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# LinkXpert Manual English



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Version 1.10.22

## LinkXpert Manual English

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## 1 Disclaimer

The information contained in these instructions corresponds to the technical status at the time of publication of this document and is passed on to the best of our knowledge. The information in these instructions is in no way the basis for warranty claims or contractual agreements concerning the products described and, in particular, cannot be regarded as a guarantee of quality and durability. We reserve the right to make changes or improvements to this manual without prior notice. The actual design of the products may deviate from the information contained in the manual if technical changes and product improvements make this necessary.

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## 3 Safety instructions and cleaning

### Safety instructions



**To prevent fire, electric shock, injury or damage to the equipment:**

1. Use the device only within the device specifications, See [specifications](#)<sup>[10]</sup>
2. Use only compatible chargers approved by Softing.
3. Never connect the device to live wiring of more than 60VAC or 60VDC or devices with voltages greater than 60VAC or 60VDC.
4. Do not open the case. You cannot repair or replace any parts inside the enclosure.
5. **Opening the housing will void the warranty!**
6. This device is not intended to be used in residential areas and cannot ensure adequate protection of radio reception in such environments.
7. If you replace parts that are not specified as spare parts, the warranty for the product is voided and the product can no longer be used safely!
8. Contact only service centers authorized by Softing. See [Service and Support](#)<sup>[53]</sup>



1. Red light source (M3)  
Never look directly into the red light source with the naked eye, as this may cause permanent, non-healable injuries to the eye.
2. SFP modules and fiber optic cables (M3)  
Never look directly into SFP modules or at open fiber optic cables with the naked eye, as you must always assume that light in the non-visible wavelength range can escape. This light can cause permanent, non-healable injuries in the eye and in the worst case can lead to permanent loss of eyesight.



The crossed-out trash can means that you are required by law to take this equipment to a separate collection from unsorted municipal waste. Disposal via the residual waste garbage can or the yellow garbage can is prohibited. If the products contain batteries or rechargeable batteries that are not permanently installed, these must be removed before disposal and disposed of separately as batteries.

### Cleaning

1. Device cleaning:  
Switch off the device before cleaning and disconnect it from the power supply if necessary.  
Use only dry, lint-free and antistatic cloths to clean the device and the screen.  
When cleaning the screen, avoid scratching the screen with cleaning cloths that are too rough or dirty.
2. Red light source, SFP modules and fiber optic test cable (M3):  
When cleaning fiber optic connectors and fiber optic ferrules, use only Softing-approved dry cleaning agents

## 4 Introduction

This manual describes the functions of the LinkXpert series test equipment.

Please note that the presence of a function depends on the respective model.

Functions or topics that only concern LinkXpert TP are marked **TP**.

Functions or topics that only affect LinkXpert M3 are marked **M3**.

### 4.1 About LinkXpert

Les appareils LinkXpert sont utilisés pour la mise en service et le dépannage de réseaux et d'appareils Ethernet.

Le LinkXpert TP (**TP**) est spécialement conçu pour les réseaux basés sur le câblage en cuivre.

Le LinkXpert M3 (**M3**) supporte non seulement le cuivre mais aussi les réseaux à fibre optique et WLAN.

Les fonctions de test suivantes sont disponibles à cet effet :

Function	Copper	Fiber optics	WLAN
<b>Physical tests</b>			
Wiring test	<b>TP</b> <b>M3</b>	n/a	n/a
Length test	<b>TP</b> <b>M3</b>	n/a	n/a
Tone generator (compatible with e.g.: CP15)	<b>TP</b> <b>M3</b>	n/a	n/a
Red light source (625nm)		<b>M3</b>	
Video microscopy according to IEC 61300-3-35 (requires separate video microscope)		<b>M3</b>	
<b>Network tests</b>			
Network detection and connection (link) See also: <a href="#">Test interface selection (M3)</a>	<b>TP</b> 1Gbit/s, <b>M3</b> 10Gbit/s detection	<b>M3</b> 1Gbit/s	<b>M3</b> 803.11ac
DHCP	<b>TP</b> <b>M3</b>	<b>M3</b>	<b>M3</b>
PoE++ up to 90W	<b>TP</b> <b>M3</b>	n/a	n/a
LLDP	<b>TP</b> <b>M3</b>	<b>M3</b>	<b>M3</b>
CDP	<b>TP</b> <b>M3</b>	<b>M3</b>	<b>M3</b>
List of network participants	<b>TP</b> <b>M3</b>	<b>M3</b>	<b>M3</b>
Scanner for duplicate IP addresses	<b>TP</b> <b>M3</b>	<b>M3</b>	<b>M3</b>
Access Point Scanner			<b>M3</b>
801.x support	<b>M3</b>	<b>M3</b>	<b>M3</b>



Adjustable MAC address **M3** **M3** **M3**

## 4.2 Connections and controls



### Element Function

t

- |   |   |
|---|---|
| 1 | On / Off switch for flashlight (7)<br>LED shows connection status of Ethernet interface(s)<br>Short press turns on the device or wakes up the device from stand-by mode<br>Long press < 5sec turns off the device<br>Long press > 10sec restarts the device |
| 2 | USB 2.0 interface   |
| 3 | DC power supply   |
| 4 | Touch-sensitive screen ( touchscreen )  |
| 5 | On / Off switch of the device<br>When the device is switched on in standby mode, the button switches the screen on again<br>LED indicates operating status<br>Green: On<br>Green flashing: Battery charging<br>Red: Battery almost empty                    |
| 6 | Slot for SFP module, <b>M3</b> only   |
| 7 | White light LED ( flashlight)   |
| 8 | Red-light class I laser (625nm) with 2.5mm ferrule , <b>M3</b> only   |
| 9 | RJ45 connector for cable and network testing  |



## 4.3 Selection of the test interface (M3)

LinkXpert M3 can be connected to copper, fiber and WLAN networks.

- To connect the device to fiber optic networks you need optional SFP modules.  
See also [specifications](#) <sup>10</sup>
- To connect the device to WLAN networks, you need the included USB WLAN adapter.



### Please note

1. If an SFP module is plugged in, the SFP port has priority over the copper port, i.e. the device will not connect to copper networks via Ethernet.  
To test copper networks, the SFP module must be removed.
2. The device can be permanently connected to WLAN networks without any interference.

Copper and fiber optic networks can also be tested with an existing WLAN connection.

- The WLAN interface is always active when the WLAN module is plugged in. To deactivate the WLAN interface, the USB WLAN module must be removed.

## 4.4 Specifications

Parameter	Specification
Screen	5 1/4" TFT screen, touch sensitive
Dimensions	160x93x33 mm
Weight	400 g (incl. internal battery)
Rechargeable battery	7.2V Li-Ion 3,12 Ah , internal, not changeable
Power supply (device)	12V DC , 2.5A, round plug, positive pole inside
External power supply	AC 100-240 V / DC 12 V, 3 A , EURO, UK and US plug
Overvoltage protection	60VDC, 55VAC
Operating temperature	-10 to 50°C
Storage temperature	-20 to 60°C
Humidity	10% to 80%, non-condensing
Copper cabling	Twisted pair, RJ45 connector Coax F (with optional adapter) Connecting cables for further plug faces like M12D, M12X and IX as optional accessories
Ethernet	10MBit/s, 100MBit/s, 1000MBit/s 10000Mbit/s (only detection with copper cables) (M3)
PoE	IEEE 802.3af, IEEE 802.3at up to class 8, 90W
Tone generator	Built-in, configurable for TP and coax cabling
Flashlight	White light LED, integrated
Fiber optic cabling (M3)	via SFP module, multimode and singlemode, LC connector
Fiber optic microscope (M3)	IEC 61300-3-35
Red light laser (M3)	625nm, Class I, < 1mW
SFP bay ((M3)	Multimode and singlemode SFP modules up to 1Gbit/s
WiFi (M3)	IEEE 802.11.ac (with external USB stick)

## 4.5 Battery Charging

The LED (5) , see [Unit Connections](#) , indicates the current charging status of the unit.

