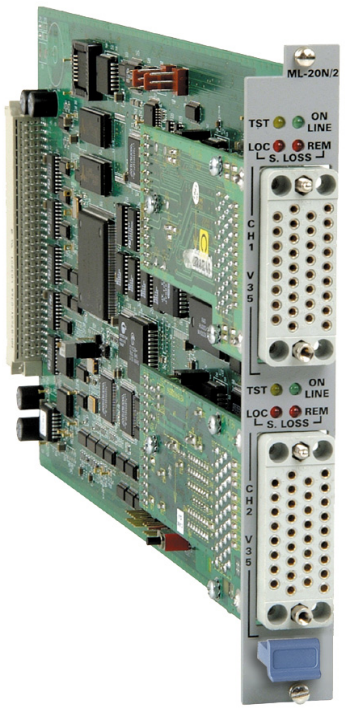
Data Sheet

Megaplex-2100/2104

ML-20N

Single/Dual n x 64 kbps Main Link Module



- User-selectable rates between 128 and 2048 kbps
- V.35, X.21, RS-530, RS-449 or AMI interfaces
- AMI interface for radio transmission with error correction
- Timing modes: DTE, External DCE and DCE
- ±256 bits receive data buffer for satellite applications

Synchronous main links for direct connection to high-speed data service networks

ML-20N is a family of n × 64 kbps main link modules that connect Megaplex-2100 and Megaplex-2104 units to high-speed digital data service networks running at sub-E1 rates (128 to 2048 kbps). In addition, ML-20N can provide backup line support for E1 main links over high-speed digital data lines.

The ML-20N modules are available with one or two links, with a choice of V.35, RS-530/RS-422 or X.21 data interfaces. RS-449 interface is also supported via a supplied adaptor cable (see *Ordering*). These interfaces operate at main link data rates of n × 64 kbps in the range of 128 to 2048 kbps (n=2 through 32). These rates correspond to payload rates of 64 to 1984 kbps (equivalent to that of a full E1). In addition to operation at a user-selected rate, the operation rate can also be selected automatically (any supported multiple of 64 kbps).

The modules provide redundancy between ports on the same ML-20N/2 module or between ports on different ML-20N modules.

Moreover, ML-20N ports can backup E1 ports, such as the ports of the ML-1E1/ML-2E1/ML-8E1 modules.

The ML-20N modules provide link backup for applications where the traffic is normally carried by E1 links (via modules such as ML-2E1). If the E1 link fails, the traffic is automatically rerouted to a leased line or an ISDN dial-up modem connected via the ML-20N port (see *Figure 1*).

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AMI INTERFACE

ML-20N is available with an AMI interface, commonly supported by various types of microwave radios, for direct connection to radio equipment (see *Figure 2*). The ML-20N AMI interface includes an error correction function that corrects random bit errors as well as error bursts, in accordance with the user's selection. Errors often occur on radio links as a result of intentional or unintentional interference, fading, etc. Error correction maintains traffic integrity despite such occurrences.

AMI interface modules operate at main link data rates of 512 to 2048 kbps. Actual available payload and link rates depend on whether the error correction function is used (see *Specifications*).

Since sensitive information transmitted by radio is vulnerable to interception and eavesdropping, bulk encryption equipment is often used to protect the traffic. This encryption can disrupt the transmission synchronization. The ML-20N AMI interface reports such synchronization problems if they occur.

DIAGNOSTICS

The ML-20N module features a self-test, and additional testing and diagnostic functions that can be controlled by the Megaplex management system. The testing capabilities include local loopbacks, remote loopbacks and BERTs at both the port and individual timeslot level. Local and remote test tone injection can be run at the timeslot level.

For V.35 and RS-530 interfaces, the user can also send V.54 loopback commands (Loop 2 and Loop 3) to the modems serving the main link.

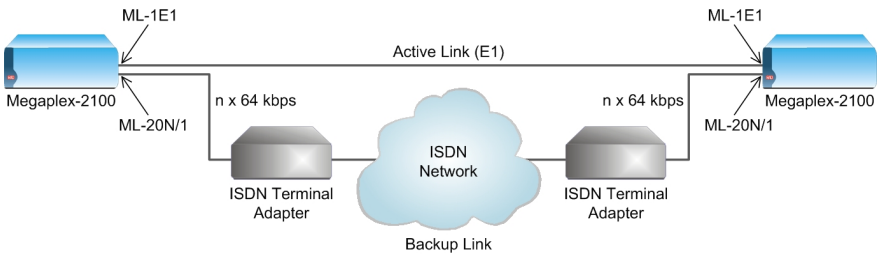

Figure 1. ISDN Backup

Specifications

Number of Ports
ML-20N/1: 1
ML-20N/2: 2

Interface and Connectors
(in accordance with order)
V.35 with 34-pin VAPL, female
RS-530/RS-422 with 25-pin D-type, female
RS-449/RS-422 with 37-pin D-type, female (via supplied adapter cable)
X.21/V.11 with 15-pin D-type, female
AMI with 25-pin D-type, female

