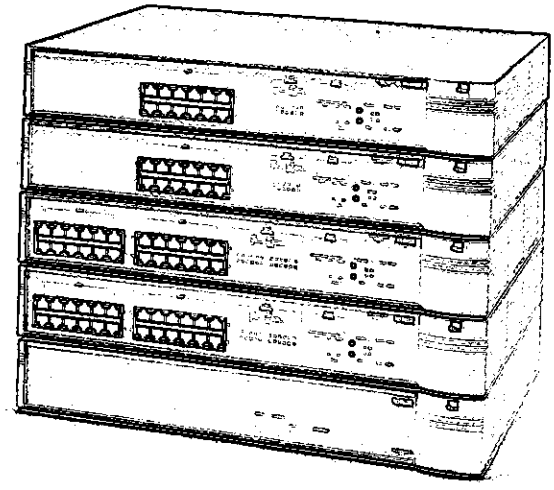
SuperStack II Hub TR
Stackable Token Ring Hubs

Robust physical layer support for all grades of UTP/STP cabling with SNMP RMON-based management



SuperStack II Hub TR lets you stack up to 20 hubs, connecting up to 260 users on a single Token Ring LAN. Slide-in modules provide SNMP RMON management and RI/RO expansion.

SuperStack® II Hub TR hubs combine RMON-based management with advanced physical layer support in an affordable, expandable platform for mission-critical Token Ring networks.

The hubs provide advanced error recovery and fault isolation technology, jitter cancellation and retiming mechanisms, and sophisticated SNMP RMON network management.

The SuperStack II Hub TR is part of the 3Com SuperStack II system, an innovative architecture that allows stackable hubs, bridges, routers, switches, and SNA-to-LAN conversion devices to be easily integrated and managed as one system.

Key Benefits:

- **Port and media flexibility.** SuperStack II Hub TR hubs support fiber, UTP, and STP wiring to accommodate a range of cabling configurations and node densities---up to 260 users per ring.
- **Plug-in expansion.** Easily installed RI/RO modules let you expand your Token Ring LAN over fiber and/or copper media.
- **Phase-Locked Loop retiming.** A PLL retiming ASIC (application specific integrated circuit) at each port ensures maximum signal strength for extended distances throughout your network, and reliable 16 Mbps operation over all major cabling types.
- **Beacon Recovery/Prevention.** The Zero Delay Lockout (ZDL) feature provides immunity by detecting and locking out faulty or misconfigured stations before they can enter the ring. Distributed Recovery Intelligence (DRI) locally isolates and resolves hard errors from lobe ports and main ring connections for devices already on the network.
- **Roving RMON.** This switch-ready feature provides flexible SNMP management in switched environments without additional costs.
- **RMON-based network management.** Slide-in management modules support the SNMP RMON MIB, allowing centralized troubleshooting with extensive network analyzer capabilities.

Stackable Token Ring Hubs

Scalable Flexibility in a Stackable Architecture

SuperStack II Hub TR hubs provide robust, scalable 4/16 Mbps Token Ring connectivity for stand-alone workgroups and floor-distribution LAN configurations.

Both models offer slide-in modules for supporting fiber, unshielded twisted-pair (UTP), and shielded twisted-pair (STP) wiring using fiber and/or copper RI/RO (Ring-In/Ring-Out) expansion modules. In addition, Simple Network Management Protocol (SNMP) RMON-based management is available at any time with a slide-in SuperStack II Hub TR RMON Management Agent Module or Advanced RMON Management Agent Module.

