TREND NETWORKS

NaviTEK IE

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Introduction

NaviTEK IE is a network tester for troubleshooting and maintenance of active and passive copper and fiber standard and Industrial Ethernet (PROFINET) networks. It performs a range of tests to determine as much information as possible about the network and port to which it is connected.

The principle of operation of NaviTEK IE is that it can automatically configure itself to match the characteristics of the connected port under AUTO Detect mode (excluding PROFINET), whether it is an un-terminated cable, a live copper switch port or a live fiber switch port, and runs tests appropriate to that configuration. The manual selection of individual test mode gives you quick access of the different tests. These tests are designed to give information about the port, such as the switch MAC address and identification, as well as to confirm that the port has been properly configured and is capable of reaching a number of strategic targets in the local network and the Internet in standard Ethernet environment. The user may customize the tests if required.

Because the suite of tests runs and saves the results automatically, it is a simple task for the user to move from port to port, fully testing and saving the results from each one. All that is required is to plug the tester into the port socket and press the Autotest button. Once all of the required network ports have been tested, the saved reports can be uploaded either using a USB memory key to a PC or via Wi-Fi to a Smartphone, for transfer to client databases or to colleagues for further analysis.

The PROFINET tests are designed to discover information about the connected Industrial Ethernet nodes (devices) using DCP and SNMP protocol to pull the node (device) details without interfering with the network operation.

In this manual, references to Ethernet mean Standard Ethernet Network, and not Industrial Ethernet (PROFINET) Networks unless specifically stated.

Safety Information

When using NaviTEK IE, always take basic safety precautions to reduce the risk of fire, electric shock and injury to persons. These include the following:

- When connecting to the port, special care must be taken as high voltages may be present and there may be a danger of electrocution.
- Avoid using the tester during an electrical storm - there is a remote risk of electric shock by lightning.
- Use only the mains electricity adaptor supplied with your NaviTEK IE.

DO NOT CONNECT ANY TELECOMMUNICATIONS NETWORK TO ANY OF THE TESTER'S PORTS

Power and Maintenance

NaviTEK IE can be powered from:

- A rechargeable power module,
- Directly from power connected to the DC inlet built in to the power module.
- An optional non-rechargeable battery pack

Power Module Management

The power module must be fully charged before you use it for the first time

A fully charged power module will support up to five hours of heavy, continuous use. For maximum life of the power module it is recommended to discharge it fully and then recharge it fully at least once a month. The power module is not user-serviceable. When it has reached the end of its life, please contact your local TREND representative for service.

Power Module Recharging

The power module can be fully recharged in three hours with the NaviTEK IE switched ON or OFF. To recharge the power module, connect the supplied power adaptor to the DC inlet. For convenience the power module may be removed from, or left attached to, the unit for charging. The Power LED next to the DC inlet glows green to show that the battery is being charged, and flashes green to show that it is not being charged. The power module charge state is indicated at FULL, 2/3, 1/3 and EMPTY by the graphical power meter shown in the display's information bar at the top of its LCD display.

Switching ON and OFF

To switch ON the tester, press the ON/OFF button. A splash screen showing the TREND logo and model identity is shown on the display. The home screen is then shown on the display and NaviTEK IE is ready for a network to test by selecting operation mode.

To switch OFF, press and hold the Power button for approximately 1/2 second, a shutdown message is displayed on the screen. The currently stored setup is saved. If the unit does not switch OFF within five seconds of pressing the Power button, please see *Master Reset*. Always switch OFF the unit before removing the power module.

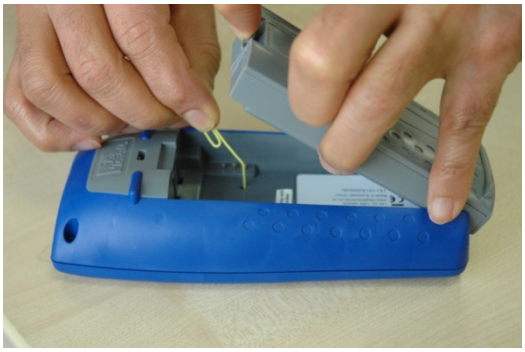
Caution

Do NOT remove the power module when the tester is switched on.

Power Saving
Power saving preferences are selected from SETUP / SYSTEM / PREF. Auto Off can be Disabled (unit remains ON indefinitely), or set to switch the unit OFF after three, 10 or 30 minutes of inactivity. The backlight can be set to Always On, or to dim to 50% brightness after three minutes of inactivity. Note that when mains power is connected the display is always on full brightness and the unit remains ON indefinitely.

Master Reset
In the unlikely event of a system lock-up which prevents the unit from being switched OFF, it may be necessary to perform a master reset. This will not delete any stored data.

1. Remove the power module to access a small aperture in the NaviTEK IE.
2. Insert a paper clip into the reset hole and press the internal reset switch.



3. Replace the power module.

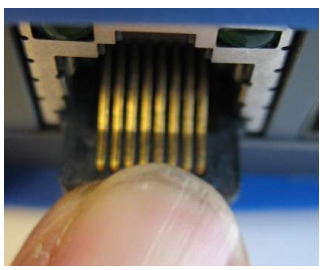
Replaceable insert – RJ-45 socket
To replace a damaged or worn RJ-45 socket insert proceed as follows:

Equipment required: Kit, TREND part number 150058 – includes Tool x1 and Replacement Insert x10.

1. Switch the NaviTEK IE off.
2. Remove cables.
3. Carefully push the tool STRAIGHT into the socket. BE CAREFUL - DO NOT MOVE THE TOOL VERTICALLY!
4. Keeping the tool STRAIGHT firmly pull the insert out from the socket.
5. Using fingers replace a new insert STRAIGHT into the socket and secure in place by firmly pushing

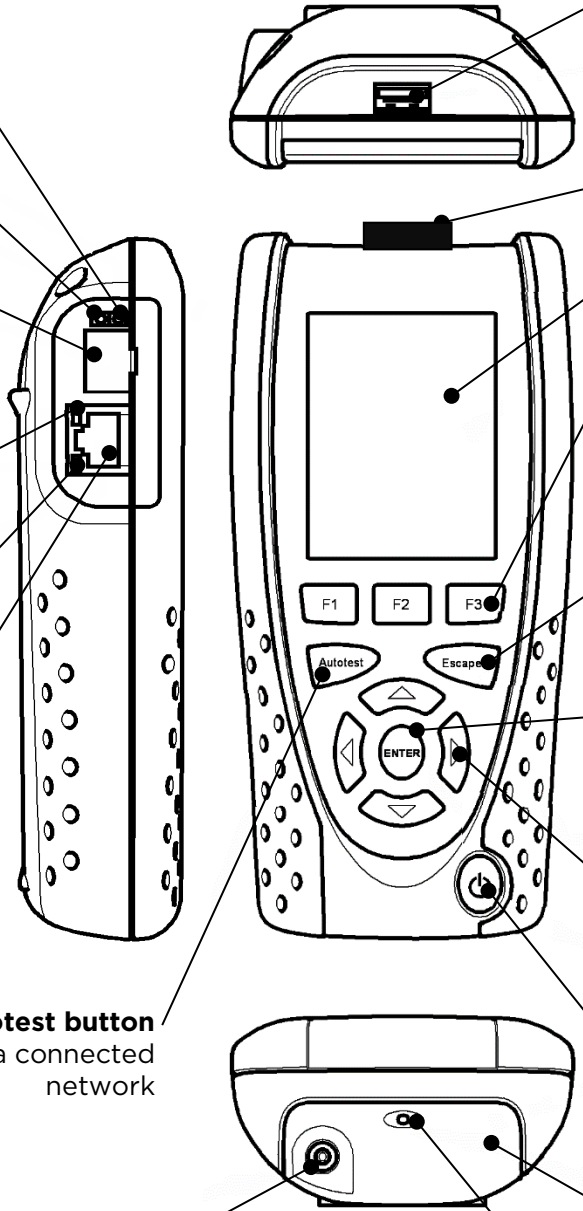
3.

4.



5.

Tester Layout



Optical link LED
Indicates that a Fiber network is connected

Optical activity LED
Indicates Fiber link data activity

Optical port (SFP)
Accepts SFP optical modules to connect the tester to 1Gb/s Fiber networks

Ethernet LED
Indicates that Ethernet is connected

Activity LED
Indicates Ethernet data activity

Cable socket
RJ45 socket to connect the tester to copper Ethernet cables and networks

USB socket
Used for uploading results and for downloading user logo and software updates

Wi-Fi Adapter
Connects to smartphone app

Touchscreen Display
Shows settings and results

Function buttons F1~F3
Press to activate the function shown in the screen area above the button

Escape button
Press to go back to the previous screen without saving changes

ENTER button
Press to select the currently highlighted screen function, or to confirm changes

Cursor buttons
Press to change which screen function or item is highlighted

Autotest button
Press to search for a connected network

Power button
Press to switch the tester ON/OFF

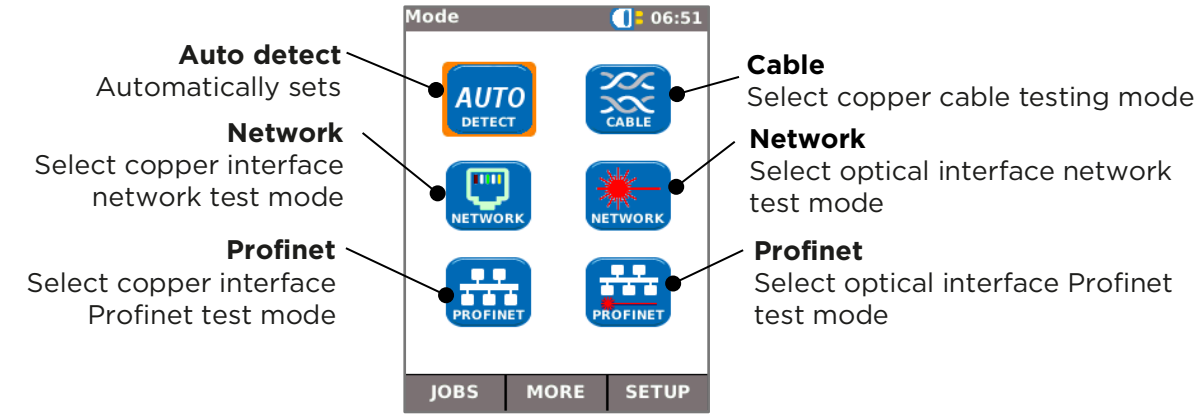
DC Input
Used to connect the power supply / charger (12vDC 2.5A)

Rechargeable battery module
(Non-rechargeable backup battery packs are also available)

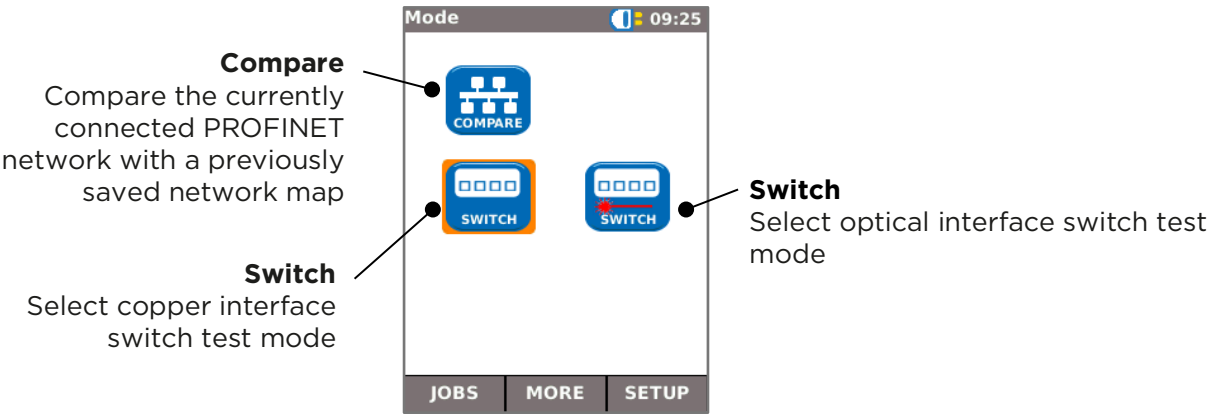
Charging Indicator LED:
- ● Charging
- ○ Charging complete
- (Flashing) Not charging

Mode Selection

The Mode screen is displayed following start-up. Select either with arrow key or tap one of the test mode icons to select the desired test function.



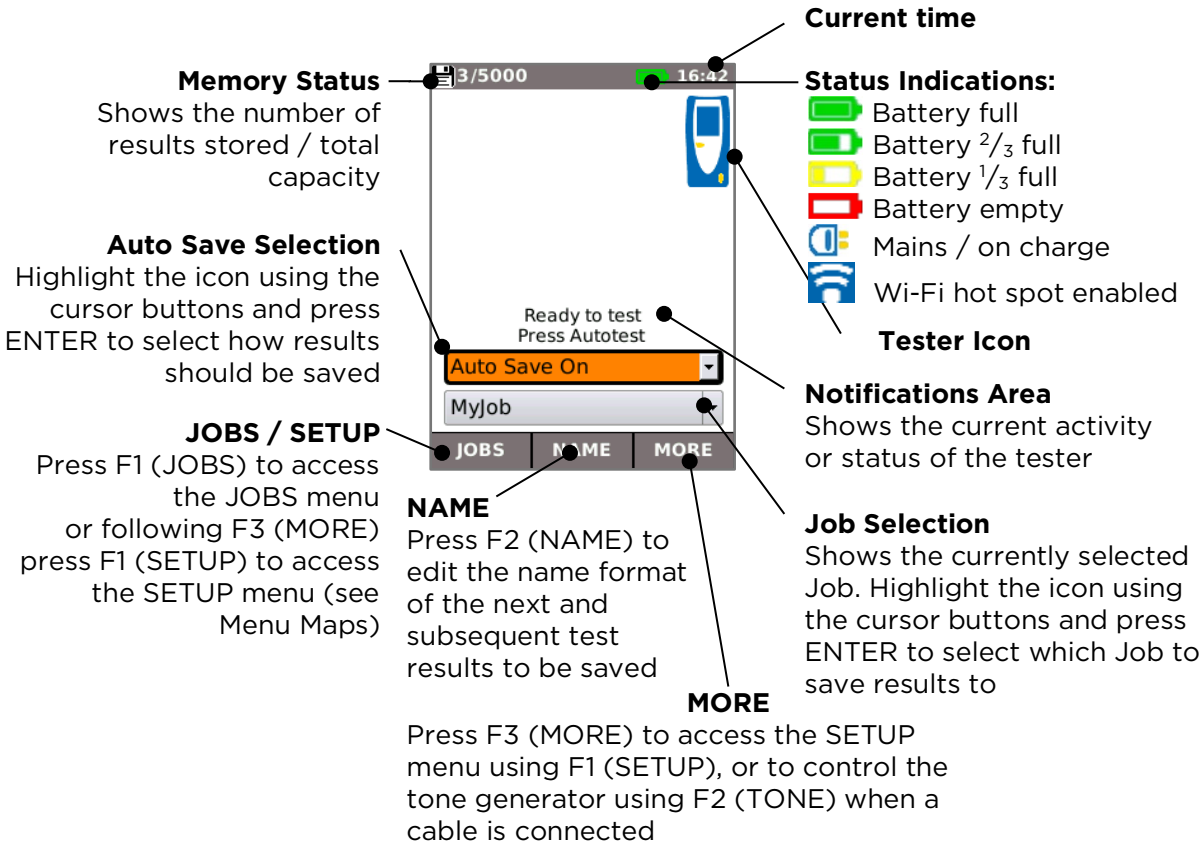
Press F2 (MORE) to display more Modes.



Press F2 (MORE) to display the first page of Modes again.

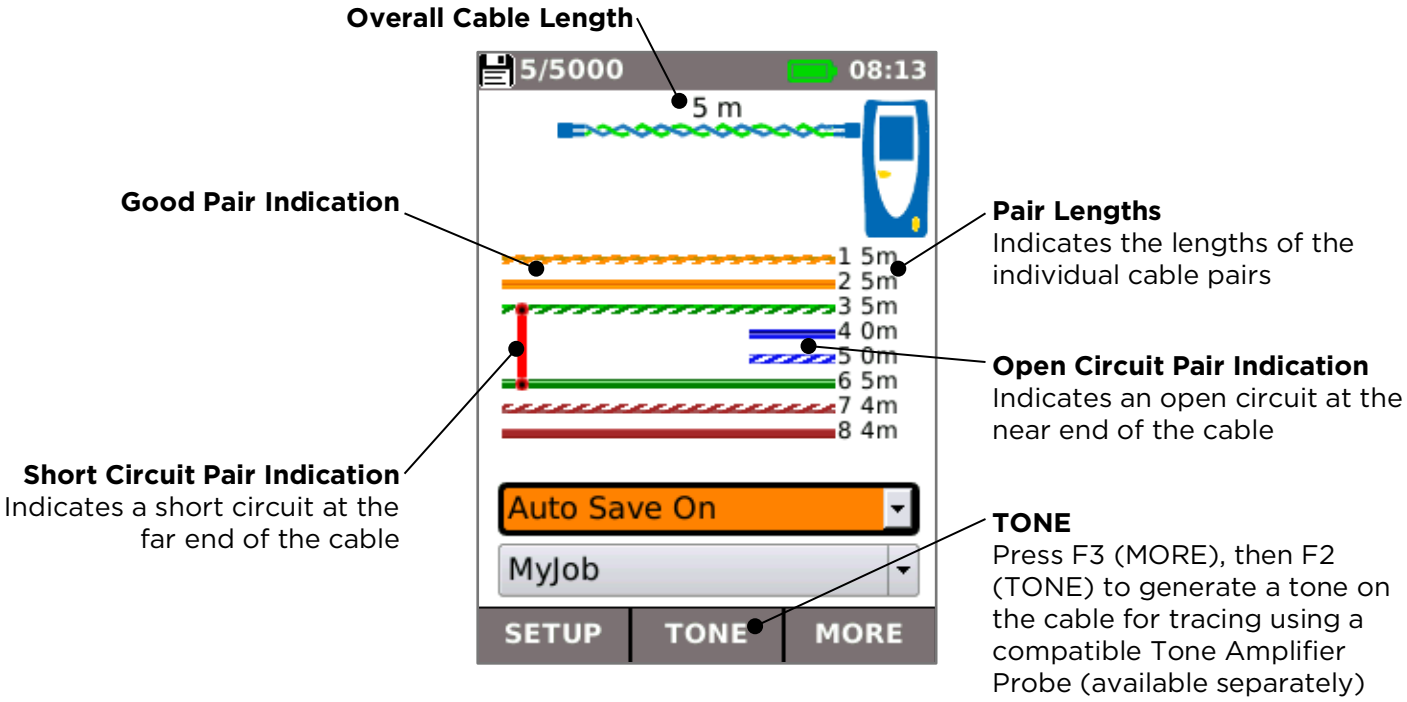
MAIN Screen

- The MAIN screen is displayed when a Mode has been selected.
- To refresh the MAIN screen and update the display of the current connection status, press Autotest.
- To display more information about an item on the MAIN screen, use the Cursor buttons to move the orange highlight to the required item on the screen, then press ENTER.
- To return to the MAIN screen from any other screen, press Escape repeatedly until the HOME screen appears.



