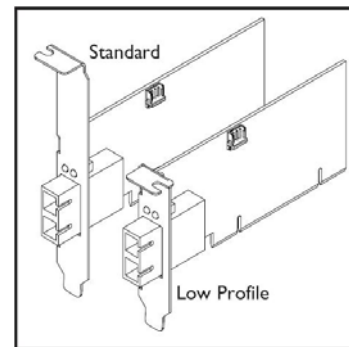![Transition Networks logo]

User Guide

N-FX-xx-03

100-Base-FX Network Interface Cards (NICs)

Introduction

Transition Networks N-FX-xx-03 PCI 100FX NICs provide a 100Base-FX fiber port and delivers low cost, fiber optic connectivity to the desktop in fiber-rich LAN environments.

With standard- and low-profile form factors, these NICs have driver support for most popular operating systems, and PCI 2.2 / 2.1 plug-and-play capabilities. These fast Ethernet NICs can be installed in virtually any PC on the network. The N-FX-xx-03 modules include both Standard and Low Profile brackets.

Contents

Models / Part Numbers

Part Number	Duplex Fiber-Optic Port
N-FX-ST-03	100Base-FX 1300nm multimode (ST); [2 km/1.2 mi.]***** Link Budget: 12.0 dB
N-FX-SC-03	100Base-FX 1300nm multimode (SC); [2 km/1.2 mi.]***** Link Budget: 12.0 dB
N-FX-LC-03	100Base-FX 1300nm multimode (LC); [2 km/1.2 mi.]***** Link Budget: 12.0 dB
N-FX-MT-03	100Base-FX 1300nm multimode (MT-RJ); [2 km/1.2 mi.]***** Link Budget: 14.5 dB*

* Typical maximum cable distance. Actual distance depends on network physical characteristics.

Installation

Description

The N-FX module has bootable ROM and Wake-On LAN capabilities. The two LED indicators, **LINK/ACT** and **FDX**, located on the bracket, show network/board link, activities, collision, and full-duplex statuses. See Figure 1 below.
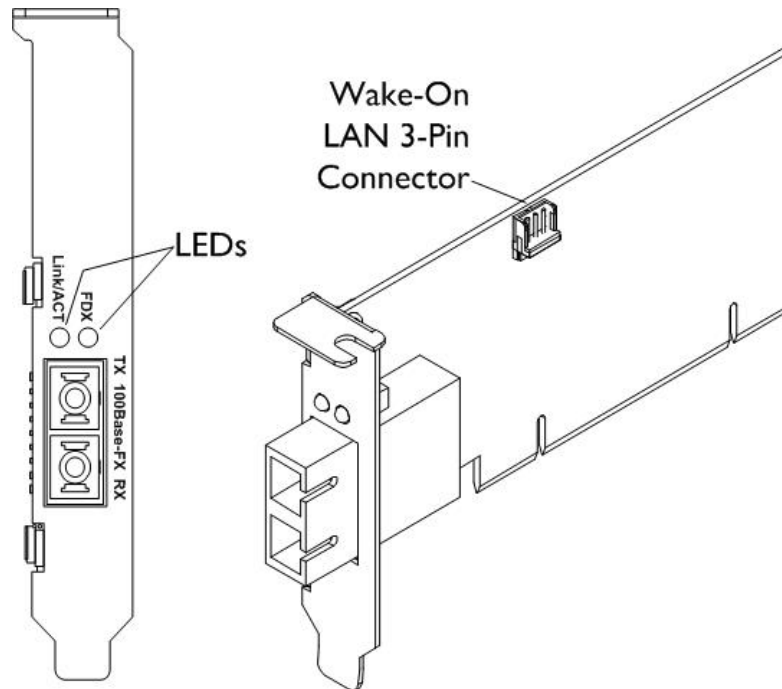

Figure 1: LEDs and Wake-On LAN Connector

Installation Procedure

CAUTION: Wear a grounding strap and observe electrostatic discharge precautions when installing the N-FX module. Failure to observe this caution could result in damage or failure of the N-FX module.

Perform the steps below to install the NIC. **Important:** Install the N-FX NIC in a "master slot" only.

