

# WireXpert

## *Cat 6A+ Adapters*

Version: WireXpert4500\_Copper\_CAT6APLUS\_IT\_EN\_201911

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# 1 Introduction

## 1.1 About product

Please ensure v8.1 and above firmware has been installed into WireXpert and workstation before proceeding further. Please refer to Installation Guide for detailed instructions on how to obtain and install eXport.

With the **CAT 6A+ Channel** adapters, besides testing all of the AUTOTEST parameters required for a channel link test, WireXpert will be able to measure direct current resistance unbalance or DCRU between and in pairs of twisted pair LAN cabling in accordance with TIA and IEC specifications. The enhanced shield integrity test help to determine if shielded cables are connected on the correct socket. The enhanced wire map test enables pre-defined crossovers cables to be tested.

This user guide will only contain information and instructions on how to use the Cat6A+ Channel and Permanent Link Adapters with WireXpert. Please refer to User Manual and Guides for WireXpert for device and PC software help respectively.

The Cat6A+ Channel and Permanent Link adapters are compatible with WireXpert 4500, WireXpert 500+ and WireXpert 500-CU.

## 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**

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

**DANGER**

**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
201907	Firmware update to v8.1
201911	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 <b>Start</b> → <b>Control Panel</b> → <b>Programs</b>
Buttons from the user interface are enclosed in brackets and set to bold typeface	Press <b>[Start]</b> 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 <i>C:\&lt;product name&gt;\delivery\software\Device Description files</i>

## 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/IEC 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 Scope of delivery

WireXpert Cat6A+ Channel test kit (WX\_AD\_6ACH\_PLUSKIT2) comprises the following parts:





CAT 6A+ Channel  
adapters  
(WX\_AD\_6ACH\_PLUS2)

CAT 6A RJ45-RJ45  
Reference Cord  
(WX\_AC\_6ACH\_CORD1)

WireXpert Cat6A+ Permanent Link test kit (WX\_AD\_6APL\_PLUSKIT2) comprises the following parts:



CAT 6A+ Channel  
adapters  
(WX\_AD\_6APL\_PLUS2)



CAT 6A TERA-TERA  
Reference Cords  
(WX\_AC\_6APL\_CORD1)



CAT 6A+ Permanent Link  
Calibration artefact  
(WX\_AC\_6A\_CORD\_CAL)



CAT 6A Permanent Link  
Test Cords  
(WX\_AC\_6ALCORD2)

## 1.7 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

The Direct Current (DC) resistance of twisted pair cabling has become an important parameter with the roll-out of high-power Power-over-Ethernet (PoE) applications up to 60 or 100W.

If the DC resistance of a cable is too high and/or the DC resistance between pairs or even within wires or a pair differs too much, the temperature of that pair or wire can increase above the allowed cable or connector specification. This DC resistance unbalance (DCRU) will cause the cabling to suffer from accelerated aging or damaging, as well as significant risk to lose data due to signal distortion.

ISO/IEC, TIA and Cenelec have defined testing of DCRU as an optional parameter that can be added to regular cable certification, in case the use of high power PoE is planned for a specific cabling installation.

When using the **CAT6A+** adapters, the general requirements such as maximum distance between links remains unchanged as per documented by the Standards.

### 3 Setting Reference

The **CAT 6A+ Channel and Permanent Link** adapters behaves differently from the regular CAT 6A Channel and Permanent Link adapters. The pair of CAT6A+ adapters can be paired together to perform a set reference if the WireXpert units are paired for the first time.

To set reference,

1. Connect the CAT 6A+ Channel or Permanent Link adapters to both LOCAL and REMOTE units.
2. Connect the 2 units together using the reference cord provided in the kit.
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



#### Note

WireXpert will prompt for calibration after completing set reference for the Permanent Link adapters. Press the **[BACK]** button to skip the calibration process and return to the Tools menu.