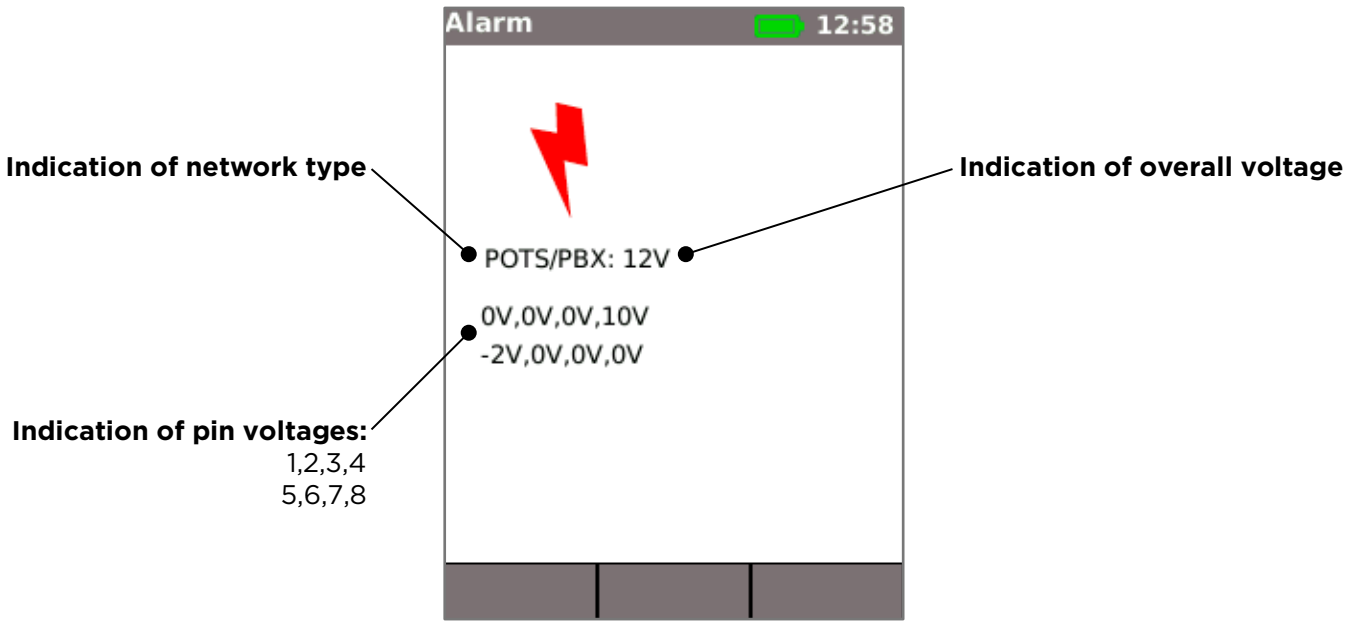
MAIN Screen (with network cable connected)

When the tester is connected to an un-terminated cable greater than ~3m (10ft) long, Autotest displays a graphical illustration of the cable, using the colour scheme set in SETUP/TESTS/WIREMAP, showing the cable length and any faults by pair.



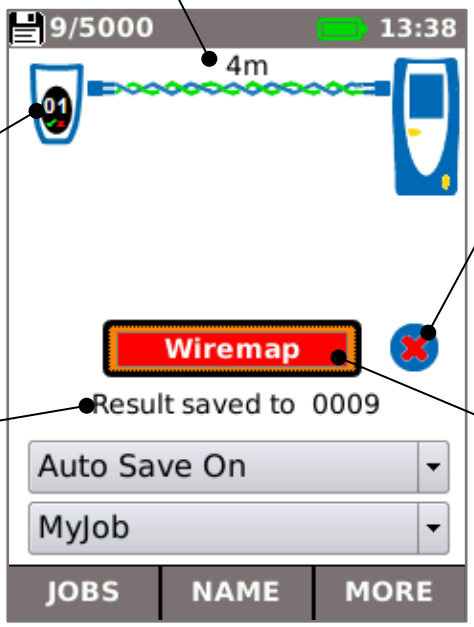
MAIN Screen (with unknown network connected)

If the tester is accidentally connected to any type of network carrying voltages, for example a telephone or ISDN network, the MAIN screen displays an alarm and details of the voltages. No further testing is possible until the voltages have been removed.



MAIN Screen (with network cable connected to Active Remote)

When the tester is connected to a cable that is terminated with an Active Remote, Autotest runs an advanced Wiremap test that can detect split pairs and faults by pin. The MAIN screen displays a bar indicating the progress of the test. Select this bar and press ENTER to display the Wiremap result screen. When the test is complete the result is saved (depending on the Auto Save setting).



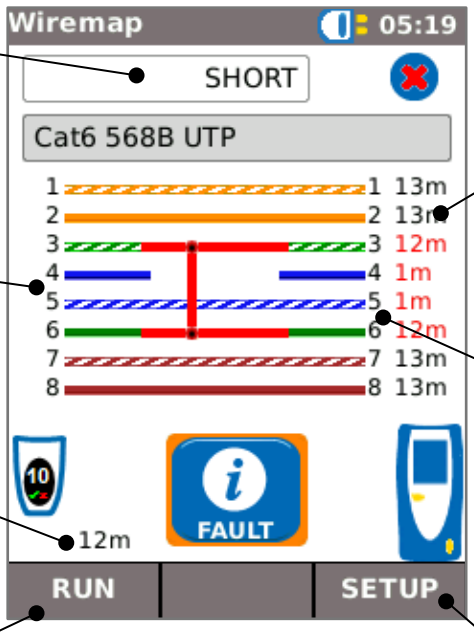
Overall Cable Length

Active Remote ID number

Test Status:
- Ready to test
- Test in progress
- Test Passed
- Test Failed

Result saved indication
Indicates the name of the last saved result

Wiremap test bar
Indicates progress and final test result (Green = PASS, Red = FAIL)
Highlight the bar using the cursor keys then press ENTER to display the Wiremap screen



Test Result

Pair Lengths
Indicates the lengths of the individual cable pairs

Active Remote pin numbers

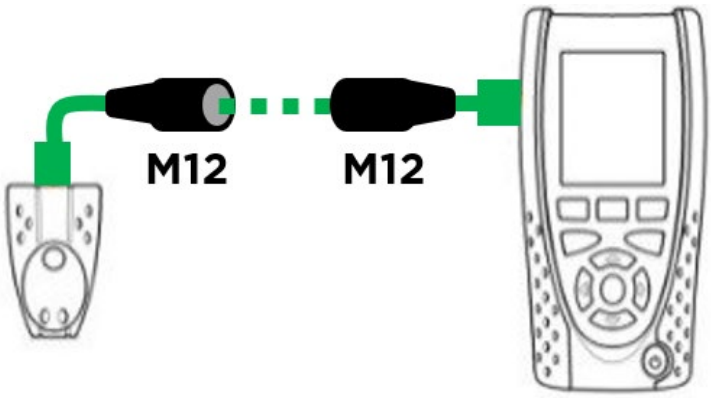
Tester pin numbers

Overall cable length

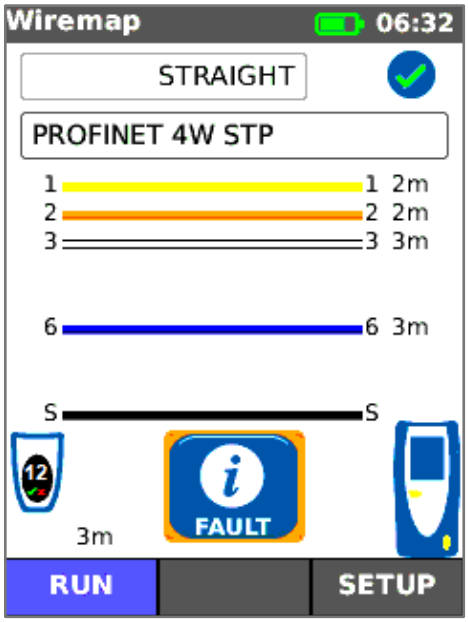
RUN
Press F1 (RUN) to re- run the Wiremap test without saving a result

SETUP
Press F3(SETUP) to set the Wiremap parameters according to the type of cable tested

To test the cabling of PROFINET networks which use the M12 connector type, use M12 to RJ45 adaptors to connect the tester and the Active Remote to the cabling.

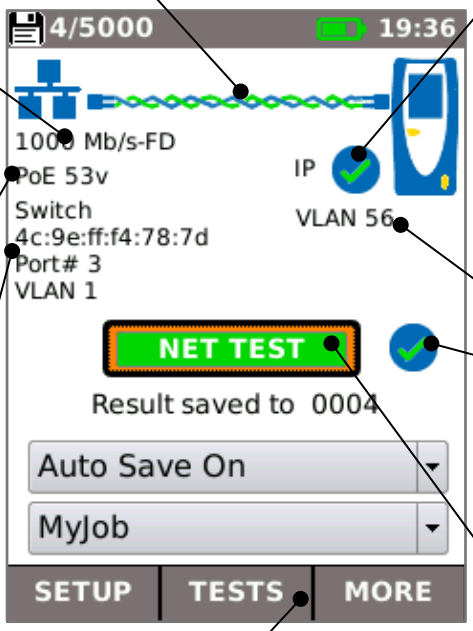


The cable type is set to PROFINET 4W and the appropriate M12 cable colour scheme is displayed on the wiremap screen.



MAIN Screen (with live copper network connected) and TESTS screen

When the tester is connected to a live copper-based network, Autotest detects the partner Ethernet device at the far end of the cable and automatically tests the network connection and displays information about it.



Copper network connection

Port rate and duplex
Select then press ENTER to display the Statistics, VLAN and Port screens

Power over Ethernet status
Select then press ENTER to display the PoE test screen

MAC and ID of switch port and port VLAN setting
Select then press ENTER to display details of the nearest switch, reported by CDP, LLDP or EDP (if supported by the switch)

Tester IP Status:
- IP address assignment in progress
- Dynamic (DHCP) IP address assigned
- Static IP address assigned
- IP address assignment failed

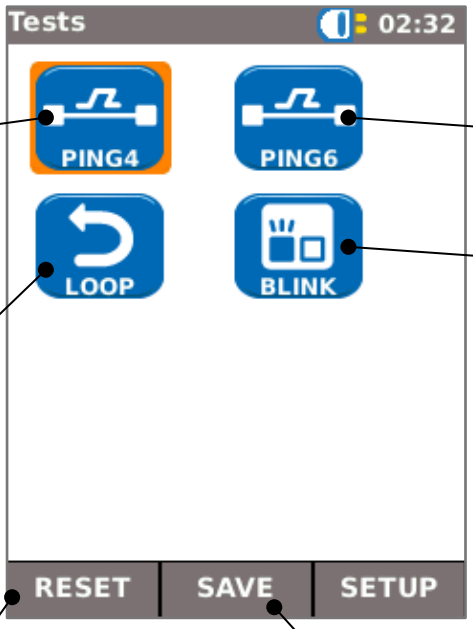
Select then press ENTER to display the IP screen

Tester VLAN ID

NET TEST Status:
- Ready to test
- Test in progress
- Test Passed
- Test Failed

NET TEST test bar
Indicates progress and final test result (Green = PASS, Red = FAIL)
Select then press ENTER to display the NET TEST screen in detail

TESTS
Press F3 (MORE) then F2 (TESTS) to display the TESTS menu to allow individual tests to be selected and run independently of the NET TEST



PING4
Select to access the screen to run and view Ping4 test results

PING6
Select to access the screen to run and view Ping6 test results

LOOP
Select to access the screen to set up and apply various types of Ethernet loop

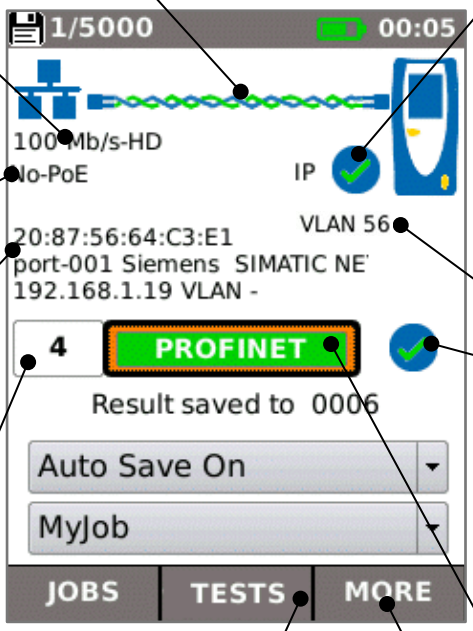
BLINK
Select to flash the switch LED to assist in port identification

RESET
Press F1 (RESET) to reset the test results

SAVE
Press F2(SAVE) to save the test results

MAIN Screen (with live copper PROFINET connected) and TESTS screen

When the tester is connected to a live copper-based PROFINET network, the tester detects the partner Ethernet device at the far end of the cable and automatically tests the network connection and displays information about it. In addition, the number of PROFINET nodes is detected and displayed.



Copper network connection

Port rate and duplex
Select then press ENTER to display the Statistics, VLAN and Port screens

Power over Ethernet status
Select then press ENTER to display the PoE test screen

MAC and ID of switch port and port VLAN setting
Select then press ENTER to display details of the nearest switch, reported by CDP, LLDP or EDP (if supported by the switch)

PROFINET nodes count
Indicates the number of PROFINET nodes detected

Tester IP Status:
IP address assignment in progress
Dynamic (DHCP) or static IP address assigned
IP address assignment failed
Select then press ENTER to display the IP screen

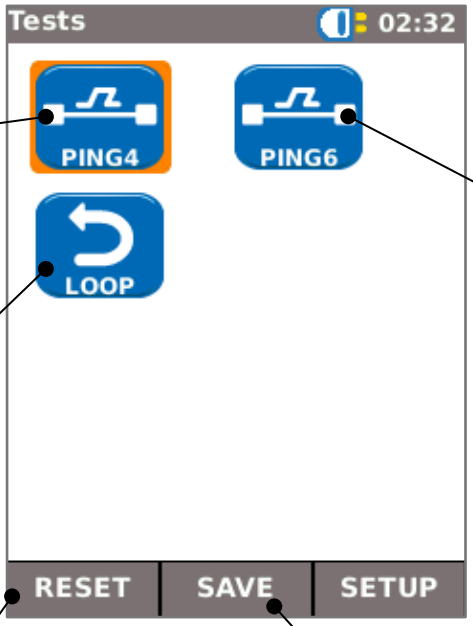
Tester VLAN ID

PROFINET Status:
Ready to test
Test in progress
Test Passed (PROFINET nodes detected)
Test Failed (No PROFINET nodes detected)

PROFINET test bar
Indicates progress and final test result (Green = PASS, Amber = MARGINAL, Red = FAIL
Select then press ENTER to display the PROFINET Nodes screen in detail

TESTS
Press F3 (MORE) then F2 (TESTS) to display the TESTS menu to allow individual tests to be selected and run independently of the PROFINET test

