

Cobalt 4 DA

Automatic balunless measuring system for LAN cables



DESCRIPTION

LAN cables are more and more specified for large and wider frequency ranges. Balun based systems cannot measure more than 3 frequency decades with reasonable accuracy. The Cobalt system based on a modal decomposition mathematical algorithm supports the development of new cables (complete tests at the lab) and simplifies operator's difficult job within systematic testing operations during production which are essential to achieve reliable results.

Cobalt can measure very easily patch cords or coaxial cables. Using a simple interface and introducing a de-embedding software correction, it doesn't need frequent and time-consuming calibration routines. It can provide not only the standard parameters as Next and RL, but also many other cable and individual wire parameters required for development of new cable designs as well as for detailed troubleshooting and quality analysis.

KEY FEATURES

- **Multiple uses**
 - Quality inspection, with very high accuracy
 - Development, with individual values per wire
 - Data cables
 - Patch cords with RJ45 connectors (standard) or others
- **High-Tech**
 - Balunless technology (modal decomposition mathematical algorithm)
 - Executive HF switches using MIL standardized relays (min 2'000'000 cycles)
- **Performant**
 - More than 170 parameters (including TCL measurement with integrated common mode)
 - Performs all electric tests on cables responding to major standards
- **Go over the limits**
 - Very broad frequency range (<4GHz) for cat 8 and higher
 - Full dynamic range available
 - Short cable length (10m)
- **Add-on**
 - EMC parameters (TI, AS, AC)
 - Alien Crosstalk



AESA Cortailod

TECHNICAL SPECIFICATIONS

Parameters	More than 170 parameters available (Transmission, Reflection, NEXT, FEXT, TCL...) <i>Note: Cobalt offers complete S-parameter capabilities (Differential-, Common- and Mixed Mode Parameters)</i>
Standards	Performs all electrical tests on cables responding to: <ul style="list-style-type: none"> • ANSI/TIA-568-C.2 for Category 3, 5e, 6 and 6A • ANSI/TIA-568-C.2-1 for Category 8 • IEC 61156-5/-6 for Category 5e, 6, 6A, 7 and 7A • IEC 61156-7/-8 for cables up to 1200MHz • IEC 61156-9/-10 for Category 8.1 and 8.2
Measuring length	Cable samples from 10m up to 100m
Components	<ul style="list-style-type: none"> • 4 pairs connecting frame for HF measurements exceeding 4 GHz • 1 state-of-the-art computer with a 17" colour monitor • Operating Windows system • 1 license OptiTest, AESA measurement and result management software • Power supplies, interfaces, connecting cables and measurement accessories
Supply Voltage	100 - 240 VAC / 50 - 60 Hz, Consumption: 600 W without printer, 1000 W with printer
Article No:	03.3504.0001.0

ACCURACY

	100 kHz - 10 MHz	10 MHz - 100 MHz	100 MHz - 200 MHz	200 MHz - 400 MHz	400 MHz - 750 MHz	750 MHz - 1.5 GHz	1.5 GHz - 3 GHz	3 GHz - 4.5 GHz (typical)
Attenuation (corrected at 20°C)								
-80 to -50 dB	± 1.3 dB	± 1.5 dB	± 1.7 dB	± 1.9 dB	± 3 dB	± 4 dB	± 6 dB	± 6 dB
-50 to -25 dB	± 0.5 dB	± 0.6 dB	± 0.6 dB	± 0.7 dB	± 0.9 dB	± 1.5 dB	± 2 dB	± 3 dB
-25 to -10 dB	± 0.2 dB	± 0.2 dB	± 0.3 dB	± 0.4 dB	± 0.8 dB	± 1.3 dB	± 1.7 dB	± 2 dB
-10 to 0 dB	± 0.2 dB	± 0.2 dB	± 0.2 dB	± 0.4 dB	± 0.8 dB	± 1.3 dB	± 1.5 dB	± 1.5 dB
Near-End Crosstalk NEXT & Far-End Crosstalk FEXT								
-90 to -60 dB	± 2 dB	± 2 dB	± 2 dB	± 2.5 dB	± 4 dB	± 6 dB	± 8 dB	± 8 dB
-60 to -30 dB	± 1.6 dB	± 1.4 dB	± 1.4 dB	± 1.6 dB	± 1.8 dB	± 4 dB	± 6 dB	± 6 dB
-30 to -10 dB	± 0.5 dB	± 0.8 dB	± 0.8 dB	± 1 dB	± 1.5 dB	± 2 dB	± 3 dB	± 3 dB
Impedance								
70 Ω - 90 Ω	± 1 Ω	± 1.5 Ω	± 2 Ω	± 2 Ω	± 3 Ω	± 4.5 Ω	± 6 Ω	± 6 Ω
90 Ω - 110 Ω	± 0.75 Ω	± 1 Ω	± 1.5 Ω	± 1.5 Ω	± 2 Ω	± 4 Ω	± 5 Ω	± 5 Ω
110 Ω - 130 Ω	± 1 Ω	± 1.5 Ω	± 2 Ω	± 2 Ω	± 3 Ω	± 4.5 Ω	± 6 Ω	± 6 Ω

