FLUKE
networks ™

NetTool™
Network Connectivity Tester

Quick Reference Guide

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NetTool™
Quick Reference Guide

Ready, Aim, Register!

What's in it for me?
A FREE PERSONALIZED HOLSTER!!!!

Get a free holster with a personal or company name
embossed on it for your NetTool by visiting
www.flukenetworks.com and registering your NetTool
today.

What is NetTool?

What? More busywork to slow me down?

NetTool is easy to use and saves time! It is a unique
handheld device that combines cable, network, and PC
configuration testing into a single, handheld unit.
NetTool was designed specifically to speed your
frontline network troubleshooting, "moves, adds &
changes," and desktop-to-network connectivity work.

I'm bored and want to kill time…
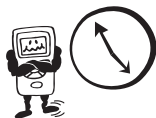
Access the *NetTool Users Manual* on the CD-ROM
disk that came with your purchase if you have
a lot of time to kill. Hey, you can also surf to
www.flukenetworks.com for the latest news on
NetTool, troubleshooting tips, and service information.

How to use NetTool
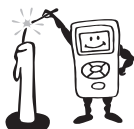
I don't have a lot of time to kill, how do I light this candle?

NetTool has two RJ-45 jacks, one on either side of the unit. Plug it in and turn it on… either between two devices like a hub and a PC or directly into a wall plate to check a network drop.

Think of it as your virtual eyes and ears in checking PCs connected to networks. NetTool can be used in two modes: **Single-Ended Mode** (page 3) and **Inline Mode** (page 7).

NetTool Capabilities

Service Identification	Link Configuration
Telco Token Ring Ethernet	Link ID Receive Pair Advertised Speed Actual Speed
Health	Level
Broadcast/Error meters	Polarity Advertised Duplex
Cable Test	Actual Duplex
Wiremap	**Services (Key Devices)**
PC Configuration	IP Servers IPX (NetWare) Servers NetBIOS Servers
Link Config Health Addresses Used Servers Used	Printers Routers
	Problems
	Problem Log

Single-Ended Mode
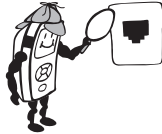

What's lurking behind that wall plate?

Note

To optimize discovery, connect NetTool with the device (like a PC) off, turn NetTool on, press AutoTest, then turn the device on.

⇒ Plug an RJ-45 (supplied PN 642774) cable into a network drop or a single network device, such as a hub, PC, server, or printer.

⇒ Plug the other end of the cable into either side of NetTool, power up NetTool, and start **AutoTest** by pressing the **Select** (middle) button. The NetTool screen displays the NetTool icon and the other device icon.
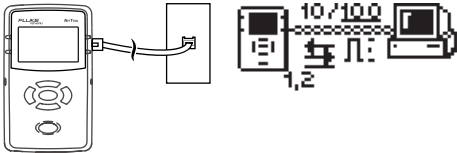
afq01f.eps

Use this mode to quickly prove a network drop or network device is active, determine its speed and duplex settings, confirm healthy frames are being sent, or check connectivity to the network (when plugged into a hub or switch). Check *AutoTest* (page 17) for more information on the icons.

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Cable Testing

You can check cable length, detect split pairs, or use the wiremap adapter (supplied PN 1563930) to verify pin-to-pin continuity from the near to the far end of a cable.

Cable Test

⇒ Plug the cable to test into the jack on either side of the NetTool. Power up NetTool. **AutoTest** flashes. Press **Select**.

```
         ▣═══════▤
      ▐▐ 7ft
  ○▬ AutoTest
```
afq31s.bmp

⇒ Highlight the Spool icon and press **Select** to see cable status. NetTool detects cable length, opens, shorts, and split pairs.
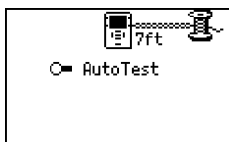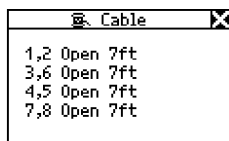
```
    ▨ Cable              ✕

  1,2 Open 7ft
  3,6 Open 7ft
  4,5 Open 7ft
  7,8 Open 7ft
```
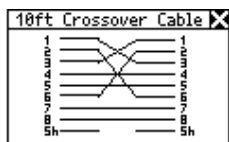afq32s.bmp

Wiremap

⇒ To use wiremap, attach the wiremap adapter to the far end of the cable.

