Kilomux-2100/2104

Data, Voice, Fax and LAN Integrating Modular Multiplexer

Modular integrating access multiplexer for data, voice, fax and LAN

TDMoIP® Driven

- Maximized utilization of main-link bandwidth and high-quality low bit rate voice
- Fractional E1/T1, switched or leased ISDN, and DDS links on main link modules
- Operation over IP/Ethernet-based networks with TDMoIP® main link
- Operation over radio and satellite links
- Analog and digital voice interfaces, with fax and data modem transmission

The compact, modular Kilomux time-division multiplexer transports data, voice, fax and LAN traffic over one or two main links, at rates of 9.6 kbps to 1536 kbps each.

Kilomux can be connected to various services including leased line, DDS, ISDN or Fractional E1/T1. Main link buffers and echo cancellation on voice channels ensure full operation over radio and satellite.

Kilomux features both analog and digital voice interfaces for direct connection to PBX tie lines and extensions, ISDN PBX extension lines, telephone handsets and E1/T1 trunks.

The unit uses time-division multiplexing (TDM) techniques to ensure minimal delay and protocol transparency, so that applications such as SNA and voice are assured the bandwidth and short delay they require.

RAD
data communications
The Access Company

Kilomux traffic can be transported over IP or Ethernet-based networks, using its TDMoIP® main link module.

The unit transmits high quality voice (either compressed or uncompressed). It employs two encoding methods: PCM (64 kbps) and ADPCM voice compression techniques for voice, fax and data transmission (32 kbps).

The MPMLQ voice compression algorithm enables voice, fax, and data transmission at rates ranging from 16 kbps down to 4.8 kbps.

Standard fax and data modem relay rates are between 14.4 kbps and 2.4 kbps.

Kilomux can be used in point-to-point applications between two sites, or in "V" or chain applications for multiple sites.

The unit supports two independent configuration databases (day/night) and can switch between them in case of any network event. This feature enables alternate routing in case of failure.
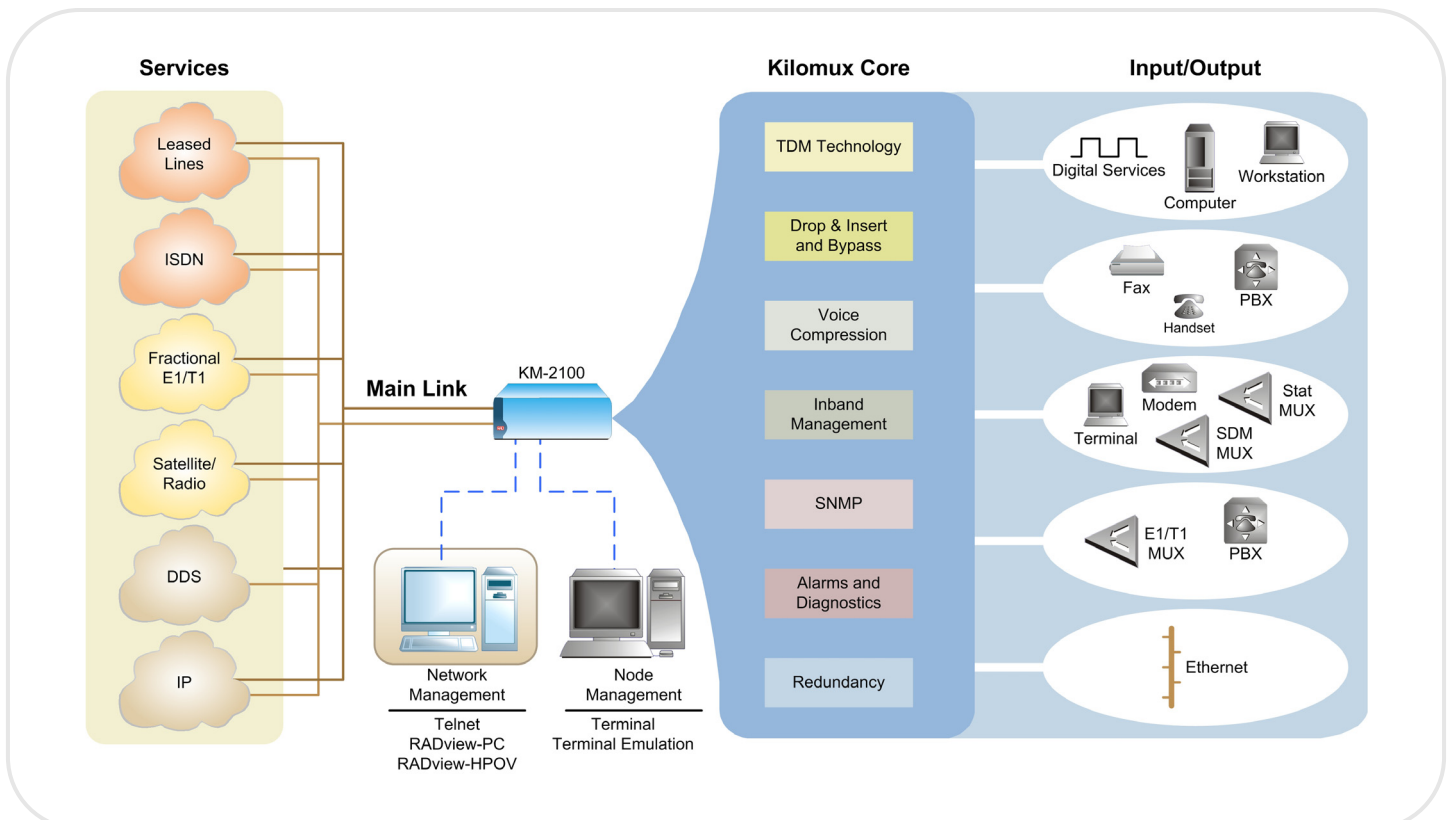
Various timing modes are available, enabling the system to use the received clock from a main link, a subchannel or an internal oscillator clock.