REQUIRED COMPONENTS

The system must be completed with:

- Vector Network Analyzer (VNA).
This can be provided by AESA or by the customer.

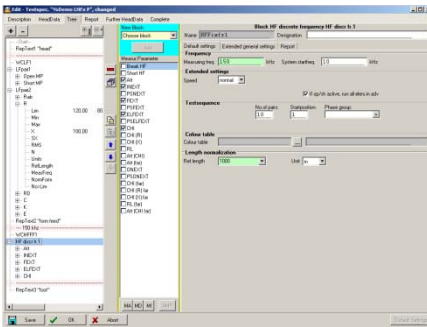
AVAILABLE OPTIONS

The equipment can be completed with:

- Low frequency parameters measuring unit
- Coaxial cable measurement (50Ω or 50+75Ω)
- Switch for options
- EMC parameters
(Transfer Impedance, Screening/Coupling Attenuation)
- Connecting frame for connectors (e.g. RJ45)
- 9000 Low Frequency standards
- 9800 High Frequency standards
- Spare parts

AESA proposes other specific equipment for high frequency measurement

KEY BENEFITS



USER-FRIENDLY

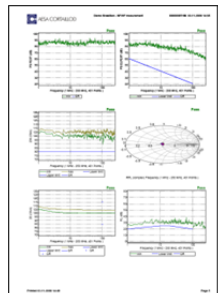
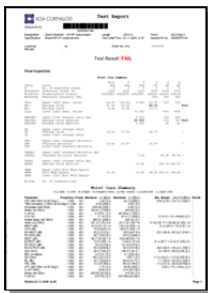
- Fast measurements
- No special HF or LF knowledge required
- OptiTest software is multilingual
- Direct results without post calculation
- Test order library

ISO 17025 ACCREDITED



ACCURATE AND REPEATABLE

- The equipment is checked against traceable calibration standards according to ISO/IEC 17025
- Perfect reproducibility
- The risk of human error is reduced to its strict minimum
- Calibration managed/saved by computer



SMART

- All data (results & conditions) are saved in the PC
- Reports and evaluations can be printed
- Data can be exported (PDF, TXT or XLS files)

Overview

SYSTEM

No balun so individual values per wire available and not only pair.
 Accept wire diameters between 0.3 and 1.0mm (28AWG to 18AWG).
 Full two ports calibration (Thru-Open-Short-Load) for high accuracy measurement.
 No movable parts for maximum measurement speed and reliability.
 Robust mechanical design studied to facilitate maintenance and servicing operations.

LOW FREQUENCY PARAMETERS (Optional)

The low frequency parameters feature is designed to measure pairs or quads.
 The resistance is measured at 4 points (Kelvin bridge)
 The capacitance can be measured at different frequencies in order to accommodate different cable lengths
 (*Please refer to our application note 'Length Restrictions in Cable Testing'*).
 The feature provides self-calibration.