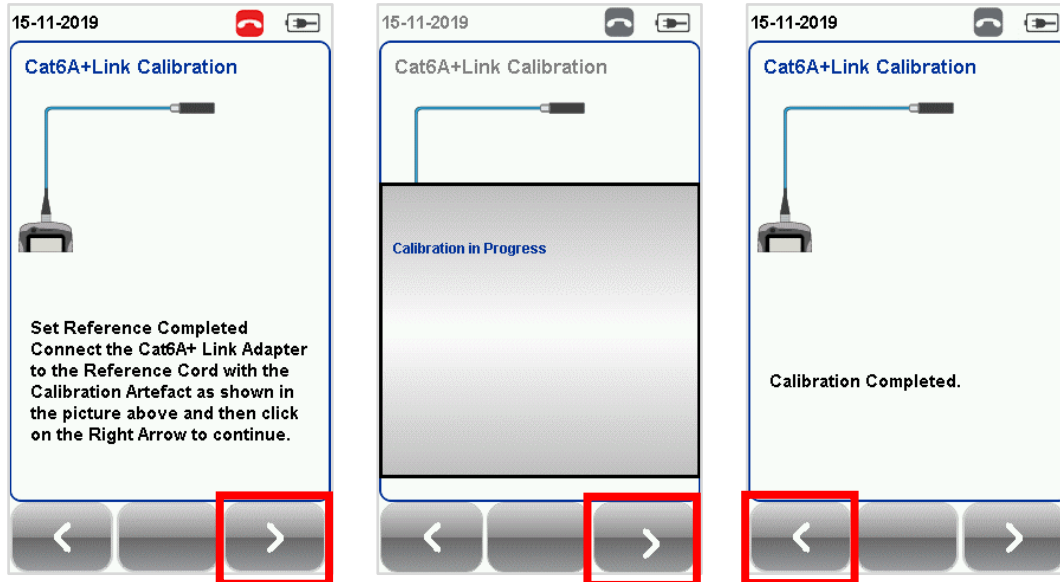
#### 3.1 Calibration for Permanent Link

To ensure accuracy for DCRU measurements in Permanent Links, Softing has included a calibration artefact in the test kit. Calibration is only required when the adapters are paired for the first time, or when DCRU measurements are inconsistent after multiple use.

1. To calibrate, Connect the Permanent Link adapters to both LOCAL and REMOTE units.
2. Press the **[TOOLS]** button → **Set Reference**
3. WireXpert will prompt for Calibration after completing a set reference.

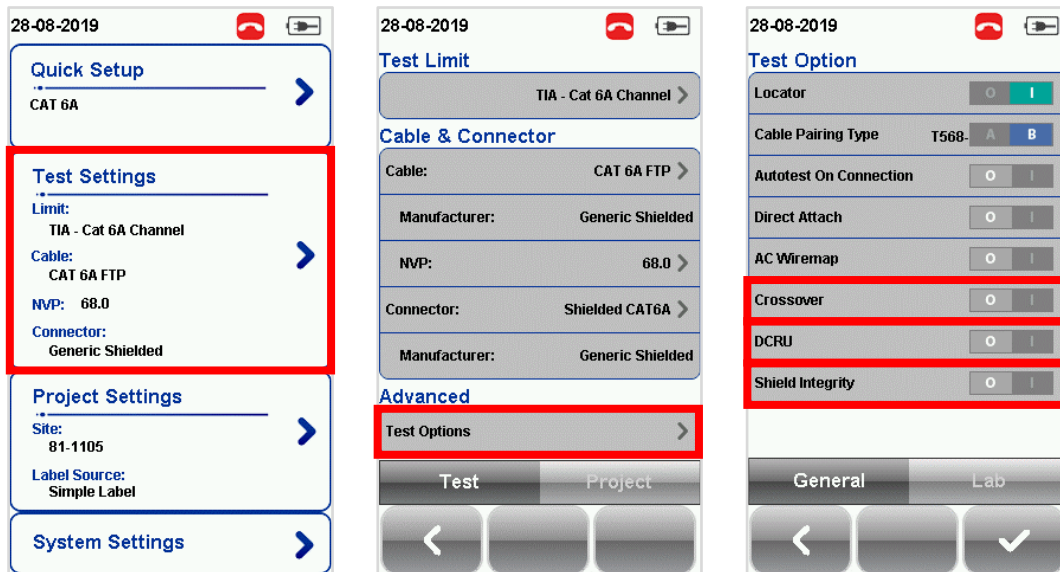
## Setting Reference

4. Connect the Permanent Link cords to each adapter after setting reference.
5. Connect the Calibration artefact to the cord on the LOCAL end and press the **[NEXT]** button to proceed.
6. Remove Calibration artefact from the LOCAL end.
7. Connect Calibration artefact to REMOTE end and press the **[NEXT]** button to proceed.
8. Press the **[BACK]** button to return to Tools menu or **[NEXT]** button to perform Calibration again.



