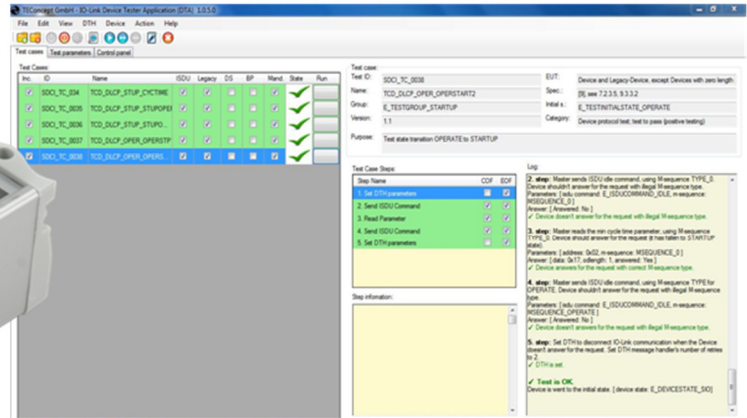




Use  **IO-Link**
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Device Tester



Overview

Every manufacturer of an IO-Link compliant Device needs to issue a manufacturer declaration of compliance.

This requires that numerous tests that are defined in the IO-Link test specification need to be executed. This Device tester simplifies the execution of many of these tests protocol compliance tests. The TEConcept Device tester is powered by an external 24V power supply, it is controlled via an USB port and it offers a standard M12 connector to connect the Devices Under Test "DUT". A PC-software tool imports the IODD of the DUT and automatically adjusts most of its test procedures parameters according to the capabilities of the DUT.

The test cases are defined by XML-files that are accessible by the user.

Additional tests like checking the validity ranges of device-specific parameters can easily be added by extending the test procedures in XML.

Deliverables

- Device Tester Hardware
- 24V power supply
- Device Tester Application (Windows based)

Device Tester Features

- Complies to IO-Link Test specification V1.1.2 (V1.1.3 support in preparation)
- IO-Link profiles (Firmware Update, BLOB Transfer, etc. are supported)
- Extendible with customer specific test cases
- USB control
- External 24V/300mA power supply
- Class A M12 IO-Link master connector
- Approved by IO-Link Quality Working Group

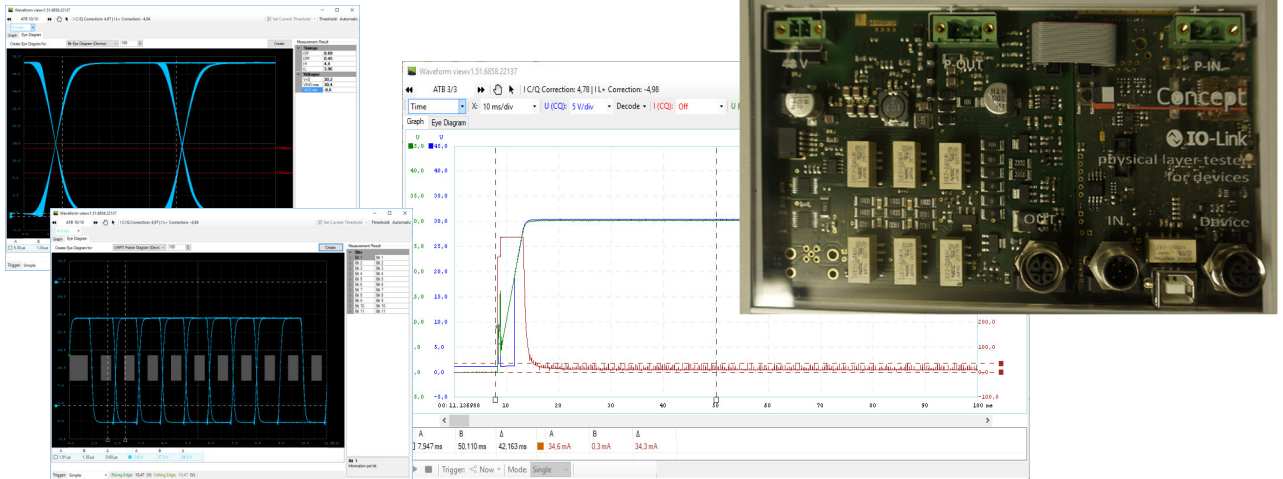
Device Tester PC Application Features

- Graphical User Interface
- Test Report generation in PDF format
- Selectable Test Case execution
- Step-By-Step test report
- Hex-Trace of IO-Link communication
- Log- and Trace File export
- Session store/restore (project file)
- Firmware update feature
- Temporal downgrade to an USB master is possible



Use **IO-Link** Physical Layer Tester

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Overview

TEConcept has developed a Physical Layer Tester "PLT" for Devices to run Physical Layer Tests according to the IO-Link Test Specification. The Physical Layer Tester is powered by an external 48V power supply; it is controlled via an USB port and it offers a standard M12 connector for Devices under test "DUT".

