY, WHILE ENSURING FULL  
TRACEABILITY





IN COMMUNICATION  
CABLE, CERTIFICATION IS  
ACHIEVED THROUGH A  
THOROUGH SERIES OF TESTS  
IN ACCORDANCE WITH MAIN  
INTERNATIONAL STANDARDS  
FROM ORGANIZATIONS LIKE  
TIA (TELECOMMUNICATIONS  
INDUSTRY ASSOCIATION),  
IEC (INTERNATIONAL  
ELECTROTECHNICAL COMMISSION) OR  
YD/T (CHINESE COMMUNICATION  
INDUSTRY STANDARDS).

## OUR SOLUTION

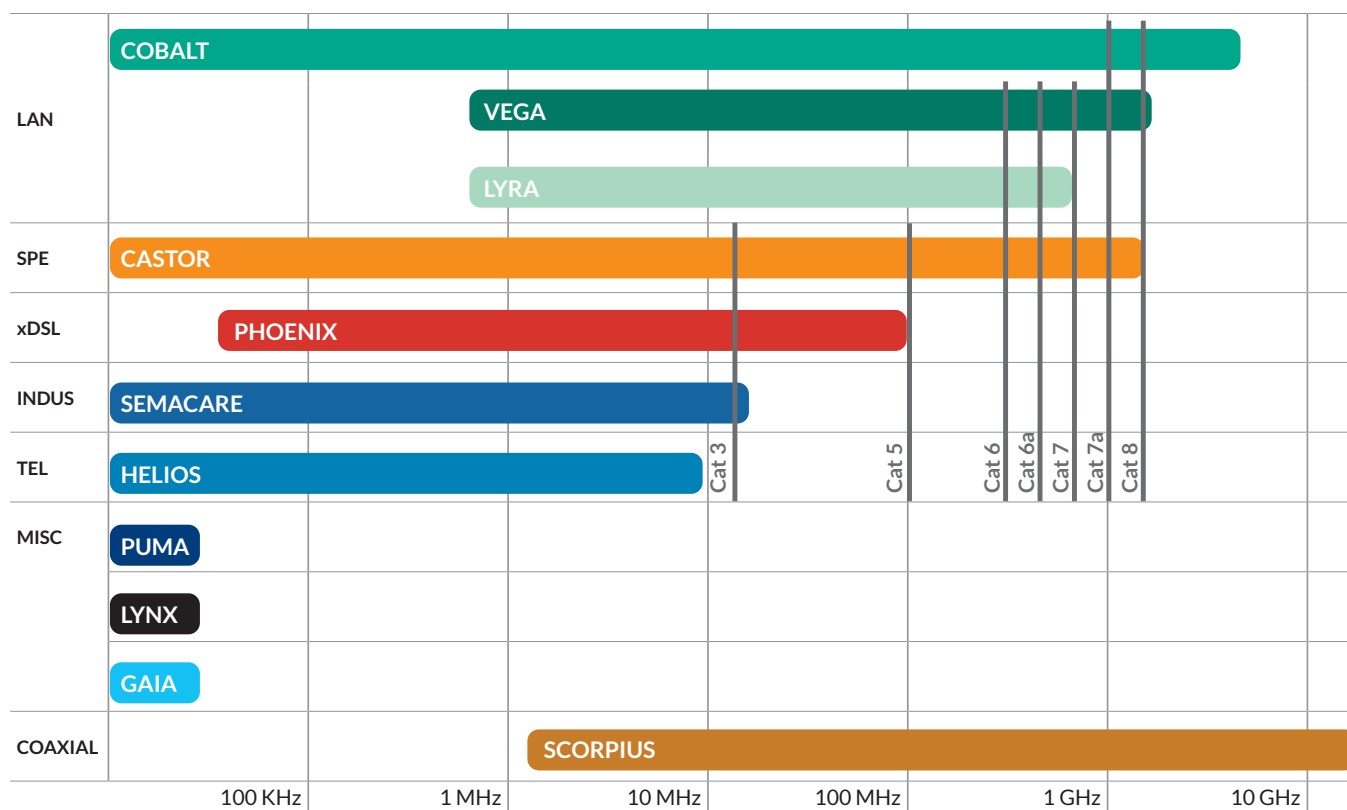
Automatic Test Equipment (ATE) must be used to perform these numerous tests that not only provide "Pass" or "Fail" information but also the complete cable characterization

AESA range of ATE covers the performance tests according to procedures defined in the respective standards. With its low and high frequency as well as high voltage modules, these can be customized depending on the specifications or requirements of the final user. From the Lynx system - for intermediate test - to the balunless Cobalt - for Cat8 and higher frequencies - via the Gaia for dielectric strength, AESA provides a complete set of solutions for all type of cables such as, LAN cables or Coaxial, as well as for patch cords with connectors.

