SBS Bit 3 Operations

MODEL 400
Fiber-Optic Interfaces

Model 400-5 Two Fiber Card

Model 400-50 Two Fiber Module

Model 400-6 Four Fiber Card

Model 400-60 Four Fiber Module

Model 400 Fiber-Optic Interfaces for SBS Bit 3 Adapters

SBS Bit 3's Model 400 Fiber-Optic Interfaces provide fiber-optic links between two computer chassis equipped with SBS Bit 3 adapter cards. The Fiber-Optic Interfaces are 100% transparent to adapter functions. Configurations using copper-conductor cable between two adapter cards will run without modification when Fiber-Optic Interfaces are added.

Fiber-Optic Interfaces resynchronize and reformat parallel data from SBS Bit 3 adapters into high-speed serial data that are transmitted over an optical cable. All data transfer capabilities supported by SBS Bit 3 adapters can be performed. Furthermore, because of the inherent characteristics of the fiber-optic cable, the distance that data can travel between chassis is greatly extended and its immunity to electromagnetic interference is increased. Cable lengths to 2 kilometers (km) are supported.

In addition, the Fiber-Optic Interfaces offer a choice of two error checking schemes: Basic and Enhanced. The error checking mode is selected via a configuration jumper.

Because Fiber-Optic Interfaces are transparent additions to SBS Bit 3 adapters, adapter cards in a chassis at either end of the cable function as if the Fiber-Optic Interfaces were not present and can:

- Detect if all cables are present;
- Detect if the adapter card at the opposite end of the link is powered up; and
- The adapter requires no additional software support.

SBS Bit 3 currently offers two Fiber-Optic Interface cards for use with SBS Bit 3 VMEbus adapter cards:

- Model 400-5 Two Fiber Fiber-Optic Interface Card;
- Model 400-6 Four Fiber Fiber-Optic Interface Card.

Fiber-Optic Interface Modules, used with *any* SBS Bit 3 adapter card are also available:

- Model 400-50 Two Fiber Fiber-Optic Interface Module;
- Model 400-60 Four Fiber Fiber-Optic Interface Module.

The Model 400-6 Card and Model 400-60 Module are high-performance fiber-optic interfaces that accommodate four-fiber fiber-optic cable. Model 400-6 is a printed circuit card that installs in a VMEbus chassis; consequently, the card is powered by the VMEbus system.

Model 400-60 is the same as the Model 400-6 but its printed circuit card is housed in a stand-alone chassis with a power supply. The four-fiber models effectively support adapters, such as Models 467-1, 477-1, 487-1, and 413-1, that allow high-speed DMA Burst Mode data transfers for applications requiring above 15 Megabytes per second (M Bytes/sec).

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The Model 400-5 Card and Model 400-50 Module, two-fiber fiber-optic cable versions, are economical solutions for environments requiring less than 15M Bytes/sec peak DMA data transfer rates. As with the higher performance models, the Model 400-5 is a printed circuit card that installs in a VMEbus chassis and Model 400-50 is a stand-alone module.

Model 400-5 Two Fiber Card

Model 400-5, an economical version of the Fiber-Optic Interface Card, provides all the advantages of a fiber-optic link for VMEbus installations whereModel 400-6 maximum performance is not a key issue. Connected by one duplex fiber-optic cable, the Model 400-5 uses one fiber for transmitted data and the other for received data.

Model 400-5 supports peak DMA data transfer rates to 15M Bytes/sec.

A set of two Fiber-Optic Interfaces adds a total latency of 1.6 microseconds to all transfers. Each meter of fiber-optic cable adds an additional 10 nanoseconds (total round-trip time).

Model 400-6 Four Fiber Card

Like the Model 400-5, Model 400-6 installs in a VMEbus chassis. It provides a peak DMA data transfer rate of up to 30M Bytes/sec. Supporting two duplex fiber-optic cables, the Model 400-6 Fiber-Optic Interface Card uses two fibers for transmitted data and the other two fibers for received data.

Added latency is the same as for the Model 400-5.

Model 400-50 Two Fiber Module

Model 400-50, an economical version of the Fiber-Optic Interface Module, has a stand-alone chassis, interface card and power supply. It provides all the advantages of a fiber-optic link for situations where maximum performance is not a key issue. Connected by one duplex fiber-optic cable, the Model 400-50 Module uses one fiber for transmitted data and the other for received data. Model 400-50 provides the same performance and functionality as the Model 400-5 Card but can provide fiber-optic capabilities for any SBS Bit 3 adapter.

Model 400-50 supports DMA data transfer rates to 15M Bytes/sec. Added latency is the same as for the Model 400-5.

Model 400-60 Four Fiber Module

Model 400-60 is a high-performance Fiber-Optic Interface Module with a stand-alone chassis, interface card and power supply. Model 400-60 provides the same performance and functionality as the Model 400-6 Card but can provide fiber-optic capabilities for any SBS Bit 3 adapter.

