BLACK BOX®
NETWORK SERVICES

Plug and Play Commercial Phone Line Managers: XL-3 x 6; XL 4 x 12; XL 8 x 24; XL 12 x 36; XL 16 x 48
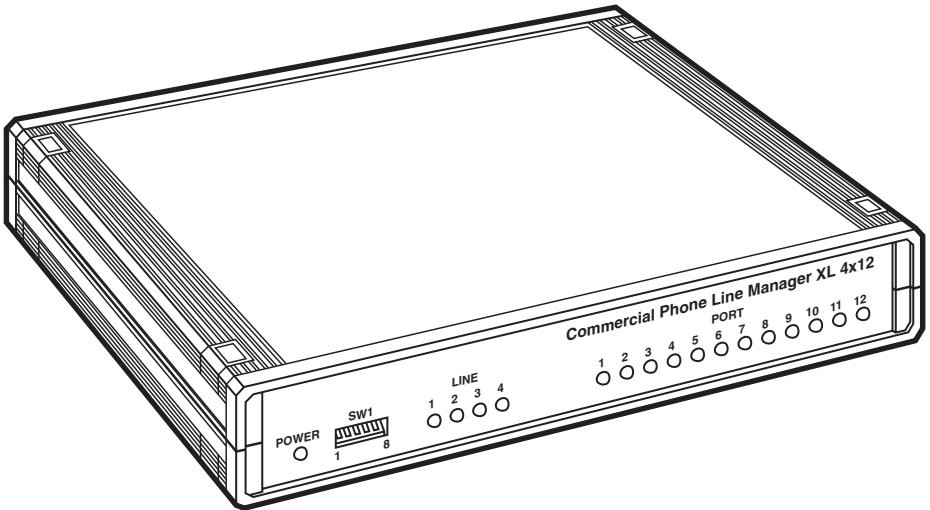
TRADEMARKS USED IN THIS MANUAL

UL is a registered trademark of Underwriters Laboratories Incorporated.

Other product names mentioned in this manual may be trademarks or registered trademarks of their respective companies and are hereby acknowledged.

FEDERAL COMMUNICATIONS COMMISSION
AND
INDUSTRY CANADA
RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

FCC REQUIREMENTS FOR
TELEPHONE-LINE EQUIPMENT

1. The Federal Communications Commission (FCC) has established rules which permit this device to be directly connected to the telephone network with standardized jacks. This equipment should not be used on party lines or coin lines.

2. If this device is malfunctioning, it may also be causing harm to the telephone network; this device should be disconnected until the source of the problem can be determined and until the repair has been made. If this is not done, the telephone company may temporarily disconnect service.

3. If you have problems with your telephone equipment after installing this device, disconnect this device from the line to see if it is causing the problem If it is, contact your supplier or an authorized agent.

4. The telephone company may make changes in its technical operations and procedures. If any such changes affect the compatibility or use of this device, the telephone company is required to give adequate notice of the changes.

5. If the telephone company requests information on what equipment is connected to their lines, inform them of:

   a. The telephone number that this unit is connected to.

   b. The ringer equivalence number.

   c. The USOC jack required: RJ-11C.

   d. The FCC registration number.

   Items (b) and (d) can be found on the unit's FCC label. The ringer equivalence number (REN) is used to determine how many devices can be connected to your telephone line. In most areas, the sum of the RENs of all devices on any one line should not exceed five (5.0). If too many devices are attached, they may not ring properly.

6. In the event of an equipment malfunction, all repairs should be performed by your supplier or an authorized agent. It is the responsibility of users requiring service to report the need for service to the supplier or to an authorized agent.

CERTIFICATION NOTICE FOR
EQUIPMENT USED IN CANADA

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications-network protective, operation, and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single-line individual service may be extended by means of a certified connector assembly (extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility—in this case, your supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION:

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The LOAD NUMBER (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices, subject only to the requirement that the total of the load numbers of all the devices does not exceed 100.

NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

   A: El cable de poder o el contacto ha sido dañado; u

   B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

   C: El aparato ha sido expuesto a la lluvia; o

   D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

   E: El aparato ha sido tirado o su cubierta ha sido dañada.