A PC-software tool asks for the IODD of the DUT and automatically adjusts most of its test procedures parameters according to the capabilities of the DUT. The test cases are defined by an XML-files that are accessible by the user.

Functional Description

The PLT is based on a high-speed multi-channel A/D converter that measures voltages and currents on both the C/Q and the L+ line. For every test case, specific snapshot of signals is taken and stored. In order to generate these signals, the PLT includes all necessary elements, like an IO-Link Master, adjustable voltage and current sources, line simulations and so forth.

These snapshots are visualized in an oscilloscope-like view by the PC application. They have to be analyzed in a semiautomatic way where measurements are taken by moving graphical cursors that are linked with voltage current and time values. The measured data are entered / copied into predefined fields and used for an automatically generated test report.

Features

- Compliant to IO-Link Test Specification V1.1.2
- User calibration support
- IODD support
- Integrated IO-Link Master
- Integrated Line Simulation
- Semiautomatic measurement procedure based on recorded waveforms
- SIO – Mode tests
- BIT – and UART Eye-Diagrams
- Test Report Generation (PDF)
- All test results are stored in a reloadable test data file

Advantages

- All components to run physical Layer Tests are included
- Substantial reduction of test effort and test duration
- Automatic test report generation

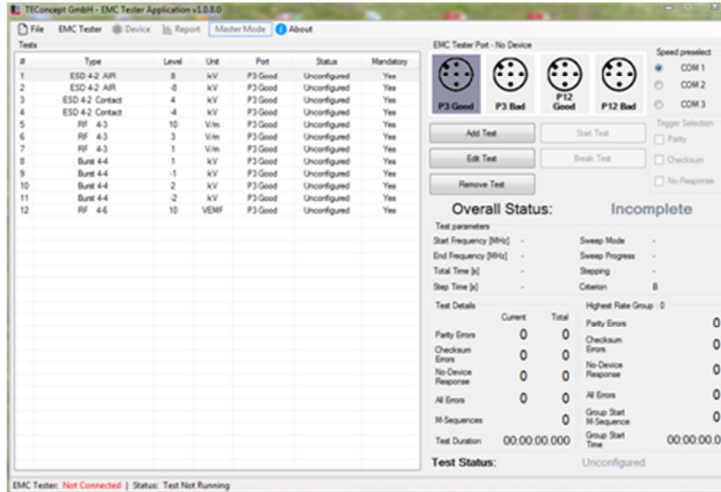
Deliverables

- IO-Link Physical Layer Tester
- 48V power supply, USB cable
- Connector Cables



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EMC Test Master



Overview

The IO-Link specification defines well defined procedures to test the EMC robustness of IO-Link devices.

Some tests are checking the sensitivity of the IO-Link communication of IO-Link devices under EMC conditions.

This requires a robust master that is much less sensitive to EMC noise than the device under test.

This is achieved by separating the IO-Link master into two parts: part 1 contains the sensitive digital logic (μ C-box), part 2 contains the IO-Link transceiver (PHY-box).

Both parts are separated by an optical connection with a length of up to 10m.

Deliverables

- 2 EMC test boxes (Controller-box and PHY-box)
- 6 Optical cables
- 2 connectors for 24V supply
- EMC Test Graphical User Interface
- PC based IO-Link control tool

Features

- Complies to IO-Link interface specification V1.1.2 (V1.1.3 coming) and the current IO-Link test specification.
- Error and Signal output
- 4 electrical IO-Link port configurations
 - COM1/2 speed port (good signal)
 - COM1/2 speed port (bad signal)
 - COM3 speed port (good signal)
 - COM3 speed port (bad signal)
- RS232 and USB interfaces
- Terminal based control command set
- Additional EMC test and control software with graphical user interface
- Test report generation in PDF Format
- Can be configured to operate as standard "USB IO-Link Master"
- Firmware update supported

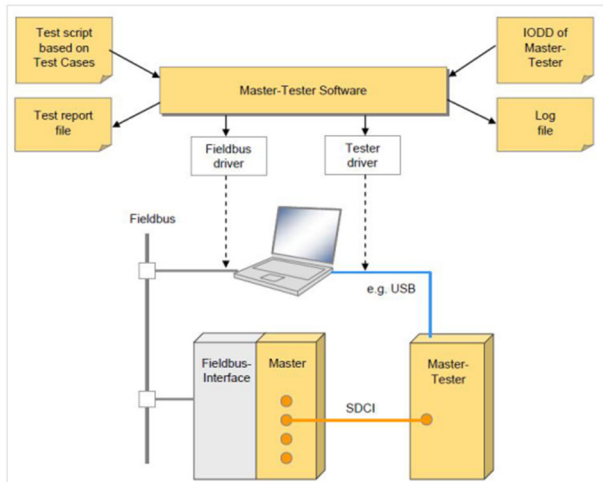
Advantages

- Sensitive Parts are located outside EMC chamber
- EMC robustness considerably better than required



Use **IO-Link** Master Tester

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Overview

The IO-Link Master Tester consists of a PC program and a hardware box. The test system allows complex IO-Link Master tests according to the IO-Link test specifications. Correct IO-Link behavior as well as possible erroneous functions can be tested.

