

Automatic Testing Equipment (ATE)

Advantages of measuring automatically telecom/LAN cables

INTRODUCTION

The quality tests are often seen as tedious and thus considered a burden. However it is not only a necessary step to demonstrate the cable quality: Reliable data are a source of information to improve the processes, therefore their efficiency and your competitiveness. ATE (Automatic Test Equipment) simplify the operator's job while providing additional inputs.

3 CONCRETE EXAMPLES

- **MANUAL vs AUTOMATIC MEASUREMENT**

The first example highlights the advantages to measure automatically LAN cables, even if they have only four pairs.

- **ALIEN CROSSTALK MEASUREMENT**

Cat 6a cables are built with 4 unshielded pairs. The crosstalk between the different pairs of the bundles must be measured implying a heavy job.

- **LF/HF MEASUREMENT**

Large cable composition implies manifold combinations to be measured (each pair against each other). This tricky job can be drastically simplified using an ATE.

All the times given within these examples have been measured using the specified AESA equipment. Nevertheless small differences are possible depending from the operator skills.

MANUAL vs AUTOMATIC MEASUREMENT

Cable: LAN cat 8, 4 pairs
 Equipment: **Cobalt 4 DT**
 Frequencies: sweep 2000 points up to 2 GHz
 Parameters: HF basic* parameters

Operation	Manual	Automatic
Cable preparation	5 minutes	5 minutes
Data acquisition	4 hours	3 minutes
Evaluation & Report	4 hours	2 minutes
Total	8 h 05	10 min

* The comparison is done using the basic parameters that are usually required by the norms. Nevertheless, Cobalt can measure 170 parameters, therefore more than 20'000 measurements. This can be done automatically in 1 hour whereas the manual measurement is simply not possible.

ALIEN CROSSTALK MEASUREMENT

Cable: cat 6a, 7x4 pairs
 Equipment: **Vega AXT**
 Frequencies: sweep 801 points up to 750 MHz
 Parameters: LF, HF, AXT

Parameters	Nb of sweeps	Time
IL, PD, SKEW	28	1 min
Z, Zf, RL:	28	1 min
NEXT, ACRN, PS...	42	1 min 30
FEXT, ELFEXT, ACRF, PS...	42	1 min 30
Alien ANEXT, PS	96	3 min 20
Alien AFEXT, PS	96	3 min 20
HF/LF switch		2 min
LF (RCKE)	28	3 min
TOTAL	360	< 17min

LF/HF MEASUREMENT

Cable: xDSL, 104 pairs
 Equipment: **Phoenix 100104**
 Frequencies: sweep 101 points up to 100 MHz
 Parameters: LF, HF

Parameters	Nb of sweeps	Time
IL, PD, SKEW	104	1 min 40
Z, Zf, RL:	104	1 min 40
NEXT, ACRN, PS...	~5000	1 hour
FEXT, ELFEXT, ACRF, PS...	~5000	1 hour
LF (RCKE)	104	5 min
TOTAL	~10'500	2 hours 10

BENEFITS

- **Time saving**
 Drastically reduction of the measuring time, from 8 hours to 10 minutes, and more if the cable is prepared in hidden time.
- **Cost reductions**
 Thanks to less scrap and less operating costs
- **Quality improvement**
 By systematic tests instead of sampling
- **Credibility enhancement**
 By providing a complete test report

CONCLUSION

Investing in quality means saving money.

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