MASTERSERIES

FLEXmaster16 Service Module

16 port T1/E1 module for the MASTERseries platform enables a highly efficient and more cost-effective RAN access network

Advanced bandwidth and traffic management capabilities

Greater transport utilization with Abis protocol optimization

Converge GSM, 3G UMTS and IP traffic over same transport

Access and Transport Optimization for Greater T1/E1 Bandwidth Utilization

The MASTERseries™ FLEXmaster16 Service Module is a component of the MASTERseries cell site access platform that adds increased T1/E1 traffic carrying capacity with the powerful FLEXengine™. The FLEXmaster16 module eliminates the uncertainty of cell site backhaul network protocol migration from TDM to ATM or IP by offering unparalleled backhaul networking flexibility for UMTS migration paths. ATM, IP and GSM Abis compression options can be remotely upgradeable via simple software loads. Wireless carriers can now control transport costs, install new services, and more efficiently utilize existing T1/E1 lines with the FLEXmaster16 module with GSM, UMTS and IP traffic consolidation over a common backhaul transport (TDM,ATM or Ethernet). It is the ideal solution for carriers implementing next-generation transport solutions for their BSS network over existing infrastructures.

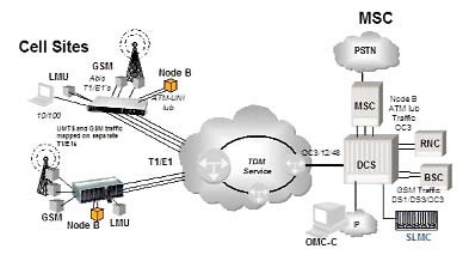
MASTERseries FLEXmaster16 Service Module

Software features enable easy expansion and upgrades for GSM transport optimization to further maximize bandwidth between the BTS and BSC. BTS network access bandwidth can be T1/E1, or multi-T1/E1 in order to satisfy user demand for the increasing bandwidth required for today's wireless transport applications.

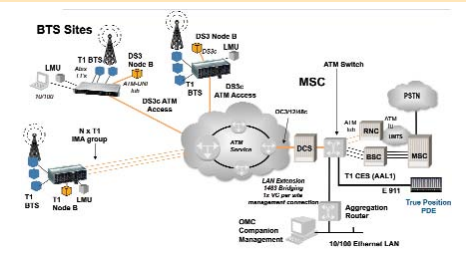
The FLEXmaster16 Service Module installs in any MASTERseries 2- or 8- slot enclosures capable of supporting FLEXmaster modules to provide improved backhaul transport optimization and compression functions that consolidates GSM traffic over a truly dynamic backhaul transport.

The FLEXmaster16 provides full featured T1/E1 access and management as well as timeslot cross-connects, CSU and terminal server router functions in a single, compact platform, replacing multiple pieces of equipment. The result is significant savings in cost, space, and power and simplified management.

Application: TDM



Application: ATM



Key Features

- Converge GSM, 3G UMTS and IP traffic over same transport
- Interoperability with infrastructure interfaces
- High availability – extended operating temperature range, redundant power
- Supported by OMC Companion Element Management, performance monitoring, configuration, upgrade and alarm gathering
- V.35 port, 4 10/100 Ethernet LAN ports, 2 10/100 WAN uplink ports for T1/E1 transport over Ethernet
- Software upgrades for TDM, ATM and Ethernet Transport
- Supports Abis optimization, ATM-IMA and pseudowire capabilities
- Non-blocking DS0 cross-connect

FORCE10

Specifications: FLEXmaster16 Service Module

ATM Software for the MASTERseries FLEXmaster16 Service Module

The ATM software for the FLEXmaster16 Service Module provides wireless mobile transport networking solutions for voice and data T1/E1 integrated access, wireless cell site traffic grooming, concentration, backhaul and LAN extension. The FLEXmaster16 with ATM software act as an 8 or 16 T1/E1 ATM access concentrator and multi-link T1 DSU/CSU with Ethernet bridging.

The ATM software supports RFC2684 Bridged operation (essentially AAL5 Transparent Bridging) for the front panel 10/100Base-TX Ethernet ports. This provides the connections for the management data channel and the FLEXmaster module acts as a transparent LAN Bridge providing a data transport pipe for the private management LAN extension network at the cell site.