MORE
Select to replace F2(TESTS) with the PROFINET net compare function



PING4
Select to access the screen to run and view Ping4 test results

PING6
Select to access the screen to run and view Ping6 test results

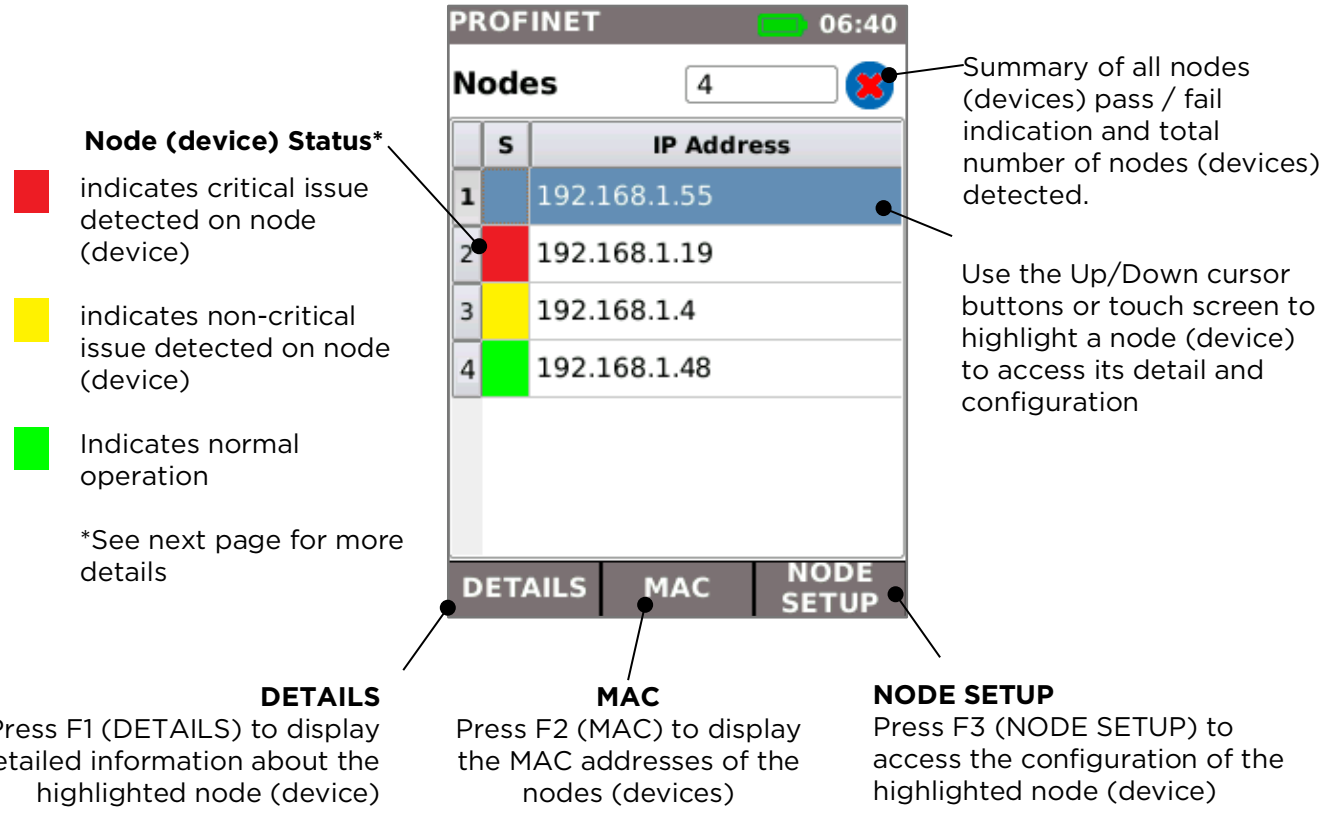
LOOP
Select to access the screen to set up and apply various types of Ethernet loop

RESET
Press F1 (RESET) to reset the test results

SAVE
Press F2(SAVE) to save the test results

PROFINET Nodes Screen

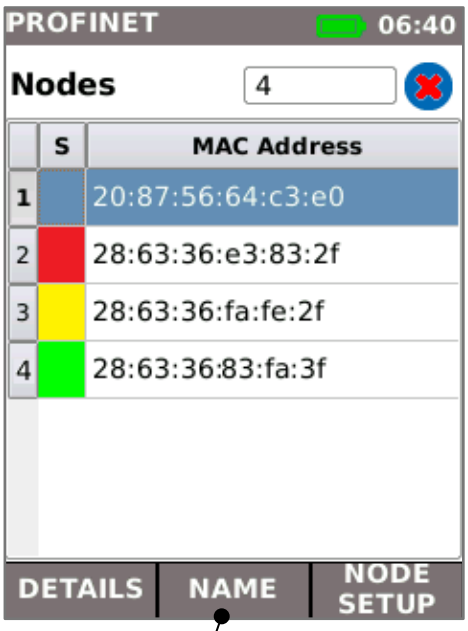
The PROFINET Nodes Screen is accessed by selecting the PROFINET test bar on the Main screen. It lists all of the PROFINET nodes (devices) detected together with their health status and identification. It also allows an individual node (device) to be selected and its details displayed and its configuration set up.



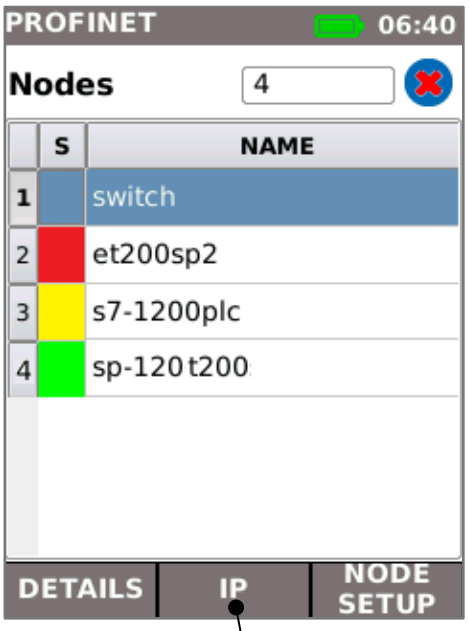
DETAILS
Press F1 (DETAILS) to display detailed information about the highlighted node (device)

MAC
Press F2 (MAC) to display the MAC addresses of the nodes (devices)

NODE SETUP
Press F3 (NODE SETUP) to access the configuration of the highlighted node (device)



NAME
Press F2 (NAME) to display the Names of the nodes (devices)



IP
Press F2 (IP) to display the IP Addresses of the nodes (devices)

The node (device) health status is indicated using a “traffic light system”:

Red indication

- Critical events detected and device may not be operational
- No or duplicate name set
- Duplicated or wrong IP address set
- No or wrong device subnet mask set
- Device communication failure
- Device IP outside the tester subnet mask
- Packet errors exceeding acceptable limits
- Link load > 50%

Amber indication

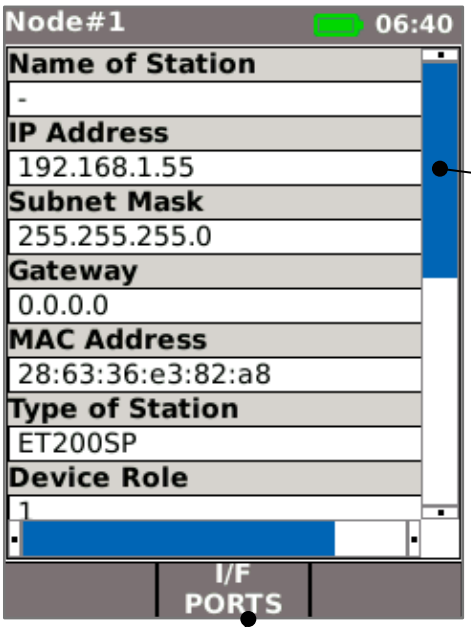
- No critical events detected, and device is still operational
- Packet errors occur but at an acceptable limit
- Link load 10%~ 50%
- Another identical device model found but has different firmware / hardware version
- Device speed is 10Mb/s
- Device port half duplex

Green indication

- No abnormal events detected
- No errors
- No alarms
- No duplicated IP address or name
- Link traffic load below 10%

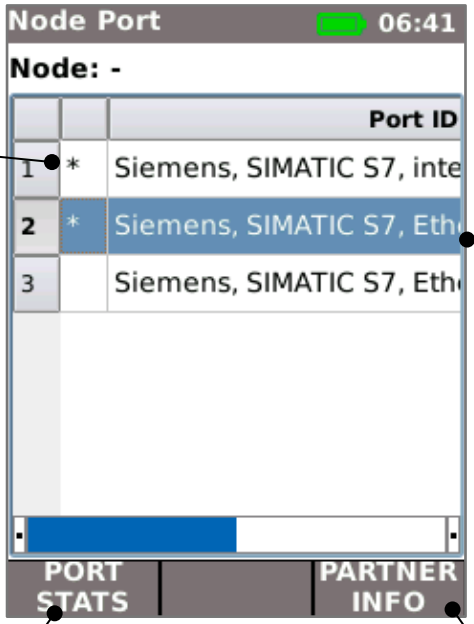
PROFINET node (device) Details screen

The PROFINET node (device) Details screen is accessed from the PROFINET Nodes screen by pressing F2 (DETAILS). It displays all of the available information about the selected node (device).



Use the Up/Down and Left/Right cursor buttons, or slide gestures on the touch screen, to scroll through the list of node (device) parameters

I/F PORTS
Press F2 (I/F PORTS) to display a list of the ports on the selected node (device) interface (I/F)



* Indicates that the interface port is active

Use the Up/Down cursor buttons to highlight a port

PORT STATS
Press F1 (PORT STATS) to display statistics relating to the highlighted port

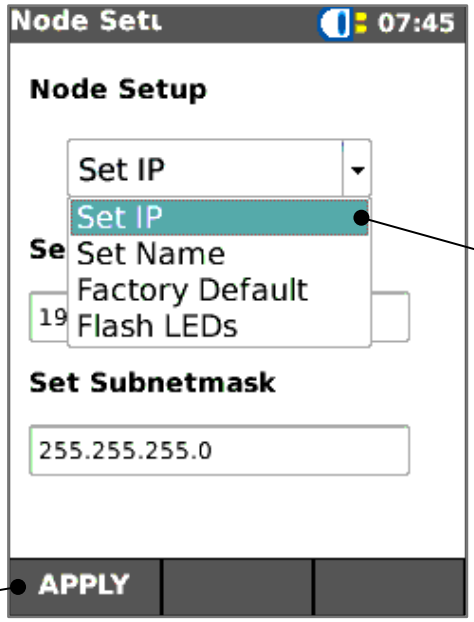
PARTNER INFO
When the highlighted port is connected to a partner port, press F3 (PARTNER INFO) to display information about the device that it is connected to

PROFINET Node Setup screen

The PROFINET Node Setup screen is accessed by pressing F3 (NODES SETUP) from the PROFINET Nodes screen. It provides controls for:

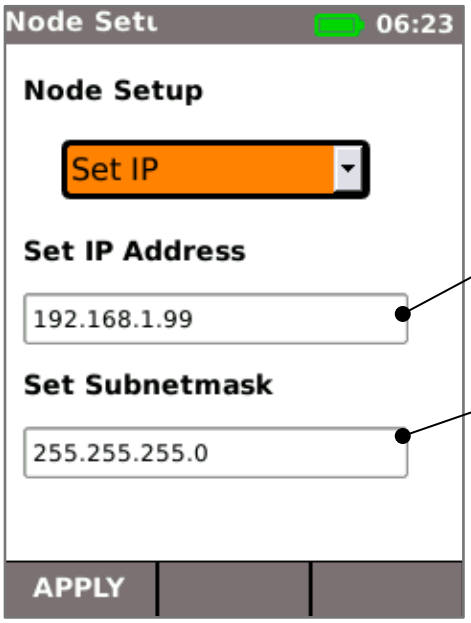
- Setting the IP Address (and Subnet Mask) of the highlighted node (device)
- Setting the Name of the highlighted node (device)
- Setting the highlighted node (device) to its Factory Default
- Flashing the LEDs on the highlighted node (device) for ease of identification. Before making changes to any node (device) it is very important to confirm that the correct node (device) is selected, by using the Flash LEDs function. Changes made to a wrong node can lead to potentially very serious network malfunction.

These functions provide a quick and easy way to configure new or replacement nodes.



Use the Up/Down cursor buttons to select the required function from the drop-down list then press ENTER.

APPLY
Press F1 (APPLY) to apply the new setting to the selected node (device)



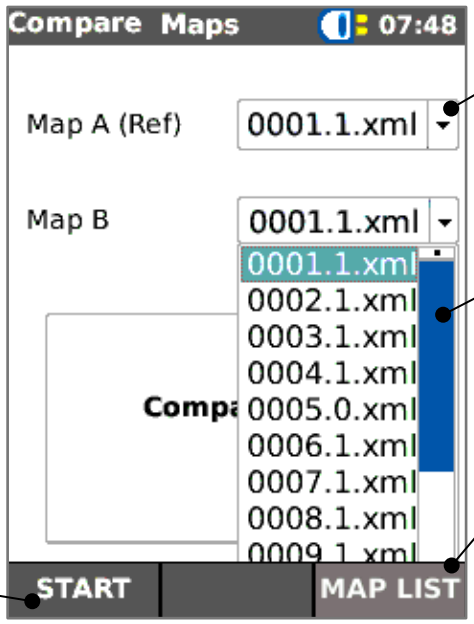
Set the IP address of the selected node (device)

Set Subnet Mask of the selected node (device)

PROFINET Network Map comparison function

The network map comparison function provides information about changes that have occurred in the network, by comparing a captured map of the network with a previously captured map. Network mapping happens automatically and any captured maps (not just the most recent) may be selected for comparison

The comparison function is accessed by pressing F2 (COMPARE) on the PROFINET main Screen or by selecting the COMPARE icon from the Modes Screen.

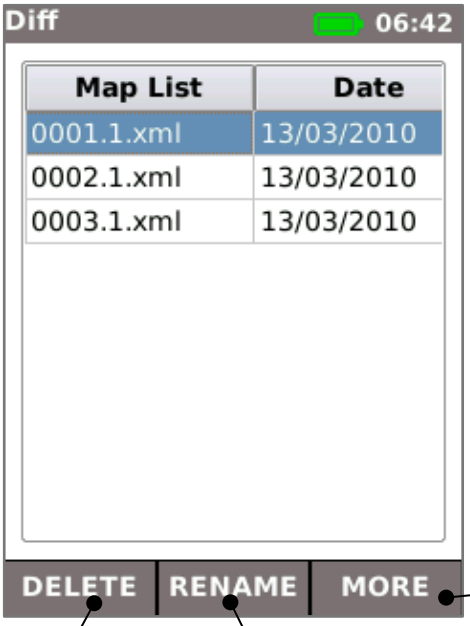


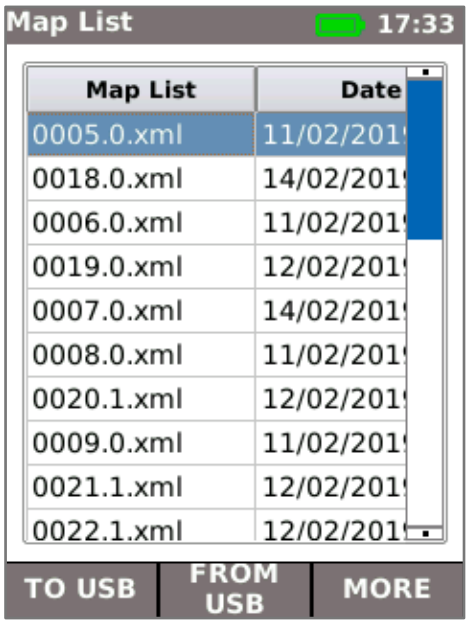
Select a previously captured map from the drop-down list to be the comparison reference.

Select another captured map to be compared with the reference

MAP LIST
Press F3 (MAP LIST) to manage the stored maps

START
Press F1 (START) to start the comparison process





Press F3 (MORE) to copy maps to or from a USB memory key.

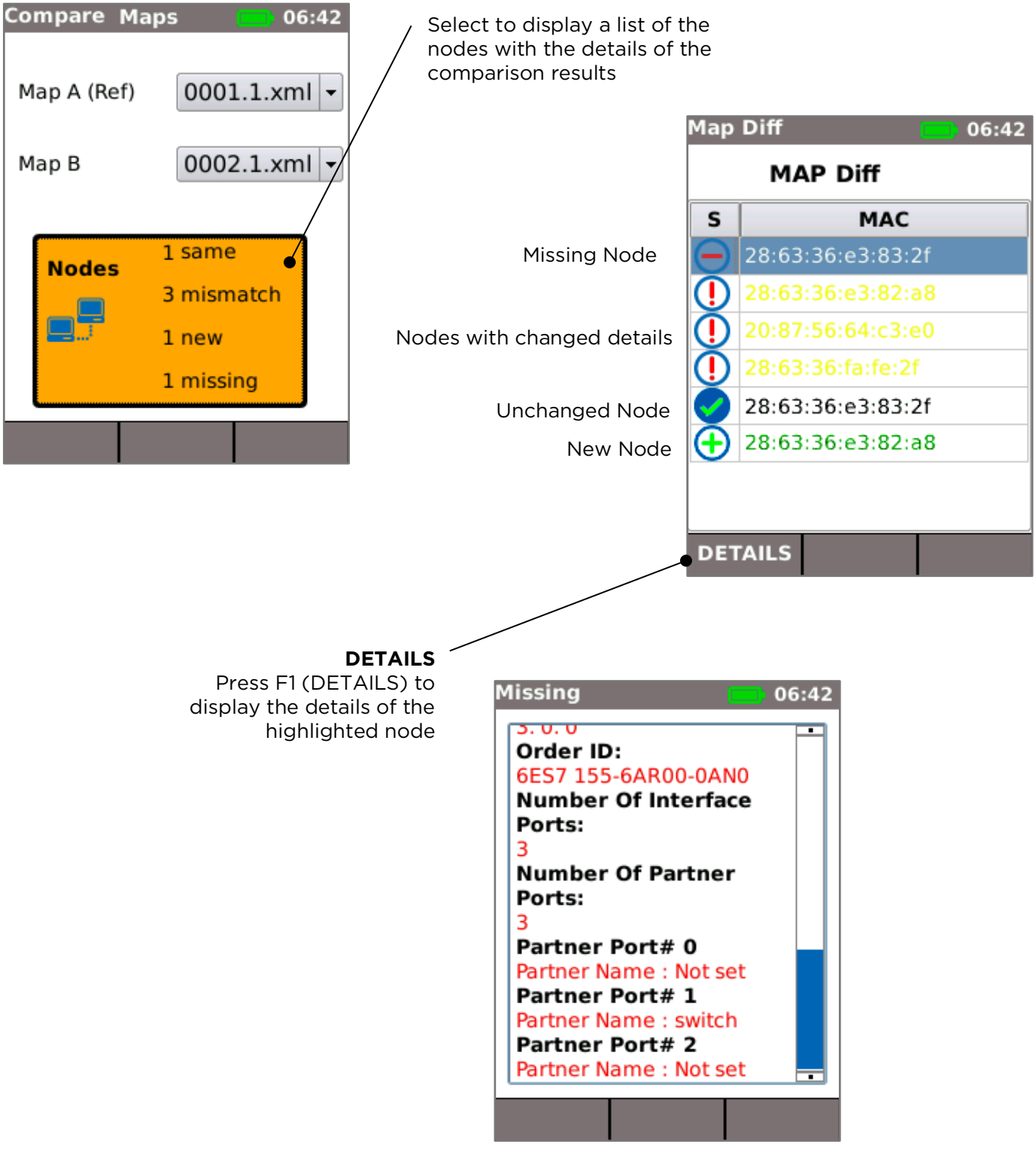
(Note that maps can only be transferred one by one to/from USB and can not be transferred using TREND AnyWARE™.)