## OUR OFFERING

AESA provides a full range of equipment to fulfil the specificities of all types of communication cables going from low frequencies to very high frequencies for wire/pairs/triads/quads like:

- LAN Cable
- Single Pair Ethernet (SPE)
- xDSL Cable
- Telephone cable
- Coaxial cables
- Industrial cables (like railway, instrumentation, signalling, etc...)
- Patch cords and assemblies
- Special cables for medical, military or aerospace domains



## COBALT & CASTOR

LAN/Data cables are specified for increasingly broader frequency ranges. Conventional (balun based) equipment cannot measure more than three frequency decades, and that is the reason why the cable industry is looking for a substitution measuring method.

**Cobalt**, the unique automatic balunless test system on the market based on the modal decomposition mathematical algorithm, is your perfect solution.

**Castor**, the fully integrated automatic system for Single Pair Ethernet (SPE) data cables.

## OUR OFFERING

By conducting measurements on individual wires and not just on pairs, Cobalt allows measurement of a particularly wide range of parameters that cannot generally be tested by conventional methods. Cobalt is a valuable tool also to assist you in cable development.

Equally important, final cable testing is rendered simpler and more reliable as it is fully automated, thus eliminating the need for the operator to conduct very cumbersome tasks with the associated risks of handling errors.

## KEY FEATURES

- Very broad frequency range (>4GHz), for Cat 8 and higher
- No balun = full dB dynamic of the VNA is available for the measurement
- More than 170 parameters (including TCL/LCL/ELTCTL automatic measurement)
- Able to measure very short cables
- Individual values (per wire)
- Compliant with the standard ANSI /TIA-568.2-D, IEC 61156 series and YD/T 1019-2023
- EMC parameters (option)
- Alien XT (option)
- Different models :
  - Cobalt standard
  - Cobalt DT (desktop)
  - Cobalt WA (with wago connectors)
  - Castor DT (desktop) for SPE



# LAN/DATA CABLES (BALUNS)

## VEGA & LYRA

**Vega**, equipped with ultra-reliable relays, offers the fastest and most reproducible solution on the market to test LAN cables up to cat 8 (2 GHz).

**Lyra**, equipped with self-cutting knives, is the optimized solution for large volume production testing of LAN cables up to cat 7 (600 MHz).

## OUR OFFERING

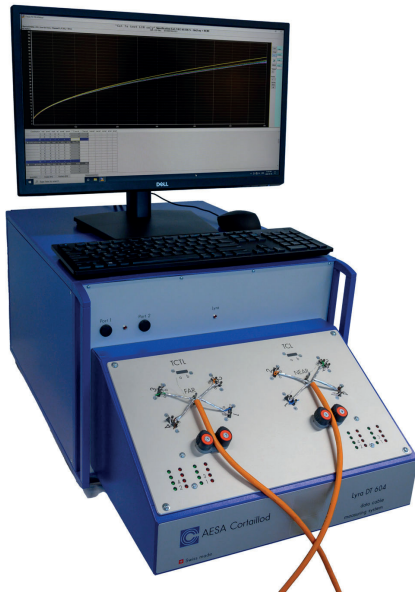
This automatic testing system has been developed to offer an effective solution for testing Cat 5 to Cat 8 LAN cables. It allows low frequency measurement of pairs and quads (RCKE) as well as high frequency parameters up to 2 GHz.

Different options such as EMC (AC, AS, TI) or alien crosstalk (AXT) functionalities offer considerable flexibility in terms of parameters, thus allowing full characterization of your cable, including shielding parameters.