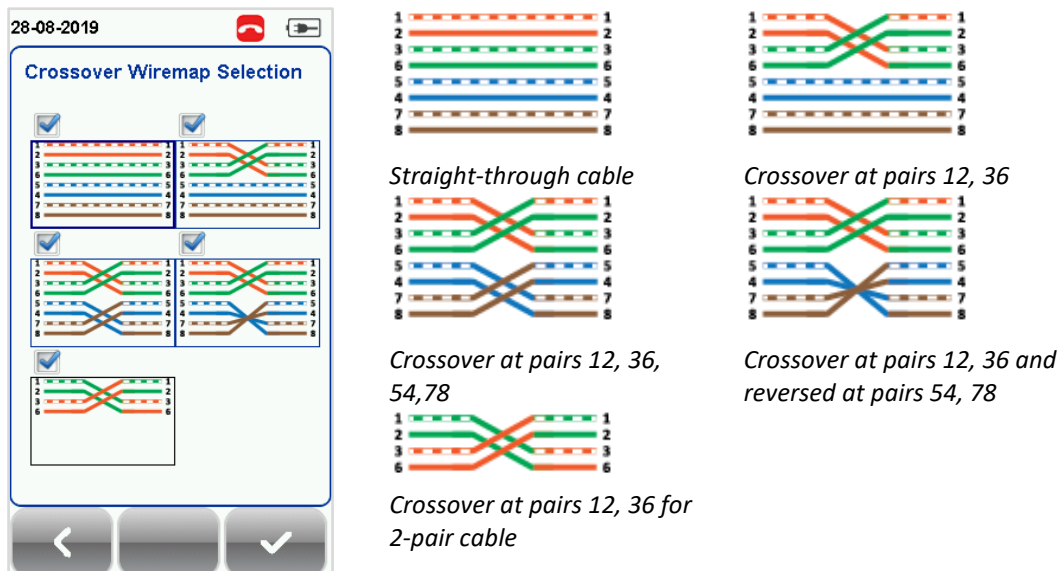
## 4 Configuring an AUTOTEST

### 4.1 Setting up WireXpert



#### 4.1.1 Crossover

1. Press the **[SETUP]** button → **Test Settings** → **Test Options** → **General**
2. Enable **Crossover** option to perform testing of a crossover cable.
3. Depending on the limit selected, select the crossover wiremap(s) that will be allowed during an AUTOTEST. At least one wiremap must be selected to proceed.



4. Click **[OK]** on Crossover Wiremap Selection screen to save selection.
5. Click **[OK]** on Test Option screen to save option.

**Note**

Crossover can only be selected by selecting a test limit from **Test Settings** → **Test Limit** → **Application Standards**. Disabled by default.

Crossover wiremap selections will only be available for the applicable limits as follows:

	<i>Straight-through cable</i>	<i>Crossover at pairs 12, 36</i>	<i>Crossover at pairs 12, 36, 54, 78</i>	<i>Crossover at pairs 12, 36 and reversed at pairs 54, 78</i>	<i>Crossover at pairs 12, 36 for 2-pair cable</i>
<b>1000BASE-T</b>	Yes	No	No	Yes	No
<b>1000BASE-TX</b>	Yes	No	Yes	No	No
<b>100BASE-TX</b>	Yes	Yes	Yes	Yes	Yes
<b>10BASE-T</b>	Yes	Yes	Yes	Yes	Yes

### 4.1.2 DCRU (Direct Current Resistance Unbalance)

The DCRU test allows to perform additional DC resistance unbalance measurements between and within each pair in accordance with TIA and IEC specifications, on top of the AUTOTEST parameters required in a Channel or Permanent Link.

1. Press the **[SETUP]** button → **Test Settings** → **Test Options** → **General**
2. Enable **DCRU** option to perform additional testing of DCRU Pair-to-Pair (P2P) and In-Pair.
3. Click **[OK]** on Test Option screen to save option

**Note**

DCRU option can only be selected when a **CAT6A+** adapter is used on WireXpert. Disabled by default.