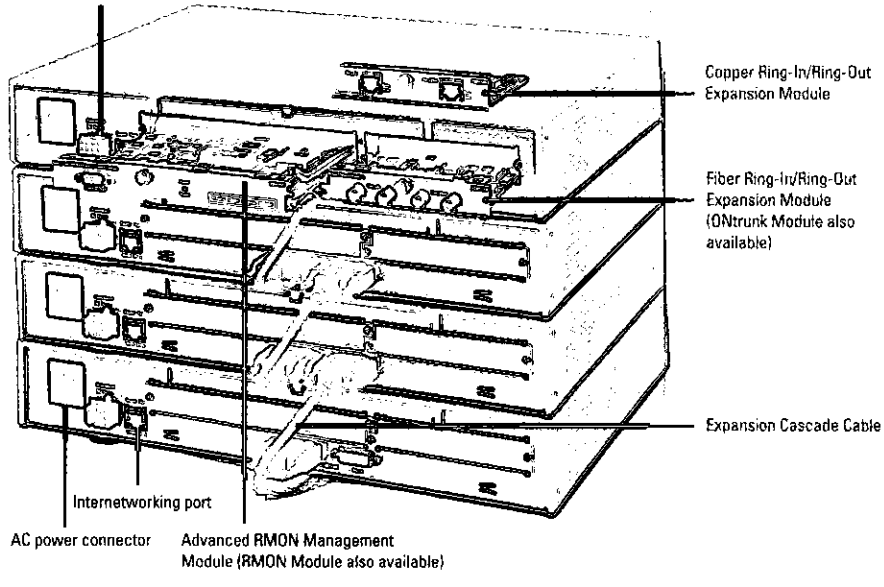
For connectivity in a central wiring closet, cascade cables can connect up to 20 hubs in one rack, or up to 260 users.

Three different cascade cables are available: a 12-inch Expansion Cascade Cable for ring expansion in the same wiring closet or stack, a 4-foot Cascade Cable and an 8-foot Redundant Ring Cascade Cable for redundant connections within the same stack. The redundant cable directly connects the top hub to the bottom hub in a stack, providing a backup path should one of the expansion cables or hubs fail.

Slide-in RI/RO expansion modules also allow main ring connections to 20 hubs in different locations from each other. Slide-in RI/RO expansion modules are available in fiber, copper, and copper/fiber, providing flexibility depending on your wiring configuration requirements. And for connectivity between 3Com CoreBuilder™ 5000, ONline™, ONsemble®, and SuperStack II Hub TR hubs, slide-in copper or fiber ONtrunk modules are available for seamless integration.

The stackable architecture of the SuperStack II Hub TR hubs make them ideal for dynamic LAN environments that require fast and easy reconfiguration.

Rear view of a stack of four SuperStack II Hub TR hubs. Both 12-port and 24-port models provide for RMON management and RI/RO expansion modules.



Advanced Physical Layer Support and Fault Tolerance

SuperStack II Hub TR hubs provide robust physical layer support and fault tolerance on every port. The hubs react to a variety of network failures and correct them before they can impair the efficiency of your network.

Phase-Locked Loop Retiming Maximizes Performance

Each port on the SuperStack II Hub TR hub provides PLL active retiming via a custom chip (ASIC), a significant advantage over tank-circuits and other passive designs.

PLL retiming circuits constantly compensate for changes in operating conditions. This self-correction guarantees stable operation and dependable, accurate signal quality over longer distances, overcoming environmental or cabling deficiencies.

The PLL circuit ensures optimal performance on all hub ports over all grades of UTP media—all the time.

Maximum Media Length

Media	4 Mbps	16 Mbps
UTP Cat. 3	660 ft/200 m	330 ft/100 m
UTP Cat. 4/5	1320 ft/400 m	660 ft/200 m
Type 1	2000 ft/600 m	1000 ft/300 m
Fiber Optic*	6600 ft/2000 m	6600 ft/2000 m

**Available Ring In/Ring Out.*

Zero Delay Lockout (ZDL) Ensures Maximum Uptime

Often stations connect to networks with faulty or misconfigured interface cards. The resulting hard errors can halt your ring and significantly impact the productivity of your network environment.

Providing maximum physical layer protection, the SuperStack II Hub TR hubs use ZDL to safeguard your Token Ring by instantly locking out any station that exhibits an error condition before it can enter the ring and halt network traffic. This preventive measure secures the integrity of your network and ensures user productivity.