Main Link Data Rates (per port)
V.35, RS-530, X.21 Interfaces:
n × 64 kbps in the range of 128 to 2048 kbps (n = 2 to 32)
AMI Interface:
- Without error correction: n × 64 kbps in the range of 512 to 2048 kbps (n = 8 to 32)
- With error correction: 2n × 64 kbps in the range of 512 to 2048 kbps (n = 4 to 16)

Payload Data Rates (per port)
V.35, RS-530, RS-449, X.21 interfaces:
64 kbps less than the link data rate
AMI Interface:
- Without error correction: 64 kbps less than the link data rate
- With error correction: 64 kbps less than half the link data rate

Timing
DTE: ML accepts TX and RX clock from the DCE (e.g. modem) connected to it
External DCE: ML provides TX clock to external DCE, and accepts RX clock from DCE
DCE: ML provides TX and RX clock to the DTE

Receive Data Buffer
Normal: ±8 bits
Extended: ±256 bits, for satellite links

Error Correction (AMI only)
Random mode: any 3 randomly distributed errors in a 24-bit sequence
Burst mode: any burst of up to 9 errors in a 72-bit sequence

Control Signals
RS-530, RS-449 and V.35 interface:
Outputs: RTS and DTR
Inputs: CTS, DSR, DCD
X.21 interface:
Output: C; Input: I
AMI interface:
Synchronization flag output, indicates synchronization status of port receive path

Diagnostics
Local and remote main link loopbacks per port
ITU-T Rec. V.54 Loop 2 and Loop 3 (only for V.35 and RS-530) per port
Local and remote BER test per port
Local and remote loopbacks per timeslot
Local and remote BER test per timeslot
Local and remote test tone injection per timeslot

Indicators (per port)
On-Line, Test, Local Sync Loss
Remote Sync Loss

Configuration
Programmable via the Megaplex management system

Environment
Operating temperature: 0°C to 45°C (32°F to 113°F)
Storage temperature: -20°C to +70°C (-4°F to +160°F)
Humidity: up to 95%, non-condensing

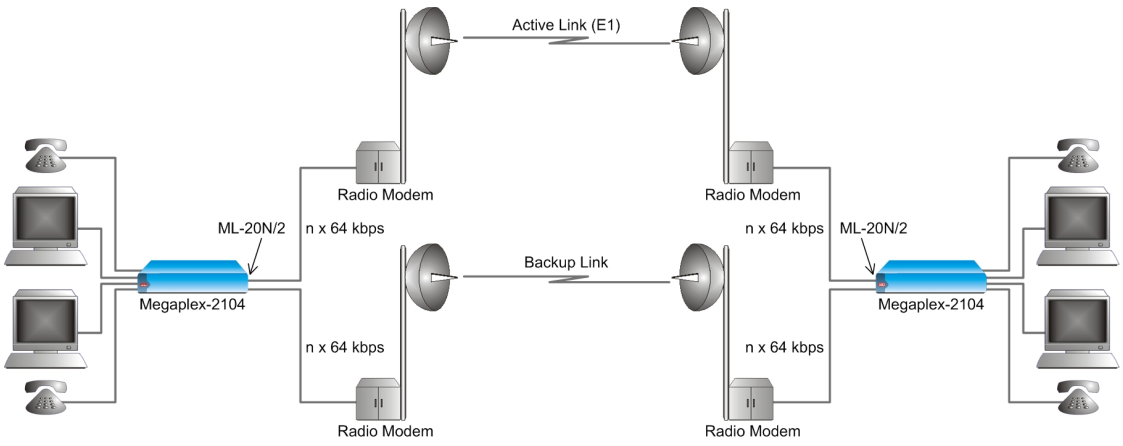

Figure 2. Data Transport over n x 64 kbps Radio Links

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Single/Dual n x 64 kbps Main Link Module

Ordering

STANDARD CONFIGURATIONS

MP-2100M-ML-20N/1/V35

MP-2100M-ML-20N/1/X21

SPECIAL CONFIGURATIONS

MP-2100M-ML-20/#/*

Legend

\# Number of ports:

1	Single port
2	Two ports

* Interface:

AMI	AMI interface
V35	V.35 interface
RS449	RS-449 interface (via supplied cable)
RS530	RS-530 interface
X21	X.21 interface

SUPPLIED ACCESSORIES

CBL-530/449/F

Adapter cable for connecting V.36/RS-449 user equipment to the module RS-530 connector

Table 1. Megaplex Main Link Modules

Feature	ML-E1/T1	MLF-E1/T1	ML-8E1/8T1	MSL-8	ML-IP	ML-20N
						
Interface Type	E1/T1	E1/T1	E1/T1	SHDSL	ETH (TDMoIP)	n x 64 kbps
Number of Channels	1/2	1/2	8	8	2	1/2
Redundancy	Link	Link	None	None	Bundle	Link
Ring	E1/T1	E1/T1	None	None	RFER	None

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