Measured parameters

	<u>Pairs</u>	<u>Quads</u>
Conductor Resistance	Ra, Rb	Ra, Rb, Rc, Rd
Loop Resistance	R	R1, R2
Resistance unbalanced	DR	DR1, DR2, DR3
Capacitance	C	C1, C2, C3
Capacitance unbalanced	K	K1-K12
Capacitance unbalanced to ground	Ei, Ea, E	Ei1-Ei3, Ea1-Ea3, E1-E3

Calculated parameters at (100Hz to 10kHz)

Attenuation
 Characteristic Impedance

Statistical parameters

Maximum and minimum measured values	Upper quality factor
Absolute minimum measured value	Lower quality factor
Average value	RC product
Quadratic average	Standard deviation RC
Standard deviation	Variance
and more ...	

HIGH FREQUENCY PARAMETERS

The high frequency parameters are measured as pairs only (1 quad = 2 pairs).

The measurement can be done according to a configurable curve or predefined fixed points.

2 connecting frames allow to connect both ends of the cable for an automatic measurement of all parameters.

A complete calibration is saved in the system allowing to change specifications without having to perform a new calibration.

Available HF parameters:

<p>Transmission/Reflection</p>	<ul style="list-style-type: none"> • Reflection Differential Mode (each parameter is available at near and/or far end): Return Loss dd, characteristic impedance, S11, Fitted impedance, SRL • Transmission Differential Mode (each parameter is available for forward and reverse measurement): Attenuation (Insertion Loss), S21, S21 phase, Phase delay, phase delay velocity, Group delay, Delay skew... • Reflection Common Mode (each parameter is available at near and/or far end): Return Loss cc, characteristic impedance, S11, Fitted impedance, SRL • Transmission Common Mode (each parameter is available for forward and reverse measurement): Insertion Loss, S21, S21 phase, Phase delay, phase delay velocity, Group delay, Delay skew... • Conversion Loss (each parameter is available for forward and reverse measurement): LCLdc, LCTLdc, TCLcd, TCTLcd, ELTCTLcd • Single Ended Reflection (each parameter is available at near and/or far end and for wire a and/or b): Characteristic impedance, S11, Fitted impedance, SRL • Single Ended Transmission (each parameter is available for forward and reverse measurement and for wire a and/or b): Attenuation (Insertion Loss), S21, Phase, Phase delay, In Pair Skew... • Single Ended NEXT: S31, S13, S42, S24 • Single Ended FEXT: S41, S14, S32, S23
<p>Near-NEXT</p>	<ul style="list-style-type: none"> • NEXT Differential Mode: Nextdd, PSNextdd, ACR-Ndd, PSACR-Ndd • NEXT Common/Differential Mode: Nextcd • NEXT Differential/Common Mode: Nextdc • NEXT • Common Mode: Nextcc
<p>Far-NEXT</p>	<ul style="list-style-type: none"> • Same as Near-NEXT but measured at the far end
<p>FEXT</p>	<ul style="list-style-type: none"> • FEXT Differential Mode: Fextdd, PSFextdd, Elfextdd, PSEIFextdd, ACR-Fdd, PSACR-Fdd • FEXT Common/Differential Mode: Fextcd • FEXT Differential/Common Mode: Fextdc • FEXT Common Mode: Fextcc

Statistical parameters

Maximum and minimum measured values
 Pair of worst case
 and more ...

