Signal integrity support

Signal integrity

HARTING Electronics provides end customers with signal integrity support. We also deliver simulation models and evaluation kits along with our products for signal integrity investigations. The evaluation kits are assembled with SMA's in order to connect them directly with the measurement instruments. Customers benefit from savings in terms of time and the costs for the preliminary evaluation of the connector. We offer test boards suitable for the connector evaluation itself and have built back-planes for measurements within applications such as VME and CompactPCI. Reference structures and well established measurement techniques allow a full de-embedding of the propagation characteristics of the interconnect itself for testing and verification. Furthermore, we have developed a high-speed test backplane with different connector areas and PCB design topologies. We can provide footprint and routing recommendations for each of our products. A variety of test boards and technical data for different products are available on request.

HARTING Electronics is also an active member in standardization groups such as VITA, PICMG, OBSAI and supports sub-committees for new interconnect solutions. We engage in close cooperation with universities and industrial partners for research activities.

Signal integrity capabilities
• Simulation and modeling
• Measurement and verification
• Test board design
• Design-in support

Simulation and modeling

We have the capability to perform full 3D-FEM simulations of the CAD geometry with different well established tools such as CST Microwave Studio and Ansoft HFSS. This enables us to post-process the data for field distribution and full S-Parameter analysis.
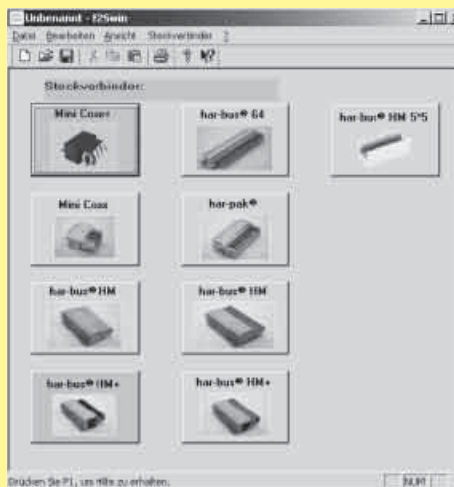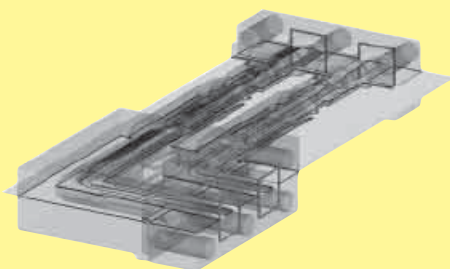

In conducting SPICE modeling, impedance calculation and field distribution analysis of the geometry, we draw on static 3D-FEM, 2D-FEM and planar field solvers.

System simulation, including particular chip, trace, vias and connector sub-circuits are performed with tools such as HSPICE and ADS.
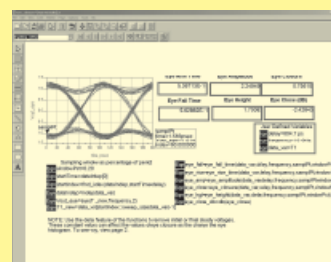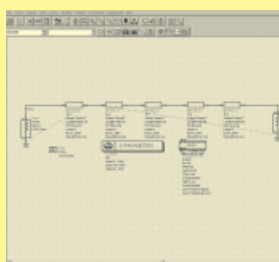
We have developed tools for SPICE netlist conversion based on R, L, C, G files for the post-processing of the data.
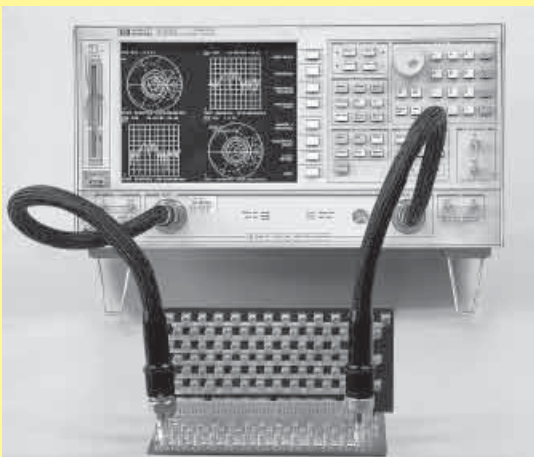
Signal integrity