⇒ Power up NetTool. **AutoTest** flashes. Press **Select**.

```
         ▣═══════▢
      ▐▐ 7ft
  ▨▬ AutoTest
```
afq33s.bmp

⇒ Highlight the Wiremap icon and press **Select**.

```
  10ft Crossover Cable ✕
  1 ─────────── 1
  2       ╲ ╱       2
  3        ╳        3
  4       ╱ ╲       4
  5 ─────────── 5
  6 ─────────── 6
  7 ─────────── 7
  8 ─────────── 8
  Sh ────────── Sh
```
afq34s.bmp

4

Service Identification

⇒ Plug one end of a cable into the RJ-45 jack on either side of NetTool and the other end into any RJ-45 wall jack.

⇒ Power up NetTool and select **AutoTest**. Doing so shows you what service is active on the jack:

Telco: Shows the tip and ring pins.

⚠ Caution

Although NetTool can detect Telco signals, it is not designed to be used on the public telephone network. Disconnect immediately. NetTool cannot reliably discover Telco information with the AC adapter or serial cable connected. It also detects ISDN signals but cannot reliably detect the S/T interface.

Token Ring: Indicates the presence of a Token Ring network.
Ethernet: Tells you if the jack is hot, what's on the other end (hub, switch, etc.), as well as the speed and duplex, level, and polarity. Also shows the segment ID so you can choose the right network (if there are multiple jacks).

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Services Discovered

Servers

IP Servers (IP services discovered): DHCP, DNS, email (SMTP, POP, IMAP), Web (HTTP, HTTP proxy), WINS

NetWare Servers (IPX service types): Nearest File Server, File Server, NetWare Access Server, Time Synchronization Server, NetWare Directory Server (NDS), NetWare Management Server

NetBIOS Servers: Primary Domain controllers, Backup Domain controllers, Master Browsers

Routers

IP Routers: RIP, IGRP, EIGRP, OSPF, IRDP, RIP2

IPX routers: RIP

Printers

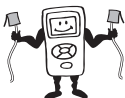**IP Printers** - IP Printers, IP Print Spoolers

IPX Printers - IPX Print services

DLC Printers - Microsoft DLC, HP DLC

Inline Mode

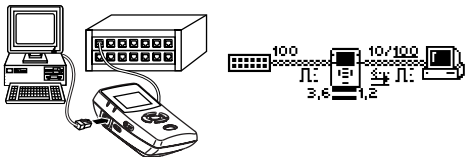*They say two jacks are better than one…*

Note

NetTool can't tell you about what it doesn't see. NetTool must sense traffic on a network or device so it can supply protocol or health information.

Inline means NetTool is connected between two devices simultaneously like a PC and hub. Use this mode to verify that a PC will communicate properly with the network.


afq02f.eps

$\Rightarrow$ Plug NetTool inline between the PC and the network.

$\Rightarrow$ Power up the PC.

$\Rightarrow$ Select **AutoTest**. The example shown above is NetTool connected inline between a PC and a hub. The icons represent the discovered devices. Check *AutoTest* (page 17) for more on the icons.

So what?

$\Rightarrow$ Select the **PC** or **Hub** icon for more link configuration information, health, Segment ID, and for PCs−address and server information.
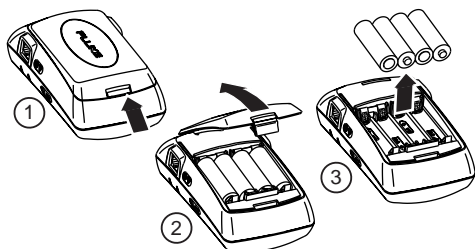
Getting Acquainted
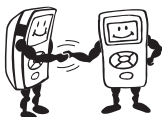
Skip this page if you have ever used a radio…
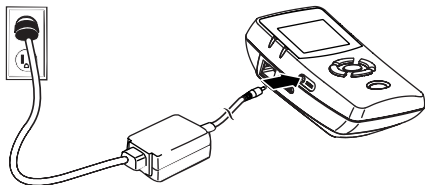
Batteries

