Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

Reference Manual

Check the Extron Web site (www.extron.com) for updates.

IPL 250

IP Link® Ethernet Controller

68-1715-01 **Rev. A**
08 09

Precautions

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Avertissement

Alimentations• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

安全须知 • 中文

这个符号提示用户该设备用户手册中有重要的操作和维护说明。

这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

警告

电源 • 该设备只能使用产品上标明的电源。 设备必须使用有地线的供电系统供电。 第三条线（地线）是安全设施，不能不用或跳过 。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

电源线保护 • 妥善布线， 避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。 设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。 不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE *This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.*

For more information on safety guidelines, regulatory compliances, EMI/EMF compliance, accessibility, and related topics, click here.

Table of Contents

Table of Contents, cont'd

Table of Contents, cont'd

68-1715-01 **Rev. A**
08 09

Chapter One

Introduction

About This Manual

About the IPL 250

IR and RS-232 Device Control

How the IPL 250 Works: Components and Interactions

Optional TouchLink Touchpanels

System Requirements

Introduction

About This Manual

This manual provides detailed information and best practices recommendations about cabling and configuring the Extron IPL 250 IP Link® Ethernet Control Processor and reference information about the controller's specifications, programming, and special applications.

It does not contain instructions on the most basic setup steps: those are covered in the *IPL 250 Setup Guide*, which describes how to set up the hardware, how to use the Global Configurator (GC) program to download drivers, add A/V devices to a GC configuration, configure the front panel buttons, set a shutdown schedule, and set up e-mail alerts to flag a projector disconnection or warn that lamp hours are exceeded.

About the IPL 250

The IPL 250 is capable of controlling a projector, source devices, switchers, and various other items such as lights, a projector lift, or a screen motor in a distributed control system environment or as a stand-alone controller. It allows legacy products to be linked to and controlled via a network. Throughout this manual the IPL 250 is also referred to as the IPL, "Ethernet control processor,"or "controller."

Features

General features

Flexible options for device control — The IPL offers RS-232 and IR-based projector/display/source control; relays for controlling items such as a projector lift, motorized projection screen, and lights; and contact closure input control of the relays.

A variety of mounting options — The 1U high, one quarter rack wide enclosure can be rack mounted, furniture mounted, or mounted to a projector mount pole.

Universal power system compatibility — The IPL includes an external power supply that accepts 100-240 VAC, 50-60Hz input.

Network and configuration features

The IPL 250 can be configured and controlled via a host computer via IP Link Ethernet control. Setup and control can be accomplished by simple ASCII commands (Simple Instruction Set, SIS™) or via the included Global Configurator program. The software offers many more setup options than does SIS programming. After being configured, the IPL 250 can be controlled by an Extron TouchLink™ touchpanel connected to the same network.

Via Ethernet/IP communication you can access the IPL 250's embedded Web pages, which include online diagnostics and monitoring of basic control features. As an integrated part of the IPL 250, IP Link provides the following advantages:

Global compatibility — The IPL uses standard Ethernet communication protocols, including ARP, DHCP, ICMP (ping), TCP, IP, Telnet, HTTP, and SMTP.

Embedded Web page serving — The IPL 250 offers up to 7.25 MB of flash memory for storing Extron and user-supplied Web pages, configuration settings, and device drivers. Data in flash memory is served at a transfer rate of 6 Mbits per second.

Remote equipment management — The IP Link connection allows you to remotely manage projectors, cameras, video conferencing equipment, switchers, and other A/V equipment.

Multi-user support — Up to two hundred (200) simultaneous connections enable each IP Link device to support many concurrent users and improve system throughput by sending information in parallel.

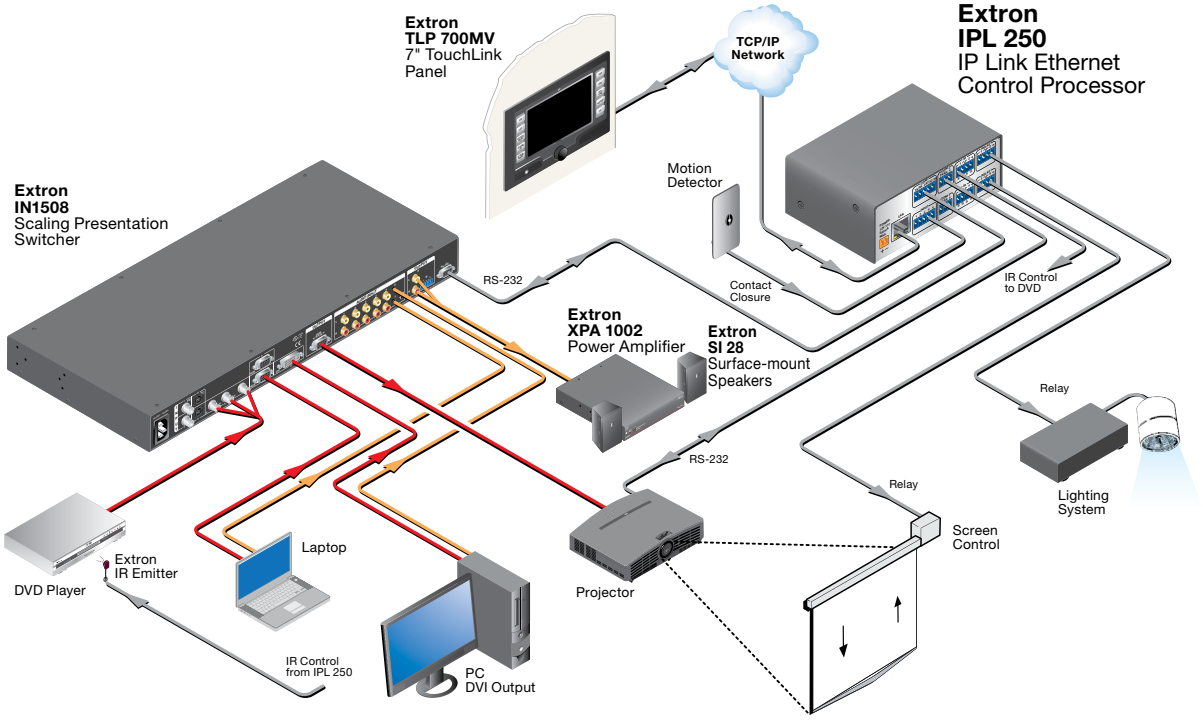
Built-in multilevel security — The user controls access to the devices attached to the controller. Two levels of password protection provide appropriate security.

Management ability via Global Configurator 3.0 and higher — The included software and the GlobalViewer Web pages associated with it allow you to control, monitor, and schedule various functions of devices connected to IP Link products such as the IPL.

E-mail notification — The IPL 250 can be set up to send an e-mail when a projector has been disconnected or the projector's lamp has been used for a designated number of hours.

Controlling other devices

The IPL 250 offers RS-232, infrared (IR), and relay device control. It can learn IR signals from remote controls to communicate with sources such as VCRs and DVD players. Users can create their own device drivers (IR) or go to the Extron Web site (www.extron.com) to obtain device drivers.



A typical IPL 250 application with a TouchLink panel

IR and RS-232 Device Control

The IPL must be configured in one of the following ways before it will send commands to a projector/display/source:

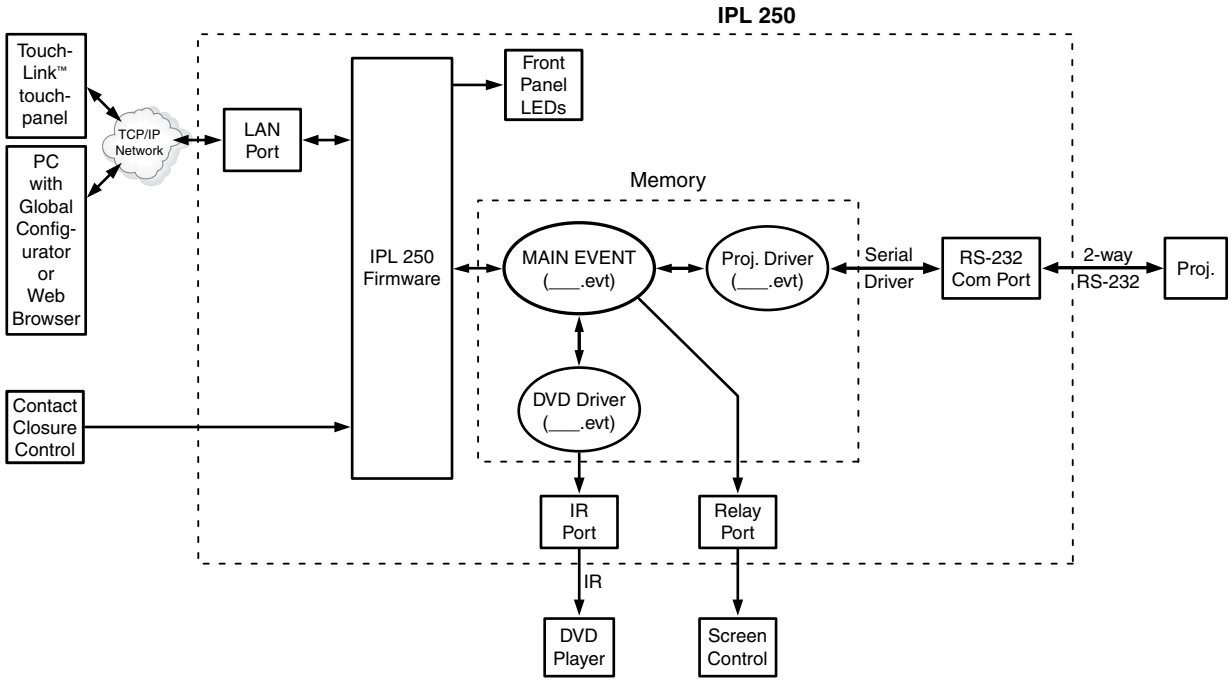
- An IR or an RS-232 driver file can be installed from a disk, downloaded from the Extron Web site (www.extron.com), or downloaded from Extron using the driver subscription feature within Global Configurator. The driver is saved to a folder and uploaded to the IPL via Global Configurator.
- RS-232 command strings can be entered directly from a host computer using Extron Global Configurator software.
- IR commands can be entered directly from an IR remote control through IR learning and the Extron IR Learner software to create a driver that the IPL can

use. IR learning is convenient for installing new or updated commands into the IPL 250 in the field.

