Megaplex-4100/4104

Next Generation Multiservice Access Nodes

- Carrier-class multiservice platform: high speed, low speed, analog voice, data, fiber multiplexing, pseudowire connectivity and Ethernet services
- Central solution aggregating Ethernet and TDM services over fiber/copper from RAD CPEs towards SDH/SONET and/or PSN core networks
- High Capacity DS0 cross-connect with GbE and STM-4/STM-1/OC-12/OC-3 uplinks
- Powerful protection including resilient ring topology and module redundancy at various levels

Part of the AXCESS+ portfolio, Megaplex-4100/4104 functions as a carrier-class, TDM and Ethernet aggregator, as well as a high capacity DS0 cross connect and next generation multiservice access node, for transporting legacy and next-generation services over any infrastructure for seamless migration.

When deployed as a carrier-class Ethernet aggregator, Megaplex-4100/4104 can terminate Ethernet traffic carried over E1/T1/SHDSL/SHDSL.bis/fiber links or native Ethernet copper and fiber, as well as through a VCG in the SDH/SONET circuits. This traffic can then be switched either to a different PDH/TDM trunk or to Ethernet ports.

Using pseudowire, Megaplex-4100/4104 provides legacy services over packet-switched networks (PSN). Megaplex-4100/4104 converts the data stream from TDM/serial modules in the MP-4100/4104 chassis (E1/T1, SHDSL, data or voice ports) into IP or MPLS packets for transmission over Ethernet, IP or MPLS networks.

Various users can benefit from this solution:

- SDH/SONET customers who need to continue using their network while maximizing bandwidth utilization
- Subscribers with mixed Ethernet and TDM services
- Subscribers looking for a future-proof migration path to IP connectivity
- Dual network owners using SDH/SONET for voice and packet for data.

Megaplex-4100/4104 offers carrier-class provisioning features, including end-to-end path management, to ensure continuous service availability. Advanced SNMP management capabilities enable Megaplex-4100/4104 to control and monitor all network elements: SDH/SONET access and ring units, as well as remote POP and first mile broadband access feeders and CPEs.

Its ability to handle a broad range of Ethernet, data and voice services, as well as a large variety of network technologies in a single compact managed node, makes Megaplex-4100/4104 an ideal core/edge solution for carriers and service providers. It also provides a perfect fit for large enterprises, utilities and transportation companies that require an efficient way to transport and provision multiple legacy and next-generation services over their high capacity pipes.

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Applications

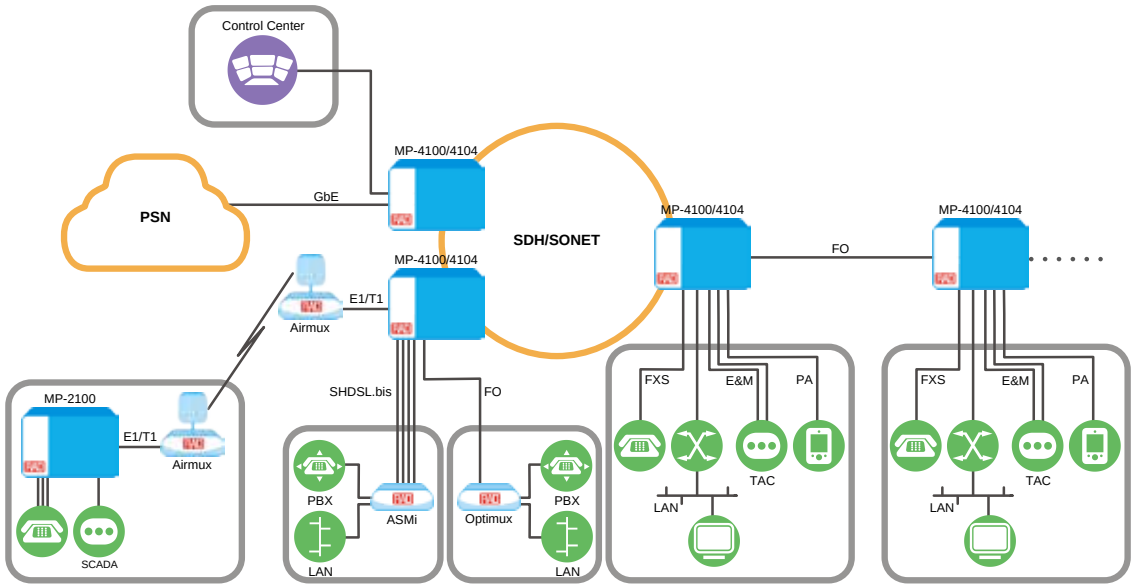

Figure 1. Megaplex-4100 and Megaplex-4104 as Multiservice Platforms with Diverged Interfaces and Access Topologies for U&T Market Segment

