

# Kilomux-2100/2104

## Data, Voice, Fax and LAN Integrating Modular Multiplexer



- Maximized utilization of main-link bandwidth and high-quality low bit rate voice
- Fractional E1/T1 links on main link modules
- Operation over IP/Ethernet-based networks with TDMoIP<sup>o</sup> 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 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, 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.

Kilomux traffic can be transported over IP or Ethernet-based networks, using its TDMoIP<sup>o</sup> 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.

**TDMoIP<sup>o</sup>**  
**Driven**

### 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.

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## Data, Voice, Fax and LAN Integrating Modular Multiplexer

### 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, Fractional E1/T1. 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.

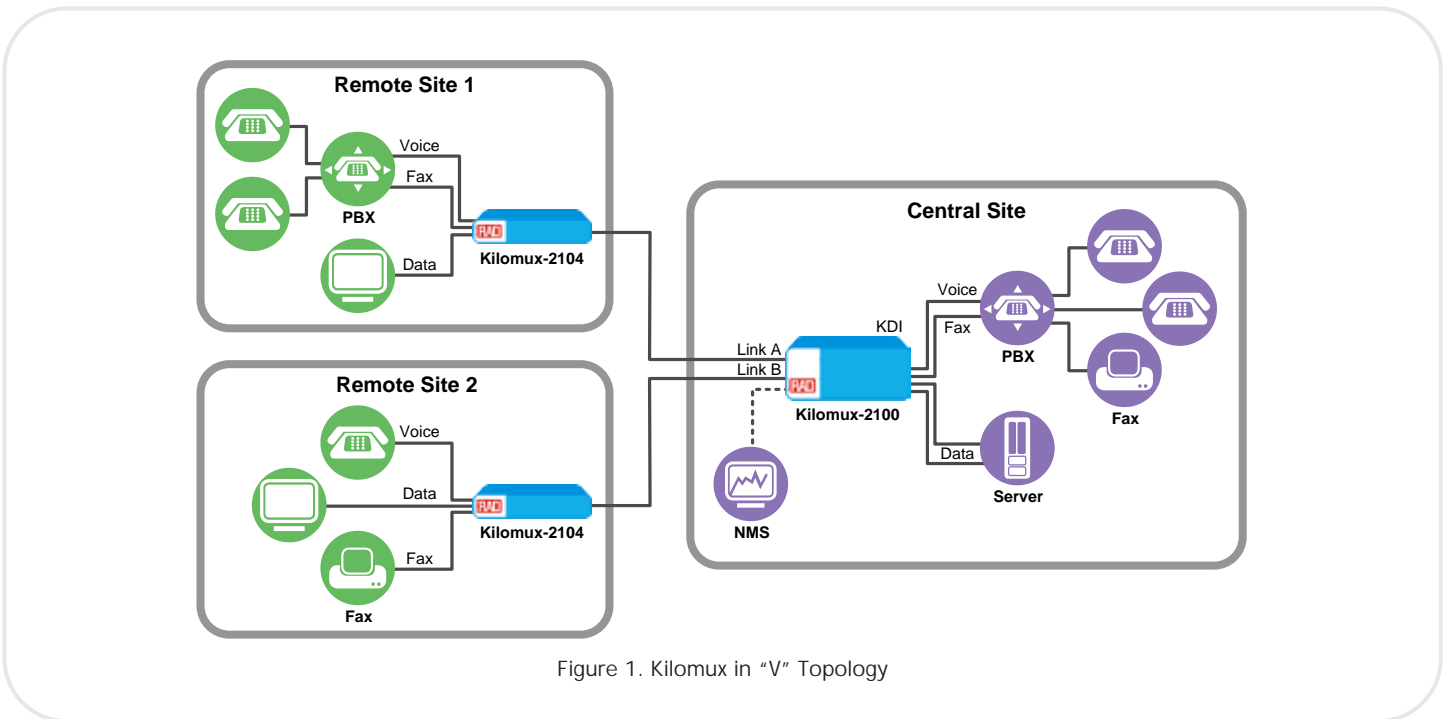


Figure 1. Kilomux in "V" Topology

**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. 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, and RS-530.

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

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.

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.

