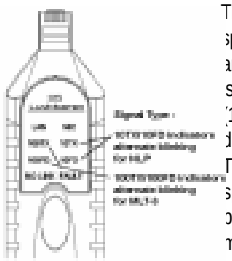
LINK SIGNAL TYPE

Three different signals can be used to establish a Link: a Link Code Word, an NLP or an MLT-3 waveform.



The Link Code Word is specific in both Link speed and duplex mode. The NLP is specific in speed (10Mbps) but ambiguous in duplex mode (half or full). The MLT-3 waveform is also specific in speed (100Mbps) but ambiguous in duplex mode. Duplex modes for equipment that use NLP or MLT-3 signaling must be known to ensure proper Link operation.

(**Example**: a switch port can be configured to a 100Mbps full duplex mode of operation. Most switches use MLT-3 signaling for this mode. When this port is connected to a NIC in a full Auto-negotiating mode, the NIC will assume the switch port is in a half duplex mode based on the MLT-3 signal. The duplex configuration mismatch will cause the Link to perform poorly due to high error rates and collisions.)

The LanMaster 25 indicates an NLP signal by alternately blinking the 10TX and 10FD indicators. An MLT-3 signal is indicated by alternately blinking the 100TX and 100FD indicators. When this condition exists, both Link Partners must be configured for the same speed and full duplex mode or one must be configured for half duplex operation and the other in full Auto-negotiation mode for the Link to operate properly.

BATTERY LIFE

The LanMaster 25 remains on until the "Test" button is pressed and released a second time. Check that the unit is off (all indicators are dark) after each test to conserve battery life.

APPLICATIONS

Network Planning - Identify capabilities of installed equipment for LAN upgrades without opening the case.

Installation - Verify physical layer connectivity to the far end. Link activation signals verify two way continuity and identify connected hub/switch port.

Trouble Calls - Reduce troubleshooting time by ensuring the Link is active and no faults are detected. Locate physical layer problems with built-in tone generator and standard tone probe.

Moves, Adds and Changes - Identify correct wire pair with tone generator feature and verify Link is operating after punching down new connections.

Network Management - Test current configuration of installed equipment to determine if modes have been configured manually and type of Link signaling used.

WARRANTY

Psiber Data Systems Inc. warrants that the product shall be free from defects in parts or workmanship for a period of 12 months from the date of purchase if used in accordance with Psiber Data Systems Inc. operating specifications.

THIS IS THE ONLY WARRANTY MADE BY Psiber Data Systems Inc. AND IS EXPRESSLY MADE IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

Should any parts or workmanship prove defective, Psiber Data Systems Inc. will repair or replace at Psiber Data Systems' option, at no cost to the Buyer except for shipping costs from the Buyer's location to Psiber Data Systems Inc. This is Buyer's **SOLE AND EXCLUSIVE REMEDY** under this Agreement.

This warranty does not apply to products which have been subject to neglect, accident or improper use, or to units which have been altered or repaired by other than a Psiber Data Systems Inc. authorized repair facility.

Return of Equipment - To return a product to Psiber Data Systems Inc., first obtain a Return Authorization number from our Customer Service by calling 619-287-9970. The RA# must be clearly marked on the shipping label, or the package will not be accepted by Psiber Data Systems Inc.

See sample label below.

To: Psiber Data Sytems Inc.
7075-K Mission Gorge Road
San Diego, CA 92120
RA# XXXXXXXX

Part No. 1005-0250-0000 Rev B

LANMASTER 25
USER'S GUIDE

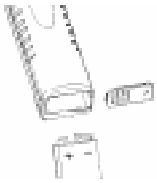
psiber

BOX CONTENTS

- LanMaster 25 Link Tester
- 9 Volt Alkaline Battery
- RJ-45 Coupler
- User Guide

BATTERY

The LanMaster 25 operates on one 9 volt alkaline battery. Remove the battery cover at the bottom of the unit and insert the battery with the terminal orientation as shown. Battery polarity is marked on the back of the battery cover and inside the battery well for reference.



