# LAN RANger Family MBE Family

## *Ethernet Remote Access Routers*
## *ISDN/Frame Relay/Sync/Async/X.25*

## FEATURES

- Remote access routing and bridging on link-by-link basis
- IP and IPX routing
- Bridge links transparently support all level 3 protocols
- Backup capability for router and bridge links
- BOOTP auto configuration for IP router links
- Dial-up, leased line, DDS, ISDN, and Frame Relay services
- 4-wire modem for campus and factory applications
- Data rates up to 115.2 kbps async, 1.5 Mbps sync
- Supports PPP, SLIP, CSLIP and Multilink PPP
- STAC data compression (4:1)
- Quick setup and configuration
- Solid Firewall (session based) protection
- Single IP address translation
- PAP/CHAP security for PPP links
- RADIUS billing and authentication support
- Scripting tool
- Protocol/address filtering
- Connection on demand
- Spoofing for RIP, SAP and IPX Keep Alive
- SNMP and TELNET support
- FLASH memory for software and parameter file downloading
- Dual image FLASH

# DESCRIPTION

■ The MBE Family is part of the LAN RANger Series of Ethernet Remote Access Routers that provide cost-effective remote access connectivity for SoHo (Small office Home office) applications.

■ The MBE Family supports **remote access routing** and **bridging** for connecting remote PCs or LANs to a central LAN over a wide variety of WAN interfaces and services, including **ISDN, Frame Relay, Leased Line, dial-up modems,** and **DDS**.

■ Routing and bridging are performed on a link-by-link basis. There are no bridging or routing limitations on the central LAN. However, additional bridges should **not** be connected to the remote LAN.

■ **IP** can be routed over PPP, SLIP, CSLIP or Frame Relay; **IPX** can be routed over PPP or Frame Relay.

■ Router links can operate opposite any **PPP standard** compliant device, including third party routers and software based PPP dialers (e.g., Windows 95).

■ Bridge links are transparent to layer 3 protocols, such as NetBIOS and DECNET.

■ The **Single IP** address translation feature allows a small or medium office LAN to connect to the Internet using a single, dynamically or statically allocated IP address from the central access router.

■ For router links, the IP parameters and the configuration file are learned automatically from any **BOOTP** server via standard **BOOTP** protocol.

■ **Transparent remote to remote forwarding** enables direct data transfer between links whether the links are bridge or router (see Figure 1).

■ **Multilink PPP** support enables use of ISDN at 128 kbps.

■ The MBE family includes the following models:

– **MBE10-1**, single link router supporting a single remote station for bridge links or full LAN segment for router links.

– **MBE10-1D**, dual link router supporting a single remote station on each bridge link or a full LAN segment on each router link.

– **MBE10-8**, single link router supporting a remote Ethernet LAN of up to 80 workstations on bridge links or a full LAN segment on router links.

– **MBE10-8D**, dual link router supporting a remote Ethernet LAN of up to 80 workstations on each bridge link or a full LAN segment on each router link.

# APPLICATION

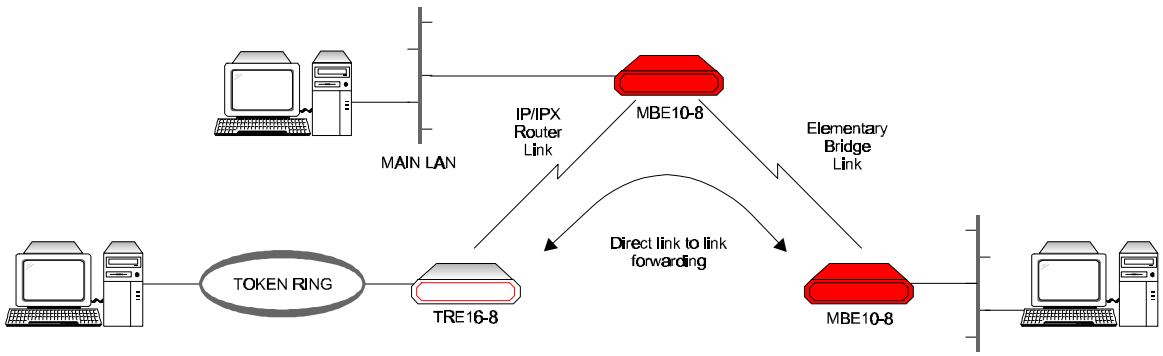


**Figure 1 - Transparent Remote to Remote Forwarding allows direct communication between two remote sites, irrespective of the type of links being used**

## INTERFACES

■ Both the LAN and WAN link interfaces are modular, and accommodate several standards.