### LED colour

Dark

### Charging status

Unit off, battery not charging (even if charger is connected)

Green  
Green, flashing  
Red, flashing

Unit on, battery is not charging  
Battery is being charged  
Unit on, battery capacity <15%, battery not charging



**Please note**

1. Only use compatible chargers approved by Softing.
2. The unit must be switched on for the charging process to begin.  
After switching off the unit, the battery continues to be charged until the battery is fully charged.
3. After switching on the unit, the battery charge status is only displayed correctly after a few seconds.
4. See also [Changing the battery](#) <sup>11</sup>

## 4.6 Battery change

---



The internal battery cannot be replaced on site.  
Please send the device to an authorized Softing [service center](#) <sup>53</sup> to replace the battery.

## 5 Operation

See also [Connectors and Controls](#)<sup>[9]</sup> and [Selecting the Test Interface \(M3\)](#)<sup>[9]</sup>.

The user interface of the LinkXpert series is operated exclusively via the touch-sensitive screen (touchscreen).

The home screen is the central element of the user interface.

### 5.1 Operating concept

---

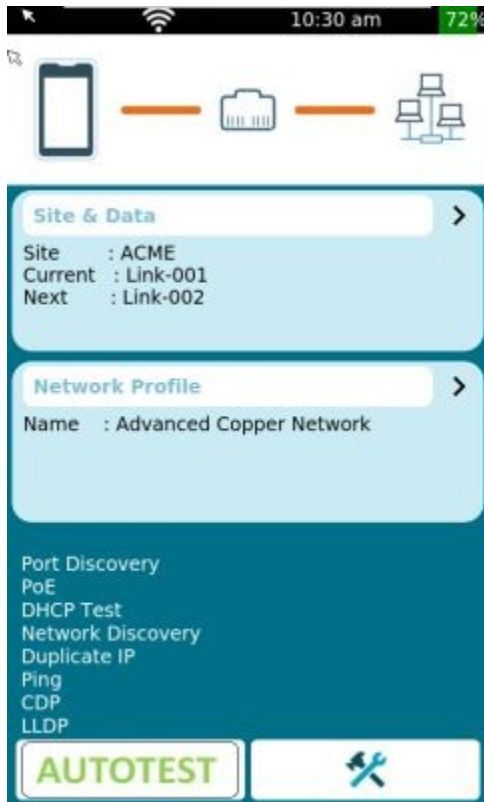
LinkXpert supports 2 basic approaches for testing Ethernet networks and cabling:

1. [Autotest](#)<sup>[25]</sup>
2. Individual tests under [Tools](#)<sup>[27]</sup>

Autotests are especially useful if the same test sequence is to be repeated often, e.g. for acceptance tests of a new network.

Single tests are particularly useful when errors are to be found in a network or when only one specific parameter is to be checked on a port, e.g. whether PoE class 8 is supported on port xy or whether the end face of a fiber optic connector is clean. (M3)

## 5.2 Home screen



1	2
<b>Function keys</b>	

The Home screen contains all information about the most important settings of the device

- Clicking on the black bar leads directly to the system settings of the device.
- The Link LED (See [Device Connections](#)) shows the Ethernet connection status for copper and fiber connections (M3)
- The status bar shows the Ethernet connection status in general and the connection status to WLAN (M3)

### • SITE

Clicking on "Site" shows the list of tests in the current directory and allows to create a new "Site" and switch between "Sites".

### • PROFILE

- Clicking PROFILE opens the "Profile" menu to change or create new profiles.

Function keys:

1. performs an automatic test based on the selected profile.
2. calls up the "Tools" menu in which individual tests can be performed and system settings can be called up.

## 5.3 SITE

**SITE** are directories in which tests are stored.

For example, you can create a project, a customer or an individual building as **SITE**.

Please also read [Naming and counting scheme](#)



The table contains all tests included in this SITE .  
 Note: If a new SITE is created, only an empty table is shown as the table must first be filled with measurements!

Function keys:

1. Back to main screen
2. Call up list of existing SITE and manage SITE
3. Create reports, see also [Reports](#) <sup>19</sup>

1	2	3
<b>Function keys</b>		

## 5.3.1 Manage a SITE



The table contains all "Sites" stored on the device.

Note: At delivery state the device contains a "Site" default---.tst

Function keys:

1. Return to main screen
2. Create new "Site
3. Edit selected site
4. Delete selected site
5. Use selected "Site

1	2	3	4	5
<b>Function keys</b>				



1. Once deleted, "Sites" cannot be restored. All tests stored in them are irrevocably deleted!
2. Note that when renaming files, the file extension must NOT be changed, otherwise the changed file will NOT be listed any more, as the file filters will hide this file.
3. Just used "sites" cannot be deleted

### 5.3.2 Create a new SITE



1	2	3	4	5
Function keys				

From the start screen, call up [Sites](#)<sup>13</sup> and go to [Manage Sites](#)<sup>15</sup>

Click on function key (2) to create a new "Site".





Select a profile to use.  
See also [Profiles](#) <sup>23</sup>

Note: You can use multiple profiles in one "site".

Click on function key (2) to continue.

1	2
<b>Function keys</b>	

sites 10:09 am 77%

New Site

W

Simple Cable Label

Free Form

None

Select the naming and counting scheme to be used for storing tests.

See also [Profiles](#) <sup>23</sup>

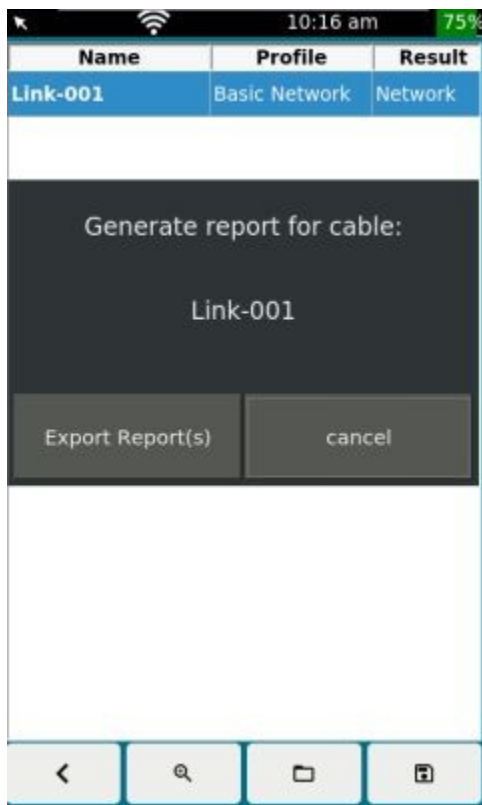
Note: the naming and counting scheme cannot be changed later.

Click on function key (2) to continue.

For the further procedure please go to [Naming and counting scheme](#) <sup>19</sup>

Back	Next
1	2
Function keys	


## 5.4 Reports




Reports in PDF, XML or CSV format can be created directly on the device.

The reports are created via the menu SITE. see also SITE. Go to the menu SITE and select a site.



Then click  to create a report LinkXpert summarizes all tests in the SITE in this report.

The tests are stored in the internal memory. Go to [Copy files to USB to](#) 

Function keys:

1. Return to home screen
2. Open the list of SITE.
3. Goto Report Menu

1	2	3
<b>Function keys</b>		

## 5.5 Naming and counting scheme

See also [Rebuild Sites](#) .



Back	Next
1	2
<b>Function keys</b>	

LinkXpert has several methods to save tests.