Use four (4) AA size batteries (supplied PN 1560231) or the optional rechargeable batteries (PN 1572184) as shown (optional charger PN 1572191).

afq05f.eps

AC Adapter

The optional AC adapter (PN 1556346) can be used to power the unit and conserve battery power.

afq03f.eps

Buttons and Indicators

Press the buttons all you want. What you press won't hurt you or your network.

⇒ **Power** – press and hold for two seconds to turn on or off.

⇒ **Backlight** – After NetTool has power, you may turn on the *backlight* by simply pressing the power button once quickly. Turn it off by….*you guessed it*…pressing the **Power** button again.

Navigation Keys

Power

Link, Collision, and Error LED

Utilization LED

Select
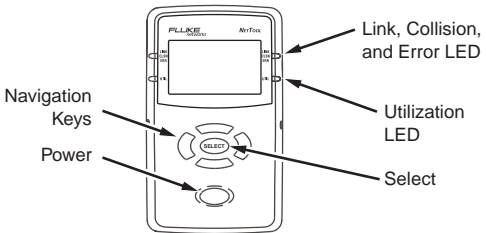
afq24f.eps

Navigation Buttons

⇒ After powering up NetTool, just press the buttons that make up the oval under the screen to highlight an icon or menu item that you wish to view (up, down, right, left). As you navigate, the highlighted area flashes.


afq25f.eps

⇒ Press **Select** (middle button) once to view an item and related screens.

⇒ Within a screen that is "scrollable," use the up and down key to scroll. Within a menu screen, the right button returns you to the ⊠. The right and left buttons act as a page up (left) or page down (right) if there are more items to view.

⇒ Press the **Up** key to navigate to the ⊠ (top right) and press **Select** to close the current screen.

NetTool LED Indicators

NetTool has two tricolor LED indicators on each side to reflect link and health information at a glance.
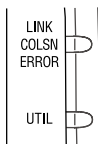
afq26f.eps

LINK/CLSN/ERR LED

Green = Link pulse present

Yellow = Collisions occurring

Red = Errors occurring

Utilization LED

The bottom tricolor LED (UTIL) indicates utilization percentages for each side.

Green = utilization levels below 40%

Yellow = levels between 40% and 70%

Red = levels greater than 70%

Serial Connection

Connecting NetTool to a PC via the customized serial cable (supplied PN 1541340) allows you to download new software, enable options, or save screens using the NetTool Blaster program supplied on the CD-ROM. Read *NetTool Updates, etc.* (page 24) for details.

NetTool Menus

*Just show me the dessert menu. Life is too short not to order dessert first.*

There are two sets of menus to assist in troubleshooting: **icons** on the top of the screen and the **main menu** below the icons.
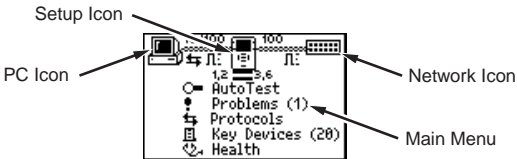
afq27f.eps

Selecting an icon takes you through menus corresponding to the three elements of the connection: **PC**, **NetTool** setup, and **Hub**. The main menu takes you through various discovery screens that reflect NetTool's connection to devices.

Between the top area icons there are several indicators that reflect link and cabling information as shown below.
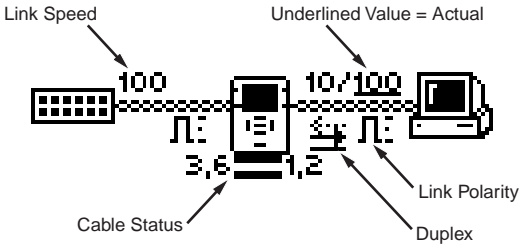
afq29f.bmp

Duplex Settings:

⇄	= Full Duplex
⇄	= Half Duplex

NetTool displays duplex settings for each device, advertised or collision-determined. Duplex mismatches can impede communication between devices.

