

A complete wireless network solution for the AS/400® system and other IBM host/server systems



2480 Wireless LAN Access Points

- **Spread-spectrum, direct-sequence radio operating in the 2.4- to 2.4835-GHz bandwidth**
- **Seamless roaming and network management throughout the coverage area**
- **Compact and lightweight devices to create or extend your wireless LAN network**
- **Now available in various models**
- **Flexibility to connect to existing wired LANs**



2480 Wireless LAN Access Point

The 2480 Wireless LAN Access Points and PC LAN Adapters are members of the 2.4-GHz Wireless LAN family of products that provide a complete wireless network solution for the AS/400 system and other IBM host/server systems. This wireless environment can enhance productivity by allowing access to data when and where it is needed. The 2480 Wireless LAN Access Points are compact, lightweight devices that create or extend a Wireless LAN network. Each Access Point creates a cell of wireless LAN coverage. Networks are normally designed with overlapping cells so that users can move from cell to cell within a network without disrupting interaction with their host/server system. These devices operate with existing application software interfaces, enabling the seamless addition of this new operating environment. Access Points come in many different models.

2480 Wireless Ethernet LAN Access Point - Model E00

The Ethernet Access Point can be attached to any Ethernet 10BASE2, 10BASE5 or 10BASE-T LAN to create a wireless LAN network. This device can also attach to any server system via a cable connected directly to an Ethernet adapter. This configuration provides a high-bandwidth solution for attaching desktop and notebook computers, which are equipped with 2480 Wireless LAN ISA, Micro Channel® (MCA) or PCMCIA Adapters.

The Ethernet Access Point can communicate with the AS/400 system through the radio link created by the AS/400 Wireless LAN Adapter. This configuration provides support for Portable Transaction Computers (PTCs) as well as desktop and notebook computers that are equipped with the 2.4-GHz Wireless LAN ISA, MCA or PCMCIA Adapters.

When using the new Wireless Connection for AS/400 Licensed Program Offering (LPO), you can connect a 2480 Ethernet Access Point directly to the Ethernet adapter on the AS/400.

You can use multiple Access Points to create a multi-cell network. The first Access Point attaches to the host via Ethernet cabling or an RF link. You can attach additional Access Points either to the Ethernet cabling or through an RF link.

An Ethernet LAN Bridge 2480-EB0 is required for two or more Ethernet LAN segments to communicate without using a wired connection.

2480 Wireless Token Ring LAN Access Point - Model TR0

The Token Ring Access Point can be attached to the IBM cabling system through the DB9 connector or to unshielded twisted pair using the RJ-45 connector to create a wireless LAN network. Refer to the *IBM Token Ring Network Introduction and Planning Guide, GA27-3677* and the *IBM Cabling System Catalog, GA27-3883* for more information. This device provides a high-bandwidth solution for attaching desktop and notebook computers that are equipped with the 2.4-GHz Wireless LAN ISA, Micro Channel (MCA) or PCMCIA Adapters. Any Token Ring-equipped server, including an AS/400 system, can be used in this configuration.

The Token Ring Access Point can also connect to the host system through the radio link created by the AS/400 Wireless LAN Adapter. This configuration provides support for PTCs as well as desktop and notebook computers that are equipped with the 2.4-GHz Wireless LAN ISA, MCA or PCMCIA Adapters.

You can use multiple Access Points to create a multi-cell network. The first Access Point attaches to the AS/400 via Token-Ring cabling or an RF link. You can attach additional Access Points either to the Token-Ring cabling or through an RF link.

A Token-Ring LAN Bridge 2480-TB0 is required for two or more Token-Ring LAN segments to communicate without using a wired connection.

2480 Wireless Ethernet LAN Bridge Access Point - Model EB0

The Ethernet LAN Bridge Access Point allows two or more Ethernet LAN segments to be connected without wires. When connected by the Ethernet Bridge, workstations can communicate with each other as though they were on the same LAN.

An Ethernet network can be extended up to 600 feet (183 m) between wired Access Points. The Ethernet Bridge also provides transparent, wireless data communications between a wired Ethernet LAN and a wireless LAN equipped with the 2.4-GHz Wireless LAN family of products. Using any combination of the 2480-E00 and 2480-EB0 Access Points, you can create multi-building, indoor/outdoor wireless networks while providing mobile users with seamless roaming and network management throughout the covered area.