DELETE
Press F1 (DELETE) to delete the highlighted map from the list

RENAME
Press F2 (RENAME) to edit the name of the highlighted map

When F1 (START) is pressed in the Compare Maps screen, the comparison function is started. When it is complete, a summary of the result is displayed. This shows:

- The number of nodes in the network that have the same characteristics as the reference
- The number that are still present but whose details have changed
- The number of new nodes that have been detected that were not present in the reference
- The number of nodes that were present in the reference map but are now missing.

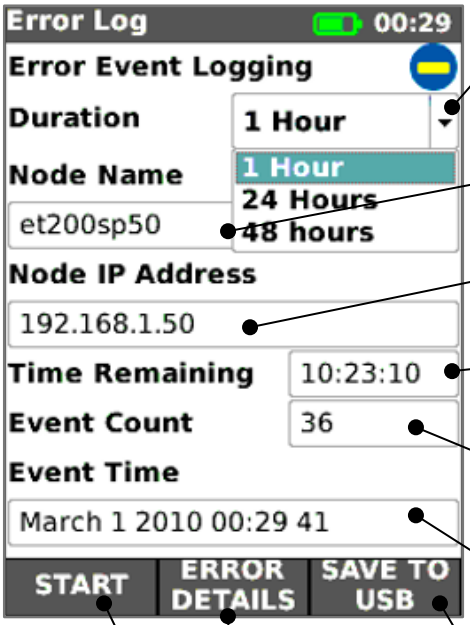


PROFINET Error Log

A log of error events occurring on a selected PROFINET network node (device) can be captured over a long period to assist in identifying the source of network errors. The error events are time stamped, allowing the user to find out when they occurred and analyse the conditions in the environment at the time on a specific node (device) monitored.

Only the most recent error condition for the selected node (device) is displayed on the tester screen. To analyse historical data about previous error conditions, the log file can be saved to a USB memory key and viewed on a PC.

The Error Log function is accessed by pressing F3 (ERROR LOGGING) in the PROFINET Details screen.



Select the duration of the error logging test

Indicates the Name of the selected Node

Indicates the IP Address of the selected Node

Indicates the length of time remaining until the test is complete

Indicates the total number of error events detected on the selected node of all ports

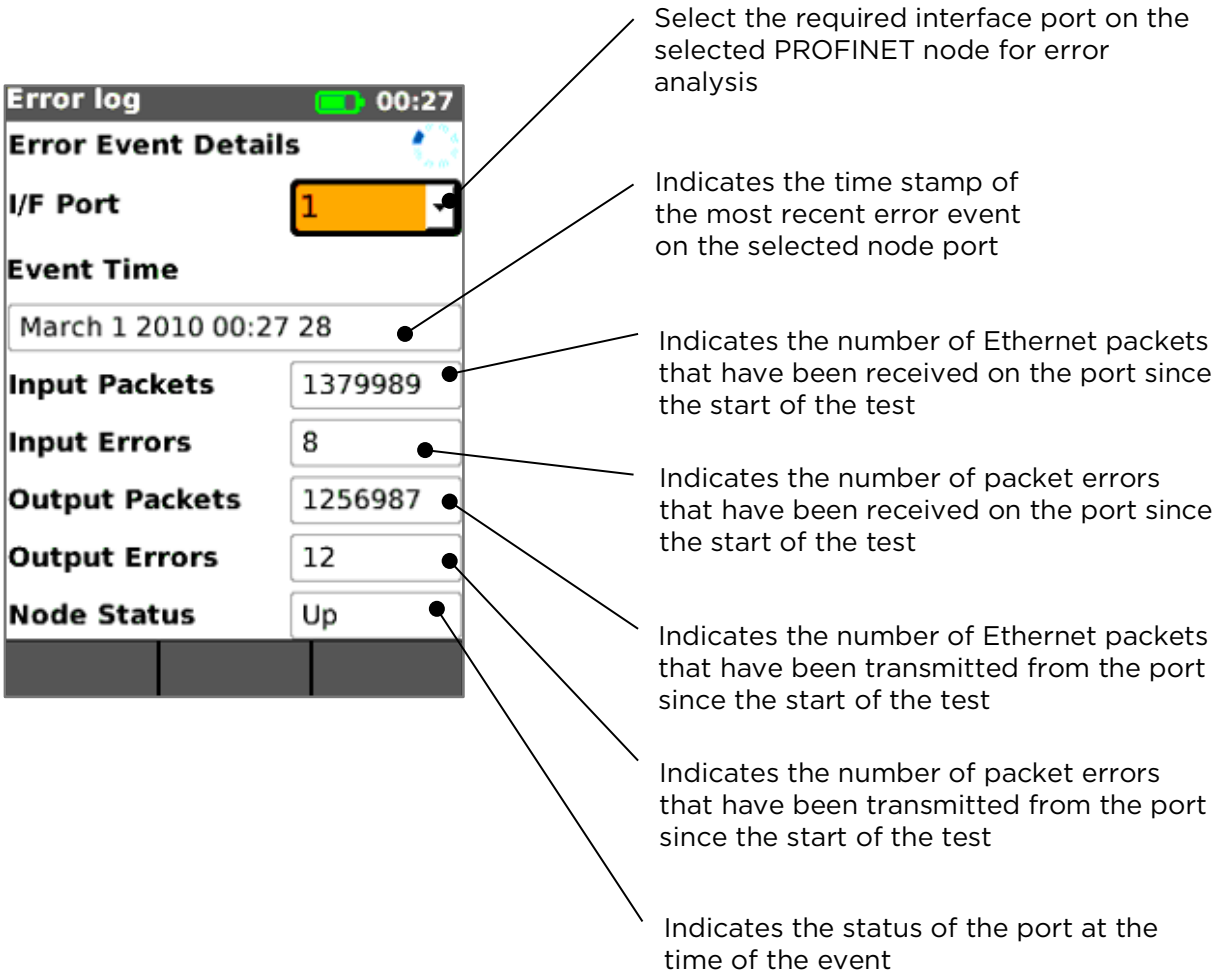
Indicates the time stamp of the most recent error event on the selected node

START
Press F1 (START) to start the error event log

SAVE TO USB
Insert a USB memory key into the USB port and Press F3 (SAVE TO USB) to save the full event log, in Excel file format, for analysis on a PC

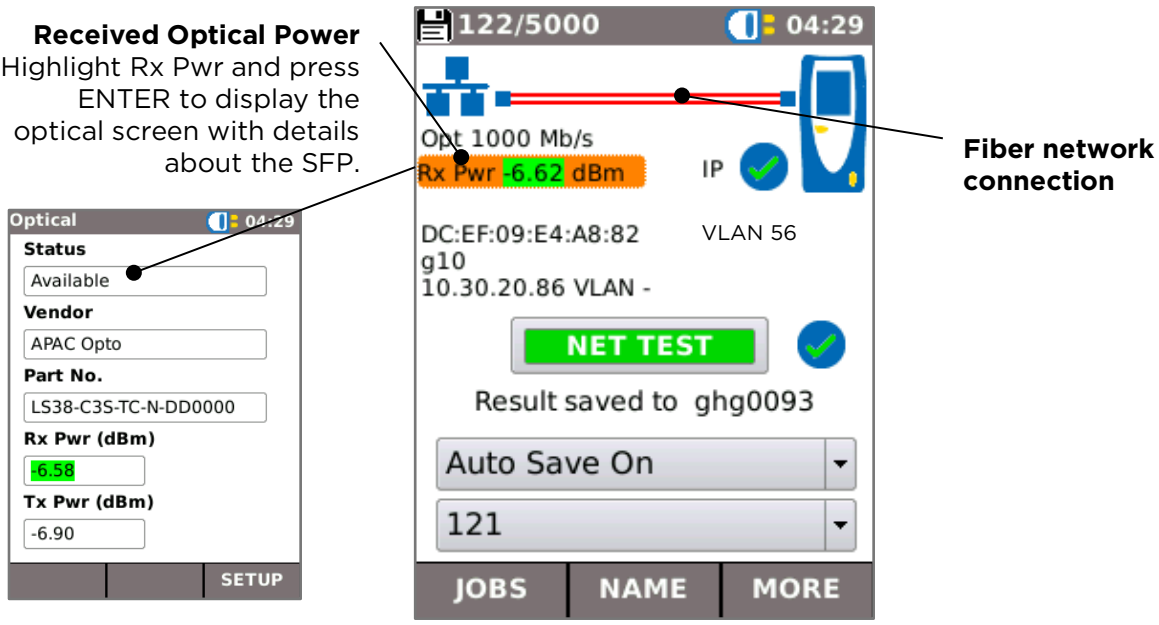
ERROR DETAILS
Press F2 (ERROR DETAILS) to display details of the most recent error event on a particular node (device)

Press F2 (ERROR DETAILS) in the Error Log screen to display details of the most recent error event.



MAIN Screen (with live fiber network connected)

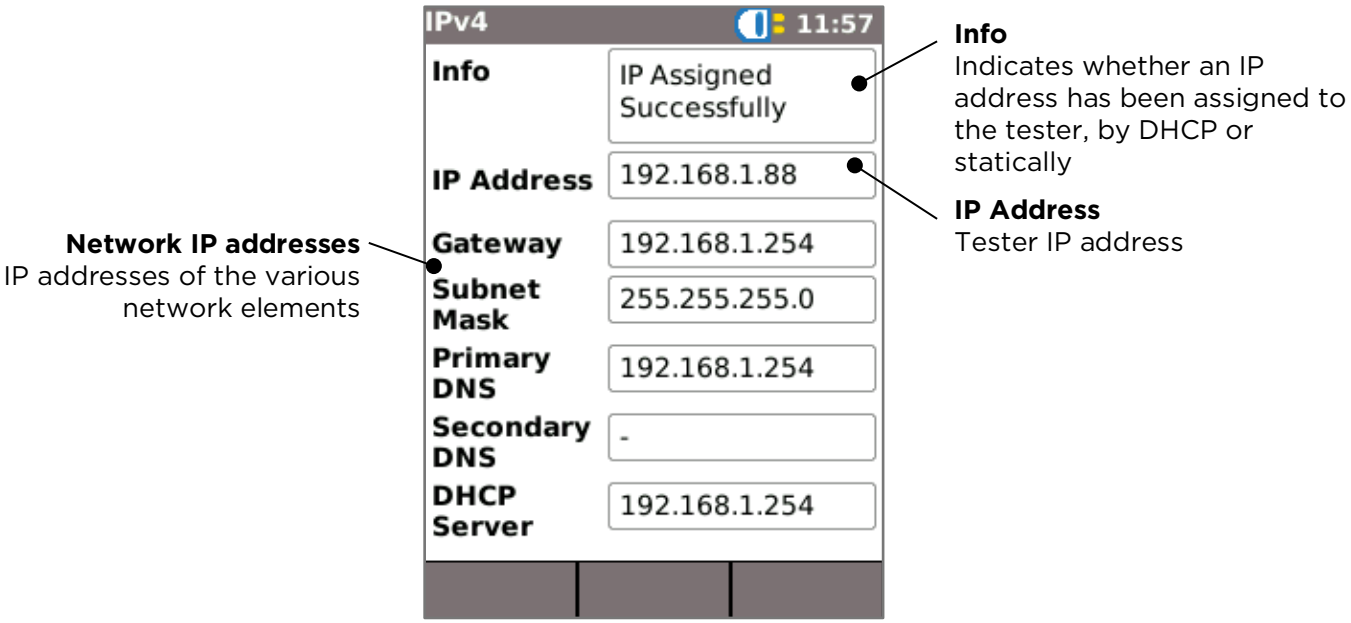
When the Pro tester is connected to a live 1Gb/s fiber network, AUTO DETECT automatically detects the partner Ethernet device at the far end of the fiber.



IP details screen

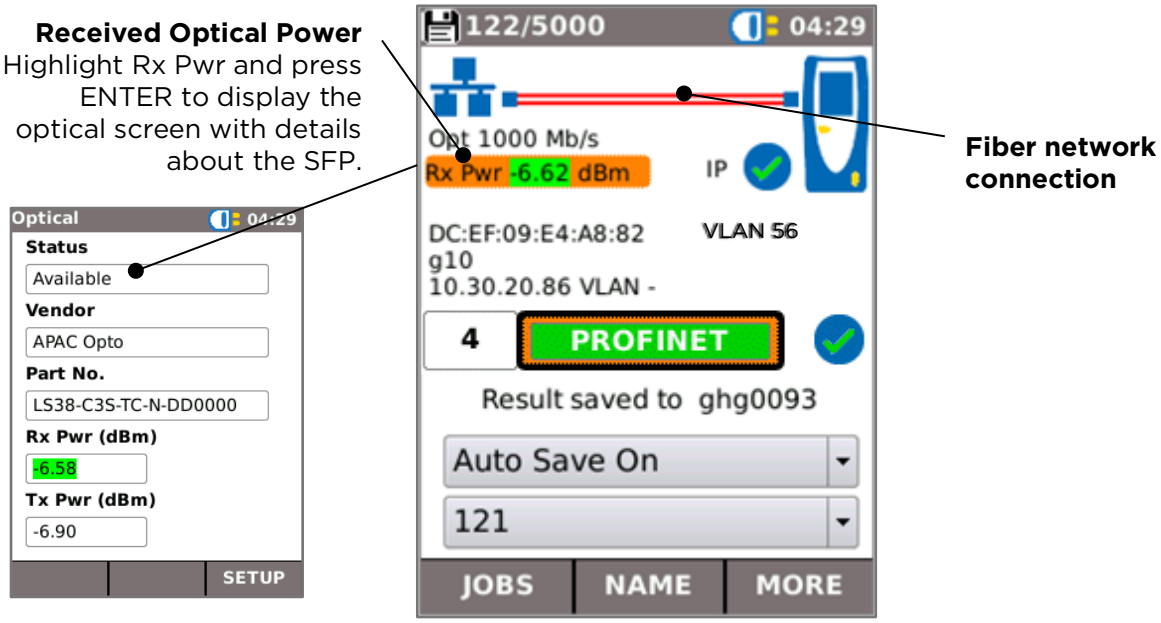
In the HOME screen, select the IP icon then press ENTER to display the IP screen.

This screen shows detail of the IP status and address of the tester and the IP addresses of the network elements that are tested by the NET TEST.



MAIN Screen (with live fiber PROFINET network connected)

When the tester is connected to a live 1Gb/s fiber PROFINET network, and the PROFINET optical icon is pressed, the tester detects the partner Ethernet device at the far end of the fiber.

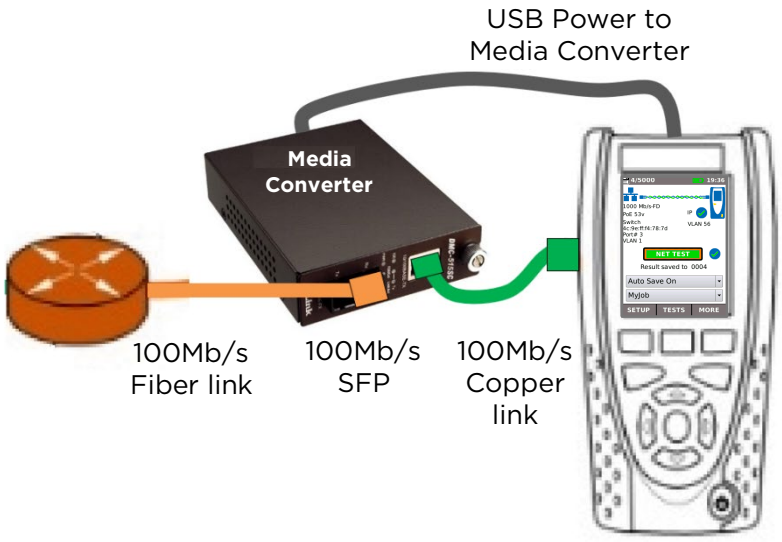


Testing 100Mb/s fiber networks

It is not possible to connect to 100Mb/s fiber links using the tester's SFP port. The SFPs provided for use with the tester can operate at 100Mb/s but must be used with a Media Converter. This converts 100Mb/s Fiber Ethernet (100BaseFX) to Copper Ethernet (100Base-T). A suitable SFP must be inserted into the media converter. If the media converter is USB-powered it can be connected to the USB port of the tester which will then supply power to it.

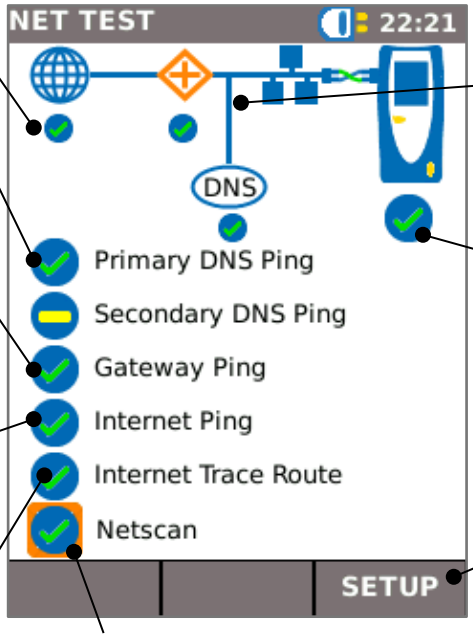
The diagram below shows the setup for a 100Mb/s optical link test.

The Main Screen of the tester will appear as it does for a normal 100Mb/s Copper RJ45 link.