Stackable Token Ring Hubs

Distributed Recovery Intelligence (DRI) Isolates Errors

Occasionally hard errors can be generated by devices already on the network, causing a station to beacon. When a beacon condition occurs, the network stops.

DRI is an algorithm built into every SuperStack II Hub TR hub that isolates hard errors. This feature, combined with ZDL, provides "bullet-proof" protection from common errors that would otherwise stop your network. Both ZDL and DRI function in both unmanaged and managed environments.

In addition, Advanced Distributed Recovery Intelligence (ADRI) accelerates recovery time in stacks with management agents.

Roving RMON Maximizes Management in Switched Environments

When a stack of SuperStack II Hub TR hubs are being segmented into multiple rings via switching, a single management agent module can continue to manage each new ring in a microsegmented stack. The management agent module can be placed in any single hub and roved into any other hub, negating the need for additional modules in each segmented ring. Each hub in a stack must be its own individual ring. This feature can be invoked via Transcend network management applications, Telnet, or a console connection.

Management Agents for Embedded Network Analyzer Functions

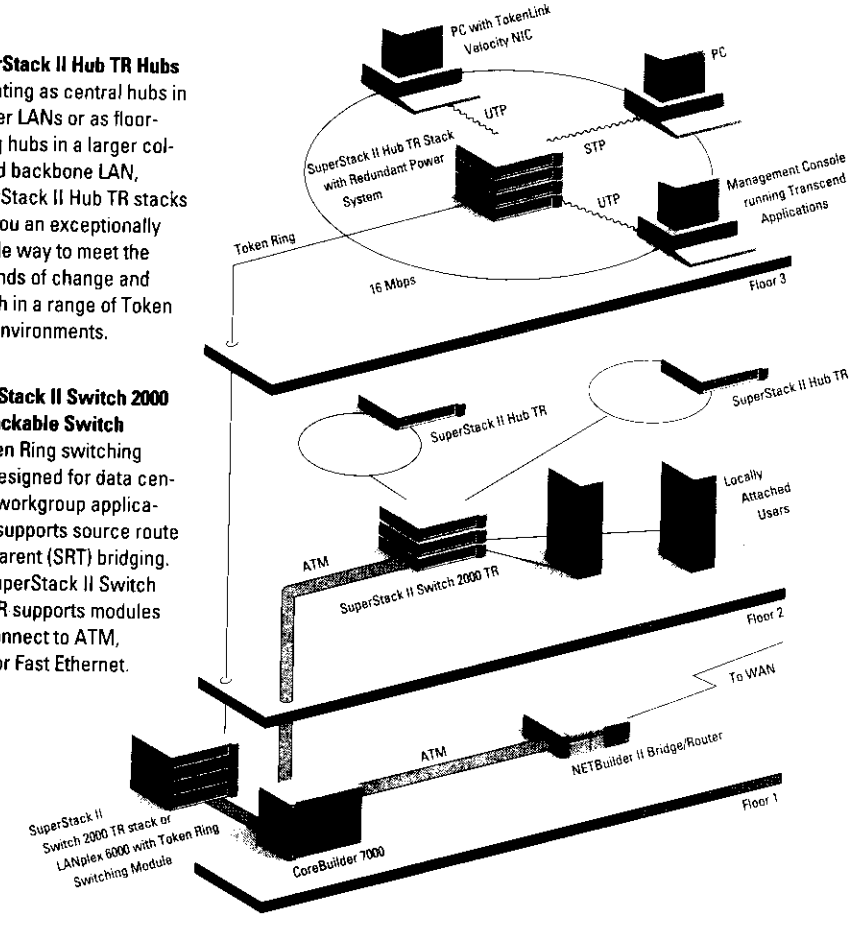
Slide-in management, RMON Management Agent and Advanced RMON Management Agent, modules on both 12- and 24-port models provide built-in network analyzer capabilities for your Token Ring network as well as configurable trap-based reporting.

