

Megaplex-2100/2104

Version 12 Modules

The following tables present all the main link, I/O and system modules, supported by the Megaplex-2104 (2U-high) and Megaplex-2100 (4U-high) systems with the Version 12.xx CL.2 common logic module. For full module details and ordering information, see individual module data sheets. The following types of modules are available:

- Main Link Modules
- Low Speed Data I/O Modules
- High Speed Data I/O Modules
- Internetworking I/O Modules
- Voice/Fax I/O Modules
- System Modules
- Ringers.

Table 1. Main Link Modules

ML-8E1 NEW	8-port copper E1 interface modules. Feature full cross-connect, bypass and diagnostics. Equipped with integral user-enabled LTU and station clock interface.
ML-1E1 ML-2E1	Single/dual copper E1 interface modules. Feature full cross-connect, bypass, R2 CAS, diagnostics and statistics. Equipped with integral user-enabled LTU and station clock interface. Enhanced diagnostics with BERTs (dual-port modules only), loopbacks, and tone injection per timeslot. Can display signaling bit state of any timeslot carrying voice. Support self-healing ring redundancy topology.
MLF-1E1 MLF-2E1	Single/dual E1 interface modules with built-in fiber optic modems. Available with various fiber optic interface/connector combinations. Station clock interface provided (on single link module only). Support same features as described for ML-1E1/ML-2E1 above, including ring topology.
MSL-8 NEW	SHDSL technology 8-E1 2-wire interface module extending the range of Megaplex to 10.6 km/3.5 miles over existing copper lines. Supports same features as described for M8E1 above.
ML-8T1 NEW	8-port copper T1 interface modules. Feature full cross-connect, bypass (including multiframe synchronization) and diagnostics. Equipped with integral user-enabled CSU and station clock interface.
ML-1T1 ML-2T1	Single/dual copper T1 interface modules. Feature full cross-connect, bypass (including multiframe synchronization), diagnostics and statistics. Equipped with integral user-enabled CSU and station clock interface. Enhanced diagnostics with BERTs (dual-port modules only), loopbacks, and tone injection per timeslot. Can display the signaling bit state of any timeslot carrying voice. Support self-healing ring redundancy topology.
MLF-1T1 MLF-2T1	Single/dual T1 interface modules with built-in fiber optic modems. Available with various fiber optic interface/connector combinations. Station clock interface provided (on single link module only). Support same features as described for ML-1T1/ML-2T1 above, including ring topology.



Table 2. Main Link Modules (cont.)

ML-IP TDM-IP Driven[®] Enhanced	Provides standard 10/100 Mbps Ethernet connectivity for Megaplex, complying with all relevant IEEE Ethernet LAN standards. Uses RAD's TDMoIP [®] technology to convert the Megaplex TDM bit stream into IP packets for transmission over IP networks. Features two Ethernet uplinks with choice of 10/100BaseT (UTP) or 100BaseF (fiber) interface and additional 10/100BaseT Ethernet user port. Employs Resilient Fast Ethernet Ring (RFER) technology to build Fast Ethernet networks with 50-msec self-healing link protection.
ML-20N/1 ML-20N/2	One or two n x 64 kbps synchronous main links for direct connection to high-speed data service networks running at rates between 128 and 2048 kbps. Can provide link backup for E1 main links over high-speed digital data lines.

