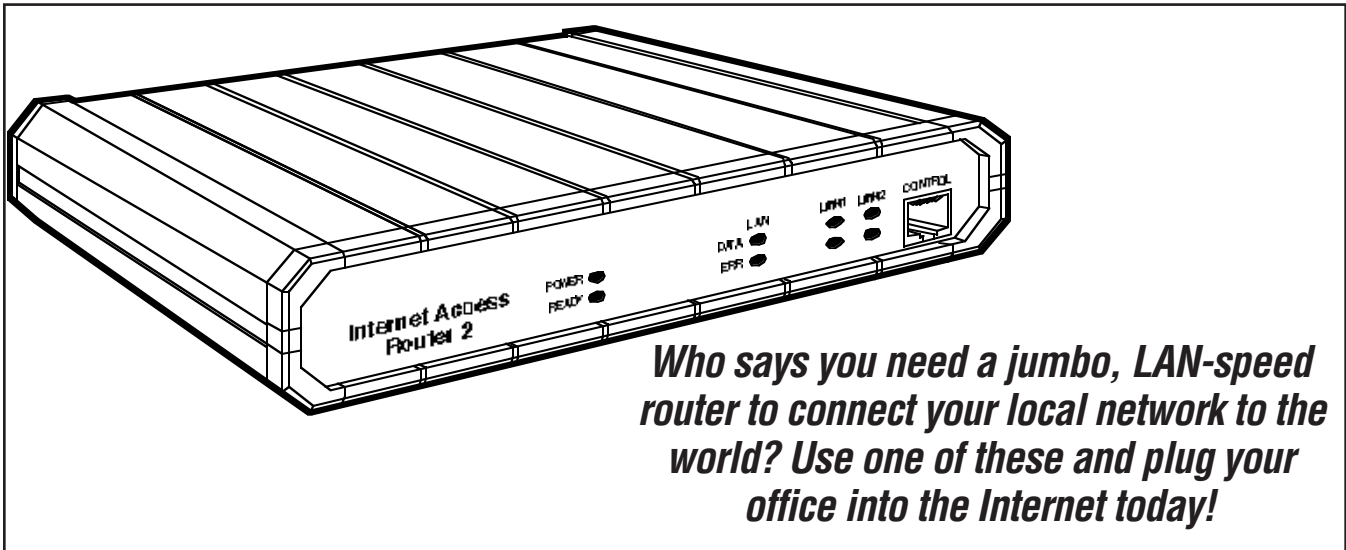# BLACK BOX®
NETWORK SERVICES

INTERNET ACCESS ROUTER 2

Who says you need a jumbo, LAN-speed router to connect your local network to the world? Use one of these and plug your office into the Internet today!

Key Features

▶ **Performs IP and IPX routing and bridging.**

▶ **Functions as a "Solid Firewall."**

▶ **"Single IP" connects LAN users to the Internet or an intranet through just one IP address.**

▶ **WAN links can be dial-up, leased line (DDS or full or fractional E1 or T1), or Frame Relay.**

▶ **Supports PPP, HDLC, RFC 1490, SNMP, PAP, and CHAP, as well as T1/E1 drop & insert.**

If your network users want access to the Internet, or to the company intranet, there's always someone ready to sell you a solution that doesn't do what you need, includes bells and whistles you don't need, and whose install-ation and maintenance costs will wipe out your budget twice over.

Before you put yourself through that, try our Internet Access Router 2 (IAR 2) on for size. It's a router you can hook up to one or two Ethernet LANs in order to WAN-link them to an external IP internetwork. For the price, the IAR 2 is remarkably full-featured—*with the good stuff:*

• Its IP routing includes support for static IP configuration, dynamic IP learning with RIP and RIP-2, CIDR topologies, multiple IP nets on the same LAN, numbered and unnumbered interfaces, and IP fragmentation.

• Its IPX routing includes RIP and SAP support.

• Its bridging is IEEE 802.1d compliant (but does *not* include the Spanning Tree algorithm). It can bridge two LANs across the WAN link, opposite any standard third-party bridge; two-LAN units can bridge those two LANs also, or even all three LANs at once.

• As a "Solid Firewall," it makes your local LAN totally invisible to unauthorized outside users, which makes it ideal for security-sensitive offices. External logins can be handled with the PAP or CHAP protocol.

Probably the most useful and exciting feature of the IAR 2, though, is "Single IP." Normally a LAN requires a complete, unique, legal, statically assigned subnet to connect to an external IP network. But with Single IP, your entire small office can access the Internet or an intranet the same way a single PC would: by using just one IP address, statically or dynamically assigned by your ISP.