Worst case
 Frequency of worst case

STANDARDS

Cobalt capabilities

Standard requirements

	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8
Port 1	RLdd11 Sdd11	NEXTdd12 Sdd12	NEXTdd13 Sdd13	NEXTdd14 Sdd14	ILdd15 Sdd15	FEXTdd16 Sdd16	FEXTdd17 Sdd17	FEXTdd18 Sdd18
Port 2	NEXTdd21 Sdd21	RLdd22 Sdd22	NEXTdd23 Sdd23	NEXTdd24 Sdd24	FEXTdd25 Sdd25	ILdd26 Sdd26	FEXTdd27 Sdd27	FEXTdd28 Sdd28
Port 3	NEXTdd31 Sdd31	NEXTdd32 Sdd32	RLdd33 Sdd33	NEXTdd34 Sdd34	FEXTdd35 Sdd35	FEXTdd36 Sdd36	ILdd37 Sdd37	FEXTdd38 Sdd38
Port 4	NEXTdd41 Sdd41	NEXTdd42 Sdd42	NEXTdd43 Sdd43	RLdd44 Sdd44	FEXTdd45 Sdd45	FEXTdd46 Sdd46	FEXTdd47 Sdd47	ILdd48 Sdd48
Port 5	ILdd51 Sdd51	FEXTdd52 Sdd52	FEXTdd53 Sdd53	FEXTdd54 Sdd54	RLdd55 Sdd55	NEXTdd56 Sdd56	NEXTdd57 Sdd57	NEXTdd58 Sdd58
Port 6	FEXTdd61 Sdd61	ILdd62 Sdd62	FEXTdd63 Sdd63	FEXTdd64 Sdd64	NEXTdd65 Sdd65	RLdd66 Sdd66	NEXTdd67 Sdd67	NEXTdd68 Sdd68
Port 7	FEXTdd71 Sdd71	FEXTdd72 Sdd72	ILdd73 Sdd73	FEXTdd74 Sdd74	NEXTdd75 Sdd75	NEXTdd76 Sdd76	RLdd77 Sdd77	NEXTdd78 Sdd78
Port 8	FEXTdd81 Sdd81	FEXTdd82 Sdd82	FEXTdd83 Sdd83	ILdd84 Sdd84	NEXTdd85 Sdd85	NEXTdd86 Sdd86	NEXTdd87 Sdd87	RLdd88 Sdd88
Port 1	LCLdc11 Sdc11	NEXTdc12 Sdc12	NEXTdc13 Sdc13	NEXTdc14 Sdc14	LCLdc15 Sdc15	FEXTdc16 Sdc16	FEXTdc17 Sdc17	FEXTdc18 Sdc18
Port 2	NEXTdc21 Sdc21	LCLdc22 Sdc22	NEXTdc23 Sdc23	NEXTdc24 Sdc24	FEXTdc25 Sdc25	LCLdc26 Sdc26	FEXTdc27 Sdc27	FEXTdc28 Sdc28
Port 3	NEXTdc31 Sdc31	NEXTdc32 Sdc32	LCLdc33 Sdc33	NEXTdc34 Sdc34	FEXTdc35 Sdc35	FEXTdc36 Sdc36	LCLdc37 Sdc37	FEXTdc38 Sdc38
Port 4	NEXTdc41 Sdc41	NEXTdc42 Sdc42	NEXTdc43 Sdc43	LCLdc44 Sdc44	FEXTdc45 Sdc45	FEXTdc46 Sdc46	FEXTdc47 Sdc47	LCLdc48 Sdc48
Port 5	LCLdc51 Sdc51	FEXTdc52 Sdc52	FEXTdc53 Sdc53	FEXTdc54 Sdc54	LCLdc55 Sdc55	NEXTdc56 Sdc56	NEXTdc57 Sdc57	NEXTdc58 Sdc58
Port 6	FEXTdc61 Sdc61	LCLdc62 Sdc62	FEXTdc63 Sdc63	FEXTdc64 Sdc64	NEXTdc65 Sdc65	LCLdc66 Sdc66	NEXTdc67 Sdc67	NEXTdc68 Sdc68
Port 7	FEXTdc71 Sdc71	FEXTdc72 Sdc72	LCLdc73 Sdc73	FEXTdc74 Sdc74	NEXTdc75 Sdc75	NEXTdc76 Sdc76	LCLdc77 Sdc77	NEXTdc78 Sdc78