■ LAN:
The Ethernet/802.3 LAN interface options supported are:

- AUI (10Base5)
- BNC (10Base2)
- UTP Ethernet (10BaseT).

■ WAN:
WAN link interface modules include:

- V.24/RS-232, which can be configured for **asynchronous** operation over dial-up modem links. These links operate at data rates from 2.4 kbps to 115.2 kbps. Use of compression modems improves performance and throughput of the MBEs.
- Digital interfaces (V.24/RS-232, V.35, X.21, RS-530 and V.36) for **synchronous** leased lines at data rates up to 1.5 Mbps
- Built-in CSU/DSU for connection to leased lines operating at up to 56 kbps.
- An internal ISDN terminal adapter module.
  Two B channels are available on the dual port module as well as one redundant link (sync/async). ISDN switches supported include 5ESS, and DMS-100. The ETSI NT1 European standard, and I430 are also supported.
- A built-in **4-wire**, short range modem. This option permits operation at data rates up to 768 kbps (See Figure 5, and Table 1). It is suitable for campus or factory environments where either a single station or a workgroup LAN requires connection to the LAN, beyond the distance normally attainable over copper media. The 4-wire interface model has an internal clock with selectable data rates from 16 kbps to 768 kbps according to the required range.

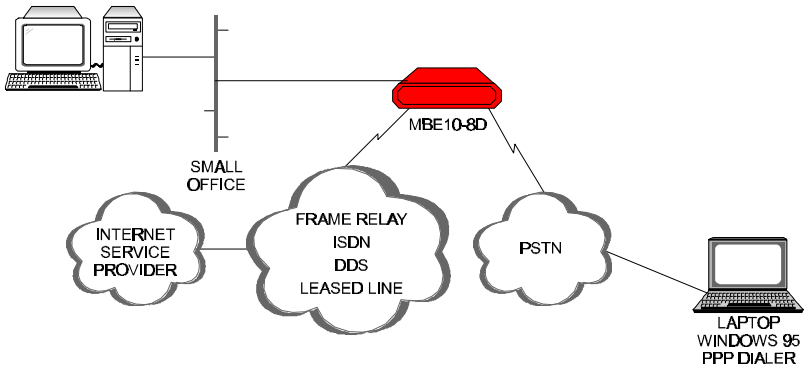


**Figure 2 - An MBE can be used to simultaneously provide dial-in capability for standard PPP dialer PCs/laptops to the office and uplink connectivity to the Internet for use by users in the office as well as teleworkers**

## CONTROL

- **Quick setup and configuration** is performed via terminal emulator attached to control port or by using **TELNET** access into the device over the LAN or WAN.
- An **SNMP** agent provides in-band or out-of-band management by RADview or any other standard SNMP management station.
- **Software downloading** is available via the control port, using XMODEM, and via LAN or WAN using TFTP.

**Parameter file downloading and uploading** is available via LAN or WAN using TFTP.

**Product configurations and software** are saved in FLASH memory. Two versions of the software are stored for redundancy.

- An **SNMP** agent provides management by RADview or any other standard SNMP management station.

## SECURITY

- **An integral Solid Firewall** protects an office LAN from undesired entry from the Internet, using session based firewalling.
- **PAP/CHAP** security is provided for users utilizing router links.
- **Dialback** over PPP to a station using a router link at a fixed location is supported in Microsoft environments (e.g., opposite Windows 95). This adds security by verifying user identity and location. The dialback feature helps reduce costs to mobile users.
- **Internet Access authentication** is provided by PAP/CHAP and the Scripting Tool.
- **Undesired Access** to the WEB RANger via TELNET or SNMP can be blocked or password protected.

## WAN ECONOMY

- **Connection On Demand** (**COD**) allows links to be connected or disconnected according to time, traffic or management. COD may be triggered based on user defined masks.

**Spoofing** is used to reduce WAN link up-time and traffic by increasing the period between RIP, SAP, or IPX Keep Alive broadcasts.

**Filters** based on user definable masks improve WAN utilization by ensuring that only necessary packets are transmitted over the WAN. To ensure high performance and easy installation, a special hardware filtering technique is used.

## MISCELLANEOUS

- MBE is supplied as a stand alone unit. Special hardware for mounting either a single unit or two units side-by-side in a 19" rack, using minimal rack space of 1U (1.75") in height, can be ordered separately (see *ORDERING*).