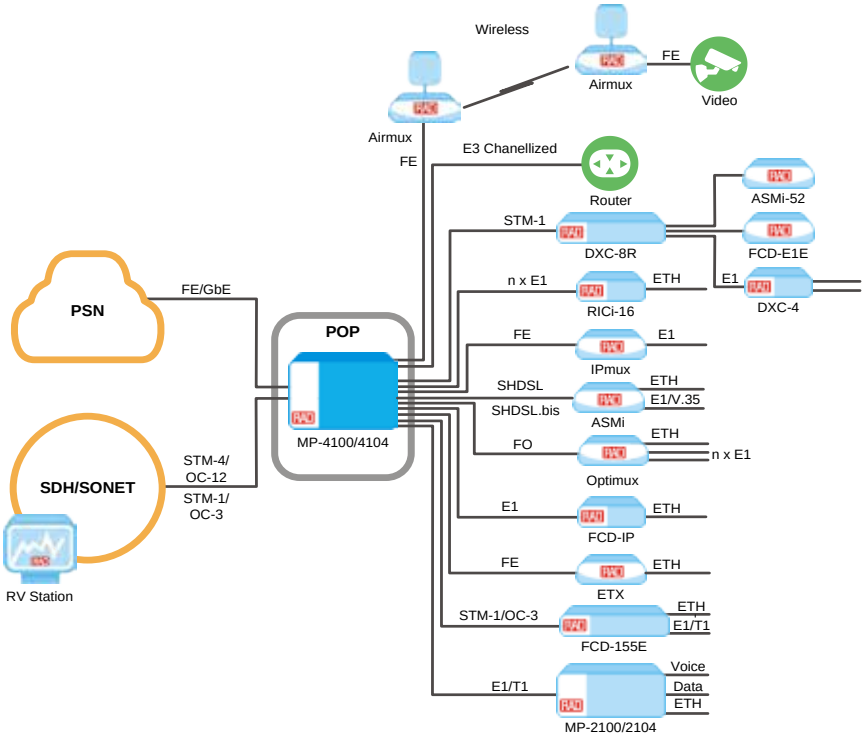

Figure 2. Megaplex-4100 as a Central Site Aggregator for different RAD CPEs, Ethernet and TDM Aggregator for SDH/SONET and PSN

Specifications

SDH/SONET INTERFACE

Number of Ports
2 per CL.2 module (4 per chassis)
Protection
1+1 unidirectional APS (G.842)
1+1 bidirectional APS (G.841, Clause 7.1).
1+1 bidirectional optimized APS (G.841 Annex B. Linear Multiplex Section (MSP))
Path Protection (Telecordia UPSR standard and ITU-T SNCP recommendation)

Line Coding
NRZ

Connectors
SFP socket

Data Rate
STM-4/OC-12: 622.08 Mbps ± 4.6 ppm
STM-1/OC-3:155.52 Mbps ± 4.6 ppm

Compliance
SDH: ITU-T G.957, G.798, G.783
SONET: ANSI T1.105-1995, GR-253-core
GFP (Generic Framing Procedure): ITU-T G.7041, ANSI T1-105.02, framed mode

LAPS (Links Access Procedure); X.86

LCAS (Link Capacity Adjustment Scheme): ITU-T G.7042

Framing
SDH: ITU-T G.707, G.708, G.709
SONET: GR-253-core

GIGABIT ETHERNET INTERFACE

Number of Ports
2 per CL.2 module (4 per chassis)

Data Rate
10/100/1000 Mbps
Autonegotiation (copper interface only)

Connectors (per port)
RJ-45, shielded
SFP socket

Maximum Frame Size
9600 bytes (for max. frame sizes supported by different I/O modules, see individual data sheets)

SDH/SONET AND GbE SFPs

For full details, see the SFP/SFP Transceivers data sheet at www.rad.com

- All SFPs listed for STM-4/OC-12 and STM-1/OC-3 are supported by SDH/SONET link except those with external calibration
- All SFPs listed for GbE are supported by the GbE link except those with external calibration and SGMII.

