# Token Ring Network Management Modules

## Management Agent Options

## Automatic Failure Detection

## Multiple Functional Designs

Bay Networks System 3000™ Token Ring network management modules work with Bay Networks DOS- and UNIX-based management systems to provide a centralized, integrated Token Ring management solution.

Token Ring network management modules reside in System 3000 intelligent hubs, where they attach to the network management bus on the hub's backplane. Using the industry-standard Simple Network Management Protocol (SNMP), the modules gather and process activity, configuration, and diagnostic data at the ring, hub, module, and port levels. The data is condensed and forwarded in band to a central management station running Bay Networks Optivity® or EZ LAN™ network management application, where the software displays the information through the patented Expanded View™ application.

The modules can operate at either 4 or 16 megabits per second (Mbps) over one of two Token Ring buses on the System 3000 hub backplane. Ring selection and speed are determined by setting switches prior to installation. In hubs supporting two active rings, two management modules are required, one dedicated to each ring. Working with System 3000 Token Ring host modules, the Token Ring network management modules provide the repeater functions required to connect hubs and build rings supporting up to 260 stations over a variety of copper cabling.

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## Benefits

### Management Agent Options

The System 3000 Token Ring network management modules support a variety of Bay Networks software agents to deliver differing levels of management capabilities.

***Standard Agent*** The Model 3513 and Model 3514-ST come configured with Bay Networks Standard management agent, providing fault and diagnostic tools for monitoring and controlling hubs through a manually created network map. The Standard agent supports the Expanded View interface, a real-time image of the hub's front panel that offers Fault, Performance, and Configuration pull-down menus to provide hub- and port-level diagnostic, status, and activity data. From the Expanded View image, network managers may also wrap and enable host and Ring-In/Ring-Out ports, as well as monitor each port's Phantom status.

***Advanced Agent*** The Model 3513-A and Model 3514-ST-A include Bay Networks Advanced agent, which offers all the functionality of the Standard agent plus a host of additional features for managing larger enterprise networks. The Advanced agent includes:

- The Autotopology™ dynamic mapping feature, which automatically creates and maintains a real-time map of the network topology.
- Bay Networks patented Auto Beacon Resolution (ABR) feature, which automatically detects, wraps, and reports faulty stations, cables, and unmanaged media attachment units (MAUs) to maintain network integrity.
- Events logging, which provides a permanent record of network errors and activity.
- Allowed Nodes, which enforces network security by denying access to unauthorized users.
- Thresholds, which allows users to determine acceptable performance, activity, and error levels that warn of impending or potential problems.

***Advanced Analyzer Agent*** The Model 3517SA Token Ring Network Management Module features Bay Networks Advanced Analyzer™ agent, which delivers all the functionality of the Advanced agent plus highly sophisticated network troubleshooting and problem resolution capabilities.

The Advanced Analyzer agent provides full industry-standard remote monitoring (RMON) functionality that, combined with Bay Networks embedded hub management, delivers unprecedented visibility into the network. With the Advanced Analyzer, network managers can determine the cause of a network problem, as well as its physical port location, network address, and fault and performance information. Working with Optivity, which includes Optivity LAN,™ Optivity Internetwork™ and Optivity Design & Analysis™ applications, as well as Network General Corporation's Distributed Sniffer System (DSS), the Advanced Analyzer delivers a comprehensive management solution for gathering and analyzing critical network information.

### Automatic Failure Detection

The System 3000 Token Ring network management modules support both primary and secondary trunk ring paths. Should the primary link fail, the modules automatically reconfigure to the secondary or backup path to maintain network operation. In a pure Bay Networks environment, if a hub experiences a loss of power, the network management modules automatically detect the failure and wrap at the powered hubs. This isolates any failed units and maintains operation on the remaining segments.

### Multiple Functional Designs

Three versions of the System 3000 Token Ring network management modules are available, each offering different functionality and connector options: the Model 3513 Shielded Twisted Pair (STP) Token Ring Network Management Module; the Model 3514-ST Fiber Optic Token Ring Network Management Module; and the Model 3517SA STP/Fiber Optic Token Ring Network Management Module.

