Application Note

Industrial Automation

Choose right - Diagnostic Tools for PROFIBUS and PROFINET

NEWBURYPORT, MA – Softing routinely receives calls from customers and maintenance engineers seeking advice on how to effectively diagnose their PROFIBUS and PROFINET networks. There are a lot of inaccurate perceptions of available diagnostic options and how many troubleshooting tools work. Softing's team members gladly take the time to inform every caller and put all options into perspective.

The most common problems of PROFIBUS networks are faulty cabling or connectors causing poor signal quality levels. In order to detect and identify those kinds of issues an engineer can either use an oscilloscope (and lots of experience) or he can use an Electrical Tester for PROFIBUS that makes his job much easier.

Here are a few guidelines and recommendations that may help you to decide on the most cost-effective diagnostic tool for your specific requirements.

PROFINET

The good news is that PROFINET (as well as all major industrial Ethernet p rotocols) is based on the well-established Ethernet technology. There is a wealth of reasonably priced off-the-shelf cable testers for Ethernet networks. Customers have a choice between simple continuity testers similar to the "VDV MultiMedia Cable Tester Kit" or somewhat more sophisticated cable testers like the "Fluke CableIQ Qualification Tester".
Follow the following links for more information:

http://ideal.datacomtools.com/idealcatalog/multimedia-testers.htm
http://www.flukenetworks.com)

PROFIBUS

If your application requires a condition-based maintenance strategy you will need a diagnostic product that is permanently attached to your network and continuously monitors the health of

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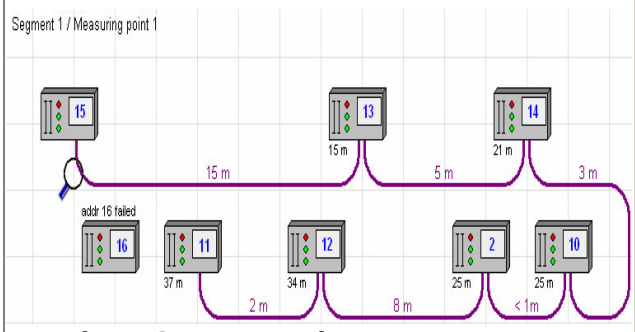
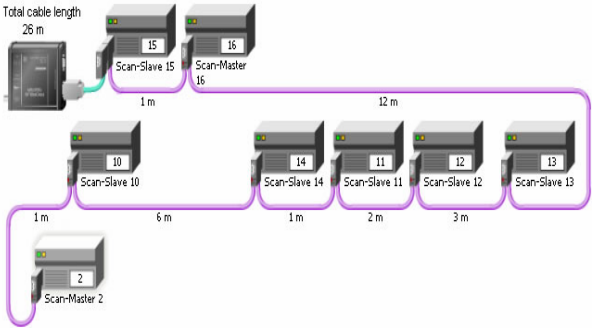
your system. For troubleshooting acute network problems, a solid Electrical Tester for PROFIBUS DP or PROFIBUS PA used simultaneously with a sophisticated Protocol Analyzer is typically all you need.

Today, a user has a choice between dedicated PROFIBUS cable testers and multifunctional diagnostic tools. All dedicated cable testers perform very robustly and are able to accurately pin-pinpoint the actual problem within a network.

Multifunctional diagnostic products provide a multitude of diagnostic tools based on a single hardware platform. The disadvantage of such an approach is that the robustness of each included diagnostic tool is suffering due to design restrictions when it comes to performance, accuracy, and reliability. In fact, in some cases multifunctional tools may even mask the actual problem and, in effect, slow-down the troubleshooting process (see below).

Multifunctional PROFIBUS Diagnostic Tool	Dedicated PROFIBUS Electrical Tester
	
Topology Scan: Result Incorrect This multifunctional PROFIBUS diagnostic tool failed to determine the physical topology of a healthy PROFIBUS network. The overall cable length and the order (and position within the bus cable) of the devices differs significantly from the order of the devices on the actual test network.	**Topology Scan: Result Correct** This dedicated PROFIBUS cable tester is able to determine the actual physical topology of the same network. The cable length is determined correctly (within 1m/3 feet) and all connected devices are displayed in the correct location reflecting precisely the actual topology of the test network.