Link Level and Polarity: Polarity is displayed via waveform shaped icons.

⊓⁚	Normal level, normal polarity
⊔⁚	Normal level, reverse polarity
⊓⁚	Low level, normal polarity
⊔⁚	Low level, reverse polarity. Link level is displayed by the height of the waveform.

1,2 ▬ 3,6

3,6 ⤬ 3,6 **Cable Status**: NetTool shows you the status of the cables connected to it and detects whether the cables are straight or swapped. If NetTool sees a swap cable problem, it will swap it internally, allowing you to troubleshoot past a simple swap cable problem.

NetTool Menus - PC

$\Rightarrow$ Connect NetTool to a PC and select the PC $\blacksquare$ icon. The icon displays on the left or right, depending on where you connected the cable.

$\Rightarrow$ After the PC sends frames, you can scan the PC configuration by navigating through the menu. This view of the PC is invaluable in troubleshooting networked PCs.

```
   ▣ Station            ✕
  ЛL Link Config
  ⚙ Health
  ▓▓ Addresses Used
  ▣ Servers Used
```

afq16s.bmp

Link Configuration ЛL

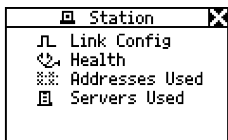*Hey there, what's your sign?*

The link configuration screen provides the following key link information about the device to which NetTool is connected:

```
   ЛL Link Config       ✕
  Rx Pair: 1,2
  Advertsd Spd: 10/100
  Actual Spd: 100Mb
  Level: ЛL (5)
  Polarity: Normal
  Advertsd Duplex: Full
  Actual Duplex: Half
```
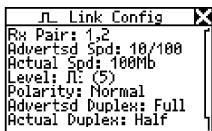
afq15s.bmp

Receive Pair   Polarity
Advertised Speed   Advertised Duplex
Actual Speed   Actual Duplex
Level

14

Health 🐌

Don't know why that PC seems a bit under the weather?

Check out the health of frames the PC has sent since you started **AutoTest** and isolate PC related problems.

```
🐌 Health            ✕
Frames: 6826
Broadcsts: 51 (1%)
Errors: 26 (1%)
FCS: 0 (0%)
ShortFrames: 26 (1%)
Jabbers: 0 (0%)
Collisions: 7 (1%)
```
afq35s.bmp

Frames
Broadcasts
Errors
FCS (Frame Check Sum)

Short Frames
Jabbers
Collisions

Addresses Used ⠿
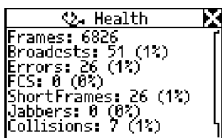
My name is, my name is…

NetTool displays the best-discovered name on the PC as well as the IP, IPX, and MAC address of the PC.

```
⠿ Addresses Used     ✕
Best:JOMILLS2
IP:129.196.195.102
IPX:10:00105aabd69b
Encap:802.3
DN/WGRP:SPASSKY
MAC:00105aabd69b
```
afq28s.bmp

Servers Used ▤

Shows the network resources the PC is using, including HTTP, SMTP, POP, WINS, Nearest NetWare, DHCP and DNS servers, as well as the router gateway.

```
▤ Servers Used       ✕
▥First Resp:
Best:10:00a0c96b77b2
Encap:802.3
MAC:00a0c96b77b2(Intel)

▥Default Router:
Best:DBINDER-DELL
```
afq22s.bmp

15
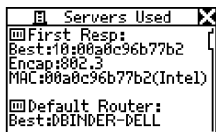
NetTool Setup

Select the **NetTool** 📱 (middle) icon. You can:

⇒ Check the battery level 🔋 .

⇒ Select feet or meters.