## Features

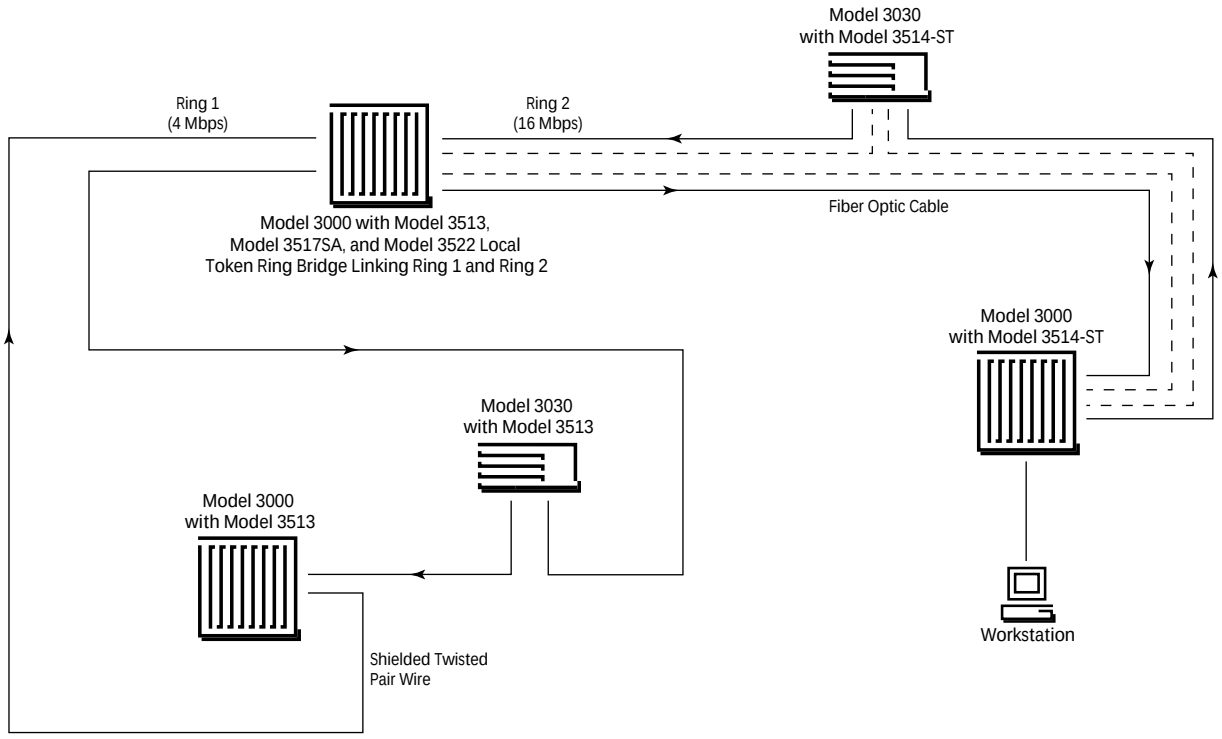
### Model 3513 STP Token Ring Network Management Module

The Model 3513 STP Token Ring Network Management Module features STP Ring-In and Ring-Out repeater ports utilizing female DB-9 connectors. The module, working IBM Type 1, 2, 6, 8, and 9 data grade STP cabling, supports trunk ring connections extending up to 1,100 feet (at 16 Mbps) and 2,500 feet (at 4 Mbps) between concentrators. The Model 3513 also supports connections to other IEEE 802.5-compatible MAUs via standard IBM Cabling System patch cables.

### Model 3514-ST Fiber Optic Token Ring Network Management Module

The Model 3514-ST Fiber Optic Token Ring Network Management Module offers repeating fiber optic Ring-In/Ring-Out ports utilizing ST-type bayonet connectors. The fiber ports provide repeater connections to compatible ports on other Model 3514-ST modules or Model 3534-ST Token Ring Repeater Modules in other concentrators. One duplex port provides the primary Ring-In and Ring-Out connections while the other serves as the secondary Ring-In/Ring-Out connection. The Model 3514-ST also extends the allowable distance between concentrators to 2 kilometers on fiber optic cable for widespread network environments.

Figure 1 **System 3000 Token Ring network management modules collect specific management data and forward it to the management station. The modules also provide the Ring-In/Ring-Out and repeater functions necessary to create large rings connecting several concentrators.**




### Model 3513/Model 3514-ST Common Features

Each Model 3513 and Model 3514-ST Token Ring network management module employs an onboard V35 microprocessor, 1 megabyte (MB) of DRAM, and the Texas Instruments TMS 380/16C chip set to gather and process statistical management data such as isolating and nonisolating errors, MAC addresses, and wrap conditions. An onboard frame processing unit (FPU) counts bytes and packets on the network, providing ring performance and diagnostic information even under heavy network load conditions.

The modules also feature a variety of performance LEDs to report module status, module wrap conditions, online status, and data activity. A four-character alphanumeric display also provides module fault and diagnostic information, including Boot status (BOOT), software downloading functions (LOAD), and successful module operation (RUN).