### 4.1.3 Shield Test

The improved shield integrity test allows the instrument to differentiate between a shield being present and connected at both ends on the actual cable under test, as opposed to alternative electrical path between the shield pins of the WireXpert units.

1. Press the **[SETUP]** button → **Test Settings** → **Test Options** → **General**
2. Enable **Shield Test** option to perform shield integrity test during an AUTOTEST.
3. Click **[OK]** on Test Option screen to save option

**Note**

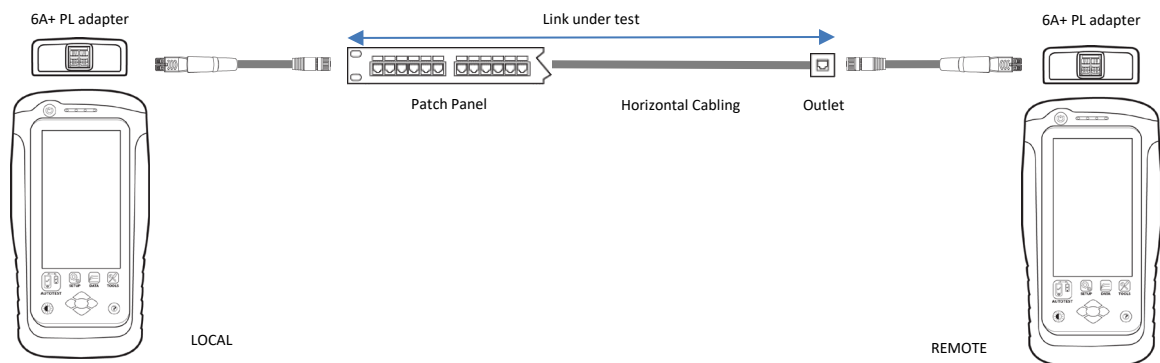
Shield Test option can only be selected when a **CAT6A+** adapter is used on WireXpert. Disabled by default.

Option will be disabled when the AC Wiremap option is enabled.

## 4.2 Testing Guide for Permanent Link Testing

Permanent Link (PL) test is comprised of the connection from a patch panel to a telecommunication outlet (horizontal cabling) using Permanent Link test adapters at each end of the link under test.

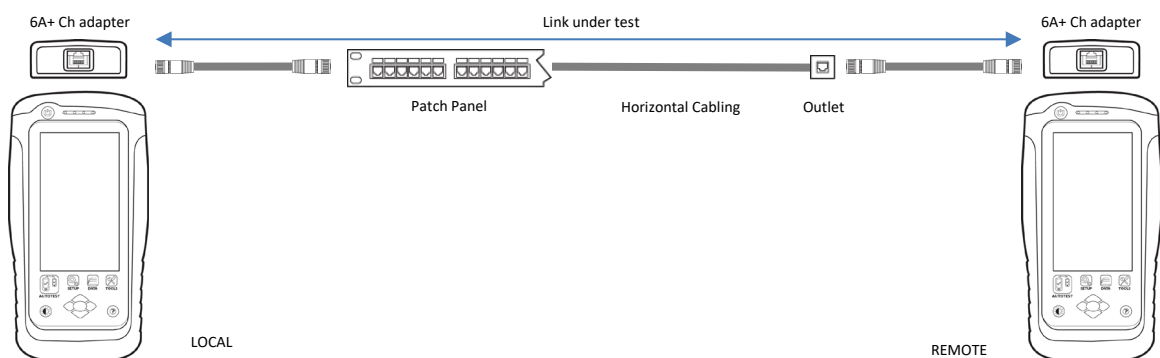
1. Insert the Permanent Link adapters into the LOCAL and REMOTE units of the WireXpert.
2. Power ON WireXpert. Check that WireXpert is in Copper testing mode.
3. Set reference is required if the units are being paired for the first time.
4. Choose the Permanent Link limits and configure other settings if necessary.
5. Connect the LOCAL unit to the patch panel and REMOTE unit to the outlet using the patch cord provided.
6. Press the **[AUTOTEST]** button to begin AUTOTEST.



### 4.3 Testing Guide for Channel Testing

Channel (Ch) test is comprised of the connection from an active device (eg. Router) in a data rack, a telecommunication outlet (horizontal cabling) and the connecting patch cords at both ends using Channel test adapters at each end of the link under test. The recommended length for the patch cord from the patch panel and the outlet is 5m.