This means that any of the users on your network can run a Web browser, FTP client, email client, news reader, Telnet, TN3270, or other IP application using any TCP/IP stack on any type of computer. Several of them can even do this simultaneously.

The IAR 2 can also connect or disconnect from its WAN link(s) based on actual or specific usage, and it can filter traffic to avoid wasting bandwidth.

On the LAN side, different models of the Router have either one or two 10BASE-T ports or one 10BASE2 (ThinNet) port. On the WAN side, different models have either one E1 port, two E1 ports (one main and one sublink), one T1 port, two T1 ports (one main and one sublink), one V.35 port, or one X.21 port. The E1 ports have both balanced (RJ-45) and unbal-anced (dual BNC) connectors for maximum compatibility.

22598

The IAR 2 is more than just another remote-access device—it's flexible enough to handle all kinds of business communication.
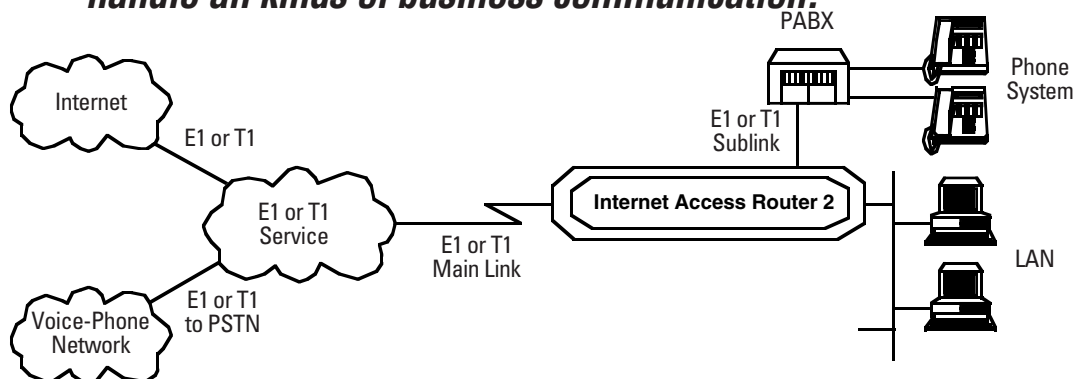
Specifications

Standards —
LAN: IEEE 802.3 Ethernet v. 2;
E1: ITU-T G.703, G.704, G.706, G.732

Interfaces —
Control: EIA/TIA RS-232 proprietarily pinned on RJ-45;
LAN:
-UBE1 model only: 10BASE2;
All other models: 10BASE-T;
LINK:
-UE1, -UBE1, and -2UE1 models only: E1;
-UT1 and -UT1S models only: T1;
-U35 and -2U35 models only: ITU-T V.35;
-U21 and -2U21 models only: EIA/TIA RS-530 patched to ITU-T X.21

Protocols — On LINK interface:
Synchronous PPP, Frame Relay (RFC 1490), HDLC

Data Format —
Control interface: 8 data bits, no parity, 1 stop bit (fixed);
E1:
Framing: D4 or ESF;
Line coding: AMI;
Zero suppression:
Transparent, B7ZS, B8ZS;
T1:
Framing: 256N (no MF, CCS) with or without CRC-4, 256S (TS16 MF, CAS) with or without CRC-4;
Line Coding: AMI;
Zero suppression: HDB3

E1 Line —
Impedance: 120 ohms (balanced) or 75 ohms (unbalanced);

E1 Line (continued)—
Signal Levels:

Receive: 0 to –30 dB with LTU, 0 to –12 dB without LTU;
Transmit: 2.7 to 3.3 volts balanced or 2.133 to 2.607 volts unbalanced;
Jitter Performance: As per ITU-T G.823

T1 Line —
Impedance: 100 ohms (balanced);
Signal Levels:
Receive: 0 to –36 dB with CSU, 0 to –10 dB without CSU;
Transmit: 0, –7.5, –15, –22.5 dB with CSU, user-adjustable at up to 200 m without CSU;
Jitter Performance: As per AT&T Pub. TR-62411

Data Rate — Control interface:
9600 bps (fixed);
E1: 2.048 Mbps;
T1: 1.544 Mbps

User Controls —
On-screen menus;
(1) Rear-mounted rocker switch for power

Indicators —
All front-mounted LEDs;
All models:
(1) POWER,
(1) READY,
(2) LINK1:
(1) DATA (activity),
(1) ERR (error);
(2) LINK2:
(1) DATA (activity),
(1) ERR (error);
-UE1, -UBE1, -UT1, -UT1S, -U35, and -U21 models only:
(2) LAN:
(1) DATA (activity),
(1) ERR (error);