- **Simple Cable Label**

All autotests are stored with the prefix "Link-" and an ascending number.

E.g:

Link-001

Link-002

Link-003

- **Free Form**

All autotests are stored with a freely selectable prefix of the test name and an ascending number.

E.g:

Office-001

office-002

Office-003

- **<%None%> "**

Before each test, the user can freely assign a name for an auto test. The test is then saved with this name and an ascending number.

The ascending number is used here to safely distinguish test data.

e.g:

"Office A-001"

"Room 3-002"

"Corridor B-003"

"Office A-004"

Function keys:

1. Back one menu level higher
2. Further configure selected counting form

### 5.5.1 Simple Cable Label

In this setting, a name of a test consists of 3 components:

Link - <Fixed counter with 3 digits>.

All tests are saved according to the following pattern.

Link-001

Link-002

Link-003

Link-004

etc.

## 5.5.2 Free Form

Sites 09:58 am 79%

New Site

Review

Site Name: ACME2

Profile: Copper Cable

Labels: Simple Label

Back Next

In this counting scheme, a fixed component of the name can be selected, followed by a "-" and a 3-digit consecutive counter.

Enter the fixed part of the name in the first field.  
In the 2nd field, enter the first variable component.

Example:  
Dose-001  
Dose-002  
Dose-003  
Dose-004

1	2
Funktionstasten	



im folgenden Bildschirm werden die gewählten Einstellungen nochmals gezeigt.

Funktionstasten:

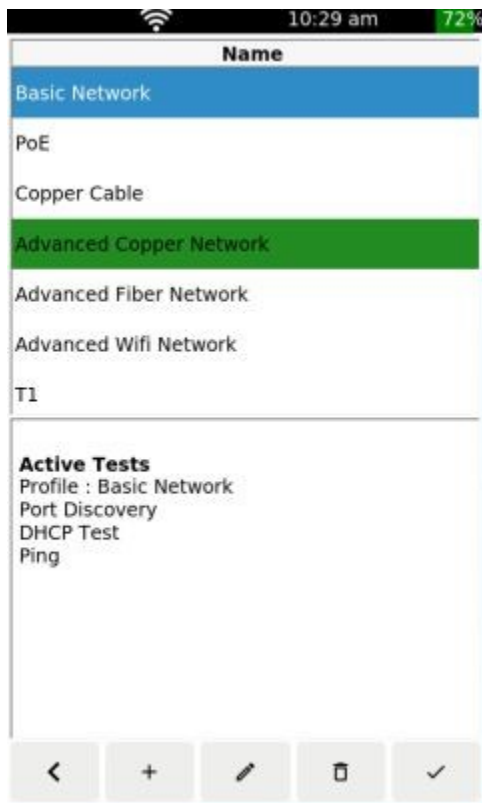
1. Zurück eine Menu-Stufe höher
2. Ausgewählte Einstellungen verwenden

1	2
<b>Funktionstasten</b>	

### 5.5.3 None

In this mode, no counting scheme is specified. The tester requests a name for the current test series before each jump to the Autotest menu.

## 5.6 Profiles



1	2	3	4	5
<b>Function keys</b>				

The upper area of the screen shows the available profiles. The device is equipped with some default profiles ex works. The lower area of the screen shows the most important settings and parameters of the selected profile

Function keys:

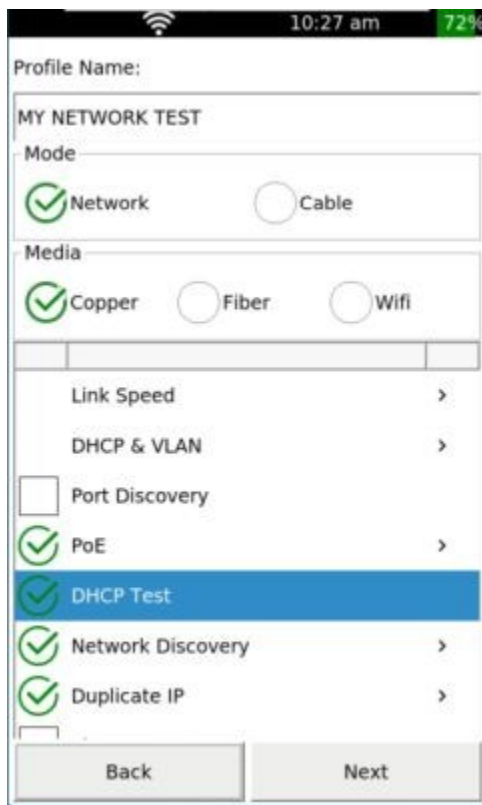
1. return to the Home screen.
2. create another profile.
3. edit a profile.
4. delete a profile
5. activate a selected profile

Remark:

You can only edit or delete profiles as long as no autotest has been performed with this profile.

As soon as an autotest has been performed, the associated profile is locked.

## 5.6.1 Create new profile




- Enter the desired name of the new profile at "Profile Name", e.g. "MY NETWORK TEST".
- At "Mode" , select whether you want to create a profile for a network test or a cabling test.
- Select the desired interface at "Media".

Note: For LinkXpert TP only the copper interface is available.

In the lower part of the screen you can select and deselect certain tests.

Please note, the selection option depends on the mode and media.

- With  you can make further settings of the respective test parameter.

See also [Individual tests](#) <sup>39</sup>

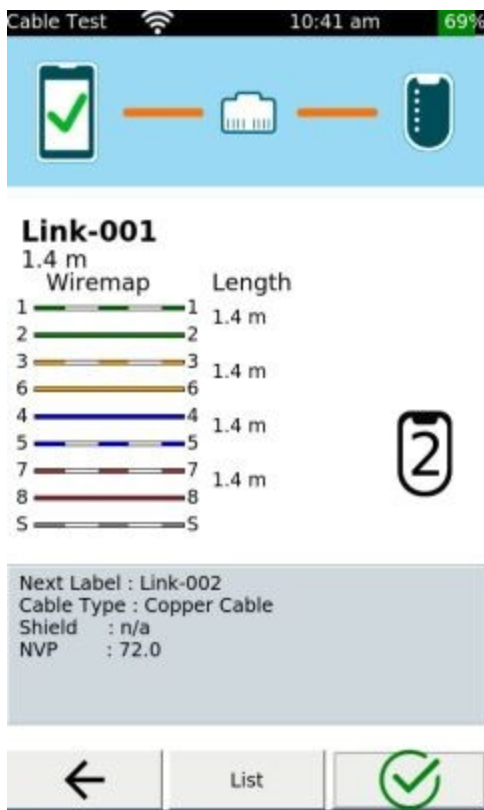
Function keys:

1. Back to main screen
2. Next

1	2
<b>Function keys</b>	



## 5.7 Autotest - passive wiring



In the wiring test module, the device displays the wiring diagram with lengths.

Function keys:

1. Return to main screen
2. List of tests in this SITE.
3. Run this test again under the same test name. The existing results will be discarded.
4. Perform a new test with a new test name.

1	2	3	4
<b>Function keys</b>			

## 5.8 Autotest - Ethernet Tests



1	2	3	4
<b>Function keys</b>			

Autotests in network mode list all tests of the linked [profile](#)<sup>23</sup>

The listed single tests are executed one after the other. The test time of an autotest depends strongly on the individual tests and can take up to several minutes. Do not disconnect from the network during the test so that the final result of the test is not affected.

Tests are automatically saved at the end of the autotest. By clicking on a single test, the results of a single test are listed.