Refer to the Global Configurator help file or the IR Learner help file (which comes with the software) for details on setting up the IPL and for downloading, programming, or learning device control commands.

How the IPL 250 Works: Components and Interactions

The IPL 250 requires and uses event files to perform functions. The event files define, monitor, and govern how an IPL 250 works. The following diagrams are examples of how the IPL interacts with accessories, event scripts, drivers, ports, and input and output devices.



The IPL can be configured completely via Global Configurator software. Once you have set up how you want it to work (assigned drivers to ports, configured relays and contact closure input, and set up IP addresses and functions), that information is saved to a project file that is uploaded into the IPL.

The configuration information is used to create the "main event" (0.evt) script file that defines the IPL's operation. The main event file also controls and monitors ports and optional control accessories. Scripts are compiled to generate the main event file to monitor events and to generate actions (such as issuing commands and triggering relays).

Creating a Control System Using the IPL with Optional Extron TouchLink™ Touchpanels

Not only can the IPL 250 act as a stand-alone controller that can be accessed via its internal and GlobalViewer Web pages, but it also can act as the centerpiece of a control system that features Extron TouchLink Touchpanels. The touchpanels provide a convenient, aesthetically pleasing interface for controlling the IPL, which, in turn, controls the other system components.

If you have additional questions or need support for your Extron control system installation, contact the Extron S3 Control Systems Support Hotline.

System Requirements

The IPL 250 and Global Configurator have the following hardware and software requirements:

Hardware requirements

- Intel® Pentium® III, 1 GHz processor
- 512 MB of RAM
- 50 MB of available hard disk space
- A network connection with a minimum data transfer rate of 10 Mbps (100 Mbps is recommended)

Software requirements

For GUI Configurator and Global Configurator 3:

- Microsoft® Windows® operating system
  - Windows XP service pack 2,
  - Windows Vista® or
  - a higher version of Windows

CAUTION *Do not run Global Configurator software on a PC that uses an earlier version of Windows.*

Global Configurator has the following system requirements in addition to those listed above:

- Microsoft Internet Explorer® 6.0 or higher with ActiveX® enabled
- Microsoft Windows Script 5.6

Chapter Two

Hardware Features and Installation

Setup Checklist: How to Proceed With Installation

Front Panel Features

Mounting the IPL 250

Rear Panel Features and Connections

Resetting the Unit

Application Diagram

Hardware Features and Installation

Setup Checklist: How to Proceed With Installation

Get Ready

- ☐ Familiarize yourself with the IPL 250's features.
- ☐ Download and install the latest version of the Extron Global Configurator software (version 3.0 or higher) and the latest driver package (available from www.extron.com or the *Extron Software Products Disk*.)
- ☐ Obtain IP setting information from the network administrator for the IPL.
- ☐ Obtain model names and setup information for devices that the IPL will control.

Perform Physical Installation

- ☐ Mount the unit to a rack, furniture, or projector mount. (See the instructions in this chapter.)
- ☐ Cable devices to ports on the IPL 250. (See chapter 2 of this manual or of the *IPL 250 Setup Guide*.)
- ☐ Connect power cords and turn on the devices in the following order: output devices (projectors, monitors, speakers), the IPL, a PC (for setup) or touchpanel (for control after configuration), then all input devices (DSS, cable boxes, etc.).

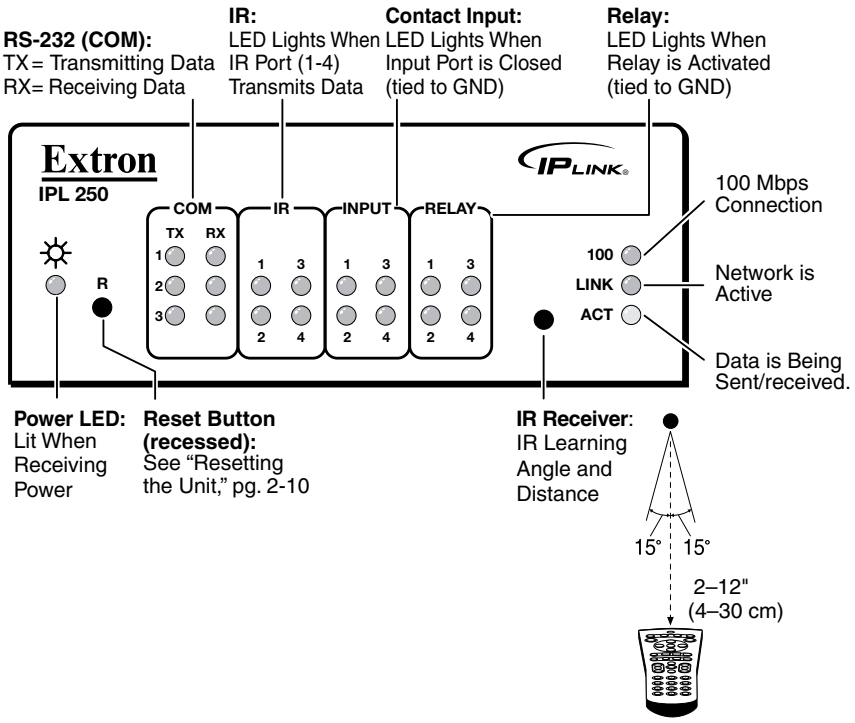
Configure the IPL

- ☐ Connect the PC to the IPL 250 via Ethernet patch or crossover cable (see chapter 2) and use Telnet or a similar application to configure the IPL for network communication.
- ☐ Connect any TLP touchpanels that will be part of the system to the same network as the PC and IPL. Create a user interface layout for the touchpanels and upload the GUI configuration to each touchpanel. (See the GUI Configurator software help file for details.)
- ☐ Configure the IPL 250 using Global Configurator. (Refer to the *Global Configurator Help* file.)
  - ☐ Create a new Global Configurator project.
  - ☐ Set the IPL's IP address, subnet mask, and other IP settings.
  - ☐ Define the unit's GlobalViewer Tree location.
  - ☐ Add the IPL to the project.
  - ☐ Define e-mail settings and contacts.
  - ☐ Add serial, IR, and Ethernet device drivers.
  - ☐ Configure the IPL's ports and assign device drivers as needed.
  - ☐ Configure touchpanel buttons, if applicable, in GC.
  - ☐ Create a display shutdown schedule.
  - ☐ Create a display lamp hours notification e-mail.
  - ☐ Create a display disconnection notification e-mail.
  - ☐ Perform configurations for special applications, if needed.
  - ☐ Save the Global Configurator project/configuration.
  - ☐ Build and upload the configuration.
- ☐ Test the system.

Front Panel Features

NOTE *The IPL 250 must be set up in order to function. See chapter 3, "Software-based Configuration and Control," and the Global Configurator help file for information about Global Configurator, which you must use to set up the unit.*

Front panel LED indications are described below.



IR learning sensor

In most cases, Extron has already produced a driver file for controlling the projector, display, or source device you plan to use. If a device driver file is not available, you can create your own using Extron IR Learner software, the projector or display's remote control, and the IPL's IR learning receiver sensor, shown above.

This receiver accepts infrared signals of from 30 kHz to 1 MHz. The IR remote control must be pointed directly at the receiver for best results. The front panel diagram (above) indicates the best distances and angles at which to hold the remote control.

Reset features

Reset button and LED — Pressing this recessed button causes various IP functions and Ethernet connection settings to be reset to the factory defaults. The green LED flashes depending on the selected reset mode. See "Resetting the Unit" on page 2-10 for details.

Mounting the IPL 250

Optional rack shelves and an assortment of mounting kits (back of the rack, furniture, and projector pole mount) are available for use with the IPL. See appendix A for part numbers of these accessories, and read the instructions that come with the rack shelf or mounting kit for installation procedures.

The IPL 250 includes rubber feet so it can be set on a table. If you are going to mount the unit to a rack, rack shelf, furniture, or pole, and these feet were attached to the enclosure, remove the feet before mounting.

Rack mounting

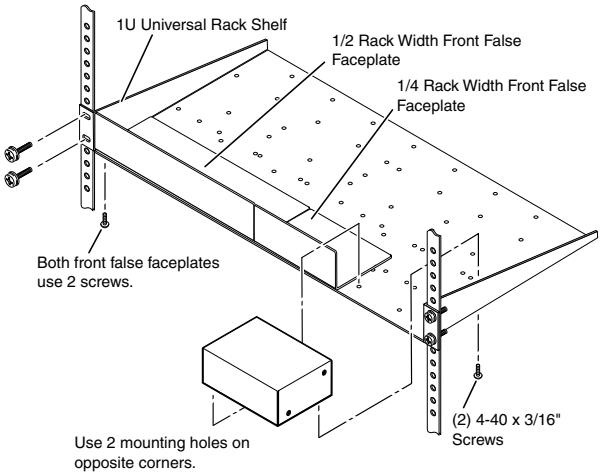
UL rack mounting guidelines

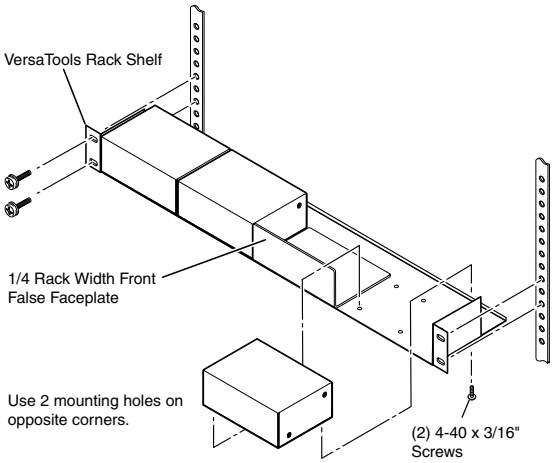
The following Underwriters Laboratories (UL) guidelines pertain to the safe installation of the IPL 250 in a rack.