This analyzer function is based on the SNMP RMON MIB standard. RMON supplies a variety of statistics and services that provide network managers with the necessary tools to fully manage and control remote sites. RMON functions can be separated into three broad categories: maintaining performance-summary tables, capturing and filtering packets for later analysis, and generating alarms when predefined thresholds are exceeded.

Performance summary tables describe network traffic, error rates and types, active user addresses, and user activity. The history tool constantly logs these detailed error and performance statistics for each station locally in the agent so that historical analysis information can be

SuperStack II Hub TR Hubs
Operating as central hubs in smaller LANs or as floor-wiring hubs in a larger collapsed backbone LAN, SuperStack II Hub TR stacks give you an exceptionally reliable way to meet the demands of change and growth in a range of Token Ring environments.

SuperStack II Switch 2000 TR Stackable Switch
A Token Ring switching hub, designed for data center or workgroup applications, supports source route transparent (SRT) bridging. The SuperStack II Switch 2000 TR supports modules that connect to ATM, FDDI, or Fast Ethernet.



Transcend Network Management
The 3Com Transcend Enterprise Manager, running under UNIX or Windows NT, provides a robust, enterprise-wide network management platform. Transcend management applications and the Advanced RMON Management Agent Module work together to provide a sophisticated set of RMON analyzer tools to monitor the stack.

TokenLink Velocity Network Interface Cards (NICs)
TokenLink® NICs support ISA and PCI bus connections. The TokenLink Velocity™ NICs increase throughput performance and, because of extensive 3Com driver support, they are compatible with IBM applications as well as a broad range of operating systems.

CoreBuilder 7000 Switch
The CoreBuilder 7000 ATM switch provides a 5 Gbps backplane and full, non-blocking throughput across all interfaces that connect backbone links with high-performance servers. When attached to the CoreBuilder 7000 switch, the SuperStack II Switch 2000 TR permits delay-sensitive host traffic to travel on the backbone without timing errors.

Stackable Token Ring Hubs

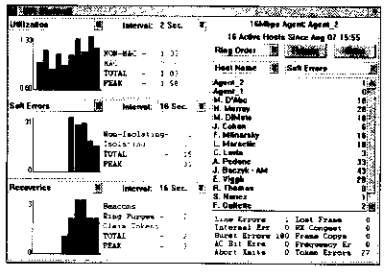
uploaded from any network management station, even after a fault occurs.

Packet capture and storage of LAN-analysis statistics in the agent allows a remote manager to selectively filter and review packet traffic from the managed network. Captured packets can be uploaded to the manager and saved to disk as Network General Sniffer files for more detailed analysis by other tools.

Alarms are issued by management agents from local and remote sites. By setting thresholds and parameters, the manager can use alarms to give warning of problems in any location before they become severe.

Additional RMON Management Support

In addition to the eight Token Ring RMON groups supported in the RMON management Agent module, the Advanced RMON Management Agent module includes support for all 10 RMON groups including Matrix and Host Top N Table. Other value-added features include Protocol Breakdown Summary, MAC to IP and MAC to Netware Name Mapping. Only one Advanced RMON Management Agent Module is required per ring (up to 260 users) to gain all the added management functionality for the entire ring.



Token Ring Accessories for Maximum Operation

Fiber Converter TR

The 3Com Fiber Converter TR expands the range of your Token Ring networks with optical cabling (62/125 microns) where copper cabling (UTP/STP) is not recommended or the distances involved are too great. Typically, the Fiber Converter TR is used as a fiber-optic connection between data center switches/routers and departmental switches/hubs or between PCs and hubs. The Fiber Converter TR features include auto speed detect (4/16Mbps), copper and fiber fault detection, and a signal drive distance of 2 kilometers.