MANAGEMENT

Kilomux system operation and management, including configuration, diagnostics and monitoring local and remote units, can be performed via ASCII terminal, Telnet, or RADview. An ASCII terminal can be connected locally, through dial-up modem or via Telnet.

RADview, RAD's Network Management System running over PC or UNIX (HP OpenView), monitors and controls multiple Kilomux-2100/2104 chassis from a central station via a user friendly GUI.

The system provides direct online supervision, configuration, diagnostics and alarm reception. Storing all configuration information in non-volatile memory ensures data integrity in the event of power failure.

Services

- Leased Lines
- ISDN
- Fractional E1/T1
- Satellite/ Radio
- DDS
- IP

Main Link

KM-2100

Network Management
Telnet
RADview-PC
RADview-HPOV

Node Management
Terminal
Terminal Emulation

Kilomux Core

- TDM Technology
- Drop & Insert and Bypass
- Voice Compression
- Inband Management
- SNMP
- Alarms and Diagnostics
- Redundancy

Input/Output

- Digital Services
- Computer
- Workstation
- Fax
- Handset
- PBX
- Terminal
- Modem
- Stat MUX
- SDM MUX
- E1/T1 MUX
- PBX
- Ethernet

KILOMUX CHASSIS

The Kilomux product line features two chassis models for different network requirements. The modular Kilomux design enables upgrading and customizing the system by adding System and I/O modules.

Kilomux-2100 is a modular, 3U-high device that supports system modules, up to 12 I/O modules, and optional redundancy for main link and power supply.

Kilomux-2104, with its compact size of only 1U, is designed for applications at smaller sites. It supports up to four I/O modules, and is limited to a single main link and a single power supply.

Note: Kilomux-2100/2104 support all Kilomux-2000M I/O, main link, and system modules.

SYSTEM MODULES

KCL.2, the Kilomux Common Logic control module monitors the system operation, sets configuration, and ensures communication with the management station. Common Logic modules can also be ordered separately for special purposes.