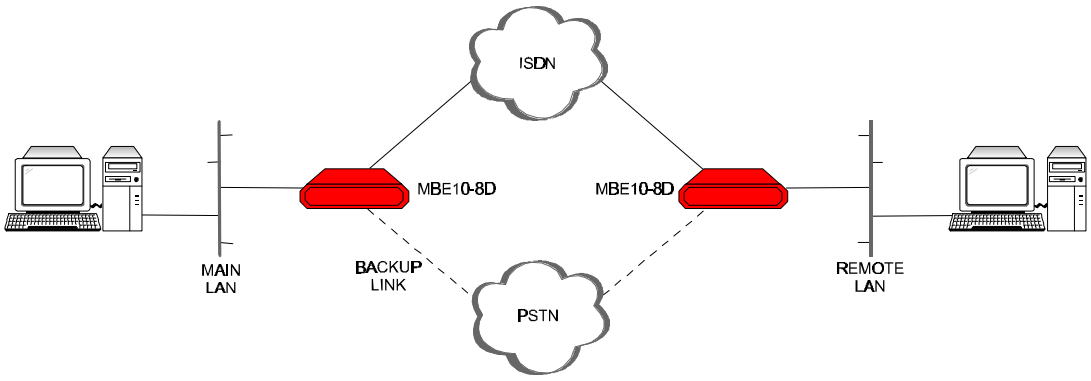


**Figure 3 - Backup link can be configured to allow automatic redundancy in the event of a link failure**

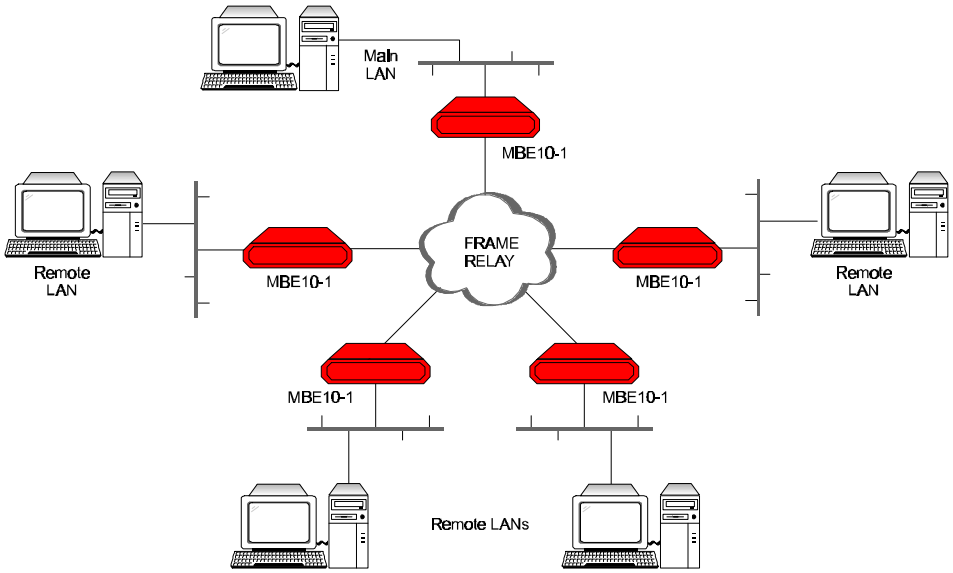


**Figure 4 - Integral Frame Relay**

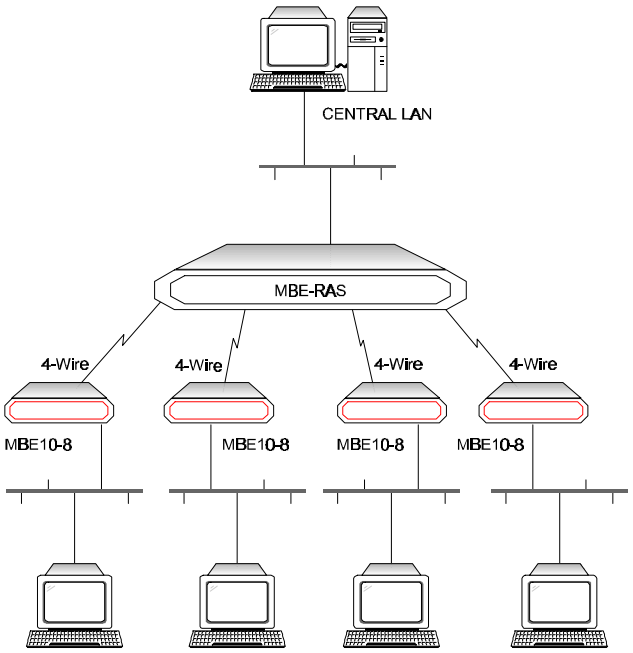


**Figure 5 - Integral 4-wire modem interfaces**

**Table 1: Maximum range using the 4-wire option**

| Data Rate (kbps) | @24 Gauge (.5 mm) km | miles |
|---|---|---|
| 16 | 6.0 | 3.7 |
| 32 | 6.5 | 4.0 |
| 48 | 7.0 | 4.3 |
| 64 | 6.0 | 3.7 |
| 96 | 5.5 | 3.3 |
| 128 | 4.5 | 2.7 |
| 256 | 3.0 | 1.8 |
| 768 | 1.0 | 0.6 |