1. Select one of the two options for WoL to match the host PC's capabilities:
    a. via WoL 3-pin connector (Fig. 1 above), or
    b. via PCI bus; see Wake-on-LAN (WoL) on page 6.
2. Locate a master slot on the PC workstation or file server.
3. Remove the cover from the PC workstation or file server - keep all screws.
4. Remove and keep the screws holding the cover to the installation slot.
5. Carefully align the module to the slot guides and slide it into the "master slot."
6. Ensure that the module is firmly seated in the slot.
7. Use the screws saved in Step 4 above to secure the module to the workstation or file server housing.

Configuration

For motherboards with automatic PCI configuration:

- No specific setup is needed. (You can enter the system BIOS setup menu to view or specify the interrupt (INT) line of the PCI slots.)

For motherboards with bus master and interrupt jumpers:

- Enable bus master operation in a selected PCI slot and select an INT request line (IRQ) level, using the appropriate motherboard jumper.
- Enable I/O on the N-FX, PCI slot.

PCI Bus System and Configuration

- Ensure that the PCI machine supports master slots, INT multiple sharing, and timing compatibility.
- DO NOT install N-FX in PCI slave slots. Please refer to your PC system manual and select the appropriate configuration settings.
- When installing multiple N-FX modules in a server station, you can correctly configure the IRQ settings of the PCI slot.
- Up to four N-FX modules can be installed in a PCI file server, running a NetWare operating system.
- N-FX server modules share the same INT line with the driver supporting multiple INT services at a time. The IRQ of each N-FX module should not conflict with other boards.
- Operation in full duplex (default) or half-duplex mode is configured by LAN driver options. The operating mode should match the working status of the remote link device.
- Use EMM386 version 4.49 or higher, and install both DOS and EMM386 from the same DOS package to avoid software problems.

Booting the System

The NIC can boot according to PXE (default) or RPL protocols. If you want to boot from BIOS you must re-configure the NIC according to BIOS settings.

Boot Options

The NIC is capable of the following boot modes:

Local Only: In this mode, network boot is disabled on the NIC. This option is useful for conserving Option ROM space or ensuring the network boot will not occur through this NIC.

According to BIOS: In this mode, the NIC will follow the BIOS configuration for network boot. This option can be used when the user wants the host process to be controlled entirely by the BIOS.

Network first, then Local (default): In this mode, the NIC takes over the boot process regardless of the BIOS boot configuration and the NIC attempts to force the PC to boot through its own network interface. If the network boot fails, the PC diverts back to booting according to the boot order configured in the BIOS. This mode is useful for enabling network boot on PCs that do not have network boot options in the BIOS.

Local first, then Network: In this mode, the NIC allows booting according to the BIOS boot order configuration. If booting according to the BIOS boot order fails, the NIC attempts to force booting through its own network interface.

To Change Boot Options

1. At start-up, a prompt displays to *Press <Shift> + <Tab> key to display boot option menu*.

2. Press Shift and Tab keys together at the prompt. A screen displays with the NIC boot options:

3. Change the Boot Option setting to the desired option.

4. Save and exit.

Wake-on-LAN (WoL)

This section outlines the methods for configuring WOL based on the type of PCI bus in the PC. Wake-on-LAN is implemented using a special network message called a magic packet. The magic packet contains the MAC address of the destination computer. The listening computer waits for a magic packet addressed to it and then initiates system wake-up. The magic packet is sent on the data link (OSI Layer 2) and is broadcast to all NICs using the network broadcast address (the IP-address is not used).

The Technical Specifications section of this manual shows:

Wake-ON-LAN supports magic packets only:

- PCI 2.1 implemented via the 3-PIN WOL connector (WOL cable needed)
- PCI 2.2 implemented directly via PME# signal (no WOL cable needed)

Note that PCI 2.2 does not use the WOL cable; the WOL function is done via the PCI slot.

For PCI 2.1, these slots do require the use of a WOL cable, and you are installing the N-FX-xx-03 in a PCI 2.1 slot and you want to use the WOL feature, use the provided WOL cable The WOL cable TN part number is 4100 (included with the N-FX-xx-03).