1. **Elevated operating ambient temperature** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the IPL in an environment compatible with the maximum ambient temperature (Tma = +122 °F, +50 °C) specified by Extron.
2. **Reduced air flow** — Install the equipment in a rack so that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading** — Mount the equipment in the rack so that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit overloading** — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Rack mounting with a rack shelf

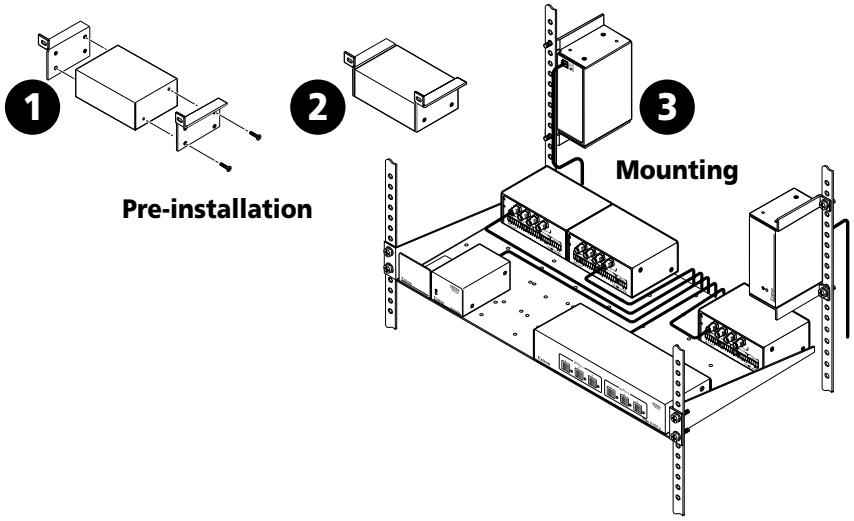
Mount the unit on an optional 1U rack shelf and install blank panels or other units to the rack shelf as shown below.





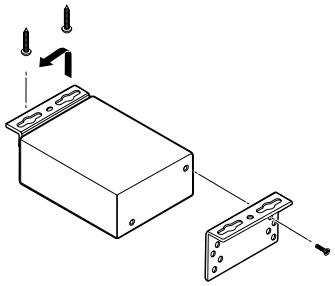
Rack mounting with brackets

Installation instructions are available with the optional Extron MBB 100 back of the rack mounting kit (part number 70-367-01).



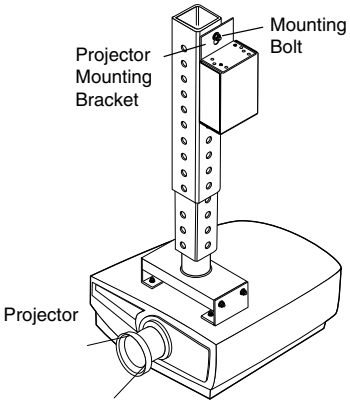
Furniture mounting

You can furniture mount the IPL 250 using an optional MBU 123 Under-Desk Mount Kit (Extron part 70-212-01).

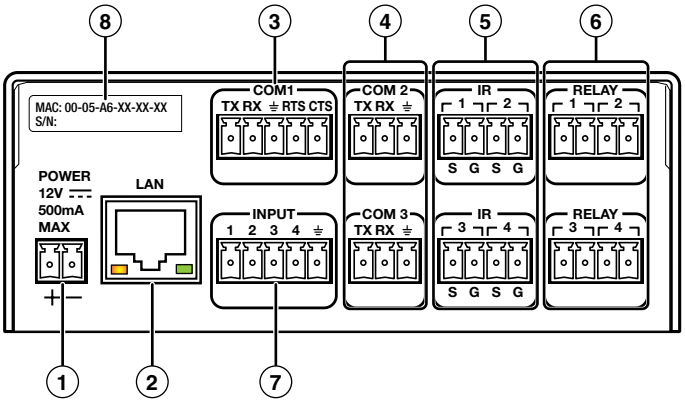


Mounting to a projector mount pole

Several optional pole mounting kits are available for use with the IPL 250, either multiproduct mounting kits or an optional Extron PMK 100 pole mount kit (part #70-217-01, shown here).



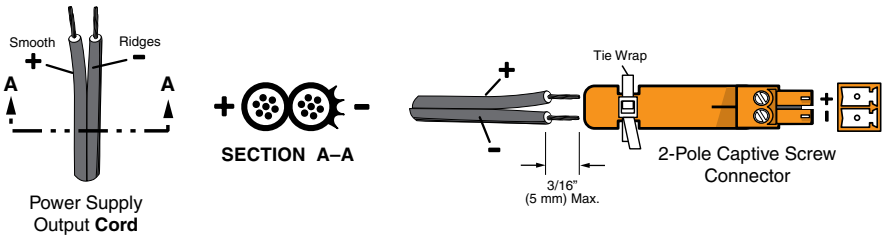
Rear Panel Features and Connections



1. **Power connector** (page 2-6)
2. **LAN (Ethernet, IP) connector and LEDs** (page 2-6)
3. **COM1 configurable RS-232 port** (page 2-7)
4. **COM2 and COM3 RS-232 ports** (page 2-7)
5. **IR output ports 1-4** (page 2-8)
6. **Relay ports 1-4** (page 2-9)
7. **Input (contact input) ports** (page 2-9)
8. **MAC address** — (page 2-9)

Power connection

1. **Power connector** — To power the IPL, connect a cable between this port and the included 12 VDC, 1 amp (maximum) power supply. The Extron power supply included with the IPL is ready to plug in. Wiring is shown in the following diagram.



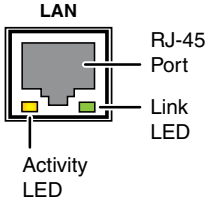
Bidirectional control and communication connections

2. **LAN (IP) connector and LEDs** — To connect and to control the IPL and the devices connected to it in an Ethernet network, plug a cable into this RJ-45 socket and connect the other end of the cable to a network switch, hub, router, or PC connected to an Ethernet LAN or the Internet.
   - For 10Base-T (10 Mbps) networks, use a CAT 3 or better cable.
   - For 100 Base-T (max. 155 Mbps) networks, use a CAT 5 cable.

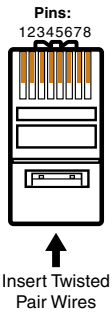
   You must configure this port before using it.

   Activity LED — This yellow LED blinks to indicate network activity.

   Link LED — This green LED lights to indicate a good network connection.



- Use a **straight-through cable** for connection to a switch, hub, or router.
- Use a **crossover cable** for connection directly to a PC. Wire the connector as shown in the tables at right.



Straight-through Cable
(for connection to a switch, hub, or router)

End 1		End 2	
Pin	Wire Color	Pin	Wire Color
1	white-orange	1	white-orange
2	orange	2	orange
3	white-green	3	white-green
4	blue	4	blue
5	white-blue	5	white-blue
6	green	6	green
7	white-brown	7	white-brown
8	brown	8	brown

Crossover Cable
(for direct connection to a PC)

End 1		End 2	
Pin	Wire Color	Pin	Wire Color
1	white-orange	1	white-green
2	orange	2	green
3	white-green	3	white-orange
4	blue	4	blue
5	white-blue	5	white-blue
6	green	6	orange
7	white-brown	7	white-brown
8	brown	8	brown

Configure the settings for this port via either SIS commands or Global Configurator. See the programming sections of this manual (chapters 3 and 4) for details.

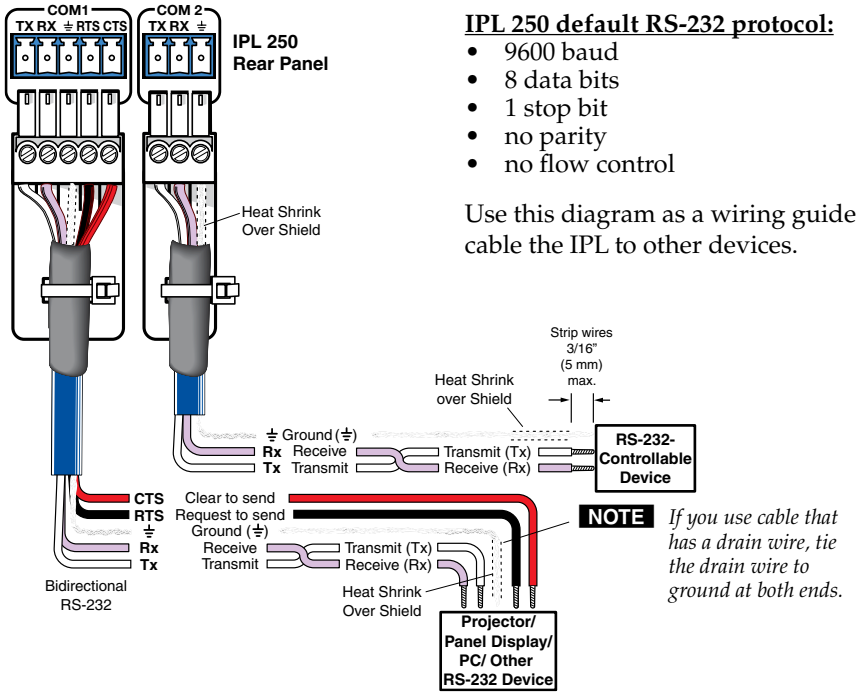
LAN port defaults:

- **IPL 250's IP address:** 192.168.254.254
- **gateway's IP address:** 0.0.0.0
- **subnet mask:** 255.255.0.0
- **DHCP:** off

③ **COM1 configurable RS-232 port** (-5 VDC to +5 VDC) and

④ **COM2 and COM3 RS-232 ports** (-5 VDC to +5 VDC) — Use COM ports for serial control of a display or other device and to receive status messages from the connected devices. These ports can send commands from a driver file.

