

IMX-2

ISDN Inverse Multiplexer and Backup Unit



FEATURES

- Supports ISDN backup of leased lines and Dynamic Bandwidth Allocation
- Provides Bandwidth On Demand (smart terminal adapter)
- Operates over a combination of two switched (B channels) and one leased line
- Integrated terminal adapter supports 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

■ IMX-2 is an inverse multiplexer that splits a data channel between a leased line and an ISDN switched circuit connection, according to mode of operation, line availability and traffic load.

■ Typical applications for IMX-2 include high speed leased line backup, Dynamic Bandwidth Allocation and Bandwidth On Demand.

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-2 senses the bandwidth requirement of an application and automatically adds or drops ISDN B channels during the transmission. Typical applications include bridge/router internetworking links. Dynamic Bandwidth Allocation is only available for a leased line of 64 kbps, enabling a data port bandwidth of between 64 to 192 kbps (see *Figure 1*).

LEASED LINE BACKUP

■ IMX-2 can backup one leased line, operating at data rates from 64 kbps to 256 kbps, over two B channels (in backup mode the maximum data rate is 128 kbps). When the leased line returns to proper operation, IMX-2 automatically reverts to the leased line (see *Figure 2*).

BANDWIDTH ON DEMAND (Smart Terminal Adapter)

■ For applications such as video-conferencing that require switched connections, IMX-2 can act as a smart terminal adapter and call up one or two B channels to provide up to 128 kbps aggregate bandwidth (see *Figure 3*).

OPERATION

■ During the initial hand-shaking 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 three separate channels and thus ensures that the data is delivered in the correct order. The differential delay can support two satellite hops.

■ IMX-2 offers a large choice of interfaces on the network side as well as the data ports. It connects to basic rate ISDN (BRI) switched digital service. It also supports one dedicated circuit (leased line) with a wide range of interfaces (see *Ordering*).

■ Using the BONDING 1, 2 and 3 protocol specifications for inverse multiplexing, IMX-2 can operate with other vendor products, or with RAD's IMX-64 (see *Figure 5*).

■ Dialing can be performed either manually or by dialing protocols through 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-2 is a compact 1U high stand-alone unit. It can be mounted in a 19" rack using the optional rack-mount hardware (RM-17).

APPLICATIONS

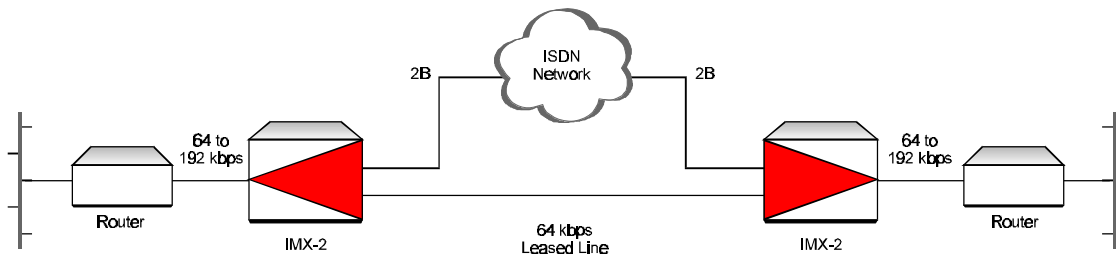


Figure 1. Dynamic Bandwidth Allocation

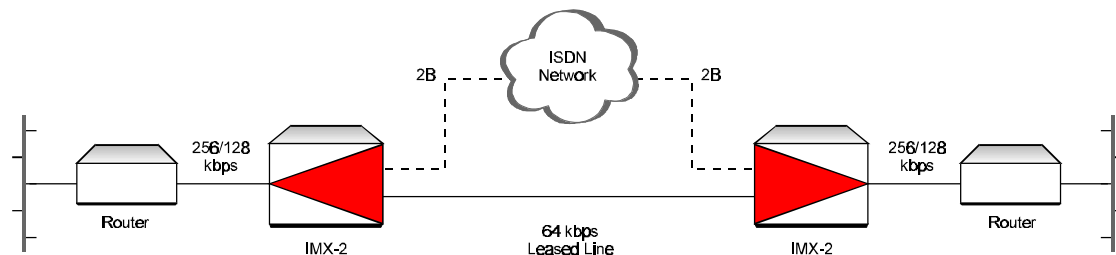


Figure 2. High Speed Leased Line Backup

SPECIFICATIONS

NETWORK PORTS

Number of ports:
1 leased line and 1 ISDN interface

■ Leased Line

Number of ports: 1

Data rate:

64 kbps or $n \times 64$ kbps,
($n = 1$ to 4 for transparent
call/leased line backup
 $n = 1$ for DBA)

Transmit timing:

DTE transmit timing
(looped back from network)
Internal: ± 32 ppm

Interfaces:

V.35, V.36/RS-449, RS-530,
RS-530A or 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.