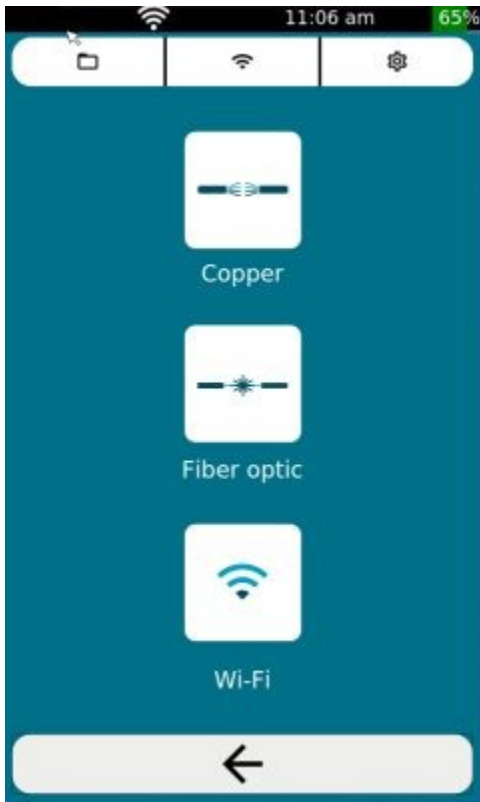
Function keys:

1. Back to the main screen
2. List of tests in this SITE.
3. Run this test again under the same test name. The existing results will be discarded.
4. Perform a new test with a new test name.

See also [Selecting the test interface \(M3\)](#)<sup>9</sup>

See also [Individual tests](#)<sup>39</sup>

## 5.9 Tools






The Tools menu is divided into 2 sections.

In the upper area of the screen, you will find the file manager and global WLAN and system settings.

See also [WLAN global configuration](#)<sup>[29]</sup> and system [settings](#)<sup>[32]</sup>

In the lower area you can start single tests for copper networks, and for LinkXpert M3 fiber and WLAN networks.

- Click on  to access the individual tests for copper networks.
- Click on  to enter the single tests for fiber optic networks. M3
- Click on  to access the individual tests for WLAN user networks. M3

See also [individual tests](#)<sup>[39]</sup> for more details

### 5.9.1 File manager without USB memory connected



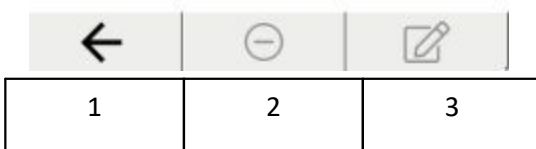
In the file manager you can filter by different file formats, delete or rename files.

The following filters are available.

- TST: compresses measurement results
- PDF: Test reports in PDF format
- CSV: test reports in CSV format
- XML: test reports in XML format

Function keys:

1. Back one menu level higher
2. Delete selected file
3. Rename selected file



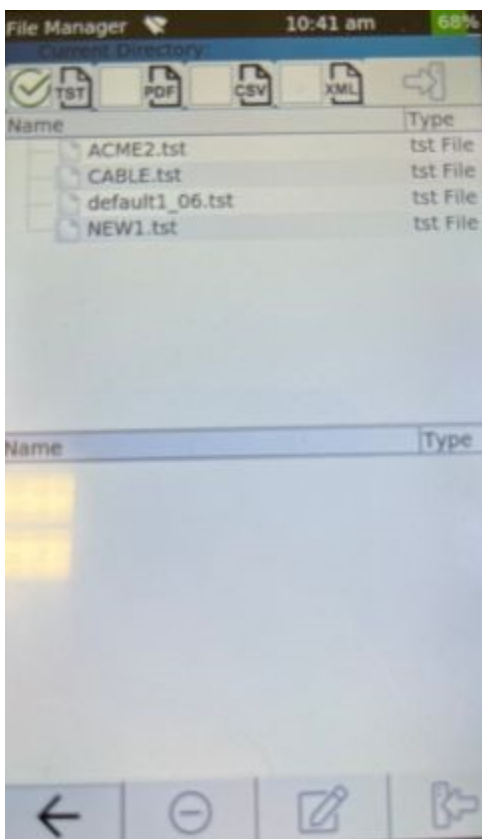
**Function keys**



1. Once deleted, files cannot be restored.
1. Note that when renaming files, the file extension must NOT be changed, otherwise the changed file will NOT be listed any more, as the file filters will hide this file.en.

### 5.9.2 Generate reports and copy to USB

As soon as a connected USB memory is detected, the file manager shows 2 file areas. The upper area shows the internal memory of the LinkXpert. The lower area shows the contents of the external USB memory.




In the file manager you can filter for different file formats, delete or rename files.

The following filters are available.

- TST: compresses measurement results
- PDF: Test reports in PDF format
- CSV: test reports in CSV format
- XML: test reports in XML format



Using the button  you can copy selected files to the connected USB memory.

Function keys:

1. Back one menu level higher
2. Delete selected file
3. Rename selected file
4. Copy selected files from the USB memory to the device.

1	2	3	4
<b>Function keys</b>			



1. Once deleted files can not be restored.
2. Note that when renaming files, the file extension must NOT be changed, otherwise the changed file will NOT be listed anymore, as the file filters will hide this file.
3. When copying files from external USB memory to the device, no version or compatibility check is performed. If you copy test files of an older software version to the device, the device may malfunction.

### 5.9.3 WLAN Global configuration

In the WLAN settings you can view the list of available access points and connect to an access point.



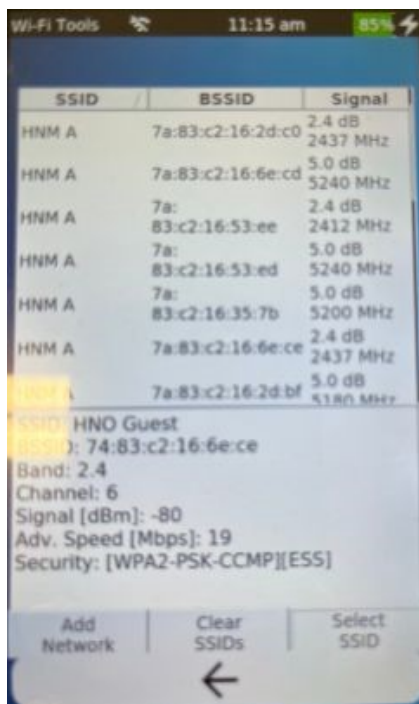
1. The WLAN functions of the LinkXpert M3 are only available if a compatible USB WLAN module is plugged into the USB socket.
2. General system settings of the WLAN interface like DHCP and VLAN can be found in the system settings under [network](#)<sup>34</sup>
3. The WLAN settings are global settings

**1. CAUTION for networks consisting of multiple access points!**

**Unlike conventional smartphones or laptops, LinkXpert connects to one physical access point, i.e. to one of the network's BSSIDs. It will NOT automatically jump to another BSSID if the physical hardware becomes unreachable.**

**The reason for this is that LinkXpert puts more focus on testing a physical access point than on the general connection to a network.**

### 5.9.3.1 WLAN access point selection (M3)



In the upper part of the screen you will see the list of visible access points.

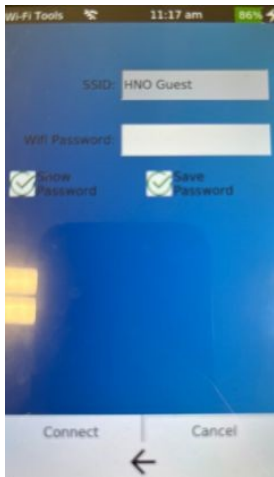
In the lower part of the screen you can see the details of a selected access point.

Function keys:

1. Manual configuration of an access point.
2. Previously saved access point forgotten.
3. Regenerate the list of access points.
4. Select access point.

1	2	3	4
<b>Function keys</b>			

### 5.9.3.2 Configure access point



**SSID**

This field contains the name of the access point selected by the user.

**Wifi Password**

Enter the password for the access point here.