Contents

1. Specifications

User Connections — All models: Mini jack for power supply; FX6306NA: (3) RJ-11 modular jacks for telephone lines, (6) RJ-11 modular jacks for industry-standard telephone devices; FX6412NA: (4) RJ-11 modular jacks for telephone lines, (12) RJ-11 modular jacks for industry-standard telephone devices; FX6824NA: (8) RJ-11 modular jacks for telephone lines, (24) RJ-11 modular jacks for industry-standard telephone devices; FX1236NA: (12) RJ-11 modular jacks for telephone lines, (36) RJ-11 modular jacks for industry-standard telephone devices; FX1648NA: (16) RJ-11 modular jacks for telephone lines, (48) RJ-11 modular jacks for industry-standard telephone devices

Indicators — FX6306NA: (3) telephone line-in-use LEDs, (6) IST device-in-use LEDs, (1) Power-on LED; FX6412NA: (4) telephone line-in-use LEDs, (12) IST device-in-use LEDs, (1) Power-on LED; FX6824NA: (8) telephone line-in-use LEDs, (24) industry-standard telephone device-in-use LEDs, (1) Power-on LED; FX1236NA: (12) telephone line-in-use LEDs, (36) IST device-in-use LEDs, (2) Power-on LEDs; FX1648NA: (16) telephone line-in-use LEDs, (48) IST device-in-use LEDs, (2) Power-on LEDs

Compliance — FCC Part 68 registered; FCC Part 15 registered; Ringer Equivalence 0.7B; UL listed 81J1, E81356, CSA-power supply

Power — Wallmount AC adapter; 9V, 1 A, 115 VAC, 60 Hz; UL® and CSA

NOTE
FX1236NA and FX1648NA use two power supplies.

Size —   FX6306NA: 2.45"H x 6.2"W x 10.2"D
(6.2 x 15.7 x 25.9 cm); FX6412NA: 2.45"H x
11.45"W x 10.2"D (6.2 x 29.1 x 25.9 cm);
FX6824NA: 4.25"H x 11.45"W x 10.2"D (10.8 x
29.1 x 25.9 cm); FX1236NA: 5.25"H x 19"W x
10.2"D (13.4 x 48.3 x 25.9 cm); FX1648NA: 7"H
x 19"W x 10.2"D (17.8 x 48.3 x 25.9 cm)

Weight —   FX6306NA: 2 lb. (0.9 kg);
FX6412NA: 5 lb. (2.3 kg);
FX6824NA: 8 lb. (3.6 kg);
FX1236NA: 11 lb. (4.9 kg);
FX1648NA: 14 lb. (6.4 kg)

2. Introduction

2.1 Description

The Plug and Play Phone Line Manager XL allows a company to use the minimum number of telephone lines required to support the maximum number of industry-standard telephone (IST) devices. An IST is any type of telecommunications device that works on a standard telephone company telephone line, such as modems, fax machines, fax/modems, credit-card terminals, etc. The Plug and Play Phone Line Manager XL can save a company hundreds to thousands of dollars per year in telephone-line installation costs and recurring monthly line charges.

The Plug and Play Phone Line Manager XL can work with any type of standard telephone line: POTS (Plain Old Telephone Service) or Centrex, touchtone or rotary. It also works with any industry-standard telephone lines with any type of telephone system—you can even share industry-standard telephone extensions on any telephone system.

The Plug and Play Phone Line Manager XL is designed for analog telephone-line switching in the U.S. and Canada only. The switching is accomplished using metallic contacts to ensure no degradation of the signal, for any suitable application. You can be sure that any device which works directly with an analog phone line will work equally well through a Plug and Play Phone Line Manager XL.

