

# IMX-64

## *Inverse Multiplexer*



### FEATURES

- Supports up to six 64 kbps channels
- One or two data ports support total bandwidth of 384 kbps
- Integrated ISDN (BRI) or external TAs
- Supports ISDN backup of high speed leased lines (up to 256 kbps)
- Provides Bandwidth On Demand
- Dynamic Bandwidth Allocation
- Operates over a combination of switched and non-switched lines
- Support for Euro-ISDN , 5ESS, National ISDN (NI1), DMS-100 and NTT
- Supports "S" and "U" interfaces
- Supports S0 leased line
- Supports BONDING 1, 2 and 3 protocol specifications
- Differential delay of up to 512 msec
- Configuration via front panel or control port
- Resilient operation with failure recovery
- SNMP support using SLIP protocol
- Software download via Xmodem protocol

# DESCRIPTION

- The IMX-64 inverse multiplexer supports up to six network channels (via three or four physical network ports) and one or two data ports.
- IMX-64 splits the bandwidth of its data ports over some or all of the networks channels, in order to provide the required bandwidth for the application connected to the data ports.
- Typical applications for IMX-64 include high speed leased line backup, Bandwidth On Demand and Dynamic Bandwidth Allocation.

## DYNAMIC BANDWIDTH ALLOCATION

- Dynamic Bandwidth Allocation can be performed on the basis of traffic sensing, time of day or manual intervention. In traffic sensing mode, IMX-64 senses the bandwidth requirement of an application and automatically adds and drops ISDN B channels during the transmission. Typical applications include bridge/router interconnecting links. Dynamic Bandwidth Allocation is only available for leased lines of 64 kbps (see *Figure 1*).

## LEASED LINE BACKUP

- IMX-64 can backup one or two leased lines, operating at data rates from 64 kbps to 256 kbps, over up to four B channels. When the leased line returns to proper operation, IMX-64 automatically reverts to the leased line (see *Figure 2*).

## BANDWIDTH ON DEMAND

- For applications such as video conferencing that require high speed switched connections, IMX-64 can call as many as six B channels to provide up to 384 kbps aggregate bandwidth (see *Figure 3*).

## OPERATION

- During the initial handshaking process, the unit measures the delay of each 64 kbps circuit. This enables both units to reconstruct the data after it has been spread across the six separate channels and thus ensure that the data is delivered in the correct order. The differential delay can support two satellite hops.
- IMX-64 offers a large choice of interfaces on the network side, as well as for the data ports. It connects to basic rate ISDN (BRI) switched digital service. It also supports dedicated circuits (leased lines) with a wide range of interfaces (see *Ordering*).

- Using the BONDING 1, 2 and 3 protocol specifications for inverse multiplexing, IMX-64 can operate with other vendor products.
- IMX-64 supports two independent calls (one per data port) up to the 384 kbps maximum permissible bandwidth. Dialing can be performed either manually or via protocols using the DTE leads.
- Command-driven software offers complete control of configuration, call setup, diagnostics, alarms and other functions.
- SNMP over SLIP support is available for most monitoring and configuration functions.
- The software download function, performed using Xmodem protocol, facilitates product upgrades.
- IMX-64 is a compact 1U high stand-alone unit. It can be mounted in a 19" rack using the optional rack-mount hardware (RM-7/NEW).

