User Guide

WireXpert

MPTL Testing

Version: WireXpert4500_Copper_MPTL_IT_EN_201910

Disclaimer of liability

The information contained in these instructions corresponds to the technical status at the time of printing of it and is passed on with the best of our knowledge. The information in these instructions is in no event a basis for warranty claims or contractual agreements concerning the described products, and may especially not be deemed as warranty concerning the quality and durability. We reserve the right to make any alterations or improvements to these instructions without prior notice. The actual design of products may deviate from the information contained in the instructions if technical alterations and product improvements so require.

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The latest version of this manual is available in the Softing download area at: http://itnetworks.softing.com.

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1 Introduction

1.1 About product

Softing's WireXpert, with its unparalleled 2,500 MHz measurement range, is the first cable certifier with capability to certify the highest performance cabling systems in enterprise networks and data centers. Cable installers make significant gain in productivity with WireXpert‘s industry leading test speed and ease of use. With certification testing up to Class FA and CAT8 copper cabling, as well as MPO, SM, MM and MMEF fiber optic cabling, WireXpert is ready for 40G and beyond.

Starting from v7.4, WireXpert is available in four variants- WireXpert 500 copper (up to 500MHz) only, WireXpert 500 fiber only, WireXpert 500-plus; copper + fiber and WireXpert 4500- to provide more flexibility to suit your certification requirements. The WireXpert 500 series provides an affordable solution that can grow with your cable certification needs. Upgrade the copper only or fiber only variants to the combined WireXpert 500-plus or WireXpert 4500 for the full 2,500MHz capability.

With v8.0, cloud-based data management features have been integrated into WireXpert and eXport PC Software. Users will be able to connect unlimited numbers of WireXpert and transfer test data to and from their private network using Wi-Fi or mobile hotspot. The cloud feature is available in all variants of WireXpert.

1.2 Safety precautions

Read this manual before starting

For damages due to improper connection, implementation or operation Softing refuses any liability according to our existing warranty obligations.

Note

This symbol is used to call attention to notable information that should be followed during installation, use, or servicing of this device.

Hint

This symbol is used when providing you with helpful user hints.

CAUTION

Selection of option may cause all or partial of saved data and/or settings in the device to be erased or restored to non-reversible original factory state. Backing up of saved result(s) is recommended before executing option.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

1.3 Intended use

WireXpert series has been designed for use in factory, process and building control. The unit must not be used in explosion hazard areas. The permissible ambient conditions given in the Technical Data must be complied with.

The faultless and safe operation of the product requires proper transport, proper storage and installation, and expert operation and maintenance in accordance with the manual.

1.4 About this document

Read this manual before starting

For damages due to improper connection, implementation or operation Softing refuses any liability according to our existing warranty obligations.

1.4.1 Document history

Document version	Modifications compared to previous version
201910	Firmware update to v8.2

1.4.2 Conventions used

The following conventions are used throughout Softing customer documentation:

Keys, buttons, menu items, commands and other elements involving user interaction are set in bold font and menu sequences are separated by an arrow	Open **Start ➔ Control Panel ➔ Programs**
Buttons from the user interface are enclosed in brackets and set to bold typeface	Press **[Start]** to start the application
Coding samples, file extracts and screen output are set in Courier font type	`MaxDlsapAddressSupported=23`
Filenames and directories are written in italic	Device description files are located in *C:\<product name>\delivery\software\Device Description files*

1.5 Before you start

Check that the latest eXport PC software and firmware is installed in the workstation and WireXpert respectively to ensure the latest features are available.

Key differences between WX4500 and WX500 series

Features	WX4500-FA	WX500-PLUS	WX500-CU	WX500-FIBER
Frequency of measurement	2500 MHz	500 MHz	500 MHz	N/A
Accuracy Specification	TIA Level 2G ISO/IEC Level VI	TIA Level IIIe ISO/IEV Level IIIe	TIA Level IIIe ISO/IEC Level IIIe	N/A
Fiber Testing option	Yes	Yes	No	Yes
Class FA/CAT 8 options	Yes	No	No	No
Patch Cord Test adapters	Yes	Yes	Yes	No

Softing recommends WireXpert to be calibrated annually. Starting from v7.4, WireXpert will remind the user to calibrate the units if the last calibration was more than one year ago. This notification can be closed by clicking the **[OK]** button, but will be displayed on every boot up until the units are calibrated.