NOTE *The 5-pole COM1 port supports both hardware and software flow control. The 3-pole COM2 and COM3 ports support software (XON, XOFF) flow control.*



Wiring for RS-232 control

IPL 250 default RS-232 protocol:

- 9600 baud
- 8 data bits
- 1 stop bit
- no parity
- no flow control

Use this diagram as a wiring guide to cable the IPL to other devices.

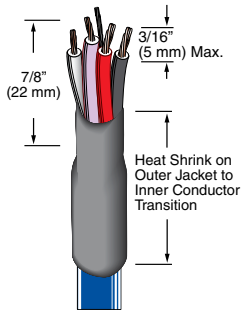
NOTE *If you use cable that has a drain wire, tie the drain wire to ground at both ends.*

For bidirectional RS-232 communication, the transmit, ground, *and* receive pins must be wired at both the IPL 250 and the other device. Each projector or other device may require different wiring. For details, refer to that equipment's manual or to the Extron device driver communication sheet.

NOTE *Maximum distances between the IPL and the device being controlled may vary up to 200 feet (61 m). Factors such as cable gauge, baud rates, environment, and output levels (from the IPL and the device being controlled) all affect transmission distance. Distances of about 50 feet (15 m) are typically not a problem. In some cases the IPL may be capable of transmitting and controlling a given device via RS-232 up to 250 feet (76 m) away, but the RS-232 response levels of that device may be too low for the IPL to detect.*

Extron Comm-Link (CTL and CTLP) cable is recommended for these connections. Before inserting wires in the connectors, strip the cable and apply heat shrink as shown at right.

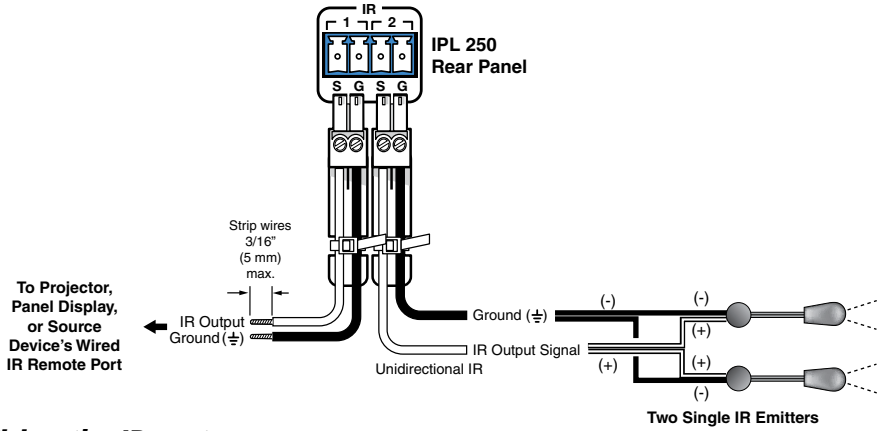
TIP *For best results and to avoid short circuits, Extron recommends using shielded wires or wires insulated using heat shrink (instead of bare wires) for the common/drain wires.*



Extron Comm-Link Cable

Unidirectional control and communication connections

⑤ **IR output ports** — An IPL 250 can use infrared signals to control up to 16 devices. You can connect one of these ports directly to the wired IR port of another device. Or you can insert the wires from up to four IR Emitters in an IR port and place the emitters' heads over or next to the devices' IR signal pickup windows. The figure below shows some wiring examples.

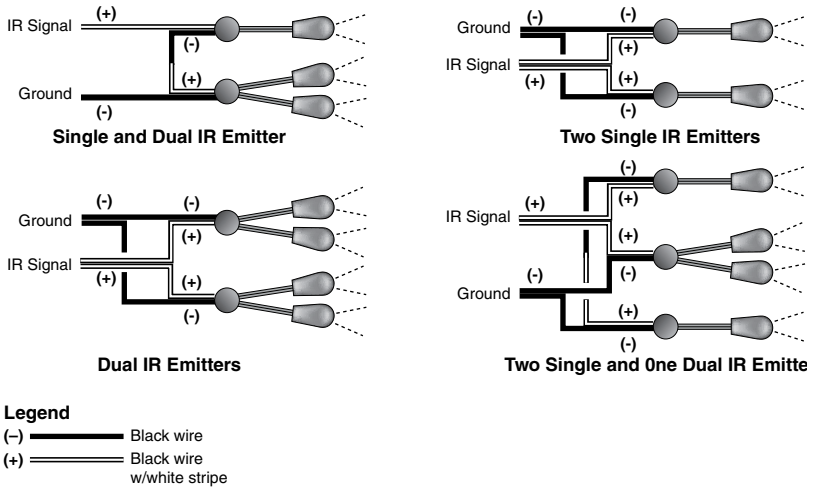


Two Single IR Emitters

Wiring the IR ports

NOTE *Each emitter must be within 100' of the IPL for best control results.*

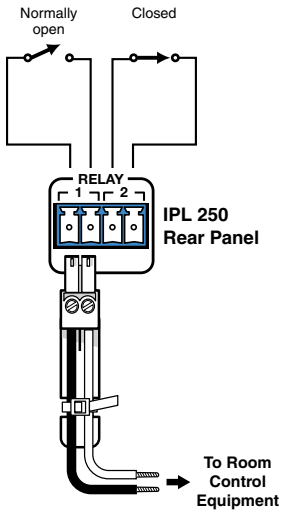
- If using all single emitters *or* all double emitters, wire the emitters in parallel.
- If using a mix of both single and dual emitters, see the following figure and the *IR Emitter Installation Guide*, part number 68-808-01.



Wiring emitters for IR control

⑥ **Relay ports** — Four relay ports provide control for power, screen/projector lifts, window coverings, and similar items, when trigger events occur.

These relay contacts may be used to control any equipment as long as the contact specifications of a total of 24 volts at 1 ampere are not exceeded for each port. These relays are **normally open** by default.

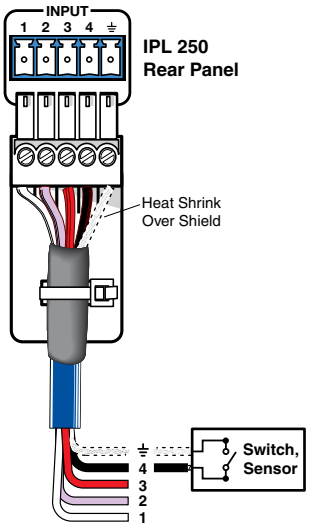


When activated, the closed contacts open, and the open contacts close. They can be set up to operate in one of two ways:

- **latching** (brief contact) (press to turn on, press to turn off), or
- **momentary** (timed) (press to turn on, timeout to turn off).

In the timed mode the default timeout period is ½ second (500 ms). Use the GC software or SIS commands to change the length of the timeout period. See X63 in "Serial Communication", chapter 4, for details.

⑦ **Input (contact closure input) ports** — To allow the IPL 250 to monitor devices to trigger events, connect a switch, sensor, or similar item to one of these four ports. See the figure at right for an example.

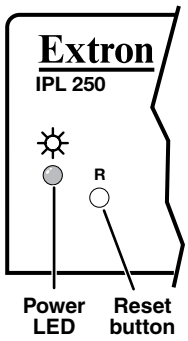


A 1k ohm pull-up resistor in a TTL (5 VDC) circuit senses external switch or contact closure. After these ports have been configured, when the circuit between a signal pin and a ground pin is closed, each port can trigger events (such as toggling relays, issuing commands, or sending an e-mail).

⑧ **MAC address** — This is the unique user hardware ID number (MAC address) of the unit (for example, 00-05-A6-00-00-01). You may need this address during configuration.

Resetting the Unit

There are five reset modes that are available by pressing the Reset button on the front panel. The Reset button is recessed, so use a pointed stylus, ballpoint pen, or Extron Tweeker to access it. See the following table for a summary of the modes.



CAUTION *Review the reset modes carefully. Using the wrong reset mode may result in unintended loss of flash memory programming, port reassignment, or an IPL unit reboot*

The reset modes (with the exception of Mode 2) close all open IP and Telnet connections and close all sockets.