The 2480 Wireless Ethernet LAN Bridge Access Point attaches directly to 10BASE2, 10BASE5 or 10BASE-T Ethernet LAN segments conforming to IEEE 802.3 or Ethernet Blue Book Specifications. The Bridge Access Point is protocol-independent and operates with environments such as:

- TCP/IP based protocols
- Client Access/400
- LAN Manager and other NDIS-compliant protocols
- Novell® NetWare®

Operation in a particular networking environment is determined by the software drivers running in the workstations.

2480 Wireless Token-Ring LAN Bridge Access Point - Model TB0

The Token-Ring LAN Bridge Access Point allows two or more Token-Ring LAN segments to be connected without wires. When connected by the Token-Ring Bridge, workstations can communicate with each other as though they were on the same LAN.

The Token-Ring Bridge also provides transparent, wireless data communications between a wired Token-Ring LAN and a wireless LAN equipped with the 2.4-GHz Wireless LAN family of products. Using any combination of the 2480-TR0 and 2480-TB0 Access Points you can create multi-building, indoor/outdoor wireless networks while providing mobile users with seamless roaming and network management throughout the covered area.

The Token-Ring Bridge Access Point can be attached to the IBM cabling system through the DB9 connector or to an unshielded twisted pair using the RJ-45 connector. Refer to the *IBM Token Ring Network Introduction and Planning Guide, GA27-3677* and the *IBM Cabling System Catalog, GA27-3883* for more information. The Bridge Access Point is protocol-independent and operates with environments such as:

- TCP/IP based protocols
- Client Access/400
- LAN Manager and other NDIS compliant protocols
- Novell NetWare

Operation in a particular networking environment is determined by the software drivers running in the workstation and servers.

2480 Wireless RS-485 LAN Access Point - Model RS0

The RS-485 Access Point connects an RS-485 network to a wireless LAN. An RS-485 network can be extended up to 8000 feet (2438 m) from the AS/400 system using up to four RS-485 Access Points. The RS-485 backbone network supports a data rate of 230 Kbps. This type of network is most often used with data collection applications. The RS-485 Access Point attaches to an AS/400 system via twisted-pair wiring connected to the AS/400 Wireless LAN Adapter or through the radio link created by the AS/400 Wireless LAN Adapter.

The RS-485 Access Point creates a cell of wireless network coverage and acts as a network repeater to extend the area of coverage beyond the initial cell created by the AS/400 Wireless LAN Adapter. Networks are designed to create overlapping cells to ensure consistent coverage of the desired area.

These Access Points, when connected to an AS/400 Wireless LAN Adapter, provide support for desktop and notebook computers equipped with the 2.4-GHz Wireless LAN ISA, MCA and PCMCIA Adapters, plus PTCs for data collection applications.

The RS-485 Access Point cannot be used to connect two wired RS-485 segments together.

Note: A 2.4-GHz antenna is required for each wireless Access Point. A site survey can determine which antenna is appropriate for the network environment. A variety of antennas are available including the dipole, omnidirectional, hemispherical and Yagi. A power supply is shipped with each Access Point.