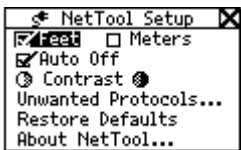⇒ Enable/disable **Auto Off**. If you leave the unit on
without touching any keys for more than 10
minutes, **Auto Off** automatically shuts the unit
down to save battery power.

```
   ⬆ NetTool Setup    ✕
  ☑Feet  ☐ Meters
  ☑Auto Off
  ◐ Contrast ◑
  Unwanted Protocols...
  Restore Defaults
  About NetTool...
```

afq07s.bmp

⇒ Adjust the display contrast. Highlight ◐ and press
Select to decrease contrast or ◑ to increase it.

⇒ Choose **Unwanted Protocols…** Navigate to this
item and press **Select** to specify protocols that
NetTool will warn you are present on the network.
This helps in situations like a network-wide
migration away from certain protocols. If NetTool
sees them, it reports them in the Problem Log.

⇒ Select **Restore Defaults** to restore all factory
settings. If you have not changed any settings,
NetTool displays **Defaults Restored** and no
action is required.

⇒ View software/hardware details. Highlight and
select **About NetTool…** to view the serial number,
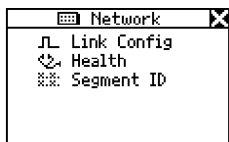MAC address, and revision information.

Network

⇒ Select the network ⊞ icon to view network activity. The icon displays on the left or right depending on where you connected the cable.
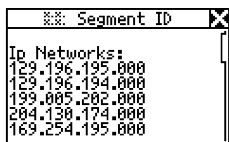
Link Config: (described in the PC section)

Health: (as described in the PC section)

Segment ID: If there are multiple Ethernet drops, knowing the Segment ID tells you which jack to use for correct configuration.

⊞ Network ✕
⌐ Link Config
⟳ Health
▒▒ Segment ID

afq11s.bmp

▒▒ Segment ID ✕
Ip Networks:
129.196.195.000
129.196.194.000
199.005.202.000
204.130.174.000
169.254.195.000

afq21s.bmp

NetTool Main Menu

The main menu items are your starting point. View NetTool's discovery screens to resolve those daily connectivity battles you face.

AutoTest ⊂▬

⇒ Select **AutoTest** so NetTool can discover what is connected to it. Both RJ-45 connections are searched independently and NetTool finds Telco, Token Ring, or Ethernet service. It also provides cable information when used for cable testing.


afq06s.bmp

Problems

Use NetTool. Solve problems. Get home on time. It's a beautiful thing.

⇒ Select **Problems** to view the Problem Log. The Problem Log provides a concise list of all problems detected, from physical layer to application layer problems. You can think of problems fitting into two categories: **Link Connectivity** level and **Network** level. Read the online users manual for full descriptions of problems and troubleshooting tips. As you see problems, you will become familiar with the associated icons that display.

afq18s.bmp
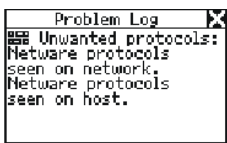
ahn122s.bmp

In single-ended mode, NetTool can only report **Unwanted Protocols** and link connectivity problems. Inline mode is required to discover any other problems.

Link Connectivity Problems

- Speed mismatch
- Pair mismatch
- Duplex mismatch
- Polarity reversed
- Level low
- Transmit pair open

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Network Problems

Health 🔧

- Short Frames received (also jabber/FCS).
- Excessive utilization seen (also collisions).

NetWare ▤

- Ethernet frame-type mismatches.
- No nearest server replies seen on network.
- No first responder replies seen on network. Unable to configure PC network number.

TCP/IP

- Device using incorrect IP address and/or subnet masks.
- Router issued ICMP redirect. Hosts or devices using incorrect gateways/routers.
- PC using incorrect IP subnet mask.
- PC using incorrect IP address.
- Duplicate IP detected.

Host Configuration

- BootP/DHCP server not responding.
- DHCP server issuing IP address that causes duplicate IP on network.

Name Resolution

- No DNS server found on network to resolve names.
- DNS resolution failed.
- WINS resolution failed.
- Incorrect WINS server xxx.xxx.xxx.xxx configured on PC.
- No WINS server found on network to resolve names.
- Hosts unable to find WINS servers on network or network bounded by routers.
- PC WINS incorrect.
- Incorrect DNS server configured.