MAIN LINK MODULES

Several different types of Kilomux Main Link (KML) modules are available for compatibility with various digital data service interfaces and public services.

Kilomux features a wide range of interfaces, such as: V.35, V.24/RS-232, X.21, G.703, Fractional E1/T1, ISDN Basic Access. The TDM over IP main link supports interfaces for 10/100BaseTx Ethernet networks.

Kilomux-2100 supports up to two main link modules. The second main link module can be used as a redundant link for backup, or as a load-sharing link to provide double capacity.

KDI is a system module that provides drop-and-insert functionality between two Kilomux-2100 links, by bypassing any channel or combination of channels between link A and link B (see (see *Figure 3*). Refer to the separate KDI data sheet for more details.

I/O MODULES

Up to 12 I/O modules can be accommodated by the Kilomux-2100 chassis. Up to four modules can be accommodated by the smaller Kilomux-2104.

The Kilomux high-speed sync KHS data modules operate at selectable data rates from 2.4 kbps to 614.4 kbps per channel. Interfaces supported include V.35, V.36/RS-449, X.21, RS-530, as well as BRI ISDN and G.703.

The low-speed sync/async KLS modules operate at selectable data rates from 0.3 kbps to 64 kbps per channel.
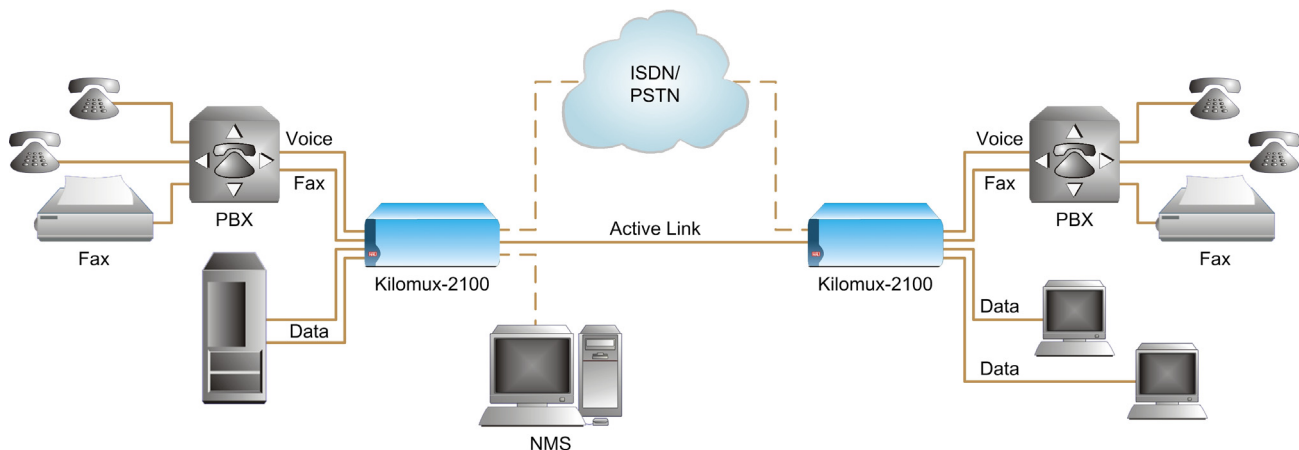

Figure 1. Point-to-point Topology

Kilomux is suitable for integrating all traffic requirements between two sites over a wide variety of links. A dual link option supports both load sharing between the two links, as well as automatic backup with priority bumping.

The **KVC** voice and **KVF** voice/fax/ data modem modules support standard PCM and 32 kbps ADPCM voice, or high quality compressed voice. Advanced speech coding techniques include G.723.1 MPMLQ, which offers very high quality voice at bit rates as low as 6.4 kbps.

Voice/fax/data modem modules feature automatic fax/data modem identification, which enables Group III fax and data modem transmission at rates of up to 14.4 kbps.

Both analog and digital voice interfaces provide connection to PBX tie lines, extensions or direct connection to telephones, as well as to E1/T1 trunks and ISDN PBXs.

