Data Sheet

Megaplex-4, Megaplex-2100/2104

HSF-1, HSF-2

Fiber Optic Teleprotection Modules

- Up to 10 ´ 64 kbps per fiber interface port connected to teleprotection equipment
- IEEE C37.94 compliance
- Single or dual optical link with 850 nm multimode fiber interface
- Simple configuration
- HSF-2 operation in all Megaplex chassis
- IEEE-1613 compliant option

The HSF-1 and HSF-2 modules comply with the IEEE C37.94 standard for up to 10 ´ 64 kbps optical fiber interfaces, thus enabling teleprotection equipment to utilize the advanced transport capabilities offered by Megaplex.

The modules feature a single- or dual-port fiber optic interface, operating at a nominal wavelength of 850 nm. Each port is terminated in a pair of ST connectors for connection to standard multimode fiber.

The fiber optic link operates at a nominal line rate of 2.048 Mbps and uses the framing mode specified in the IEEE C37.94 standard (based on the G.732N framing for E1 links).

In accordance with the IEEE C37.94 standard, each teleprotection payload channel occupies two timeslots on the HSF optical link, and is processed by the HSF module for transport via a single 64-kbps port. This increases the channel immunity to environmental disturbance and facilitates error correction. The HSF module optimizes each payload channel into a single 64-kbps timeslot over the E1/T1/SDH/SONET link, thus achieving 50% bandwidth saving over the transport network. In addition, the timeslots that do not carry the payload are suppressed and generated locally, assuring further bandwidth optimization over the transport network.

The fiber optic interface has a wide dynamic range, which ensures that the receiver will not saturate even when using short fiber optic cables (saturation is caused when the optical power applied to the receiver exceeds its maximum allowed input power, and results in very high bit error rates).

The receive path of the HSF optical port uses the clock signal recovered from the corresponding received line signal. The transmit path timing is derived from the nodal clock used by Megaplex. The user's teleprotection equipment should be set to loopback timing, that is, its link transmit clock should be locked to the receive clock derived from the receive data of the same port.

Specifications

TDM INTERFACES

Number of Ports
1 or 2

Compliance
Frame: IEEE C37.94

Connectors
Pair of ST connectors

Payload Rate (per port)
n ´ 64 kbps, where *n* = 1 to 10 (64 to 640 kbps)

Nominal Bit Rate
2.048 Mbps

Wavelength
850 nm

Fiber Type
62.5/125 mm multimode

Transmitter Type
VSCEL

Power Coupled into Fiber
-11 to -19 dBm (-15 dBm typical)

Data Sheet

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Fiber Optic Teleprotection Modules

Receiver Sensitivity
-32 dBm

Maximum Receiver Input Power
-11 dBm

Receiver Dynamic Range
21 dB

Range (Typical)
With 6.8 dB margin: 2 km/1.25 miles
With 3.4 dB margin: 4 km/2.5 miles

MANAGEMENT

Programmable via the Megaplex management system

TIMING

Internal Oscillator: ±30 ppm

GENERAL

Environment
Operating temperature: -10°C to 55°C (14°F to 131°F)
Storage temperature: -20°C to +70°C (-4°F to +158°F)
Humidity: up to 95%, non-condensing

Indicators
ALARM – On when a fault has been detected in the module
ON LINE – On when the link is operating properly and is active
LOC S. LOSS – On when the local module link has lost frame synchronization
REM S. LOSS – On when an indication of loss-of-frame synchronization is received by the module from the equipment connected to the remote end of the fiber optic link
TST – Reserved for future use

Power Consumption
HSF-1: 8.0W
HSF-2: 9.0W

Ordering

RECOMMENDED CONFIGURATIONS

MP-2100M-HSF-1/ST/85

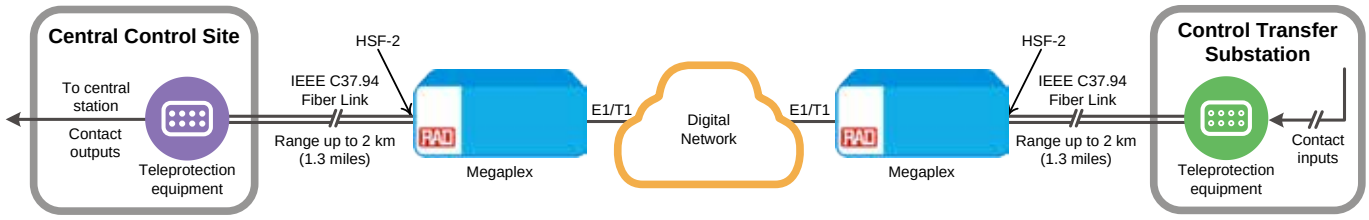
Single-port fiber optic teleprotection module for the MP-2100/2104 chassis

MP-2100M-HSF-2/ST/85

Dual-port fiber optic teleprotection module for the MP-2100/2104 and Megaplex-4 chassis

SPECIAL CONFIGURATIONS

Please contact your local RAD partner for additional configuration options



Transporting Teleprotection Signals over a Digital Network

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