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NetXpert XG

Next Generation Ethernet Speed Certifier

December 2019
Menu structure and user guide

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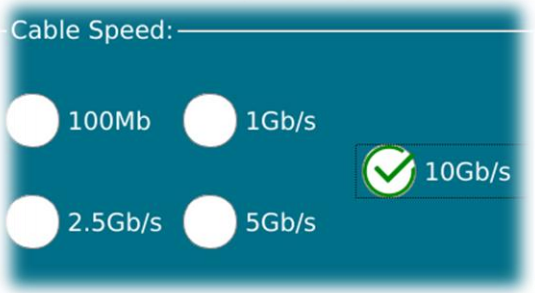
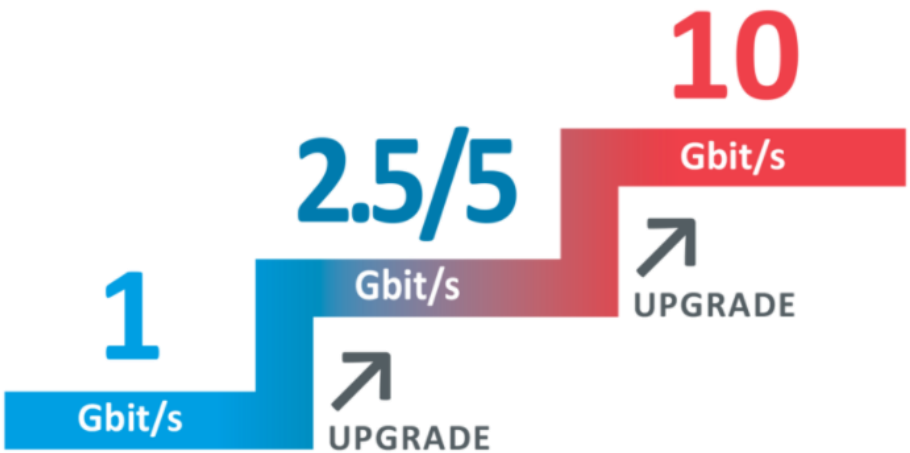
NetXpert XG – Next Generation Qualifier
Main operating modes

- Qualifying passive communication lines on copper and fiber
  - Main unit communicates with wiremap, mapper or active remotes at the far end of the line to…
    - …implement a wiremap test and troubleshoot the cable
    - …locate the connected ports
    - …identify the Ethernet performance of a transmission path (up to 10 Gbit/s)
- Ethernet commissioning and troubleshooting
  - Main unit is connected directly to an active Switch-Port to…
    - …identify Ethernet connection speed and PoE capabilities
    - …identify existing network structure
    - …test PoE/PoE+/PoE++ availability (idle and loaded)
    - …test DHCP
    - …implement ping and traceroute tests
    - …find related switch ports
    - …decode CDP und LLDP protocols
    - …identify VLANs

Three Speed Levels

- NetXpert XG – Next Generation „Ethernet Speed Certifier“
  - Three scalable models
    - 100 Megabit and 1 Gigabit Ethernet
    - 100 Megabit and 1/2,5/5 Gigabit Ethernet
    - 100 Megabit and 1/2,5/5/10 Gigabit Ethernet
  - Passive copper cable qualification
    - Wiremap
    - Signal to noise ratio (SNR)
    - Bit Error Rate Testing (BERT)
    - Delay Skew
  - Passive qualification of fiber cables
    - Bit Error Rate Testing (BERT)
  - Tools for setup and troubleshooting in active networks
    - Copper
    - Fiber optic (1G/10G)
    - WLAN (2,4 GHz Band)





Hardware

- Main unit
  - Housing is impact-resistant plastic with edge protector elastic bands
  - Foldable kickstand for convenient operation
  - Ergonomic landscape format to maximize readability
  - Hand straps for carrying comfort
  - Rubber material to cover all the ports
  - User accessible battery
  - On/off button
    - Power unit on and off
    - Integrated LED indicates the status of the power supply
    - Green= Battery charge >20%
    - Green flashing = Unit is charging (both fans are running)
    - Red= Battery charge <20%
    - Red flashing= Unit is not charging because of excessive internal heating (Do not unplug the charger! Both fans are running and charging will start automatically, when temperature returns to normal)

Ports

Micro-USB port (in conjunction with an adapter)

- For importing…
  - Logos for reporting
  - List Based Testing (LBT) test lists from eXport-Software
  - Firmware-Updates
  - License key
- For exporting…
  - Test-projects in various formats to share or external processing

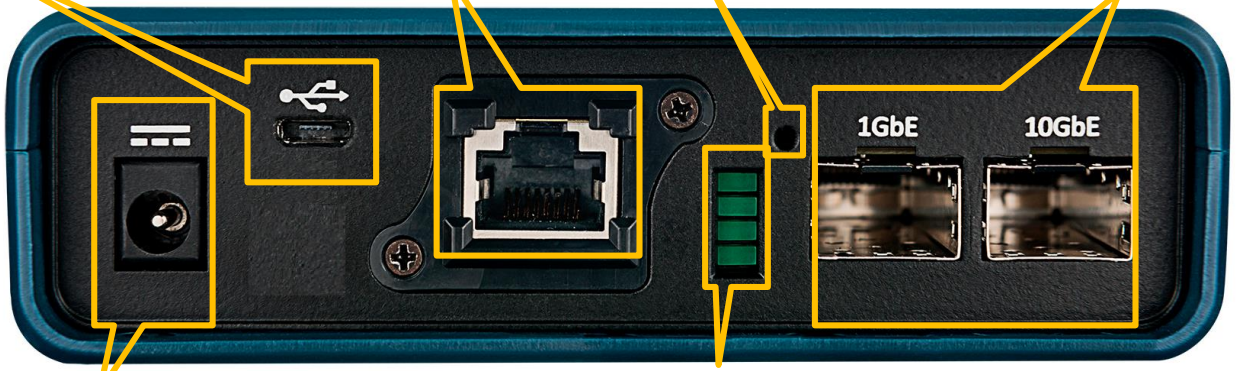
RJ45 measuring port

- Replaceable parts with 10 Gigabit Performance
- Part number 226582

Restart button

SFP slots

- 1 Gigabit Ethernet LWL SFP
- 10 Gigabit Ethernet



Power supply connection (12 Vdc)

- Operations of the device and charging the batteries (Li-Ion)

LED port indicators (top to bottom)

- Optical Link and Activity, 10G
- Optical Link and Activity, 1G
- Copper Link, any speed
- Copper Activity, any speed

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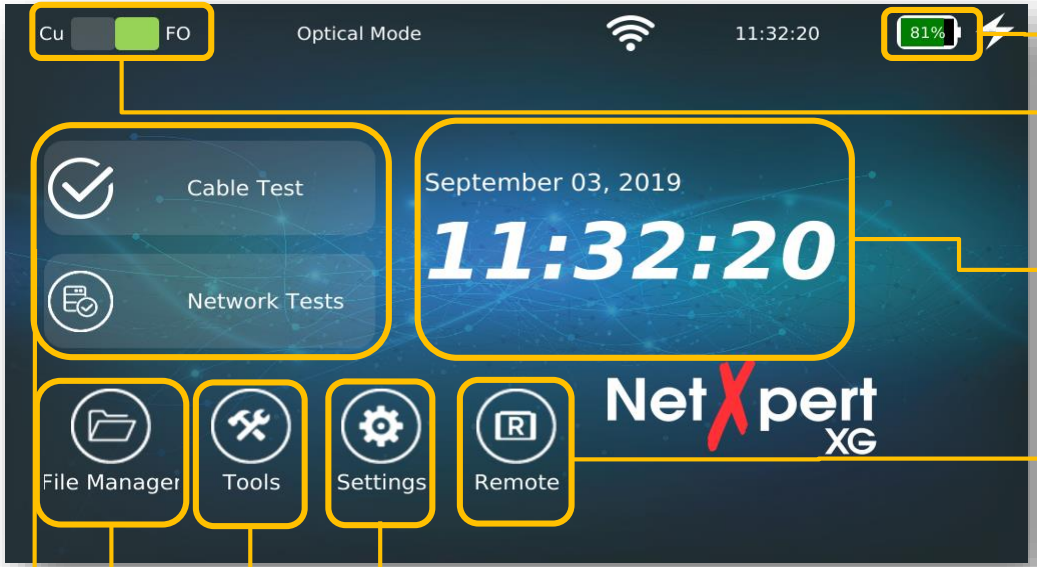
Setting up the device

- Switch-on
  - Boot-Screen appears with a progress bar
  - During initial operation, EULA (End User License Agreement) must be confirmed
    - Hardware belongs to the user
    - Operating software is licensed to the user
- Switch-off
  - Long press on on/off button
    - Prevents accidentally turning off the unit
    - Confirmation screen requires entry
  - Shut down screen appears with a progress bar
    - File structure is evaluated and if necessary repaired

Start screen



Battery charge level /charging indicator

Enables the user switch between copper and fiber mode for cable qualification

Date and time

- Make sure that values are correct. It will be used in test reports.

Remote mode

- Only visible on fiber mode
- Assigns the unit as remote for fiber cable testing

Device settings (section 7)

- Device settings
- Test parameter specifications

Tools (section 6)

- Troubleshooting and quick testing

Cable test (section 3)

- Test setup
- Passive cable qualification

Network tests (section 4)

- Test setup on various media

File Manager (section 5)

- Data management and reports

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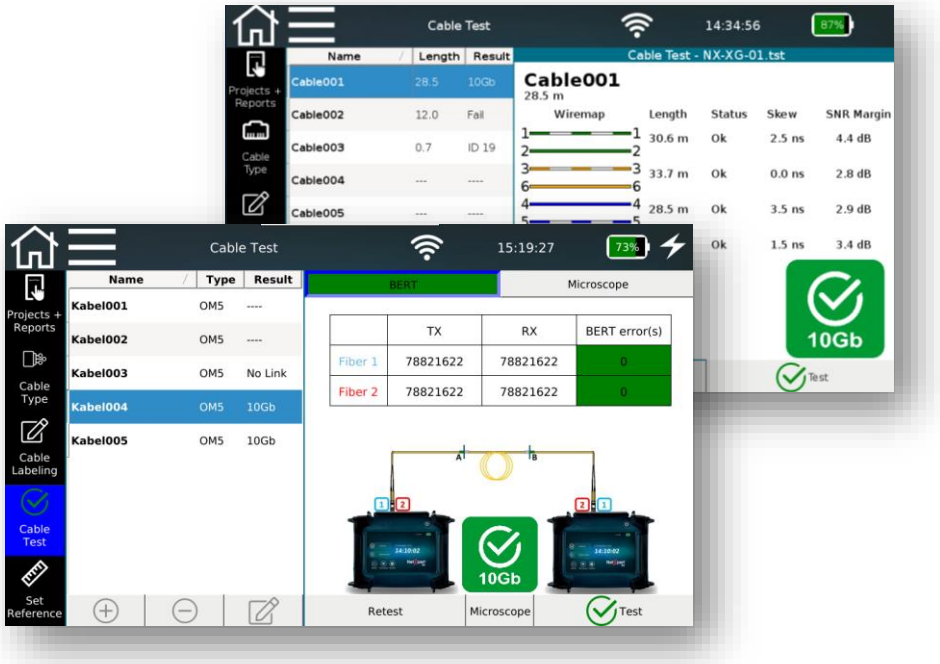
Cable Test Function

Determining transmission capabilities of passive cabling

- Supported media
  - Copper (connected to active remote)
  - Fiber optic
    - Second main unit is required
- Test parameters
  - Wiremap
  - Signal to noise ratio (SNR)
  - Signal propagation delay (Delay Skew)
  - Bit Error Rate Test (BERT)
- Available Ethernet speeds
  - 100 Megabit/1 Gigabit Ethernet
    - All models
  - 100 Megabit and 1/2,5/5 Gigabit Ethernet
    - Model „NX_XG_10G / 226552“ and „NX_XG_25_5G / 226553“
  - 100 Megabit and 1/2,5/5/10 Gigabit Ethernet
    - Model „NX_XG_10G / 226552“
  - Upgrading all the models up to 10 Gigabit Ethernet is possible via license key



Testing passive copper cabling
Remotes and cable tracking

- Available remotes
  - Test parameters are determined by the type of remote used
  - Ethernet Speed Certification Active Remote
    - Starting a test is possible on the remote unit (test and link indicator)
    - Status indicator for battery charge and last test result (pass/fail)
  - Wiremap test and port identification via optional wiremap remote units (#1 to 8)
  - Port identifying via optional mapper remote units (#1 to 24)
- Cable tracking/ acoustic port allocation
  - Intern tone generator
  - Optional analog cable tracker/port locator (e.g. Softing CP15, shown here)

Wiremap Remotes (226528)

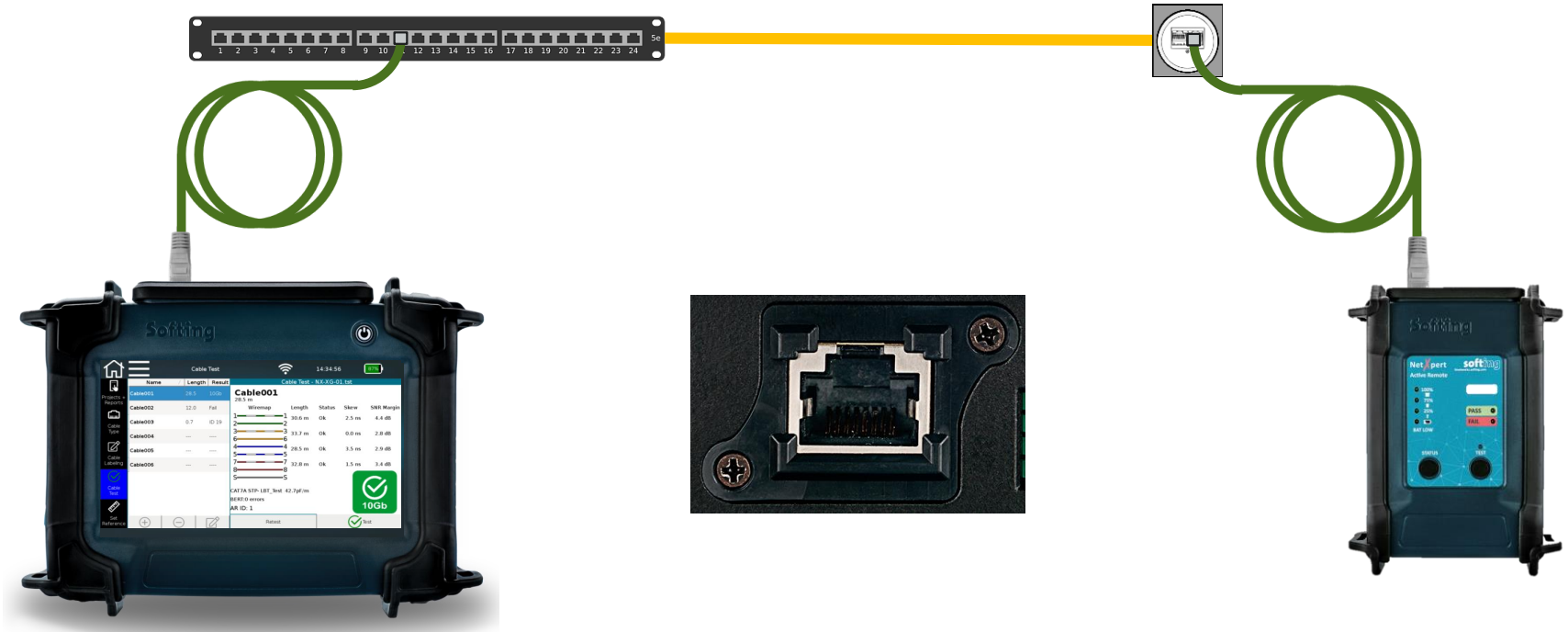
Mapper Remotes (226581)

Cable tracker/port locator (226007)

Testing passive copper cabling

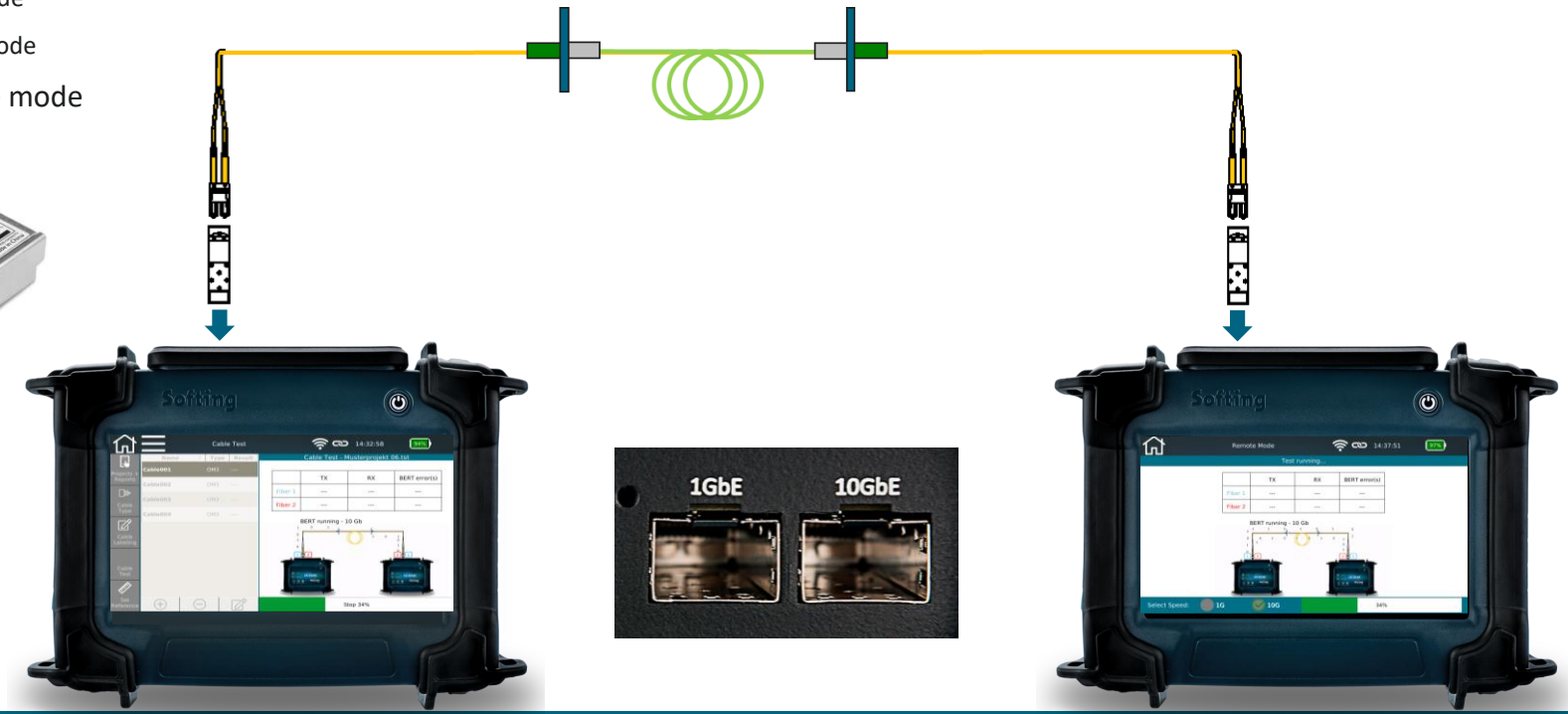
Test setup for qualification

- Main unit und active remote required
- „Set reference“ of both test cables of the main unit and remote unit before starting a test