Calibration can only be done by the service center. Please contact your local vendor for more information.

1.6 System requirements

Hardware

- ❑ PC

Operating system

- ❑ Windows 7, 8.x or 10 (32 bit or 64 bit)
- ❑ Intel Core 2 Duo, 2GHz
- ❑ 1 GB of RAM
- ❑ 200 MB of free space of installation

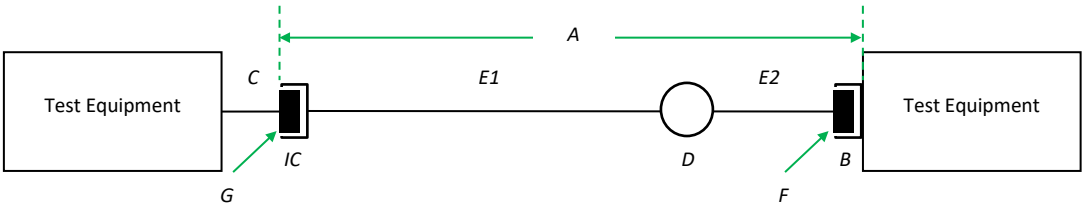
- Microsoft .NET framework

2 Application description

For a long time, Structured Cabling was reserved for use in communications networks as the interconnectivity of active devices which exchanged their respective protocols.

Today's applications are becoming increasingly diverse. In the past, a network was only used to link computers, but nowadays far more applications, not just additional telephones, are managed via the same infrastructure. In the past, the design of a transmission link was clearly defined. It consisted of a fixed installation cable terminated at both ends with passive components, mostly RJ45 sockets, which were connected by flexible connection cords (patch cords), establishing for example the connection between a switch and a terminal device. With the advent of Ethernet in the industrial environment, “Industry 4.0”, this form of classical transmission line has already been dissolved.

For industrial cabling, a direct connection has just been standardized, in which plugs are mounted directly on the installation cable, instead of installing sockets plus patch cords for the connection of active components. This new form of transmission link is called "End-to-End Link" ("E2E"). The IoT, the Internet of Things, where more and more equipment become network-enabled, extends the number of structures of communication cabling with another type of transmission link, the so-called "direct connect" or in technical term from the American ANSI/TIA draft standard, "Modular Plug Terminated Link" (MPTL).



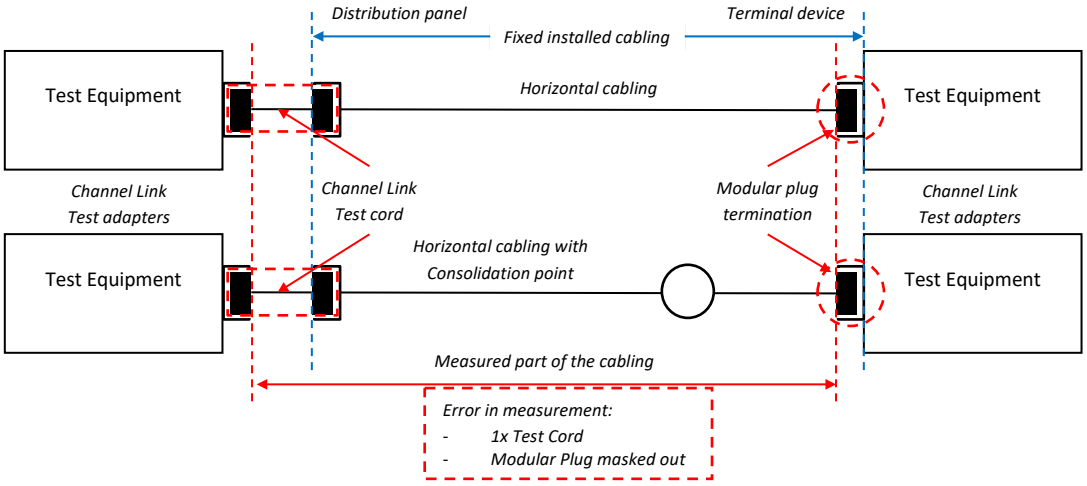
Cables and cords
Horizontal cabling – E1, E2
Connecting hardware
Interconnect – IC
Optional consolidation point – D
Maximum length
E1 + E2 = 90m

A: MPTL Under Test (MUT)
B: Qualified Patch cord test head
C: Test equipment cord
F: Modular plug termination
G: Qualified Test plug

2.1 Measurement Types

Before the Standards were defined by ANSI/TIA, the following hybrids methods which produces inaccurate measurements were adopted.