NET TEST and Netscan

When an Ethernet link is established, or Autotest is pressed while a link is up, a NET TEST is run automatically. This test consists of a series of Ping tests to multiple strategic targets in the network, a Trace Route to a set destination, and a scan of all the hosts in the local network. To display the NET TEST screen, select the test bar in the HOME screen and press ENTER.



Individual test result

DNS Ping results
The Secondary DNS is only tested if the Primary DNS Ping fails. Select and press ENTER to display full details

Gateway Ping result
The Gateway is the route from the local network to the Internet. Select and press ENTER to display full details

Internet Ping result
If this test passes, the tested port has access to the Internet. Select and press ENTER to display full details

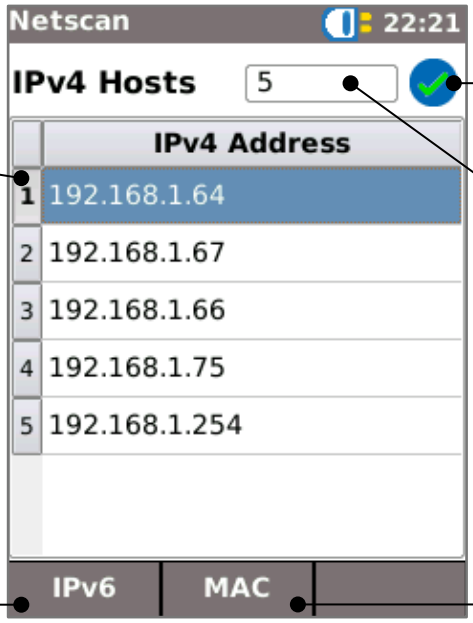
Trace Route result
Select and press ENTER to display a list of all the hops passed in route to the Internet destination

Network map
Each tested network element is shown by an icon that is highlighted when the test result is selected

Overall Test Result:
- Not tested
- Test in progress
- Test Passed
- Test Failed

SETUP
Press F3 (SETUP) to access the NET TEST setup screen

Netscan result
Select and press ENTER to display the Netscan screen



Host list
A list of all the hosts detected in the local network

Netscan test result

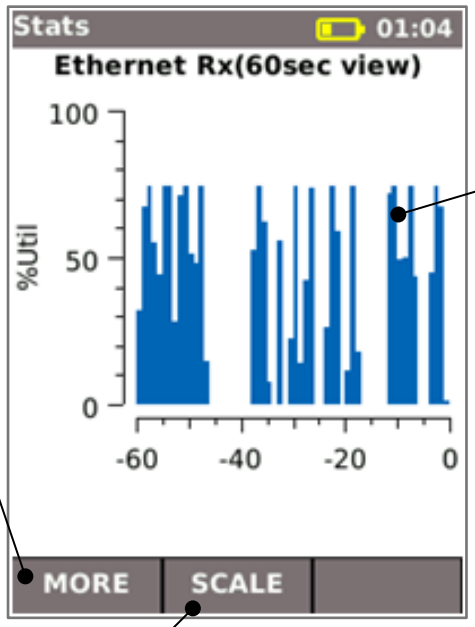
Number of hosts found

IPv6 / IPv4
Press F1 to display IPv6 hosts or IPv4 hosts

MAC / IP
Press F2 to display the MAC address or IP address for each host listed

Statistics, VLAN scan, Port, Errors and 802.1x status

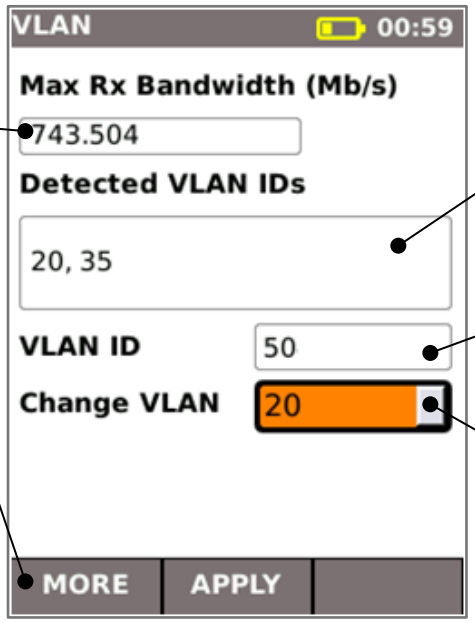
When an Ethernet link is established, select the Port Rate / Duplex field in the HOME screen and press ENTER to display detailed information about the connection and the network.



Traffic graph
Shows the percentage of the port rate utilised over time. Connect the tester to a mirror port or test port on the switch to monitor traffic in a particular network span

MORE
Press F1 (MORE) to display the next screen

SCALE
Press F2 (SCALE) to adjust the time scale



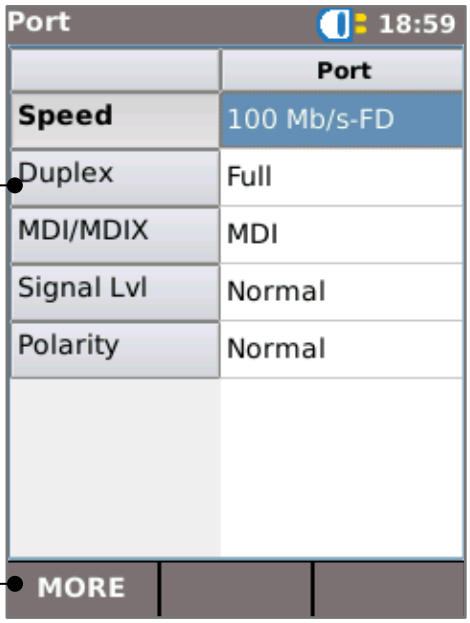
Bandwidth
Shows the peak traffic bandwidth

VLANs
Lists the VLANs with ID detected in the network traffic

VLAN ID
The current VLAN setting of the tester

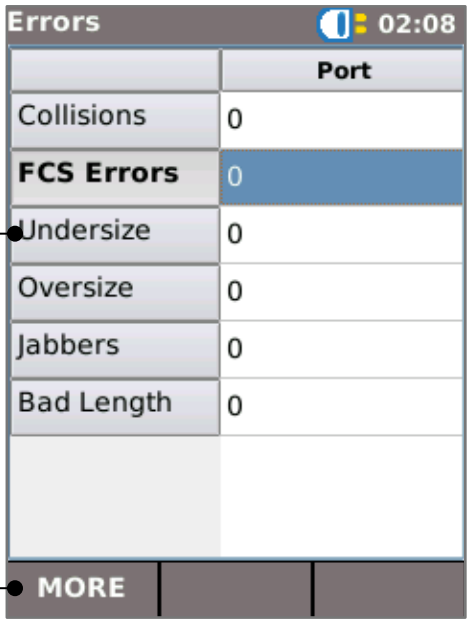
MORE
Press F1 (MORE) to display the next screen

Change VLAN
Select a VLAN from the list of network VLANs detected. Press ENTER to set the chosen VLAN as the current tester VLAN setting, then press F2 (APPLY)



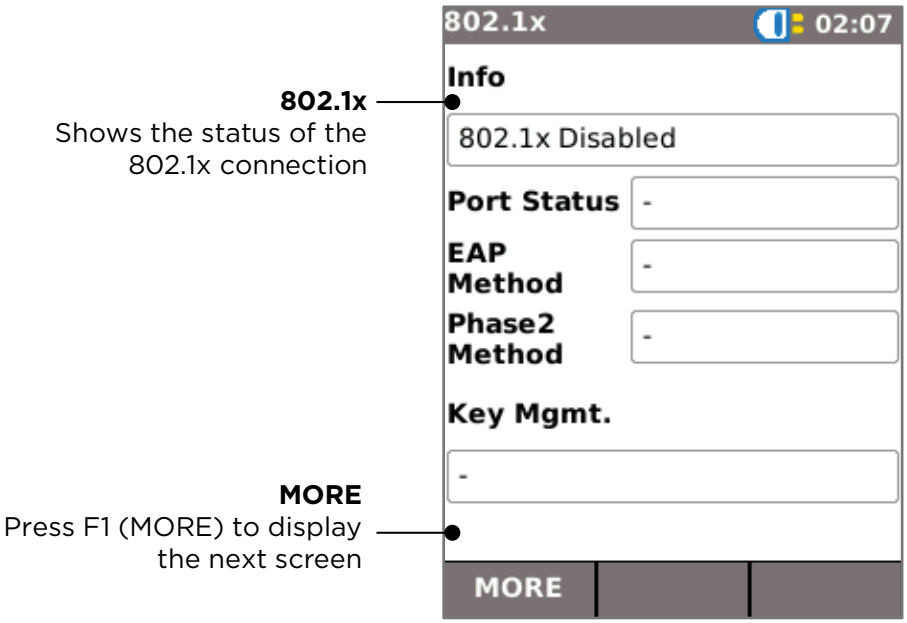
Port data
Shows information about the connection and the partner port

MORE
Press F1 (MORE) to display the next screen



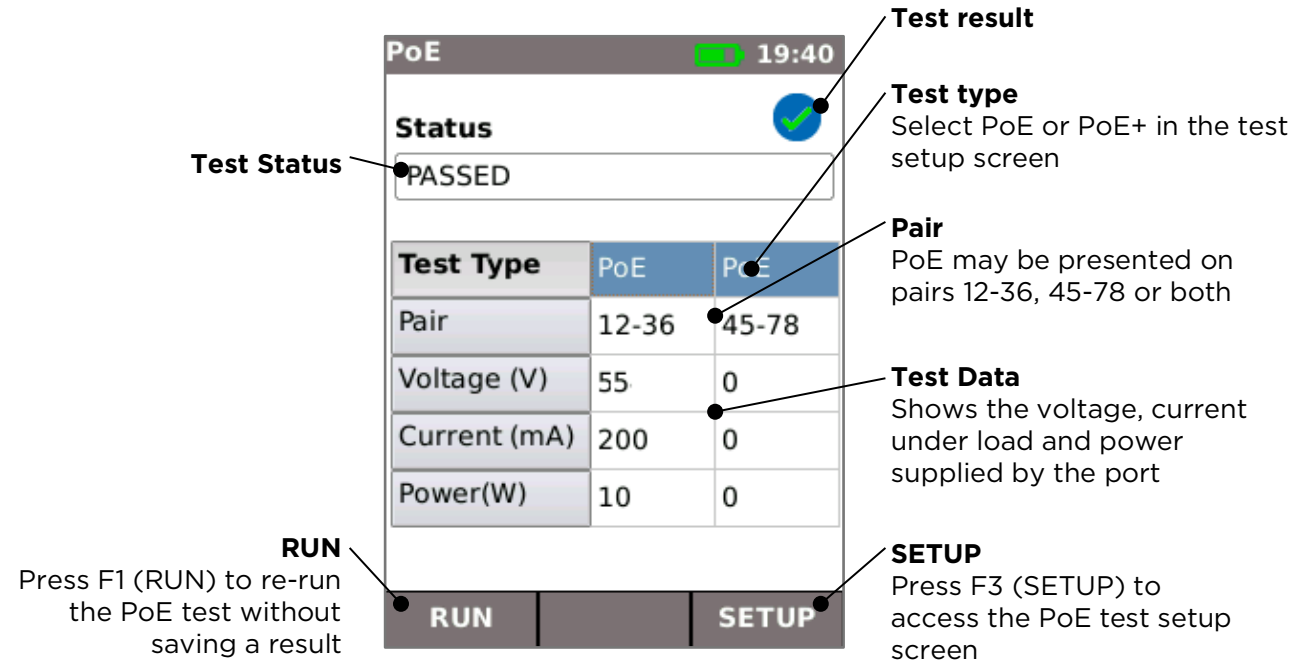
Error data
Shows the number of Ethernet errors detected

MORE
Press F1 (MORE) to display the next screen



Power over Ethernet

When an Ethernet link is established, Autotest automatically tests the port for the presence of PoE and measures the available power by applying a minimum load. Select the PoE field in the HOME screen and press ENTER to display the PoE screen.



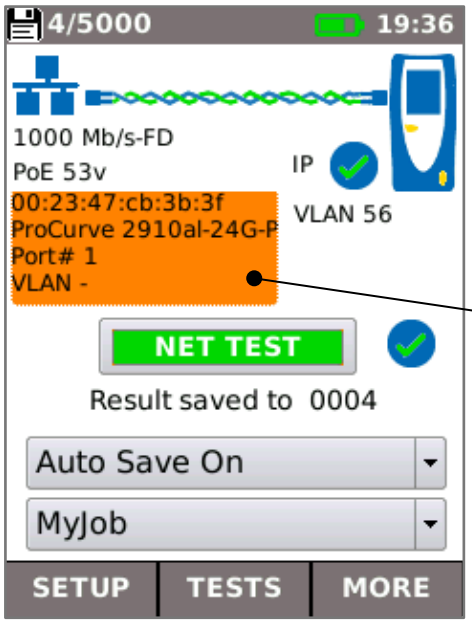
Port Discovery information details

When an Ethernet link is established, Autotest automatically scans the partner port for Link Layer Discovery Protocol (LLDP), Cisco Discovery Protocol (CDP) and Extreme Discovery Protocol (EDP) messages. These Discovery Protocol messages may contain various details about the switch and the port connected, depending on how they are configured. Discovery Protocol messages may take up to 60 seconds to be transmitted by the switch. In non-standard network configurations it is sometimes possible for Discovery Protocol messages to arrive from other devices in the network. In this case, the tester attempts to resolve which are the messages from the directly connected port.

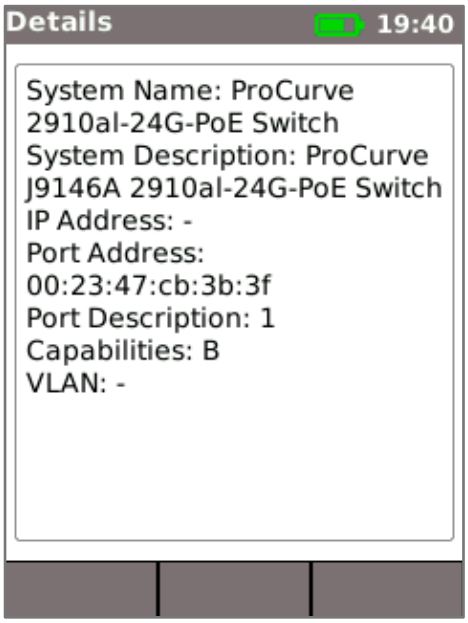
Following link establishment, the screen flashes "Searching for Port Identification" until the first Discovery Protocol message is received. The screen then starts to flash the switch name and MAC address of the port that the Discovery Protocol message has come from. If the message is confirmed as coming from the directly connected port, the screen then shows full details of the port continuously.

At the end of 60 seconds from link establishment:

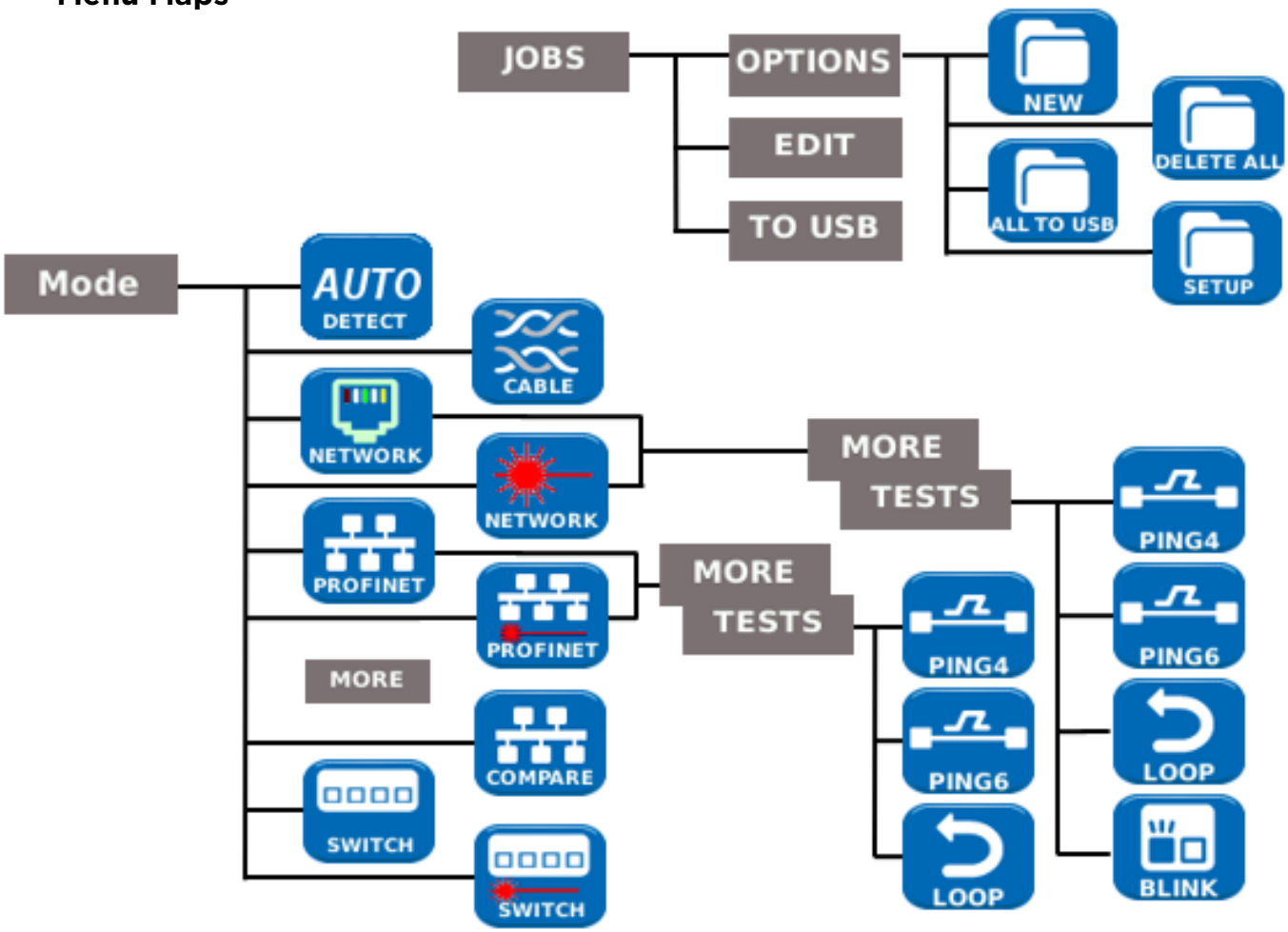
- If a unique or confirmed Discovery Protocol message has been received, the screen shows the port details continuously.
- If multiple different Discovery Protocol messages have been received, and it is not possible to resolve which one has come from the directly connected port, the screen shows "Multiple". The user can then select this and review a list of the different Discovery Protocol messages that have been received, to aid in identification of the correct port.
- If no Discovery Protocol message has been received, the screen shows "No Discovery Info".