Port 8	FEXTdc81 Sdc81	FEXTdc82 Sdc82	FEXTdc83 Sdc83	LCLdc84 Sdc84	NEXTdc85 Sdc85	NEXTdc86 Sdc86	NEXTdc87 Sdc87	LCLdc88 Sdc88
Port 1	TCLcd11 Scd11	NEXTcd12 Scd12	NEXTcd13 Scd13	NEXTcd14 Scd14	TCLcd15 Scd15	FEXTcd16 Scd16	FEXTcd17 Scd17	FEXTcd18 Scd18
Port 2	NEXTcd21 Scd21	TCLcd22 Scd22	NEXTcd23 Scd23	NEXTcd24 Scd24	FEXTcd25 Scd25	TCLcd26 Scd26	FEXTcd27 Scd27	FEXTcd28 Scd28
Port 3	NEXTcd31 Scd31	NEXTcd32 Scd32	TCLcd33 Scd33	NEXTcd34 Scd34	FEXTcd35 Scd35	FEXTcd36 Scd36	TCLcd37 Scd37	FEXTcd38 Scd38
Port 4	NEXTcd41 Scd41	NEXTcd42 Scd42	NEXTcd43 Scd43	TCLcd44 Scd44	FEXTcd45 Scd45	FEXTcd46 Scd46	FEXTcd47 Scd47	TCLcd48 Scd48
Port 5	TCLcd51 Scd51	FEXTcd52 Scd52	FEXTcd53 Scd53	FEXTcd54 Scd54	TCLcd55 Scd55	NEXTcd56 Scd56	NEXTcd57 Scd57	NEXTcd58 Scd58
Port 6	FEXTcd61 Scd61	TCLcd62 Scd62	FEXTcd63 Scd63	FEXTcd64 Scd64	NEXTcd65 Scd65	TCLcd66 Scd66	NEXTcd67 Scd67	NEXTcd68 Scd68
Port 7	FEXTcd71 Scd71	FEXTcd72 Scd72	TCLcd73 Scd73	FEXTcd74 Scd74	NEXTcd75 Scd75	NEXTcd76 Scd76	TCLcd77 Scd77	NEXTcd78 Scd78
Port 8	FEXTcd81 Scd81	FEXTcd82 Scd82	FEXTcd83 Scd83	TCLcd84 Scd84	NEXTcd85 Scd85	NEXTcd86 Scd86	NEXTcd87 Scd87	TCLcd88 Scd88
Port 1	RLcc11 Scc11	NEXTcc12 Scc12	NEXTcc13 Scc13	NEXTcc14 Scc14	ILcc15 Scc15	FEXTcc16 Scc16	FEXTcc17 Scc17	FEXTcc18 Scc18
Port 2	NEXTcc21 Scc21	RLcc22 Scc22	NEXTcc23 Scc23	NEXTcc24 Scc24	FEXTcc25 Scc25	ILcc26 Scc26	FEXTcc27 Scc27	FEXTcc28 Scc28
Port 3	NEXTcc31 Scc31	NEXTcc32 Scc32	RLcc33 Scc33	NEXTcc34 Scc34	FEXTcc35 Scc35	FEXTcc36 Scc36	ILcc37 Scc37	FEXTcc38 Scc38
Port 4	NEXTcc41 Scc41	NEXTcc42 Scc42	NEXTcc43 Scc43	RLcc44 Scc44	FEXTcc45 Scc45	FEXTcc46 Scc46	FEXTcc47 Scc47	ILcc48 Scc48
Port 5	ILcc51 Scc51	FEXTcc52 Scc52	FEXTcc53 Scc53	FEXTcc54 Scc54	RLcc55 Scc55	NEXTcc56 Scc56	NEXTcc57 Scc57	NEXTcc58 Scc58
Port 6	FEXTcc61 Scc61	ILcc62 Scc62	FEXTcc63 Scc63	FEXTcc64 Scc64	NEXTcc65 Scc65	RLcc66 Scc66	NEXTcc67 Scc67	NEXTcc68 Scc68
Port 7	FEXTcc71 Scc71	FEXTcc72 Scc72	ILcc73 Scc73	FEXTcc74 Scc74	NEXTcc75 Scc75	NEXTcc76 Scc76	RLcc77 Scc77	NEXTcc78 Scc78
Port 8	FEXTcc81 Scc81	FEXTcc82 Scc82	FEXTcc83 Scc83	ILcc84 Scc84	NEXTcc85 Scc85	NEXTcc86 Scc86	NEXTcc87 Scc87	RLcc88 Scc88