Indicators (continued)—

-2UE1, -2U35, and -2U21 models only:
(2) LAN1:
(1) DATA (activity),
(1) ERR (error);
(2) LAN2:
(1) DATA (activity),
(1) ERR (error);
-UE1, -UBE1 models only:
(2) SYNC LOSS:
(1) LOC (local),
(1) REM (remote);
-2UE1 model only:
(4) SYNC LOSS:
(2) LINK1 (main channel):
(1) LOC (local),
(1) REM (remote);
(2) SUB (subchannel):
(1) LOC (local),
(1) REM (remote);
-UT1 model only:
(2) ALARM:
(1) RED, (1) YEL (yellow);
-UT1S model only:
(4) ALARM:
(2) LINK1 (main channel):
(1) RED, (1) YEL (yellow);
(2) SUB (subchannel):
(1) RED, (1) YEL (yellow)

Connectors —
(1) Front-mounted RJ-45 control port;
All others rear-mounted;
All models: (1) IEC 320 male power inlet;
-UE1, -UT1, -UT1S, -U35, and -U21 models only:
(1) RJ-45 female 10BASE-T port,
-UBE1 model only:
(1) BNC female 10BASE2 port,
-2UE1, -2U35, and -2U21 models only:
(2) RJ-45 female 10BASE-T ports,

Connectors (continued) —
-UE1 and -UBE1 models only:
(1) RJ-48C female balanced E1 port,
(2) BNC female unbalanced alternative E1 port:
(1) TX, (1) RX;
-2UE1 models only:
(2) RJ-48C female E1 ports:
(1) main channel,
(1) subchannel;
(4) BNC female unbalanced alternative E1 ports:
(2) main chnl.: (1) TX, (1) RX;
(2) subchnl.: (1) TX, (1) RX;
-UT1 model only:
(1) RJ-48C female T1 port;
-UT1S model only:
(2) RJ-48C female T1 ports:
(1) main channel,
(1) subchannel;
-U35 and -2U35 models only:
(1) M/34 female V.35 port;
-U21 and -2U21 models only:
(1) DB25 female RS-530 port patched to (1) DB15 female X.21 port

Power —
Input: 100 to 230 VAC, 50 or 60 Hz;
Consumption: Up to 10 VA

Temperature Tolerance —
0 to 50°C

Humidity Tolerance —
Up to 90% noncondensing

Size — 1.8" (1U) 4.4 x 21.6 x 24 cm

Weight — 1.2 kg

22598

▼ The complete package

- The Internet Access Router 2 itself.
- Its power cord.
- An RJ-45 male to DB9 or DB25 female serial control cable.
- A users' manual.

▼ What else you might need

- LAN and WAN cables.
- An adapter for your control cable.
- AC-power and data-line surge protectors.

▼ *Ordering Information*

ITEM	CODE
Internet Access Router 2:	

LAN Interface(s): *WAN Interface(s):*

ITEM	CODE
Single 10BASE-T ...Integrated E1...	LR0003A-UE1
Single 10BASE2 (ThinNet) ...Integrated E1...	LR0003A-UBE1
Dual 10BASE-T ...Integrated E1 with Integrated Subchannel E1 CSU/DSU ...	LR0003A-2UE1
Single 10BASE-T ...V.35 ...	LR0003A-U35
Dual 10BASE-T ...V.35 ...	LR0003A-2U35
Single 10BASE-T ...X.21 ...	LR0003A-U21
Dual 10BASE-T ...X.21 ...	LR0003A-2U21
Cables (specify length):	
10BASE-T: Category 5 UTP, TIA-568B pinned, PVC patch cable ...	EVMSL05
10BASE2: PVC ThinNet cable ...	LCN300
E1 (unbalanced on BNC): BNC male to BNC male indoor-only RG-59 coaxial cable...	ETN59-BNC
V.35: Straight-pinned M/34 male to M/34 male cable...	EYN450-MM
X.21: Straight-pinned DB15 male to DB15 male cable ...	EGM16E-MM
Control-Cable Adapters (if your computer's serial ports are both the wrong type):	
DB25 male to DB9 female ...	FA520A-R2
Data-Line Surge Protectors:	
10BASE-T ...	SP512A-R2
10BASE2 ...	SP350A-R2
E1 (balanced on RJ-48) or T1 (non-span-powered)...	SP513A-R2
E1 (unbalanced on BNC): *Call Black Box Tech Support; we might be able to give you a quote on this.*	
V.35 ...	SP143A
X.21 ...	SP508A
RS-232 (on RJ-45) ...	SP250A