The Plug and Play Phone Line Manager XL 3 x 6 can support up to six IST devices and three telephone lines. The Plug and Play Phone Line Manager XL 4 x 12 can support up to twelve IST devices and four telephone lines. The Plug and Play Phone Line Manager XL 8 x 24 can support up to twenty-four IST devices and eight telephone lines. The Plug and Play Phone Line Manager XL 12 x 36 can support up to 36 IST devices and 12 telephone lines. The Plug and Play Phone Line Manager XL 16 x 48 can support up to 48 IST devices and 16 telephone lines. You can also link or daisychain multiple Plug and Play Phone Line Manager XL units together to support an even greater number of IST devices and telephone lines. Please see **Section 3.1.1, Networking Multiple Units Together**, for other possible line and device combinations.

The Plug and Play Phone Line Manager XL has inbound and outbound calling capabilities. On inbound calls, ringing lines connect directly through to specific IST ports. This ring-through capability allows the Plug and Play

Phone Line Manager XL to reside unobtrusively in front of many telephone systems: KSU or PBX, analog or digital. In this situation, the Plug and Play Phone Line Manager XL can share outgoing IST devices with a main pool of voice telephone lines.

The Plug and Play Phone Line Manager XL is an electronic switch and has been designed for durability and ease of maintenance, but some care should be taken when handling it. Do not expose the Plug and Play Phone Line Manager XL to high humidity or extreme electrical fields. As with all electronic devices, you should take precautions against static electricity.

2.2 What's Included

Unpack the Plug and Play Phone Line Manager XL. Check to make sure the Plug and Play Phone Line Manager XL was not damaged in shipping. If you notice any obvious damage that occurred in transit, notify your shipper immediately.

Verify that you have everything that should be included with your Plug and Play Phone Line Manager XL. A checklist is provided below.

- •Plug and Play Phone Line Manager XL 3 x 6, 4 x 12, 8 x 24, 12 x 36 (includes one 4 x 12 and one 8 x 24), or 16 x 48 (includes two 8 x 24 units)
- •Wallmount AC Adapter
- •Rubber feet and hook & loop fastener with mounting instructions
- •This manual

The 12 x 36 and 16 x 48 models will also include:

- •One 11.45" x 10.2" black finished steel 0.090" shelf
- •One 19"W black finished steel 0.125" shelf faceplate
- •Four truss-head screws, 10-32, ⅜" long
- •Six truss-head screws, 10-32, ½" long
- •Four nylon insert nuts, 10-32
- •Shelf assembly instructions

If anything is missing from your order, call us at 724-746-5500.

3. Installation

Select an appropriate location away from direct sources of heat or cold. The Plug and Play Phone Line Manager XL can be stacked on a desk or table, or mounted vertically on a wall. Typically the Plug and Play Phone Line Manager XL is located in the same area as other computer network or telephone equipment. All device and power connections are made in the rear of the unit. *All connections or disconnections must be made with power removed from the unit.*

The FX1236NA and FX1648NA mount in a 19" rack. First, locate the four pre-drilled holes in the bottom of the faceplate and front of the shelf. Align the faceplate holes with the shelf holes and then insert the screws through the holes. Place the nylon insert nuts onto the back of the screws. Tighten the screws until hand-tight. Now you can mount the shelf in a standard 19" rack using the supplied 10-32, ½" long truss-head screws. Once the shelf is mounted, the units can be placed on the shelf with front-panel LEDs facing forward or with the RJ-11 connectors facing forward for patch-panel applications.

We have included both self-adhesive feet and an adhesive-backed hook & loop fastener. The feet are useful when the unit will be resting on a flat surface. The hook & loop fastener is useful when mounting the unit to a wall or other vertical surface. The hook & loop fasteners also provide rackmount stability when installed between the two Phone Line Manager units on the 12 x 36 and 16 x 48 models. To use the hook & loop fastener, keep the hook and loop halves together while peeling the plastic backing from one side and stick it to one of the bottom corners of the unit. Repeat the process for all four corners. Now peel the remaining plastic backing from the hook and loop halves. Carefully line the Plug and Play Phone Line Manager XL up where you want to mount it and press the unit firmly to the mounting surface. Once installed using the hook & loop fastener, the unit may be removed from the mounting surface by grasping the unit and pulling firmly away from the mounting surface. To remount, align the hook & loop halves together and press firmly together.