The IO-Link Consortium asks for all IO-Link Masters a manufacturer's declaration for IO-Link conformity. MESCO developed a test system for this purpose, based on the IO-Link Consortium test specifications.

As the first field bus type it supports PROFIBUS DP and may be customized to further field bus interfaces.

A serial test interface that allows to test the IO-Link master without using the fieldbus is available.

The IO-Link Master Tester comes with a complete set of specified test cases.

Moreover, it can be easily extended with additional test cases. The test system can be used during the development phase for manufacturer's self-declaration of conformity as well as in the production process.

Deliverables

- IO-Link Master Tester handheld
- Software on CD-ROM
- USB-Cable

Features

- Test system for realization of automated, reproducible and complex IO-Link Master tests according to the IO-Link test specifications Rev 1.0 / Rev 1.1
- Monitoring function for direct error search and bug fix
- Programmable via script
- Creation of status information
- Test of field bus implementation according to integration instructions
- Possibility of stimulation of any ISDU parameter
- Open application interface for adaptation to other interfaces
- Appropriate tool for Master manufacturers for simulation of different device types and its malfunctions.

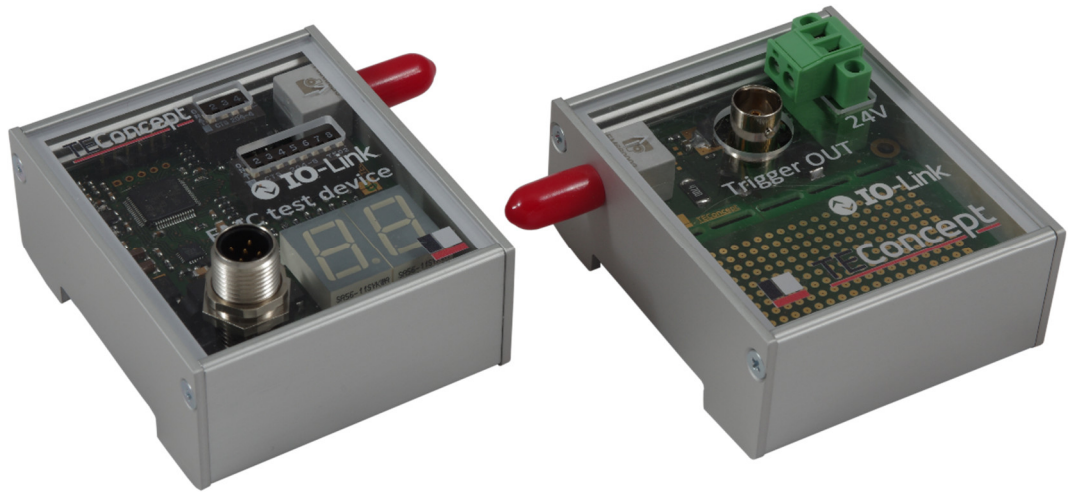
Advantages

- Highly automated test of IO-Link masters
- Allows to test the IO-Link master without fieldbus or backplane gateway.
- Maintenance contract offered for updates to later test specifications or IO-Link "packages"



Use IO-Link EMC Test Device

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Overview

The IO-Link Interface Specification V1.1.2 defines a specific Test-Device (see Appendix G.2.2 Test of a Master) that shall be connected to an IO-Link Master during the Execution of EMC tests.

Functional Description

The device generates an 8-bit random number which are read out by the master. During the test the master shall return this random number to the device in the next IO-Link cycle.

The device checks, whether it receives the correct random number and increments an internal error counter if not. The error counter is also incremented if a checksum error or a parity error is detected on the device side.

The error count can be read out by the master via an IO-Link parameter after the test. In addition, the error counter value is also displayed by a 7-segment indicator.

When an error is detected the device generates a trigger signal at an optical output. A trigger box that converts the optical signal into a trigger pulse can be connected to the device. The trigger pulse supports developers in identifying possible issues on the master side.

The device can be configured to operate in one of 3 COM-speeds by DIP-Switches.

Features

- Device fully compliant to V1.1.2 IO-Link Interface Specification
- All 3 COM-Speeds supported (Switch Selector)
- Internal Pseudo-Random-Number Generators
- Error counter for Parity, Checksum, Data and Time-out Errors
- 7-Segment Error Counter Display
- 7-Segment Device Status Display
- Errors Counter accessible via IO-Link
- Optical Error Trigger Output

Advantages

- No development effort for master manufacturers
- Better time-to-market
- Identification of EMC issues

Deliverables

- IO-Link EMC Test device (with IODD)
- IO-Link Trigger box
- Optical link