2.1.1 Measurements using Channel Link adapters



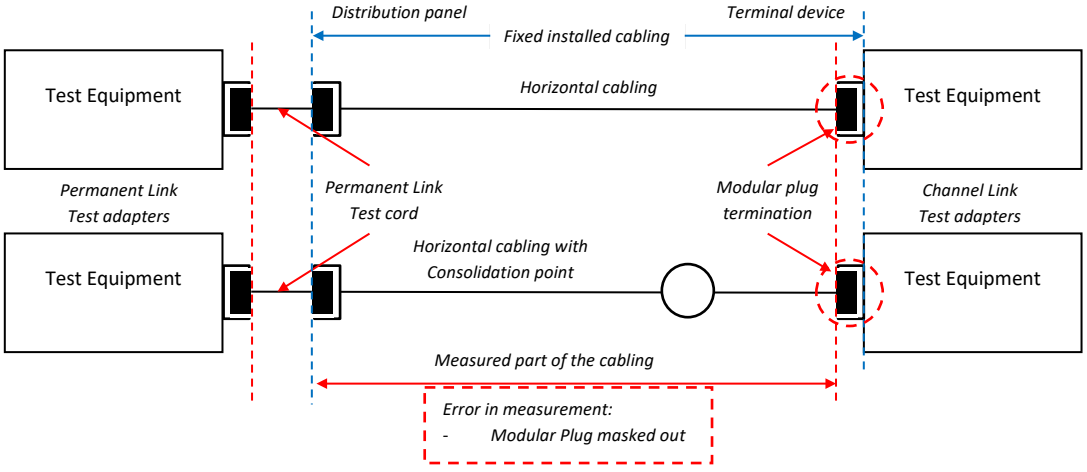
This method assumed to include the entire transmission channel; the measurement patch cable would have to be left on the distribution panel.

Pulling off the distribution panel will invalidate the measurement.

By plugging in the plug of the cable into a channel link measurement adapter, it will also be masked out of the measurement according to the channel limits.

This method is therefore not accurate.

2.1.2 Measurements using Permanent Link and Channel Link adapters

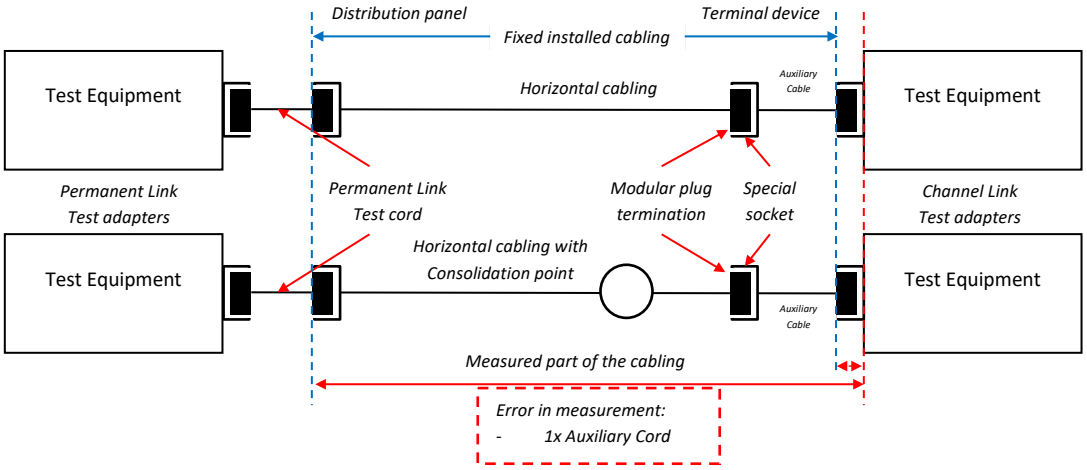


On the distribution panel, a permanent link adapter was used to at least set the measurement reference plane correctly at that side of the link.

However, this method does not measure the plug at the channel adapter.

This method is therefore not accurate.

2.1.3 Measurements using Permanent Link and Channel Link adapters with special auxiliary cable



Special auxiliary cables were used to prevent the masking of the first and last plug.

A channel adapter is still used on the terminal device side, with a short intermediate cable inserted between the connector on the installation cable and the measurement adapter.