3.1 Connecting the Telephone Lines and IST Devices

NOTE

In the following description and throughout this manual, the first number listed refers to the LINE and IST Ports available on the Plug and Play Phone Line Manager XL 3 x 6. The second and third numbers (listed in parentheses) refers to the LINE and IST Ports available on the Plug and Play Phone Line Manager XL 4 x 12 and the Plug and Play Phone Line Manager XL 8 x 24. The 12 x 36 is actually a 4 x 12 and a 8 x 24 Phone Line Manager. The 16 x 48 is actually two 8 x 24 units. You can use the 12 x 36 and 16 x 48 as two separate Phone Line Manager units, or network them together as explained in Section 3.1.1.

Connect your telephone lines to the LINE Ports numbered 1 through 3 (4 or 8), starting with LINE Port 1. If connecting fewer than 3 (4 or 8) lines, leave the higher numbered LINE Ports unconnected. Similarly, connect the RJ-11 modular line cords from your IST devices to the desired IST Ports, starting with IST Port 1. If connecting fewer than 6 (12 or 24) IST devices, leave the higher-numbered IST Ports unconnected. See the information on the next page for additional information concerning the connection of the Line Ports and Incoming IST Ports.

When connecting telephone lines and IST devices to the Plug and Play Phone Line Manager XL, the devices that will receive incoming calls must be connected to the Incoming IST Ports as listed in the chart below. The highest-priority incoming-call device should be connected to IST Port 1, and its associated telephone line should be connected to LINE Port 1. The next-highest-priority incoming-call device should be connected to IST Port 2 and its associated telephone line should be connected to LINE Port 2, etc. Incoming calls to the first line ports of the Plug and Play Phone Line Manager XL are passed directly through to the first IST Ports; therefore, the number of IST devices that can accept incoming calls is equal to the number of telephone lines connected to the Phone Line Manager XL.

Incoming IST Ports

3 x 6 Model		4 x 12 Model		8 x 16 Model	
LINE Port	IST Port	LINE Port	IST Port	LINE Port	IST Port
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
		4	4	4	4
				5	13
				6	14
				7	15
				8	16

After connecting the incoming IST devices and associated lines to the Plug and Play Phone Line Manager XL, proceed in connecting any additional outgoing devices and telephone lines to the respective Plug and Play Phone Line Manager XL IST Ports and LINE Ports.

### 3.1.1 NETWORKING MULTIPLE PHONE LINE MANAGER UNITS TOGETHER

You can network the Phone Line Managers together to provide additional IST device ports, telephone line ports, or both. The method you choose to network the units together depends on the quantity of IST devices, the telephone line use, and the application.

NOTE

The following diagrams use 4 x 12 Phone Line Manager units. The same connections apply to 4 x 12 or 8 x 24 units. If you have questions about your network application, please call Black Box Technical Support.

Example 1: Providing Additional IST Device Ports

When an application requires more IST ports than one Phone Line Manager can provide, you can network two or more Phone Line Managers together. Simply connect IST ports on the first Phone Line Manager to the line ports on the second Phone Line Manager. Providing more than one network connection between the two Phone Line Managers will permit more than one IST device on the second Phone Line Manager to simultaneously access the telephone lines on the first Phone Line Manager. A 3 to 1 ratio of devices to lines is typical, although your particular application may be different. The goal is to be able to provide dial tone and outbound call capability to all outbound IST devices, while maintaining inbound call availability for those applications and IST devices that require it. Networking two 4 x 12 Phone Line Manager units together in this manner will create a 4 x 20 Phone Line Manager. Networking two 8 x 24 Phone Line Managers together creates an 8 x 40 Phone Line Manager, while networking three 8 x 24s will create an 8 x 56 Phone Line Manager.
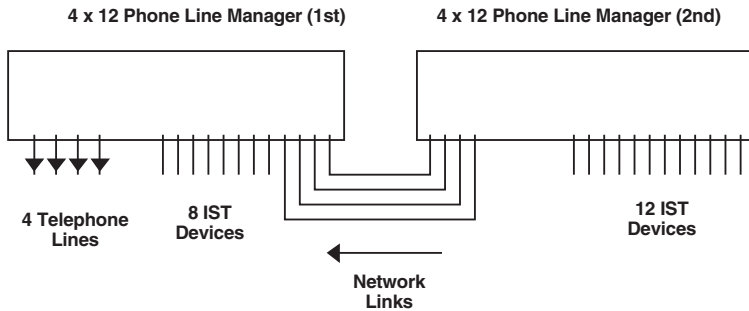
Figure 3-1. 4 x 20 Network Application.