Most versions of Microsoft Windows integrate WoL functionality into the Device Manager, available in the Power Management tab of each network device. Often, the correct BIOS configuration is also required for WoL to function. In Windows Vista and higher, you can determine how the OS was powered up by running the *powercfg / lastwake* command in a CMD prompt to list the "Wake Source". The WoL event should also be logged in the System Event log. In Linux, WoL may be changed with a subfunction of the *ethtool* command.

LED Functions

The LED is a single green color.

LED	Description
FDX	ON Full duplex. OFF Half duplex.
Link/ACT	ON Link OFF No link Blinking Activity

Cable Specifications

Fiber cable

Bit error rate: $<10-9$
Single mode fiber (recommended):   9 µm
Multimode fiber (recommended):   62.5/125 µm
Multimode fiber (optional):   100/140, 85/140, 50/125 µm

N-FX-ST-03 and N-FX-SC-03:   1310 nm multimode
Fiber optic transmitter power: min: -19.0 dBm   max: -14.0 dBm
Fiber optic receiver sensitivity: min: -30.0 dBm   max: -140 dBm
Link budget: 11.0 dB

N-FX-LC-03:   1310 nm multimode
Fiber optic transmitter power: min: -19.0 dBm   max: -12.0 dBm
Fiber optic receiver sensitivity: min: -30.0 dBm   max: -8.0 dBm
Link budget: 11.0 dB

N-FX-MT-03:   1300nm multimode
Fiber optic transmitter power: min: -19.0 dBm   max: -14.0 dBm
Fiber optic receiver sensitivity: min: -30.0 dBm   max: -140 dBm
Link Budget: 14.5 dB

A typical application is shown below.
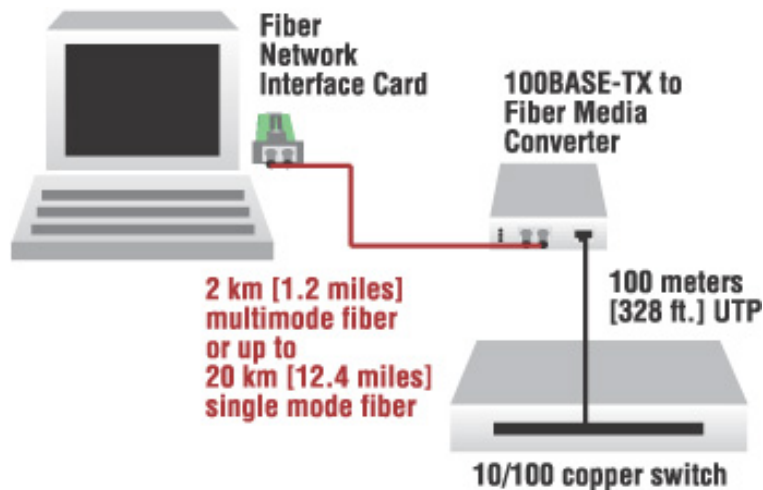
Technical Specifications

Transition Networks Model N-FX-xx-03 supports IEEE 802.1P/Q VLAN tagging.

Expansion bus standard:　　　　　　　PCI 2.1, PCI 2.2 compliant

Data rate:　　　　　　　　　　　　　100Mbps fiber media

LEDs (*on the bracket*):　　　　　　　• LINK/ACT
　　　　　　　　　　　　　　　　　　• FDX (*full/half duplex*)

Wake-On LAN:　　　　　　　　　　　Supports magic packets only:
- PCI 2.1 implemented via the 3-Pin WOL connector
- PCI 2.2 implemented directly via PME# signal (*no Wake-On LAN cable needed*)

OS Support:　　　　　　　　　　　　Windows XP x32, Vista x32-64, Win7 x32-64, Win8 x32-64

Boot server support:　　　　　　　　PXE (*default*)

PCB dimensions:　　　　　　　　　　2.2"W x 4.8"D x 0.9"H (*55.9 mm x 121.9 mm x 23 mm*)

Shipping Weight:　　　　　　　　　　1 lb (*455 g*) approximately

Power consumption:　　　　　　　　2.5 Watts

MTBF:　　　　　　　　　　　　　　greater than 550,000 MIL-HDBK-217G hours
　　　　　　　　　　　　　　　　　greater than 1,520,000 Bellcore hours

Operating temp:　　　　　　　　　　0°C to 50°C (*32°F to 122°F*)

Storage temp:　　　　　　　　　　　40°C to 85°C (*-40°C to 185°F*)

Humidity:　　　　　　　　　　　　　5% to 90%, non-condensing

Warranty:　　　　　　　　　　　　　Lifetime

WARNING: Visible and invisible laser radiation when open: DO NOT stare into the beam or view directly with optical instruments. Failure to observe this warning could result in damage to your vision or blindness.