The Ethernet internetworking **KMBE** modules connect Kilomux to remote Ethernet LANs.

DIAGNOSTICS

Kilomux incorporates numerous test features for easy maintenance and fast fault detection. On power-up and during normal operation, automatic self-test and link-tests are performed. Any problems are reported to system management.

Local and remote loops can be performed for every main link and I/O channel via user commands. Additionally, a built-in BERT can test any I/O data channel.

Table 1. Kilomux-2100/2104 Comparison Table

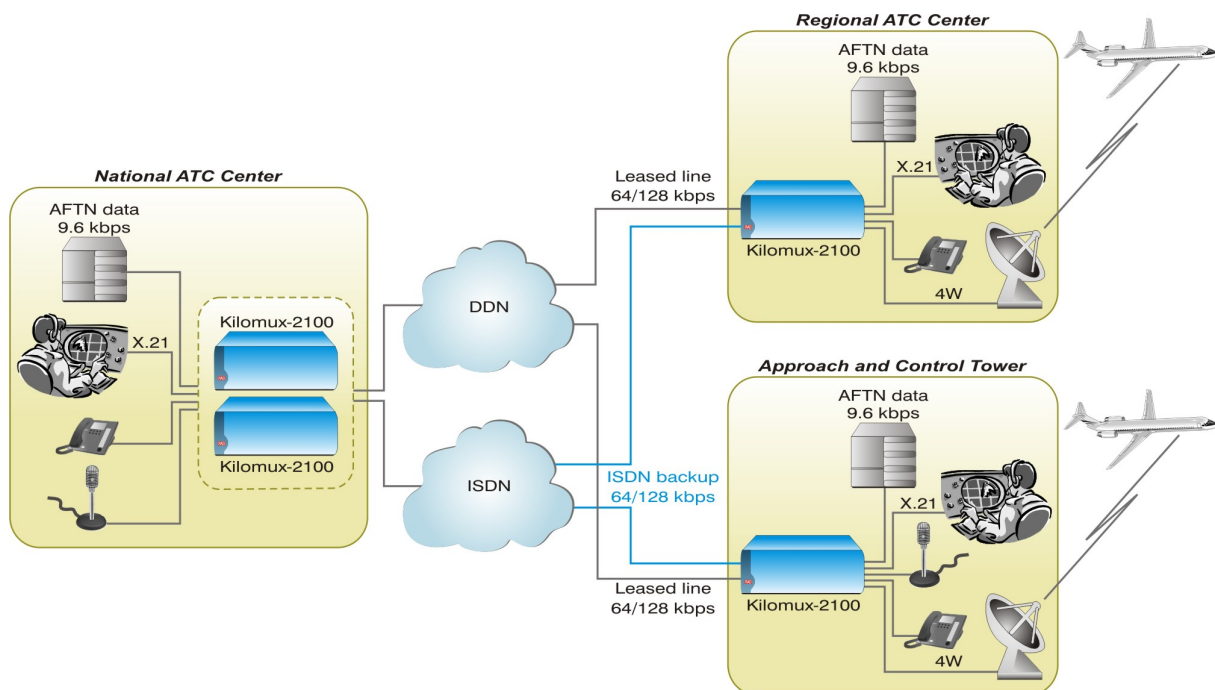|	Kilomux-2100	Kilomux-2104
Power Supply	2 (modular slots)	1 (built-in)
Supported PS types	AC, -48VDC, 24VDC	AC, -48VDC
Common Logic	1 (modular slot)	1 (built-in)
Main Links	2 (modular slots)	1 (built-in)
Supported ML types	V.35, V.24, V.36, X.21, G.703-codirectional, DDS, Fractional T1, Fractional E1, ISDN "S", IP, Fiber (1310 Laser, 1550 Laser)	V.35, V.24, V.36, X.21, G.703-codirectional, DDS, Fractional T1, Fractional E1, ISDN "S", IP
User I/O Modules	12 (+ one "Options" slot for KAI/KDI only)	4
Physical Dimensions	3U x 19"	1U x 19"

Figure 2. ATC Application

Specifications

Main Link and I/O Modules
See individual module data sheet

Main Link Data Rates
9.6, 14.4, 19.2, 28.8, 32, 48, 56, 64, 128, 192, 256, 384, 512, 768, 1024, or 1536 kbps

Note: Not all I/O modules are compatible with the higher main link rates (1024 and 1536 kbps). For detailed information, contact your RAD partner.