OPTITEST (Software)

The measuring system is equipped with OptiTest (a module of our CIQ quality data management software) which allows to prepare a measurement, to control the ATE to automatically acquire all the values of the defined parameters, to evaluate the results, to provide the measurement reports in the desired format and finally to save or export the measured values.

The software has been developed in the Microsoft® Windows™ environment and complies with the Windows features.

Creation and administration of test specification

The early creation of "Test Plan" file allows to define:

- the successive measuring sequences (Line test, LF, HF, EMC, ...)
- the appropriated limits and conditions (including complex limit curves)
- the scales (logarithmic or linear)
- the HF measuring method (sweep or frequency table; start/stop frequencies; number of points,...)
- the configuration of reports

The test plan is created only once per cable type and can be saved and re-used accordingly.

Possibility to create an unlimited number of cable specifications and test sequences.

These "test specifications" will be stored with an individual customised name and are easily retrievable.

Most of the limits and formulas recommended by the international standards are already integrated.

Their variables are programmable to enable the preparation of special specifications

Measurement

The operator only needs to connect the cable on the frame, set the right test plan, fulfil the specific data (order number, operator name,...) and start the full automatic measurement.

- Fully automatic calibration management including automated calibration procedure
- Preliminary line test to verify the cable connection (short cut, crossover,...)
- Switching sequences indicated by LEDs
- In case of problem, the operator can repeat the measurement or continue in accepting the wrong value.

Reporting

Report generation is set in the test plan and is automatically generated.

The results may be displayed, printed, stored as PDF files, exported (e.g. Excel) or sent by email.

Different highly comprehensive reports can be generated containing a limit case compilation with graphics and for each measuring block a separate summary with related graphics.

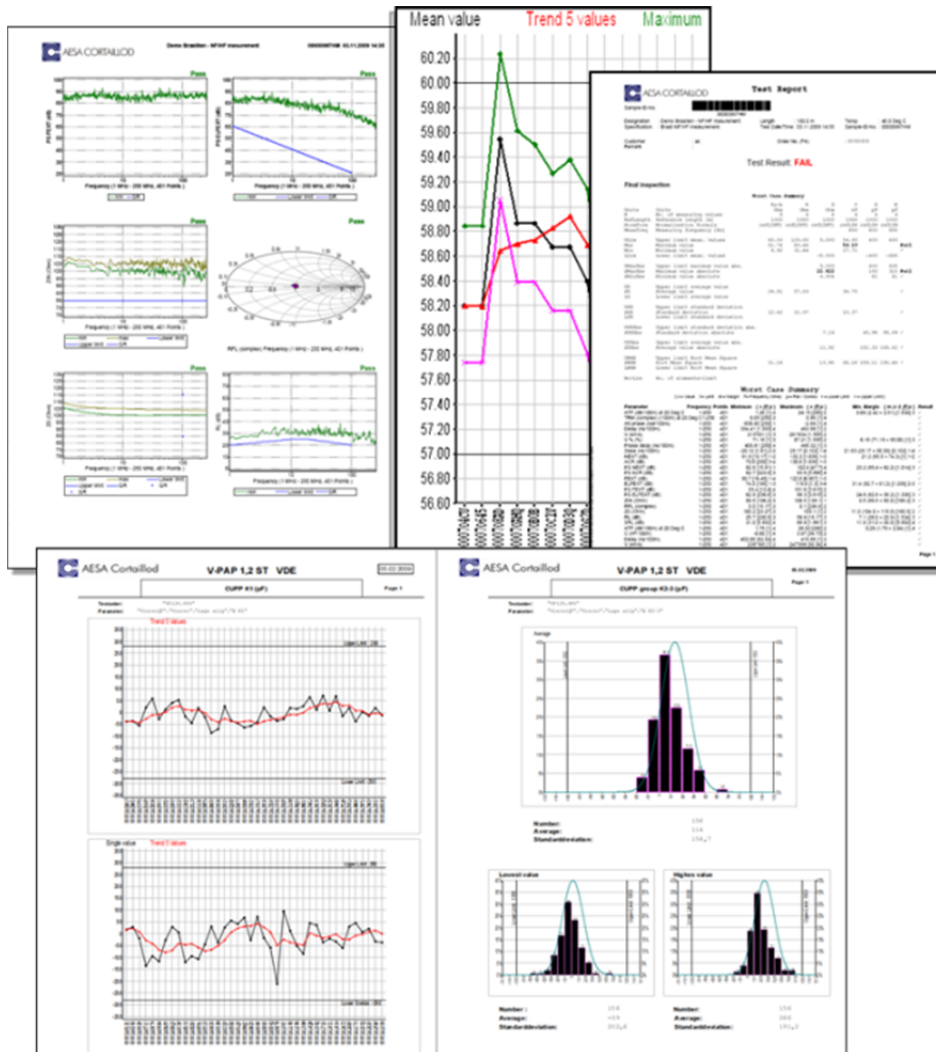
Filters and search criteria normally generate sample lists which facilitate multiple further actions such as:

- Display and process measured values
- Print reports and labels

Evaluation

All data is available for evaluation at any time. Thus, all test data of a cable can be collectively evaluated and printed. Some examples of how to perform evaluations are:

- Sample list sorted by test order
- Search with pre-defined or customized filters through the data pool
- Generate quality charts (statistics)
- Statistical distribution (Gauss type curve)
- Evolution and parameter survey as function of time
- Measurements repartition in a defined time period to determine the testing load



Data management

Connected to CIQ (AESA quality data management system), all data gathered with OptiTest can be used for further statistical evaluations and combined with other measurements gathered during the complete manufacturing process, from incoming good inspection to the dispatch of the finished product.

Options

1. Network Analyzer

- Agilent type E5071C 4 ports (9 kHz – 4.5 GHz) Article No: 51.0001.0044.0
- Rohde & Schwarz ZNB4 (9 kHz – 4.5 GHz) Article No: 51.0001.0060.0

Other types can be proposed upon request. VNA from customer can also be integrated.

2. Coaxial cables measuring option

The option includes the modification of the equipment (N-connectors, switch,...) and the related software module to allow the measurement of coaxial cables with Vega.

- **50 or 75 ohms coaxial option** Article No: 50.0001.0031.0
- **50 + 75 ohms coaxial option** Article No: 50.0001.0029.0

3. LF option for Cobalt 4 DA

Article No: 50.0001.0061.0

The low frequency parameters measuring technology provides a self-calibration. It is designed to test up to 4 pairs or 2 quads. Different measuring frequencies are integrated in the capacitance bridge. They can be used depending on the length of the cable

Description	Designation for pairs	Designation for quads	Accuracy	Scale
Conductor resistance	Ra, Rb	Ra, Rb Rc, Rd	± 0,1% + 10 mΩ	0 - 19,999 kΩ
Loop resistance	R	R1, R2		
Resistance unbalance	DR	DR1, DR2, DR3	Computed	%, Ω
Capacitance	C	C1, C2, C3	± 0,25% ± 10pF at 800 Hz ± 0,25% ± 10pF at 125 Hz ± 0,25% ± 50pF at 12,5Hz	0 – 2'000nF
Capacitance unbalance	K	K1 – K12	± 1% ± 6pF at 800 Hz	
Capacitance unbalance to ground	Ei, Ea, E	Ei1-Ei3 Ea1-Ea3 E1-E3	± 1% ± 3pF at 125 Hz ± 1% ± 30pF at 12,5 Hz	

Calculated parameters (100Hz to 10kHz)

Attenuation

Characteristic Impedance

Statistical parameters

Maximum and minimum measured values Upper quality factor

Absolute minimum measured value Lower quality factor

Average value RC product

Quadratic average Standard deviation RC

Standard deviation Variance

4. Switch for options

The option includes the necessary hardware to connect specific options to the system (e.g. EMC,...).

- **Switch + 50 ohms N-connector for options**

[Article No: 50.0001.0032.0](#)

5. EMC Parameters (TI, AS, AC)*

To perform EMC measurements (Transfer Impedance, Coupling Attenuation, Screening Attenuation) with the tri-axial method, following accessories are required

- One hardware package to prepare the sample and take care for the impedance adaptation
- One software package (specific measurement module)

These accessories allow measuring the transfer impedance, the screening attenuation and coupling attenuation according to IEC 62153-4-9 when knowing the impedance of the internal coaxial cable created with the sample under test.

** this option requires a system with a 50 ohms switch. If the system is not equipped with it, it must be ordered separately.*

Pictures next page.