In the above example, IST devices on the first and the second Phone Line Manager will have equal outbound access to the four telephone lines since four network links have been provided. For inbound calls on the incoming/outgoing Phone Line Manager, the four telephone lines will ring the first four IST ports on the first Phone Line Manager. All other IST ports (5-12) on the first Phone Line Manager and all IST ports (1-12) on the second Phone Line Manager are for outbound calling only.

Example 2: Providing Additional Line Ports and Device Ports

If the quantity of telephone lines and IST devices that are required for your application exceed the capacity of one Phone Line Manager, then you can network two or more units together. In this application, to increase the Phone Line Manager capacity to handle the quantity of lines and device ports you need, connect one half of the telephone lines to the first Phone Line Manager and the other half of the telephone lines to the the second Phone Line Manager. Leave at least one Line port and one IST port open on each Phone Line Manager for networking. By connecting Line Port #1 on the first Phone Line Manager to the last IST port on the second Phone Line Manager, and by connecting Line Port #1 on the second Phone Line Manager to the last IST port on the first Phone Line Manager, an outgoing call from any IST port can access the telephone lines on any networked Phone Line Manager.

Networking two Phone Line Managers together in this manner will allow an IST device to search and gain access to an available telephone line connected

to either Phone Line Manager unit. Networking two 4 x 12 units together by this method will effectively create a 6 line x 22 IST port Phone Line Manager. Networking two 8 x 24 Phone Line Managers together will create a 14 x 46 Phone Line Manager, and networking three 8 x 24 Phone Line Managers together will create a 21 x 69 Phone Line Manager.
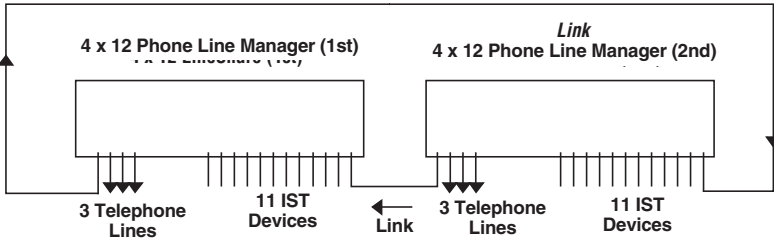
Figure 3-2. 6 x 22 Networked Application.

In the above example, IST devices on the first and the second Phone Line Manager will have equal outbound access to the three telephone lines on their own Phone Line Manager. The fourth outbound call will be networked to the other Phone Line Manager and have access to those three telephone lines over the network link that is provided. For inbound calls, the three telephone lines on each Phone Line Manager will ring the direct connect IST ports (2-4) on the same Phone Line Manager. All other IST ports (except network links) are for outbound calling only.

3.2 Connecting the Data Port

The RJ-11 jacks on the back panel labeled DATA are for field service and diagnostic use only, and should be left unconnected in the Plug and Play Phone Line Manager XL setup.

3.3 Setting the Switches

SW1 (and SW2 on the 8 x 24 model) on the front panel of the Plug and Play Phone Line Manager XL must be set to identify the line connections and operation as follows. Switches SW1-1 and SW1-5 correspond to Line 1, switches SW1-2 and SW1-6 correspond to Line 2, etc. SW2 is configured identically to SW1 on the Plug and Play Phone Line Manager XL 8 x 24, and controls Lines 5 through 8.