**Show Password**

Displays the password as plain text.

**Save Password**

Saves the password in the password list.

1
<b>Function 1</b>

Function keys:

1. LinkXpert tries to connect to the access point.

2. The menu is exited without connection



After LinkXpert has connected, the name of the access point and the assigned IP address will appear.

With Disconnect\_Wifi LinkXpert disconnects from the current access point.

If Auto Reconnect is selected, LinkXpert will automatically reconnect to the current access point.

If <%Enable**VNC**%> is selected, LinkXpert's screen can be played back on external devices using a commercially available VNC viewer.

1. If LinkXpert cannot connect to the selected access point, the menu will be left without connection!



## 5.9.4 System settings

The system settings of the LinkXpert are globally effective and independent of test profiles, only the desired Ethernet speed and DHCP setting can be overridden by a profile.

### 5.9.4.1 Time

The following settings can be made:

1. Date and time
2. Date and time formats

### 5.9.4.2 Energy

The following settings can be made:

1. Screen brightness
2. Auto power off time
3. Standby time

The device turns off the screen during standby. Standby is ended by touching the screen or pressing the On/Off key.



## 5.9.4.3 Language



Select the desired language here.

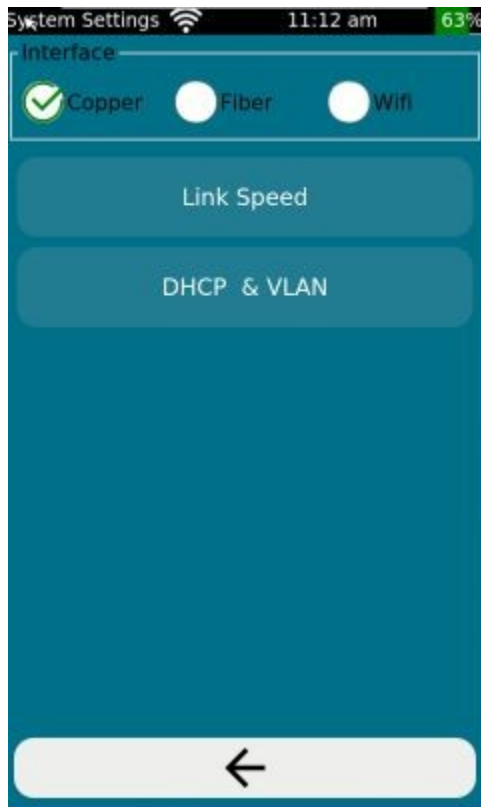
Function keys:

1. Back one menu level higher.

1

**Funktionstasten**

#### 5.9.4.4 Network



The network settings of LinkXpert are global settings and are independent of the test profile used. Settings are made separately for each interface.

**"Link Speed"** (copper only) allows the selection of the used Ethernet speeds.

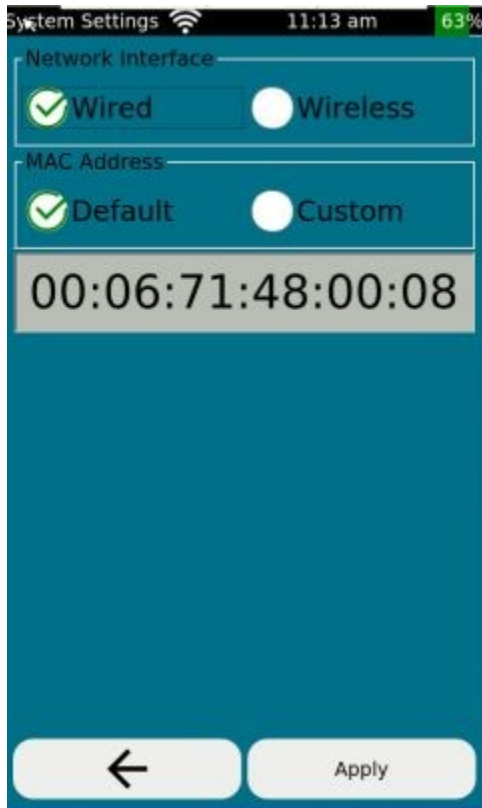
**"DHCP & VLAN"** allows the configurations for DHCP and the used VLAN

#### 5.9.4.5 MAC settings

MAC addresses (Media Access Control Address, also Media Access Code) are unique addresses of a device connected to Ethernet.

The copper interface and fiber interface (M3) share a MAC address.

The WLAN interface (M3) has its own MAC address



"Default"  
"Custom"

Function keys:

1. Back one menu level higher.
2. Apply selected settings.

1	2
<b>Function keys</b>	

Every regular Ethernet-enabled device has at least one unique, unchangeable MAC address.



With LinkXpert M3, the MAC addresses of the copper/fiber and WLAN interfaces can be changed to allow LinkXpert to connect to networks that only allow certain MAC addresses (so-called MAC whitelists).

The use of a foreign MAC address should only be done by specialists who are familiar with this topic and know the consequences for the network under investigation.

**It is strongly recommended to leave the MAC address settings on "Default", if you do not have the necessary knowledge about MAC addresses and the network to be examined!**

**Incorrect MAC address configurations can lead to serious network errors such as data loss or device malfunctions.**

## 5.9.4.6 802.1X security (M3)



"LinkXpert supports the following authentication methods:

1. Tunneled TLS
2. MD5
3. TLS
4. PWD
5. FAST
6. Protected EAP (PEAP)

Function keys:

1. Back one menu level higher.
2. Apply selected settings.

1	2
<b>Function keys</b>	

Verwenden Sie 802.1X nur, wenn das Netzwerk 802.1X unterstützt und Sie eine gültige Authentifizierung für das Netzwerk haben.



## 5.9.4.7 Units

LinkXpert supports lengths in meters (m) and feet (ft)

## 5.9.4.8 Firmware Update

- 1. Save all test data of the device before the firmware update, as they will be deleted by the firmware update!**
- 2. Test data deleted by the firmware update cannot be restored.**
- 3. Softing assumes no liability for the loss of test data.**



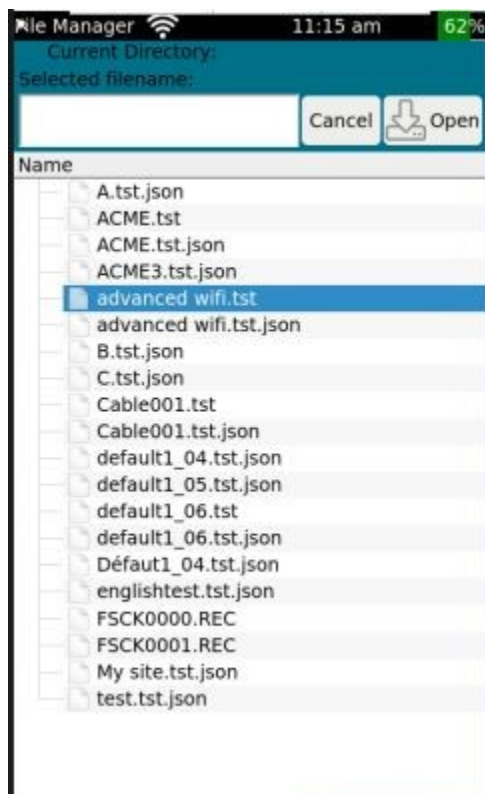


To upgrade the firmware of the device, perform the following steps:

1. Connect the LinkXpert to the supplied power supply.  
IMPORTANT: Do NOT disconnect the power supply during the upgrade!
2. Copy the new firmware version to a USB memory stick and insert the memory stick into the USB slot of the device. The file name should have the following format Linkxpert\_fw\_version.tar.gz



3. Click Tools in the main menu
4. Click on "**Firmware Upgrade**"
5. Click on "**Select File**"



The upper area of the screen now shows the system memory of the LinkXpert, the lower area shows the memory content of the USB stick.