NetBIOS

- Incorrect Workgroup or Domain configured on PC.
- Unable to find Primary Domain Controller (PDC) for network.
- xxx.xxx.xxx.xxx causing duplicate NetBIOS name.
- PC involved in MB elections.

Web

- Unable to connect to HTTP/proxy server.

Email

- Unable to connect to mail server.
- Unable to connect to SMTP server.
- Unable to connect to POP2 server.
- Unable to connect to POP3 server.
- Unable to connect to IMAP server.

Printer

- Unable to connect to IP printer server.
- Unable to connect to IP print spool server.

Unwanted protocols (when enabled)

- NetBEUI detected.
- WINS detected.
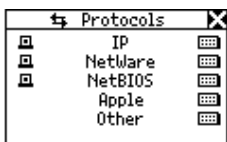- NetWare detected.
- PC involved in MB (master browser) elections.

Protocols

Exactly what languages are these devices speaking to each other?

⇒ Select **Protocols** to view the protocols seen on the desktop or network. This can be very useful for finding configuration mismatches.


afq19s.bmp

afq20s.bmp

Key Devices

Check this out!

⇒ Select **Key Devices** to view all the servers, routers, and printers NetTool has found on the network. NetTool always attempts to display the highest level address possible for that device, be it a NetBIOS name, DNS name, IP address or Mac address. This helps you determine which services or servers exist on the network.
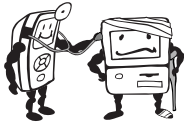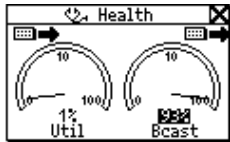

afq14s.bmp
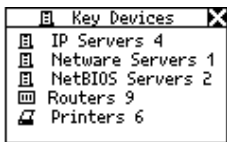
afq13s.bmp

Health

Doctor, I have a pain in my network.

⇒ Select **Health** to view the health of frames and to simultaneously check each side of the conversation for healthy frames in real time.


afq10s.bmp   afq08s.bmp

⇒ Use the navigational buttons and then press **Select** to change the meters to show utilization broadcast traffic, collision levels and errors coming from either device to which NetTool is connected.

⇒ You can highlight an item within the Health screen and press **Select** to change the view. For example, highlight the reading below a meter and press **Select** to view the data as frames per second or percentages.

Note

*If you exit the Health display and return later without powering down, NetTool displays the "last-saved" settings. If you power down NetTool while viewing the Health display, the readings will not be saved. Access Setup screen and select **Restore Defaults** to restore factory settings.*

NetTool Updates, etc.
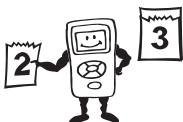
Don't miss out…

Get updates to NetTool software when they are released. To check the version you have, select the **NetTool Setup** icon and then **About NetTool..**.

⇒ To find out if there is a new version, access **www.flukenetworks.com** and navigate to the software download area. Follow the instructions to see if a newer software download file is listed.

⇒ To update your NetTool, download the file from the web or order a CD-ROM. Use the supplied serial cable and connect as shown.
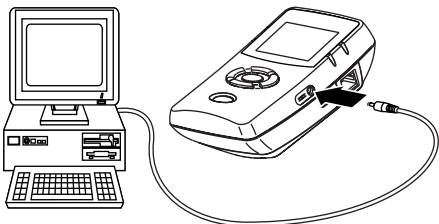
afq04f.eps

NetTool™ Blaster

What would we do without a little software in our lives?

Updating NetTool is a simple process that requires you to run the update program that came on CD-ROM or from the web.

⇒ If you received the upgrade on CD-ROM, follow the instructions on the screen to install the NetTool Blaster! program.

⇒ If you downloaded the upgrade from the web, run the self-extracting upgrade program to install the newer version.

⇒ After installing and starting NetTool Blaster!, select **Help** from the top menu and follow the instructions to update your NetTool.

Limited Warranty and Limitation of Liability

See the NetTool Users Manual on your NetTool CD for warranty information.