CAUTION: Use of controls, adjustments, or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

The information in this manual is subject to change without further notice.

Drivers Supported

The set of drivers supported includes:

- Windows Server 2008 / Windows Server 2008 R2 NIC Drivers,
- Windows 2000 Server / Windows Server 2003,
- Windows 2000 / Windows XP, Windows XP 64-bit,
- Windows Vista, Windows 7, Windows 8, and
- Solaris 10 Drivers.

See the Contact Us section on page 9.

Troubleshooting

Diagnostics LEDs

LEDS

The LINK/ACT LED lights when a fiber cable connection is good. It blinks to indicate activity.

The collision and full-duplex LED report PC board operating status.

After power UP, the LINK/ACT LED should light; if not, check the following:

1. Confirm that the N-FX module is properly inserted into the master slot.
2. Confirm that the PC is properly connected to a power source and that the power source is turned ON.
3. Check the fiber cable for proper connection.
4. If the system will not boot, you may need to reconfigure the NIC to start from a different boot option. For example, if the PC will not boot with the NIC installed, and the NIC's default boot option is selected, try changing boot option to *Local Only* or *According to BIOS*. See Booting the System on page 4.
5. Contact Tech Support; see 'Contact Us' below.

Contact Us

Technical Support: Technical support is available 24-hours a day:

US and Canada: 1-800-260-1312

International: 00-1-952-941-7600

Main Office

tel: +1.952.941.7600 | toll free: 1.800.526.9267 | fax: 952.941.2322

sales@transition.com | techsupport@transition.com | customerservice@transition.com

Address

Transition Networks

10900 Red Circle Drive

Minnetonka, MN 55343, U.S.A.

Web: https://www.transition.com

Compliance Information

Declaration of Conformity

Declaration of Conformity

Name of Mfg: Transition Networks, 10900 Red Circle Drive
                  Minnetonka, MN 55343 U.S.A.

Model(s):   N-FX-xx-03 Network Interface Cards

Part Number: N-FX-ST-03, N-FX-SC-03, N-FX-LC-03, N-FX-MT-03

Purpose:

To declare that the N-FX-xx-03, to which this declaration refers, is in conformity with the following directive(s) and standards:

EN 55024:1998 + A1:2001 + A2:2003; EN 55022:2006 + A1:2007 Class B FCC Part 15 Subpart B Class B; EN 61000-3-2:2006 + A1:2009 + A2:2009 EN 61000-3-3:2008; CFR Title 21 Section 1040.10 Class I

I, the undersigned, hereby declare that the equipment specified above conforms to the above directive(s) and standard(s).

Stephen Anderson, Vice-President of Engineering

July 2011
Date

FCC Regulations

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that of the receiver
- Consult the dealer or an experienced radio/TV technician for help

Canadian regulations

This digital apparatus does not exceed the Class B limits for radio noise for digital apparatus set out on the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

European regulations

Caution: This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Achtung! Dieses ist ein Gerät der Funkstörgrenzwertklasse B. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten. In diesem Fäll ist der Benutzer für Gegenmaßnahmen verantwortlich.

Attention! Ceci est un produit de Classe B. Dans un environment domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilsateur de prende les measures spécifiques appropriées.

In accordance with European Union Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003, Transition Networks will accept post usage returns of this product for proper disposal. The contact information for this activity can be found in the 'Contact Us' portion of this document.

Record of Revisions

Rev	Date	Notes
A	3/25/11	Initial release revision.
B	11/28/12	Add WoL information (PCI v 2.1 vs. 2.2) and 8-1/2x11" format.
C	2/15/19	Add System Boot information and update contact information.

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