1. Select the upgrade file in the lower area of the screen.
2. Click on "**Open**"

The upgrade will take several minutes. Do NOT disconnect the device from the power supply and do NOT restart the device manually.

After the upgrade, the device will reboot and display the main screen.



**Do not disconnect the device from the power supply during the upgrade and do not restart the device manually as this may cause damage to the device.**

#### 5.9.4.9 Factory settings

If the factory setting is selected, the following actions are performed:

1. All custom profiles will be deleted.
2. All "**Sites**
3. All test reports are deleted.
4. The factory settings are restored.



**The deletion of data on the device cannot be undone. Back up your data before resetting the device to factory settings.**

## 6 Individual tests

Tests can be performed with the LinkXPert series either as a single test or during an autotest.

The following tests are available:

Test	Copper cabling / networks	Fiber optic networks	WLAN networks
Wiring diagram with length	✓		
Sound generator	✓		
PoE , PoE + , PoE++	✓		
Link LED	✓	✓	
DHCP Test	✓	✓	✓
Ping test	✓	✓	✓
Duplicate IP Scanner	✓	✓	✓
Traceroute	✓	✓	✓
Network Participants List	✓	✓	✓
CDP / LLDP	✓	✓	✓
VFL Red Light Source		✓	
TX/RX		✓	✓
Microscope		✓	
WiFi Scan			✓



1. Settings for the respective [individual tests](#)<sup>39</sup> can be made directly in [Tools mode](#)<sup>27</sup>
2. Settings for each test in [Autotest](#)<sup>25</sup> mode are set via the [profile](#)<sup>23</sup>
3. The following tests cannot be performed in Autotest mode
  - Tone Generator
  - Link LED Blink
  - VFL
  - TX/RX (fiber and WLAN)

### 6.1 All media (copper, fiber (M3), WLAN (M3))

The following tests are available for all transmission media.

## 6.1.1 Link-LED



To identify the link LED on the switch, LinkXpert can flash the link LED of the switch port. To do this, LinkXpert must be connected to a switch via the copper or fiber interface.

This test is only available in Tools mode.

Function keys:

1. Back one menu level higher
2. Change settings
  - Make link LED flash for 10MBit/s
  - Link LED for 100MBit/s flashing
  - Make Link LED blink for 1GBit/s
3. Trigger test

## 6.1.2 Link Status



1	2
<b>Function keys</b>	

### Link Status

Please note:

1. For copper and fiber networks, the Link LED will also light up when connected to the network.  
See also [Device Connections](#)
2. For WLAN networks, the connection is only indicated by the WLAN icon in the status bar.

Function keys: (only in the Tools module)

1. Back one menu level higher
2. Start test



### 6.1.3 DHCP Test



In the **DHCP Test**, LinkXpert checks whether the device can be assigned an IP address by the network and whether other information such as DNS server address and address range is transmitted.

Prerequisite is that the device can connect to the network, see also [Link Status](#)<sup>[40]</sup>, [Network](#)<sup>[34]</sup> for all media and [WLAN Global Configuration](#)<sup>[29]</sup>

Function keys: (Tools module only)

1. Back one menu level higher
2. Start test

1	2
<b>Funktionstasten</b>	

### 6.1.4 Ping Test



In the **<%PingTest%>**

The table shows the ping targets and the ping's sent (TX) and received (RX) replies.

Prerequisite is that the device can connect to the network and has a valid IP address, see also [Link Status](#)<sup>[40]</sup>, [Network](#)<sup>[34]</sup>, [DHCP](#)<sup>[41]</sup> for all media and [WLAN Global Configuration](#)<sup>[29]</sup>

Function keys: (Tools module only)

1. Back one menu level higher
2. Change ping targets
3. Start test

1	2	3
<b>Function keys</b>		

## 6.1.5 Duplicate IP



1	2
<b>Function keys</b>	

In the **Duplicate IP** test, LinkXpert scans the network for devices on the network that use the same IP address.

The table shows a list of devices on the network that have the same IP address.

It is required that the device can connect to the network and has a valid IP address, see also [Link Status](#)<sup>[40]</sup>, [Network](#)<sup>[34]</sup>, [DHCP](#)<sup>[41]</sup> for all media and [WLAN Global Configuration](#)<sup>[29]</sup>

Function keys: (Tools module only)

1. Back one menu level higher
2. Start test



The device can search for IP address duplicates passively and actively. In passive mode, the device only monitors the data stream and reports when IP duplicates are found. In active mode, the device searches for duplicate IP addresses in the network. The settings for this are made in the menu [Network Discovery](#)<sup>[44]</sup>.

## 6.1.6 Traceroute



1	2	3
<b>Function keys</b>		

In the **Traceroute** test, LinkXpert shows intermediate stations that IP packets pass through until they arrive at a defined destination.

The table shows a list of intermediate stations (hops) with the corresponding time delays and the address of the intermediate station.

Prerequisite is that the device can connect to the network and has a valid IP address, see also [Link Status](#)<sup>[40]</sup>, [Network](#)<sup>[34]</sup>, [DHCP](#)<sup>[41]</sup> for all media and [WLAN Global Configuration](#)<sup>[29]</sup>

Function keys: (Tools module only)

1. Back one menu level higher
2. Select destination address. The destination address can be a URL or an IP address.
3. Start new test

## 6.1.7 Network Discovery



1	2	3
<b>Function keys</b>		

In the **Network Discovery** test, LinkXpert lists all network nodes visible in the specified search range.

The table shows the MAC and IP address of the nodes with associated station name.

Prerequisite is that the device can connect to the network and has a valid IP address, see also [Link Status](#)<sup>[40]</sup>, [Network](#)<sup>[34]</sup>, [DHCP](#)<sup>[41]</sup> for all media and [WLAN Global Configuration](#)<sup>[29]</sup>

Function keys: (Tools module only)

1. Back one menu level higher
2. Settings
  - IPV4 or IPV6
  - Listen" or "Scan" mode

The device can passively "listen" on the network or actively scan for devices.

The advantage of the passive mode is that LinkXpert itself does not send IP packets, the disadvantage of the passive mode is that devices may be found late or not at all.

In active mode LinkXpert communicates with the network and finds devices faster.

3. Start new test

## 6.1.8 CDP



1	2
<b>Function keys</b>	

In the **CDP** test LinkXpert lists CDP responses of the connected switch.

CDP is the "Cisco Discovery Protocol", according to which compatible switches send out information about the switch port used and the switch itself at regular intervals.

The content and frequency of this information depends on the configuration of the switch.

The prerequisite is that the device can connect to the network and has a valid IP address, see also [Link Status](#)<sup>[40]</sup>, [Network](#)<sup>[34]</sup>, [DHCP](#)<sup>[41]</sup> for all media and [WLAN Global Configuration](#)<sup>[29]</sup>

Function keys: (Tools module only)

1. Back one menu level higher
2. Start new test

## 6.1.9 LLDP



In the **LLDP** test LinkXpert lists LLDP responses of the connected switch.

LLDP is the "Link Layer Discovery Protocol", according to which compatible switches send out information about the switch port used and the switch itself at regular intervals.

The content and frequency of this information depends on the configuration of the switch.