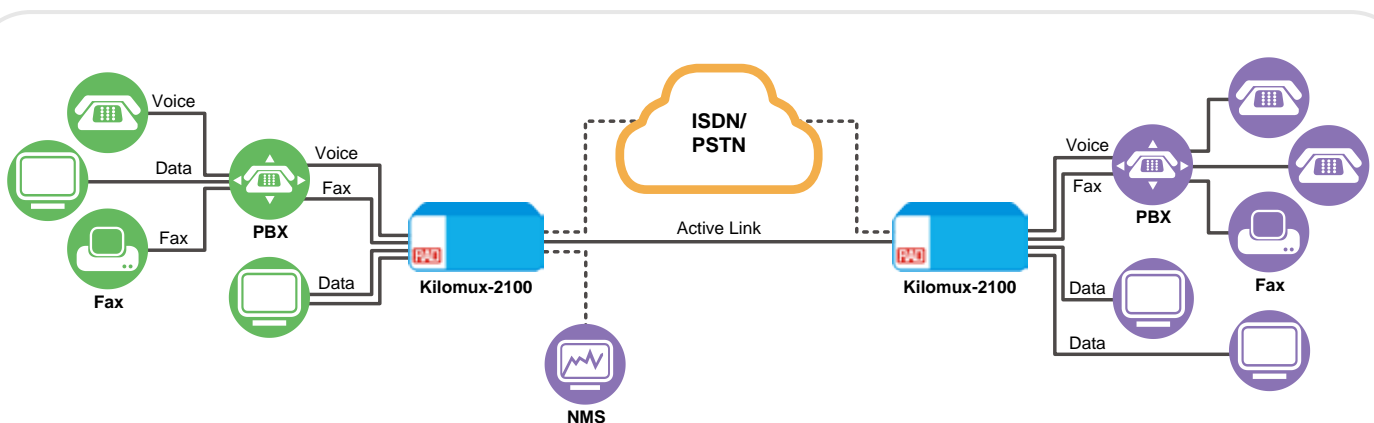


Figure 2. Point-to-point Topology

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.

# Kilomux-2100/2104

## Data, Voice, Fax and LAN Integrating Modular Multiplexer

### 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  
Fractional E1/T1

#### CLOCK MODES

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

#### SUPERVISORY PORT (TERMINAL/SLIP)

V.24/RS-232 (async or Hayesä 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

#### GENERAL

##### 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

##### *Kilomux-2104 (built-in power supply):*

100–240 VAC for 30W  
-48 VDC, 30 VA max, for 40W

##### Environment

Temperature: 0°C to 40°C (32°F to 104°F)

Humidity: Up to 90%, non-condensing

## Ordering

### RECOMMENDED CONFIGURATIONS

#### KMN-2100

KM-2100 chassis, no power supply, no CL modules

#### KM-2100/AC

KM-2100, 100 to 240 VAC power supply, no main link

#### KM-2100/AC/E1

KM-2100, 100 to 240 VAC power supply, fractional E1 main link

#### KM-2100/AC/V36

KM-2100, 100 to 240 VAC power supply, V.36/RS-422/RS-530 main link

#### KM-2100/AC/X21

KM-2100, 100 to 240 VAC power supply, X.21 main link

#### KM-2100/AC/V35

KM-2100, 100 to 240 VAC power supply, V.35 main link

#### KM-2100/AC/V24

KM-2100, 100 to 240 VAC power supply, V.24/RS-232 main link

#### KM-2100/AC/EU

KM-2100, 100 to 240 VAC power supply, additional management interface Ethernet 10BaseT (UTP), no main link

#### KM-2100/AC/EU/E1

KM-2100, 100 to 240 VAC power supply, additional management interface Ethernet 10BaseT (UTP), fractional E1 main link

#### KM-2100/AC/EU/V35

KM-2100, 100 to 240 VAC power supply, additional management interface Ethernet 10BaseT (UTP), V.35 main link

#### KM-2100/AC/EU/IP

KM-2100, 100 to 240 VAC power supply, additional management interface Ethernet 10BaseT (UTP), TDMoIP main link with Ethernet 10/100BaseTX UTP interface

#### KM-2100/AC/EU/V24

KM-2100, 100 to 240 VAC power supply, additional management interface Ethernet 10BaseT (UTP), V.24/RS-232 main link