Power Supplies

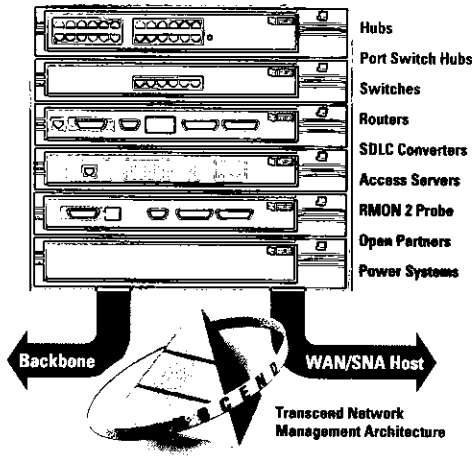
You can ensure additional fault tolerance to the stack by using the Redundant Power System or Uninterruptible Power Supply.

The Redundant Power System comprises two load-sharing bulk power supplies fed by two independent AC lines. Either of the two bulk supplies can support a stack of up to four units. In the event of a failure in one of the supplies, an alarm is automatically sent to the management console while system integrity is maintained.

In addition, 3Com offers you an Uninterruptible Power Supply (UPS). This UPS fully protects your SuperStack II system from the effects of brown-outs or spikes in outside power lines. The UPS participates in 3Com management by means of an optional slide-in SNMP management module.

Transcend applications deliver real-time views of the network topology and display local and remote diagnostic statistics on management platforms based on UNIX and Windows.

SuperStack II Systems



The 3Com SuperStack II system offers you a flexible, cost-effective connectivity solution for local, wide area, and SNA networks. You can combine diverse technologies and network services in one stacked system, strengthen it with uninterruptible and redundant power systems, and manage it all with Transcend management software.

As an important part of the 3Com Transcend Networking framework, SuperStack II will meet your evolving network needs—future-proofing your network investment.

A single SuperStack II system provides connections for a range of network environments and protocols: Ethernet, 100BASE-T Fast Ethernet, Token Ring, FDDI, ISDN, X.25, Frame Relay, and ATM. Depending on your needs, you can build SuperStack II systems for virtually any network environment. Capabilities include:

- Hubs for flexible workgroup connectivity with SNMP management
- Industry-leading physical layer support for Token Ring networks
- Full RMON support for Ethernet, Fast Ethernet, and Token Ring networks, as well as a dedicated RMON2 probe
- Full range of switches to increase performance in high-speed client/server LANs
- Full, multiprotocol network access for telecommuters or users at other off-site locations
- Routing between central site and branch offices using innovative Boundary Routing® architecture or conventional routing software for multiple WAN choices, including ISDN
- SNA-to-LAN conversion linking local and remote offices to an SNA host system
- Choice of power systems to ensure uninterrupted network operation

For smaller offices of less than 20 users, our OfficeConnect™ products can be used to complement SuperStack II products.

Stackable Token Ring Hubs

Token Ring Switching

Keeping up with the growing demands of Token Ring networks, 3Com provides Token Ring switching technology from the data center to the desktop. Now with a Token Ring Switching Module (TRSM) for the CoreBuilder 6000 switch, as well as the SuperStack II Switch 2000 TR, 3Com provides a way for your Token Ring network to keep up with your growing business.

Cost efficiency, bandwidth enhancement, network future-proofing, and manageability are all considerations when building or upgrading your network. And Token Ring switching addresses all of these considerations. By introducing switches into your network, you can segment your Token Ring LANs with more manageability than bridge-based solutions, and when implemented at appropriate points in the network, more cost efficiently than router-based solutions. Switching makes it easy to scale your network to meet your growing needs and provides a more cost-effective solution to LAN segmentation and interconnection.

Token Ring switching future-proofs your network by allowing you to scale your network to your needs. With increased bandwidth, more users can more efficiently complete their jobs. And by paving a path to high-speed technologies like FDDI, ATM, Fast Ethernet, and Token Ring switching further future proofs your network and allows you to accommodate ever-increasing bandwidth hungry applications like client/server and multimedia. Also, 3Com's Token Ring switching increases network functionality by providing a rich feature set, including:

- Source Route Transparent (SRT) functionality
- High-speed connections to ATM, FDDI, and Fast Ethernet technologies
- Cut through and store-and-forward switching
- RMON and VLAN management
- Multimedia support

As a leader in switching and solutions for IBM-based environments, 3Com is committed to providing cutting edge solutions for your network. 3Com continues to lower the costs of network ownership through enhanced technology, while preserving your investment in your current network infrastructure.