Wireless LAN Access Points Specifications

Physical specifications	Height: 48 mm (1.9 in.) Width: 203 mm (8 in.) Depth: 156 mm (6.5 in.) Weight: 1.4 kg (3 lb)
Operating environment	Temperature: -20° to 50°C (-4° to 122°F) Electrical power: 120 V ac, 60 Hz
Range	<ul style="list-style-type: none">• Wireless LAN coverage is a function of antenna gain, placement, and type, as well as building construction and density• Site survey required to determine radio-frequency coverage and effective network configuration• Indoor dense office: up to 45 m (150 ft)• Indoor open office: up to 91 m (300 ft)• Open factory/warehouse: up to 450 m (1500 ft)• Outdoor line-of-sight: up to 5 Km (3 miles) when using the Yagi antenna (FC #5190). Applicable only for the Access Points, the AS/400 Wireless LAN Adapter, the ISA Adapter and the MCA Adapter.
LAN interfaces supported	Ethernet LAN Access Point (E00) and Ethernet LAN Bridge Access Point (EBO) <ul style="list-style-type: none">•Thin Ethernet, IEEE 802.3 10BASE-2, BNC connector•Thick Ethernet, IEEE 802.3 10BASE-5, DB-15 AUI connector•Twisted-pair Ethernet, IEEE 802.3 10BASE-T, RJ-45 connector Token Ring LAN Access Point (TR0) and Token Ring LAN Bridge Access Point (TB0) <ul style="list-style-type: none">•IEEE 802.0•STP (DB-9 connector), IBM Type 1•UTP (RJ-45 connector), IBM Type 3 or higher RS-485 LAN Access Point (RS0) <ul style="list-style-type: none">•Localtalk, Din-8 connector
Hardware requirements	Ethernet LAN Access Point (E00) and Ethernet LAN Bridge Access Point (EBO) <ul style="list-style-type: none">•Any host system with an Ethernet adapter and its associated features, if any•Any AS/400 with FC 2668 and 2663 Token Ring LAN Access Point (TR0) and Token Ring LAN Bridge Access Point (TB0) <ul style="list-style-type: none">•Any host system with a Token-Ring Adapter and its associated features•For the AS/400, a Token-Ring IOA (adapter on Multi-Function Input/Output Processor (MFIOP)) FC 7175 or FSIOP FC 6516, 6517, 6518 or 6519, as well as FCs 6526, 6528 and 6529•16/4 Token-Ring High Performance for Server Models FC 9619 RS-485 LAN Access Point (RS0) <ul style="list-style-type: none">•Any AS/400 with FC 2668 and 2663 For networks that include PTCs <ul style="list-style-type: none">•Any AS/400 with an AS/400 Wireless LAN Adapter FC 2663 and 2668 except Model D02 or E02•PTCs with the appropriate software required by the host system

Software requirements**Ethernet LAN Access Point (E00) and Ethernet LAN Bridge Access Point (EB0)**

- With AS/400 Ethernet FC 2617, 2625 or 9617, OS/400 Version 2 Release 2 or higher

Token Ring LAN Access Point (TRO)

- OS/400® at the appropriate version and release level to support the AS/400 LAN adapter being used

RS-485 LAN Access Point (RS0)

- OS/400 Version 3 Release 1 or higher

Radio characteristics

- Up to 5 channels at 1 or 2 Mbps, user-selectable
- 2.4- to 2.4835-GHz frequencies
- Raw bit rate of 1 or 2 Mbps, user-selectable
- Transmit power 100 mW max.

Agency approvals

- Complies with FCC Part 15 as a Class A computing device
- Complies with both FCC and DOC regulations for license-free operation in the 2.4-GHz bandwidth

2.4-GHz Wireless LAN PC Adapters

Desktop PCs and portable computers can easily connect to the 2.4-GHz Wireless LAN using the appropriate wireless LAN PC adapter.

These adapters can be used in many different new or existing PCs. They are ordered as feature codes of the various 2480 Wireless LAN Access Points although they are not physically installed in the Access Points but in the PCs.

These products use the same, direct sequence, spread-spectrum radio as the other 2.4-GHz Wireless LAN family members. The various types of 2.4-GHz Wireless LAN PC adapters include:

Wireless LAN PCMCIA Adapter (FC 5250)

The 2.4-GHz Wireless LAN PCMCIA Adapter is a wireless network interface PC card that inserts into any notebook, laptop or personal computer fitted with a Type II PCMCIA slot.

An accompanying radio module with an integrated antenna attaches to the PCMCIA adapter via a cable, and can be mounted on the computer for efficient radio transmission. The PCMCIA adapter combined with the supplied network adapter drivers, and a local area network program, provides wireless client access communications to the AS/400 system, host server or another PC workstation. The adapter can communicate with the AS/400 Wireless LAN Adapter, all the 2480 Wireless Access Points or other 2.4-GHz Wireless LAN PC adapters to form a comprehensive wireless LAN environment.