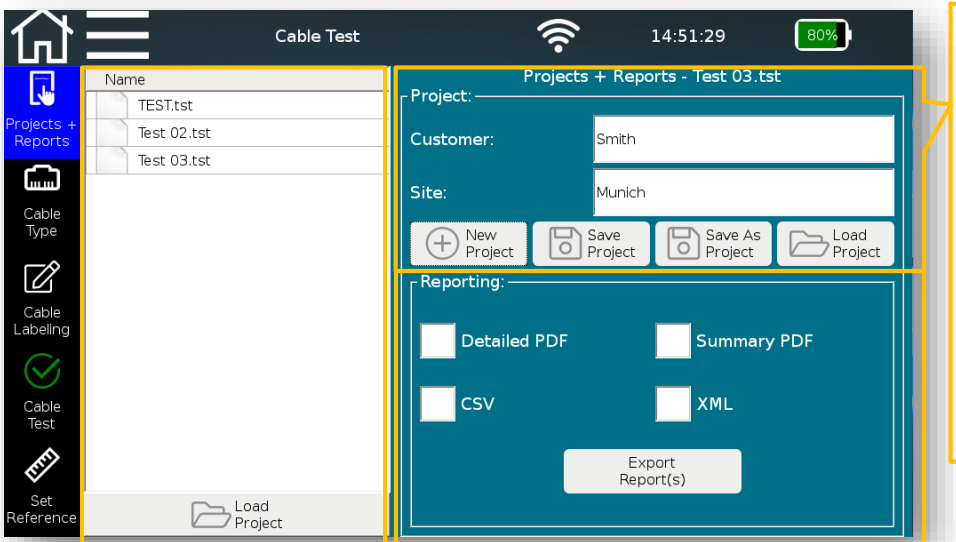
Testing passive fiber cabling

- Two main units are required
  - With corresponding SFP 1G or 10G modules
    - Multimode
    - Single mode
  - Master/Slave mode



Process of a cable testing project

Create a project- Initial screen



- Open project chosen from the list at the left side
- Details are shown for the chosen project
  - Customer data
  - Site data
- Project management
  - Creating new projects
  - Saving changes
  - Loading projects via File Manager menu

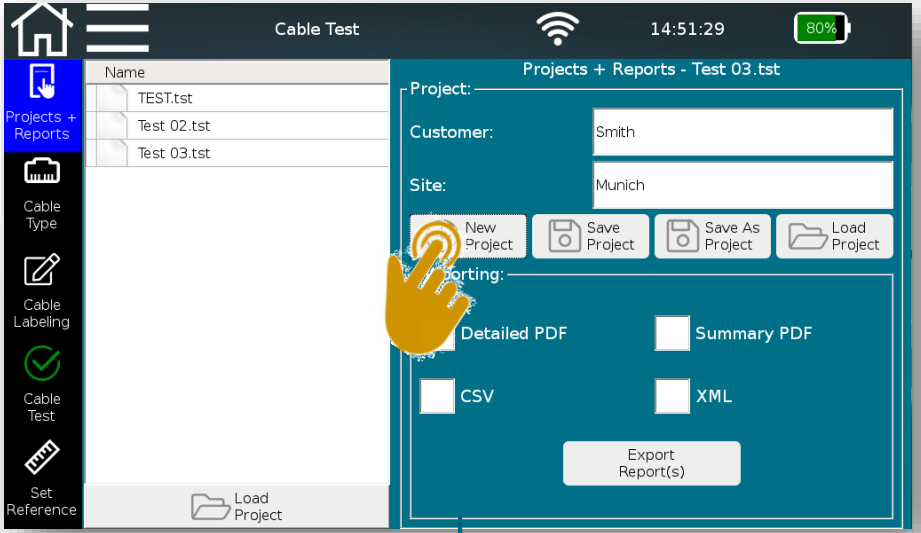
- Load existing projects in the device

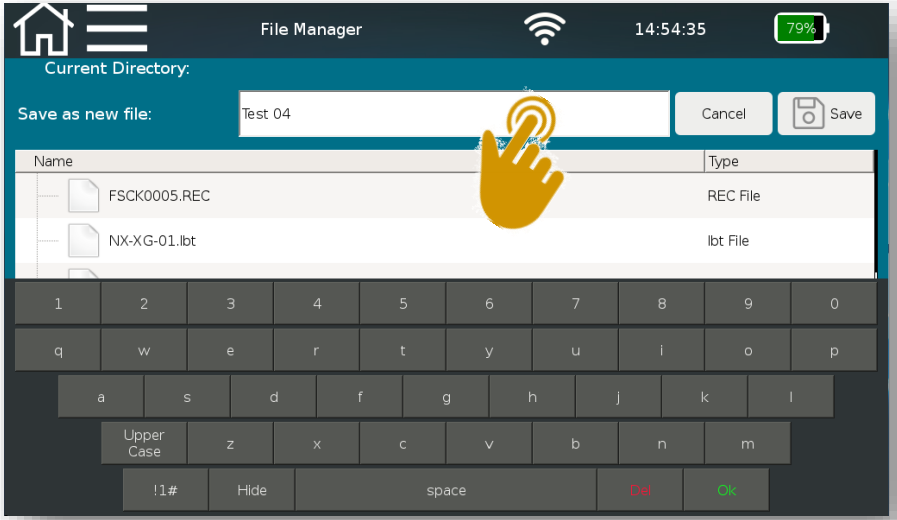
- Internal documentation generation
  - Detailed PDF (summary and details)
  - Summary PDF
  - CSV – open format, e.g. preparation on Excel
  - XML – exchange format with eXport

Process of a cable testing project

Create a project

- Creating a „new project“
  - Opens „File Manager “ menu
  - Enter project name





Process of a cable testing project

Create a project

- „Creating a „new project“
  - Opens „File Manager “ menu
  - Enter project name
- „Save Project“ saves changed information to the open project
  - Customer
  - Site
- „Save As Project“ creates a new project based on changed information

Process of a cable testing project

Create a project

- „Creating a „new project“
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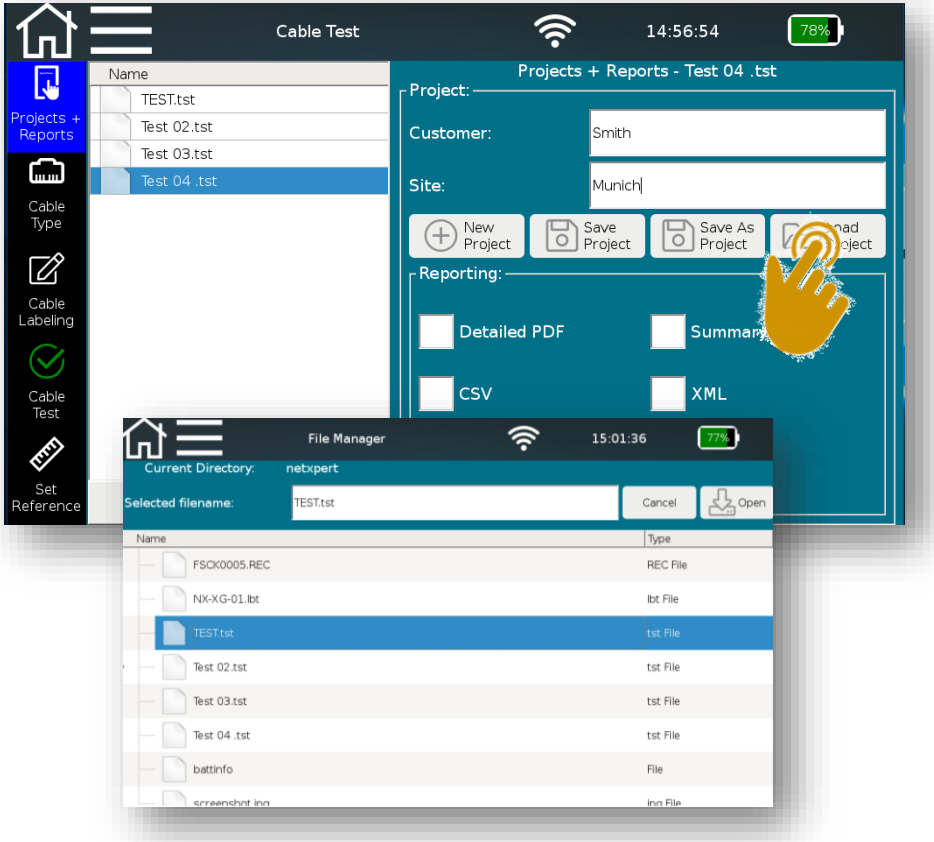
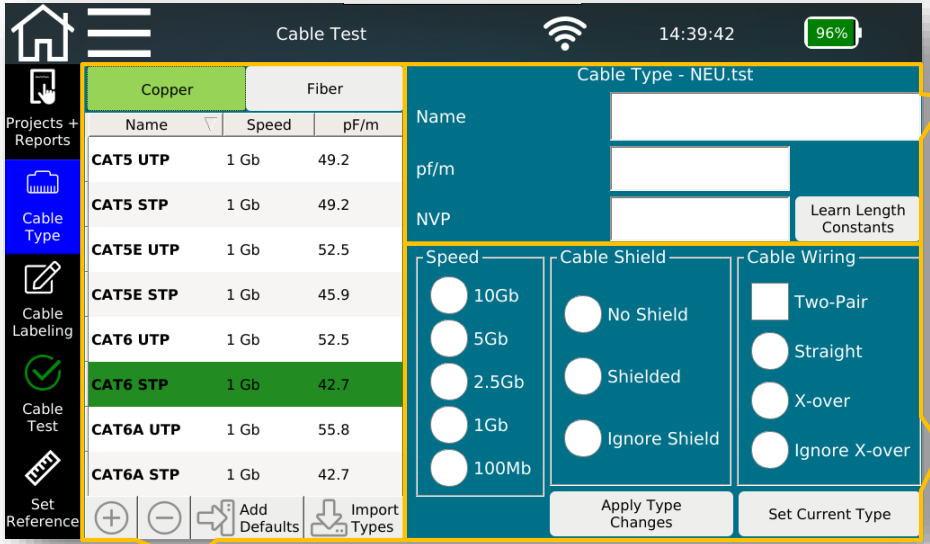
- „Save As Project“ creates a new project based on changed information
- „Load Project“ via File Manager menu



Process of a cable testing project

Defining test standards- Initial screen



- Templates of test standards
  - Basis for own test standards
  - List is expendable
  - Pattern or external template can be imported

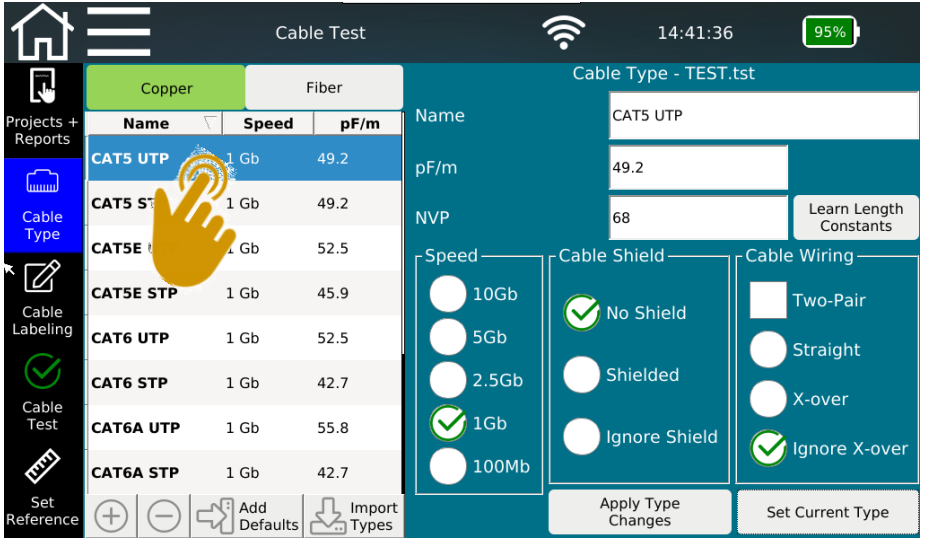
- Defining test standards via „Cable Type“ which is assigned to the currently open project
  - Name of the test standard
  - Constants for length determination
    - pf/m – cable capacity
    - NVP value – Nominal Velocity of Propagation
    - Values can be found on data sheets of the cables or determined simply by “Learn Length Constants” (Reference length>30m)

- Details on test standards
  - „Speed“ – maximum Ethernet speed to be tested
  - Cable structure
    - „Cable Shield“ – Consideration of the shielding of the installed cable
    - „Cable Wiring“ – Number of wire pairs and orientation

Process of a cable testing project

Defining test standards

- Selecting a template
  - Select a template similar to your application
  - Using the available templates helps to avoid mistakes
    - Write and deletion protection, if test results available (if some tests are already done)



Process of a cable testing project

Defining test standards

- Selecting a template
  - Select a template similar to your application
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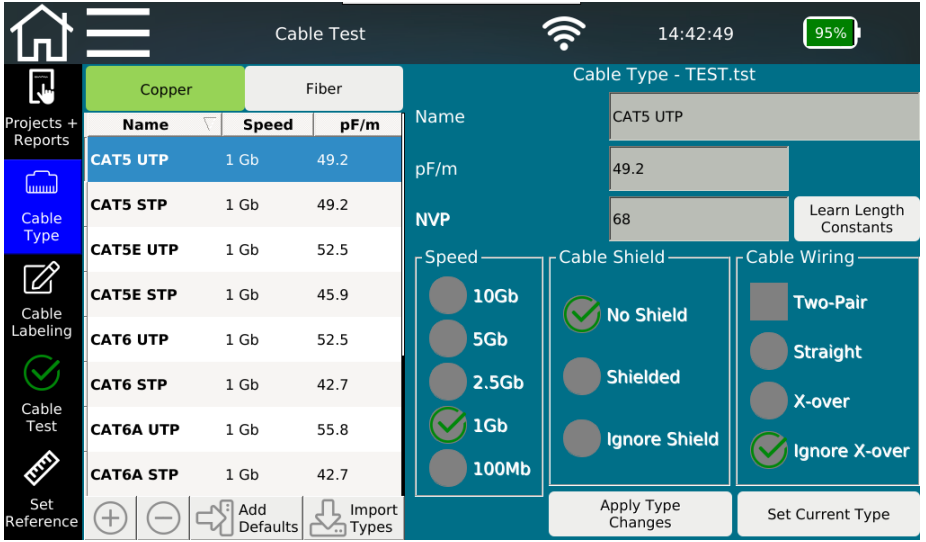
    - Write and deletion protection, if test results available (if some tests are already done)
    - If a cable test type (template) is being used in a label definition or in a cable test, the cable test type parameters on the right will be grayed out and are not editable. This will keep you from accidentally changing a cable parameter for cable templates in use.
    - If you delete the cable labels and cable tests, the template will become editable once again.



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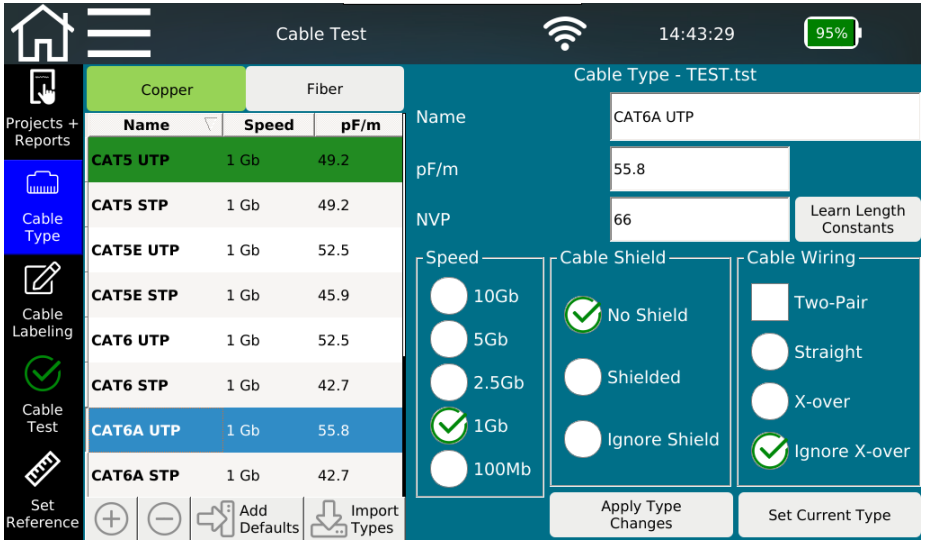
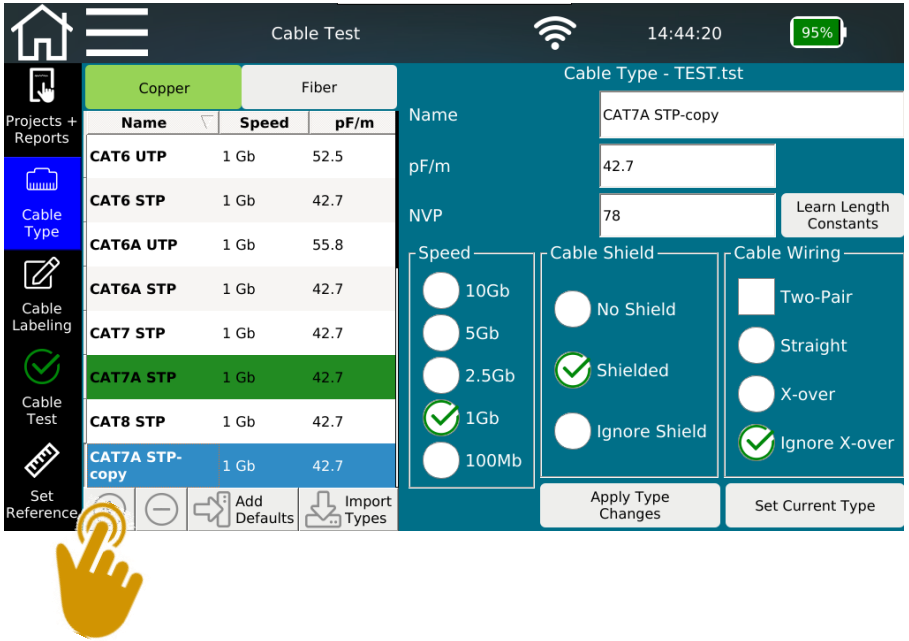
    - If you delete the cable labels and cable tests, the template will become editable once again.
    - The current cable test (Set Current Type) will be highlighted in Green.