# SPECIFICATIONS

## LAN INTERFACE

- **Standard**
  Conforms to Ethernet/IEEE 802.3
- **Type**
  AUI, BNC and UTP

## LINK INTERFACE

- **Interfaces/Connectors**
  - V.24/RS-232 or RS-530 with 25-pin D-type, female
  - V.35 with 34-pin female
  - V.36/RS-422 with 37-pin D-type, female
  - X.21 with 15-pin D-type, female
  - Basic Rate ISDN with RJ-45 using S or U interface
  - CSU/DSU with RJ-45
  - 4-wire with 5-screw terminal block
- **Protocol**
  Synchronous: HDLC based
  Asynchronous: Programmable UART
- **Data Rates**
  - V.24/RS-232:
    Asynchronous: 2.4 to 115.2 kbps;
    Synchronous: up to 64 kbps
  - V.35, X.21, V.36, RS-530: up to 1.5 Mbps
  - 4-wire: from 16 to 768 kbps (selectable, internal clock)
  - DDS: Up to 56 kbps

## CONTROL INTERFACE

- **Type**
  V.24/RS-232
- **Connector**
  RJ-45
- **Data Rate**
  2.4 to 19.2 kbps, 8 bits, No parity, automatic rate detection

## GENERAL

- **Indicators**

**Power**
ON the unit is powered on

**Ready**
ON packets can be transferred

**Main**
ON the unit is configured as local

**Remote**
ON the unit is configured as remote

**LAN TX**
ON a packet is being transmitted to the LAN

**LAN RX**
ON a packet is being received from the LAN

**LAN ERR**
ON the LAN interface indicates an error

**Link TX***
ON a packet is being transmitted to the link
BLINKS (every 15 seconds) ISDN is connected and the ISDN link is open

**Link RX***
ON a packet is being received from the link
BLINKS (every 15 seconds) ISDN is connected and the ISDN link is open

**Link ERR***
ON ISDN is not connected
BLINKS the serial LINK interface indicates an error

* Refers to both Link 1 and Link 2 in dual link

- **Panel Controls**
  Reset (front panel)
  Power ON/OFF (rear panel)
- **Power**
  100-230 VAC
  47-63 Hz, 10 VA max
- **Physical**

| | | | | |
|---|---|---|---|---|
| Height: | 4.4 | cm / | 1.8 | in (1U) |
| Length: | 30.0 | cm / | 11.8 | in |
| Width: | 21.6 | cm / | 8.5 | in |
| Weight: | 2.1 | kg / | 4.7 | lb |

- **Environment**
  Temperature: 0-50°C (32-122°F)
  Humidity: Up to 90%, non-condensing

# ORDERING

**MBE10-1/+/***
**MBE10-8/+/***
Single link

**MBE10-1D/+/***
**MBE10-8D/+/***
Dual-link

**MBE10-1D/$/+/***
**MBE10-8D/$/+/***
Dual-link, over ISDN

**+** Specify link interface:
(Note: for ISDN, this is the second interface.)

**DDS** for CSU/DSU
**V24** for V.24/RS-232
**V35** for V.35
**V36** for V.36 or RS-449/RS-422
**X21** for X.21
**530** for RS-530
**V35V24** for V.35/V.24
(MBE10-1D or MBE10-8D only)
(not valid for IBE options)
**4W** for 4-wire (built-in modem)
(not valid for IBE options)

***** Specify LAN interface:
**AUI** for 10Base5
**BNC** for 10Base2
**UTP** for 10BaseT

**$** Specify ISDN interface:
**IBE** for "S" interface
**IBU** for "U" interface

**RM-19**
Hardware for mounting one or two units in a 19" rack

Specifications are subject to change without prior notice.


RAD
data communications

**U.S. EAST:**
900 Corporate Drive
Mahwah, NJ 07430
Tel: (201) 529-1100
Fax: (201) 529-5777
Email: market@radusa.com

**U.S. WEST:**
7711 Center Avenue #350
Huntington Beach, CA 92647
Tel: (714) 897-2448
Fax: (714) 891-1764

**INTERNATIONAL HEADQUARTERS:**
12 Hanechoshet Street
Tel Aviv 69710, Israel
Tel: (972) 3-6458181
Fax: (972) 3-6498250, 6474436
Email: rad@radmail.rad.co.il
webranger@radmail.rad.co.il


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