Main Link Interfaces
V.35
V.24/RS-232
V.36/RS-422/RS-530
X.21
G.703
Standard CSU/DSU for DDS services
Fiber Optics
Fractional E1/T1
ISDN Basic Access

Clock Modes
DTE, External DCE, DCE
INT, LBT (for G.703 and DDS)

Supervisory Port (Terminal/SLIP)
V.24/RS-232 (async or Hayes™ compatible dial-up modem protocol), DTE or DCE type, 0.3–57.6 kbps

Management Port
Dial Port (for "call out") or Network Port (for agent SLIP) V.24/RS-232, DTE type
Ethernet UTP Port

Management
Software download capability to facilitate system upgrades
Full SNMP agent
RADview support
Telnet support

Physical
Kilomux-2100 (3U-high):
Two power supply module slots
One common logic module slot
12 slots for I/O and ML modules

Height: 13 cm (5.25 in) (3U)
Width: 43 cm (17.3 in)
Depth: 25 cm (10 in)
Weight: less than 8 kg (17.5 lb) for fully equipped hub with redundancy

Kilomux-2104 (1U-high):
Built-in single power supply
Built-in common logic and main link module
Four slots for I/O modules

Height: 4.4 cm (1.75 in) (1U)
Width: 43 cm (17.3 in)
Depth: 25 cm (10 in)
Weight: less than 3 kg (6.5 lb)

Power
Kilomux-2100:
100–240 VAC for 130W
-48 VDC for 25W or 56W
24 VDC for 25W max

Kilomux-2104 (built-in power supply):
100–240 VAC for 30W
-48 VDC, 30 VA max, for 40W

Environment
Temperature: 0–40°C (32–104°F)
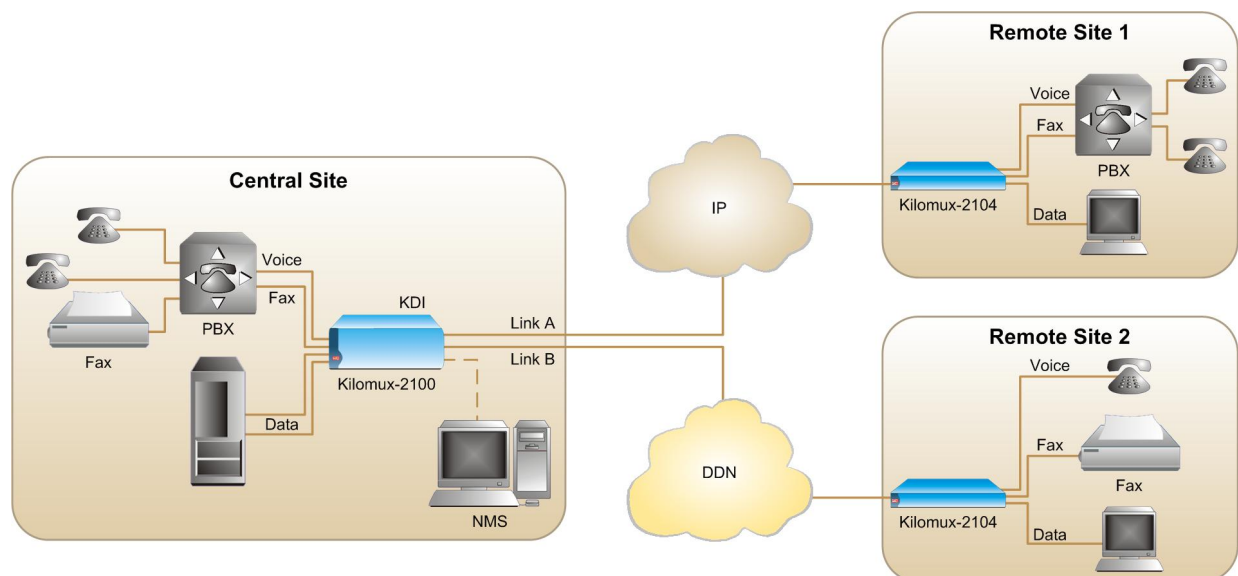Humidity: Up to 90%, non-condensing