#### KM-2100/48/E1

KM-2100, -48 VDC (25W) power supply, fractional E1 main link

#### KM-2100/48/X21

KM-2100, -48 VDC (25W) power supply, X.21 main link

#### KM-2100/48/V35

KM-2100, -48 VDC (25W) power supply, V.35 main link

#### KM-2100/48/EU/E1

KM-2100, -48 VDC (25W) power supply, additional management interface Ethernet 10BaseT (UTP), fractional E1 main link

#### KM-2100/48/EU/V35

KM-2100, -48 VDC (25W) power supply, additional management interface Ethernet 10BaseT (UTP), V.35 main link

#### KM-2100/48/EU/IP

KM-2100, -48 VDC (25W) power supply, additional management interface Ethernet 10BaseT (UTP), TDMoIP main link with Ethernet 10/100BaseTX UTP interface

#### KM-2100/48/EU/V24

KM-2100, -48 VDC (25W) power supply, additional management interface Ethernet 10BaseT (UTP), V.24/RS-232 main link

#### KM-2100/48/EU/V36

KM-2100, -48 VDC (25W) power supply, additional management interface Ethernet 10BaseT (UTP), V.36/RS-422/RS-530 main link

#### KM-2100/48/EU/X21

KM-2100, -48 VDC (25W) power supply, additional management interface Ethernet 10BaseT (UTP), X.21 main link

#### KM-2100/48HP/E1

KM-2100, -48 VDC high power (56W) supply, fractional E1 main link

#### KM-2100/48HP/V35

KM-2100, -48 VDC high power (56W) supply, V.35 main link

#### KM-2100/48HP/EU/E1

KM-2100, -48 VDC high power (56W) supply, additional management interface Ethernet 10BaseT (UTP), fractional E1 main link

#### KM-2100/48HP/EU/V35

KM-2100, -48 VDC high power (56W) supply, additional management interface Ethernet 10BaseT (UTP), V.35 main link

#### KM-2100/48HP/EU/IP

KM-2100, -48 VDC high power (56W) supply, additional management interface Ethernet 10BaseT (UTP), TDMoIP main link with Ethernet 10/100BaseTX UTP interface

# Kilomux-2100/2104

## Data, Voice, Fax and LAN Integrating Modular Multiplexer

### KM-2100/48HP/EU/V36

KM-2100, -48 VDC high power (56W) supply, additional management interface Ethernet 10BaseT (UTP), V.36/RS-422/RS-530 main link

### KM-2100/48HP/EU/X21

KM-2100, -48 VDC high power (56W) supply, additional management interface Ethernet 10BaseT (UTP), X.21 main link