# APPLICATIONS

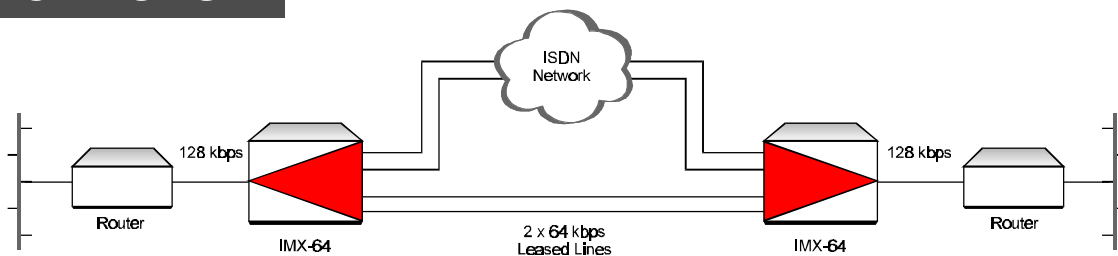


Figure 1. Dynamic Bandwidth Allocation

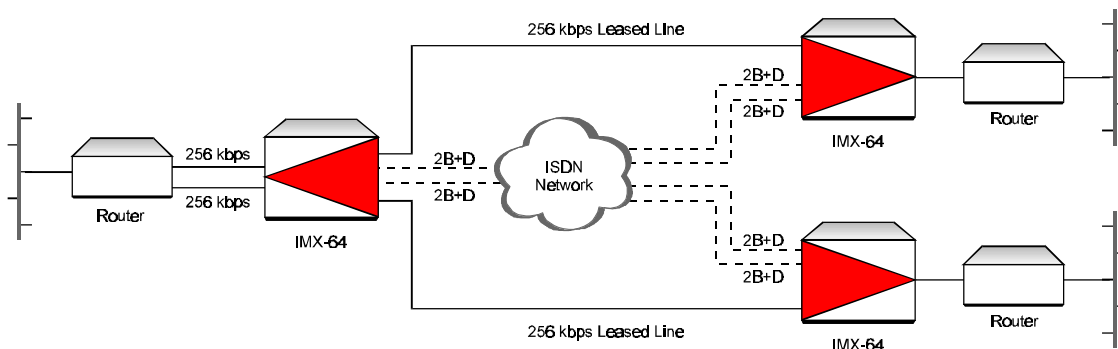


Figure 2. High Speed Leased Line Backup

# SPECIFICATIONS

## NETWORK PORTS

Number of ports: 3 or 4  
(combination of leased line and ISDN-BRI ports)

### ■ Leased Line

Number of ports: 1 or 2

Data rate per port:  
64 kbps or  $n \times 64$  kbps,  
( $n=1$  to 4 for transparent call)

Transmit timing:  
DCE transmit timing  
(looped back from network)  
Internal  $\pm 32$  ppm

Interfaces:  
V.24/RS-232, V.35, V.36/RS-449,  
RS-530, RS-530A, X.21

Connector:  
26-pin high density D-type,  
female

*Note:* see *Ordering* for conversion cables for V.24/RS-232, V.35, V.36/RS-449, RS-530, RS-530A (male), or X.21 physical interfaces.

### ■ ISDN Basic Rate Interface

(IMX-64 is TE - Terminal Equipment)

Number of "S" or "U" interfaces  
(2B+D): 2 or 3

Line termination:  $100\Omega \pm 5\%$

Transmit timing:  
Looped back from network

Connector: RJ-45, 8-pin

## DATA PORTS

Number of ports: 1 or 2  
Accumulated bit rate:  
up to 384 kbps total

Transmit timing:  
Locked to network transmit timing

Internal:  $\pm 32$  ppm

Interfaces:  
V.35, V.36/RS-449, RS-530,  
RS-530A, X.21 (See *Ordering*)

Connector:  
26-pin high density D-type,  
female

*Note:* see *Ordering* for conversion cables for V.35, V.36/RS-449, RS-530, RS-530A (male), or X.21 physical interfaces.

## RS-366 DIALING PORTS

Number of ports:  
1 or 2 (one per data port)

Interface: RS-366

Connector:  
26-pin high density D-type,  
female

## OPERATION MODES

### ■ Dialing Modes

V.25 bis  
V.25 control lead  
RS-366  
Manual (front panel or control port)

### ■ Call Types

Transparent mode  
BONDING 1, 2, 3

## CONTROL (SUPERVISORY) PORT

Number of ports: 2

Interface: V.24/RS-232

Type:  
DCE - dedicated for supervisory terminal connection  
DTE - reserved for future use