Process of a cable testing project

Defining test standards

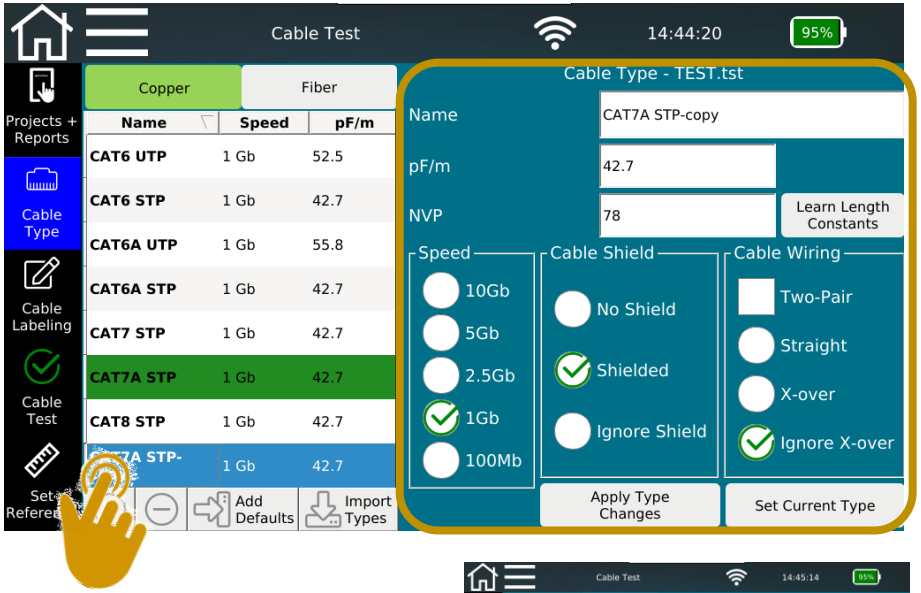
- Copy template
  - Copy will be added to the end of the list

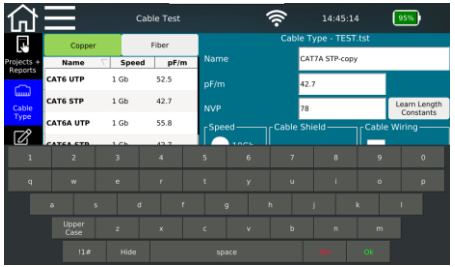


Process of a cable testing project

Defining test standards

- Copy template
  - Copy will be added to the end of the list
- Select copy
  - Customize name
  - Edit parameters
    - Cable constants
    - Ethernet speed
    - Shielding features
    - Cable Wiring





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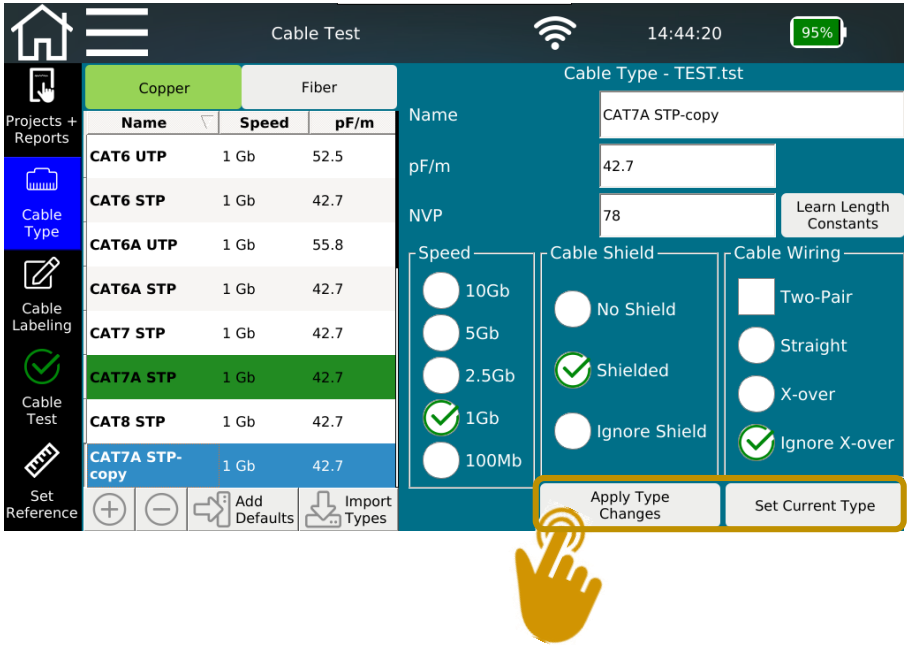
  - Confirm with "Apply Type Changes" and select "Set Current Type" for this project
  - Stored test standards or results can no longer be edited



Process of a cable testing project

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    - Cable constants
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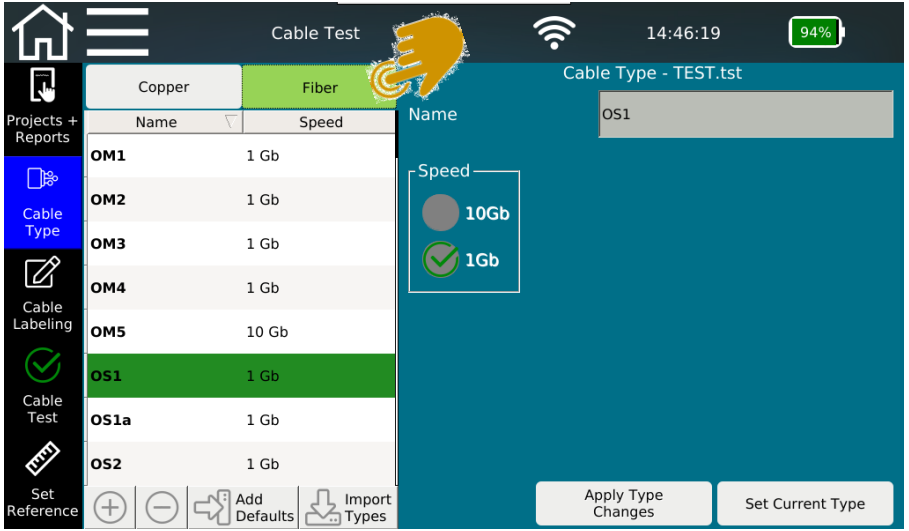
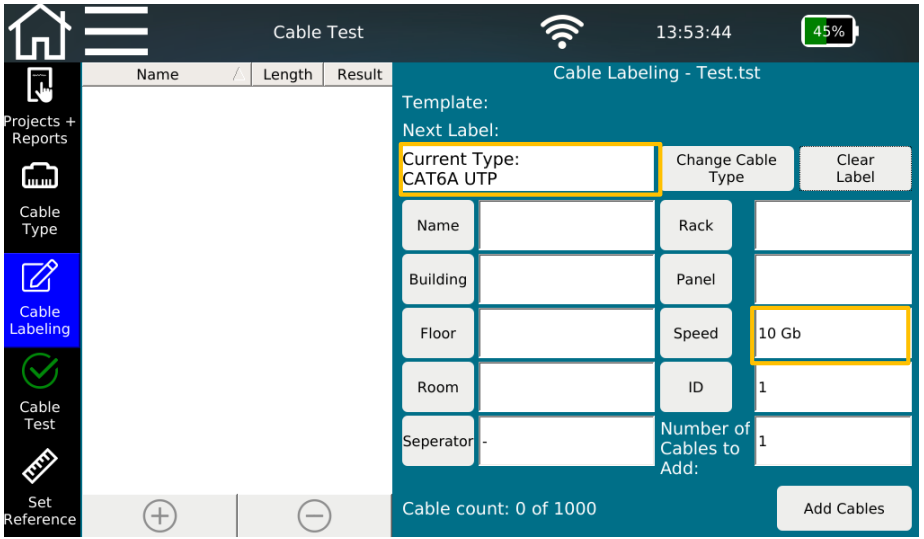
    - Shielding features
    - Cable Wiring
  - Confirm with "Apply Type Changes" and select "Set Current Type" for this project
  - Stored test standards or results can no longer be edited
  - Switch between copper and fiber cables by tapping on the corresponding tab



Process of a cable testing project

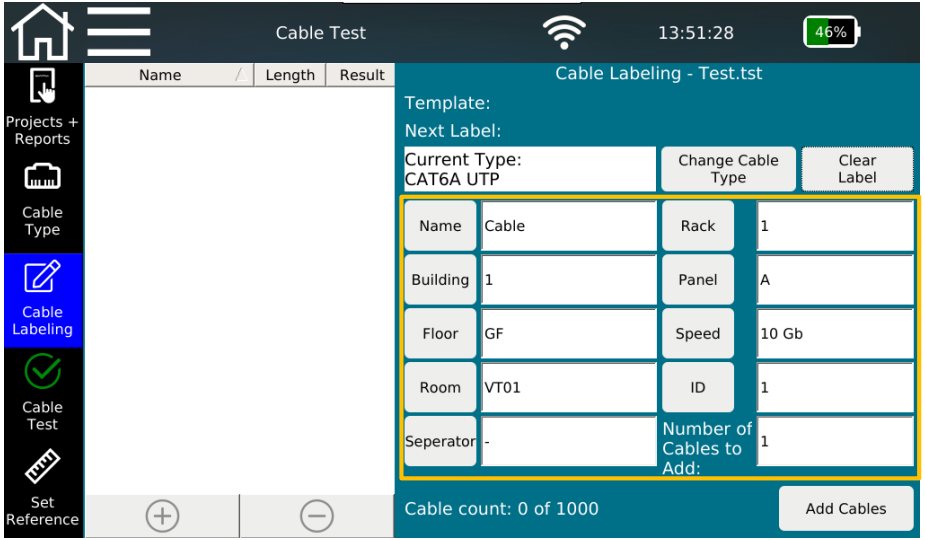
Setting up a test list- Create names for cablings



- Based on "Current Type" selected previously from the Cable Type menu

Process of a cable testing project

Setting up a test list- Create names for cablings



- Based on "Current Type" selected previously from the Cable Type menu
- Enter the names and values by pressing on the respective input field

Process of a cable testing project

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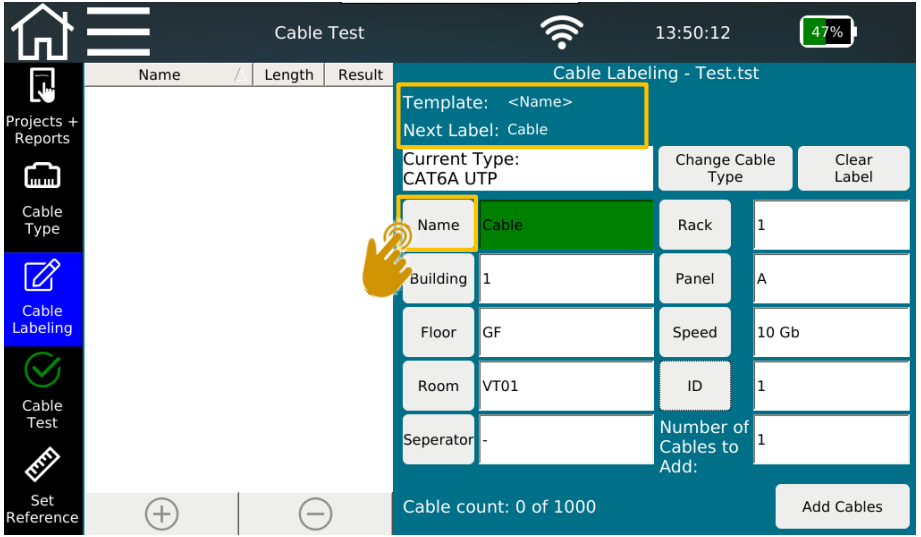

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- Enter the names and values by pressing on the respective input field
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Process of a cable testing project

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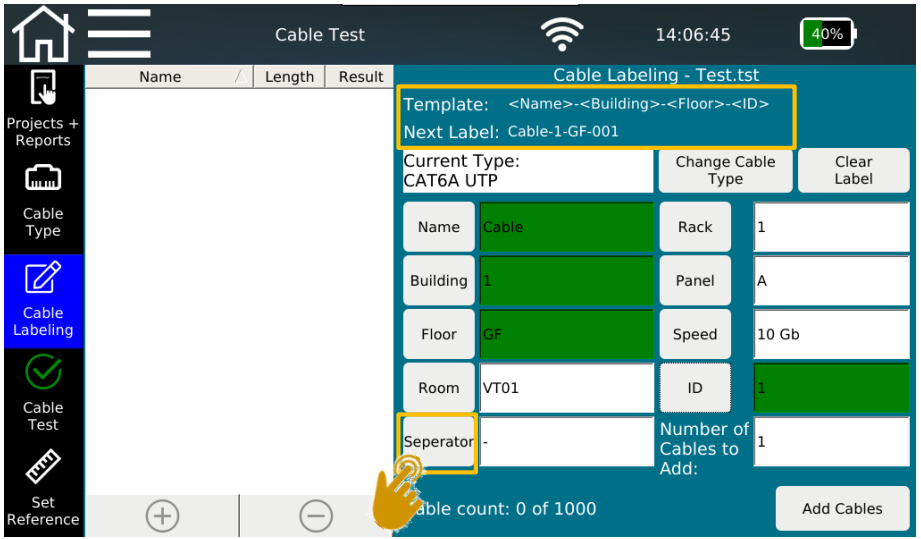

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- Separator can be used multiple times by tapping on it each time after selecting one parameter. “Template” and “Next Label” will be updated accordingly.

Process of a cable testing project

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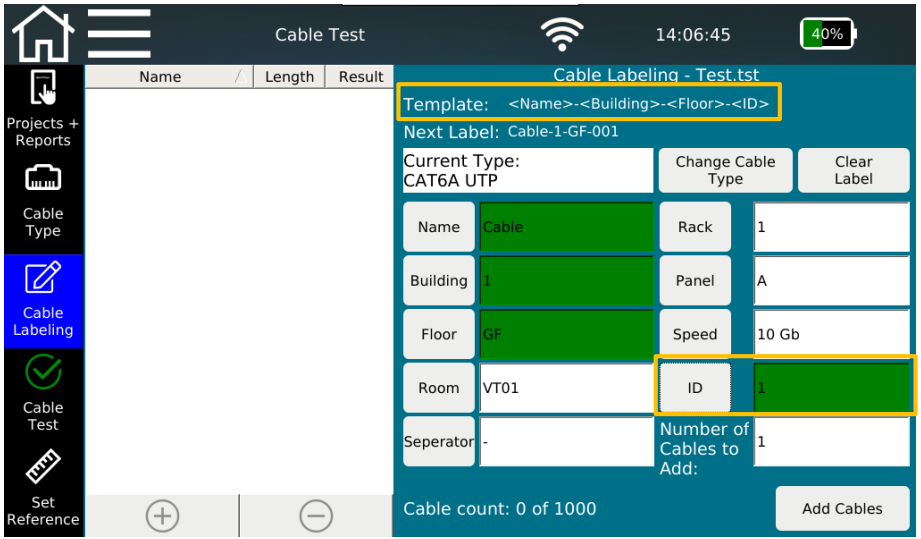

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- Separator can be used multiple times by tapping on it each time after selecting one parameter and “Next Label” will be updated accordingly.
- "ID" field (counter) can be positioned anywhere within the template

Process of a cable testing project

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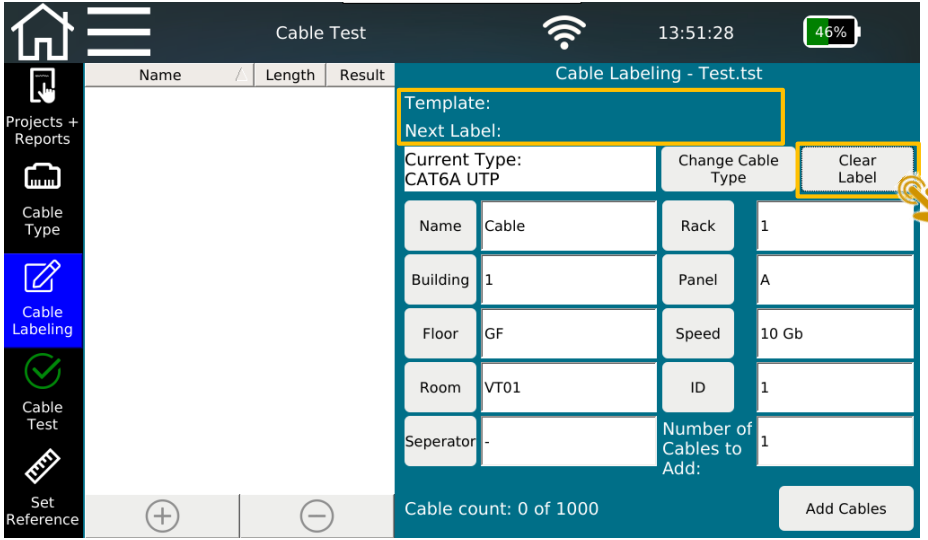

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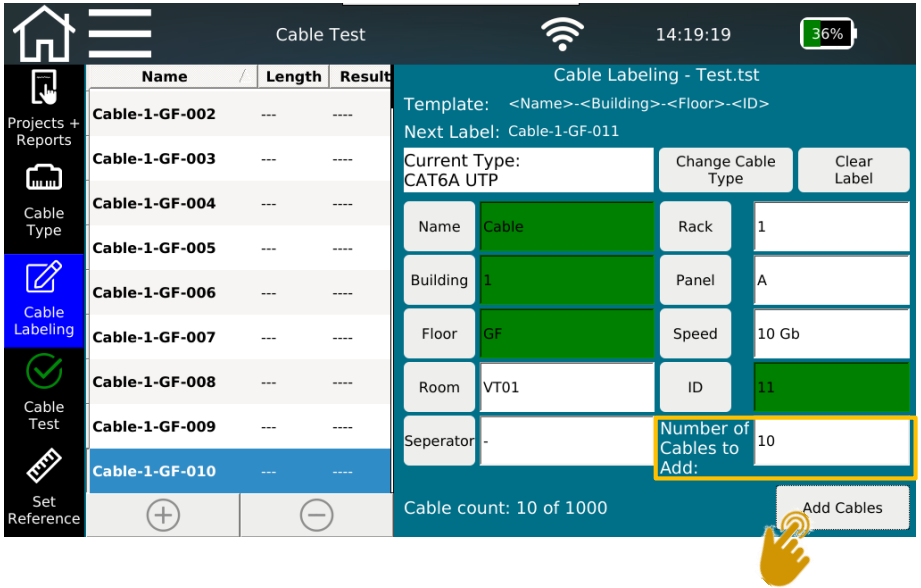
Process of a cable testing project

Setting up a test list- Create names for cablings



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- "ID" field (counter) can be positioned anywhere within the template
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- Add cables by entering number of cables to be tested in the input field

Process of a cable testing project

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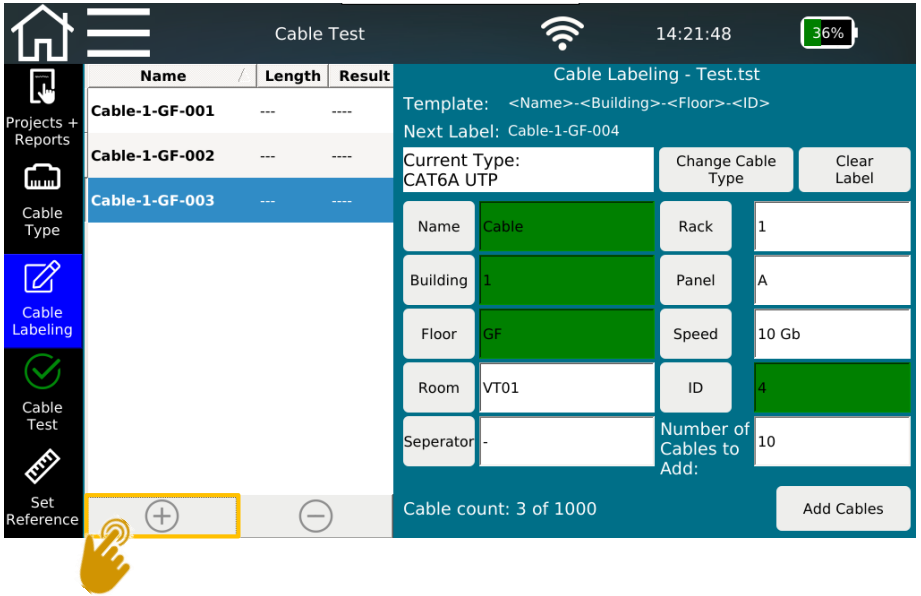

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- Or simply tap on the “+” button to add cables one by one

Process of a cable testing project

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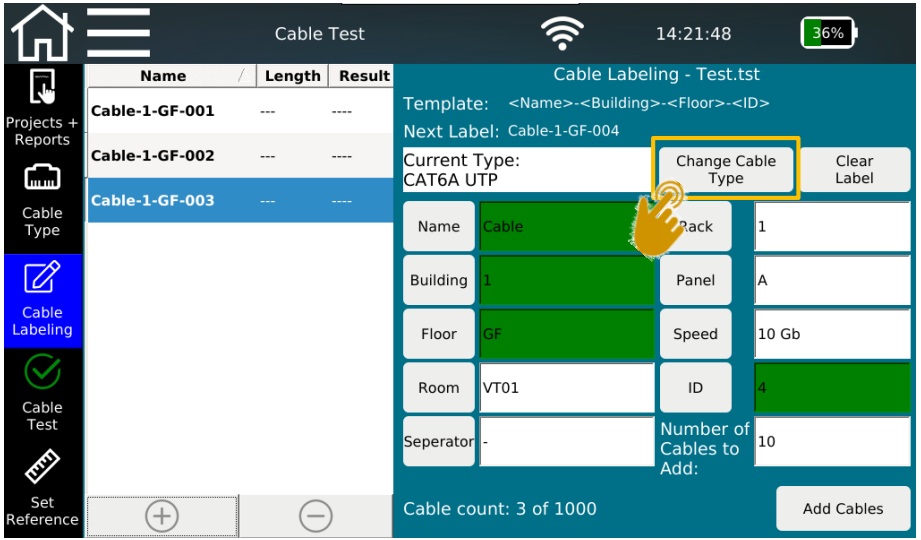