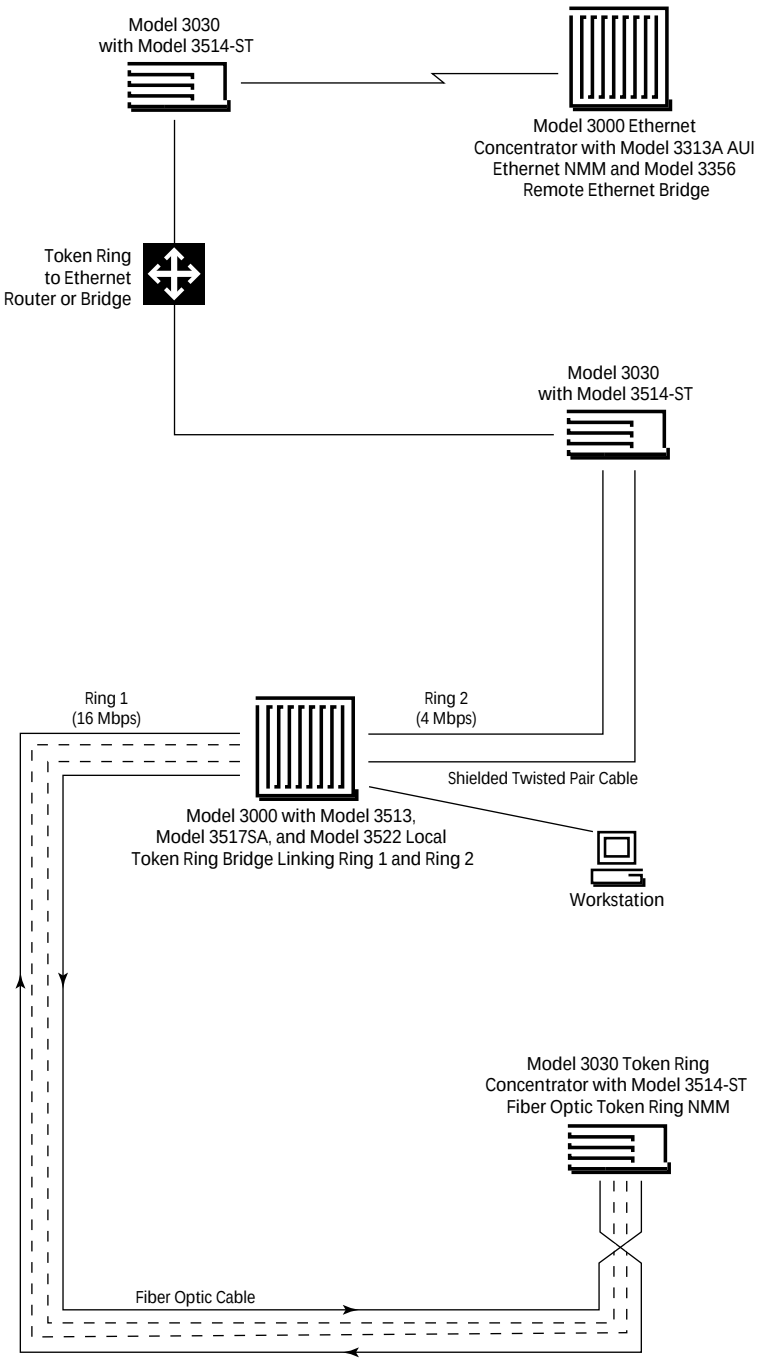
### Model 3517SA Token Ring Network Management Module

The Model 3517SA Token Ring Network Management Module features dual ST-type bayonet connectors to support repeated Ring-In/Ring-Out connections up to 2 kilometers over multimode fiber optic cabling. In addition, a second set of active retimed and repeated DB-9 connectors support Ring-In/Ring-Out connections over IBM Type 1, 2, 6, 8, and 9 STP cabling.

The Model 3517SA also utilizes a dual-processing architecture to deliver unprecedented performance and expandability for System 3000-based networks. The module dedicates a Data Collection Engine (DCE) — consisting of a Bay Networks-developed ASIC FPU and a digital signal processor (DSP) — to collect and process ring fault, performance, topology, usage, and protocol information. The distilled data is passed to a high-performance Motorola 32-bit 68040 processor for further analysis before being forwarded to the network management station.

The Model 3517SA features 512 KB of Flash EPROM (expandable to 2 MB) and 2 MB of dynamic RAM (expandable to 16 MB). A full 128 KB of nonvolatile memory is also available, and a series of port- and module-level LEDs and a four-character LED display report module status at a glance.