ATM Software Requirement

A separate purchase of the ATM software or the software key is required to install the ATM features.

Physical

MASTERseries FLEXmaster16 engine Service Module
The front-loading FLEXmaster16 engine includes six 10/100 Ethernet RJ45 ports and RJ45 RS-232 craft port.The rear-loading interface adapter includes 16 T1/E1 (RJ48C) ports and one V.35 port (sub-miniature DB-26 connector)

– 16 T1/E1 Full Non-blocking DS0 cross-connect

– Resides in MASTERseries 8-slot or 2-slot enclosure

Environment

Operating temperature: -40 °F to 149 °F (-40 °C to 65 °C)

Storage temperature range: -40 °F to 158 °F (-40 °C to 70 °C)

Maximum operating altitude: 10,000 ft (3,048 m)

Minimum operating altitude: 197 ft (60 m) below sea level

Maximum non-operating altitude: 40,000 ft (12,192 m)

Relative humidity (non-condensing) range: 0% to 95%

Management Interfaces

RJ-45 8-pin jack RS-232 craft port

Remote Access Telnet support

Local management through 10/100 or RS-232 port

Ethernet Features

6 Ethernet 10/100Base-TX LAN ports

Routing Features

PPP, Frame Relay (RFC 1490) Nx56/K64K WAN data rates

Static, RIPv1, RIPv2, OSPF v2 Routing

Un-numbered ports interface support

DHCP: Client, Relay and Server

NAT/NAPT

Ping, Trace Route

T1 Interfaces

Line rate: 1.544 Mbps ±50 bps

Framing: SF/ESF

Coding: AMI or B8ZS for T1

Front T1 Connectors: 8-pin RJ-48C jacks

Rear T1 Connectors: Wire-wrap terminals (backplaneTDM bus support in Phase 2)

Timing: Internal or external from T1 port

Line interface: T1-CSU

Receive sensitive (DS-1): 0 to -22 dB @ 772KHz ALBO

Output level (DS-1): selectable at 0 to -22dB

Jitter: meets AT&T Pub.TR-62411, G.832

Timing Source

Internal Timing: The internal oscillator provides the master clock

Loop Timing: The transmit clock is derived from a T1/E1 port's receive clock

Revertive or non-revertive (provisionable) clock switching provides automatic backup to secondary T1/E1 should the primary T1/E1 fail

Diagnostics

T1/E1 Port Loopbacks: bi-directional, fractional DS0, line, local, payload

Performance Monitoring

Data storage: last 24 hours of data in 15-min. increments, 24-hour summary

Monitors all T1 interfaces

ATM Capacity

Up to 16 T1 CES ports with an AAL1 capacity of up to six full T1 TDM streams

Up to 16 T1 ATM-UNI-IMA Node B ports can be supported

1- 16 T1 IMA network ports can be supported

Up to 4 IMA groups can be supported

Per VC queuing

Provides weighted fair queuing scheduling

Buffer management: early packet discard (EPD), partial packet discard (PPD), cell discard (CLP)

ATM Interworking

General: ATM Forum UNI 3.0/4.0

Ethernet Bridging: MPoA bridging (RFC 1483/2684), 802.1q VLAN pass-through

Adaptation: AAL1,AAL5

Service Categories: CBR, UBR,VBR

Connections: 255 connections, 8 VPi bits, 16 VCi bits VP-VC switching

OAM Support: F5 Fault Management and Performance Monitoring

Adaptation Layer: AAL1 Circuit Emulation Service V2.0

Supports: T1 over ATM-f structured CES service, version 1.0/2.0, and AAL1 adaptation with CCS support

ATM Standards

ATM Forum
- Traffic Management 4.0: af-tm-0121.000
- Signaling 4.0: af-sig-0061.000
- ILMI 4.0: af-ilmi-0065.000
- T1 Physical Layer Interface: af-phy-0016.000
- IMA Physical Layer Interface: af-phy-0086.001
- Circuit Emulation Service 2.0: af-vtoa-0078.00

Regulatory

USA
- UL6 60950-1
- FCC Part 15, Class A
- FCC Part 68 and TIA-968-A

Canada
- CSA 60950-1
- ICES-003 Class A
- CS-03

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