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- "ID" field (counter) can be positioned anywhere within the template
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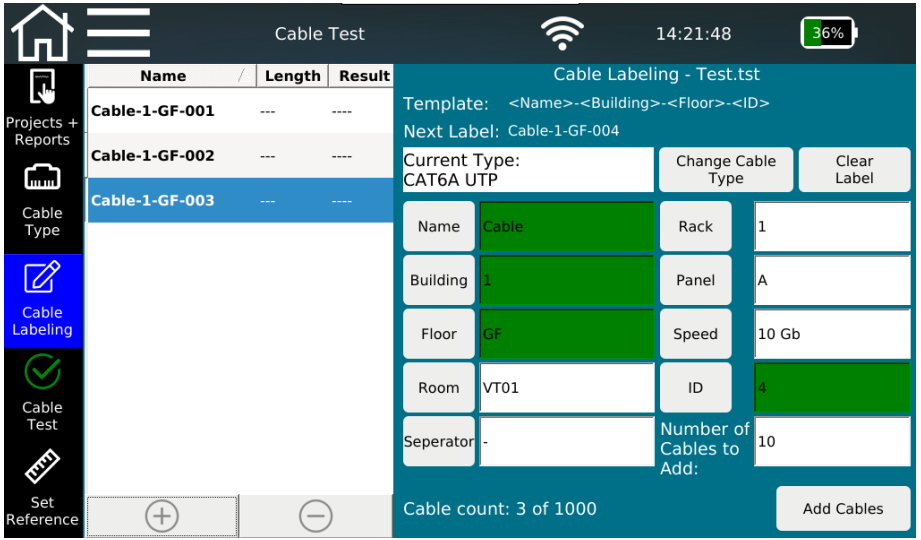
- Add cables by entering number of cables to be tested in the input field
- Or simply tap on the “+” button to add cables one by one
- Having any number of cable types is possible when creating new test lines
  - „Change cable type "jumps back to the previous menu and allows selection of another test standard
  - Cable type can no longer be changed for already created or measured test lines

Process of a cable testing project

Setting up a test list- Create names for cablings



- There will be an error message, if…
  - „ID“ field is not included in the name
  - No name field is selected and the template is empty

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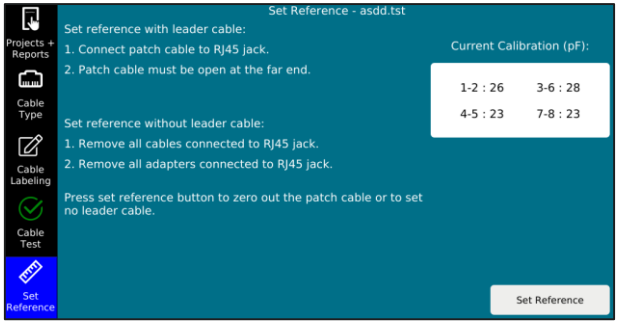
- Enter the names and values by pressing on the respective input field
- By tapping on the corresponding label button, the label parameter will turn green, which means the parameter will be used in the label name
- Separator can be used multiple times by tapping on it each time after selecting one parameter and “Next Label” will be updated accordingly.
- "ID" field (counter) can be positioned anywhere within the template
- “Clear Label” will clear the label template, but the names and values will not be cleared.
- Add cables by entering number of cables to be tested in the input field
- Or simply tap on the “+” button to add cables one by one
- Having any number of cable types is possible when creating new test lines
  - „Change cable type "jumps back to the previous menu and allows selection of another test standard
  - Cable type can no longer be changed for already created or measured test lines

Process of a cable testing project

Set reference for copper cable testing

- Increase the accuracy of the length determination
- Set reference without using patch cables
  - Remove all cables and adapters and tap on Set Reference
- Set reference without using patch cables
  - Connect reference cables only to the main unit
    - Connect both test cords by a coupler
    - Connect one end to the local tester and leave the other end open
    - Determination of capacity determines cable capacitance
    - Cable capacitance will be subtracted from the overall result later
    - Repeat the process, if you change the test cord



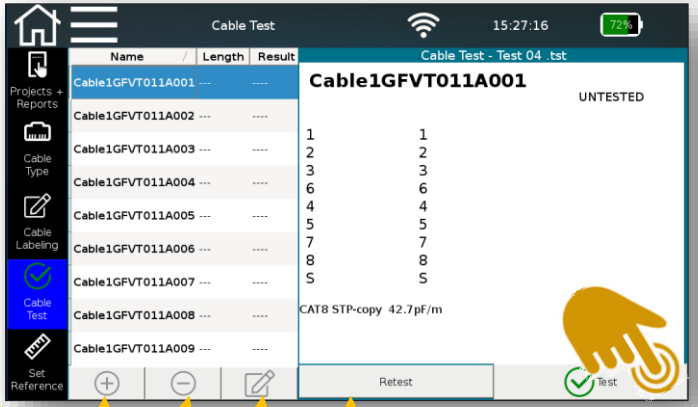
Process of a cable testing project

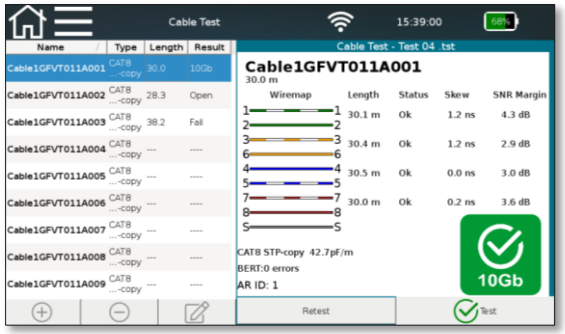
Performing a test for copper

- Test any listed cable in a random order
- Initiate a test by pressing the 

button
- Cancel a test run by pressing the 

button
- By pressing the test button, the next entry on the list will be tested
  - If the end of the list is reached, a new entry will be created automatically
- When a new test list is created, it is permanently connected with test standards
  - If the test standard is wrong…
    - Delete incorrect list entries
    - Correct the test standard in the previous menu
    - Recreate the test list





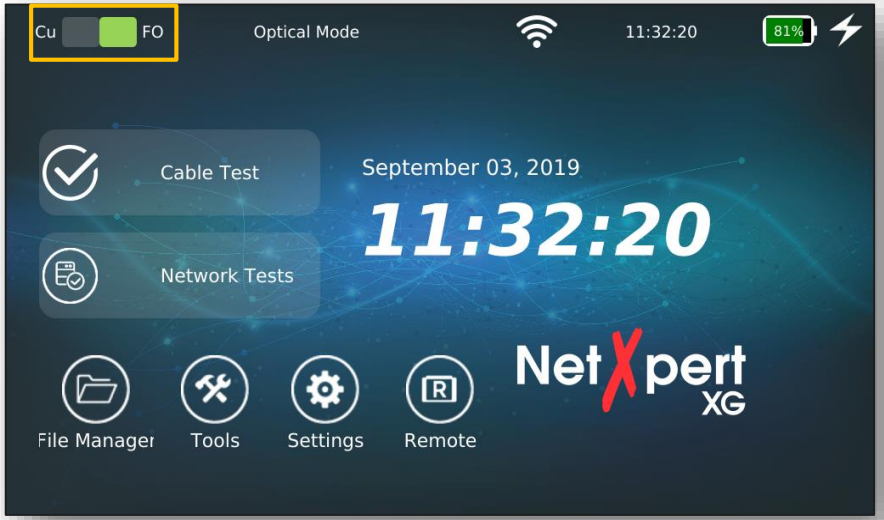
Repeat the test by pressing "retest“

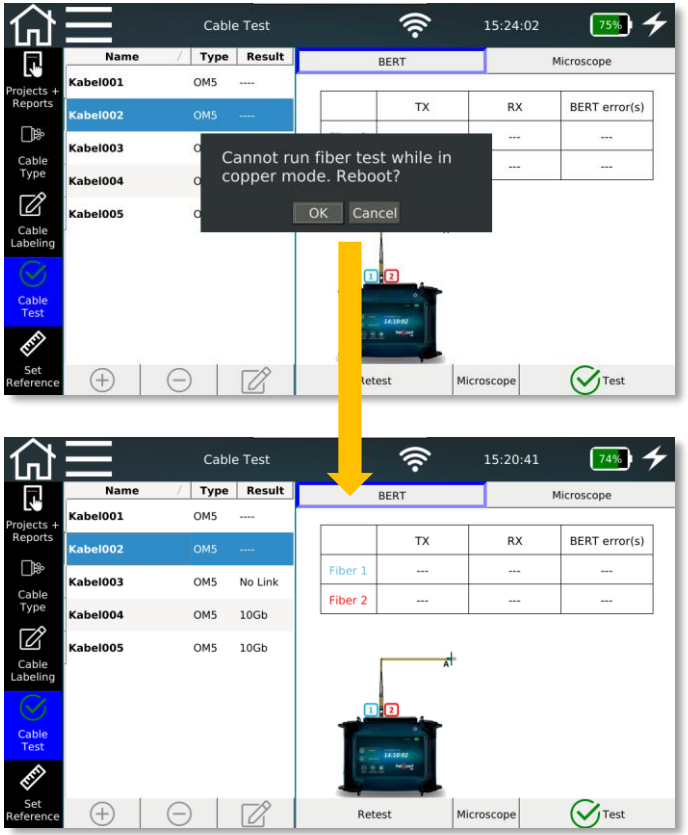
- Editing the cable name later is possible
- Adding and deleting cable names is also possible here

Process of a cable testing project

Performing a test for fiber

- If the media to be tested is changed, a confirmation message appears to change the mode of the unit.
- Mode of the unit can be changed on the main screen as well.

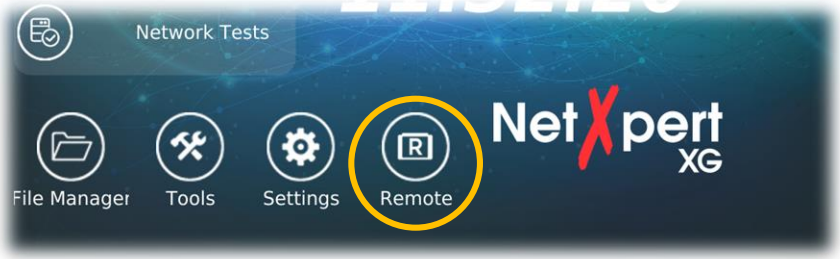


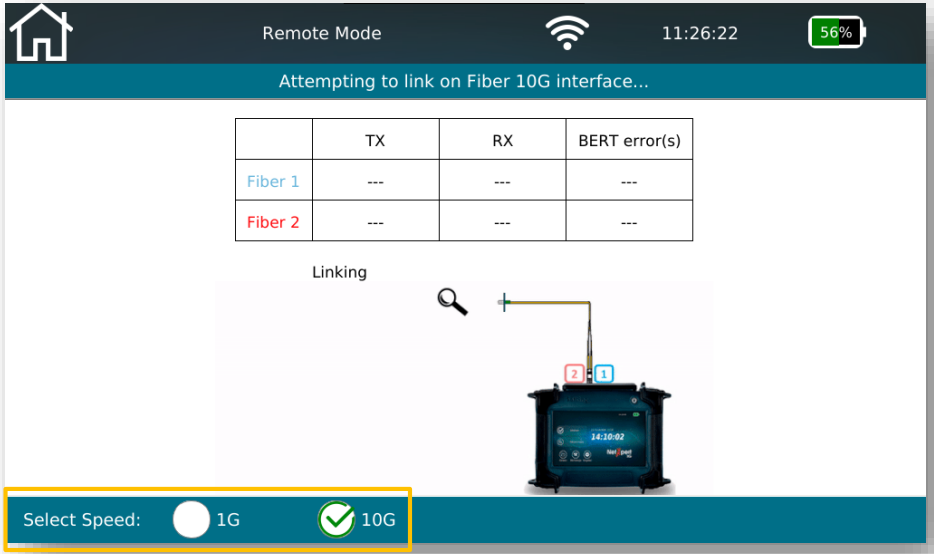


Process of a cable testing project

Performing a test for fiber

- Switch to fiber mode on both units and assign one of the units as remote by tapping on the remote icon on the main screen
- Mode of the unit can be changed on the main screen as well.
- Assign one of the main units as remote and select desired test speed on the remote screen
  - Hint: Makes sure to have the correct remote unit to perform the desired test





- Copper mode:
  Standard active remote
- Optical mode
  Second main unit
  in remote mode

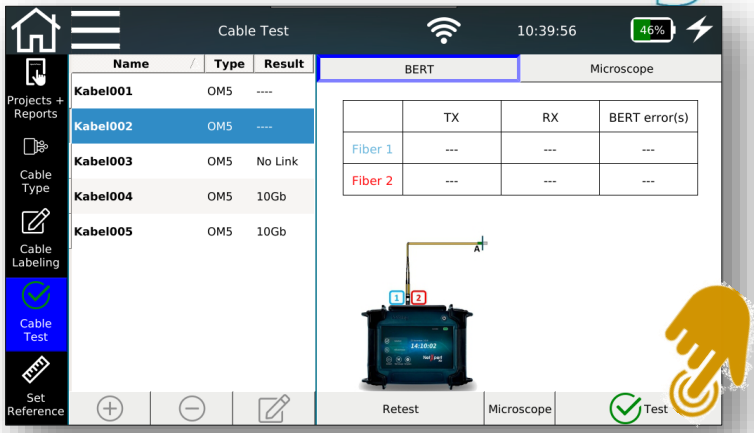
Process of a cable testing project

Performing a test for fiber

- Test any listed cable in a random order
- Initiate a test by pressing the 

button
- Cancel a test run by pressing the 

button
- By pressing the test button, the next entry on the list will be tested
  - If the end of the list is reached, a new entry will be created automatically
- When a new test list is created, it is permanently connected with test standards
  - If the test standard is wrong…
    - Delete incorrect list entries
    - Correct the test standard in the previous menu
    - Recreate the test list

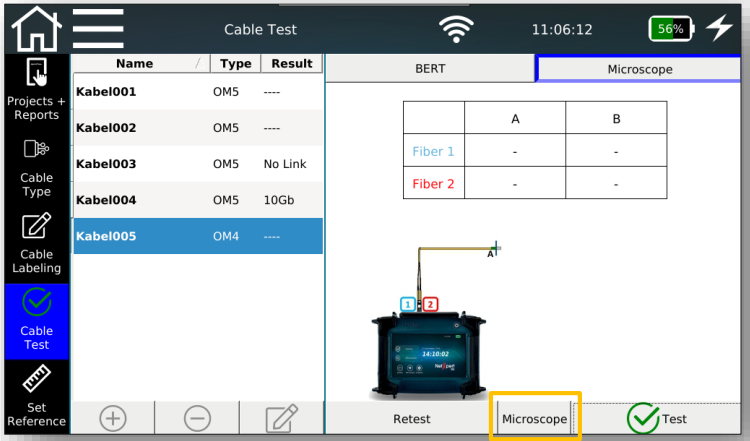


- Repeat the test by pressing "retest“
- Editing the cable name later is possible
- Adding and deleting cable names is also possible here

Process of a cable testing project

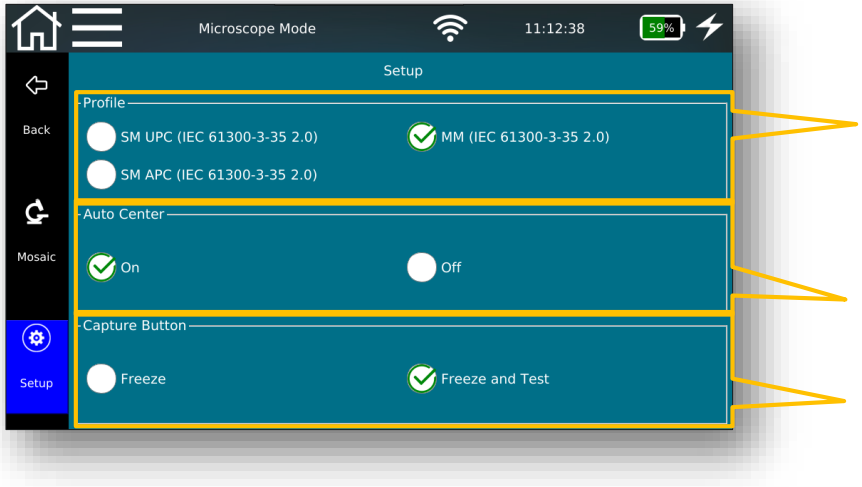
Performing a microscope test

- Prior to a qualification test, control and evaluation of the connector end-surfaces should be performed and saved using a video microscope
- Only informative evaluation according to IEC 61300-3-35 edition 2.0
- Automatic integration into test data and reports
- Enter the microscope menu via button Microscope
- Use the appropriate Softing Microscope (T / N 226539) with the appropriate probes



Process of a cable testing project
Performing a microscope test

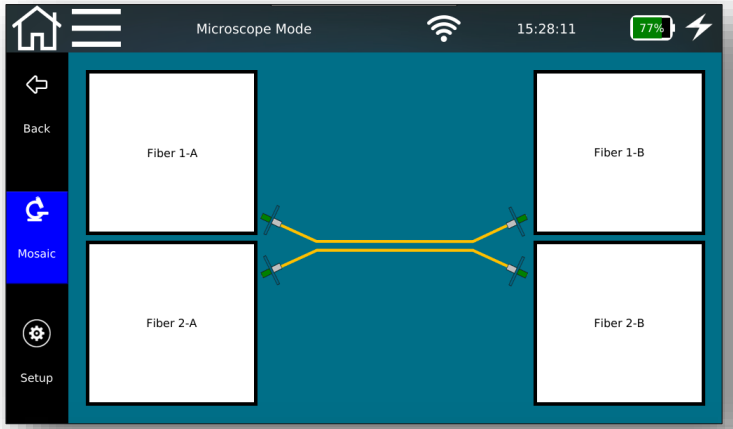
- Before you perform a test using a microscope, check the correct settings and the corresponding hardware
- Select via the **Setup** button in the microscope menu

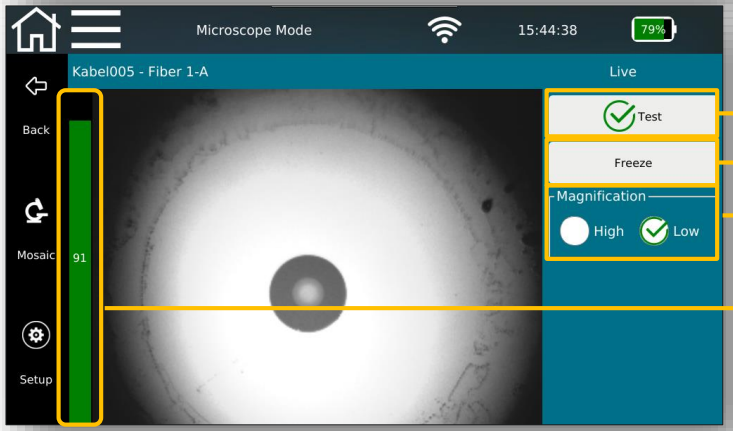


- Make sure to select the right profile before running your test.
  - Ultra physical contact singlemode connector (SM UPC ...)
  - Angle-polished singlemode connector (SM APC ...)
  - Multimode connector (default setting)
  - Make sure to have the correct adapter on the microscope
- Auto center locates the core of the fiber automatically
- It defines the function of the capture button on the microscope