Thanks to AESA software module (an element of the CIQ family) supplied with it, operators can work quickly and efficiently. The software also allows analysis of parameter measurements for process control, traceability or any other functions requiring statistical information.

## KEY FEATURES

- Ideal for LAN cables measurement from Cat 5 up to Cat 8
- High Accuracy
- Fast measurements
- Perfect reproducibility
- Easy to operate
- LF certified ISO 17025
- Different models:
  - Vega standard (trolley)
  - Vega DT (desktop)
  - Vega AXT (28 pairs)
  - Lyra DT (up to cat 7)
  - Lyra AXT (28 pairs)





## PHOENIX & HELIOS

**Phoenix** has been developed to offer an effective solution for testing xDSL cables Cat 3, 4 and 5.

**Helios** has been developed to offer an effective solution for testing telephone and xDSL cables up to 10MHz.

They allow the automatic low frequency measurement of pairs and quads (RCKE) as well as high frequency parameters.

## OUR OFFERING

Customer requirements can vary considerably in terms of size and design of connecting frames depending on how many pairs need to be hooked up to the frame simultaneously.

The Phoenix and Helios systems allow you to hook up a maximum of 112 pairs.

Thanks to the AESA software module (an element of the CIQ family) supplied with it, operators can work quickly and efficiently.

Software also allows analysis of parameter measurements for process control, traceability or any other functions requiring statistical information.

## KEY FEATURES

- High Accuracy
- Several connecting frames available up to 112 pairs
- High Accuracy
- Fast measurements
- Quick connection due to self-cutting knives
- Perfect reproducibility
- Easy to operate
- LF certified ISO 17025
- Different models :
  - Phoenix standard (trolley)
  - Phoenix DT (desktop)
  - Helios standard (trolley)



## SEMACARE

You have to measure a cable on a drum whose ends are short or rigid? You have to qualify an installed cable directly on the field whose ends are several kilometers apart? **SemaCare** is the equipment that can easily reach all cable ends in various environments.

The ideal solution to characterize industrial cables in one run, the SemaCare device has been especially designed to accommodate constraints such as large diameter or rigid extremities.

Fast and easy to use, the SemaCare offers the added advantage of providing a concise test report summarizing all the results per parameter.

## OUR OFFERING

Industrial cables (instrumentation, control, signaling, automation, ...) each have their own specificities.

The SemaCare device has been especially designed to be fully compatible with all such types of cables.

In addition to its use for conducting low frequency measurements based on the 4-point Kelvin method, the SemaCare device also offers the added benefit of letting you perform measurements at the very low end of the high frequency range, either by using the fixed points or sweeping methods.

The connecting frames are compact and mobile which allow the operator to easily come into close proximity with the coil extremities (rigid or short ends). Different trolleys or supports are available to meet special requirements.

## KEY FEATURES

- Versatile and mobile device
- LF certified ISO 17025
- HF parameters measured up to 20MHz
- Movable connecting frame to easily connect short or rigid extremities
- Possibility to support large wire diameters (diameter up to 2.5mm)
- Different models:
  - Standard version  
(for drums measurement)
  - Remote version  
(for field measurement)





## SCORPIUS

**Scorpius** automatic test equipment (ATE) is designed to measure high frequency parameters of Coaxial cables.

Coupled with a triaxial tube, DT model is also the perfect solution to measure EMC parameters (Transfer Impedance, Screening and Coupling Attenuation) of telecom cables.

Our dedicated adapters connected to the 50 and 75 ohm interface let you quickly connect your different products while ensuring perfect contact of both the core and the shield of your Coaxial cable.

This equipment is not only offering operating comfort, but also providing high measurement accuracy.

## OUR OFFERING

AESA provides money-saving solutions for testing coaxial cables. It can be either a stand-alone or rack-mountable accessory, which is easily interfaced to the network analyzer. Each end of the coaxial cable under test is connected to the front panel by way of N-type male connectors or adaptors.

### KEY FEATURES

- Complete solution for Coaxial cables
- Possibility of measurement up to 18GHz
- High Accuracy
- Easy to operate
- Fast measurements
- EMC parameters option
- Different models:
  - Standard version with external VNA
  - DT version (desktop) all integrated



# DIELECTRIC STRENGTH AND INSULATION RESISTANCE

## GAIA

Besides dedicated test equipment to measure High Frequency parameters, cable manufacturers have specific needs that only multi-purpose equipment can fulfil. The manufacturing requirements of special cables create an increasing need for flexibility and measurement of special parameters like high voltage and insulation resistance.