Prerequisite is that the device can connect to the network and has a valid IP address, see also [Link Status](#)<sup>[40]</sup>, [Network](#)<sup>[34]</sup>, [DHCP](#)<sup>[41]</sup> for all media and [WLAN Global Configuration](#)<sup>[29]</sup>

Function keys: (Tools module only)

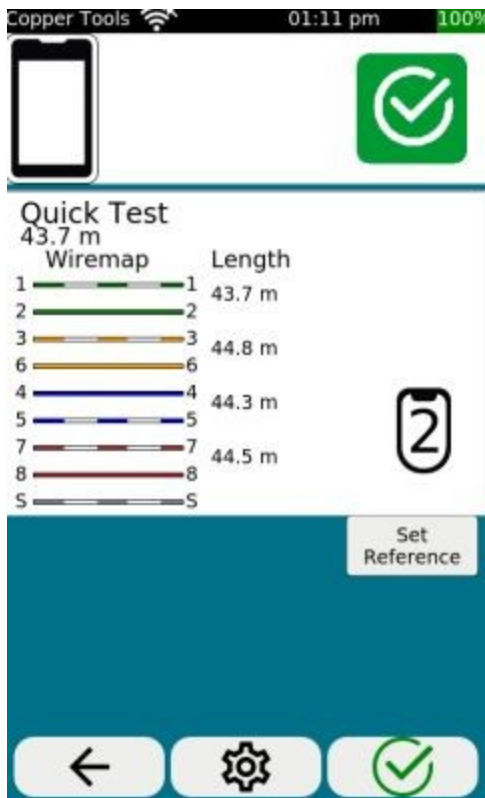
1. Back one menu level higher
2. Save test
3. Start new test

1	2
Function keys	

## 6.2 Copper media

The following tests are available for copper media.  
 Note: PoE is only available for twisted pair cabling.

### 6.2.1 Wiring diagram



The wiring diagram is given per pin, the length per pair. The shortest length is shown in the report as link length.

With **Set Reference** the reference plane for the length measurement can be set.

If the first patch cable is to be included in the length calculation, **Set Reference** should be performed WITHOUT the patch cable. If the first patch cable is not to be included in the length calculation, the cable must be connected at **Set Reference**.

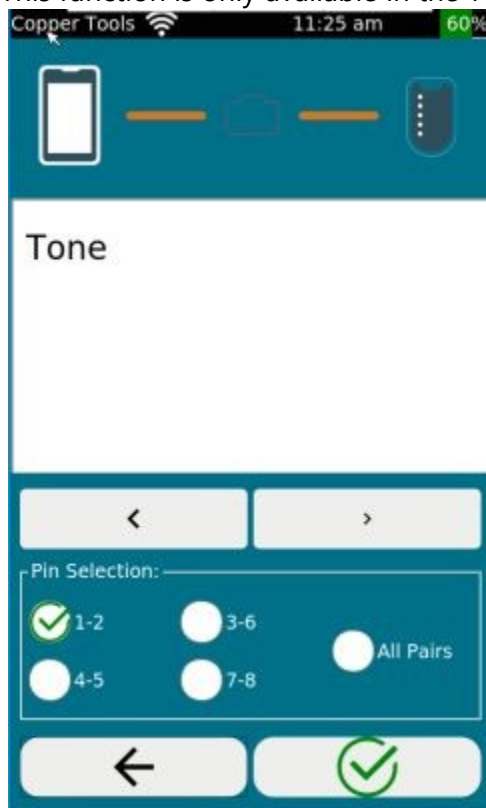
Function keys: (Only in Tools mode)

1. Back one menu level higher
2. Change wiring diagram settings
  - a. color scheme of the wiring diagram
  - b. 2 or 4 pair measurement
  - c. Use of crossed cables
  - d. Use of a cable shield
  - e. Set or determine NVP value
3. Start new test

1	2	3
Function keys		

## 6.2.2 Tone Generator

This function is only available in the Tools menu.



The built-in tone generator is compatible with analog cable locators such as Softing CP15. This menu is only accessible in the Tools module.

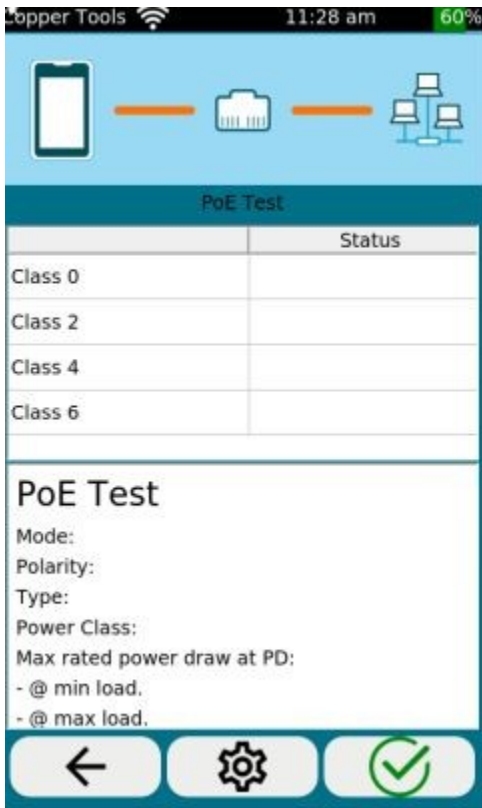
You can send the search tone either on single or all pairs.

Function keys:

1. Back one menu level higher
2. Start tone generator

1	2
<b>Function keys</b>	

## 6.2.3 PoE Test



1	2	3
Function keys		

The **PoE Test** tests the ability of network switches to provide remote power according to IEEE802.3.

Depending on the test settings, PoE mode, polarity, type, power class and the minimum and maximum voltage applied at load are tested.

Function keys: (Tools module only)

1. Back one menu level higher
2. Change settings
  - Mode **AUTO** : automatically detect highest PoE class and perform PoE test.
  - Mode Manual : select a special **PoE Test** and perform **PoE Test**.
  - Mode **Quick Auto** : Select multiple PoE classes and perform **PoE Test**.
3. Start new test

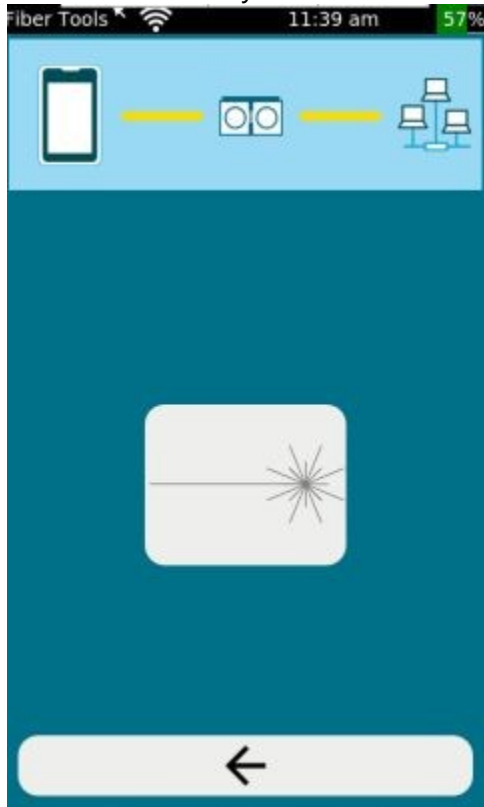
## 6.3 Fiber optic media (M3)

The following tests are only available for fiber media.



## 6.3.1 VFL Visual Error Locator

This function is only available in the Tools menu.



In the **VFL** , the red light source of the LinkXpert M3 will be activated.

The red light source can be used for fiber tracking and port detection on fiber optic links.

The VFL port is compatible with all common fiber optic connectors with 2.5mm universal ferrule, such as SC and FC and ST connectors.

For fiber optic connectors with 1.25mm ferrule, such as LC connectors, Softing recommends the use of either adapter cables from 2.5mm to 1.25mm, e.g. SC to LC cable, or the use of an adapter #226542.