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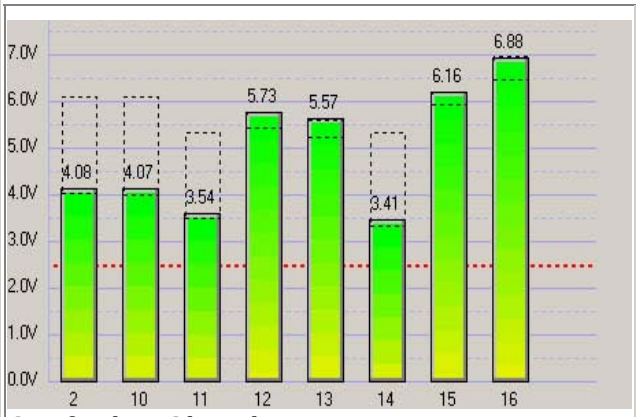
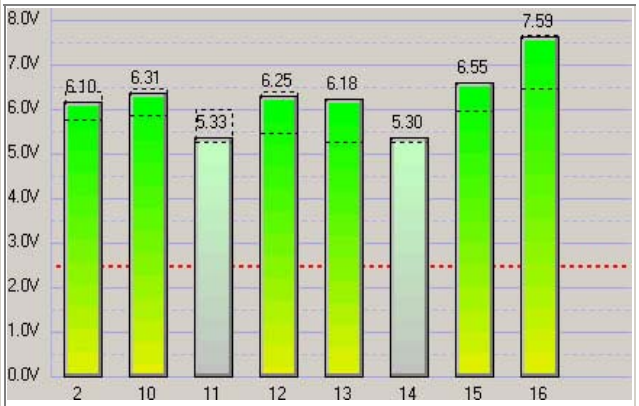
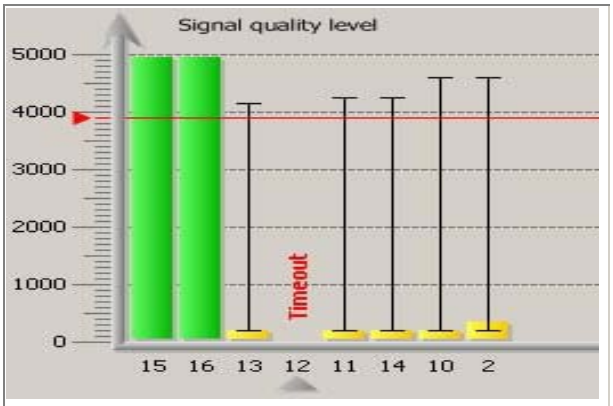
Multifunctional PROFIBUS Diagnostic Tool	Dedicated PROFIBUS Electrical Tester
 **Confusing Signal Pattern**	 **Clear Signal Pattern based on correct topology scan**
 **Incorrect evaluation of Signal level after removing bus termination**	 **Correct evaluation of Signal level after removing bus termination**

Softing has established itself as the undisputed market leader for network diagnostic products and is the only vendor

- with a complete set of novel PROFIBUS diagnostic tools in its portfolio that are reliable, extremely powerful, yet very easy to use
- that is a manufacturer and direct supplier (not a distributor/reseller) of diagnostic tools within the US market

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About Softing
In industrial automation, Softing is a specialist for fieldbus technology and has established itself as a world-leading partner for networking automation systems and control solutions. Softing provides customers the key technology to connect devices, controls and systems with the leading communication technologies. In fieldbus technology, Softing is a world-class expert for FOUNDATION fieldbus, PROFIBUS, and CAN/CANopen/DeviceNet. The company's wide range of expertise includes solutions for OPC, FDT, and Real-Time-Ethernet protocols such as, PROFINET IO, EtherNet/IP, or Modbus/TCP. Many of the products and services developed by Softing since the company was founded in 1979 have become reference standards throughout the world. In addition, Softing has established itself as a provider of sophisticated diagnostic tools for fieldbus systems.

For more information: http://www.softing.us or Tel: (978) 499-9650, Fax: (978) 499-9654, Email: ken.hoover@softing.com.

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