1. Insert the **CAT6 A+ Channel** adapters onto the LOCAL and REMOTE units of the WireXpert.
2. Power ON WireXpert. Check that WireXpert is in Copper testing mode.
3. Set reference is required if the units are being paired for the first time. Refer to Chapter 2 on how to set reference.
4. Choose the Channel limits and configure other settings if necessary.
5. Connect the LOCAL unit to the patch panel and REMOTE unit to the outlet using the patch cord connected to be used.
6. Press the **[AUTOTEST]** button to begin AUTOTEST.





### **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”.



### **Note**

Depending on the number additional options that are enabled, WireXpert may take a slightly longer time to perform accurate measurements of the parameters.



## 5 Performing an AUTOTEST

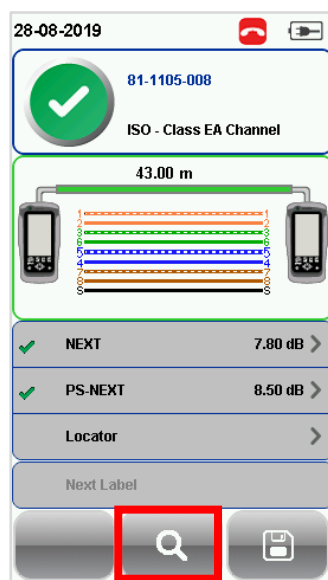
### 5.1 Understanding AUTOTEST

Press the **[AUTOTEST]** button once settings and limits have been selected. WireXpert will use the last configuration or factory settings to perform the AUTOTEST if new settings are not configured.

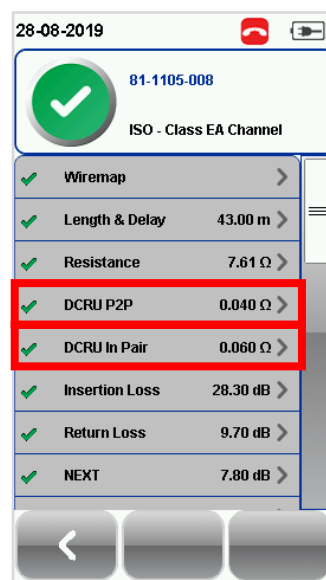
WireXpert will display summarized result with PASS or FAIL once AUTOTEST is completed. Press the **[View]** details button to view the comprehensive result or the **[Save]** button to save the results.



*AUTOTEST in progress*

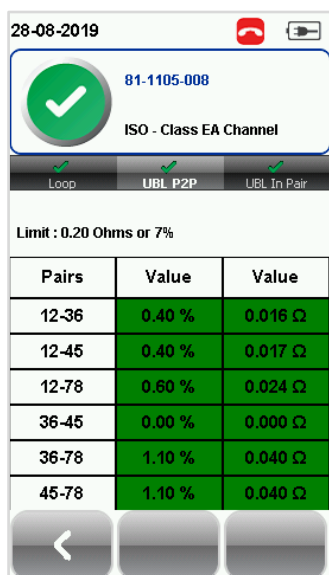


*AUTOTEST complete*

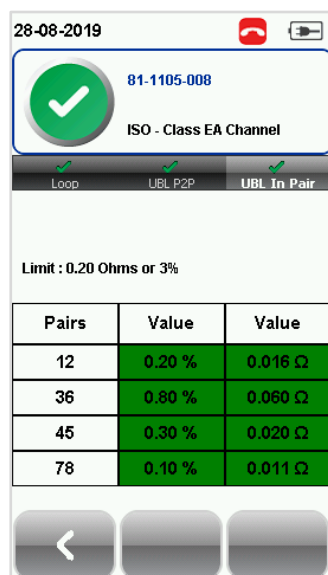


*[View] results with DCRU parameters.*

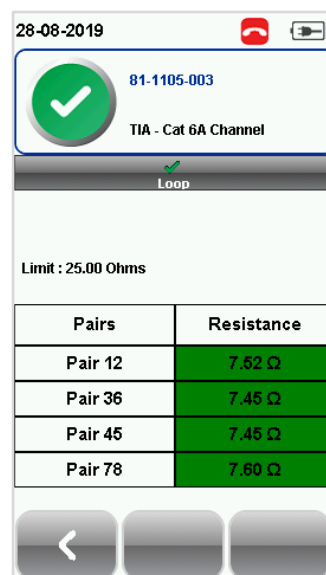
If the DCRU option is enabled, two additional parameters – **DCRU P2P** and **DCRU in Pair** – will be listed in the summary results list. Select the additional options to view the detailed result of the parameter.