Figure 2 **Optivity and EZ LAN manage Token Ring and Ethernet networks from a single station.**



## Technical Specifications

Technical specifications for the System 3000 Token Ring Network Management Modules are shown in Table 1.

Table 1 **System 3000 Token Ring Network Management Modules Technical Specifications**

| | |
|---|---|
| **Data Rate** | 4 Mbps or 16 Mbps differential Manchester encoding |
| **Physical Dimensions** | (H) 15 in. x (W) 1.2 in. x (D) 10.5 in.<br>(H) 38.1 cm x (W) 3.1 cm x (D) 26.7 cm |
| **Microprocessors** | |
| Model 3513/3514-ST | 10 MHz (80186-class) NEC V35<br>TI TMS 380 Token Ring Chip Set |
| Model 3517SA | 32-bit Motorola 68EC040 20 MHz CPU<br>32-bit TMS 320C31 Digital Signal Processor 20 MHz |
| **Memory** | |
| Model 3513/3514-ST | 1 MB of DRAM |
| Model 3517SA | 2 MB DRAM, upgradable to 16 MB<br>1 MB shared RAM frame buffer between DSP and 68EC040<br>64 KB high-speed SRAM buffer between FPU and DSP<br>640 KB RAM TI NIC memory and frame buffer |
| **EPROM** | |
| Model 3513/3514-ST | 256K |
| Model 3517SA | 512K, upgradable to 2 MB |
| **EEPROM** | |
| Model 3513/3514-ST | 8K |
| Model 3517SA | 128K |
| **Compatibility** | IEEE 802.5 Token Ring access method and physical-layer specifications |
| **Environmental Specifications** | |
| Operating Temperature | 5°C to 40°C |
| Storage Temperature | -25°C to 70°C |
| Operating Humidity | 85% max relative humidity, noncondensing |
| Storage Humidity | 95% max relative humidity, noncondensing |
| Operating Altitude | 10,000 ft (3,048 m), 40°C max |
| Free Fall/Drop | ISO 4180-2, NSTA 1A |
| Vibration | IEC 68-2-6/34 |
| Stock/Bump | IEC 68-2-27/29 |
| Thermal Rating (max) | 23 watts (78 Btu/hr) |
| **Weight** | 3 lbs, 1 oz (1.4 kg) |
| **Optical Specifications (Model 3514-ST/Model 3517SA)** | |
| Transmitter/Receiver | LED/PIN diodes |
| Wavelength | 850 nm |
| Optical Power Coupled into a 62.5/125-micron, 0.275 NA fiber | -9 dBm +2 dB/-3 dB peak |
| Optical Power Coupled into a 50/125-micron, 0.23 NA fiber | -13 dBm +2 dB/-3 dB peak |
| Optical Receiver Sensitivity | <-27 dBm peak |
| Optical Receiver Dynamic Range | -7 dBm to -27 dBm peak |
| Optical Power Budget | For 62.5/125 micron = 15 dB<br>For 50/125 micron = 11 dB |

Table 1 **System 3000 Token Ring Network Management Modules Technical Specifications (continued)**

| | |
|---|---|
| **Electromagnetic Emissions** | Meets FCC Part 15, Subpart J, Class A<br>Meets EN 55 022 (CISPR 22: 1985), Class A or B<br>Meets General License VDE 0871, Class B (AmtsblVfg 243/1991, 46/1992)<br>Meets VCCI Class 1 ITE<br>(Refer to individual reference sheets for additional information) |
| **Electromagnetic Susceptibility** | |
| Electrostatic Discharge (ESD) | IEC 801-2, Level 2/4 |
| Radiated Electromagnetic Field | IEC 801-2, Level 2 |
| Electrical Fast Transient/Burst | IEC 801-4, Level 2/3 |
| Electrical Surge | IEC 801-5, Level 1/3 |

## Ordering Information

Ordering information for the System 3000 Token Ring Network Management Modules is shown in Table 2.

Table 2 **System 3000 Token Ring Network Management Modules Ordering Information**

| | |
|---|---|
| 3513 | Model 3513 Token Ring Network Management Module with Shielded Twisted Pair (STP) Repeater; includes License for Basic Network Management Agent (order SL351X-A for Advanced Agent) |
| 3514-ST | Model 3514-ST Token Ring Network Management Module with Fiber Optic Repeater; includes License for Basic Network Management Agent (order SL351X-A for Advanced Agent) |
| 3517SA-08 | Model 3517SA-08 Token Ring Network Management Module with Shielded Twisted Pair (STP) and Fiber Optic Repeater; includes License for Advanced Analyzer Network Management Agent |

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