

Preparing for Installation

Before you install the AccessPro card, read this chapter carefully. It contains important information that will make your installation quicker and easier. This chapter contains the following sections:

- Safety Recommendations
- Preventing Electrostatic Discharge Damage
- Preparing to Make Connections
- Dealing with Electromagnetic Interference
- The Console Port
- The Auxiliary Port

Safety Recommendations

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.
- When you remove the chassis cover, store it in a safe place.
- Keep tools away from walk areas where you and others could trip over them.
- Do not wear loose clothing that could get caught in the chassis. Fasten your tie or scarf and sleeves.

Safety Recommendations

- Wear safety glasses when working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.



Warning Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. (To see translated versions of this warning, refer to the appendix “Translated Safety Warnings.”)

- Locate the emergency power-off switch for the room in which you are working. If an electrical accident occurs, you can act quickly to shut off power.
- Before working on the system, turn off the power to the PC and unplug the power cord.
- Disconnect all power before doing the following:
 - Installing or removing a card
 - Working near power supplies
 - Performing a software upgrade
- Do not work alone when potentially hazardous conditions exist.
- Never assume that power has been disconnected from a circuit. Always check.
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, and missing safety grounds.
- If an electrical accident occurs, proceed as follows:
 - Use caution; do not become a victim yourself.
 - Turn off power to the system.

- If possible, send another person to get medical aid. Otherwise, assess the condition of the victim and then call for help.
- Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

Note Refer to the documentation that came with the host personal computer (PC) for additional safety recommendations. If there is a conflict between recommendations described there and the recommendations described in this user guide, the host PC's documentation should take precedence.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) is a discharge of stored static electricity that can damage electronic equipment and impair electrical circuitry, resulting in complete or intermittent failures. ESD is increased by the combination of synthetic fibers and dry atmosphere.

Always follow ESD-prevention procedures when removing and replacing components. Ensure that the chassis is electrically connected to earth ground. Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to safely channel unwanted ESD voltages to ground. To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis. Always follow the guidelines in the preceding section, "Safety Recommendations."



Caution Do not touch any exposed contact pins or connector shells of interface ports that do not have a cable attached. If cables are connected at one end only, do not touch the exposed pins at the unconnected end of the cable.

Note This device is intended for use in residential, commercial, and light industrial environments only.

Preparing to Make Connections



Caution Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

Preparing to Make Connections

The ports for the Ethernet or Token Ring, serial, and auxiliary connections are located on the rear panel of the main card and the daughter card. (See Figure 2-1, Figure 2-2, Figure 2-3, and Figure 2-4.)

Figure 2-1 **Rear-Panel Connectors, Model AP-EC**

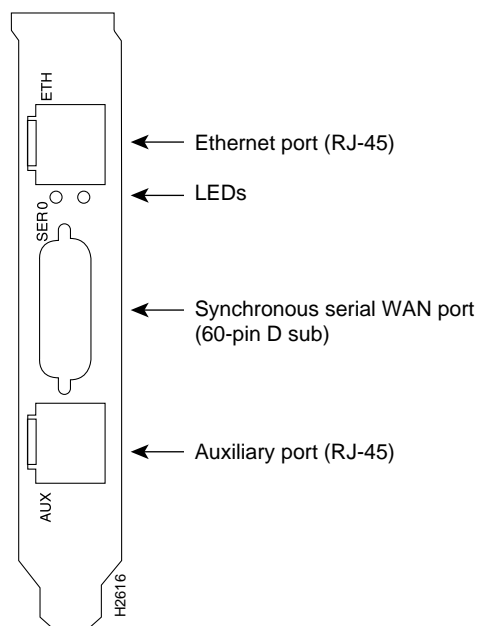
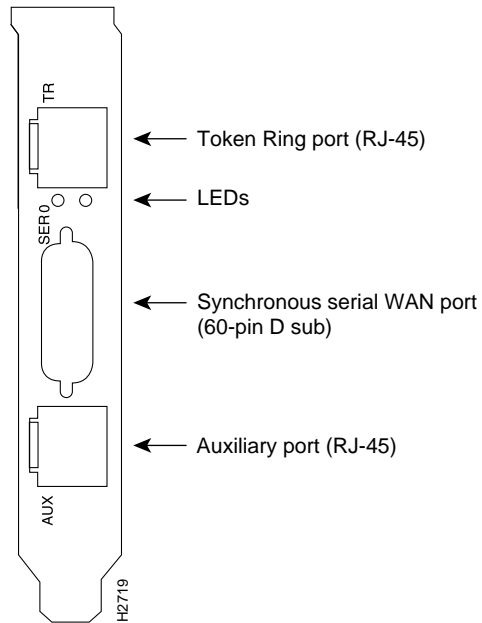