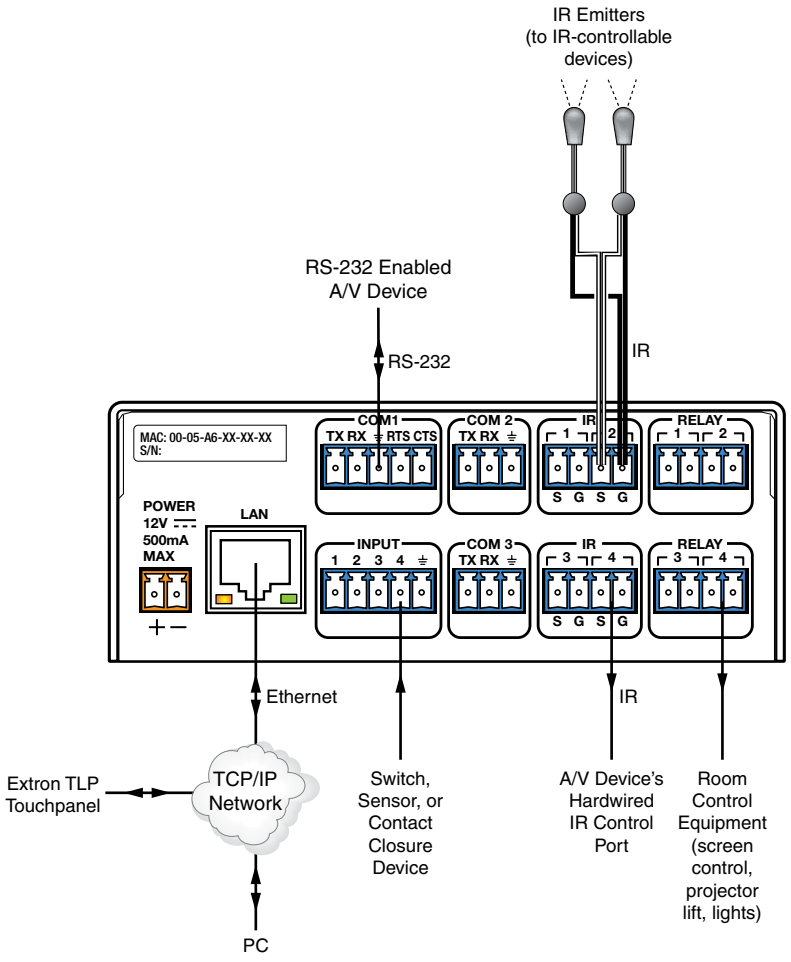
NOTE *If you hold down the reset button continuously, every 3 seconds the LED blinks, the unit enters a different mode from Modes 3 through 5. For Mode 5 the LED blinks three times, the third blink indicating the last mode. The modes are separate functions, not a continuation from Mode 1 to Mode 5.*

IPL 250 Reset Mode Summary

	Mode	Activation	Result	Purpose/Notes
Use Factory Firmware	1	Hold down the recessed Reset button while applying power to the IPL. **NOTE** *After a mode 1 reset is performed, update the IPL's firmware to the latest version. **Do not** operate the IPL firmware version that results from the mode 1 reset. If you want to use the factory default firmware, you must upload that version again. See appendix B, for details on uploading firmware.*	**The IPL reverts to the factory default firmware.** Event scripting does not start if the IPL is powered on in this mode. All user files and settings (drivers, adjustments, IP settings, etc.) are maintained. **NOTE** *If you do not want to update firmware, or you performed a mode 1 reset by mistake, cycle power to the IPL to return to the firmware version that was running prior to the mode 1 reset. Use the 0Q SIS command to confirm that the factory default firmware is no longer running (look for asterisks following the version number.)*	Use mode 1 to revert to the factory default firmware version if incompatibility issues arise with user-loaded firmware. **NOTE** *User-defined Web pages may not work correctly if using an earlier firmware version.*
Enable Serial Console	2	Press and release the Reset button. Within 2 seconds, type +++ on the keyboard. **NOTE** *If the three "+'s" (+++) are not enetered in the 2-second time frame, the COM port becomes a control port only.*	**The connected COM port becomes a console port to send SIS commands.** Scripting remains on.	Mode 2 enables the SIS console port
Run/Stop Events	3	Hold down the Reset button for about 3 sec. until the Power LED blinks once, then release and press Reset momentarily (<1 sec.) within 1 second.	**Mode 3 turns events on or off.** **NOTE** *Nothing happens if the momentary press does not occur within 1 second.*	Mode 3 is useful for troubleshooting.
Reset all IP Settings	4	Hold down the Reset button for about 6 sec. until the Power LED blinks twice (once at 3 sec., again at 6 sec.). Then release and press Reset momentarily (for <1 sec.) within 1 second. **NOTE** *Nothing happens if the momentary press does not occur within 1 second.*	**Mode 4** • Enables ARP capability. • Sets the IP address back to factory default (192.168.254.254). • Sets the subnet back to factory default. • Sets the default gateway address to the factory default. • Sets port mapping back to factory default. • Turns DHCP off. • Turns events off.	Mode 4 enables you to set IP address information using ARP and the MAC address.
Reset to Factory Defaults	5	Hold down the Reset button for about 9 sec. until the Power LED blinks three times (once at 3 sec., again at 6 sec., again at 9 sec.). Then release and press Reset momentarily (for <1 sec.) within 1 second. **NOTE** *Nothing happens if the momentary press does not occur within 1 second.*	**Mode 5 performs a complete reset to factory defaults (except the firmware).** • Does everything mode 4 does. • Clears driver-port associations and port configurations (IR/RS-232). • Removes button/touchpanel configurations. • Resets all IP options. • Removes scheduling settings. • Removes/clears all files from IPL 250.	Mode 5 is useful if you want to start over with configuration and uploading, and also to replace events.

Application Diagram

The following figure shows an example of types of devices that are connected to some of the IPL's ports.



3

Chapter Three

Software-based Configuration and Control

Software-based Configuration and Control

Configuration and Control: an Overview

An IPL 250 must be configured before use in order to recognize and accept commands and pass them on to the controlled devices. It can be configured and controlled via a host computer attached to the LAN (local area network) port. See chapter 2 for details about the port and cabling.

- The primary means for configuring the controller is by using the Extron Global Configurator (GC) software. This method requires a properly configured PC with Windows® 2000, Windows XP, or a higher version of Windows installed. Global Configurator generates GlobalViewer® Web pages that are uploaded to the IPL and can be used to control the unit and make adjustments to its settings.

NOTE *Microsoft® Internet Explorer® is currently the only Web browser that fully supports GlobalViewer pages.*

- Alternatively the default Web pages embedded within the IPL 250 provide a means to perform some setup, adjustment, and control via a Web browser (Internet Explorer version 5.5+, or Mozilla® Firefox® version 1.0+) from any type of network-enabled computer.
- The third way to control and configure the controller is by using Simple Instruction Set (SIS™) commands via Telnet, a Web browser, or RS-232. SIS commands are discussed in detail in chapter 4.

The Basic Setup Steps: a Guide to this Chapter and Other Resources

NOTE *Setup/configuration may be performed away from the job site.*

1. **Configure the IPL for network communication**. See "Configuring the Unit for Network Communication" on page 3-3.
2. **Download or install Global Configurator and other Extron software (IR Learner, Firmware Loader, GUI Configurator) and device drivers.** See chapter 1 of the *IPL 250 Setup Guide*, the software disk that was shipped with the unit, and the Extron Web site for instructions.

NOTE *The* IPL 250 Series Setup Guide *is shipped with the unit. It is also available as a PDF file on the Extron Web site (www.extron.com). The disk included with the unit contains software, device drivers, a PDF file of the full reference manual, and additional documentation available when the unit was shipped. The setup guide outlines most of the common tasks required to set up an IPL.*

3. **Create a Global Configurator project and configure basic settings and functions.** See chapter 3 of the setup guide or see the *Global Configurator Help* file for step-by-step procedures.
4. **Configure additional or advanced functions**, if desired. See the *Global Configurator Help* file. For information on IR learning, read the *IR Learner Help* file. If Extron TouchLink (TLP Series) touchpanels will be part of the system, you will also need to use GUI Configurator to design and set up the interface for the touchpanels, preferably before completing the IPL's configuration.
5. **Save and upload the configuration to the IPL.** See the *IPL 250 Setup Guide*, chapter 3.
6. **Control the IPL and devices connected to it** by using the IPL's embedded Web pages, its GlobalViewer (GV) Web pages, or a fully configured TLP touchpanel. See "Controlling an IPL 250" later in this chapter.

Communicating with the IPL

To communicate with the IPL 250, you must power on the IPL and the PC you will use to configure it, and connect the two devices for IP (network) communication.

- **Power:** see chapter 2 for wiring instructions. It is best to power the IPL using the 12 VDC external power supply that is shipped with the unit.
- **Communication:** to connect the IPL to a network or to connect it directly to the PC using a serial cable, see page 2-6 or page 2-7 of this manual for wiring instructions. See "Configuring the IPL for Network Communication," below to set the unit up to talk with the PC.

Configuring the IPL for Network Communication

To function together, both the PC and the IPL 250 must be configured correctly. The PC must be network-capable with the proper protocols, and the IPL must be set up so it can be connected to a LAN or other network.

When you power on the IPL for the first time, you have a choice of several ways to set up the IP address:

- Use the Global Configurator software via the LAN connector.
- Use the ARP (address resolution protocol) command via the LAN connector.
- Use a Web browser via the LAN connector.
- Use SIS commands via Telnet and the LAN connector.

If you use a Web browser or Telnet the first time you connect a PC to an IPL via IP, you may need to temporarily change the PC's IP settings in order to communicate with the controller. See "Setting up the PC for IP communication with an IPL" later in this chapter. Then you must change the controller's default settings (IP address, subnet mask, and [optional] administrator name and password) in order to use the unit on an intranet (LAN) or on the Internet. After you have set up the IPL 250 for network communication, you can reset the PC to its original network configuration.

IPL 250's LAN port defaults:

- **IPL's IP address:** 192.168.254.254
- **Gateway's IP address:** 0.0.0.0
- **Subnet mask:** 255.255.0.0
- **DHCP:** off
- **Link speed and duplex level:** autodetected

NOTE *Both the computer and the IPL must be connected to the same subnet on a LAN (using a straight-through cable). Alternatively, you can use a crossover Ethernet cable to connect the controller directly to your computer's Ethernet card.*

The following instructions assume that you have already connected the PC to the IPL's LAN port and powered on the controller and the PC.

Configuring the IPL for network use via Global Configurator

You can configure the controller's IP address via an IP/Ethernet connection using the Extron Global Configurator (GC) software. Read the Global Configurator help file for basic information on using Global Configurator software and setting up a project. Also read the *IPL 250 Setup Guide* for step-by-step instructions of how to use GC to set up the IPL's IP address.