Table 3-1. SW1 Configuration

	Ln 1 SW1-1	Ln 2 SW1-2	Ln 3 SW1-3	Ln 4* SW1-4	Ln 1 SW1-5	Ln 2 SW1-6	Ln 3 SW1-7	Ln 4* SW1-8
Line Present	ON	ON	ON	ON				
Ln Not Pres	OFF	OFF	OFF	OFF				
Hunt Enabled					ON	ON	ON	ON
Hunt Disabled					OFF	OFF	OFF	OFF

*For the Plug and Play Phone Line Manager XL 3 x 6, SW1-4 and SW1-8 are not present.

Table 3-2. SW2 Configuration

	Ln 5 SW2-1	Ln 6 SW2-2	Ln 7 SW2-3	Ln 8 SW2-4	Ln 5 SW2-5	Ln 6 SW2-6	Ln 7 SW2-7	Ln 8 SW2-8
Line Present	ON	ON	ON	ON				
Ln Not Pres	OFF	OFF	OFF	OFF				
Hunt Enabled					ON	ON	ON	ON
Hunt Disabled					OFF	OFF	OFF	OFF

The Line Present/Not Present settings determine which of the lines are checked for purposes of **outgoing** line access. When a device connected to an IST Port goes off-hook, the Plug and Play Phone Line Manager XL will search for an available line. The Plug and Play Phone Line Manager XL always searches the higher-numbered LINE Ports first. Example: If four lines are connected to the Plug and Play Phone Line Manager XL, the Plug and Play Phone Line Manager XL will check LINE Port 4 first, then LINE Port 3, then LINE Port 2, etc. The only exception to this is the first IST Ports (those IST Ports that have a corresponding line connected to them). Each of these IST Ports checks its own" line first. Example: IST Port 2 checks for line availability

(dial tone) on LINE Port 2 first. If LINE Port 2 is not available (another device is using it), the Plug and Play Phone Line Manager XL will check LINE Port 4, then LINE Port 3, etc. If all lines are in use, then the requesting IST Port will get no dial tone to indicate no line available.

Each "line present" switch is factory-set initially in the "ON" position. If a LINE Port has no line connected to it, or if the line is to be restricted for incoming calls only, the "line present" switch should be set to the "OFF" position. The Hunt Enabled/Disabled settings determine the mode of operation for handling an incoming call. When hunt is disabled (the Hunt Enabled/Disabled switch is in the "OFF" position), an incoming call is connected through to the same-numbered IST Port. Example: LINE Port 1 connects to IST Port 1, LINE Port 2 to IST Port 2, etc. If the desired IST Port is in use (connected to another line), the call is left unconnected in the Plug and Play Phone Line Manager XL, causing a ring-no-answer (RNA) condition. This is desirable on a modem or fax line, since normally an incoming line is associated with a single device that must be available when called. However, when the Plug and Play Phone Line Manager XL is installed in front of a telephone system KSU or PBX, this RNA condition defeats the hunt sequence that a telephone company normally provides when an incoming call is directed to a main number which is busy. In such an application you would set hunt enabled "ON" for each line connected to the Plug and Play Phone Line Manager XL in front of the KSU or PBX. This causes the Plug and Play Phone Line Manager XL to hunt from IST Port to IST Port on an incoming call when the first port or ports in the sequence are busy.

In most applications, the Hunt Enabled/Disabled switches should be in the "OFF" position. The switches should be set to the "ON" position only when an application calls for an incoming call ringing into a device that is busy to forward to the next device. The following are incoming-call applications where hunt enabled should be set to the "ON" position: modem pooling, fax pooling, and sharing lines with a KSU or PBX telephone system. You must set at least two or more consecutive switches to the "ON" position to create a loop or pool.

Since the Plug and Play Phone Line Manager XL routes the 3 (4 or 8) telephone lines directly through to the Incoming IST Ports, as listed in **Section 3.1**, take this into account when placing the Plug and Play Phone Line Manager XL in front of a KSU or PBX system, or when matching incoming telephone numbers with IST devices during installation. Only the Incoming IST device ports are capable of receiving incoming calls.

Each "hunt enabled" switch is factory-set initially in the "OFF" position.