*DCRU Pair-to-Pair*



*DCRU In-Pair*



*If DCRU option is disabled, the Unbalance (UBL) P2P and In-Pair tabs will not be available.*



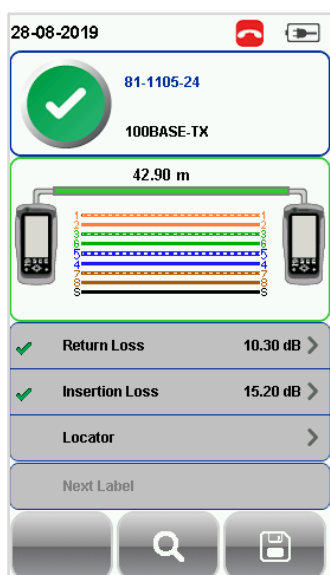
### Note

DCRU test parameters are only applicable to certain Test Limits as per standards. When DCRU is selected but not applicable to the selected test limits, WireXpert will mark the result with an “i” instead of a “PASS” or “FAIL” to symbolize “For Information Only”. Any values marked with “i” will not influence the test results.

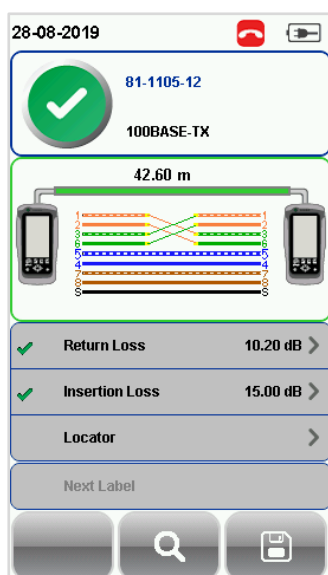
DCRU parameters are applicable to the following Test Limits in WireXpert:

Standard	Test Limit	In-Pair	Pair-to-Pair
AS-NZ 3080	All Classes Channel	Yes	No
	All Classes Permanent Link	Yes	No
Cenelec EN	All Classes Channel	Yes	Yes
	All Classes Permanent Link	Yes	Yes
End-to-End	All Classes	Yes	No
ISO	All Classes Channel, except DTR11801, TR11801-9901, TR24750	Yes	Yes
	All Classes Permanent Link except TR24750	Yes	Yes
Japan / JIS	All Classes Channel	Yes	Yes
	All Classes Permanent Link	Yes	Yes
TIA	All Categories Channel, including TIA-1005 except TSB-155	Yes	No
	All Category 8 Channel and Permanent Link	Yes	Yes

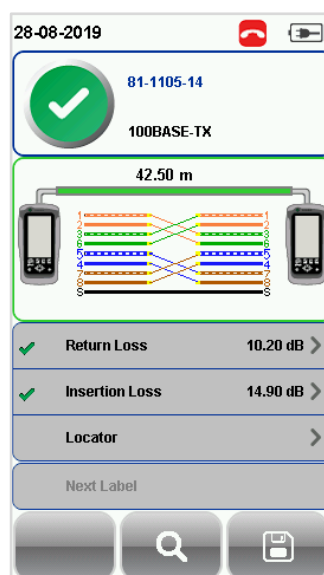
If the Crossover option is enabled, depending on the template(s) selected, the following wiremap(s) will pass an AUTOTEST when the selected crossover cable is used.