Wireless LAN ISA Adapter (FC 5254)

The 2.4-GHz Wireless LAN ISA Adapter is a half-size 8-bit PC adapter that can be installed in any ISA bus computer. This adapter operates with the AS/400 Wireless LAN Adapter and all the 2.4-GHz 2480 Wireless LAN Access Points to provide Wireless client access to the LAN. Software drivers are supplied for operating the adapter under Novell NetWare, ODI, DOS and NDIS-compliant network operating systems such as LAN Manager. A packet driver is also included for operation with third-party protocols. The standard antenna supplied with the ISA adapter is a detachable dipole antenna that attaches directly to the back of the adapter. Optional antennas are also available including the omni-directional, hemispherical and Yagi described on the following page.

**Wireless LAN Micro Channel Adapter
(FC 5256)**

The 2.4-GHz Wireless LAN MCA Adapter is a full-size 8-bit PC adapter that can be installed in any computer using the Micro Channel architecture bus. This adapter operates with the AS/400 Wireless LAN Adapter and all the 2.4-GHz 2480 Wireless LAN Access Points to provide Wireless client access to the LAN. Software drivers are supplied for operating the adapter under Novell NetWare, ODI, DOS, and NDIS-compliant network operating systems such as LAN Manager. A packet driver is also included for operation with third-party such as LAN Manager. A packer driver is also included for operation with third-party protocols. The standard antenna supplied with the MCA adapter is a detachable dipole antenna that attaches directly to the back of the adapter. Optional antennas are also available including the omni-directional, hemispherical and Yagi described below.

Access Point accessories

**Yagi Antenna
(FC 5190)**

The Yagi Antenna is a high-gain directional antenna designed to extend the range of RF coverage for a specific type of coverage area and point-to-point links. It can be used indoors or outdoors and is intended for mast-mounting. Outdoors, with a clear line-of-sight between Yagi antennas that are directed at each other, a range of up to 5 km (3 miles) can be achieved. A mounting kit is shipped with the antenna.

**Detachable Dipole Antenna
(FC 5191)**

This antenna can be directly attached to any of the 2480 Access Points. It attaches to the antenna terminal of the device without the use of any tools. Note that this antenna provides limited signal strength in some office environments because of interference from furniture, walls and other obstacles.

**Omni-Directional 360° Antenna
(FC 5192)**

This is general purpose antenna used in most office and (360°) warehouse locations. It provides a sphere of coverage from the antenna and should be mounted in the ceiling or in a location that gives an unobstructed view in all directions to achieve the greatest distance. This antenna is weatherproof and can be mounted outdoors, but adequate weatherproofing of the antenna cables is required.

**Hemispherical (180°) Antenna
(FC 5193)**

This antenna is used in applications where the signal is required on only one side of the antenna. This antenna is weatherproof and can be mounted outdoors, but adequate weatherproofing of the antenna cables is required.

**5/20/50-Foot Antenna Cable
(FC 0021, 5195, 5196)**

Three different antenna cables are used to connect an external antenna to a 2480 Access Point, a Wireless LAN ISA or MCA adapter, or an AS/400 Wireless LAN Adapter. This allows mounting one of the external antennas 1.5 m (5 ft), 6.1 m (20 ft) or 15.2 m (50 ft) from the device.

**RS-485 Balun Transformer
(FC 5197)**

One balun is required on each end of the RS-485 cable. Connections to the RS-485 and the AS/400 Wireless LAN Adapter are made using RJ-11 (telephone-style) connectors. This device performs the following functions:

- Isolates the transmission line from the drivers and receivers
- Permits devices to be removed and reinstalled on the line without disturbing the activity of other devices
- Provides a convenient method of terminating the transmission line at both ends
- Is required to achieve specified transmission distances from the transmission (twisted-pair) line

**Lightning Arrester
(FC 5219)**

The Lightning Arrester is connected in series with the antenna and the antenna cable to suppress lightning-type surges that might damage the radio. The Lightning Arrester includes mounting instructions to ensure a positive ground connection, which is required for correct operation. Note that the Lightning Arrester might not prevent damage caused by a direct lightning hit to the antenna.

Supplementary Information

The following sales tools are available for the 2480 Wireless LAN Access Points:

- Specification sheet: *IBM 2480 Wireless Access Points*, G224-4545
- Information on the 2480 Wireless LAN Access Points and related products is available at:
www.networking.ibm.com/wireless