Configuring the IPL for network use via the ARP command

The ARP (address resolution protocol) command tells your computer to associate the IPL 250's MAC (media access control) address with the assigned IP address. You must then use the ping utility to access the controller, at which point the controller's IP address is reconfigured.

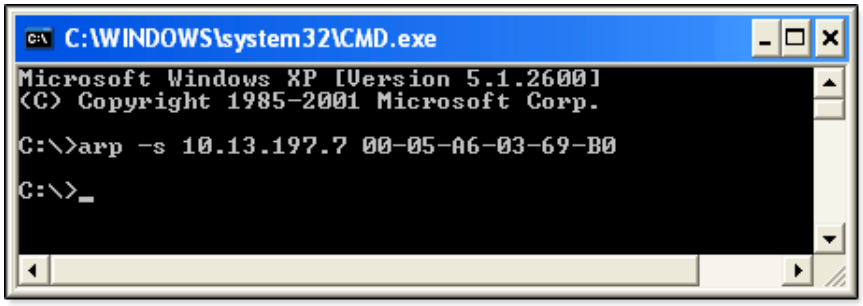
Use ARP to configure the IP address as follows:

1. Obtain a valid IP address for the IPL 250 from your network administrator.
2. Obtain the IPL's MAC address (UID #) from the label on its rear panel. The MAC address should have this format: 00-05-A6-xx-xx-xx.
3. If the IPL has never been configured and is still set for factory defaults, go to step **4**. If not, perform a Mode 4 system reset. For detailed information on reset modes, see "Resetting the Unit" in chapter 2, "Installation".

CAUTION *The IPL must be configured with the factory default IP address (192.168.254.254) before the ARP command is executed, as described below.*

4. At the PC, access the MS-DOS command prompt, then enter the `arp -s` command. Type in the desired new IP address for the unit and the unit's MAC address. For example:

   ```
   arp -s 10.13.197.7 00-05-A6-03-69-B0
   ```



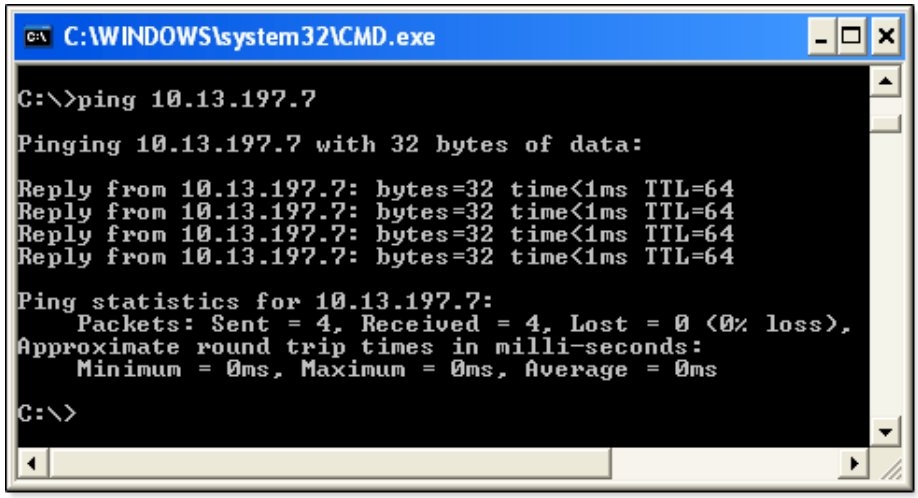
NOTE *The MAC address is listed on the rear panel.*

   After the `arp -s` command is issued, the controller changes to the new address and starts responding to the ping requests, as described in the next step.

5. Execute a ping command by entering "ping" followed by a space and the new IP address at the command prompt. For example:

   ```
   ping 10.13.197.7
   ```

   You must ping the IPL 250 in order for the IP address change to take place. The response should show the new IP address, as shown in the following picture.



You can reconnect using either Telnet or a Web browser to verify that the update was successful.

6. After verifying that the IP address change was successful, enter and issue the `arp -d` command at the DOS prompt. For example:

   `arp -d 10.13.197.7` removes 10.13.197.7 from the ARP table

   or

   `arp -d*` removes all static IP addresses from the ARP table.

Configuring the IPL for network use via a Web browser

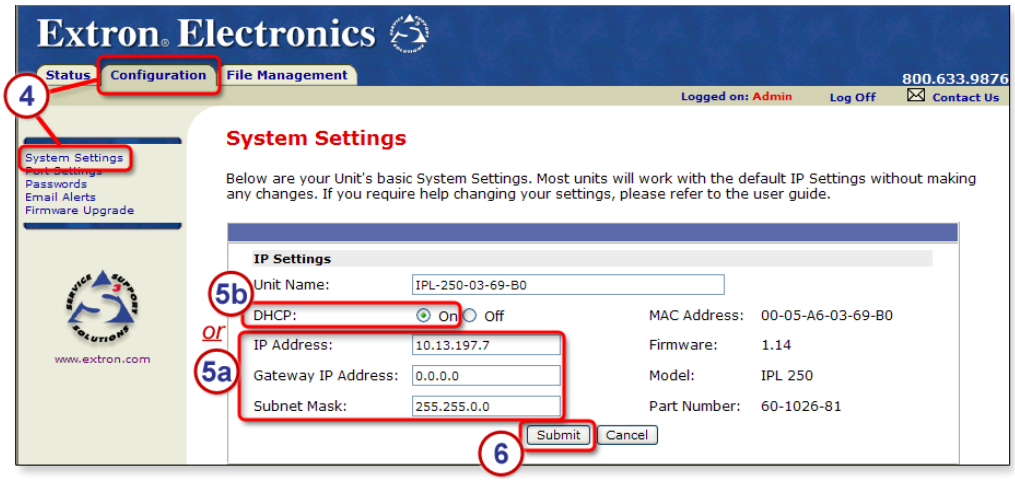
The default Web pages that are preloaded on the IPL 250 are compatible with popular Web browsers such as Microsoft Internet Explorer (version 5.5 or higher) or Mozilla Firefox (version 1.0 or higher). However, the IPL and the PC must both be part of the same subnet before they can communicate via the LAN port. You must change the PC's IP address to one that is on the same subnet as the default IP address of the IPL 250 (192.168.254.254).

NOTE *This method requires a crossover cable. See page 2-7 for cabling details.*

NOTE *Make a note of the host PC's TCP/IP configuration before changing its IP address and make sure the PC and IPL 250 are on the same subnet.*

1. Temporarily change the host PC's IP address. See "Setting up the PC for IP communication with an IPL 250" later in this chapter for step-by-step instructions.
2. Obtain a valid IP address for the controller from your network administrator.
3. Launch the Web browser on the connected PC (for which you set up the network configuration earlier), and enter `http://192.168.254.254/` in the address box. The IPL 250's default Web page is displayed.

4. Select the **Configuration** tab, then select **System Settings** from the menu on the left of the screen. A Web page appears. The top part of a typical screen is shown in the following picture.



5. Set the IPL for the new IP address using either step **5a** *or* step **5b**.

   5a. Enter the new IP address for the IPL 250, the corresponding subnet mask, and the gateway address. IP addresses and subnet masks follow standard naming and numbering conventions. The IP network administrator should provide the IP addresses and subnet mask to be used with this controller.

   5b. Select **DHCP On**.

6. Click **Submit**. It takes a minute or more for the controller to store the new settings. Once the controller's IP address is changed, you lose communication with the controller.

7. Close the browser.

8. After changing the controller's IP settings, change your PC's TCP/IP settings back to their original configuration.

Configuring the IPL for network use via SIS™ commands and Telnet

The IPL and the PC must both be part of the same subnet before they can communicate via the LAN port. You must change the PC's IP address to one that is on the same subnet as the default IP address of the IPL 250 (192.168.254.254).

NOTE *This method requires connecting the IPL to the PC's LAN port using a crossover network cable. See page 2-6 for cabling details.*

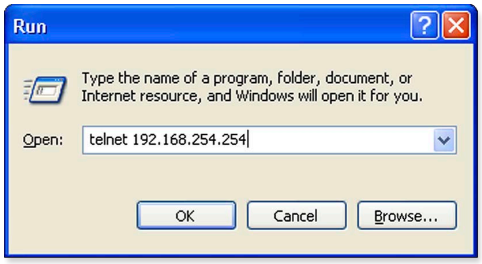
NOTE *Make a note of the host PC's TCP/IP configuration before changing its IP address and make sure the PC and IPL are on the same subnet.*

1. Temporarily change the host PC's IP address. See "Setting up the PC for IP communication with an IPL 250" on the next page for step-by-step instructions.

2. Start Telnet on the PC

   a. Click the **Start** menu and select **Run**. The Run dialog box appears.

   b. Type `telnet`, a space, and the default IP address (192.168.254.254) into the Open area, and click **OK**.



3. Set the IPL for the new IP address by doing one of the following.

   - Enter SIS command Esc X14 CI ↵, where X14 is the new IP address (see chapter 4, "SIS™ Programming and Control") to set the IP address.

   - Enter SIS command 1DH↵ to enable DHCP.

4. After changing the controller's IP address, change your PC's TCP/IP settings back to their original configuration.

Setting up the PC for IP communication with an IPL 250

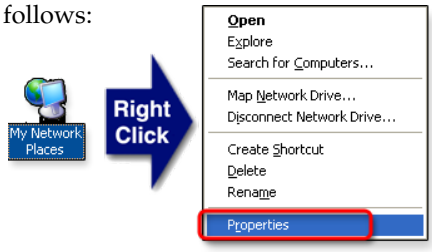
You need a Windows-based (Windows 2000, XP, or higher) PC equipped with an operating network adapter. For your PC to work with Extron Ethernet-controlled products, the TCP/IP protocol must be installed and properly configured.

When setting up the IPL for network communication via a Web browser or Telnet connection, you must change the IP address of the PC to one that is on the same subnet as the IPL.