## OUR OFFERING

The **Gaia** is a multipurpose test device that allows to measure the dielectric strength, the insulation resistance, the low frequency parameters (RCKE) and as well the high frequency parameters, attenuation, impedance and crosstalk in a single run: The Gaia High Voltage Low Frequency High Frequency multiple cable tester is your ideal automatic solution to characterize instrumentation and multi-pairs telecom cables up to 208 wires.

## KEY FEATURES

- High voltage test AC 5 KV,  $\leq 2A$
- High voltage test DC 6 KV,  $\leq 4mA$
- Insulation resistance  $\leq 200G\Omega$
- Low Frequency measurements RCKE
- High Frequency parameters @ 800 Hz or 1 kHz
- Three different connecting frames from 8 to 208 wires available.
- Robust and sturdy-made for the shop floor
- Mobile on trolleys with wheels
- Different models:
  - Gaia S up to 24 wires
  - Gaia M up to 104 wires
  - Gaia L up to 208 wires





## TCL TRANSVERSE CONVERSION LOSS



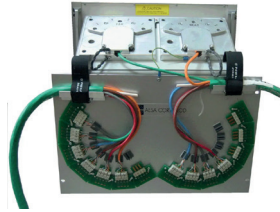
Transverse Conversion Loss (TCL) is the ratio (in dB) of a common-mode returned voltage measured on a wire pair relative to a differential-mode voltage applied to the same end of the pair. The TCL value shows how well the impedance of the pair's conductors is balanced.

This parameter and its derivatives, also called Unbalanced Attenuation measurements, are required by all major standardization bodies like ANSI/TIA, IEC or YD/T. AESA provides corresponding test fixtures for 4 or 25 pairs.

The test frame consists either of 2 baluns including common mode ports or a balunless solution to measure unbalance parameters. If requested, also differential transmission and reflection parameters can be measured.

- Semi-automatic measurements
- Used with 50 ohms ports of AESA ATE's or directly on a VNA
- Software and easy software-guided calibration and measurement procedures
- Cost effective solution for sporadic measurements of unbalanced attenuation

## AXT ALIEN CROSSTALK



The "Alien crosstalk" test consists in measuring the perturbation created by the 6 disturbing cables on the centered disturbed cable. It implies that the crosstalk between the 6 "external" cables (24 pairs) and each pair of the central cable (4 pairs) has to be measured. These measurements have to be performed from both the near and far end of the cabling under test.

To measure this parameter, AESA offers either an automatic solution with its 28-pair devices, or a semi-automatic solution able to perform this test on a 4-pair connecting frame, for example on a Vega (baluns) or Cobalt (balunless) system.

- Compliant with the test methods described in standards
- Different solutions proposed to cover all cases
- All pairs not under test properly terminated

## TI, AC, AS TRANSFER IMPEDANCE, COUPLING ATTENUATION, SCREENING ATTENUATION



Even if different test methods exist, the triaxial test method is the favoured one in the cable industry to measure TI, AC and AS. Both, coaxial and balanced cables can be characterized with this method. The frequency range is from 30 kHz to 3 GHz or above depending on the setup and the parameters.

The EMC measurements require perfect skills in the RF domain, due to the fact that the precision of the results depends heavily on the care given to cable preparation and test fixture connection.

- Insensitive against electromagnetic disturbances from outside
- No radiation of electromagnetic signals to the environment
- High dynamic range > 125 dB
- High reproducibility

## RK REDUCTION FACTOR



A telecom copper cable placed in the vicinity of a power line will suffer from electromagnetic perturbation. This will be especially important in the case of mono-phase lines (railways traction system) as compared to three phase lines (power lines). Signal perturbation, which causes reduction in the signal/noise ratio, could lead to accidents such as aspect change of railway signals. This is why it is essential to measure the screening effect of the cable armoring, represented by the Reduction Factor rk.

The test equipment for the reduction factor complies with the standards while allowing for a variable distance between the loop conductor and the cable under test.