Connectors:  
9-pin D-type female for DCE type  
9-pin D-type male for DTE type

Baud rate:  
1.2, 2.4, 4.8, 9.6, 19.2, 38.4,  
57.6 kbps, auto-baud option

Character  
8 bit, no parity  
7,8 bit; odd, even parity

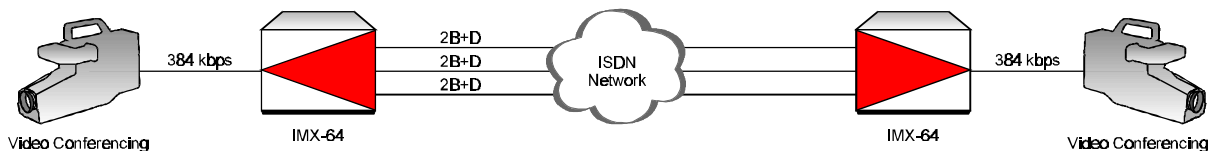


Figure 3. Bandwidth On Demand

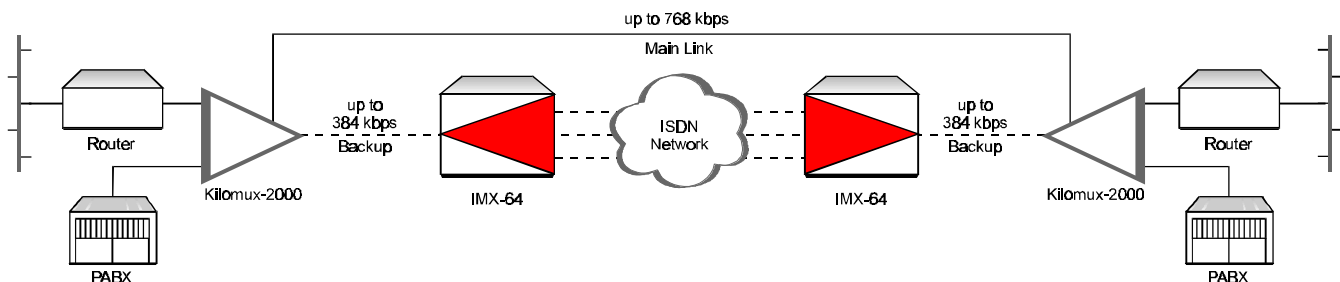


Figure 4. High Speed Backup over ISDN

## GENERAL

- **Delay Equalization**  
512 ms
- **ISDN Protocol Compliance**  
EURO-ISDN, AT&T (5ESS),  
DMS-100, National ISDN (NI1),  
NTT
- **Standard Compliance**  
I.430, Q.921, Q.931
- **Indicators**  
Channel Activity (per channels 1-6)  
TD, RD, Call (per data port)  
Test, Alarm
- **Front Panel Controls**  
Cursor, Scroll, Enter
- **Physical**  
Height: 4.3 cm / 1.7 in (1U)  
Width: 43.2 cm / 17.0 in  
Depth: 24.3 cm / 9.5 in  
Weight: 2.3 kg / 5.0 lbs
- **Power**  
100-240V, 35W
- **Environment**  
Temperature: 0-50°C / 32-122°F  
Humidity: up to 90%,  
non-condensing

## ORDERING

### IMX-64/\*/#/!&/\$

- \* Specify port configuration:  
(see table below)  
**A** for 1 data, 1 leased line and  
2 ISDN ports  
**B** for 1 data and 3 ISDN ports  
**C** for 2 data, 2 leased lines and  
2 ISDN ports  
**D** for 2 data and 3 ISDN ports
- # Specify data port interfaces:  
**V35** one or two V.35  
**V36** one or two V.36  
**530** one or two RS-530  
**530A** one or two RS-530A  
**X21** one or two X.21  
**V35X21** one V.35 and one X.21
- & Specify leased line interfaces:  
**V24** one or two V.24  
**V35** one or two V.35  
**V36** one or two V.36  
**530** one or two RS-530  
**530A** one or two RS-530A  
**X21** one or two X.21  
**V35V24** one V.35 and one V.24  
**V35X21** one V.35 and one X.21  
**X21V24** one X.21 and one V.24
- \$ Specify ISDN port interfaces:  
**IBE** for ISDN-BRI "S"  
**IBU** for ISDN-BRI "U"

## Cables

All data port and 64 kbps leased line network interfaces use a 26-pin high density D-type, female connector. The following cables convert the 26-pin connector to other physical interfaces and should be ordered separately. Cable length is 2 meters.

### CBL-SCS26/a/b

- a Specify physical interface:  
**V24** for V.24/RS-232, 25-pin  
**V35** for V.35, 34-pin  
**V36** for V.36/RS-449, 37-pin  
**530** for RS-530, 25-pin  
**SCS26** for RS-530A, 26-pin  
**X21** for X.21, 15-pin
- b Specify connector type:  
**F** for female connector  
**M** for male connector

### RM-7/NEW

Hardware for mounting one or two stand-alone units in a 19" rack

Port Configuration Option	Data Ports	Network Ports (Leased Line and ISDN)
<b>A</b>		
<b>B</b>		
<b>C</b>		
<b>D</b>		

Specifications are subject to change without prior notice.

www.pulsewan.com ☐  
sales@pulsewan.com ☐  
Toll Free: 888-785-7393 ☐  
Int'l: 1-909-244-6477