Specifications

SuperStack II Hub TR Stackable Token Ring Hubs

Dimensions

12-Port Hub

Width:17 5/16 in/44.1 cm
Depth: 12 in/30.4 cm
Height: 2 5/8 in/6.6 cm
Weight: 9 3/4 lb/4.4 kg

24-Port Hub

Width: 17 3/8 in/44.1 cm
Depth: 12 in/30.4 cm
Height: 2 5/8 in/6.6 cm
Weight: 9 3/4 lb/4.4 kg

Management Modules

Width: 7 1/2 in/19 cm
Depth: 10 1/2 in/26.6 cm
Height: 1 in/2.5 cm
Weight: 12 oz/340 g

RI/RO Modules

Width: 5 in/12.7 cm
Depth: 12 in/30.4 cm
Height: 1 in/2.5 cm
Weight: 4 oz/113 g

Redundant Power System

Width:17 3/8 in/44.1 cm
Depth: 12 in/30.4 cm
Height: 2 5/8 in/6.6 cm
Weight: 14 lb/6.3 kg

Connectors and Cables

12-Port Hub

13 RJ-45 ports, 2 DB-15 cascade connectors, 1 redundant DC power connector, 1 AC line connector

24-Port Hub

25 RJ-45 ports, 2 DB-15 cascade connectors, 1 redundant DC power connector, 1 AC line connector

Modules for the 12/24-Port Hub

1 DB-9 RS-232 port with either management module

2 RJ-45 ports with the Copper RI/RO Module

2 fiber ST ports with the Fiber RI/RO Module

1 RJ-45, 1 fiber ST port with the Copper/Fiber RI/RO Module

Power Requirements

SuperStack II Hub TR Hubs and Modules

Power supply: 90 to 264 VAC, 47 to 63 Hz

Power consumption

12-Port Hub: 40 W

24-Port Hub: 55 W

RMON Management Agent Module: 15 W

Advanced RMON Management Agent Module: 20 W

Copper RI/RO Module: 3.5 W

Fiber RI/RO Module: 5 W

Copper/Fiber RI/RO Module: 5 W

Copper ONtrunk Module: 4 W

Fiber ONtrunk Module: 4 W

Power inlet: IEC320

Fuse protection: 4 A

Heat dissipation/hour

12-Port Hub: 136 BTU

24-Port Hub: 136 BTU

RMON Management Agent Module: 51 BTU

Advanced RMON Management Agent Module: 68 BTU

Copper RI/RO Module: 12 BTU

Fiber RI/RO Module: 18 BTU

Copper/Fiber RI/RO Module: 18 BTU

Copper ONtrunk Module: 14.4 BTU

Fiber ONtrunk Module: 14.4 BTU

Mean Time Between Failures

12-port*	125,000 hrs
24-port*	125,000 hrs
RMON Management Agent	400,000 hrs
Advanced RMON Management Agent	400,000 hrs
Fiber RI/RO Module	500,000 hrs
Copper RI/RO Module	500,000 hrs
Copper/Fiber RI/RO Module	500,000 hrs
Copper ONtrunk Module	500,000 hrs
Fiber ONtrunk Module	500,000 hrs
Power Supply	136,000 hrs

*Excluding power supply and fan.