Table 2. Low Speed Data I/O Modules

LS-2A	Data module with 10 synchronous/asynchronous V.24/RS-232 channel interfaces for X.50 and SDM multiplexing, or 6 synchronous channel interfaces for X.58 multiplexing, with data rates from 2.4 to 19.2 kbps per channel.
LS-2A/2TS	Similar to the LS-2A module for X.50 multiplexing, but can transmit the channels over two timeslots. Thus a single module can service all ten channels, even at 9.6 kbps channel rate. Alternatively, the traffic of four channels can be transmitted at 19.2 kbps rate by a single module (plus another two channels at 9.6 kbps).
LS-2/M	Six synchronous data channels with built-in short-range modems. Operates at channel rates from 2.4 to 19.2 kbps, using X.50 multiplexing. Compatible with RAD's SRM-8 miniature modems.
LS-6N LS-12	6 or 12 sync/async V.24/RS-232 data channels, with independent data rates from 2.4 to 64 kbps. Feature end-to-end control signal and BERT. LS-12 can bundle channels into two groups, each of which can be directed to a different main link, while LS-6N can bundle channels into one group only.
HS-RN*	Four low-speed sync/async data channels with data rates from 0.6 to 64 kbps (sync) or 38.4 kbps (async), including HDLC-based end-to-end control signaling.
HS-DP/3 HS-DP/6	3 or 6 OCU-DP (Office Channel Unit - Data Port) channels, operating at data rates of 2.4, 4.8, 9.6 and 56 kbps per channel. The OCU-DP interface directly connects to products with a built-in CSU/DSU. It is also used with standalone CSU/DSU products in DDS networks. The modules are compatible with AT&T PUB 62310 (Standard DDS), BELLCORE TA-TSY-000077, and TR-TSY-000458 standards.

Table 3. High Speed Data I/O Modules

HS-2	Two high speed synchronous data channels with V.35 or V.11/RS-422 (for V.36/RS-449, RS-530, X.21) interface, at data rates of n x 56 or n x 64 kbps, up to 1984 kbps.
HS-703	Four 64-kbps G.703 codirectional data channels.
HS-S	Four ISDN "S"-interface (2B+D) channels, operating as an ISDN channel extension, and providing ISDN leased line services over "S" interface, including power feeding.
HS-U*	Four ISDN "U"-interface (2B+D) channels; for "last mile" solutions at ranges of up to 5.5 km/3.4 miles, and for ISDN channel extension including power feeding for remote NT-1. Automatic configuration download and full-duplex management, including remotely initiated BERTs and loopbacks, for ASMi-31 modems.
HS-U-6* HS-U-12*	Similar to the HS-U module above, but with 6 or 12 ISDN "U"-interface (2B+D) channels. D channel signaling information can be compressed to reduce bandwidth.
HSF-1* HSF-2* NEW	One- or two-port 850 nm multimode fiber interface, with a capacity of up to 10 x 64-kbps per port, for teleprotection equipment, complying with IEEE C37.94 requirements
HS-6N* HS-12N*	Similar to HS-Q/N, but with 6 or 12 high speed synchronous data channels, operating at data rates of n x 56 or n x 64 kbps, up to 1984 kbps. Feature enhanced clock mode and BERT. Any channel can be directed to any main link module.

Table 4. Voice/Fax I/O Modules

VC-6	Six analog voice channels using 64-kbps PCM encoding. Features EIA RS-464 loop-start signaling. E&M, FXS, FXO interface options available.
VC-6A	Six analog voice channels using 64-kbps PCM or 32-kbps ADPCM compression. Suitable for various loop-start applications, PSTN applications, and public payphone applications. Features loop-start as well as ground-start signaling, reverse polarity for wink-start, and pulse-metering. E&M, FXS, FXO interface options available.
VC-6/LB	Six analog voice channels for connecting between 2-wire local battery-powered (LB) military-type field telephones at different locations, point-to-point. A four-channel version is available for LB telephone connection via PBX extension lines.
VC-4* VC-8* VC-16*	4, 8 or 16 analog voice channels using 64-kbps PCM encoding, with E&M, FXS or FXO interface options. Suitable for various loop-start applications, PSTN applications, and public payphone applications (requiring wink-start signaling and pulse-metering). With VC-16, a single Megaplex-2100 unit can transmit up to 120 PCM voice channels (or up to 60 channels with Megaplex-2104).
VC-4A* VC-8A* NEW	4- or 8- analog voice channels using PCM (64-kbps) encoding or ADPCM (24 or 32-kbps) encoding, with E&M, FXS or FXO interface options. Suitable for various loop-start applications, PSTN applications, and public payphone applications (requiring wink-start signaling and pulse-metering).
VC-16A*	16 analog voice channels using 64-kbps PCM or 32-kbps ADPCM compression. Transmits voice without any channel signaling, thus it is primarily intended for basic point-to-point applications which do not require signaling, or use only inband signaling (such as DTMF). Enables a single Megaplex-2100 unit to transmit up to 160 ADPCM voice channels (or up to 64 channels with Megaplex-2104).
VC-4/OMNI* NEW	A special "omnibus" E&M interface module providing four toll-quality voice channels for applications where a master site needs to communicate with multiple remote stations simultaneously (such as to broadcast an important message).
VF-24/T1* VF-48/T1* VF-30/E1* VF-60/E1*	Digital voice compression modules for connecting PBX trunks with greater bandwidth utilization (compression ratio of up to 10:1). Employ a choice of several high-quality voice compression methods, including G.723.1 at 6.4 kbps or 5.3 kbps per channel, or G.729A at 8 kbps. Compression methods are user-selectable per bundle. Support Group III fax and modem relay, at user-selectable standard rates up to 14.4 kbps. Feature transparent timeslot transfer, voice activity detection, silence suppression, and comfort noise generation. Module versions are offered with single T1 (up to 24 channels), dual T1 (up to 48 channels), single E1 (up to 30 channels) or dual E1 (up to 60 channels) ports.
VFS-24/T1* VFS-48/T1* VFS-30/E1* VFS-60/E1* NEW	In addition to all features of the VF modules above, the VFS modules also act as voice and FAX relay compression servers, performing compression of analog voice channels within the same module.