Note: *It is strongly recommended to order this device with* ***original*** *RAD SFPs* ***installed****. This will ensure that prior to shipping, RAD has performed comprehensive functional quality tests on the entire assembled unit, including the SFP devices. RAD cannot guarantee full compliance to product specifications for units using non-RAD SFPs.*

MANAGEMENT

Control Port
Interface: RS-232/V.24 (DCE)
Connectors:
- CL.2: DB-9
- CL.2/4104: MINI-USB

Baud Rate: 9.6, 19.2, 38.4, 57.6, 115.2

Ethernet Management Port
Interface: 10/100BaseT
Connector: RJ-45

Management Options
Command-driven interface with password protected access, authorization levels

Telnet/SSHv2, SNMPv2, SNMPv3, RADview-EMS, SFTP

RADIUS

- Out-of-band
- Inband, via the STM-4/STM-1/OC-12/OC-3 links or over a dedicated timeslot in any E1/T1 or SHDSL link or via any of the user Ethernet ports

TIMING

Clock Sources
The user can define the following clock sources:

- Recovered from the STM-4/STM-1/OC-12/OC-3 interface, including automatic selection based on SSM (Synchronization Status Messaging)
- Internal crystal free-running oscillator-based clock
- Derived from the receive clock of a specified user port
- Adaptive clock recovered (ACR) from a pseudowire circuit
- External station clock.

Station Clock
Bit Rate:
- 1.544 Mbps (T1) (AMI)
- 2.048 Mbps (E1) (AMI)
- 2.048 MHz squarewave

Connector: RJ-45

DIAGNOSTICS

Alarm Relay
1 inbound relay (dry contact)
2 outbound relays triggered by any user-selected Megaplex alarm
Operation: normally open, normally closed, using different pins
Connectors:
- CL.2: DB-9, female
- CL.2/4104: 9-pin, flat

GENERAL

Environment

MP-4100
Operating temperature: -10°C to 55°C (14°F to 131°F)
Storage temperature: -20°C to +70°C (-4°F to +160°F)
Humidity: up to 95%, non-condensing

MP-4104
Operating temperature: -10°C to 55°C (14°F to 131°F)
Storage temperature: -20°C to +70°C (-4°F to +160°F)
Humidity: up to 95%, non-condensing
Note: *Actual operating temperature range is determined by the specific modules installed in the chassis. For extended operating temperature ranges, contact your local RAD Business Partner.*

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MP-4104 "No-Fans"

Operating temperature ranges for MP-4104 "no-fans" chassis are provided per specific configuration. For more information, please contact your local RAD Business Partner.

Power Supply Input

MP-4100, AC:
110/115 VAC (allowed range: 85 to 150 VAC), 50/60 Hz
220/230 VAC (allowed range: 150 to 264 VAC), 50/60 Hz

MP-4100, DC:
48 VDC (allowed range: -36 to -57 VDC)
24 VDC (allowed range: 18 to 40 VDC)
Selectable ground reference
or floating ground

MP-4104, DC:
48 VDC (allowed range: -36 to -72 VDC)
Selectable ground reference
or floating ground

Maximum Input Power

MP-4100: 315W + power supplied for ring and feed voltage

MP-4104: 200W + power supplied for ring and feed voltage

Total Output Power

MP-4100: 250W + power supplied for ring and feed voltage (drawn directly from external source)

MP-4104: 160W + power supplied for ring and feed voltage

Output Power (max)

MP-4100: 250W
MP-4104: 160W

Power Consumption (per CL, max)

MP-4100, MP-4104: 27.75 W

Physical

MP-4100 (4U-high)

2 power supply module slots
2 CL. 2 module slots
10 slots for I/O modules
Height: 18 cm (7 in) (4U)
Width: 44 cm (17 in)
Depth: 33 cm (13 in)
Weight: 15.3 kg (33.8 lb) max.
(fully loaded chassis)

MP-4104 (2U-high)

2 power supply module slots
2 CL.2 module slots
4 slots for I/O modules
Height: 9 cm (3.5 in) (2U)
Width: 44 cm (17 in)
Depth: 33 cm (13 in)
Weight: 7.54 kg (16.6 lb)
(fully loaded chassis)

Note: The chassis weight depends of the type and number of installed modules.

CL.2 Module

Height: 17.3cm (6.8 in)
Width: 4.5 cm (1.8 in)
Depth: 32.5cm (12.8 in)
Max Weight**:** 630 g (1.3 lb)

CL.2/4104 Module

Height: 17.3cm (6.8 in)
Width: 2.5 cm (1 in)
Depth: 32.5cm (12.8 in)
Max Weight**:** 540 g (1.2 lb)

Ordering

MP-4100/4104 must be ordered with the RADcare Basic Plus service package for one year.

RECOMMENDED CONFIGURATIONS

MP-4100-2/230R/622GBESFPR

MP-4100-2/48R/622GBESFPR

MP-4100-2/230R/DS0R

MP-4100M-CL.2/622GBESFP

MP-4100M-CL.2/622GBESFP/155SK

MP-4104-2/48R/622GBESFPR

MP-4104-2/48R/DS0R

MP-4104M-CL.2/622GBESFP

MP-4104M-CL.2/622GBESFP/155SK

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