

A Universal Cable Tester Based on the LXI Bus

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With the improvement of the industrial automation, the need of complicated multicore cables and harnesses is on the rise in fields such as aircrafts, satellites, ships, communications, vehicles, large-scale test systems, automated factories and so on. Meanwhile, problems of system or equipment malfunction caused by cable failures become more and more severe. Traditional testing and repairing of cables are mainly based on manual methods, which is inconvenient to test and difficult to operate, time-consuming, strenuous and inaccurate, and the test results often depends on test operators' ability and working experience. The disadvantages of traditional methods are more obvious especially in testing of multicore cables.

In order to solve the above problems, Shaanxi Hitech Electronic Co., Ltd has developed the Universal Cable Tester using LXI technology based on the research of cable testers both home and abroad. The product has overcome the disadvantages of traditional cable testers in extension of functions and measuring points, and appears as an open structure multicore tester with high expansibility and flexible topology.

Universal Cable Tester consists of a host test chassis, LXI multiplex switches and extension modules, among which the LXI multiplex switch is Core (the former LXI Class C) compliant developed solely by Shaanxi Hitech Electronic Co., Ltd.



Figure 1 Structure of Universal Cable Tester

Functions:

- 2 conduction test modes: 2-wire resistance and 4-wire resistance;
- Insulation test;
- Withstand test;
- Software setup of test voltage, boosting time and dwell time of Insulation and withstand tests;
- Failure locating of cable measurement to a specific core wire;
- Distributed detection of cables, and long-distance detection can be achieved;
- The maximum number of core wires of cables under test can be improved through the increase of multiplex switches;
- Optional multiplex switch modules with different voltage levels;

- Single-core cables can be tested with an individual host test chassis;
- Automatic analysis, storage and printing of test results;
- Self-test of modules and interfaces;
- LAN and Web interfaces make remote tests through network available.

Specifications are shown in the following table:

Low Voltage Test			
Test Item	Range	Accuracy	
2-wire Resistance	0Ω-10MΩ	1.5% reading+0.45Ω	
4-wire Resistance	0Ω-10MΩ	1.5% reading+0.05Ω	
High Voltage Test			
Test Item	Range	Accuracy	Test Voltage
Insulation Resistance	0.5MΩ-500MΩ	3.5% reading	500VDC
	0.5MΩ-1GΩ	3.5% reading	1000VDC
Withstand Test	0mA-5mA	1.5% reading+0.05uA	0-3500VDC
Remote Extension Modules			
Model	Voltage	Number of Extension core wire for 2-wire/4-wire items	Test Interface/Measuring Points
HTLX3036	500VDC	40/20	2 Dsub50 (pins) /80
HTLX3036-1	1000VDC	40/20	2 Dsub50 (pins) /80

The Universal Cable Tester can be used to integrate distributed cable testing systems based on LXI bus (See Figure 2). At present, Hitech Universal Cable Tester has been used to implement tests of long-distance cables of large-scale aircrafts, which has dramatically simplified the testing process. For example, users can move the LXI modules (the testers) to appropriate places close to their products under test, which eliminates long as well as cumbersome adapter cables and therefore reduces cost. In addition, the LXI modules can be placed and moved to anywhere whenever needed in testing sites, for instance, you may put them both on the ground and in aircrafts (such as the cockpit, the cabin or the wings), which is very convenient for distributed tests.



Figure 2 Distributed Cable Test System based on LXI Bus