■ ISDN Basic Rate Interface

(IMX-2 is TE - Terminal Equipment)

Number of "S" or "U" interfaces
(2B+D): 1

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

Transmit timing:

Looped back from network

Connector: RJ-45, 8-pin

DATA PORTS

Number of ports: 1

Data rate:

up to 192 kbps total

Transmit timing:

Locked to network transmit
timing

Internal: ± 32 ppm

Interfaces:

V.35, V.36/RS-449, RS-530,
RS-530A or 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.

OPERATION MODES

■ Dialing Modes

V.25 bis

V.25 control lead

Manual (via front panel or
control port)

■ Call Types

Transparent mode

BONDING 1, 2, 3

CONTROL (SUPERVISORY) PORT

Interface: V.24/RS-232

Type:

DCE, dedicated for supervisory
terminal connection

Connector:

9-pin D-type female, DCE

Data 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

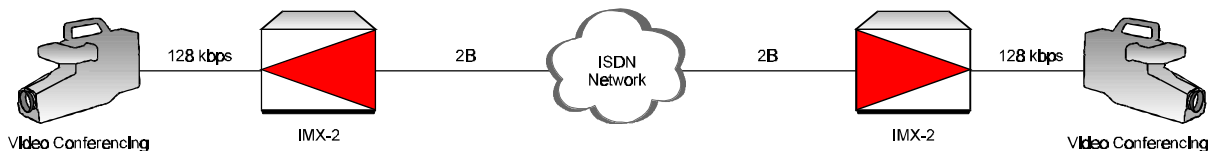


Figure 3. Bandwidth On Demand

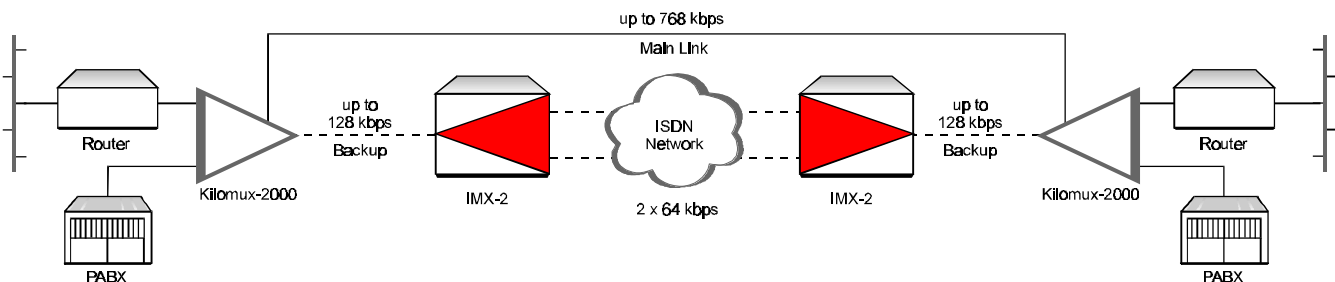


Figure 4. High Speed Backup over ISDN

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 B1, B2, DTE),
Call Sync, Test, Alarm

■ Front Panel Controls

Cursor, Scroll, Enter

■ Physical

Height: 4.3 cm / 1.7 in (1U)

Width: 21.5 cm / 8.5 in

Depth: 24.3 cm / 9.5 in

Weight: 1.5 kg / 3.5 lbs

■ Power

100-240V, 35W

■ Environment

Temperature: 0-50°C / 32-122°F

Humidity: up to 90%,
non-condensing

ORDERING

IMX-2/#/!&/\$

ISDN Inverse Multiplexer

Specify data port interface:

V35 for V.35

V36 for V.36/RS-449

530 for RS-530

530A for RS-530A

X21 for X.21

& Specify leased line interface:

V35 for V.35

V36 for V.36/RS-449

530 for RS-530

530A for RS-530A

X21 for X.21

\$ Specify ISDN port interface:

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:

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-17

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

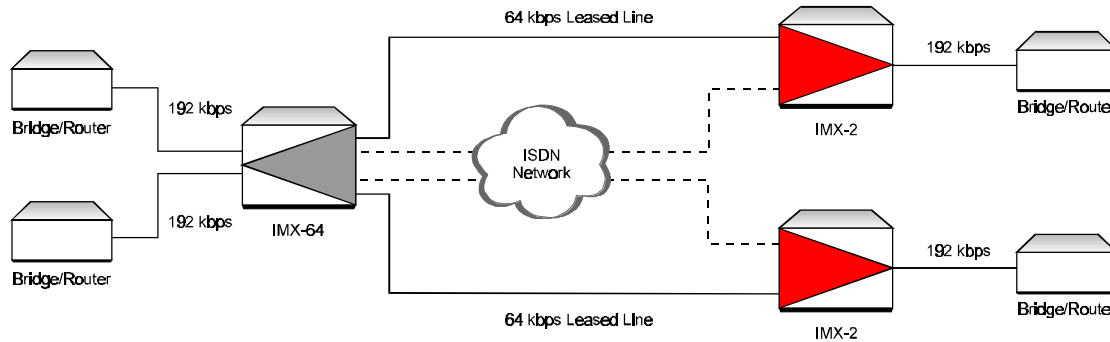


Figure 5. ISDN Backup using Bonding Standards across from an IMX-64 Inverse Multiplexer

Specifications are subject to change without prior notice.

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