- **Transfer Impedance Kit, Ø 2.3 - 9.8 mm**

[Article No: 51.0001.0035.0](#)

- **Transfer Impedance Kit, Ø 6 - 22 mm**

[Article No: 51.0001.0056.0](#)

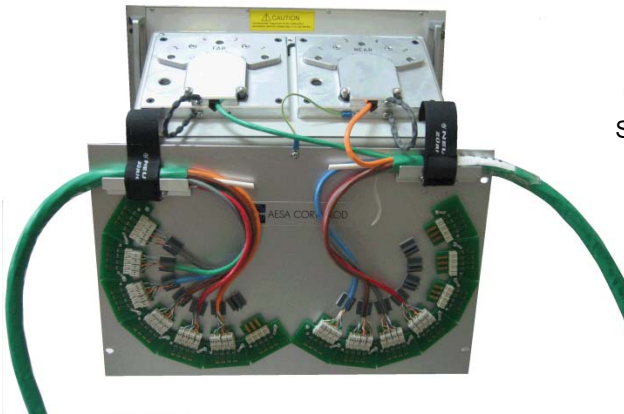


6. Option Alien Crosstalk AXT for ATE up to Cat. 6A (semi-automatic, incl. software)

Article No: 52.0001.0007.0

AESA has developed a software package along with a test procedure that allows the swapping of the different cables on a 4-pair connecting frame. It allows making all necessary measurements in a well-defined order. The software will then compute the measured crosstalk and show the results as specified in the standards.

This option is optimized for 4-pair unshielded cables (U/UTP) up to 500MHz.



Semi-automatic AXT option connecting frame

7. Option Alien Crosstalk AXT for ATE up to Cat. 8 (semi-automatic, incl. software)

Article No: 52.0001.0011.0

AESA has developed a software package along with a test procedure that allows the swapping of the different cables on a 4-pair connecting frame. It allows making all necessary measurements in a well-defined order. The software will then compute the measured crosstalk and show the results as specified in the standards.

This option is optimized for screened cables (X/FTP, F/UTP) up to 2000MHz and unshielded cables (U/UTP) up to 500MHz.



Semi-automatic AXT option Cat 8 connecting frame

8. Option for connector RJ45

Article No: 50.0001.0070.0

Patch cord for RJ45 connectors: easy and direct adaptation to the Cobalt frame.
 Using a simple interface and introducing a de-embedding software correction, it doesn't need frequent and time-consuming calibration routines. It can provide not only the standard parameters as Next and RL, but also other cable parameters for development and further analysis



9. Set of ISO 17025 certified LF standards type AESA 9000

Article No: 45.9000.0001.0

This set of "Low Frequency" standards, certified ISO 17025, allows the periodic calibration, thus proving the accuracy of the complete measurement system. The kit is composed of:

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



ISO 17025 ACCREDITED



10. Set of ISO 17025 certifies HF calibration standards type AESA 9800

Article No: 45.9800.0001.0

This set of "coaxial" primary standards, certified ISO 17025, allows the periodic calibration, thus proving the accuracy of the complete measurement system (Vector Network Analyzer + RF multiplexer + connecting frame).

This set of "coaxial" primary standards should not be mixed up with the "symmetrical" zero correction kit, delivered with the ATE, which is used to carry out the periodical zero correction files of the equipment, required to measure LAN cables.

The set of certified HF standards is composed of:

- 2 attenuation references type 9801 – 3dB
- 2 attenuation references type 9802 – 6dB
- 2 attenuation references type 9803 –10dB
- 2 attenuation references type 9804 –20dB
- 2 attenuation references type 9805 –30dB
- 2 x 50Ω terminations
- 2 special connectors for the terminations
- 4 HF connecting cables for the attenuation
- 1 set of miscellaneous HF material



ISO 17025 ACCREDITED



11. Movable Trolley

Article No: 51.0190.0001.0



For convenience or operational reasons, it is possible to add a professional movable trolley to the system. In such a case, all tester components are integrated in the trolley, including the computer system and the printer.

12. Spare parts

AESA recommends following set of spare parts for a secured operation for two years:

Cobalt Type	HF measurement only (Mini kit)	Including optional LF measurement (Full kit)
1 CKE measuring bridge type KM		✓
1 R measuring bridge type RM		✓
1 LF relay matrix board type AZU		✓
1 CPU board		✓
2 test heads (4 if two different connecting frames)	✓	✓
2 HF relays (3 if two different connecting frames)	✓	✓
1 control boards set	✓	✓
1 set of HF cable	✓	✓
1 set of different mechanical and electronic hardware	✓	✓
Article No	50.0900.0003.0	50.0900.0002.0