Table 6. Internetworking I/O Modules

HS-ETH	1/2/4-channel Ethernet bridge/router module transmitting at data rates of n x 56/64 kbps (up to 1.984 Mbps payload) per channel. Suitable for LAN to LAN extension applications. Provides up to four high-performance, remote, self-learning 10BaseT Ethernet bridge or IP router channels. Each channel terminates in a separate RJ-45 connector. Supports VLANs. 10/100BaseT Fast Ethernet bridge module also available.
HS-ETH/SW*	4-channel 10/100BaseT Ethernet I/O module with a built in Layer-2 Ethernet switch, featuring VLAN support and double-tagging. Employs static routing, IP subnet switching over PPP, STP and RSTP protocols. WAN side transfers data at rates of 64 to 1536 kbps for T1 links, and 64 to 1920 kbps for E1 links. Total WAN capacity is up to 4096 kbps.

* These I/O modules can utilize the 4 buses of Megaplex-2100/2104 (up to 124 timeslots) using any main link; other I/O modules can utilize up to 62 timeslots. HS-6N and HS-12N in conjunction with the ML-8E1/T1 modules can utilize the full TDM capacity of Megaplex-2100/2104 (up to 248 timeslots).

Table 7. System Modules

CL.2 (Ver.12.xx) Enhanced	CL.2 common logic module for MP-2100/MP-2104. Available with choice of Ethernet BNC, Ethernet UTP or V.24 port for management. Can be ordered separately to provide redundancy for the CL module supplied with chassis, or for upgrading older systems. <i>Note:</i> Contact your local distributor for more information about system upgrades.
ACM	Alarm and diagnostics module with four outbound relays for reporting internal alarms to outside indicators such as bells, buzzers, etc. Eight inbound sensors enable external alarms or conditions to be reported to the Megaplex system.
PS	Power supply module for MP-2100 chassis. Supply 115 VAC, 230 VAC, -24 VDC or -48 VDC input. Can be ordered separately to provide redundancy for PS module supplied with chassis.

Table 8. Ringers

Ringer-2100R	DC power supply module providing DC feed and ring voltages required by certain voice/fax modules or phantom feeding for ISDN modules installed in MP-2100 chassis. (MP-2104 chassis can be ordered with a built-in ringer.) Supports up to 32 active voice channels.
Ringer-2000	DC power supply standalone unit providing DC feed and ring voltages required by certain voice/fax modules or phantom feeding for ISDN modules used by Megaplex. Can be mounted in a 19" rack. Supports up to 60 active voice channels.
Ringer-2200N	Enhanced DC power supply standalone unit providing DC feed and ring voltages required by certain voice/fax modules or phantom feeding for ISDN modules used by Megaplex. Can be mounted in a 19" rack. Supports up to 120 active voice channels.

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