If you use an existing Ethernet LAN intranet, your network administrator can provide you with a unique IP address for the controller or confirm whether you need to set up the IPL 250 for DHCP (Dynamic Host Configuration Protocol) to have an address assigned automatically when you sign on.

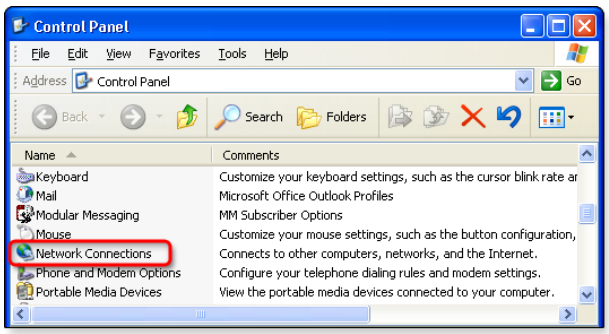
1. Open the Network Connections page as follows:

   - Locate and right-click on **My Network Places** on the Windows (2000, XP, or higher) desktop, then click on **Properties**.

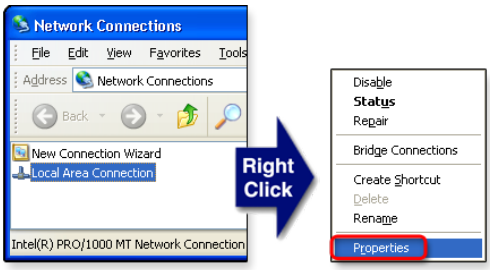


   or

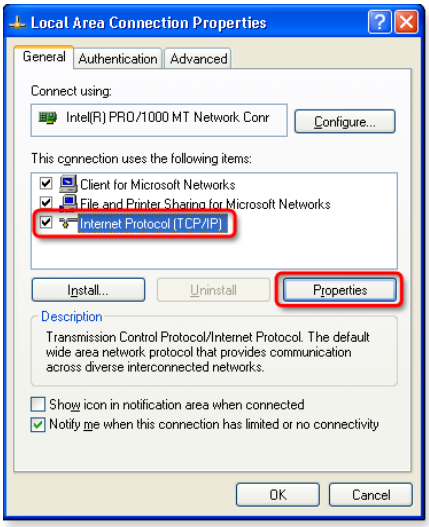
   - Click on the **Start** menu, click on **Settings** (if needed), click on **Control Panel** to open the Control Panel window, double-click on **Network and Dial-up Connections** (Windows 2000) or **Network Connections** (Windows XP, shown below).



2. Right-click on **Local Area Connection**, then select **Properties**.



3. Select **Internet Protocol (TCP/IP)** and click on the **Properties** button (shown at right). If **Internet Protocol (TCP/IP)** is not on the list, it must be added (installed). Refer to the Microsoft Windows user's manual or the Windows online help system for information on how to install the TCP/IP protocol.



4. Write down the PC's current IP address and subnet mask below. If your PC is set to "Obtain an IP address automatically," make a note of that, instead. You will need to restore these settings to the PC later.

   IP address:

   . . . .

   Subnet mask:

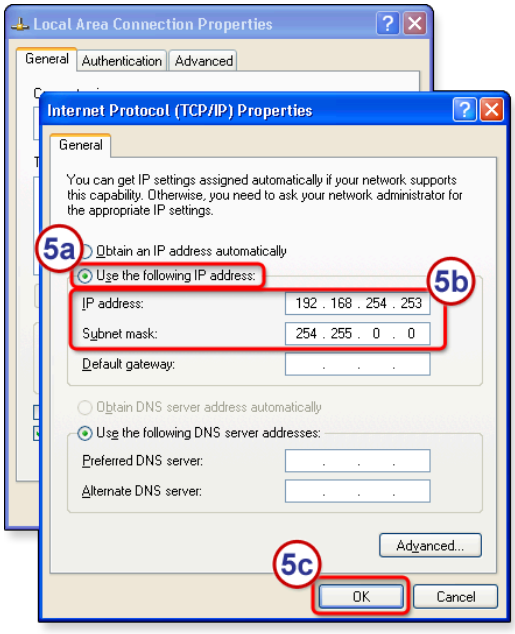
   . . . .

5. Change the **PC's** IP address so it can communicate with the IPL 250 and change the controller's IP settings.

   a. Click the **Use the following IP address** button.

   b. Enter the following values, as shown in the following picture:

   IP address: 192.168.254.253
   Subnet mask: 255.255.0.0
   Default gateway: blank or 0.0.0.0



c. Click the **OK** button to save the changes and exit the network setup. Reboot the PC, if required, for the changes to become effective.

6. Plug one end of a Category 5 network/Ethernet crossover cable into the IPL's Ethernet (LAN) connector. See chapter 2 for RJ-45 LAN connector wiring. Plug the other end of the Ethernet cable into the Ethernet port on the PC.

NOTE *If a network hub or switch is used between the PC and the IPL, use a straight-through CAT 5 cable instead of a crossover cable.* *See page 2-6.*

7. Set up the IPL's IP address using a Web browser, or SIS commands as described earlier in this chapter.

8. Restore the PC's previous IP configuration by following steps **1**, **2**, **3**, and **5** but using the PC's original IP address settings you wrote down in step **4**.

Global Configurator Software for Windows®

The included Extron Global Configurator (GC) program for Windows offers the most complete way to configure and customize the controller via either RS-232 or IP connection. GC provides the ability to generate a Web browser-based GlobalViewer® (GV) application and Web pages for each IP Link-based device (IPL 250, IP Link interface, System 5 IP, MLC 226 IP, MLC 104 IP Plus, or other Extron device) on a network. Once an IPL 250 is configured, its GlobalViewer Web pages allow the user to manage, monitor, and control the IPL and the devices connected to it.

Global Configurator offers the best and easiest way to configure the IPL. Other setup options include using SIS commands and the factory-embedded Web pages, but many setup features are available only via Global Configurator. GC includes some functions found on the controller's embedded Web pages and many additional features that are available only through the software.

Downloading the software and getting started

Global Configurator software is included with the controller. Global Configurator software updates and a large variety of device drivers can be downloaded at no charge from the Extron Web site (http://www.extron.com).

NOTE *Device drivers (for controlling projectors, VCRs, DVD players, etc.) can be used by other Extron IP Link products, so they may be listed on the Extron Web site as an IP Link driver package. You may also want to download the optional IR Learner™, a free software utility for capturing infrared codes from a handheld IR remote control to create custom drivers for operating IR-controlled devices like the IPL that use IP Link and GlobalViewer.*

NOTE *Do not change the directory or the name of the directory where the software files are installed by default.*

Refer to the *IPL 250 Series Setup Guide* for specific information on how to download the software. Refer to that guide and to the *Global Configurator Help* file for details and step-by-step procedures on how to start a GC project and perform basic setup tasks for an IPL. Both the setup guide and the help file contain instructions on how to set the **IP address, gateway IP address, subnet mask, mail server IP address, domain name, Telnet port, Web port, SMTP username**, and **SMTP password** so that the IPL 250 is able to communicate with the network. Obtain these parameters from your network administrator and set them before continuing.

PC system requirements

For the IPL, Global Configurator

The IPL 250 and Global Configurator have the following hardware and software requirements:

- Intel® Pentium® III 1 GHz processor
- Microsoft Windows operating system
  - Windows 2000 service pack 4, or
  - Windows XP service pack 2, or
  - a later version of Windows

CAUTION *Do not run this software on a PC that uses an earlier version of Windows.*

- Microsoft Internet Explorer 6.0 with ActiveX® enabled
- Microsoft Windows Script 5.6
- 512 MB of RAM
- 50 MB of available hard disk space
- A network connection with a minimum data transfer rate of 10 Mbps (100 Mbps is recommended)

NOTE *The* IPL 250 *requires GC version 3.0 or higher.*

For a system that includes TouchLink touchpanels and GUI Configurator

If you use the IPL 250 with Extron TLP Series touchpanels, you will also need the Extron GUI Configurator software to set up the panels' user interface controls. GUI Configurator has the same requirements as Global Configurator 3.0 and higher.

Using Global Configurator: helpful tips

Resources and notes

- The *Global Configurator Help* file provides information on settings and how to use the Global Configurator program, itself.

- The *IPL 250 Setup Guide*, which is shipped with the unit, and the help file included with the software cover basic setup steps. They include instructions and examples on how to use the basic tabs in GC.
- See the front and rear panel features sections in chapter 2 of this manual for features and settings for the ports you will configure in GC.
- If you will configure the IPL at the installation site, Extron recommends using the driver subscription function within Global Configurator to download drivers for all manufacturer and device types before you go out into the field.
- The Global Configurator project file (**.gc2* or **.gcz*) contains configuration settings and it can be saved to a directory or folder for backup or for installation on another IPL 250 controller. Saving a configuration is recommended before you perform a firmware upgrade.
- Global Configurator 3 is capable of loading all GC2 project files from GC version 2.0.3.3 and up. GCZ files can be opened by clicking **File** > **Open**, by clicking the toolbar icon, or by double-clicking on the GCZ file. GC2 and GCC files must be imported, however.
- The IPL can be set up to allow configuration access to administrators only to prevent other users from making changes to the settings, events, and drivers. If an administrator password is set for the controller, non-administrator users can select inputs, adjust output volume, and trigger some other device commands from the GlobalViewer Control pages but are prevented from making any other changes using GlobalViewer Web pages.
- IP addresses, subnet mask, and e-mail addresses follow standard naming and numbering protocol. The network administrator provides the IP addresses and subnet mask to be used with this controller.
- The unit name is any name (for example, Room107-ipl250, Lab1234control, ConfRmSystem) that you want to use to label a specific IPL 250 unit. The default is a combination of the product name and part of the hardware address. This can be changed to your choice of alphanumeric characters and hyphens (-).
  - Spaces are not permitted within a unit's name.
  - Underscores (_) are not permitted.
  - Valid characters are A-Z, a-z, 0-9, and - (hyphen).
  - The name cannot start with a number or a hyphen, and it cannot end with a hyphen.
  - Maximum name length is 24 characters.