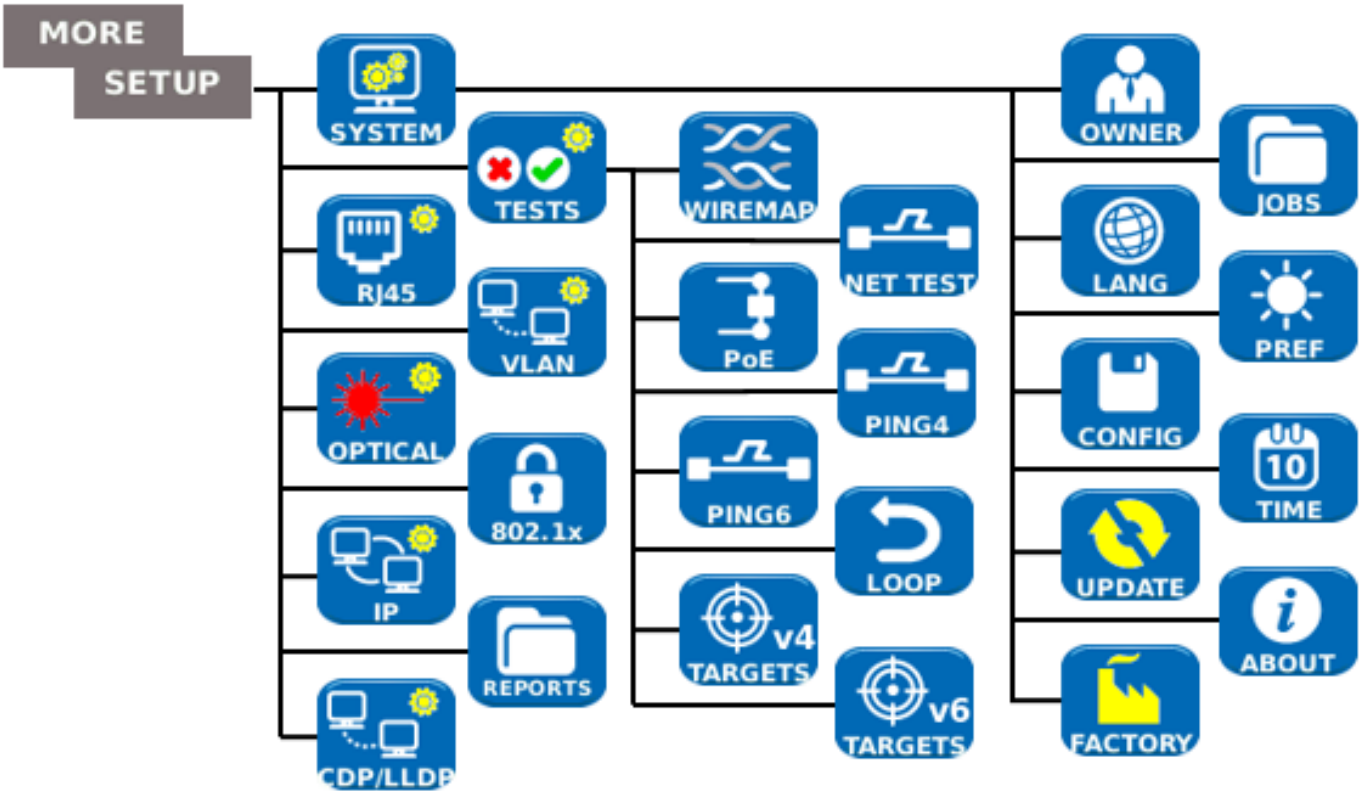


Port details
Select the switch / port details field in the HOME screen and press ENTER to display the port discovery details screen.



Menu Maps


JOBS
OPTIONS
EDIT
TO USB
NEW
DELETE ALL
ALL TO USB
SETUP
Mode
AUTO DETECT
CABLE
NETWORK
NETWORK
PROFINET
PROFINET
MORE
COMPARE
SWITCH
SWITCH
MORE TESTS
PING4
PING6
LOOP
MORE TESTS
PING4
PING6
LOOP
BLINK


MORE SETUP
SYSTEM
TESTS
RJ45
VLAN
OPTICAL
802.1x
IP
REPORTS
CDP/LLDP
WIREMAP
PoE
PING6
TARGETS v4
TARGETS v6
NET TEST
PING4
LOOP
OWNER
LANG
CONFIG
UPDATE
FACTORY
JOBS
PREF
TIME
ABOUT

Setup

Select SYSTEM to access the system setup:

Enter details of the test engineer and company information and logo (see Reports) for inclusion in the reports

Access the JOBS menu

Set the menu language

Set preferences for auto off, backlight, length units, date and time format

Export or import setup information

Set the date and time for inclusion in the reports

Update the software. All settings and results will be lost. Save data to USB or smartphone first.

View details about the system information of the tester

Reset to factory defaults. All settings and results will be lost. Save data to USB or smartphone first.

Select TESTS to access the tests setup:

Set the details of the Wiremap test:

- Cable Type
  - Cat 3, Cat 5, Cat 5e, Cat 6, Cat 6A, Cat 7 and 7A, Cat 8, USOC8 1Pair, USOC8 2Pair, USOC8 3Pair, USOC8 4Pair, ETH 1236, ETH 1278, PROFINET 4W, COAX RGxx, ISDN BRI, DB, Custom
- Shield Type
  - UTP - Shield must not be connected for test to pass
  - STP - Shield must be connected for test to pass
  - UTP / STP - Test can pass if shield is connected or disconnected
- Display Preference
  - None, 568A, 568B, USOC, TERA
- Custom NVP.
  - Accurate length measurement relies on correct setting of the Nominal Velocity of Propagation (NVP) for the cable to be tested. Use Custom NVP - enabling custom NVP and entering number
- Split Pair:
  - Enable or disable
- Xover (crossover) Allowed:
  - Enable or disable

Set the details of the NET TEST:

- Primary / Secondary DNS and Gateway
  - Disabled - The target is not tested as part of the NET TEST
  - Auto - IP address of target is assigned by DHCP
  - Manual - IP address of target is assigned manually or picked from the Targets list by selecting 
- Target
  - Disabled - The Internet target is not tested as part of the NET TEST
  - IP Address - Enter a numerical IP address for the Internet target or pick from the Targets list by selecting 

- URL - Enter a URL for the Internet target or pick from the Targets list by selecting 
- Ping Setup
  - Count - Number of Ping attempts
  - Pause - Interval between Ping attempts
  - Length - Number of bytes in the Ping packet
- TRoute (Trace Route) Setup
  - TRoute - Include or omit the Trace Route test from the NET TEST
  - Max Hops - The number of hops that can be detected before the test fails to reach the destination target
  - Timeout - the timeout before the test fails to reach the destination target
  - Name Lookup - When ticked, the name of each hop is included in the test result. Note that selecting this option causes the test time to be longer
- IPv4 Netscan setup
  - Netscan - Disable Netscan from inclusion in the NET TEST or select Local or Custom network
  - IP Addr - Set Custom network sub-net
  - Scan range - Select a small scan range (Class C) for fast test time or a larger scan range (Class B) for a wider search

Set the details of the Power over Ethernet test:

- Type
  - PoE - Applies a load to draw current up to the maximum allowed for PoE
  - PoE+ - Applies a load to draw current up to the maximum allowed for PoE+
  - None - PoE test disabled
- Min PoE power (W)
  - Enter the minimum power in watts for the PoE test to pass
- Min PoE+ power (W)
  - Enter the minimum power in watts for the PoE+ test to pass

Set the details of the Ping 4 test

Set the details of the Ping 6 test

Set the parameters for the Ethernet Loop for Wireline (physical), MAC, IP and UDP layer loopback signal

Set up a list of targets to be used in the Ping and TRoute tests using IPv4 addresses or URLs

Set up a list of targets to be used in the Ping and TRoute tests, using IPv6 addresses or URLs

Select RJ45 to set the parameters for the RJ45 copper port including Auto Negotiation, Speed, Mode, Min Rx frame size, MDI and MAC address.

Select VLAN to set the VLAN ID and Priority of the tester if required

Select OPTICAL to set up minimum and maximum receiving optical power of pass fail limit. Select optical power item in the main screen to view information about the SFP. The following SFP types are supported. The use of other SFP types is possible but correct operation is not guaranteed.

Type	Manufacturer	Part No	Speed	Fiber type	Wavelength	Connector Type
SX	Avago	AFBR-5705PZ	1Gb/s	Multimode	850nm	LC Duplex
SX	Apac	LM28-C3S-TI-N-DD	1Gb/s	Multimode	850nm	LC Duplex
LX	Avago	AFCT-5705PZ	1Gb/s	Singlemode	1310nm	LC Duplex
LX	Apac	LS38-C3S-TC-N-DD	1Gb/s	Singlemode	1310nm	LC Duplex
ZX	Apac	LS48-C3U-TC-N-DD	1Gb/s	Singlemode	1550nm	LC Duplex

Select 802.1x to set the tester to use 802.1x security protocol if required

Select IP to set up the IP behaviour of the tester including IP type, address, Netmask, Gateway and DNS if required.

Select REPORTS to set the parameters to be used for the reports:

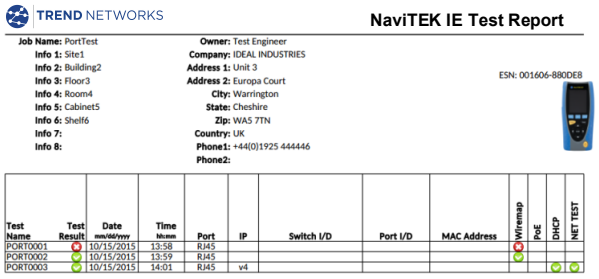
- Format
  - PDF & CSV - the reports contain both PDF and CSV files
  - PDF - the reports contain only a PDF file
  - CSV - the reports contain only a CSV file
- Size
  - Summary - the reports contain only a summary table listing the overall result of each test
  - Brief - the reports contain a summary table and a single page result for each test
  - Full - the reports contain a summary table and full details of each test
- Results
  - All- every test made is included in the reports
  - Pass - only tests that have passed are included in the reports
  - Fail - only tests that have failed are included in the reports
- SSID - The identity of the Wi-Fi hot spot set up by the tester for report transfer to smartphones (factory set)
- Wi-Fi Password - If required, edit the default password (trend001606) used by the TREND Anyware™ app to access the tester.

Select CDP, LLDP, EDP to enable the various types of Discovery Protocol supported by the tester

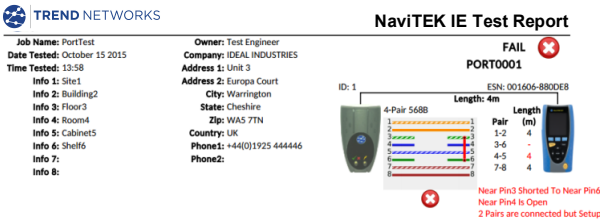
Reports

Reports are very important because they are documented proof that the ports have been tested. To select the required report style press F3 (MORE) then F1 (SETUP) in the HOME screen, then select REPORTS. Alternatively, the setup screen can be accessed by JOBS / OPTIONS / SETUP.

The example 4-page Brief report below shows the results of tests on 3 ports on a standard Ethernet network:

<table>
<tr>
<td> 
TREND NETWORKS
NaviTEK IE Test Report
Job Name: PortTest
Info 1: Site1
Info 2: Building2
Info 3: Floor3
Info 4: Room4
Info 5: Cabinet5
Info 6: Shelf6
Info 7:
Info 8:
Owner: Test Engineer
Company: IDEAL INDUSTRIES
Address 1: Unit 3
Address 2: Europa Court
City: Warrington
State: Cheshire
Zip: WA5 7TN
Country: UK
Phone1: +44(0)1925 444446
Phone2:
ESN: 001606-880DE8
Test Name | Test Result | Date mm/dd/yyy | Time hh:mm | Port | IP | Switch I/D | Port I/D | MAC Address | Wiremap | PoE | DHCP | NET TEST
PORT0001 | 10/15/2015 | 13:58 | RJ45
PORT0002 | 10/15/2015 | 13:59 | RJ45
PORT0003 | 10/15/2015 | 14:01 | RJ45 | v4</td>
<td>Page 1

This is the summary of all the tests.

(To include your own logo in the PDF reports, select SETUP / SYSTEM / OWNER / F1 (LOGO). Insert a USB memory key containing an image named logo.png with maximum size of 250 x 160 pixels.)</td>
</tr>
<tr>
<td> 
TREND NETWORKS
NaviTEK IE Test Report
Job Name: PortTest
Date Tested: October 15 2015
Time Tested: 13:58
Info 1: Site1
Info 2: Building2
Info 3: Floor3
Info 4: Room4
Info 5: Cabinet5
Info 6: Shelf6
Info 7:
Info 8:
Owner: Test Engineer
Company: IDEAL INDUSTRIES
Address 1: Unit 3
Address 2: Europa Court
City: Warrington
State: Cheshire
Zip: WA5 7TN
Country: UK
Phone1: +44(0)1925 444446
Phone2:
FAIL
PORT0001
ID: 1
ESN: 001606-880DE8
Length: 4m
4-Pair 568B
Pair | Length (m)
1-2 | 4
3-6 | -
4-5 | 4
7-8 | 4
Near Pin3 Shorted To Near Pin6
Near Pin4 Is Open
2 Pairs are connected but Setup</td>
<td>Page 2

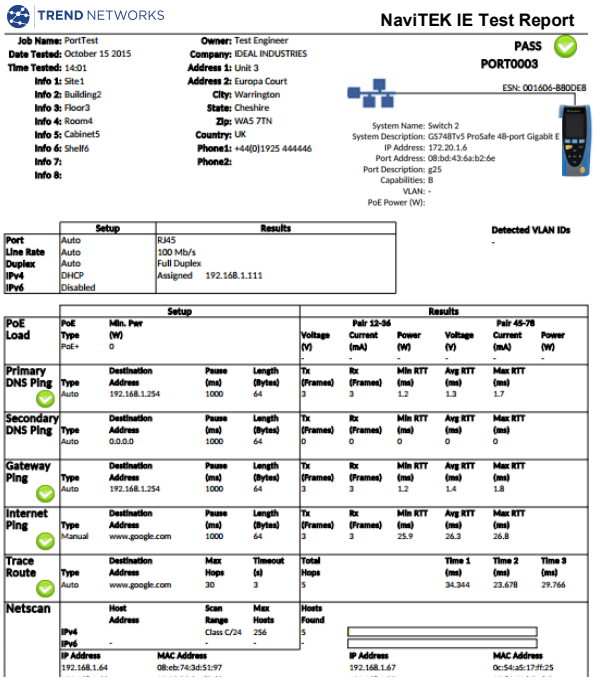
This is the Brief report for PORT0001.

It shows that this port failed the Wiremap test.

(Note the Job and Owner details)</td>
</tr>
<tr>
<td> 
TREND NETWORKS
NaviTEK IE Test Report
Job Name: PortTest
Date Tested: October 15 2015
Time Tested: 13:59
Info 1: Site1
Info 2: Building2
Info 3: Floor3
Info 4: Room4
Info 5: Cabinet5
Info 6: Shelf6
Info 7:
Info 8:
Owner: Test Engineer
Company: IDEAL INDUSTRIES
Address 1: Unit 3
Address 2: Europa Court
City: Warrington
State: Cheshire
Zip: WA5 7TN
Country: UK
Phone1: +44(0)1925 444446
Phone2:
PASS
PORT0002
ID: 1
ESN: 001606-880DE8
Length: 4m
4-Pair 568B
Pair | Length (m)
1-2 | 5
3-6 | 4
4-5 | 5
7-8 | 0</td>
<td>Page 3

This is the Brief report for PORT0002.

It shows that this port passed the Wiremap test.

(Note the tester serial number)</td>
</tr>
<tr>
<td> 
TREND NETWORKS
NaviTEK IE Test Report
Job Name: PortTest
Date Tested: October 15 2015
Time Tested: 14:01
Info 1: Site1
Info 2: Building2
Info 3: Floor3
Info 4: Room4
Info 5: Cabinet5
Info 6: Shelf6
Info 7:
Info 8:
Owner: Test Engineer
Company: IDEAL INDUSTRIES
Address 1: Unit 3
Address 2: Europa Court
City: Warrington
State: Cheshire
Zip: WA5 7TN
Country: UK
Phone1: +44(0)1925 444446
Phone2:
PASS
PORT0003
ESN: 001606-880DE8
Port Address: 08:bd:43:6a:b2:6e
Port Description: g25
Capabilities: B
VLAN: -
PoE Power (W):
Detected VLAN IDs
Setup | Results
Port: Auto | RJ45
Line Rate: Auto | 100 Mb/s
Duplex: Auto | Full Duplex
IPv4: DHCP | Assigned 192.168.1.111
IPv6: Disabled
PoE Load
Primary DNS Ping
Secondary DNS Ping
Gateway Ping
Internet Ping
Trace Route
Netscan
IP Address 192.168.1.64
MAC Address 08:eb:74:3d:51:97
IP Address 192.168.1.67
MAC Address 0c:54:a5:17:ff:25</td>
<td>Page 4

This is the Brief report for PORT0003.

