Testing LAN Cables and Network Connectivity

Abstract

We summarize the suite of tests and functions available when using the NETcat Pro 2 combined wiremapper, network and Power over Ethernet tester.

By

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Introduction

This application note summarises many of the tests that can be carried out using NETcat Pro 2, NC-500. The NETcat Pro 2 is a hand-held tester that has a main unit and a "remote" unit that is normally stored in the bottom of the main unit. It operates on a simple 9V battery, is controlled via a touchscreen. It is also capable of producing pair identification tones which are detectable with any of Tempo's pair tracing probes.

Check an RJ45-type patch cable for correct wiring or bad connectors:

Plug one end into the Remote Unit jack and one end into the Main Unit. Run the Multi-pair Test. Read results on-screen.

Check LAN wiring from a central wiring point to a remote jack:

Using the short RJ45 adapter cable, remove the Remote Unit from the Main Unit and plug it into the service or office jack, then disconnect the patch cable from the closet panel, hub or switch and plug it into the Main Unit. Run the Multi-pair Test. Read results on-screen.

Determine if there is LAN service in a jack:

Using the short RJ45 adapter cable, plug the Main Unit into the service or office jack. Run the Multi-pair Test. Read results on-screen.

Determine the wire distance from a jack to the nearest panel, hub or switch:

Using the short RJ45 adapter cable, plug the Main Unit into the service or office jack. Run the Multi-pair Test. Read the length on-screen.

Determine if there is damage to a LAN cable run:

Using the short RJ45 adapter cable, plug the Main Unit into the service or office jack. Run the Multi-pair Test. Check the pair-by-pair results from the Multi-pair test for shorts and for variations in displayed wire pair lengths.

Check to see how much cable is left on a spool:

Using the alligator-lead adapter with the Main Unit, connect to a pair of wires on one end of the cable. Run the Single- or Multi-pair Test. Read the length on-screen. Note that for cable types other than CAT5e/6 you may want to check the chosen Velocity of Propagation. A small table of typical cable types is provided in the settings.

Determine if the LAN port on a PC is functioning:

Using the short RJ45 adapter cable, plug the Main Unit into the PC Ethernet LAN jack. Run the Multi-pair Test. Read results on-screen (similar to those shown below for a PoE switch but without PoE indication).

To identify whether Power Over Ethernet is available:

Using a known good patch cord or the short RJ45 adaptor cable, plug the main unit into the Ethernet port. Run the Multi-pair Test. Read the results on-screen.

If PoE is shown as present on pairs 1,2 & 3,6 then this is likely fed from a Power Sourcing Equipment (PSE). If PoE is present on the "spare" pairs, 4,5 & 7,8 then this is likely fed from a "mid-span injector". If PoE is present on all four pairs then this is likely an 802.3bt high power source.

To trace a wire pair or cable:

Using the short RJ45 adapter cable, plug the Main Unit into the jack. Select the tracing tone if desired (577 Hz is in Tone 3 for 200XP noise-immune tone probe users), using pair = ALL if trying to localize a cable, and pair = 1,2 (for example) if trying to identify individual pairs in a cable.

Check Coaxial Cables

The included F to BNC adaptors are used as needed to connect the main unit to a cable. Go to settings and choose the most correct velocity of propagation (NVP, nominal velocity of propagation). Run Single-Pair/Coax test. You will see the length of the cable and whether the far end is open or shorted.

Identifying Multiple Cables

If you are installing a patch panel and need to identify which lead at the patch panel is connected to which wall socket; use the multiple "remote ID" units that are available in the NC-510 accessory set. Run the relevant "Multi-pair test" or "one pair/coax test" as required, connect up and label as you go.

Identifying a Single Cable

This can be achieved by using NC-500 in conjunction with a pair tracing probe. NC-500 can be set to send a tracing tone on one or multiple pairs of the CAT5e/6 cable or coax. Three different "melodies" are available, useful if you're tracing near another NC-500 to tell them apart.

Using a tone probe such as 200EP-G, 200FP, 500XP or similar is recommended for best compatibility.

Summary

NETcat Pro 2 offers a range of tests that can confirm the presence of Power over Ethernet (PoE), correct "Network" provision in the form of Ethernet capabilities and if these are not as expected can be used to "map" the wiring to ensure that all conductors have continuity and are connected to each other in the correct pattern.

One pocket sized device is invaluable for quickly checking network cabling.

Options

NC-500, NETcat Pro2

The main unit with remote ID #1, patch cords (RJ45 and coaxial), BNC and F adaptors, crocodile clip adaptor, instruction manual.

NC-510, NETcat Pro2 Accessory Set

Contains a carry case and seven additional combined "remote ID" units. The case is large enough to accommodate all content of the NC-500 main unit set.

NC-520, NETcat Pro 2 kit

A set containing NC-500 and NC-510.

About Tempo Communications
Tempo Communications, Inc. offers a complete line of reliable, industry-leading test and measurement solutions to address all stages of network deployment, enabling the development, installation, and maintenance of xDSL, Fiber, Cable, Ethernet, and Irrigation networks. The Tempo Communications North American headquarters remains in Vista, CA, with Global headquarters in Australia and Cwmbran, UK.