Figure 2-2 **Rear-Panel Connectors, Model AP-RC**



Preparing to Make Connections

Figure 2-3 Rear-Panel Connectors, Model AP-EBC

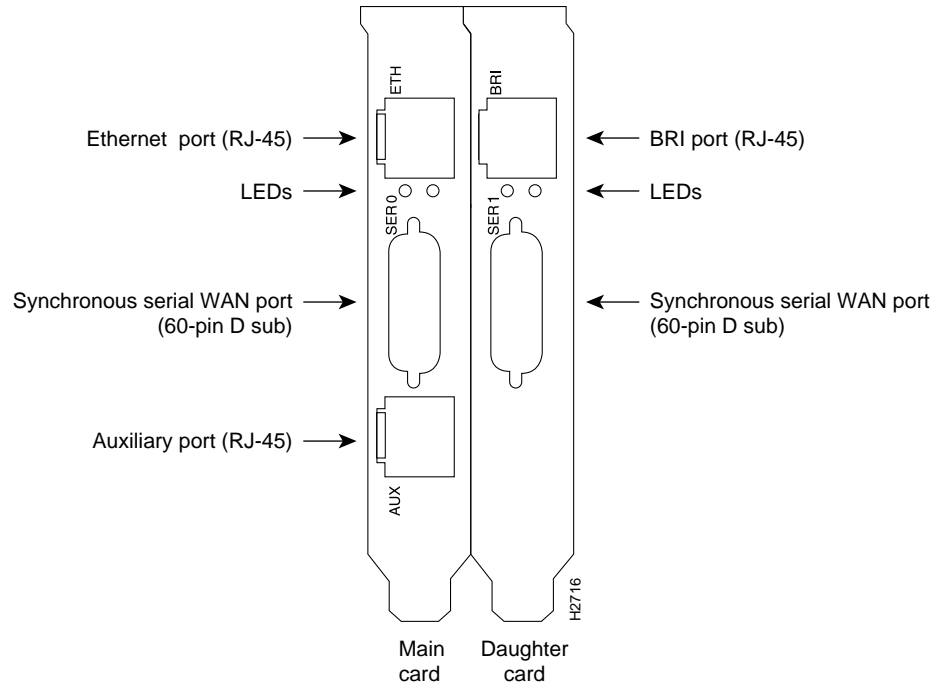
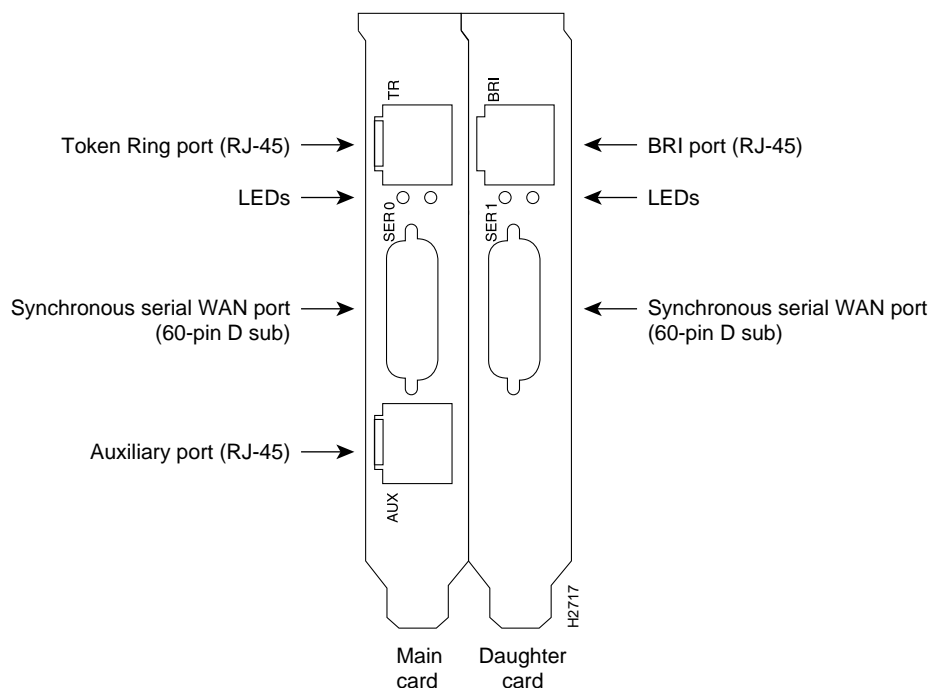


Figure 2-4 Rear-Panel Connectors, Model AP-RBC



Distance Limitations

When you set up the LAN and WAN connections, be aware of the distance limitations and potential electromagnetic interference (EMI) as defined by the EIA. Following are the distance limitation specifications for Ethernet 10BaseT, Token Ring RJ-45, BRI, and serial interfaces.

Ethernet 10BaseT

The distance limitation for the IEEE 802.3 specification is a maximum segment distance of 328 feet (100 meters) at a transmission rate of 10 megabits per second (Mbps).

Preparing to Make Connections

Token Ring RJ-45

The distance limitation for the IEEE 802.5 specification is a maximum segment distance of 328 feet (100 meters) at a transmission rate of 4 or 16 Mbps.

ISDN BRI

The specifications for the ISDN BRI cable are listed in Table 2-1.