This cable has a RJ45 standard plug on the side of the testing device which disappears in the channel adapter.

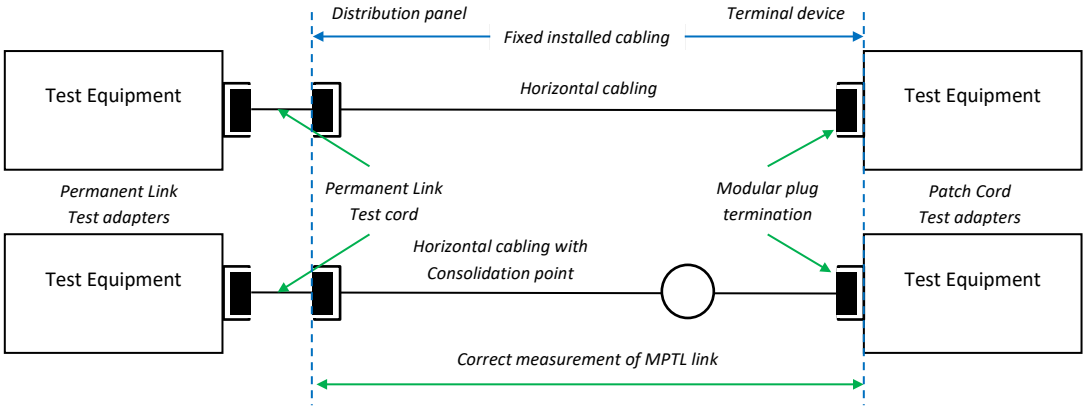
On the other side, a special standardized reference socket which the plug of the transmission link is now connected to.

This reference socket on the auxiliary cable complies with the requirements of the standards for measuring patch cables and ensures that the characteristics of the connector on the installation cable are not hidden.

However, this additional cable adds an additional length in the overall measurement, and is therefore not accurate.

2.1.4 Measurements using Permanent Link and Patch Cord adapters

TIA568.2D has defined the following setup for testing a MPTL;



A permanent link adapter is used at the distributor panel and a patch cord adapter is used at the terminal device end.

Patch cord test adapters are typically used for qualifying connection cords.

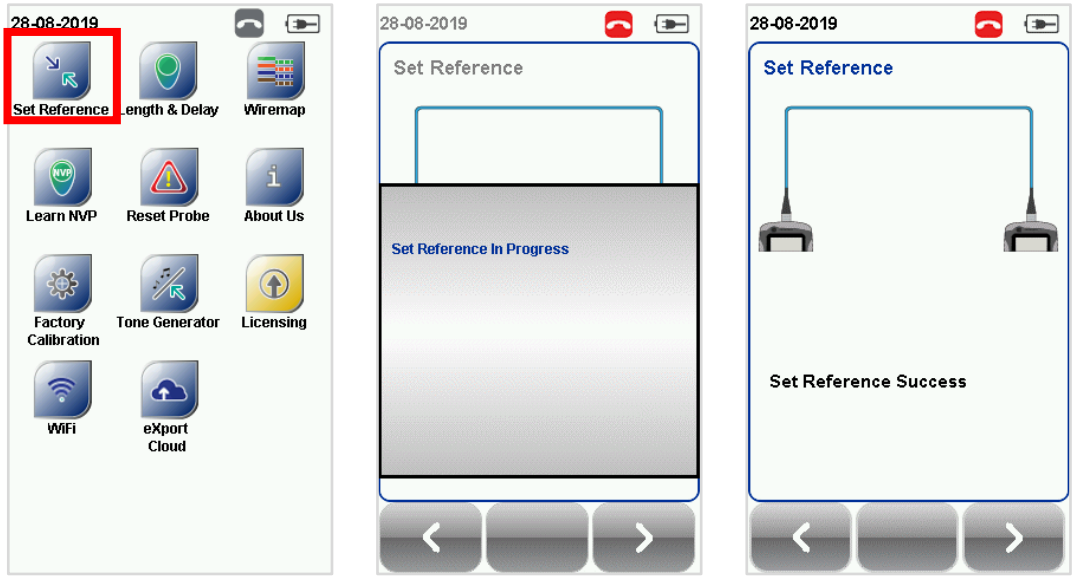
The patch cord adapter shifts the reference plane to ensure the connector is part of the measurement.