Process of a cable testing project

Performing a microscope test

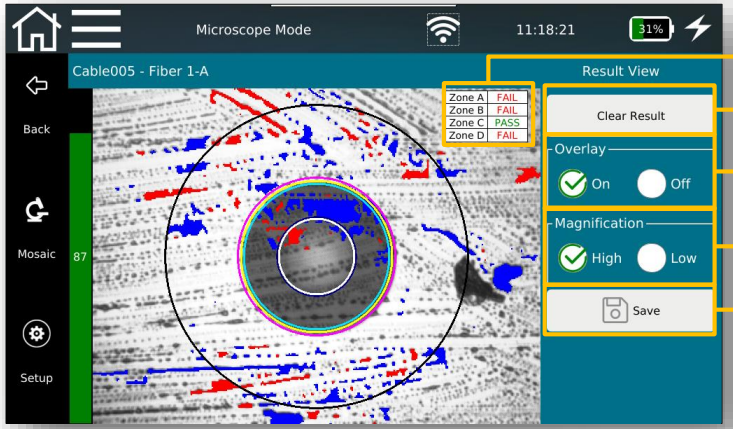


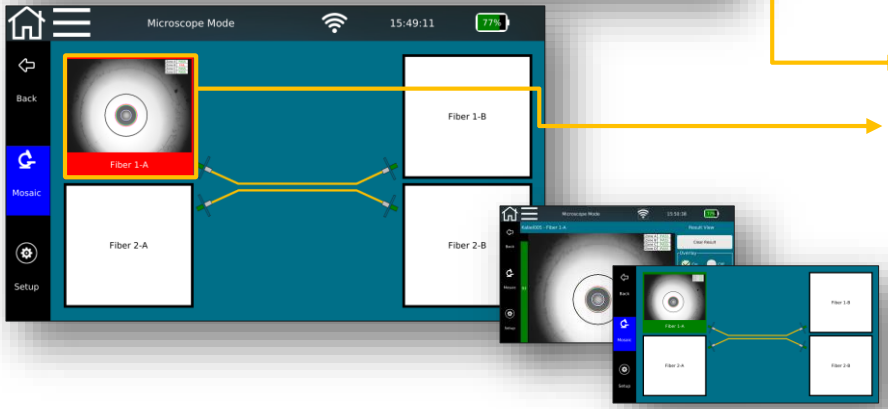


- Mosaic menu shows an overview of the connecter end-faces
- The connecter end-faces are pre-labeled and illustrated to help users identify the connecter ends.
  „1“ and „2“ refers to two fiber cables under test and „A“ and „B“ refers to the two sides of the cable.
- Initiates a microscope test with a pass/fail evaluation
- Freezes the microscope screen without evaluation
- Allows users change magnification to better locate dirt or scratch on the connector end-face
- Focus bar increases or decreases by adjusting the focus wheel on the microscope. Focus must be over 50% to be able to run a test with a pass/fail evaluation

Process of a cable testing project

Performing a microscope test

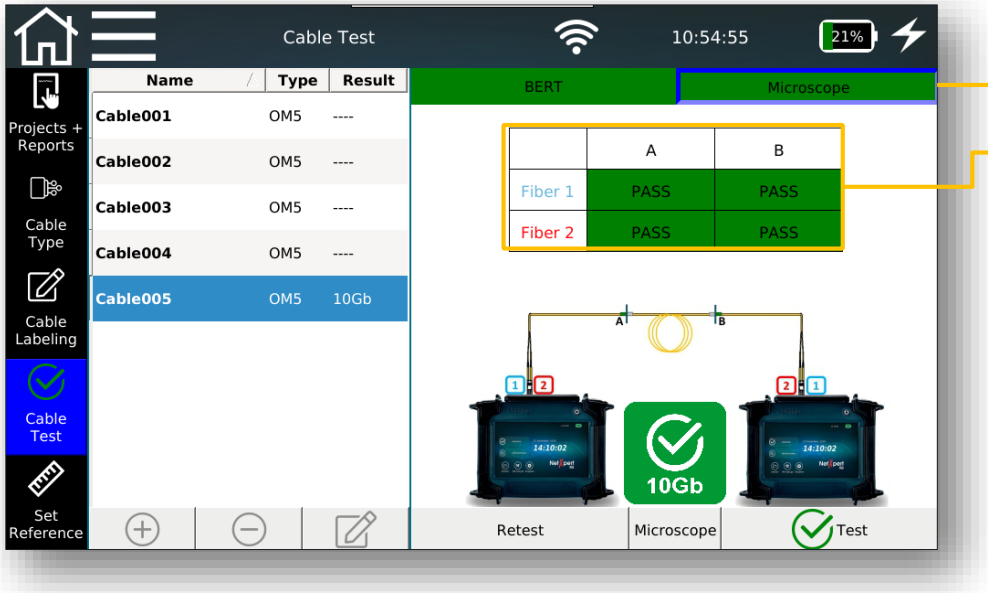




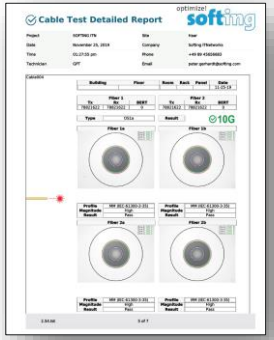
- Shows pass/fail evaluation for each zone of the connecter end-face as defined in the international standards IEC 61300-3-35 (2.0)
- Clears the result and switches back to the live view
- Removes overlay together with the evaluation table to have a better view of the connecter end-face
- Allows users change magnification to better locate dirt or scratch on the connector end-face
- Saves the result
- Background color shows the result of the microscope test
  - Red background indicates the evaluation of the connecter end-face has failed. There could be a dirt or scratch on the connector end-face. Clean the surface or change the connecter
  - Green background means that the connecter end-face is clean and undamaged. Qualification test (BERT) can be performed.

Process of a cable testing project

Performing a microscope test



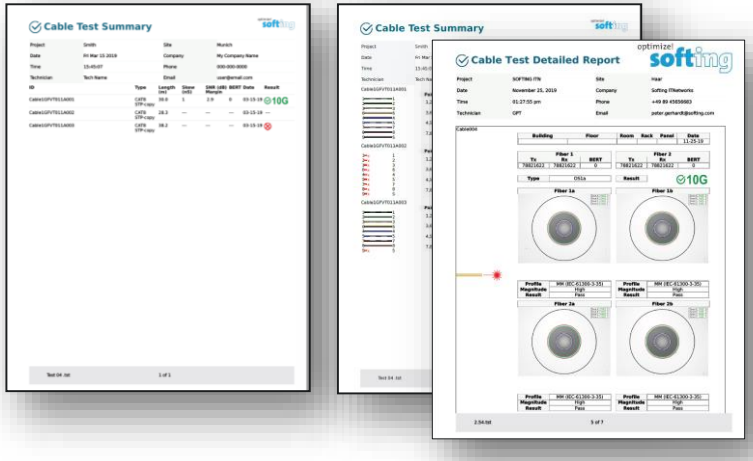
- Microscope tab turns to green, if all connecter end-faces have a pass.
- Overview of all connecter end-faces of two fiber cables that are under test
- If all connecter end-faces are tested, the result will be added to the qualification (BERT) test in the report.

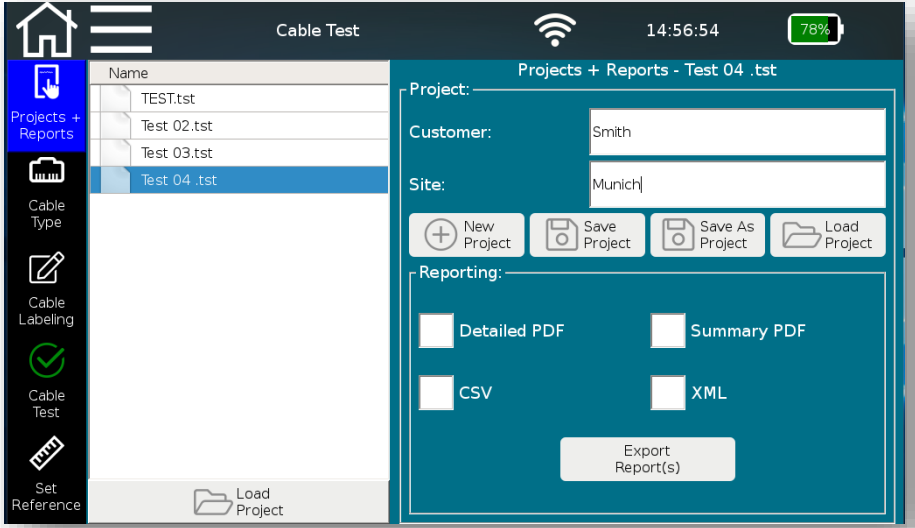


❖ Microscope test is only informative and does not have any effect on the overall speed qualification of the fiber cable.

Process of a cable testing project
Reporting

- Internal documentation
  - PDF summary
  - PDF details – summary and details
  - CSV – open format, e.g. editing on Excel
  - XML – exchange format with eXport
- Reports can be generated after completion or during project processing





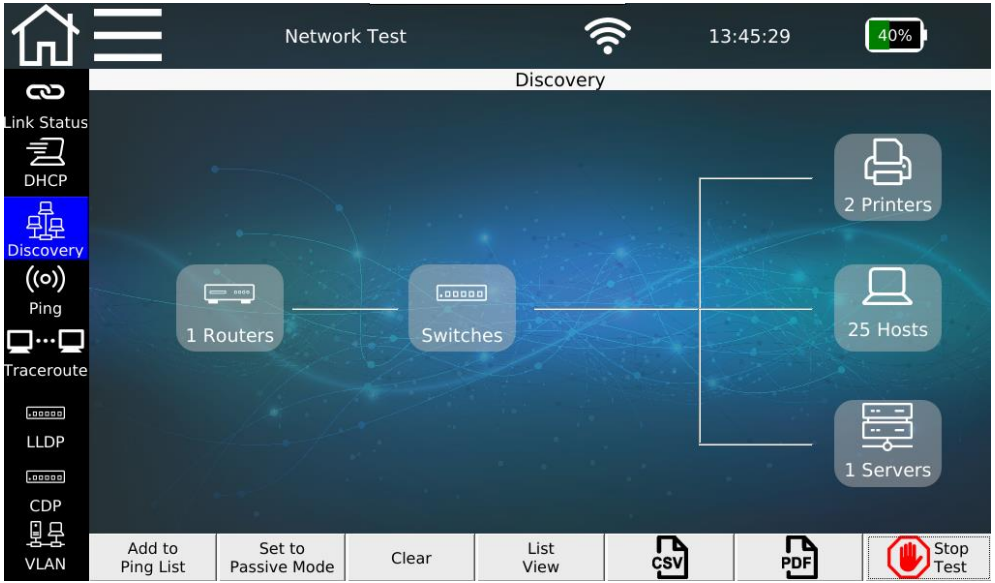
- Creation of documentation in the device automatically
  - Selection of one or more output formats
  - "Export Report (s)" to initiate internal report generation

Table of contents

„Network Tests“ function

Simple diagnosis of an active network

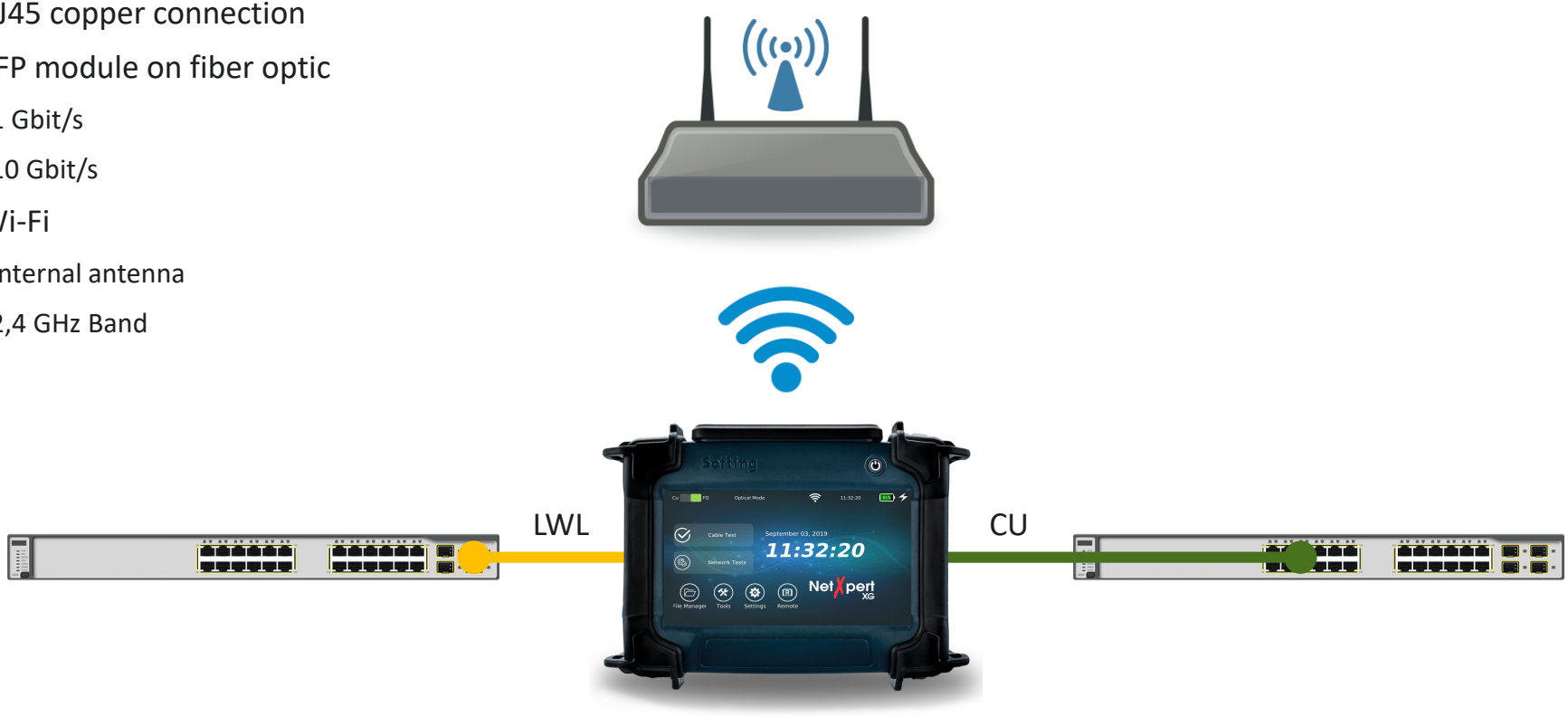
- General
  - Supported media
    - Copper, fiber optic and Wi-Fi
  - IPv4/IPv6 support
- Available Ethernet speed
  - 100 Mb / 1 Gb Ethernet
    - All models
  - 100Mb and 1/2,5/5 Gb Ethernet
    - Model „NX_XG_10G / 226552“ and „NX_XG_25_5G / 226553“
  - 100Mb and 1/2,5/5/10 Gb Ethernet
    - Model „NX_XG_10G / 226552“
  - Upgrade of all models up to 10 Gb Ethernet is possible with license key



„Network Tests“ function

Test setup

- Via RJ45 copper connection
- Via SFP module on fiber optic
  - 1 Gbit/s
  - 10 Gbit/s
- Via Wi-Fi
  - Internal antenna
  - 2,4 GHz Band



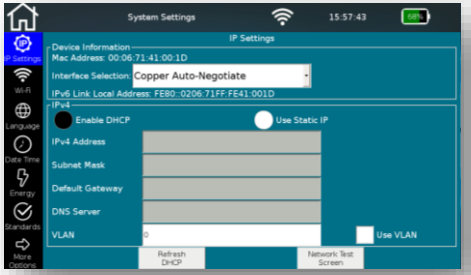
„Network Tests“ function

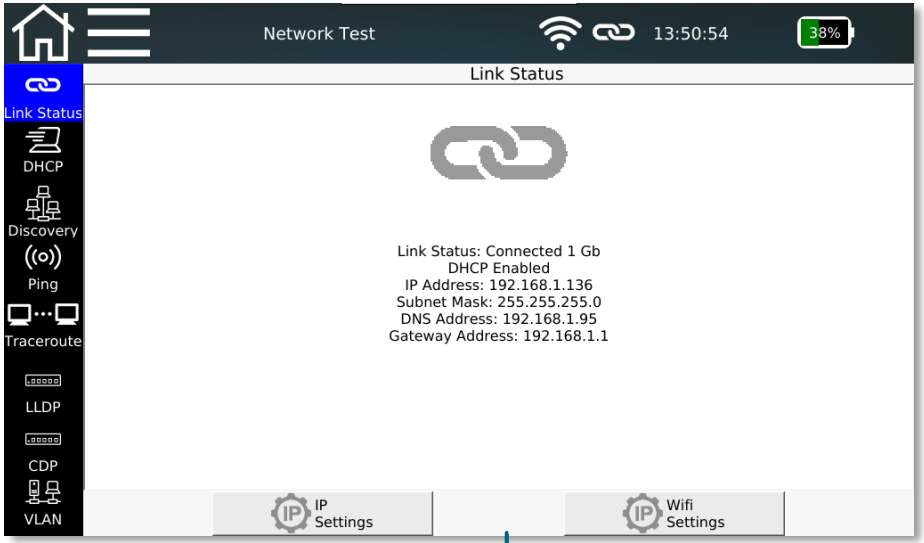
Test parameters

- Link-Status
  - Establishing connection with Switch via DHCP or fixed addressing
- DHCP-Test
  - Establishing a connection via dynamic addressing with output of the connection data
- Discovery
  - Search for stations in the network and categorization by device class
- Pinging specific addresses and address lists
  - Manual entry or transferring the address from network discovery function
  - Internal addresses or external URLs
- Traceroute
  - Step by step target tracking
- CDP und LLDP protocol detection
  - Exchange of connection information
- VLAN detection
  - Tagging after IEEE 802.1q

„Network Tests“ function
Test parameters

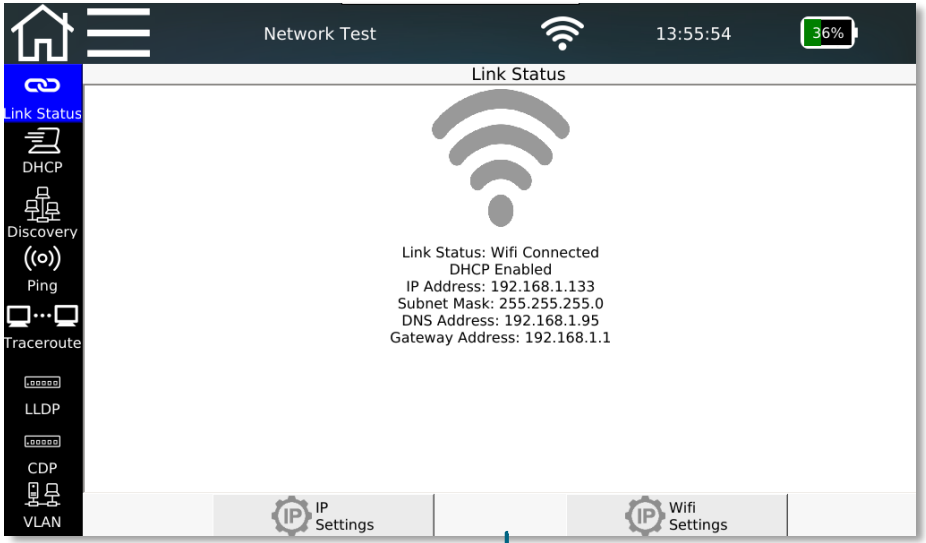
- Link Status
  - Establishing connection with Switch via DHCP or fixed addressing
  - Output of connection details