Table 2-1 **BRI Cable Specifications**

Specification	High-Capacitance Cable	Low-Capacitance Cable
Resistance (@ 96 kHz ¹)	160 ohms/km	160 ohms/km
Capacitance (@ 1 kHz)	120 nF ² /km	30 nF/km
Impedance (@ 96 kHz)	75 ohms	150 ohms
Wire diameter	0.024" (0.6 mm)	0.024" (0.6 mm)
Distance limitation	32.8' (10 m)	32.8' (10 m)

1. kHz = kilohertz.

2. nF = nanoFarad.



Warning The ISDN connection is regarded as a source of voltage that should be inaccessible to user contact. Users should not attempt to tamper with or open any public telephone operator (PTO)–provided equipment or connection hardware. Any hardwired connection (other than by nonremovable, connect-one-time-only lug) must be made only by PTO staff or suitably trained engineers. (To see translated versions of this warning, refer to the appendix “Translated Safety Warnings.”)



Warning The ports labeled “Ethernet,” “Token Ring,” and “AUX” are safety extra-low voltage (SELV) circuits. SELV circuits should only be connected to other SELV circuits. Because the BRI circuits are treated like telephone-network voltage, avoid connecting the SELV circuit to the telephone network voltage (TNV) circuits. (To see translated versions of this warning, refer to the appendix “Translated Safety Warnings.”)

Serial

As with all signaling systems, EIA/TIA-232 signals can travel a limited distance at any given bit rate; generally, the slower the data rate, the greater the distance. Table 2-2 shows the standard relationship between baud rate and maximum distance for EIA/TIA-232 signals.

Table 2-2 EIA/TIA-232 Speed and Distance Limitations

Data Rate (Baud)	Distance (Feet)	Distance (Meters)
2400	200	60
4800	100	30
9600	50	15
1200	25	7.6
3400	12	3.7



Caution If you understand the electrical problems that can arise from violating the speed and distance limitations for EIA/TIA-232, and you can compensate for them, you might be able to get good results at distances greater than those shown in Table 2-2; however, we recommend that you stay within the distances defined by the standard.

Dealing with Electromagnetic Interference

Balanced drivers allow EIA/TIA-449 signals to travel greater distances than EIA/TIA-232 signals. Table 2-3 lists the standard relationship between baud rate and maximum distance for EIA/TIA-449 signals. These limits are also valid for V.35 and X.21.

Table 2-3 EIA/TIA-449 Speed and Distance Limitations

Baud Rate	Distance (Feet)	Distance (Meters)
2400	4,100	1,250
4800	2,050	625
9600	1,025	312
19200	513	156
38400	256	78
56000	102	31
T1, E1	50	15



Caution The EIA/TIA-449 and V.35 interfaces support data rates up to 2.048 Mbps. Because data may be lost, exceeding this maximum is not recommended.

Dealing with Electromagnetic Interference

When you run cables for any significant distance in an electromagnetic field, interference can occur between the field and the signals on the cables. The construction of terminal plant cabling has two implications:

- Plant cabling can emit radio interference if it is unshielded for too long a distance.
- Strong EMI, especially if it is when caused by lightning or radio transmitters, can destroy the EIA/TIA-232 drivers and receivers in the card.

If you use twisted-pair cables with a good distribution of grounding conductors in your plant cabling, emitted radio interference is unlikely. If you exceed the maximum distances—although we do not recommend that you do this—you will get the best results if you ground the conductor for each data signal.

If you have cables that exceed the recommended distances, or if you have cables that pass between buildings, give special consideration to the effect of lightning strikes or ground loops. The electromagnetic pulse caused by lightning or other high-energy phenomena can easily generate enough energy into unshielded conductors to destroy electronic devices. If your site has experienced this kind of problem, consult experts in lightning suppression and shielding.



Warning Do not work on the system or connect or disconnect cables during periods of lightning activity. (To see translated versions of this warning, refer to the appendix “Translated Safety Warnings.”)

Most data centers cannot resolve the infrequent but potentially catastrophic problems just described without pulse meters and other special equipment. Take precautions to avoid these problems by providing a properly grounded and shielded environment, and pay special attention to issues of electrical surge suppression.

To predict and remedy strong EMI, consult experts in radio frequency interference (RFI).

The Console Port

Access to the console port interface is available through the ISA bus using terminal emulation software running on the PC. To configure the card for console port functionality, refer to the section “Setting COMport Jumpers” in the chapter “Maintaining the AccessPro PC Card.”

The Auxiliary Port

The Auxiliary Port

An RJ-45, asynchronous serial, auxiliary port is included on all AccessPro cards. This is a DTE port to which you can attach a CSU/DSU or protocol analyzer for network access. This port connects to external equipment using an RJ-45-to-DB-25 adapter, shown in Figure 2-5. The appendix “Cabling Specifications” lists the pinouts for the auxiliary port.

Note The auxiliary port does not support hardware flow control.

Figure 2-5 RJ-45-to-DB-25 Adapter