Figure 3. Kilomux in "V" Topology

Kilomux-2100/2104

Data, Voice, Fax and LAN Integrating Modular Multiplexer

Ordering

Basic units include: chassis, single power supply, single main link and common logic. (All I/O modules, as well as additional system, main link and power supply modules, are ordered separately).

KM-2100/~/*/?/&/%

12-I/O slot Modular Multiplexer

KM-2104/~/*/?

4-I/O slot Modular Multiplexer

Legend

~ Power supply type:
   24 24 VDC (KM-2100 only)
   48 -48 VDC
   AC 100 to 240 VAC

* Management Interface
   (in addition to supervisory port):
   EU Ethernet 10BaseT (UTP)
   Default is V.24/RS-232 dial port

? Main link interface
   V35 V.35
   V24 V.24/RS-232
   V36 V.36/RS-422/RS-530
   X21 X.21
   703 G.703, co-directional
   DDS standard DDS
   T1 fractional T1, G.703/G.704
   E1 fractional E1, G.703/G.704
   S ISDN "S" interface
   IP TDMoIP main link with Ethernet 10/100BaseTX UTP interface

& Fiber optic interface
   connector type (KM-2100 only):
   ST ST type connector
   FC FC/PC type connector

% Fiber optical interface wavelength and transmitter type:
   85 850 nm, multimode, LED
   13L 1310 nm, single mode, laser diode
   15L 1550 nm, single mode, laser diode

Note: ST13, FC13 and FC85 are unavailable (obsolete)

SYSTEM MODULES

(for KM-2100 chassis only)

KM-2100M-KCL.2/*
Common Logic module

* Management interface (default is serial RS-232):
   EU Ethernet 10BaseT UTP

KM-2000M-KPS.#
Power Supply module

Input voltage and power:
   3 -48 VDC, 25W
   5 24 VDC, 25W
   7 -48 VDC, 56W

KM-2100M-KPS.8
Power Supply module 100-240 VAC, 130W

SUPPLIED ACCESSORIES

CBL-530/V35/F
Adapter cable for converting 25-pin RS-530 interface to 34-pin V.35 interface (supplied with KM-2104/~/*/V35)

CBL-530/449/F
Adapter cable for converting 25-pin RS-530 interface to 37-pin RS-449 interface (supplied with KM-2100/~/*/V36 and KM-2104/~/*/V36 main links)

CBL-KVF6/8-DL
Cable for downloading software upgrades from a PC into the KVF.6/KVF.8/KML.11 3-pin terminal block DL connector (supplied with KVF.6, KVF.8 and KML.11 modules as well as with KM-2100/2104 chassis with IP main link)

PLUG-DC
Open connector plug for DC power inlet (supplied with KM-2104/48)

PLUG-DC/TB
Open terminal block connector plug for DC power inlet (supplied with KM-2100/24 and KM-2100/48 options)

RM-DXC10A
19-inch rack mount kit for KM-2104

RM-DXC30
19-inch rack mount kit for KM-2100

OPTIONAL ACCESSORIES

CBL-SP-9
Straight cable for terminal configuration with one male and one female DB-9 connector.

CBL-FANI
Cable for an external fan connection

CBL-ETH/UTP/STR
Straight cable for LAN connection

CBL-ETH/UTP/CROSS
Cross cable for LAN connection