TECHNICAL OVERVIEW

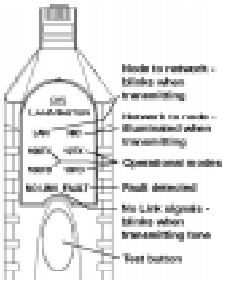
The IEEE 802.3u Standard for 100BaseTX (Fast Ethernet) requires LAN equipment to use a signaling system to establish a Link between two devices called Link Partners. Standard Ethernet uses a single Normal Link Pulse to establish the Link. Fast Ethernet equipment (and some recent 10baseT products) use a burst of Fast Link Pulses(FLPs) to transmit a Link Code Word defining the configured capabilities of the device and to report faults . If both Link Partners have Auto-negotiation capability, a Link is established based on the following priority:

1. 100BaseTX Full Duplex
2. 100BaseT4
3. 100BaseTX Half Duplex
4. 10BaseT Full Duplex
5. 10BaseT Half Duplex

The IEEE 802.3u Standard does *not* require Fast Ethernet equipment to support Auto-negotiation or more than one 100baseT mode of operation. A second type of signaling called Parallel Detection (a continuous MLT-3 waveform) can also be used to establish a Fast Ethernet Link. Parallel Detection signaling does *not* differentiate between half duplex and full duplex mode which can lead to poor network performance if both Link Partners are not properly configured. Most Ethernet LAN equipment can be manually configured to a specific mode of operation. Equipment in this "commanded" mode of operation may establish a Link with either a Link Code Word, an NLP or a Parallel Detection (MLT-3) signal. Knowing the type of signaling used on a Link is critical to optimizing system performance.The LanMaster 25 detects and decodes the different Link signals on Standard and Fast Ethernet networks and displays the equipment configuration, signaling type and reported faults. The LanMaster 25 does not test 100BaseT4.

OPERATION

The LanMaster 25 test consists of three steps: detecting Link signals, transmitting Link signals and Auto-negotiating.



Insert the LanMaster 25 plug end in to the RJ-45 port of a hub, switch, network interface card, wall outlet, or attach to a UTP or STP cable with the RJ-45 coupler.

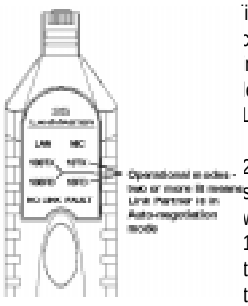
Press and release the "TEST" button. Wire pair 3,6 (Link signals from network) are scanned for two seconds. If Link signals are detected, the indicator(s) for the operational modes or fault condition are illuminated. After one second, the LanMaster 25 automatically transmits a pattern of Link signals to the Link Partner. The "LAN" indicator blinks on and off as the signals are transmitted. The Link indicator on the hub or switch at the far end will also blink indicating which port is connected to the LanMaster 25. (Hubs/ switches have different Link indicator time delays. The blink rate of the equipment may not exactly match the blink rate of the LanMaster 25. Determine the blink pattern directly at a hub/switch port prior to running tests from a remote outlet.) When no signals are detected on the first wire pair, the unit scans wire pair 1,2 (Link signals from node) for two seconds. Link signals are decoded and the indicator(s) for the modes or fault are lit. After one second, the LanMaster 25 transmits Link signals continuously to the NIC. The Link light on the NIC will light verifying two-way Link communications.

If no signals are detected, the "NO LINK" indicator is illuminated and the LanMaster 25 automatically transmits a tone pattern on both wire pairs. The "NO LINK" indicator blinks when the tone is being transmitted. A standard tone probe can be used with the LanMaster 25 to locate the physical layer problem.

The LanMaster 25 also detects Links with incorrectly installed reversed polarity pairs and displays "NO LINK" for this condition. (Links using NLP or FLP signaling only.)

AUTO-NEGOTIATION

When two or more operational mode indicators are lit, the Link being tested is capable of Auto-negotiating to the highest common level of operation with a Link Partner.



After the LanMaster 25 begins transmitting Link signals, the Link Partner will Auto-negotiate to the 10TX or 100TX mode and the LanMaster 25 indicators for the negotiated mode will light verifying the Auto-negotiation function. (Note: Auto-negotiation timing varies greatly therefore not all equipment will complete Auto-negotiation with the LanMaster 25. For equipment with long time constants, the capabilities are displayed but the negotiation to the 10TX or 100TX mode does not occur. Test a known good port to determine equipment response time.)