3.4 Connecting the AC Adapter

Plug the supplied wallmount AC adapter into a suitable electrical outlet, and plug the mini-plug into the power-outlet receptacle on the back of the Plug and Play Phone Line Manager XL. To protect the Plug and Play Phone Line Manager XL from electrical surges and brownouts, use an electrical surge protector.

The Plug and Play Phone Line Manager XL's front-panel LEDs will light to indicate a self-test; the POWER LED will stay lit if the self-test is successful. If the POWER LED does not stay on (all the LEDs turn on and then back off), remove power, check all your connections and reapply power. If the problem repeats, see **Chapter 6**, Troubleshooting.

4. Operation

4.1 Incoming Calls

Incoming calls to the first LINE Ports of the Plug and Play Phone Line Manager XL are passed directly through to the Incoming IST Ports. Therefore, the number of IST devices that can accept incoming calls is equal to the number of telephone lines connected to the Plug and Play Phone Line Manager XL. Example: four IST devices (Ports 1 through 4) can receive incoming calls if four telephone lines are connected to the Plug and Play Phone Line Manager XL.

Incoming calls to an Incoming IST port that is busy will forward to the next available Incoming IST Port if the hunt enable switches for those lines are in the "ON" position. Remember there must be at least two or more consecutive hunt enable switches set to the "ON" position to create a loop or pool.

When a Line Port is ringing an IST Port, the Line Port LED (representing the Line Port the call is coming in on) and the IST Port LED (representing the IST Port that the Line Port is directly connected to) will both light solid and the IST device will ring until answered or indefinitely until the originating party hangs up. Once answered, both the Line Port and IST Port LEDs will remain on throughout the duration of the call. If the IST Port is currently busy with a call on another line, the outside originating caller (into the Plug and Play Phone Line Manager XL) will receive a ring-back signal until the intended IST Port does become available and answers. If the "Hunt Enable Switch" parameter for the intended IST Port is set to ON, then the ringing will be passed to the next Primary IST Port and that IST Port's LED will light.

When the IST device hangs up (goes on-hook) and terminates the incoming call, the IST Port LED will go out immediately (upon sensing the IST on-hook) and the Line Port LED will flash for up to 15 seconds to allow the line to stabilize and the telephone company to release the line before allowing another IST Port to select the line for an outgoing connection. If a second incoming call comes in on the same line before the end of the 15 second timeout, the Plug and Play Phone Line Manager XL will accept and process the call.

4.2 Outgoing Calls

Any IST device connected to a port on the Plug and Play Phone Line Manager XL can access dial tone to make an outbound call. The number of IST devices that can be in use simultaneously is equal to the number of telephone lines connected to the Plug and Play Phone Line Manager XL and enabled for outgoing access via SW1 positions 1 through 3 for the Plug and Play Phone Line Manager XL 3 x 6, SW1 positions 1 through 4 for the Plug and Play Phone Line Manager XL 4 x 12, and both SW1 and SW2 positions 1 through 4 for the Plug and Play Phone Line Manager XL 8 x 24.

Outgoing calls will cause the IST Port LED and the Line Port LED to light solid. If none of the Line Ports are available (busy on another call with another IST Port), then the originating outgoing IST Port LED will flash until an outgoing Line Port does become available. If any of the Line Ports have Line Present Switch (SW1 and/or SW2) set to ON, and there is no Line attached, the Line Port LED will flash and then pass the call to the next Line Port. When an available Line Port is accessed, both the IST Port and the Line Port LEDs will light solid and remain ON throughout the duration of the call.

When an IST device hangs up (goes on-hook) and terminates the outgoing call, the IST Port LED will go out first and the Line Port LED will flash for 3 seconds (to allow the line to stabilize) before another IST Port can access the line for dial tone and outgoing calls.

4.3 Data-Transmission Speed

The Plug and Play Phone Line Manager XL is transparent to speed.

4.4 Power-Failure Transfer

The Plug and Play Phone Line Manager XL provides straight-through connections of all lines on power-off. The connections are listed below.