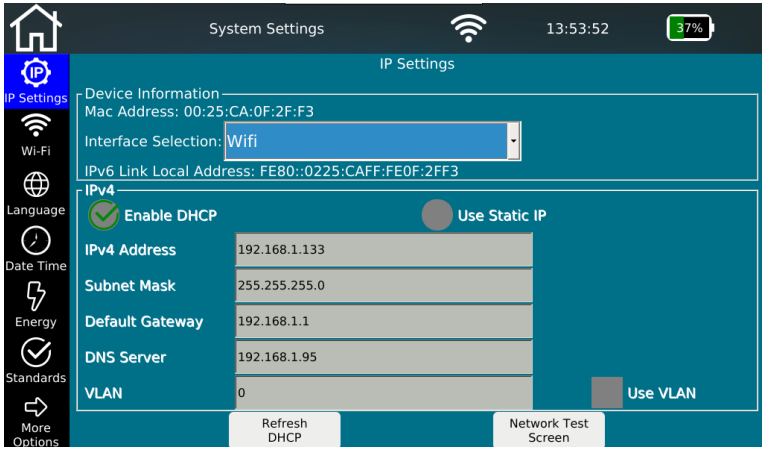




„Network Tests“ function
Test parameters

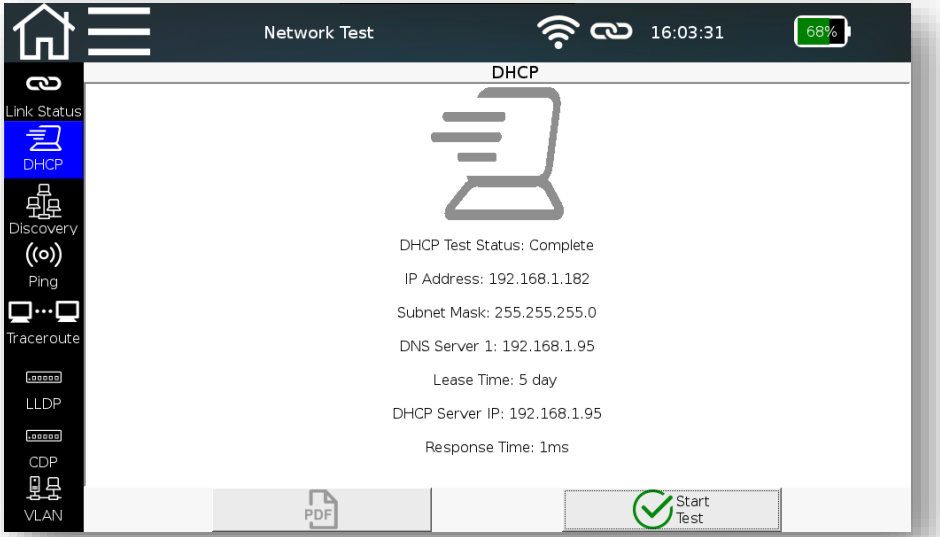
- Link Status (Wi-Fi Connection)
  - Establishing connection with Switch via DHCP or fixed addressing
  - Output of connection details

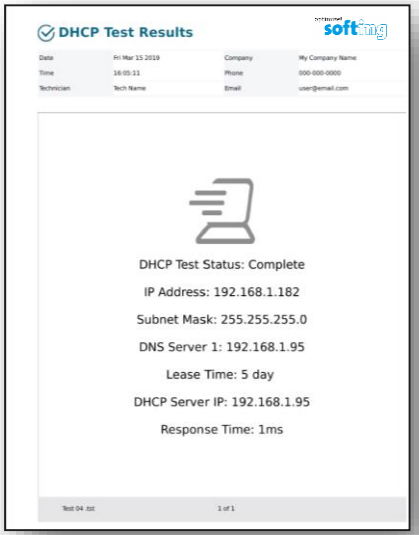




„Network Tests“ function
Test parameters

- DHCP-Test
  - Establishing a connection via dynamic addressing with output of the connection data
  - It can be documented as PDF report

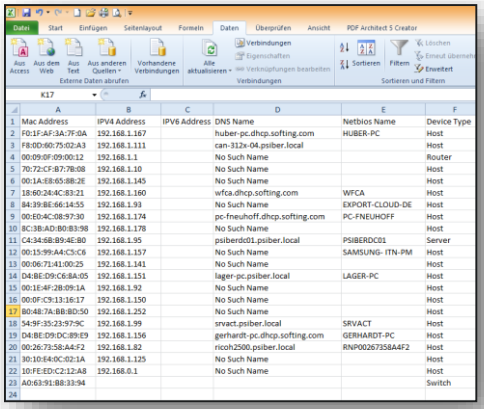


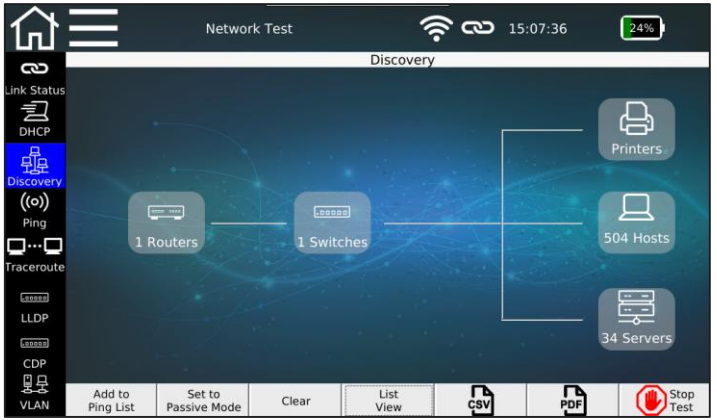


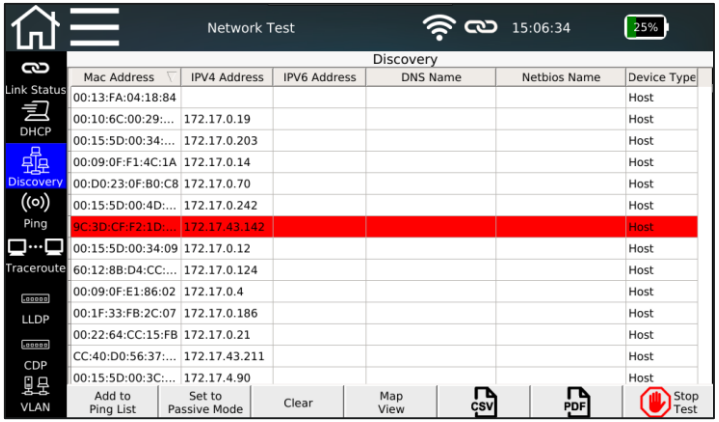
„Network Tests“ function

Test parameters

- Network discovery
  - Search for stations in the network and categorization by device class (active or passive mode)
  - Graphical or tabular layout
  - DNS resolution
  - Selectable addresses for ping list
  - Duplicate IP addresses will be marked in red
  - Documentable as PDF report or CSV export

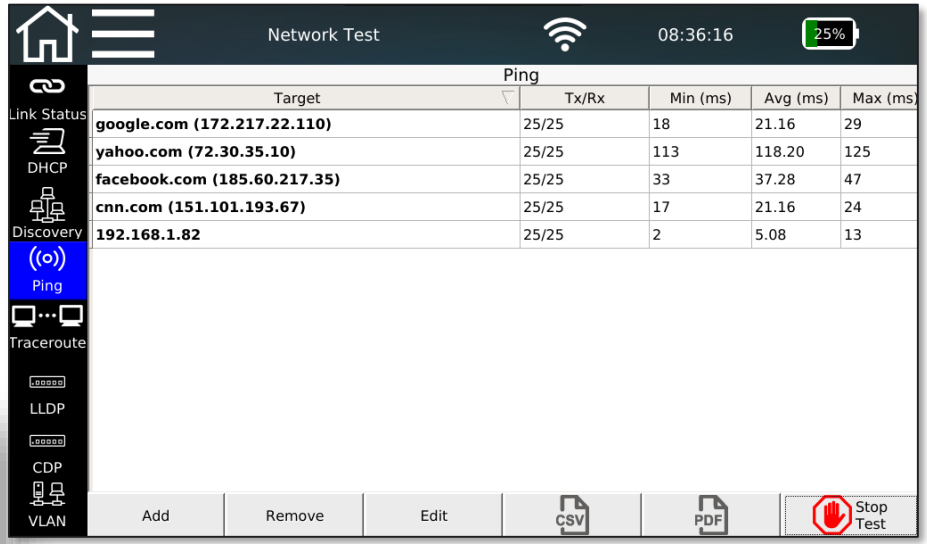


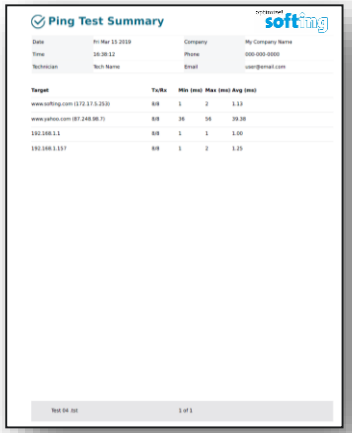


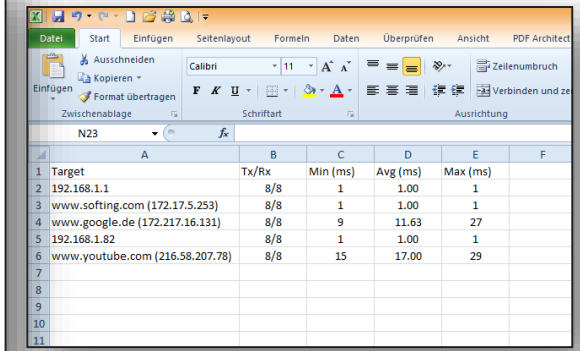


„Network Tests“ function
Test parameters

- Pinging specific addresses and address lists
  - Manual entry or transferring the address from network discovery function
  - Internal addresses or external URLs
  - Documentable as PDF report or CSV export



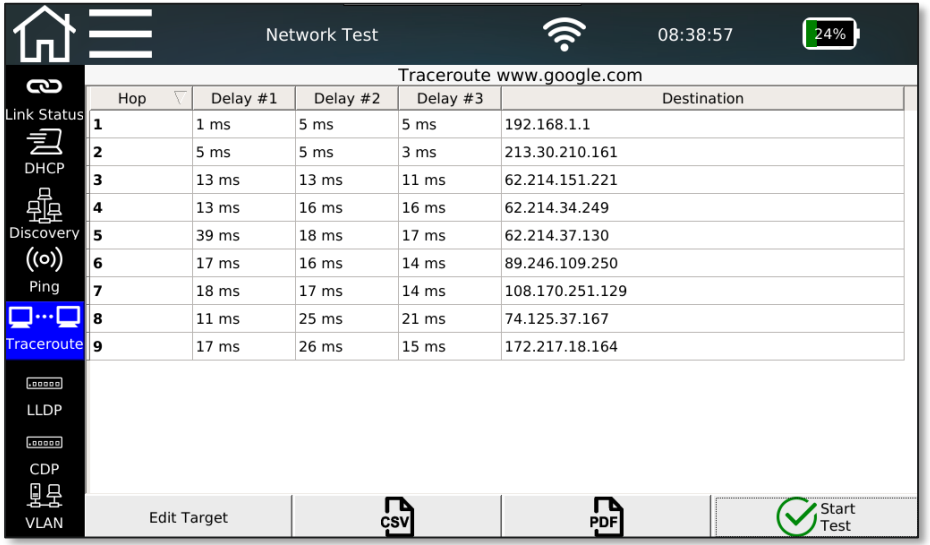




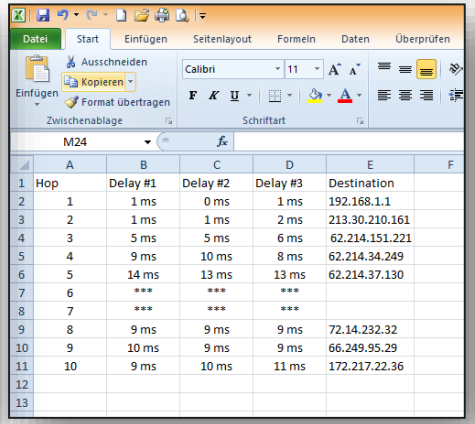
	A	B	C	D	E	F
1	Target	Tx/Rx	Min (ms)	Avg (ms)	Max (ms)	
2	192.168.1.1	8/8	1	1.00	1	
3	www.softing.com (172.17.5.253)	8/8	1	1.00	1	
4	www.google.de (172.217.16.131)	8/8	9	11.63	27	
5	192.168.1.82	8/8	1	1.00	1	
6	www.youtube.com (216.58.207.78)	8/8	15	17.00	29	
7						
8						
9						
10						
11						

„Network Tests“ function
Test parameters

- Traceroute
  - Step by step target tracking
  - Localization of interruptions in the path
    - Internal problem
    - Provider problem
  - Documentable as PDF report or CSV export



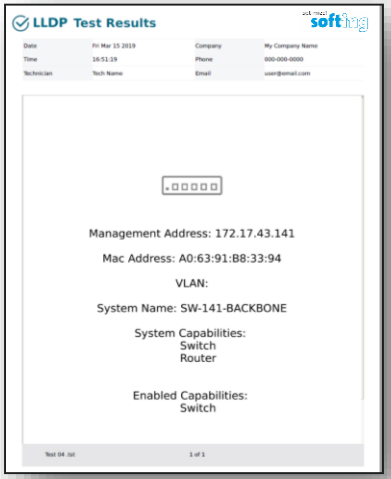
Hop	Delay #1	Delay #2	Delay #3	Destination
1	1 ms	5 ms	5 ms	192.168.1.1
2	5 ms	5 ms	3 ms	213.30.210.161
3	13 ms	13 ms	11 ms	62.214.151.221
4	13 ms	16 ms	16 ms	62.214.34.249
5	39 ms	18 ms	17 ms	62.214.37.130
6	17 ms	16 ms	14 ms	89.246.109.250
7	18 ms	17 ms	14 ms	108.170.251.129
8	11 ms	25 ms	21 ms	74.125.37.167
9	17 ms	26 ms	15 ms	172.217.18.164

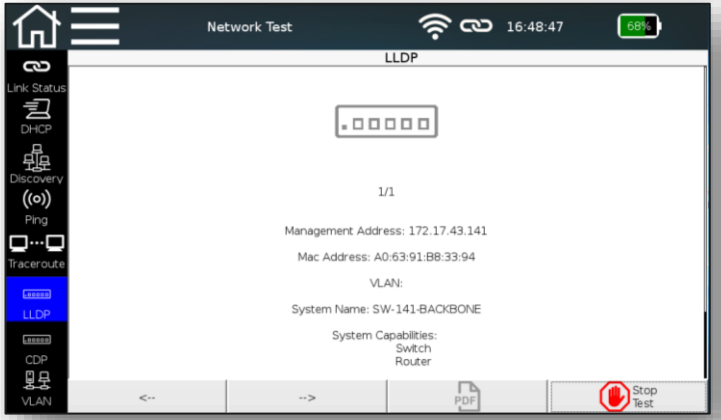


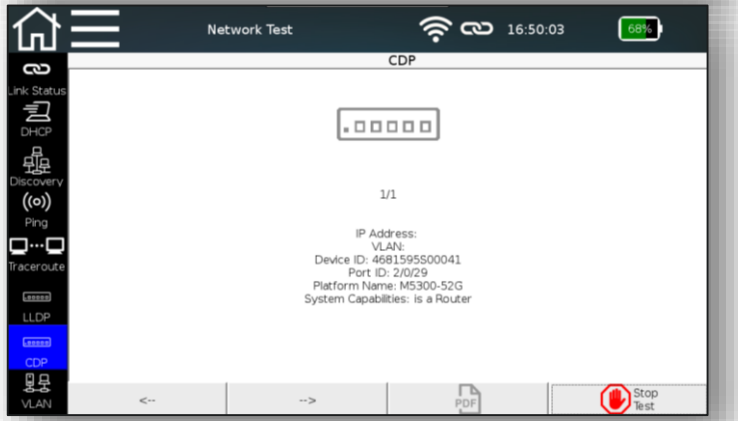
Hop	Delay #1	Delay #2	Delay #3	Destination
1	1 ms	0 ms	1 ms	192.168.1.1
2	1 ms	1 ms	2 ms	213.30.210.161
3	5 ms	5 ms	6 ms	62.214.151.221
4	9 ms	10 ms	8 ms	62.214.34.249
5	14 ms	13 ms	13 ms	62.214.37.130
6	***	***	***	
7	***	***	***	
8	9 ms	9 ms	9 ms	72.14.232.32
9	10 ms	9 ms	9 ms	66.249.95.29
10	9 ms	10 ms	11 ms	172.217.22.36

„Network Tests“ function
Test parameters

- Protocol detection
  - LLDP – Link Layer Discovery Protocol
  - CDP – Cisco Discovery Protocol
  - Exchange of connection information
  - In some applications important for mapping
  - Documentable as PDF

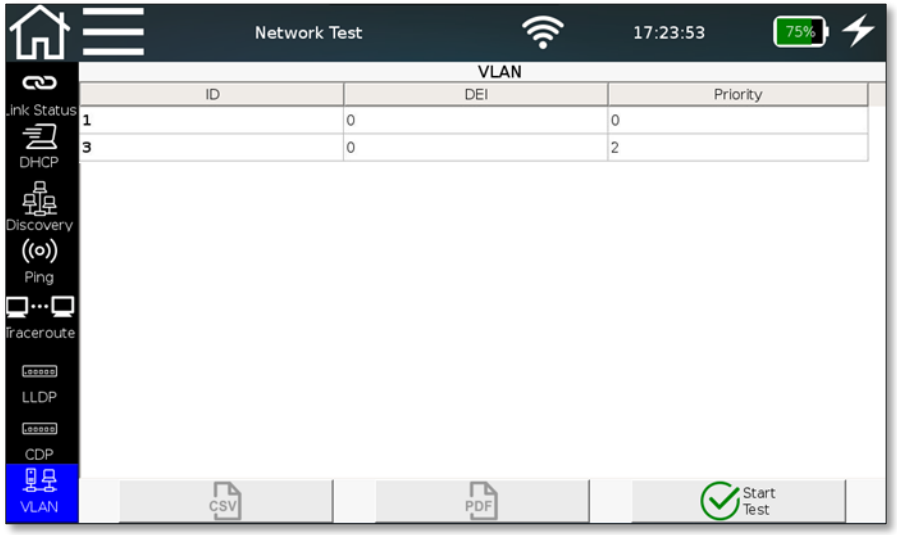


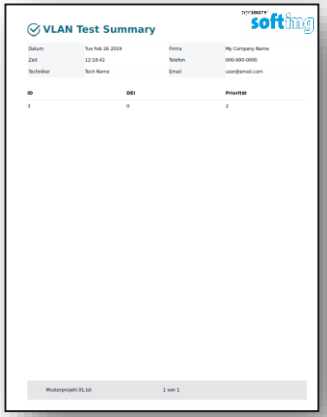


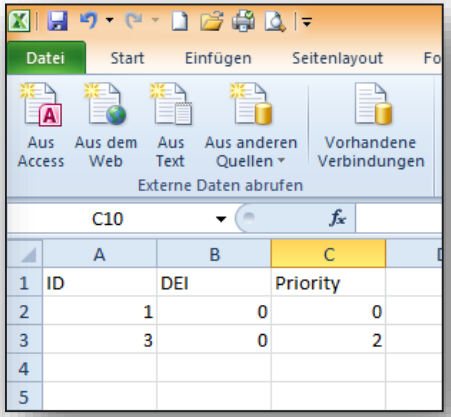


„Network Tests“ function
Test parameters

- VLAN detection
  - Tagging after IEEE 802.1q
  - Output of
    - ID – Number of the VLAN
    - DEI – Drop Eligible Indicator: Can be used to indicate that frames can be dropped in the presence of network congestions (formerly CFI).
    - Priority – User priority information
  - Documentable as PDF report or CSV export