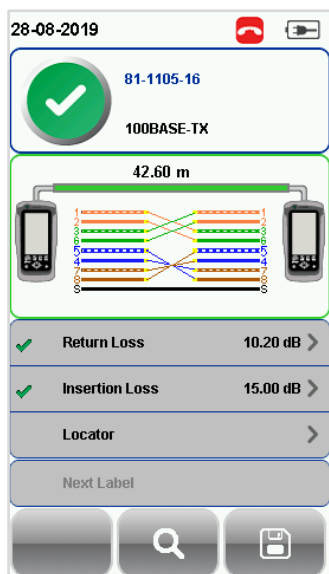
*AUTOTEST Passed with “Straight-through cable” selected.*



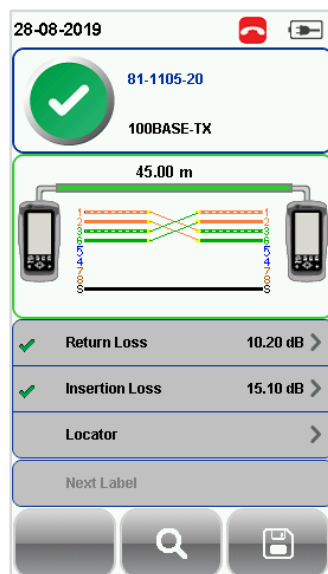
*AUTOTEST Passed with “Crossover at pairs 12, 36” selected.*



*AUTOTEST Passed with “Crossover at pairs 12, 36, 54, 78” selected.*



AUTOTEST Passed with  
"Crossover at pairs 12, 36 and  
reversed at pairs 54, 78"  
selected.



AUTOTEST Passed with  
"Crossover at pairs 12, 36 for  
2-pair cable" selected.

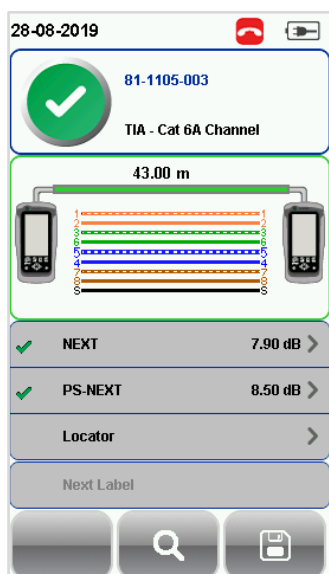


#### Note

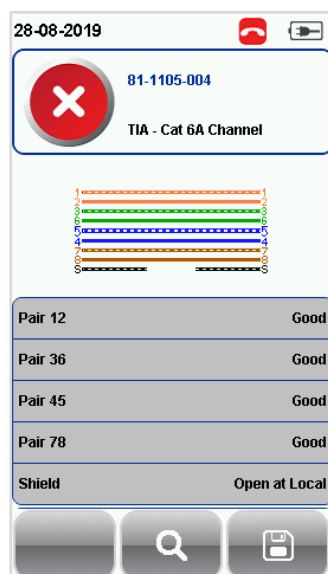
Select **Two-pair shielded** from **Test Settings** → **Cable** → **Generic Shielded** when performing test with a two-pair shielded cable.

If the Shield Test option is enabled, WireXpert will "PASS" if shield is present, and "FAIL" an AUTOTEST if;Shield is open at either or both ends of the Channel.

1. Unshielded cables are used in the Link and/or patch cords under test.
2. Unshielded connectors are used.



AUTOTEST Passed with "Shield  
Test" enabled



AUTOTEST Failed with "Shield  
Test" enabled

WireXpert will not continue with the AUTOTEST process if a shield integrity test FAIL is detected.

## 6 Managing test result(s)

eXport is a data management software designed to work seamlessly with WireXpert. Saved results can be imported to eXport PC software using USB flash drive, USB cable or eXport Cloud.



### 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”

### 6.1 Viewing results on eXport PC software

1. Launch eXport PC software and create a new project.
2. Import saved results by selecting **Import → Device/USB Flash Drive/PC**
3. Select a result on the results panel.
4. If DCRU option is enabled for an AUTOTEST, the “DCRU in Pair” and “DCRU P2P” parameters will be listed in the overall result in the summary panel.