- Fast measurement to avoid a heating up of the sheath
- Compliant to major standards like DIN 57472, VDE 0472 or IEC 62153
- Only automatic and complete solution available on the market

# RESISTANCE AND CAPACITANCE (RCKE)

## PUMA

**Puma** has been developed especially for intermediate or final testing of telecom cables or sub-assemblies. It allows low frequency measurement of pairs and quads.

It can be equipped with mono-pliers or connecting frames (different configurations available), in order to match the specific needs of the test station.

With its state-of-the-art measuring technology, it offers a fast, safe and very precise solution.

Its embedded computer is fully efficient and compatible with software and accessories that are readily available on the market. Thanks to the AESA software module supplied with, operators can work quickly and efficiently.

The software also allows analysis of parameter measurements for process control, traceability or any other functions requiring statistical information.

### KEY FEATURES

- Embedded computer
- Flexibility
- Possibility to measure long lengths
- Compact or trolley version
- State-of-the-art
- Easy to operate

## LYNX

The **Lynx** testing system has been specifically developed for intermediate testing during the manufacturing process.

The pairs or quads specifications can thus be checked at regular intervals. Results analysis provides data for process control, product traceability or any other function requiring statistical information. In addition to exceptionally high measuring accuracy and user-friendliness through the use of a touchscreen, this state-of-the-art device is fitted with a capacitance bridge with a choice of switchable frequencies allowing you to also measure long distance cables.

### KEY FEATURES

- Easy operation via a touchscreen
- High accuracy
- Possibility to conduct long distance measurements
- Compact
- State-of-the-art





AESA MANUFACTURES AND SELLS HIGH-QUALITY PRODUCTS. BUT BESIDES THIS, AS A RELIABLE SUPPLIER, AESA CLOSELY WORK WITH YOU BY OFFERING A FULL SET OF SERVICE TO ADDRESS YOUR MOST CHALLENGING NEEDS AND REQUESTS.



## WARRANTY EXTENSION

AESA is confident with its technology and the quality of its goods. This is why all new instruments are supplied with a 2-year warranty period by default.

In order to protect its customer's investment, AESA now offers an exclusive contract with a smart package of services, extending the warranty period up to 3 years.

## MAINTENANCE AND SERVICE CONTRACTS

Even the most reliable systems require regular, planned and preventive maintenance to perform at optimum levels and according to specs. For this reason, AESA proposes preventive service packages.

Based on cycles of one, two or three years depending on your specific needs, the AESA service packages will help you extend the operating life of your equipment, control your maintenance costs, and ensure optimal performance. In addition, our packages include advantages such as an extended warranty period, priority remote support, and discounted spare parts.

## ISO 17025 ACCREDITED



## ISO 17025 & SERVICE CALIBRATION

AESA is proud of its ISO quality credentials. It successfully gained accreditation for standard EN 45001 in 1994, and for ISO 17025 in 2002, for our calibration laboratory.

The AESA calibration laboratory is accredited by the Swiss Accreditation Service (SAS). The SAS is recognized by the major international accreditation bodies, such as the European Cooperation for Accreditation (EA), the International Accreditation Forum (IAF) and the International Laboratory Accreditation Cooperation (ILAC).

You can therefore rest assured that all your testing instruments are calibrated to the most stringent standards.

In addition, we offer a calibration service: not only can we re-calibrate your instruments; we can also provide certified standards for clients wishing to check instruments by themselves.

## TESTING LABORATORY

Increase your competitiveness, outsource your specific cable tests, and get an external certified report from our cable Testing Laboratory.

We can take care, for instance, of your type-testing and/or production qualification testing following the latest applicable standards. The testing is always performed on calibrated measurement instruments following the ISO17025 standard. Results are made available in a well-recognized test report.

Our testing laboratory is particularly relevant for tests for which you lack the capabilities and/or the adequate resources to perform, or that are seldom required. Moreover, it allows you to properly balance your CapEx and OpEx, while having access to unmatched knowledge and expertise.

## CABLE ACADEMY

At AESA, our aim is not only to provide our clients with effective solutions. We also help you enhance your understanding and mastery of the technology related to cable metrology, as well as optimizes your ability to gain the full benefits of the possibilities offered by AESA equipment.





## SOME USERS



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