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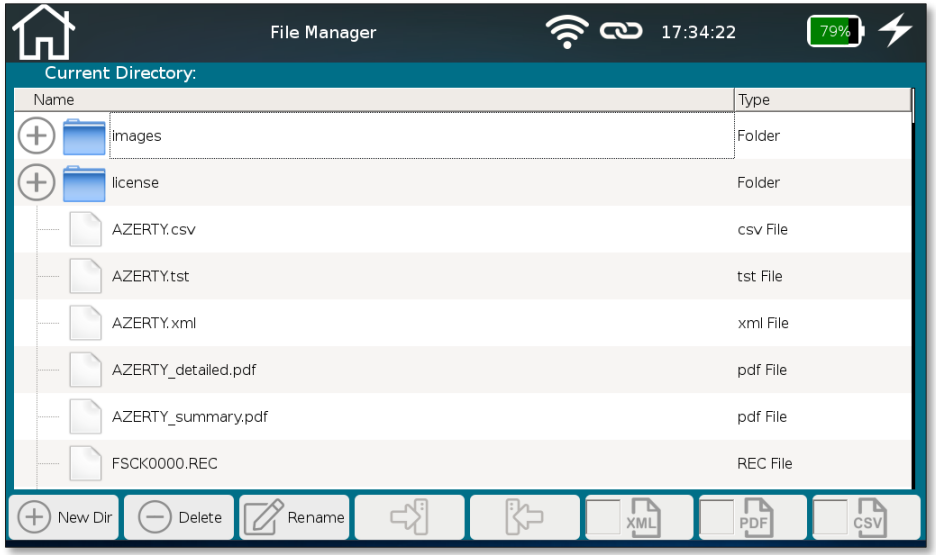
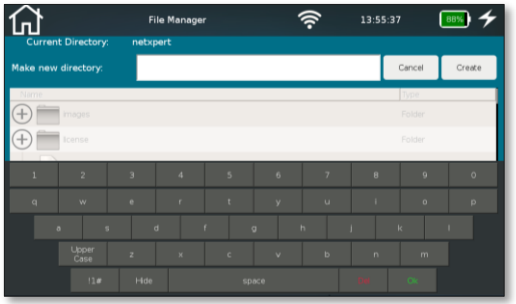
„File Manager“ menu

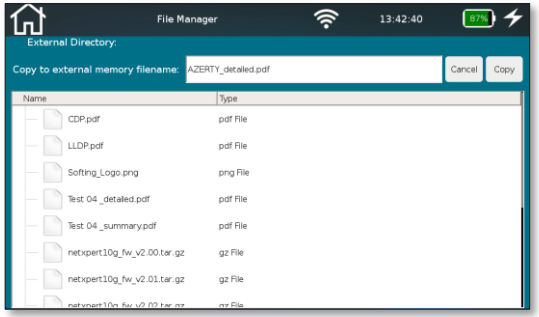
- Management of different file types
  - Original test data ending with "*.tst"
  - Test protocols for direct transfer via PDF format
    - Summary
    - Detailed
  - Test data as open „CSV“ format
    - Further processing e.g. on MS-Excel
    - Integration in network administration programs
  - Data exchange with eXport data management software via XML format (in progress)
  - Delete and rename existing files
- Switchable format filters make it easier to see an overview



„File Manager“ menu

- Create your own project structures
- Import/download…
  - external test data from eXport data management software
  - Firmware updates
  - Logos to use on reports
- Data exchange between internal memory and external medium via USB stick (micro-USB adapter is included)
  - Possibility to change the file name when copying
  - Please connect the USB flash drive with the adapter cable before inserting it to the main unit!





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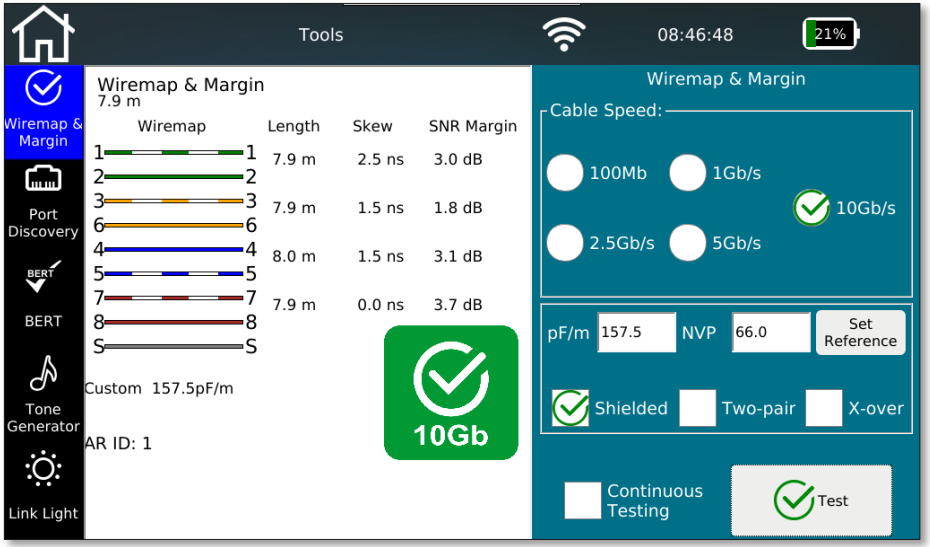
Copper „Tools“ menu
General

- Additional functions
  - Wiremap and margin
  - Port discovery
  - BERT
  - Tone Generator
  - Link Light

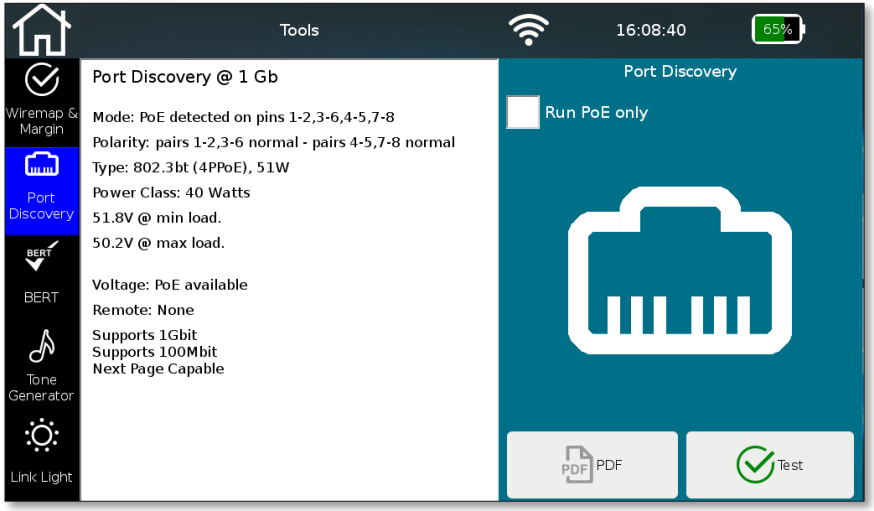
Copper „Tools“ menu
Wiremap and margin

- Passive single test
  - Wiremap test
    - Length determination
    - Error output
  - Performance test
    - Selectable Ethernet speed
- Cable wiring and shield freely selectable
  - Shielded / No shield
  - Straight / X-Over
  - Four pair / two pair
  - In case of a wrong selection, and error message will be displayed
- Continuous test
  - Locate loose contacts
  - Interruptions due to temporary events



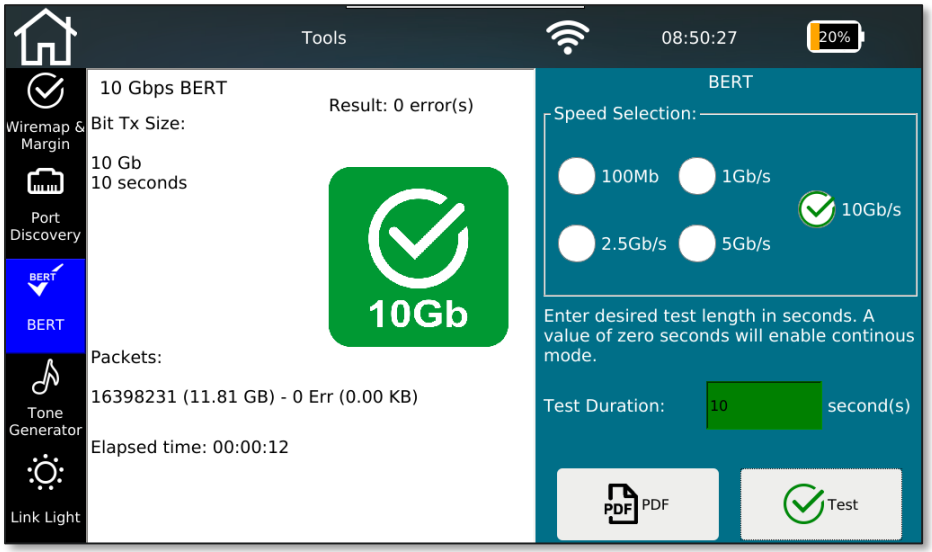
Copper „Tools“ menu
Port discovery

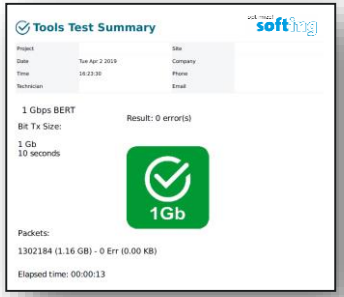
- Provides detailed information about the switch port
  - Ethernet speed of the current connection
  - Possible speeds of the port
- PoE evaluation (also as a single function)
  - Operating mode
  - Polarity
  - Type / power class
    - PoE / PoE+ /PoE ++
  - Voltage drop with or without load
  - Documentable as PDF



Cooper „Tools“ menu
Separate Bit Error Rate Test (BERT)

- Preset test times depending on selected Ethernet speed
  - Test times are based on statistical security (see table below, which is based on “required bit error rate” defined by IEEE)
  - Values can also be adjusted between 0 (continuous test) to 300 seconds
  - Evaluation via sent and received packets
  - Documentable as PDF

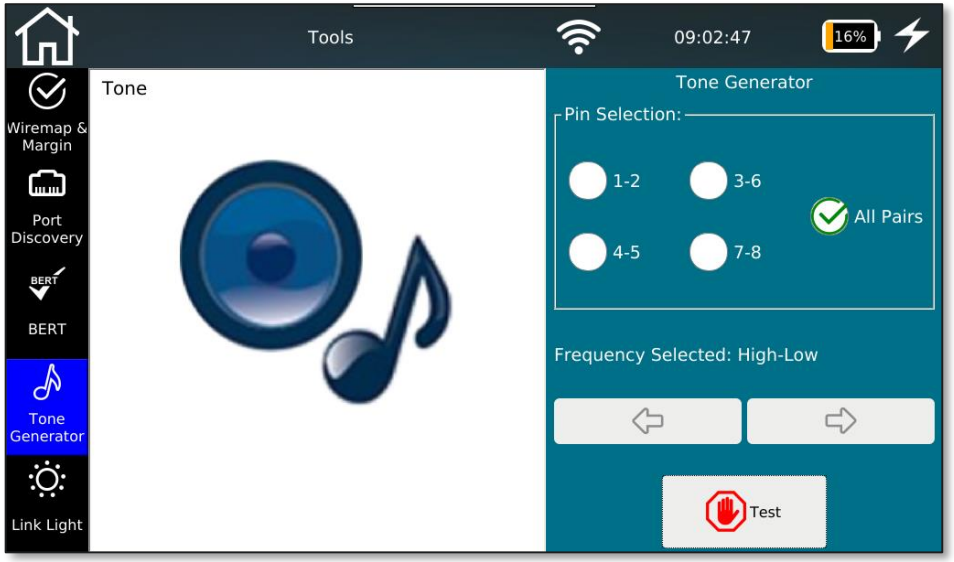




Transmission format	Standards reference	Required Bit Error Rate in standards reference	Test time for 10% confidence level	Test time for 63% confidence level	Test time for 95% confidence level
1G	IEEE Std 802.3ab	10^{-10}	1 second	10 seconds	30 seconds
2.5G	IEEE Std 802.3bz	10^{-12}	42 seconds	6 minutes 38 seconds	19 minutes 58 seconds
5G	IEEE Std 802.3bz	10^{-12}	21 seconds	3 minutes 19 seconds	9 minutes 59 seconds
10G	IEEE Std 802.3an	10^{-12}	11 seconds	1 minute 39 seconds	5 minutes 0 seconds

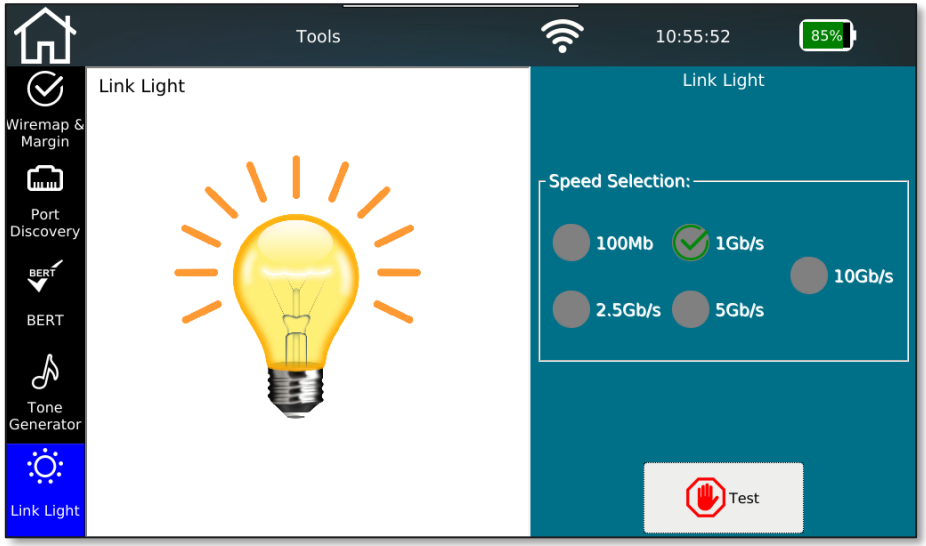
Copper „Tools“ menu
Ton generator

- Acoustic signaling
  - Signal pairs freely selectable
- Acceptance via any analog inductive receiver

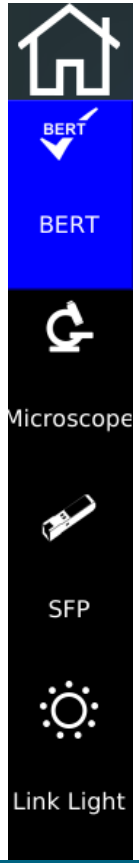


Copper „Tools“ menu
Link light

- Optical port detection on the switch
  - Localization of the connected switch port
  - Slow flashing link LED (0.5Hz)



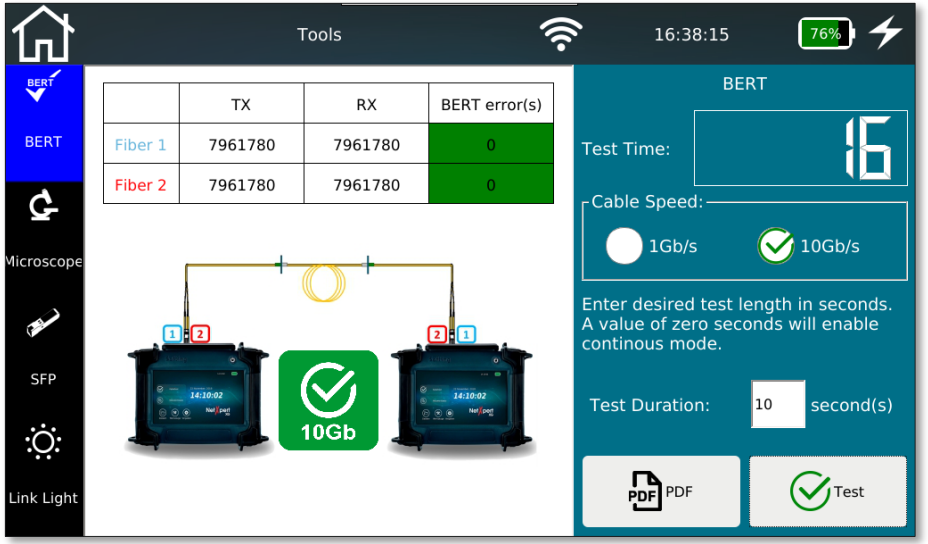
Fiber „Tools“ menu
General



- Additional functions
  - BERT
  - Microscope
  - SFP test (in progress)
  - Link Light

Fiber „Tools“ menu
BERT

- Preset test times depending on selected Ethernet speed
  - Test times are based on statistical security (see table below, which is based on “required bit error rate” defined by IEEE)
  - Values can also be adjusted between 0 (continuous test) to 300 seconds
  - Evaluation via sent and received packets
  - Documentable as PDF



Transmission format	Standards reference	Required Bit Error Rate in standards reference	Test time for 10% confidence level	Test time for 63% confidence level	Test time for 95% confidence level
1G	IEEE Std 802.3ab	10^{-10}	1 second	10 seconds	30 seconds
2.5G	IEEE Std 802.3bz	10^{-12}	42 seconds	6 minutes 38 seconds	19 minutes 58 seconds
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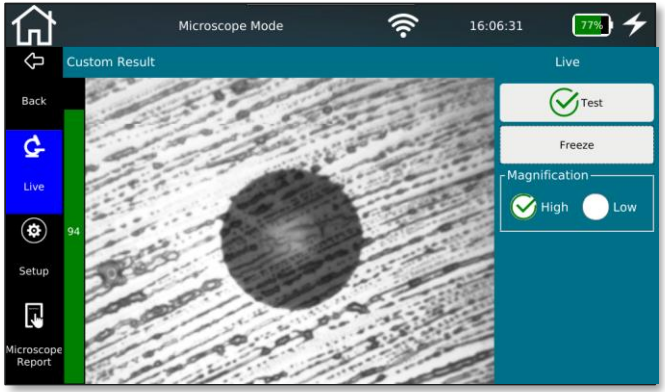
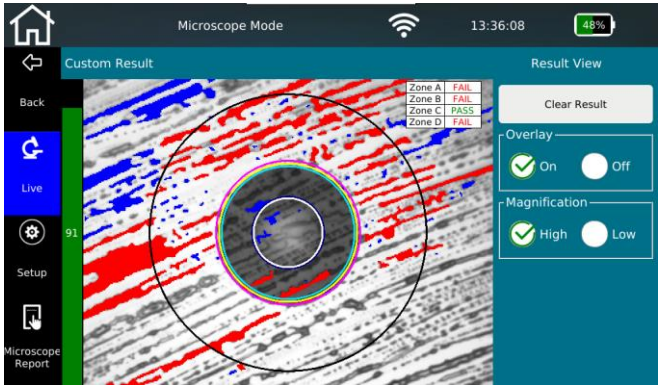
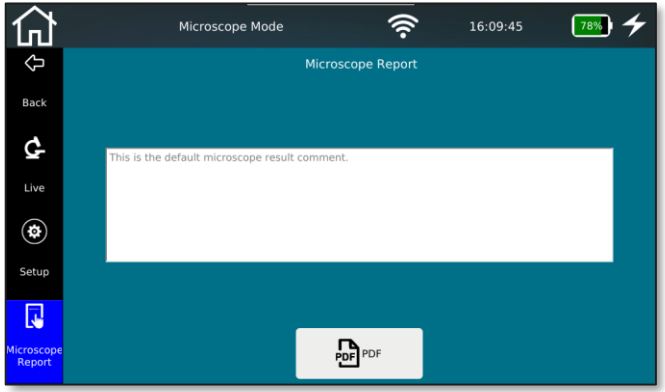
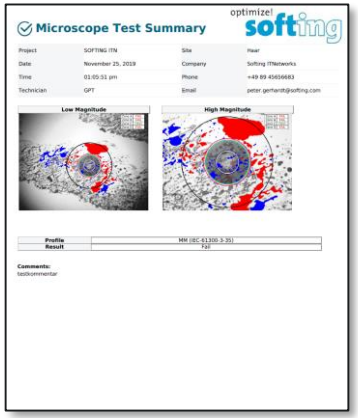
Fiber „Tools“ menu
Microscope