Function keys:

1. Back one menu level higher
2. Switch red light source ON/OFF

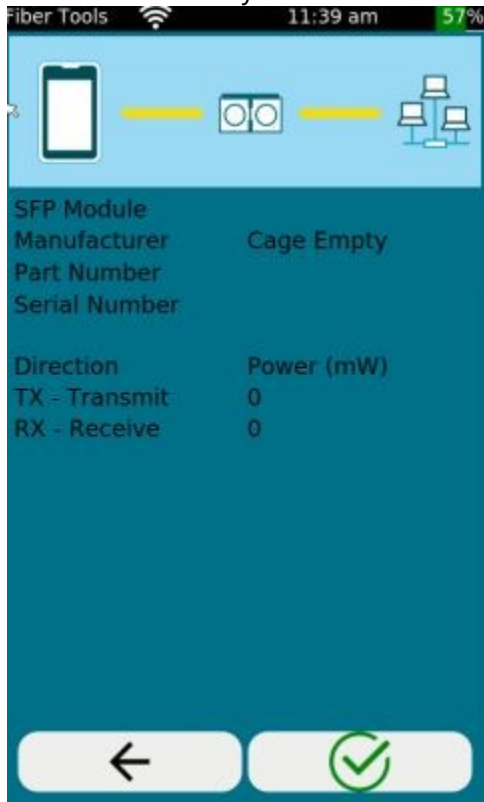
1	2
<b>Function keys</b>	



1. The red light source is a class I laser source with a power <math>< 1\text{mW}</math>. **Do not look directly into the laser light with unprotected eyes, as this may cause non-healable injuries to the eye!**
2. There is a physical contact between the red light source and the connector of the optical fiber section. Make sure to clean the connector end surface of the fiber optic cable before and after using the VFL function.

## 6.3.2 TX / RX

This function is only available in the Tools menu.



In the **TX/RX** the transmit (TX for Transmit) and receive values (RX for Receive) of the SFP module as well as information about the SFP module are read out.

The transmit and receive values are output in mW and can be used to diagnose SFP modules and fiber optic links.

Function keys:

1. Back one menu level higher
2. Start test

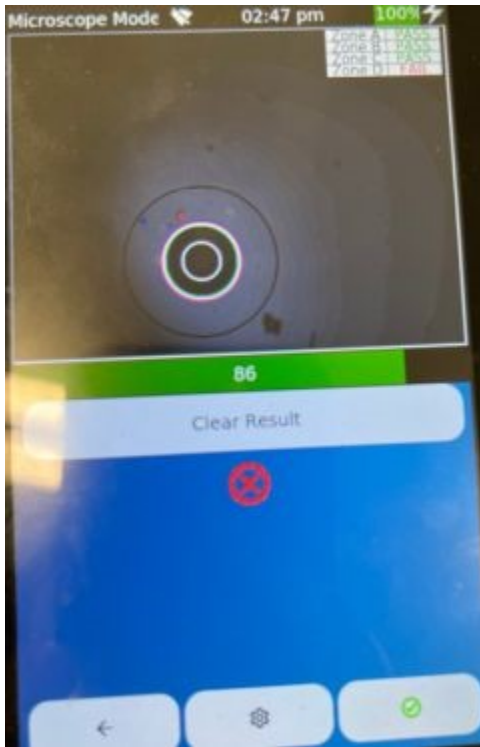
1	2
<b>Function keys</b>	



1. Not all SFP modules output their TX and RX values.
2. To read out the TX and RX values Softing recommends to use the SFP modules offered by Softing.

## 6.3.3 Microscope

This function is only available in the Tools menu.



1	2	3	4
<b>Function keys</b>			

In the **microscope** test the surface of fiber optic connectors and issue a good / bad statement according to IEC standard.

Connect the Softing fiber optic microscope #226539 to the USB port of the LinkXpert M3.

The fiber optic microscope has the following controls:

1. Large button: Switch between 200 and 400x magnification.
2. Small button: capture a connector image for end face inspection.
3. Control dial: image sharpness.

The upper screen area shows the image of the video microscope as a live image.

With the **Pause key** the live image can be paused, if "**Clear result**"

Below the live image, a bar graph is shown, which displays the current sharpness level of the live image in color and in %.

Note that you can only perform a connector check if the bar graph shows green. No check is possible when the bar graph is yellow or red.

Adjust the image sharpness with the setting wheel of the microscope until you see a clearly sharp image and green bar. The aim is to set the image sharpness close to 100%.

Function keys:

1. Back one menu level up.
2. Settings:
  - a. Selection of the test standard.  
Note that multimode, singlemode UPC and singlemode APC mating faces are subject to different test standards.
  - b. Auto Center:  
If "**Auto Center**" is selected, LinkXpert M3 will try to always center the connector center on the image. It is recommended to leave this setting "On" for normal applications.
  - c. Capture button (See 2. at Microscope above):  
"**Freeze**" only **freezes** the live image.  
"**Freeze and Record**"
  - d. Magnification:  
"**High**" selects 400x magnification, "**Low**"
  - e. Overlay:  
With "**On**" the borders of the 4 zone evaluation are displayed, with "**Off**"

3. Perform connector check. This function is equivalent to pressing the small key on the microscope.
4. Save inspection result

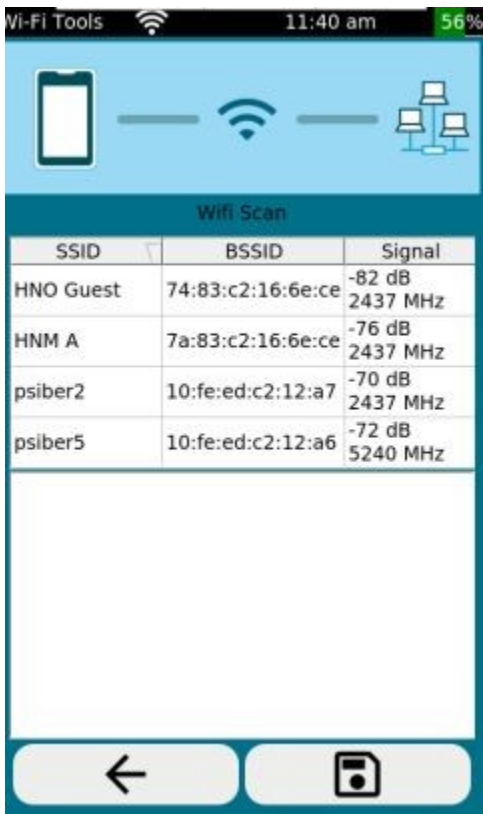
1. Use a compatible fiber optic microscope # 226539 from Softing. Microscopes from other manufacturers are not compatible.  
The fiber optic microscope is an optional accessory.



## 6.4 WLAN Media (M3)

The following tests are only available for WLAN media.

### 6.4.1 WiFi Scan



In the **WiFi Scan** test, LinkXpert M3 scans the 2.4 and 5 GHz bands for access points and lists the access points.

Note that the included WiFi USB stick #226586 must be used for this. The USB stick is compatible with 802.11 ac, a, b, g, n.

Function keys (Tools mode only):

1. Back one menu level higher
2. Start test

1	2
<b>Function keys</b>	

## 7 Service und Support

Softing's global presence ensures that our customers receive sales and technical support anywhere in the world. For more information: <https://itnetworks.softing.com>

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## 8 FAQ

### 8.1 Date and Time

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**Question**

The unit loses date and time settings

**Answer**

The date and time are buffered internally by a separate battery. If the unit is not used for too long, the internal battery may be discharged. Connect LinkXpert to a charger to charge the buffer battery. Make sure that LinkXpert remains switched on while charging.

Back Cover

The logo for DIREKTRONIK is displayed in a bold, italicized, red font with a white outline. The letters are slanted to the right, giving it a dynamic appearance. The logo is positioned on a yellow curved background that sweeps across the bottom of the page.

**DIREKTRONIK**

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