Model 400-60 provides a DMA data transfer bandwidth of up to 30M Bytes/sec. Supporting two duplex fiber-optic cables, the Model 400-60 uses two fibers for transmitted data and the other two fibers for received data.

Added latency is the same as for the Model 400-5.

Error Checking

Two modes of error checking are supported: Basic and Enhanced.

Basic Error Checking is the simpler and faster scheme. Although its use increases throughput, only simple code checking is provided. Enhanced Error Checking mode activates a second error checking circuit. This second circuit uses a cyclical redundancy check (CRC) algorithm that detects additional errors.

SBS Bit 3 Fiber-Optic Cable

All fiber-optic cables are ordered separately so that you can specify the appropriate length for your installation.

SBS Bit 3's fiber-optic cable is high-quality, OFNP-grade, 62.5/125 micron glass duplex cable with tight buffer construction and ST-style connectors. The OFNP rating means that the cable meets the 1990 National Electrical Code's most stringent flammability requirements for fiber-optic cable. It, therefore, can be routed through air ducts and above suspended ceilings without being enclosed in conduit.

Tight buffer construction enhances the cable's flexibility and resistance to crushing yet keeps the cable small in diameter.

SBS Bit 3's standard fiber-optic cables are 5 meters (approximately 16 feet) in length. Custom lengths to 2 km are available.

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SBS Bit 3 Copper-Conductor Cable

Model 400-50 and Model 400-60 Modules require an 8-foot, round, EMI-shielded, copper-conductor cable to connect the Module to the adapter card. The 8-foot cables are ordered separately so that you can order the appropriate cable for your specific SBS Bit 3 adapter cards:

- PC/AT® adapter cards use Model 400-124 cable.
- VMEbus, MULTIBUS® and Q22-bus® adapter cards use Model 400-114 or Model 400-117 cable.
- Micro Channel®, SBus®, EISA Bus, PCI and GIO® adapter cards use Model 400-120 cable.

Configuration Rules

Two Fiber-Optic Interfaces and a SBS Bit 3 adapter (includes two cards) are required for a functional link:

- Two Model 400-5 or two Model 400-6 Fiber-Optic Interface Cards can be used to link two VMEbus adapter cards.
- One Model 400-5 Fiber-Optic Interface Card and one Model 400-50 Fiber-Optic Interface Module, or one Model 400-6 Card and one Model 400-60 Module can link a VMEbus adapter card to any other SBS Bit 3 adapter card.
- Two Model 400-50 Modules or two Model 400-60 Modules can link any two SBS Bit 3 adapter cards.

A Fiber-Optic Interface Card is connected by two one-inch ribbon cables to the VMEbus adapter card.

A Fiber-Optic Interface Module connects to an installed SBS Bit 3 adapter card via an 8-foot, round, EMI-shielded copper-conductor cable.

Model 400-5 Cards and Model 400-50 Modules link fiber-optic components via one duplex fiber-optic cable. One duplex fiber-optic cable provides one path for transmitted data and one for received data.

The four-fiber models, Model 400-6 and Model 400-60, require two duplex fiber-optic cables. Using two duplex fiber-optic cables allows higher transfer speed and optimal performance because there are two paths for transmitted data and two for received data.

Technical Highlights

- 100% transparent operation.
- Supports DMA data transfers.
- Model 400-5 Card and Model 400-50 Module support two fibers: one transmit and one receive.
- Model 400-6 Card and Model 400-60 Module support four fibers: two for transmitting and two for receiving.
- 15M Bytes/sec transfer rate - Model 400-5 Card and Model 400-50 Module.
- 30M Bytes/sec transfer rate - Model 400-6 Card and Model 400-60 Module.
- Two modes of error checking: Basic and Enhanced.
- Supports fiber-optic cable lengths to 2 km.
- 1330 nanometer LED-based Optical Data Link transmitter.
- PIN photodetector-based Optical Data Link receiver.
- One-inch ribbon cable with 26-pin connectors connect Fiber-Optic Interface Cards and adapter cards.
- 8-foot, round, EMI-shielded, copper-conductor cable connects Interface Modules and adapter cards.
- 62.5/125 micron glass duplex fiber-optic cable connects Fiber-Optic Interfaces.
- ST-style connectors.
- LED Ready and Active status indicators.
- Chassis dimensions - Models 400-50 and 400-60

  Height: 2.5 inches. Width: 12 inches

  Depth: 10 inches.
- Model 400-50 and Model 400-60 power supply:

  Universal Input - automatically accepts 90 VAC to 260 VAC, 47 - 63 Hz.
- FCC A compliance - Models 400-50 and 400-60.
- UL 1950 listed - Models 400-50 and 400-60.
- VMEbus Interface cards meet IEEE 1014C specifications; draws only +5V at 3.5 Amps from VMEbus.