And prevents the addition of cable length highlighted in the previous method.

3 Setting Reference

To set reference,

1. Connect the Permanent Link adapter to the LOCAL unit.
2. Connect the Patch Cord adapter to the REMOTE unit. Depending on the type of cable installed and test requirement, this can be a CAT 5e, 6 or 6A Patch Cord adapter.
3. Press the **[TOOLS]** button ➔ **Set Reference**

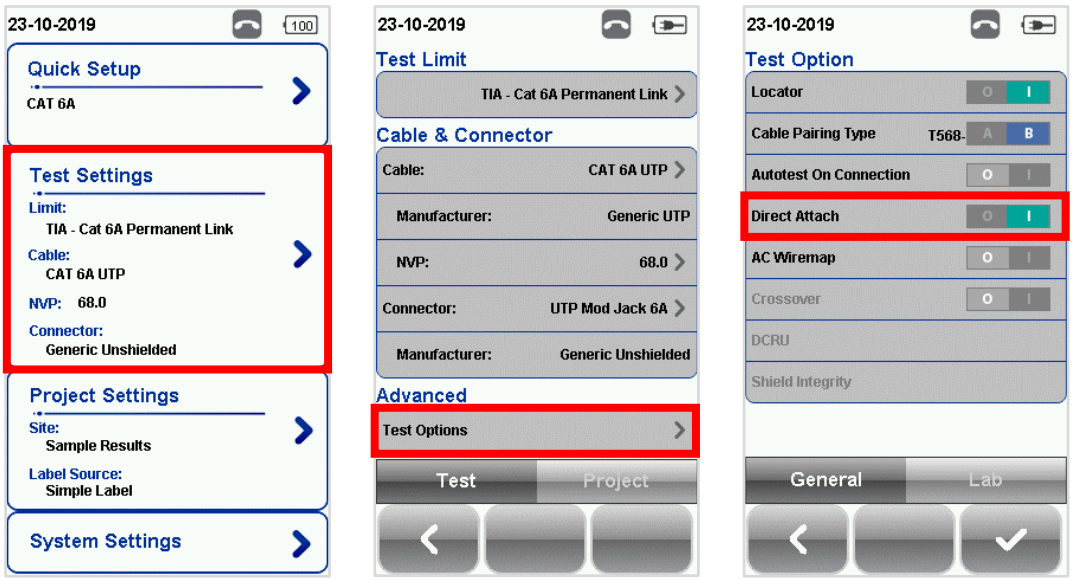


4. Set Reference will fail in the event of-

- Adapter probe mismatch, i.e., two channel or permanent link adapters
- Firmware version mismatch between LOCAL and REMOTE units
- No connection between LOCAL and REMOTE units

4 Configuring an AUTOTEST

4.1 Setting up WireXpert



1. Press the **[SETUP]** button ➔ **Test Settings** ➔ **Test Options**
2. Enable **Direct Attach**
3. Press the **[OK]** button to save settings.

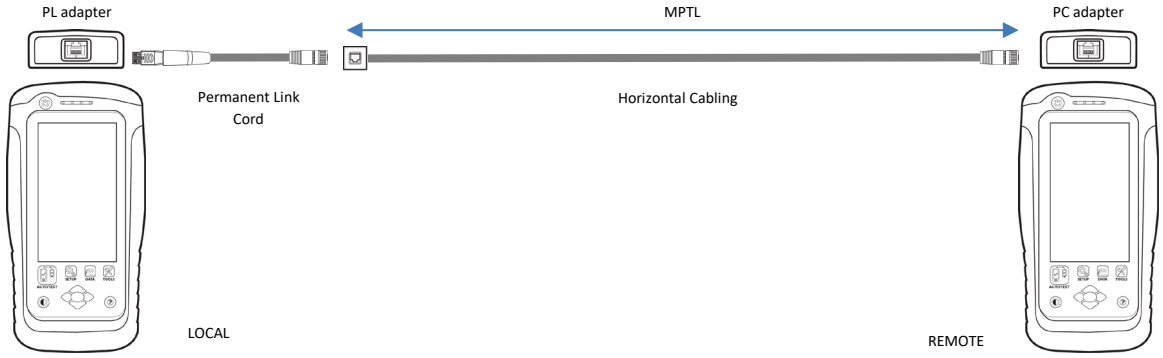
4.2 Testing Guide for MPTL Testing

MPTL test is comprised of the connection from a distributor panel and a terminal device end (eg, CCTV).