It shows that this port passed the NET TEST

Details of the setup and results of the port connection and the Discovery information from the port are shown

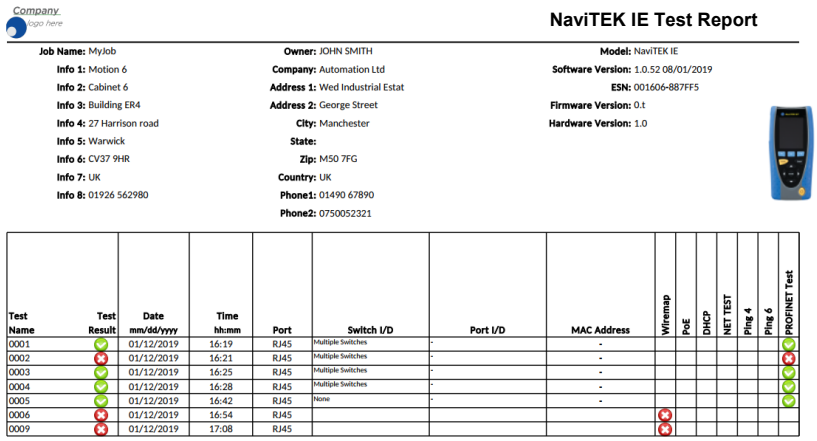
Details of the ping tests are shown

Details of the Trace Route test are shown

A list of all the hosts found by the Netscan test is shown, with a bar indicating how much of the available address space is used</td>
</tr>
</table>

PROFINET Reports

Reports created in PROFINET mode are laid out in a different format, but the same principles apply as for standard Ethernet reports:



Company logo here

NaviTEK IE Test Report

Job Name: MyJob
Info 1: Motion 6
Info 2: Cabinet 6
Info 3: Building ER4
Info 4: 27 Harrison road
Info 5: Warwick
Info 6: CV37 9HR
Info 7: UK
Info 8: 01926 562980

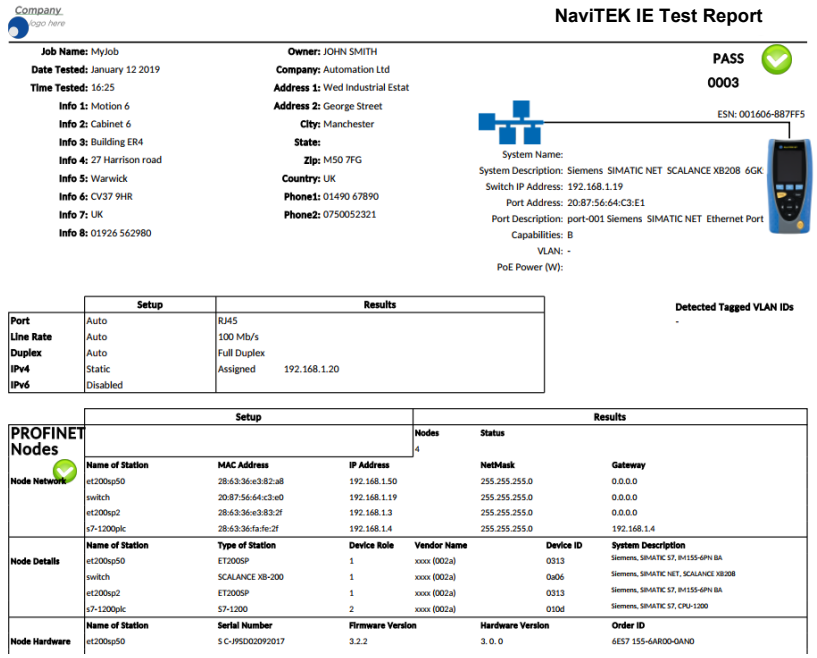
Owner: JOHN SMITH
Company: Automation Ltd
Address 1: Wed Industrial Estat
Address 2: George Street
City: Manchester
State:
Zip: M50 7FG
Country: UK
Phone1: 01490 67890
Phone2: 0750052321

Model: NaviTEK IE
Software Version: 1.0.52 08/01/2019
ESN: 001606-887FF5
Firmware Version: 0.t
Hardware Version: 1.0

Test Name	Test Result	Date mm/dd/yyyy	Time hh:mm	Port	Switch I/D	Port I/D	MAC Address	Wiremap	PoE	DHCP	NET TEST	Ping 4	Ping 6	PROFINET Test
0001	✓	01/12/2019	16:19	RJ45	Multiple Switches	-	-							✓
0002	✗	01/12/2019	16:21	RJ45	Multiple Switches	-	-							✗
0003	✓	01/12/2019	16:25	RJ45	Multiple Switches	-	-							✓
0004	✓	01/12/2019	16:28	RJ45	Multiple Switches	-	-							✓
0005	✓	01/12/2019	16:42	RJ45	None	-	-							✓
0006	✗	01/12/2019	16:54	RJ45				✗						
0009	✗	01/12/2019	17:08	RJ45				✗						

Page 1

This is the summary of all the tests.



Company logo here

NaviTEK IE Test Report

Job Name: MyJob
Date Tested: January 12 2019
Time Tested: 16:25
Info 1: Motion 6
Info 2: Cabinet 6
Info 3: Building ER4
Info 4: 27 Harrison road
Info 5: Warwick
Info 6: CV37 9HR
Info 7: UK
Info 8: 01926 562980

Owner: JOHN SMITH
Company: Automation Ltd
Address 1: Wed Industrial Estat
Address 2: George Street
City: Manchester
State:
Zip: M50 7FG
Country: UK
Phone1: 01490 67890
Phone2: 0750052321

PASS
0003
ESN: 001606-887FF5

System Name:
System Description: Siemens SIMATIC NET SCALANCE XB208 6GK
Switch IP Address: 192.168.1.19
Port Address: 20:87:56:64:C3:E1
Port Description: port-001 Siemens SIMATIC NET Ethernet Port
Capabilities: B
VLAN: -
PoE Power (W):

	Setup	Results
Port	Auto	RJ45
Line Rate	Auto	100 Mb/s
Duplex	Auto	Full Duplex
IPv4	Static	Assigned 192.168.1.20
IPv6	Disabled	

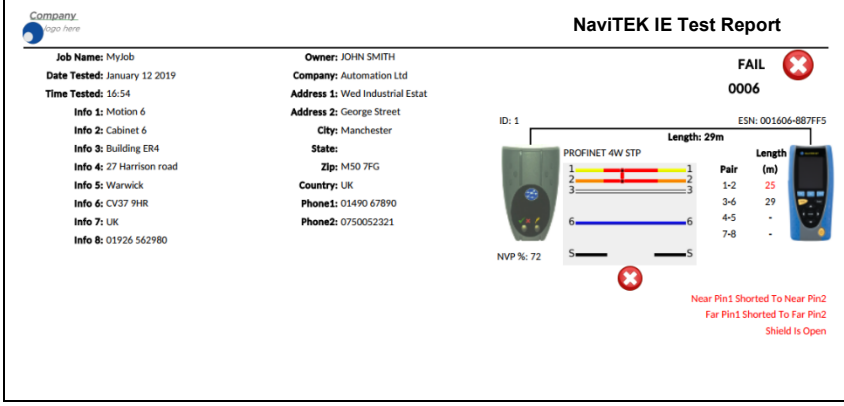
Detected Tagged VLAN IDs
-

PROFINET Nodes

	Setup			Results		
				Nodes	Status	
				4		
Node Network	Name of Station	MAC Address	IP Address		NetMask	Gateway
	et200sp50	28:63:36:e3:82:a8	192.168.1.50		255.255.255.0	0.0.0.0
	switch	20:87:56:64:c3:e0	192.168.1.19		255.255.255.0	0.0.0.0
	et200sp2	28:63:36:e3:83:2f	192.168.1.3		255.255.255.0	0.0.0.0
	s7-1200plc	28:63:36:fa:fe:2f	192.168.1.4		255.255.255.0	192.168.1.4
Node Details	Name of Station	Type of Station	Device Role	Vendor Name	Device ID	System Description
	et200sp50	ET200SP	1	xxxx (002a)	0313	Siemens, SIMATIC S7, IM155-6PN BA
	switch	SCALANCE XB-200	1	xxxx (002a)	0a06	Siemens, SIMATIC NET, SCALANCE XB208
	et200sp2	ET200SP	1	xxxx (002a)	0313	Siemens, SIMATIC S7, IM155-6PN BA
	s7-1200plc	S7-1200	2	xxxx (002a)	010d	Siemens, SIMATIC S7, CPU-1200
Node Hardware	Name of Station	Serial Number	Firmware Version		Hardware Version	Order ID
	et200sp50	S C-J95D02092017	3.2.2		3. 0. 0	6ES7 155-6AR00-0AN0

Following pages

These provide details of each node tested



Company logo here

NaviTEK IE Test Report

Job Name: MyJob
Date Tested: January 12 2019
Time Tested: 16:54
Info 1: Motion 6
Info 2: Cabinet 6
Info 3: Building ER4
Info 4: 27 Harrison road
Info 5: Warwick
Info 6: CV37 9HR
Info 7: UK
Info 8: 01926 562980

Owner: JOHN SMITH
Company: Automation Ltd
Address 1: Wed Industrial Estat
Address 2: George Street
City: Manchester
State:
Zip: M50 7FG
Country: UK
Phone1: 01490 67890
Phone2: 0750052321

FAIL
0006
ID: 1
ESN: 001606-887FF5
Length: 29m
PROFINET 4W STP

Pair	Length (m)
1-2	25
3-6	29
4-5	-
7-8	-

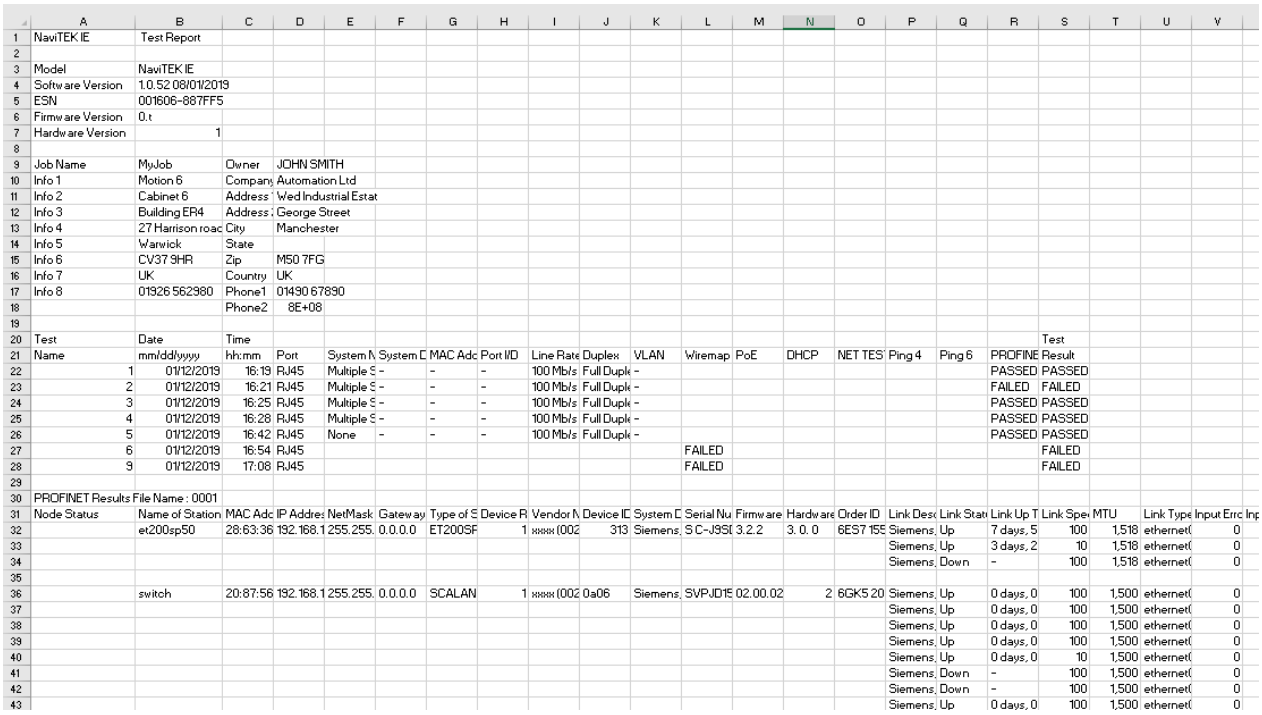
NVP %: 72

Near Pin1 Shorted To Near Pin2
Far Pin1 Shorted To Far Pin2
Shield Is Open

This is an example of a PROFINET 4 wire Wiremap Test result

In addition to the .PDF reports described above, the results can be exported to USB in .CSV format. This style of report is particularly useful for importing into network management databases.

Below is an example of part of a typical report, opened using Excel:



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	NaviTEK IE	Test Report																				
2																						
3	Model	NaviTEK IE																				
4	Software Version	1.0.52 08/01/2019																				
5	ESN	001606-887FF5																				
6	Firmware Version	0.t																				
7	Hardware Version	1																				
8																						
9	Job Name	MyJob	Owner	JOHN SMITH																		
10	Info 1	Motion 6	Company	Automation Ltd																		
11	Info 2	Cabinet 6	Address 1	Wed Industrial Estat																		
12	Info 3	Building ER4	Address 2	George Street																		
13	Info 4	27 Harrison road	City	Manchester																		
14	Info 5	Warwick	State																			
15	Info 6	CV37 9HR	Zip	M50 7FG																		
16	Info 7	UK	Country	UK																		
17	Info 8	01926 562980	Phone1	01490 67890																		
18			Phone2	8E+08																		
19																						
20	Test	Date	Time																Test			
21	Name	mm/dd/yyyy	hh:mm	Port	System N	System D	MAC Add	Port ID	Line Rate	Duplex	VLAN	Wiremap	PoE	DHCP	NET TES	Ping 4	Ping 6	PROFINE	Result			
22	1	01/12/2019	16:19	RJ45	Multiple S	-	-	-	100 Mb/s	Full Duple	-							PASSED	PASSED			
23	2	01/12/2019	16:21	RJ45	Multiple S	-	-	-	100 Mb/s	Full Duple	-							FAILED	FAILED			
24	3	01/12/2019	16:25	RJ45	Multiple S	-	-	-	100 Mb/s	Full Duple	-							PASSED	PASSED			
25	4	01/12/2019	16:28	RJ45	Multiple S	-	-	-	100 Mb/s	Full Duple	-							PASSED	PASSED			
26	5	01/12/2019	16:42	RJ45	None	-	-	-	100 Mb/s	Full Duple	-							PASSED	PASSED			
27	6	01/12/2019	16:54	RJ45								FAILED							FAILED			
28	9	01/12/2019	17:08	RJ45								FAILED							FAILED			
29																						
30	PROFINET Results	File Name : 0001																				
31	Node Status	Name of Station	MAC Add	IP Addres	NetMask	Gateway	Type of S	Device R	Vendor N	Device ID	System D	Serial Nu	Firmware	Hardware	Order ID	Link Des	Link Stat	Link Up T	Link Spe	MTU	Link Type	Input Errc	Inp
32		et200sp50	28:63:36	192.168.1	255.255.	0.0.0.0	ET200SP	1	кккк (002	313	Siemens,	S C-J9S(	3.2.2	3. 0. 0	6ES7 155	Siemens,	Up	7 days, 5	100	1,518	ethernet(	0	
33																Siemens,	Up	3 days, 2	10	1,518	ethernet(	0	
34																Siemens,	Down	-	100	1,518	ethernet(	0	
35																							
36		switch	20:87:56	192.168.1	255.255.	0.0.0.0	SCALAN	1	кккк (002	0a06	Siemens,	SVPJD1E	02.00.02	2	6GK5 20	Siemens,	Up	0 days, 0	100	1,500	ethernet(	0	
37																Siemens,	Up	0 days, 0	100	1,500	ethernet(	0	
38																Siemens,	Up	0 days, 0	100	1,500	ethernet(	0	
39																Siemens,	Up	0 days, 0	100	1,500	ethernet(	0	
40																Siemens,	Up	0 days, 0	10	1,500	ethernet(	0	
41																Siemens,	Down	-	100	1,500	ethernet(	0	
42																Siemens,	Down	-	100	1,500	ethernet(	0	
43																Siemens,	Up	0 days, 0	100	1,500	ethernet(	0	

Generating and Uploading Reports

1. Reports can be generated and exported to a USB key.

To generate a report to USB:

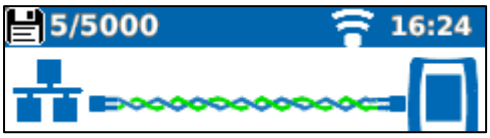
- Insert a USB key into the NaviTEK IE USB port.
- From the home screen press F1 (JOBS). The display will show the Job List screen.
- Scroll down to select the required Job
- To generate a report for a single result, press ENTER to display the Results list, select the required result, press ENTER, then TO USB (F3).
- To generate a report for a single Job select the required Job then press TO USB (F3).
- To generate a report for all Jobs, press OPTIONS (F2) then select ALL TO USB.

  The dialogue 'Result saved to USB' appears. Reports are now saved on the USB key in the selected format(s).

2. Reports can be generated and downloaded to a smartphone (only when no tests are running).

To enable Wi-Fi for results transfer:

- Insert Wi-Fi dongle into the NaviTEK IE USB port.
- From the home screen press F1 (JOBS).
- The display will show the Job List screen. Wi-Fi connectivity is indicated by the top bar on the NaviTEK IE screen changing from grey to blue:



Now the NaviTEK IE is ready for results transfer wirelessly.

Note

To minimise battery consumption the Wi-Fi connectivity is only enabled for 5 minutes following power up and whenever the user is in the JOB screen.