Incoming IST Ports

3 x 6 Model		4 x 12 Model		8 x 16 Model	
LINE Port	IST Port	LINE Port	IST Port	LINE Port	IST Port
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
		4	4	4	4
				5	13
				6	14
				7	15
				8	16

The number of telephone lines connected to the Plug and Play Phone Line Manager XL determines the number of straight-through power-fail connections available for inbound and/or outbound calling.

4.5 Non-Volatile Memory

The Plug and Play Phone Line Manager XL retains its programming during power outages and while the Plug and Play Phone Line Manager XL is electrically unplugged. When the electrical power comes on, the Plug and Play Phone Line Manager XL is ready to go.

5. Troubleshooting

If you encounter a problem when you first install or operate the Plug and Play Phone Line Manager XL, review this chapter for likely causes.

5.1 Common Problems

1) Power LED does not light.
Check whether the power supply is properly connected to the power receptacle on the back panel of the Plug and Play Phone Line Manager XL. Also, check whether the power supply is connected to a live power outlet. Verify that the power supply connected to the Plug and Play Phone Line Manager XL is the original power supply provided with the Plug and Play Phone Line Manager XL.

2) IST Port receives no dial tone when going off hook.
First, determine whether a LINE Port is available (not being used by another IST Port). Second, check the switch settings on the front panel of the Plug and Play Phone Line Manager XL. All switch settings corresponding to the Line Present/Not Present switches should be in the "ON" position for each LINE Port that a live telephone line to be used for outgoing calls is connected to. The Line Present/Not Present switches should be in the "OFF" position for each LINE Port that is for incoming calls only or that does not have a live telephone line connected to it. Third, check the telephone line before it is connected to the Plug and Play Phone Line Manager XL for dial tone. Fourth, verify that the telephone line cords connected to the LINE Ports and IST Ports are working properly.

3) Modem or other IST device does not access dial tone on outgoing calls.
Check all connections for proper installation. Determine whether the IST Port that the modem is connected to is operating properly. Do this by connecting a standard telephone to that port. If you receive a dial tone when you pick up the receiver, the Plug and Play Phone Line Manager XL is operating properly. Check the manual for the modem or other IST device for proper operating procedures for that device. Try all of the troubleshooting solutions listed in Problem 2.

4) IST device (modem, fax, etc.) does not receive an incoming call.
Verify that the IST device is connected to an IST Port that corresponds to a LINE Port. Example: An IST device connected to IST Port 4 will not receive incoming calls if there is not a live telephone line connected to LINE Port 4 (unless LINE Port 3 detects busy on IST Port 3 and the Hunt Enable switch for LINE Port 3 is ON). Test the IST device directly on a telephone line without being connected to the Plug and Play Phone Line Manager XL. If the IST device continues not to answer incoming calls, check the user's manual of the device for proper operating procedures. Try all of the troubleshooting solutions listed in Problem 2.

5.2 Calling Black Box

If you determine that your Plug and Play Phone Line Manager XL is malfunctioning, *do not attempt to alter or repair the unit.* It contains no user-serviceable parts. Contact Black Box at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.

- when the problem occurs.

- the components involved in the problem.

- any particular application that, when used, appears to create the problem or make it worse.

5.3 Shipping and Packaging

If you need to transport or ship your Plug and Play Phone Line Manager XL:

- Package it carefully. We recommend that you use the original container.

- Please wrap the original box or similar-sized carton in bubble-wrap and place in a second box for return shipping to prevent damage.

- If you are shipping the Plug and Play Phone Line Manager XL for repair, make sure you include everything that came in the original package. Before you ship, contact Black Box to get a Return Materials Authorization (RMA) number.

Appendix B: Connection Log

IST Device Name/ Location	Phone Line Manager IST Port #	Manager Line Port # and Power Fail Connection	Line Port Enabled? (Outbound)	Line Port Hunt Enabled? (Inbound)	Line Port Line #
	1	1			
	2	2			
	3	3			
	4	4			
	5				
	6				
	7				
	8				
	9				
	10				
	11				
	12				
	13	5			
	14	6			
	15	7			
	16	8			
	17				
	18				
	19				
	20				
	21				
	22				
	23				
	24				

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1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746