Model 400 Fiber-Optic Interfaces

Required Components

Model 400-5 & Model 400-6 Cards

- Two Fiber-Optic Interfaces: 2 Model 400-5 Cards, or 1 Model 400-5 Card and 1 Model 400-50 Module. Two Model 400-6 Cards, or 1 Model 400-6 Card and 1 Model 400-60 Module.
- A SBS Bit 3 VMEbus adapter*.
- One duplex fiber-optic cable for Model 400-5*; two duplex fiber-optic cables for Model 400-6*.

Each Fiber-Optic Interface Card package includes one card, two one-inch ribbon cables with 26-pin connectors, and a manual.

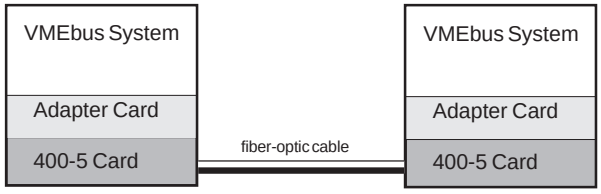
Model 400-50 & Model 400-60 Modules

- Two Fiber-Optic Interfaces: 2 Model 400-50 Modules, or 1 Model 400-50 Module and 1 Model 400-5 Card. Two Model 400-60 Modules, or one Model 400-60 Module and one Model 400-6 Card.
- A SBS Bit 3 adapter*.
- An 8-foot, round, EMI-shielded, copper-conductor cable.
- One duplex fiber-optic cable for Model 400-50*; two duplex fiber-optic cables for Model 400-60*.

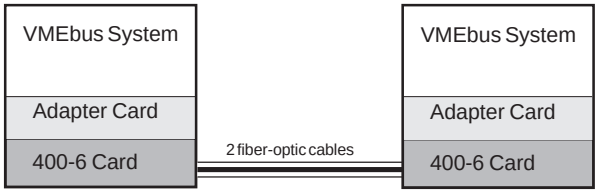
Each Fiber-Optic Interface Module package includes one module (chassis with built-in interface card and power supply), a power cord, and a manual. The copper-conductor cable is purchased separately.

* *Fiber-optic cable and adapters are ordered separately.*

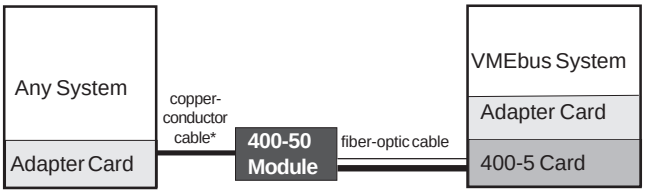
Configuration Options



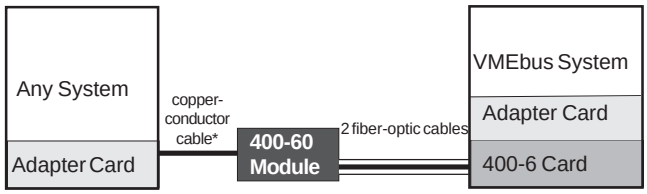
Two Model 400-5 Cards



Two Model 400-6 Cards



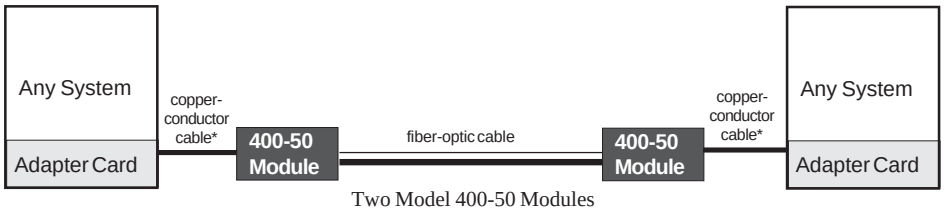
One Model 400-5 Card & One Model 400-50 Module



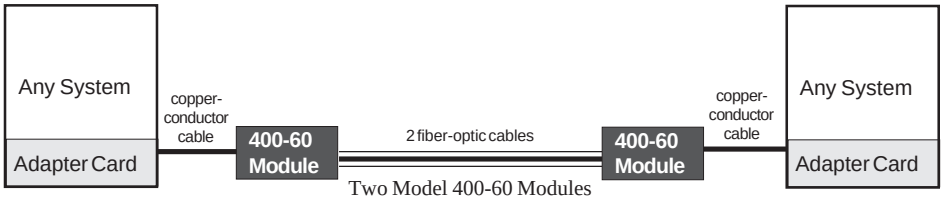
One Model 400-6 Card & One Model 400-60 Module

*** Copper-Conductor Cable**

- PC/AT adapter cards use Model 400-124 cable.
- VMEbus, MULTIBUS and Q22-bus adapter cards use Model 400-114 cable.
- PCI, Micro Channel, SBus, EISA Bus, and GIO adapter cards use Model 400-120 cable.



Two Model 400-50 Modules



Two Model 400-60 Modules

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