To download results to an Android™ smartphone:

- Download and open TREND AnyWARE™ App from the Google Play™ Store.
- Insert the USB Wi-Fi adapter in the USB port of NaviTEK IE.
- Search and connect to NaviTEK IE. The SSID will be of the form "TREND-XXXXXX". This can be viewed on the NaviTEK IE under the SETUP / REPORTS screen.
- You will be prompted for the NaviTEK IE Wi-Fi password if it has been changed from the default value. You can change the password inside SETUP / REPORTS. Make sure the USB Wi-Fi adapter is not activated (no blue colour on top bar) otherwise the change will not be allowed.

- Once connected the App will display a list of JOBs on the NaviTEK IE. These can be selected and downloaded to the smartphone.
- Once results are on the smartphone, they can then be transferred using email or other share mechanisms.

To download results to an iPhone®:

- Download and open TREND AnyWARE™ App from iTunes®.
- Insert the USB Wi-Fi adapter in the USB port of NaviTEK IE.
- Search and connect to NaviTEK IE. The SSID will be of the form "TREND-XXXXXX". This can be viewed on the NaviTEK IE under the SETUP / REPORTS screen.
- You will be prompted for the NaviTEK IE Wi-Fi password if it has been changed from the default value. You can change the password inside SETUP / REPORTS. Make sure the USB Wi-Fi adapter is not activated (no blue colour on top bar) otherwise the change will not be allowed.
- Once connected the App will display a list of JOBs on the NaviTEK IE. These can be selected and downloaded to the smartphone.
- Once results are on the iPhone® they can then be transferred using email or other share mechanisms.

Specifications - NaviTEK IE

Connectors

Test Ports

RJ45

Used for - Cable Test
- Ethernet Test

Connector type - Lifejack with user-replaceable contacts

Optical

Used for - Ethernet Test

Connector type - SFP socket

System Ports

USB

Used for - Software Update
- Results transfer
- 802.1x certificate transfer
- Import/export of config
- Wi-Fi Adapter

Class - Host

Connector type - A

USB type – 1.1

Power

Used for – Battery charging
- Mains powering via adaptor

Connector type – 2.5mm pin power jack

Polarity – Centre pin positive

Voltage – 12v

Current – 2 A

Location – Bottom of optional power module
(Not present in standard alkaline battery pack)

Controls

ON/OFF

Push button

Used for – Power ON/OFF

Function Keys

F1 to F3

Used for – Screen-defined functions

Navigation Keys

Cursor and ENTER

Used for – User interface navigation

Escape

Used for – Return to previous menu

Autotest

Used for – Launch of automatic test function

Reset

Push button

Used for – Escape from exceptional lockup condition

Displays

Screen

LCD Touchscreen

Used for – Display of setup functions and results
Location – Front
Size – 2.8-inch diagonal
Type – QVGA Colour
Pixels – 240 x 320

LEDs

Charger LED

Used for – Indication of charging status
Colour – Green
Location – Bottom of standard power module
(Not present in optional alkaline battery pack)

RJ45 Link LED

Use– ON indicates link UP
Colour - Green

RJ45 Activity LED

Use – Flashing indicates link activity
Colour - Green

Optical Link LED

Use – ON indicates Optical link UP
Colour - Green

Optical Activity LED

Use – Flashing indicates Optical link activity
Colour – Green

Ports

RJ45

Setup

Auto Negotiation – Enabled
- Disabled

Speed – 10Mb/s
- 100Mb/s
- 1Gbps

Mode – Full Duplex
- Half Duplex

MDI - AUTO
- MDI
- MDIX

Min Rx Size – 19:99 bytes

MAC – Factory set

VLAN – Enabled / Disabled
- VLAN ID – 0 to 4094
- VLAN Priority – 0 to 7

802.1x - Enabled / Disabled
- EAP Method
  - EAP-MD5
  - EAP-MSCHAPV2
  - EAP-GTC
  - EAP-TLS
  - EAP-PEAP/MD5
  - EAP-PEAP/MSCHAPV2
  - EAP-PEAP/GTC
  - EAP-PEAP/TLS

EAP-TTLS/MD5
EAP-TTLS/MSCHAPV2
EAP-TTL/GTC
EAP-TTLS/TLS

- Username
- Password
- Certificate
- Import password
- Root/CA certificate

Results

Link pulse polarity – Normal or Inverted
Link pulse height – Normal or Low

Tests

Ethernet Mode
- Ping4
- Ping6
- Trace Route4
- Trace Route6
- Hub Blink
- Netscan
- Loopback
- NET TEST (Ping DNS/Gateway/Internet, Trace Route, Netscan)

Cable Mode
- Wiremap
- Tone Generator
- Auto (Wiremap)

Service Detection

Detected Services
- PoE (802.3af/at. Not Cisco pre-standard)
- ISDN S
- PBX
- Unknown

Optical

Supported SFPs

The following SFP types are supported. Use of other types of SFP is possible but correct operation is not guaranteed.

SFP Type SX

Manufacturer Part # - Avago AFBR-5705Z / Apac LM28-C3S-TI-N-DD
Speed – 1Gbps
Fibre Type – Multimode
Wavelength – 850nm
Connector Type - LC Duplex

SFP Type LX

Manufacturer Part # - Avago AFCT-5705Z
Speed – 1Gbps
Fibre Type – Single mode
Wavelength – 1310nm
Connector Type - LC Duplex

SFP Type ZX

Manufacturer Part # - APAC LS48-C3U-TC-N-DD
Speed – 1Gbps
Fibre Type – Single mode
Wavelength – 1550nm
Connector Type - LC Duplex

Setup

Speed - 1Gb/s
Min Rx Size – 19:99
MAC – Factory set

VLAN – Enabled / Disabled
- VLAN ID – 0 to 4094
- VLAN Priority – 0 to 7

802.1x
- Enabled / Disabled
- EAP Method
  - EAP-MD5
  - EAP-MSCHAPV2
  - EAP-GTC
  - EAP-TLS
  - EAP-PEAP/MD5
  - EAP-PEAP/MSCHAPV2
  - EAP-PEAP/GTC
  - EAP-PEAP/TLS
  - EAP-TTLS/MD5
  - EAP-TTLS/MSCHAPV2
  - EAP-TTL/GTC
  - EAP-TTLS/TLS
- Username
- Password
- Certificate
- Import password
- Root/CA certificate

Tests

Optical
- Tx Power dBm (using a specified SFP)
- Rx Power dBm (using a specified SFP)
- Rx max and Rx min power limit for the pass/fail indication.

Ethernet Mode
- Ping4
- Ping6
- Trace Route4
- Trace Route6
- Hub Blink
- Netscan
- Loopback
- NET TEST (Ping DNS/Gateway/Internet, Trace Route, Netscan)

Cable Tests

Wiremap

Setup

Cable Type
- Cat 3, Cat 5, Cat 5e, Cat 6, Cat 6A, Cat 7 and 7A, Cat 8, USOC8 1Pair, USOC8 2Pair,USOC8 3Pair, USOC8 4Pair, ETH 1236, ETH 1278, PROFINET 4W, COAX RGxx, ISDN BRI, DB, Custom

Shield
- UTP
- STP
- UTP/STP

Display Reference
- None,
- 568A
- 568B
- USOC
- TERA

NVP
- Fixed 72%
- Custom 59% - 89%

Split Pair - Enable or disable
Xover Allowed - Enable or disable

Termination Type

None - Open
Active Remote - #1 - #12

Tests (No Termination)

Faults – Open circuit by pair
- Short circuit by pin

Length of pair – Metres / Feet (Set in System Setup)
- Range 3-100m / 10-330ft

Tests (Active Remote Termination)

I/D – Remote #
Indications on Remote – Voltage Warning (>±10volts on any pins)
- Pass/Fail

Faults – Open circuit by pin
- Short circuit by pin
- Crossed pairs
- Split pairs
- Bridged shorts
- Remote shorts

Length of pair – Metres / Feet (Set in System Setup)
- Range 3-100m / 10-330ft

Tone Generator

Setup

No of Tones – 3
Wire I/D – Tone applied to one of 8 pins relative to the other 7
- Tone applied across one of 4 pairs

Test

Audible tone detected using compatible tone probe

Ethernet Tests

IPv4

Setup

Addressing - DHCP
- Static

Numerical - Address
- Netmask
- Gateway
- DNS1
- DNS2

IPv6

Setup

IPv6 Enable- Enabled
- Disabled

Addressing - Stateful (DHCPv6)
- Stateless
- Static

Numerical - 128bit HEX IP address
Network Prefix - 64 bit
- 128 bit

Pingv4

Setup

Target - Numerical address
- URL (Store up to 10)

Count - 1 to 999999

Pause - 1 to 5 Sec
Length - 8 to 1000 bytes.

Results

Info - READY
- IN PROGRESS
- PASSED
- NO RESPONSE
- UNKNOWN HOST

Tx Count - 1 to 999999
Rx Count - 1 to 999999
Delay(ms) - Minimum
- Average
- Maximum

Pingv6

Setup

Target - IPv6 address
- URL (Store up to 10)

Count - 1 to 999999
Pause - 1 to 5 Sec
Length - 8 to 1000 bytes.

Results

Info - READY
- IN PROGRESS
- PASSED
- NO RESPONSE
- UNKNOWN HOST

Tx Count - 1 to 999999
Rx Count - 1 to 999999
Delay(ms) - Minimum
- Average
- Maximum

Trace Routev4

Setup

Target - Numerical address
- URL

Max Hops - 2 to 100
Timeout - 2 to 30 sec
Type - ICMP
- UDP

Results

Info - READY
- IN PROGRESS
- PASSED
- NO RESPONSE
- UNKNOWN HOST

Hop - Numerical address
Delay(ms) - t1
- t2
- t3

Trace Routev6

Setup

Target - Numerical address
- URL

Max Hops - 2 to 100

Timeout - 2 to 30 sec
Type - UDP

Results

Info - READY
- IN PROGRESS
- PASSED
- NO RESPONSE
- UNKNOWN HOST

Hop - Numerical address
Delay(ms) - t1
- t2
- t3

Netscan

Setup

Netscan - Local
- Custom
- Disabled

IP Address - IPv4 address
Scan Range - 0 (class C /24)
- 1 (class C /20)
- 2 (class B /16)

Results

- *List of IPv4 hosts*
- *List of IPv6 hosts*

Blink

Test

Sequence - Off/10/Off/100/Off/1000 Mb/s (RJ-45)
- Off/On (Optical)

Loop

Setup

Loop Type - Wireline
- MAC
- IP
- UDP

All Traffic - Yes
- No

PROFINET Tests

Node Discovery

Number of nodes (station) detected - 254 (max)

Node colour status criteria (traffic light)

Red indication (Critical events detected)

- No or duplicate name set
- Duplicated or wrong IP address set
- No or wrong device subnet mask set
- Device communication failure
- Device IP outside the tester subnet mask
- Packet error ratio exceeding $1x10^{-7}$ limits
- Link load > 50%

Amber indication (No critical events detected)

- Packet errors ratio occurring > 0 but < $1x10^{-7}$ limit
- Link load 10% ~ 50%
- Another identical device model found but has different firmware / hardware version
- Device speed is 10Mb/s
- Device port half duplex

Green indication (No abnormal events detected)

- No errors
- No alarms
- No duplicated IP address or name
- Link traffic load below 10%

Node (station) details

- Name
- Address
- Subnet
- Gateway
- Type
- Role
- Vendor name
- Device ID
- System description
- Serial No.
- Firmware Version
- Hardware Version
- Order ID

Partner details

- Name
- Port No.
- MAC address
- Description

Interface ports selection

- 1 to 3

Port statistics

- Link status (Up, Down)
- Link Up time
- Link speed (Mb/s)
- MTU
- Link Type
- Link description

Port Input (Rx) Statistics

- Errored packets count
- Utilisation (%)
- Traffic (Mb/s)

Unicast packets count
Multicast packets count
Discarded packets count
Unknown protocols packets count
Bytes

Port output (Tx) Statistics

Errored packets count
Utilisation (%)
Traffic (Mb/s)
Unicast packets count
Multicast packets count
Discarded packets count
Bytes
Queue Length

Node Setup

IP Address
Subnet mask
Name
Factory default
Flash LEDs

Map Comparison

Category - Same
- Mismatch
- New
- Missing

Result - Media: USB memory key
- Format: pdf

MAP list - Media: USB memory key
- Format: xml

Error event log

Duration - 1 hour
- 24 hours
- 48 hours

Resolution - 1 min

Node No. - One

Node Port - 1 to 3 selectable

Details - Node Name
- Node IP address
- Node port interface selection
- Time remaining
- Event count
- Event time
- Input (Rx) packets count
- Input (Rx) packet errors count
- Output (Tx) packets count
- Output (Tx) packet errors count
- Node status

Log file - Media to USB memory
- Node details as above
- Error event with time stamp
- Excel file format
- File name with date and time

Statistics

IP

Results

IPv4

- info: listening, assigned, DHCP failed
- DHCP or Static
- IPv4 Address
- IPv4 Netmask
- IPv4 Gateway
- IPv4 DNS1
- IPv4 DNS2

IPv6

- Enabled or Disabled
- info: listening, assigned, DHCP failed
- Stateful (DHCPv6) or Stateless or Static
- IPv6 Address
- IPv6 Network Prefix, 64 bit or 128 bit
- IPv6 Link Address
- IPv6 DNS

Discovery

- LLDP/CDP/EDP
- Protocol
- MAC address
- Hostname / address
- Port Name
- Max 10 hosts

VLAN

Detection

- 1 Level VLAN ID
- Rx

802.1x

Status

- Auth Not Started
- Auth Started
- Auth Completed Successfully
- Auth Failed
- Connected Successfully (auth)

Port Status

- Unauthorised
- Authorised

EAP Method Used

Key Management Used

LINK

Results

PORT

- PoE Voltage 0 – 60V
- PoE Pairs 12/36 or 45/78
- Speed, Duplex
- MDI / MDIX
- Signal Level
- Polarity

PARTNER

- *10M-HD*
- *10M-FD*
- *100M-HD*
- *100M-FD*

- *1000M-HD*
- *1000M-FD*

ERRORS - *Collisions*
- *FCS Errors*
- *Undersize*
- *Oversize*
- *Jabbers*
- *Bad Length*

Traffic Utilisation

Bargraph

Direction - *Rx*

Format - *Percentage of Link rate*
- *Peak value*

Time Interval- 1 min
- 10 min
- 60 min

Storage

Configurations

Internal storage

Number of configurations – 2 (Current & Factory settings)

Export/Import

Port – USB

Format - xml

Certificates

802.1x

Max number - 10

Results

Internal storage

Max Number of Jobs (Projects) - 50

Max Number of result sets per Job – 5000 depending on tests performed

Max total number of result sets - Up to 5000 depending on tests performed.

Export

Port – USB
- Wi-Fi

Format – PDF
- CSV (summary only)

System

Setup

Owner

Details – Name
- Company
- Address
- Phone

Preferences

Language – English
- French
- German
- Spanish
- Italian
- Portuguese
- Chinese

Auto off - Disabled

- 3 mins
- 10 mins
- 30 mins

Backlight - Always On
- Dims to 50% after 3 mins

Length Units- Meters
- Feet

Date Format- dd/mm/yy
- mm/dd/yy

Time Format- 12 hour
- 24 hour

Software update

Upgrade - Via USB

General

Date/Time

Internal Clock

Used for – Timestamping results

Autonomy – Up to 1 day with battery removed

Power

Battery

Supported Types - Standard power module (4 x AA NiMH cells)
- Alkaline battery pack with 4 AA cells

Autonomy - Up to 5 hours (power module only)

Recharge time – 3 hours (Power module only)

Battery level Indication - Full
- 2/3
- 1/3
- Empty

Physical

Dimensions

Length - 175mm

Width - 80mm

Depth - 40mm

Weight

Unit - 0.22kg

Batteries – 0.18kg

Environmental

Temperature

Operating – 0°C to 40°C

Storage – -20°C to 70°C

Relative Humidity

Min 5%

Max 90% non-condensing

Approvals

EMC

EN 55022:2006 / A1:2007

EN55024:1998 / A1:2001 / A2:2003

Safety

IEC 60950-1:2005+A1:2009/EN 60950-1:2006+A1:2010

Glossary, abbreviations and acronyms

Term	Description
10M-HD	10 Mb/s Half Duplex
10M-FD	10 Mb/s Full Duplex
100M-HD	100 Mb/s Half Duplex
100M-FD	100 Mb/s Full Duplex
1000M-HD	1000 Mb/s Half Duplex
1000M-FD	1000 Mb/s Full Duplex
Broadcast	Communication from single sender to all connected receivers
CSV	Comma Separated Value file format
DCP	Discovery and Configuration Protocol (from PROFINET)
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
IP	Internet Protocol
IPv4	Internet Protocol version 4
Static	IP address assigned manually by the operator
Dynamic	IP address assigned automatically using DHCP
IPv6	Internet Protocol version 6
Stateful	IP address assigned automatically using DHCPv6
Stateless	P address assigned automatically using Stateless Address Autoconfiguration (SLAAC) without DHCPv6
Static	IP address assigned manually by the operator
LAN	Local Area Network
MAC	Media Access Control
MDI	Medium Dependent Interface
MDIX	Medium Dependent Interface Crossover
NVP	Nominal Velocity of Propagation of signals in a cable, expressed as a percentage of the speed of light in a vacuum. Can be determined using cable manufacturers' data or experimentally using a known cable length.
PDF	Portable Document Format
PoE	Power over Ethernet
PoE+	Power over Ethernet which exceeds the IEEE 802.3af limit of 12.95 watts
RJ45	Registered Jack standard for a modular connector using 8 conductors
Rx	Receive
SFP	Small Form-factor Pluggable
SNMP	Simple Network Management Protocol
SSID	Service Set Identifier
STP	Shielded Twisted Pair
Tx	Transmit
URL	Uniform Resource Locator
USB	Universal Serial Bus
UTP	Unshielded Twisted Pair
Wi-Fi	Wireless Network