A permanent link adapter is used at the distributor panel and a patch cord adapter is used at the terminal device end.

The MPTL is recommended to not exceed 90m.

1. Insert the ***Permanent Link*** adapter onto the LOCAL units of the WireXpert.
2. Insert the ***Patch Cord*** adapter onto the REMOTE units of the WireXpert.
3. Power ON WireXpert. Check that WireXpert is in Copper testing mode.
4. Set reference is required if the units are being paired for the first time.
5. Go to **Test Settings** ➔ **Test Limits** ➔ **TIA**
6. Depending on test requirement, select TIA Cat 5e, Cat 6 or Cat 6A MPTL.
7. Connect the LOCAL unit to the socket of the MPTL using the Permanent Link cord.
8. Connect the plug of the MPTL the REMOTE unit.



9. Press the **[AUTOTEST]** button to begin AUTOTEST.

Link and Channel probes detected?

It is necessary to enable ***Direct Attach*** in the **Test Options** to test a MPTL. WireXpert will detect mismatched adapters if option is not enabled.

User Manuals

For more information on installation and using eXport PC software, please refer to “Installation Guide for eXport PC software” and “User Manual for eXport PC software”.

User Manuals

For more information on how to save and export saved test results, please refer to “User Manual – Copper Certification Testing”

5 Declarations

EU Declaration of Conformity

softing

We

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declare under our sole responsibility that the products

Model / Description

WX4500-FA	/	**WireXpert cable certifier 2500 MHz**
WX500-CU	/	**WireXpert cable certifier 500 MHz**
WX_AD_VCL_MM1/MM2	/	**Multi mode fibre adapter**
WX_AD_EF_MM1/MM2	/	**Multi mode fibre adapter (encircled flux compliant)**
WX_AD_SM1/SM2	/	**Single mode fibre adapter**
WX_AD_MM_MPO_KIT/ SOURCE/PWRMETER	/	**Multi mode MPO adapters**

including associated accessories and cables supplied by Softing Singapore, comply with the requirements of the following directives:

EMC directive 2014/30/EU

Low Voltage Directive 2014/35/EU

RoHS directive 2011/65/EU

REACH Regulation (EC) 1907/2006 including tracking changes to the SVHC list published by ECHA on an ongoing basis. As of 21st February 2017, 173 SVHCs are listed.

Applied harmonised standards:

EN 55024 (2003-10) : Information technology equipment – Immunity characteristics – Limits and methods of measurement

EN 55022 (2008-05) : Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement

IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013 : Information technology equipment – Safety – Part 1 : General requirements

Simon Harrison
General Manager

21st February 2017
Date

Template version 2.1		Document No: 3000-0007

This device complies with the requirements of the EC directive 2004/108/EG "Electromagnetic Compatibility" (EMC directive). It meets the following requirements:

Note

A Declaration of Conformity in compliance with the above standards has been made and can be requested from Softing Singapore Pte Ltd.

China ROHS

The WireXpert device and its test components are China ROHS compliant.

WEEE

Electrical and electronic equipment must be disposed of separately from normal waste at the end of its operational lifetime.

Please dispose of this product according to the respective national regulations or contractual agreements. If there are any further questions concerning the disposal of this product, contact Softing IT Networks.

CAUTION

This is a Class A product. In a domestic environment this product may cause radio interference. In that case the user may be required to take adequate measures!

ROHS

The WireXpert device and its test components are ROHS compliant.

ETL Intertek Verified

WireXpert device is ETL verified to ANSI/TIA IIIe, IEC 61935-1 levels IIIe & IV and currently proposed Level V draft, with the applicable measurement accuracy.

Class 1 Laser Product

The light source transmitted from the following fiber test modules – Single Mode (SM), Multi-Mode (MM) and Encircled Flux compliant Multi-Mode (MMEF) are classified as Class 1 lasers and are very low risk and "safe under reasonably foreseeable use", including the use of optical instruments for intrabeam viewing.

Class 1m Laser Product

The light source transmitted from the following fiber test modules – MPO REMOTE are classified as Class 1m lasers and have wavelengths between 302.5 nm and 4000 nm and are safe except when used with optical aids.

6 Technical Support

Softing's global presence ensures our customers receives sales and technical support anywhere around the world. For more information: ***https://itnetworks.softing.com***

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