- Microscope results can be saved seperately under tools menu
- Results can be saved either with a pass/fail evaluation through test button or just as an image by tapping on the freeze button
- Comments can be added to each image, which will be documented in the PDF report as well

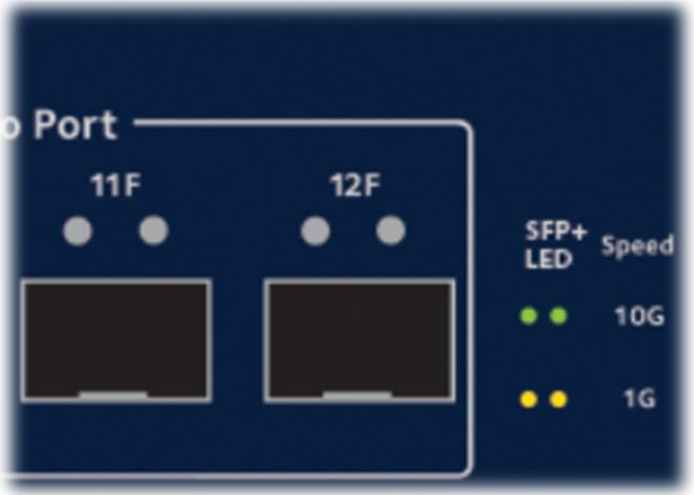


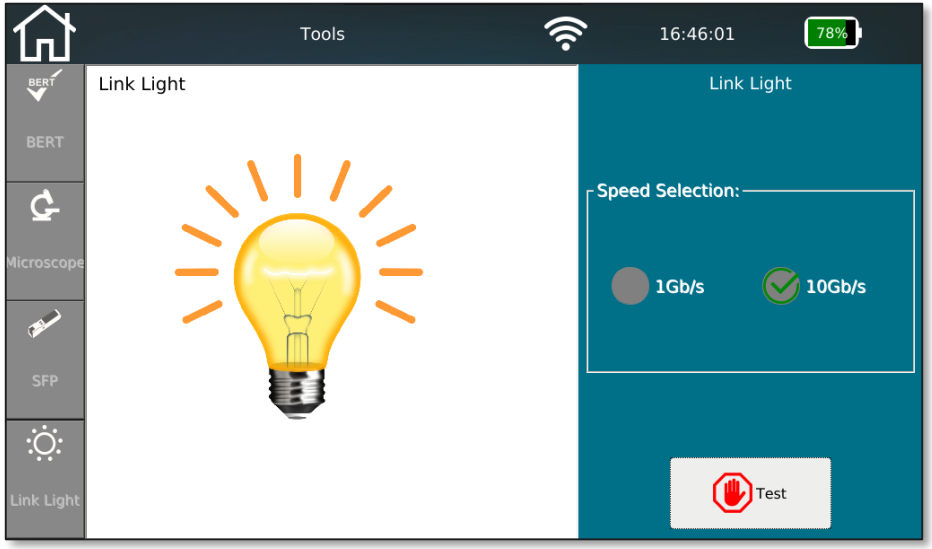




Fiber „Tools“ menu
Link light

- Optical port detection on the switch
  - Localization of the connected switch port
  - Slow flashing link LED (0.5Hz)





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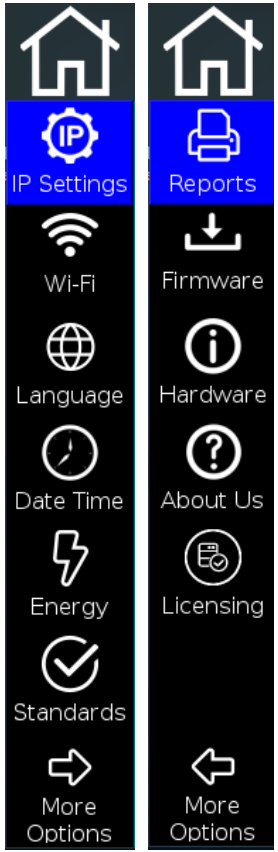
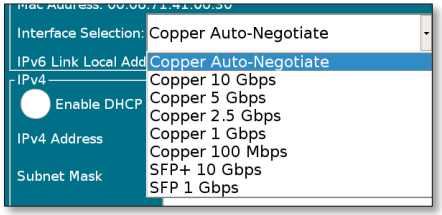
„Settings“ menu
General

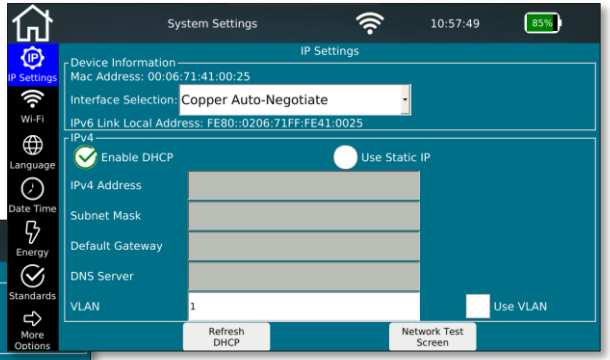


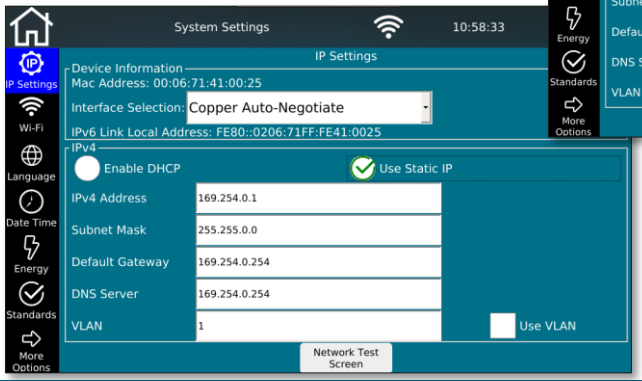
- Specify IP Details
- Wi-Fi scan and connection
- System settings
  - Language settings
  - Date/time
  - Energy saving options
  - Units (ft/m) and wiring standard (T568A/T568B) settings
- Header information and logo selection for report generation
- Info screens on
  - Installed firmware
  - Integrated hardware
  - Manufacturer contact details
  - Active licenses and upgrade options

„Settings“ menu
Specify IP Details

- Selecting interface for active tests
  - RJ45-Port for copper
    - Auto negotiation or fixed speed
  - „1GbE“ cage for fiber optic testing at 1 Gigabit Ethernet via optional SFP module
  - „10GbE“- cage for fiber optic testing at 1 Gigabit Ethernet via optional SFP+ module
    - After this selection, the device boots into a special mode
  - Wi-Fi
    - Wi-Fi connection with DHCP address assignment
    - Wi-Fi is enabled, only if the unit is connected to a network
- Additional device information for integration into an active network
  - MAC address
  - IPv6 Link local adress
- IPv4 address assignment
  - Via DHCP or
  - Manual input
  - Optional activation of VLAN function

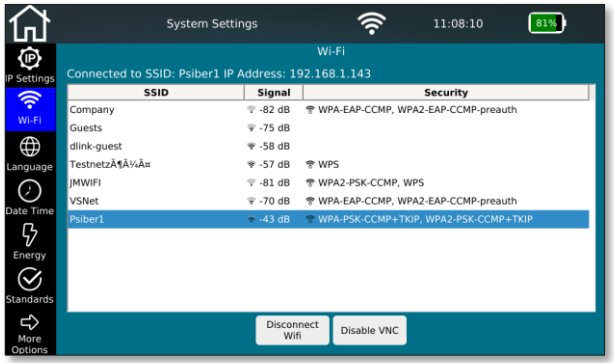


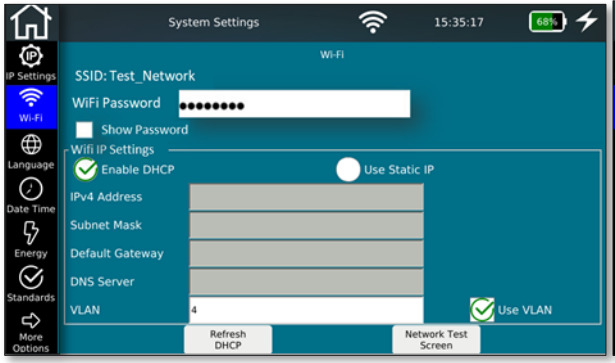


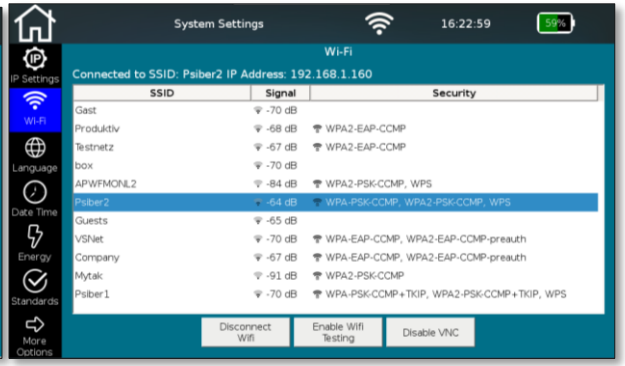


„Settings“ menu
Wi-Fi scan and connection

- By selecting the menu item, a network scan in the 2.4 GHz band starts automatically
- Display of founded SSIDs
  - Display the name
  - Signal strength
  - Encryption methods
- Selection of the WLAN network to establish the connection
  - Password entry (if necessary)
- After the connection is established, all active network tests are available
  - “WiFi” must be selected from the drop-down list as interface in the IP Settings menu
- Available VNC functions
  - Remote control of the device functions
  - Presentation mode

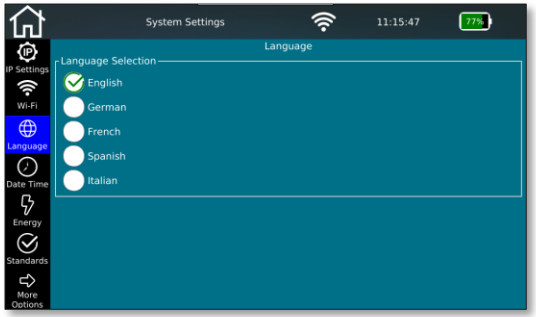




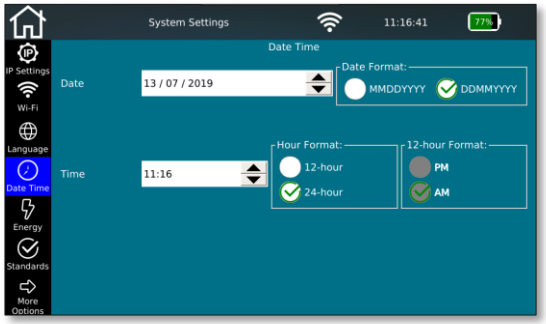


„Settings“ menu
System settings

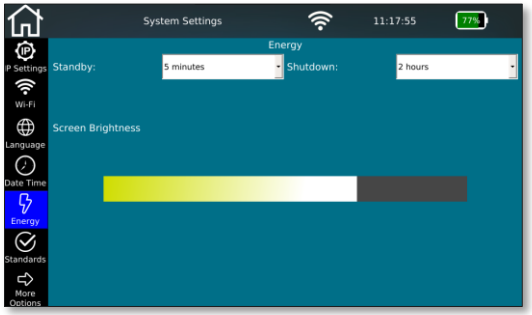
- Device specific system settings
  - Language settings



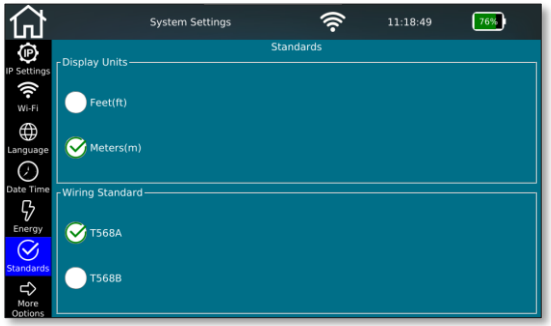
  - Date/Time



  - Energy saving options



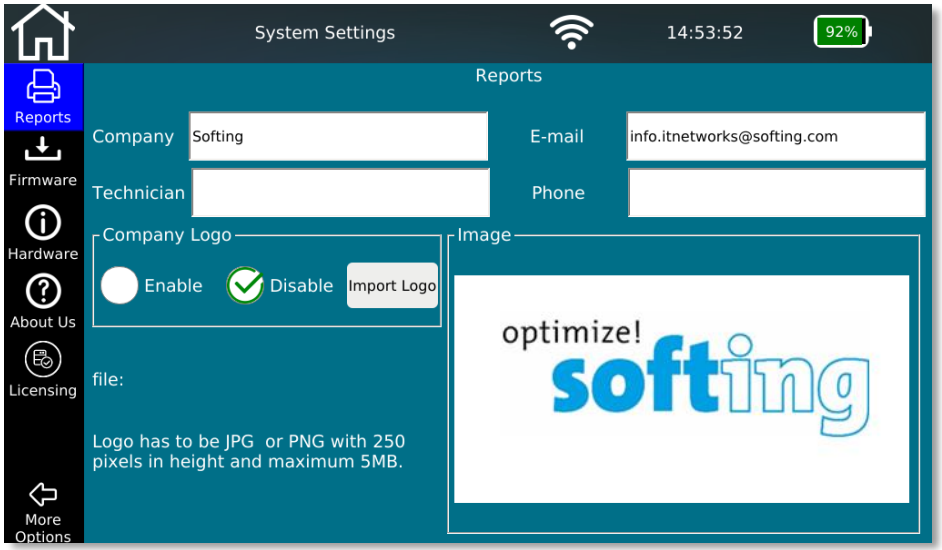
  - Units (ft/m) /wiring standards



„Settings“ menu

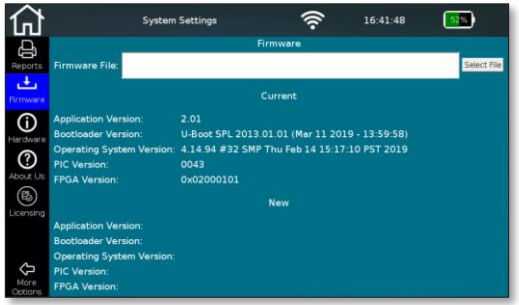
Header information and logo selection for report generation

- Information that can be permanently displayed as header information on the test reports
  - Company that is conducting the test
  - Technician who is conducting the test
  - Contact details of the company
    - E-mail address
    - Telephone number
- Logo of the company that is conducting the test
  - Enable and disable the logo display on the test reports
  - Import from external sources via USB stick
    - Note allowed file formats
    - Note size limitation

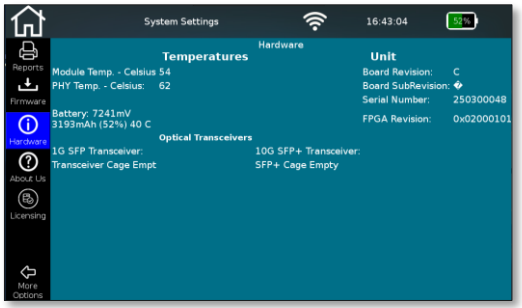


„Settings“ menu
Info screens

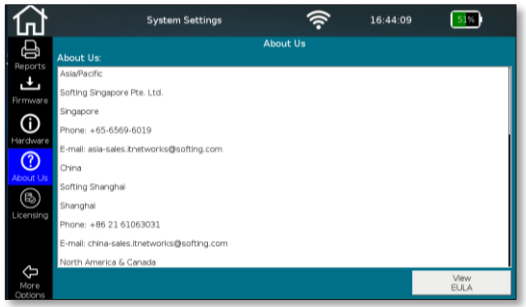
- Info screens on
  - Installed firmware



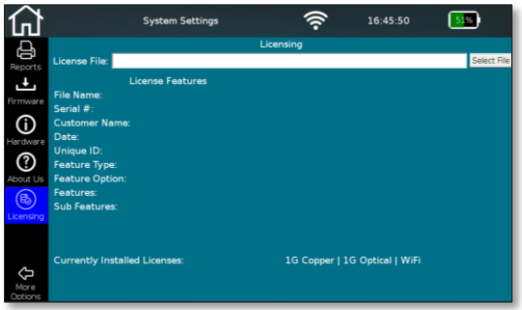
  - Integrated hardware



  - Manufacturer contact details



  - Active licenses and upgrade options



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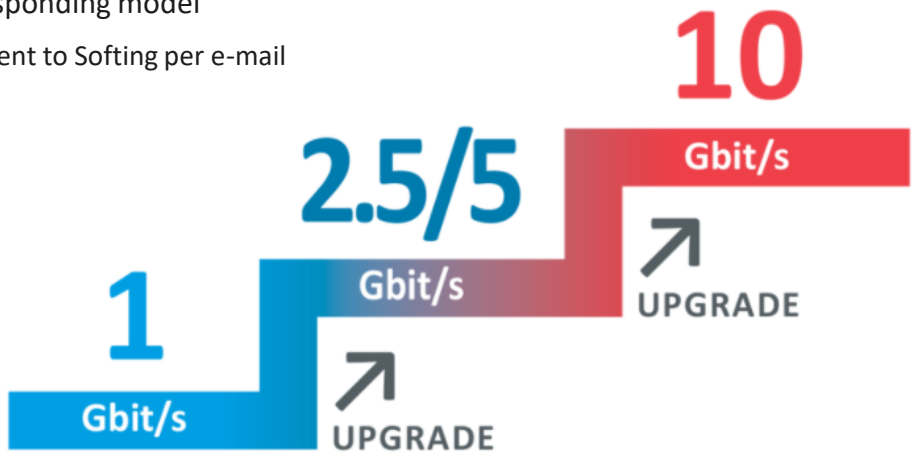
Licensing system
General

- „Step-up“ license
  - Upgrades the test speed one level at a time
  - Installation via USB-Stick after purchase
- „Functional“ license
  - Free or paid feature enhancements
- Hardware has a license preinstalled up to 1 Gbit/s
- Higher models need additionally 1 or 2 license vouchers for corresponding model
  - The serial number of the product and the voucher code must be sent to Softing per e-mail
- License key is binary file for specific serial numbers
  - It can only be used on one device



Licensing system
Installing a license

- Two ways to upgrade a license
  - Buy a NetXpert XG in 2.5 / 5G or 10G version
    - Product is always delivered with a 1G license installed
    - One or two license vouchers are delivered in a separate box
    - Email the voucher codes and the serial number of the main unit to upgrade.itnetworks@softing.com (Serial number can be found on system settings –> hardware or at the back side of the main unit)
    - Softing replies with a file (binary license file) to be installed on the main unit via USB-Stick
  - Buy a voucher at a later date
    - Classic order transaction via dealer with the serial number of the main unit
    - Download the attached file from the e-mail (binary license file) to USB stick and import to main unit
- Each installed license will be displayed at the bottom of the screen

Firmware updates

- Regular firmware updates
  - Bug fixing
  - Basic (free of charge) performance enhancements
  - Informing the end customers directly
  - Available via Softing webpage at no charge
  - Regular update cycle
  - Installing via USB stick
  - „Over the air“ (planned)

For further inquiries and support:

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