Overall Result	
Measurement	Value/Margin
Length (m)	43
Delay (ns)	214.0
Cable NVP (%)	68.0
DC Loop Resistance (Ohms)	7.60
DCRU IP (Ohms)	0.060
DCRU P2P (Ohms)	0.040
Insertion Loss (dB)	20.9
Return Loss (dB)	9.7
NEXT (dB)	7.8
PS-NEXT (dB)	8.5
ACR-F (dB)	10.9
PS-ACRF (dB)	11.2
ACR-N (dB)	15.9
PS-ACRN (dB)	17.5

*DCRU option is enabled for an AUTOTEST.*

Overall Result	
Measurement	Value/Margin
Length (m)	43
Delay (ns)	214.0
Cable NVP (%)	68.0
DC Loop Resistance (Ohms)	7.60
DCRU IP (Ohms)	-
DCRU P2P (Ohms)	-
Insertion Loss (dB)	20.9
Return Loss (dB)	9.7
NEXT (dB)	7.9
PS-NEXT (dB)	8.4
ACR-F (dB)	10.1
PS-ACRF (dB)	10.2
ACR-N (dB)	15.8
PS-ACRN (dB)	17.5

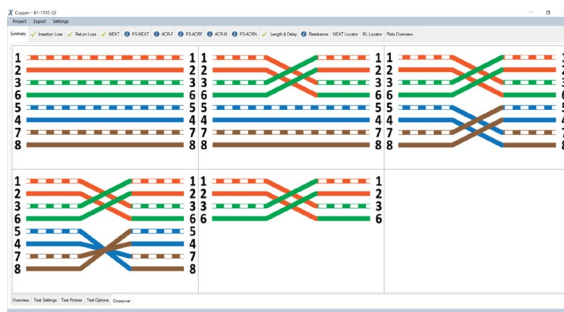
*If DCRU option is disabled, the Unbalance P2P and In-Pair parameters will not be available.*

5. Double-click on the result.
6. If DCRU option is enabled for an AUTOTEST, the parameters will be listed in the “Resistance” tab.

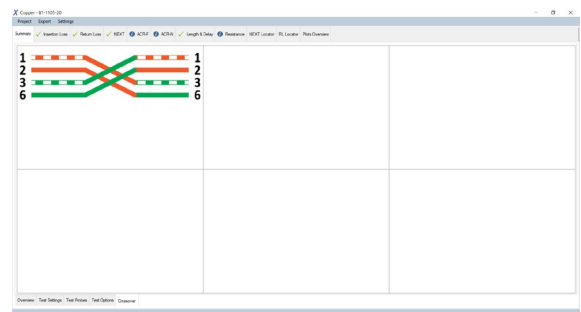
*DCRU option is enabled for an AUTOTEST.*

*If DCRU option is disabled, the Unbalance P2P and In-Pair parameters will not be available.*

7. If Crossover option(s) is enabled for an AUTOTEST, the selected crossover wiremap(s) will be displayed on the “Crossover” tab. The “Crossover” tab will not be available if option is disabled.



*“Crossover” tab with all Crossover wiremap options selected for an AUTOTEST.*



*“Crossover” tab with only 1 option selected for an AUTOTEST.*

## 6.2 Viewing results on PDF report

1. Select and export result(s) by select **Export** → **PDF** → **Detail**
2. If DCRU option is enabled during an AUTOTEST, the parameters will be listed in the Wiremap test block in the report.

	Value	Limit	Margin
Length (m):	43.0	-	-
Cable NVP:	68.0	-	-
Propagation Delay (ns):	214.0	555.0	341.0
Delay Skew (ns):	3.0	50.0	47.0
DC Loop Resistance (Ohms):	7.61	25.00	17.39
Resistance Unbalance In Pair (Ohms):	0.060	0.200	0.140
Resistance Unbalance In Pair (%):	0.8	3.0	2.2
Resistance Unbalance Pair To Pair (Ohms):	0.040	0.200	0.160
Resistance Unbalance Pair To Pair (%):	1.1	7.0	5.9

*PDF Test report indicating DCRU parameters.*

	Value	Limit	Margin
Length (m):	43.0	-	-
Cable NVP:	68.0	-	-
Propagation Delay (ns):	214.0	555.0	341.0
Delay Skew (ns):	3.0	50.0	47.0
DC Loop Resistance (Ohms):	7.62	25.00	17.38

*PDF Test report without DCRU parameters.*

## 7 Declarations

### EU Declaration of Conformity



We

Softing Singapore Pte. Ltd.  
3 Science Park Drive  
#03-09, The Franklin  
Singapore Science Park 1  
Singapore 118223

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 21<sup>st</sup> 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

21<sup>st</sup> February 2017

Date

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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.



Intertek

**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.



## 8 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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