Time-domain measurements
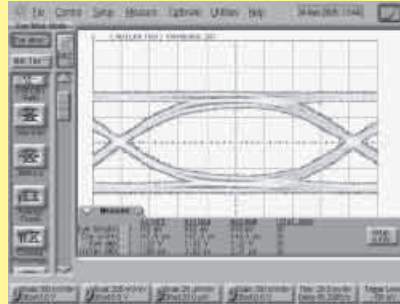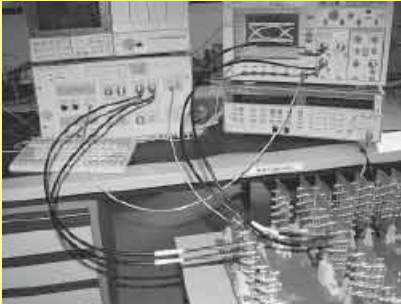
Parameters:
- Characteristic impedance
- Propagation delay
- Reflection
- Crosstalk
- Eye-diagram and mask-test
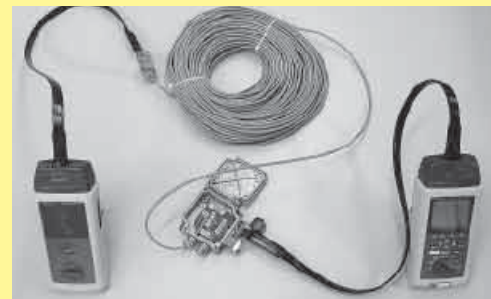- Bit-error rate testing (BERT) up to 12.5 Gbps per differential line

Frequency-domain measurements

Parameters:
- S-parameter analysis (up to 40 GHz)
- Insertion- and return loss, crosstalk
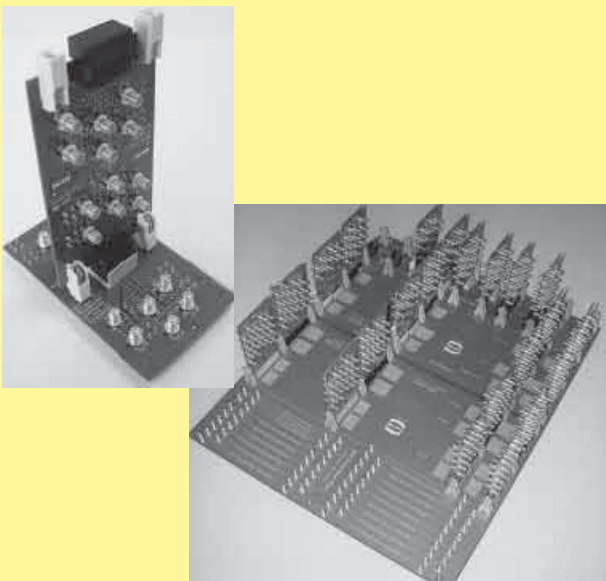- Fourier-transformation, gating, error-location
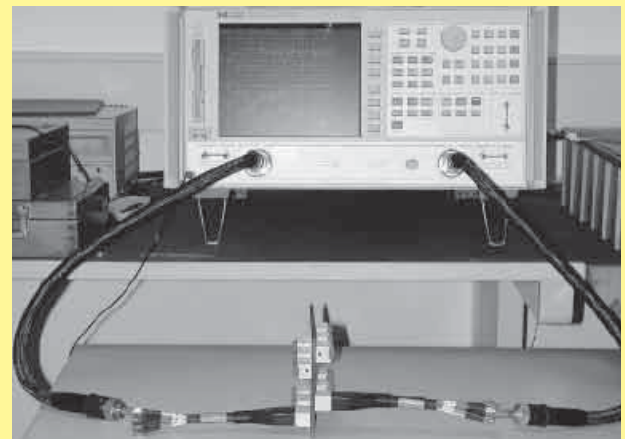
ISO/IEC 11801/CAT 5 measurements

Parameters:
- Near-end crosstalk (NEXT)
- Power sum NEXT (PS NEXT)
- Far-end crosstalk (FEXT)
- Power sum FEXT (PS FEXT)
- Return loss
- Attenuation
- Attenuation to Crosstalk Ratio (ACR)
- Power sum ACR (PS ACR)

Test board design

Design-in support

- Customized PCB design close to the real application
- Footprint and routing recommendations
- Full measurement characterization

Signal integrity

16.03

Signal
integrity