### KM-2104/AC/E1

KM-2104, 100 to 240 VAC power supply, fractional E1 main link

### KM-2104/AC/V36

KM-2104, 100 to 240 VAC power supply, V.36/RS-422/RS-530 main link

### KM-2104/AC/X21

KM-2104, 100 to 240 VAC power supply, X.21 main link

### KM-2104/AC/V35

KM-2104, 100 to 240 VAC power supply, V.35 main link

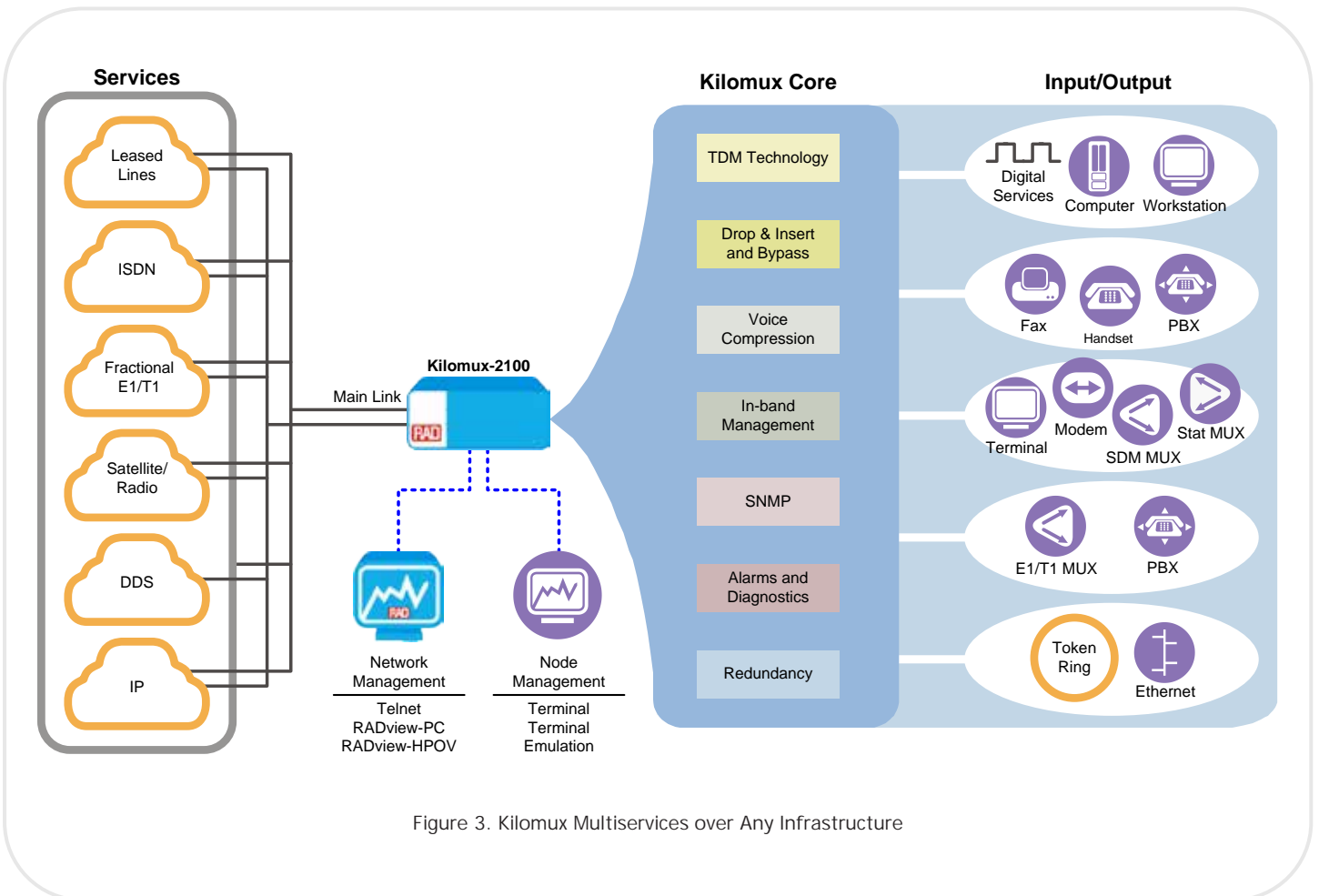


Figure 3. Kilomux Multiservices over Any Infrastructure

# Kilomux-2100/2104

## Data, Voice, Fax and LAN Integrating Modular Multiplexer

### **KM-2104/AC/EU/E1**

KM-2104, 100 to 240 VAC power supply, additional management interface Ethernet 10BaseT (UTP), fractional E1 main link

### **KM-2104/AC/EU/V35**

KM-2104, 100 to 240 VAC power supply, additional management interface Ethernet 10BaseT (UTP), V.35 main link

### **KM-2104/AC/EU/IP**

KM-2104, 100 to 240 VAC power supply, additional management interface Ethernet 10BaseT (UTP), TDMoIP main link with Ethernet 10/100BaseTX UTP interface

### **KM-2104/AC/EU/V24**

KM-2104, 100 to 240 VAC power supply, additional management interface Ethernet 10BaseT (UTP), V.24/RS-232 main link

### **KM-2104/AC/EU/T1**

KM-2104, 100 to 240 VAC power supply, additional management interface Ethernet 10BaseT (UTP), fractional T1 main link

### **KM-2104/AC/EU/V36**

KM-2104, 100 to 240 VAC power supply, additional management interface Ethernet 10BaseT (UTP), V.36/RS-422/RS-530 main link

### **SYSTEM MODULES**

(for KM-2100 chassis only)

#### **KM-2100M-KCL.2**

Common Logic module with serial RS-232

#### **KM-2100M-KCL.2/EU**

Common Logic module with serial RS-232 and additional Ethernet 10BaseT UTP management interface

**KM-2000M-KPS.3** --48 VDC, 25W power supply module

**KM-2000M-KPS.7** --48 VDC, 56W power supply module

**KM-2100M-KPS.8** – 100-240 VAC, 130W power supply module

### **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