Environmental Ranges

Hubs (operating)

Temperature: 41° to 122° F (5° to 50° C)

Humidity: up to 90% noncondensing

Hubs (storage)

Temperature: 41° to 122° F (0° to 50° C)

Humidity: 10% to 90% noncondensing

Redundant Power System (operating)

Temperature: 32° to 122° F (0° to 50° C)

Humidity: 10% to 90% noncondensing

Redundant Power System (storage)

Temperature: 32° to 122° F (0° to 50° C)

Humidity: 10% to 90% noncondensing

Specifications *(continued)*

SuperStack II Hub TR Stackable Token Ring Hubs

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LEDs

SuperStack II Hub TR

LEDs for power status (per unit), packet detection (per unit), error packet detection (per unit), link status (per port), cascade status (per cascade connect), trunk status (per trunk connect), management (per unit), data rate (per unit), and trunk phantom (per trunk connect)

Redundant Power System

LEDs for AC power status (per AC input line) and for DC output status (per DC output)

Standards Compliance

Electromagnetic Compatibility

Hubs (all configurations):
FCC 20780, Part 15J, Class A
VFG243 Level B
(with shielded cable)
EN 55022 Level A
CSA 108.8
CE

Redundant Power System:

FCC 20780, Part 15J, Class A
EN 55022 Level A
IEC801 (Parts 2-5)

Safety

EN60950:92
UL1950
CSA22.2 No. 950

Environmental (Shock and Vibration)

Redundant Power System: in accordance with IEC68

Communication Protocols

RFC 826	ARP
RFC 791	IP
RFC 792	ICMP
RFC 768	UDP
RFC 793	TCP
RFC 1055	SLIP
RFC 1298	SNMP over IPX

Communication Applications

RFC 854	Telnet
RFC 855	Telnet options
RFC 856	Telnet binary option
RFC 857	Telnet echo option
RFC 858	Telnet suppress-go-ahead option
RFC 859	Telnet status option

Management Protocols

RFC 1157	SNMP
RFC 1213	MIB-2
RFC 1271	RMON
RFC 1513	Token Ring RMON
RFC 1215	Traps

Others

RFC 783	TFTP (Trivial File Transfer Protocol)

Mounting

Includes hardware for mounting in a standard 19-inch rack.

Lifetime Limited Warranty

SuperStack II Hub TR hubs, the RMON Management Agent modules, and the RI/RO modules are covered by a lifetime limited warranty. Power supplies and fan are warranted for one year. Advance hardware exchange is available during the first year; thereafter, return the hub to 3Com for repair. The lifetime limited warranty is not offered where restricted or prohibited by law.

Ordering Information

Hubs

SuperStack II Hub TR 12-Port Hub	3C510510B†
SuperStack II Hub TR 24-Port Hub	3C510511B†

Management Modules

SuperStack II Hub TR RMON Management Agent Module	3C510502
SuperStack II Hub TR Advanced RMON Management Agent Module	3C510505

RI/RO Expansion Modules

SuperStack II Hub TR Fiber RI/RO Module	3C510503
SuperStack II Hub TR Copper RI/RO Module	3C510504
SuperStack II Hub TR Copper/Fiber RI/RO Module	3C510506
SuperStack II Hub TR Fiber ONtrunk Module	3C510513
SuperStack II Hub TR Copper ONtrunk Module	3C510514

Accessories

Fiber Converter TR	3C512210
Fiber Converter TR Rack Mount Kit	3C512212
Redundant Power System	3C565047
Uninterruptible Power System (U.S.)	3C16010
Uninterruptible Power System (International)	3C16011
Uninterruptible Power System (Japan)	3C16012
Uninterruptible Power System Ethernet Management Module	3C16020
Uninterruptible Power System Token Ring Management Module	
Uninterruptible Power System	3C16021
12-inch Expansion Cascade Cable	3C510507
8-Foot Redundant Ring Cascade Cable	3C510508
4-Foot Expansion Cascade Cable	3C510509

†Ships with one 12-inch Expansion Cascade Cable.

Management Software

Transcend Enterprise Manager for Windows	3C1501F
Transcend Enterprise Manager for UNIX (supports HP OpenView, SunNet Manager, and IBM NetView/6000) (on CD-ROM)	3C27850B
Transcend WorkGroup Manager for Windows	3C15000G

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