A brief guide to Global Configurator's tabs

In the upper right side of the GC window are several tabs that divide the program into groups of functions you can view and configure. The left three, **IP Link Settings**, **Schedule**, and **Monitor**, are displayed for all IP Link-enabled products. Tabs to the right of those three vary in quantity, type, and layout, depending on the product being configured. The figure below shows tabs that may be available when you configure an IPL 250.

To learn about the functions available on each of these tabs, look in the *Global Configurator Help* file. In the contents pane on the left, click on "Reference

Information", click "Global Configurator Window", then click on the name of the tab you want to know more about.

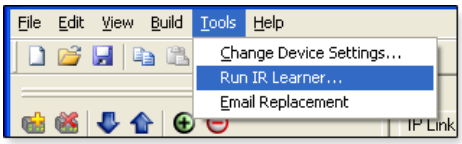
Advanced Configuration

IR learning to create customized IR driver files

If you do not find a driver on the Extron Web site for the device you plan to use, you can create your own IR driver file. Extron IR Learner™ software lets you create a customized driver file of IR commands that can be used with the Global Configurator software for port setup and button configuration. Visit http://www.extron.com to download IR Learner and install it on your PC.

Once IR Learner is installed on the PC, you can start the program directly by double-clicking the IR Learner icon, shown at right.

Or, you can select **Run IR Learner** from Global Configurator's **Tools** menu, as shown at right. The IR Learner utility opens in a new window.



Refer to the *IR Learner Help* file for instructions on how to create the driver file. During IR command capture, hold the projector or other device's remote facing the IPL's IR learning receiver within the angles and distance range shown in the figure on page 2-3.

NOTE *The IPL 250 requires IR Learner version 1.23 or higher.*

Printing a wiring block diagram or a GUI configuration report

Once you have configured a system using Global Configurator, you can generate and print a simple block diagram of what products to wire to which of the IPL 250's ports. The diagram includes model names and the type of communication (IR or RS-232) configured for each port. Read the *Global Configurator Help* file's "Reference Information" section about the **File** menu for details.

NOTE *This procedure requires Microsoft Word software. The installer or user must provide that software. It is not an Extron product.*

Procedure overview:

1. In Global Configurator, click on the **File** drop-down menu and select **Print** and then **Wiring Diagrams/GUI Configuration Report**.
2. In the Print Wiring Diagrams/GUI Configuration Report window, select the devices to include in the diagram.
3. Click the **Print Wiring Diagrams** button or the **Print GUI Report** button. GC processes the information about the selected device(s), generates a document containing the wiring diagram, and opens that document in Word.
4. Print the diagram(s), save the file(s), if desired and exit Word.
5. Close the Global Configurator Print Wiring Diagrams/GUI Configuration Report window.

Updating firmware

If the need arises, you can replace the IPL's firmware without opening the unit or changing firmware chips. See appendix B, "Firmware Updates", for instructions on how to update the controller's firmware.

NOTE *Save the existing configuration project before replacing the firmware.*

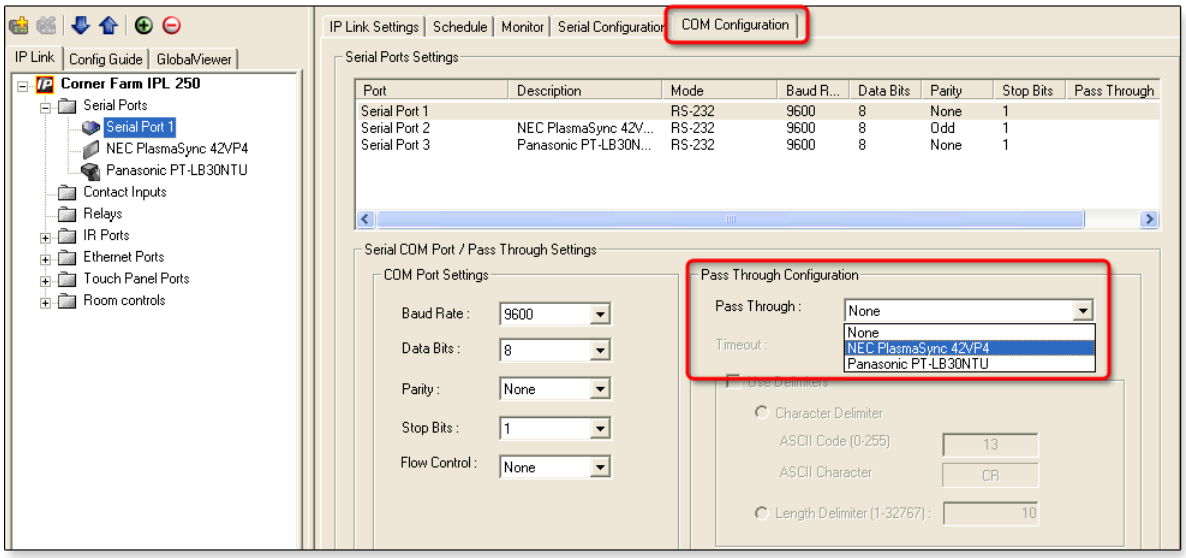
Advanced serial port control

If serial setup configurations are required, the following options provide advanced methods for communicating serially with the IPL: serial pass-through (or redirect mode), direct port access, and serial bridging.

Serial pass-through (redirect mode)

Serial pass-through allows serial commands from a controller to "pass through" an IPL 250 on route to an A/V device. Any serial port on an IPL can be configured as a pass-through connection to another serial port on the same device. For example, an RS-232 control device connected to the IPL 250's COM1 serial port could control a projector connected to the COM2 serial port.

Serial pass-through is enabled or disabled through the IPL's COM Configuration tab within Global Configurator, as shown below and described in the GC help file.



Advanced users can use the pass-through SIS command as well. See the Simple Instruction Set (SIS™) commands in chapter 4 for detailed command descriptions.

Direct port access (ports 2001 through 2003)

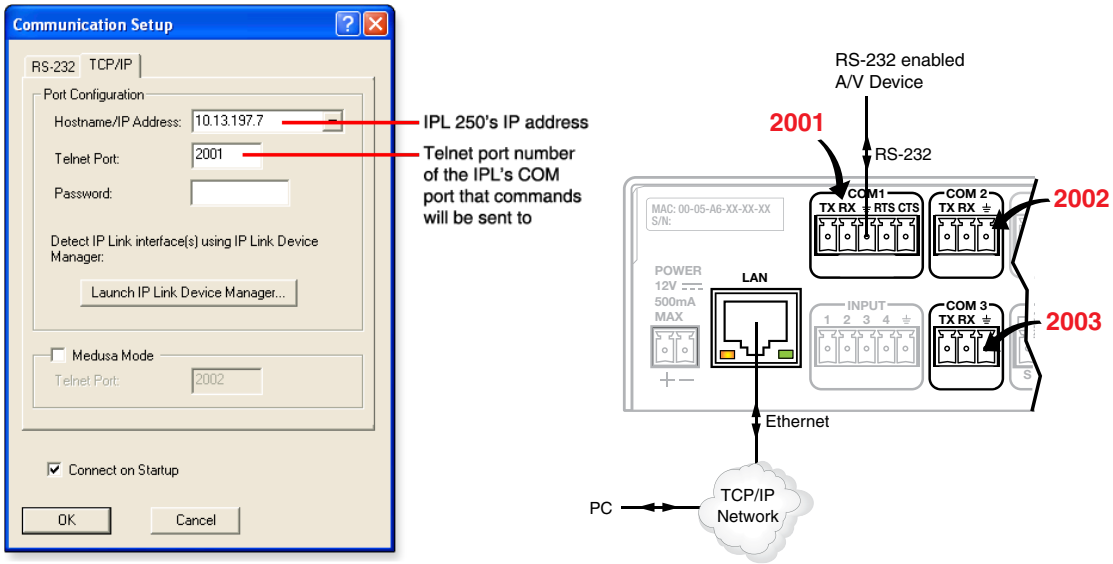
Direct port access allows a direct, one-to-one connection to any one of the IPL's serial ports using a TCP/IP connection. When a TCP session is initiated to a COM port, all data sent and received passes directly to and from that port without any processing. Set serial port parameters (baud rate, parity, etc.) within the IPL prior to using direct access.

NOTE *The reserved TCP port numbers (2001-2003) are assigned by default as follows:*
2001 = COM1
2002 = COM2
2003 = COM3
You can use SIS commands to assign a different port number to any of these serial ports, if needed.

To initiate direct port access using Extron DataViewer software:

1. Connect the IPL 250 to a network.
2. If necessary, use GC, embedded Web pages, or SIS commands to set set serial port parameters (baud rate, parity, etc.) for the IPL 250 COM port to be used.
3. Launch the Extron DataViewer program.
4. Click **File** > **Connect** to open the Communication Setup dialog box.
5. Click the **TCP/IP** tab.
6. Complete the fields with the IP address of the IPL 250 and the TCP/IP port number (2001, 2002, or 2003) of the COM port (on that same IPL unit) that will be used, as shown below.

NOTE *A password is not required for direct port access.*



DataViewer Communication Setup dialog box and direct access wiring

7. Click **OK**. The DataViewer commands window opens.
8. Type serial commands into the Commands area in the left of the window to send serial commands directly through the selected COM port to the attached A/V device.
9. To end the direct access session, close DataViewer.

NOTE *You can force the direct access session closed by logging on to the IPL 250 as an administrator and entering "Esc X1 *0CD ←", where X1 is the selected COM port.*

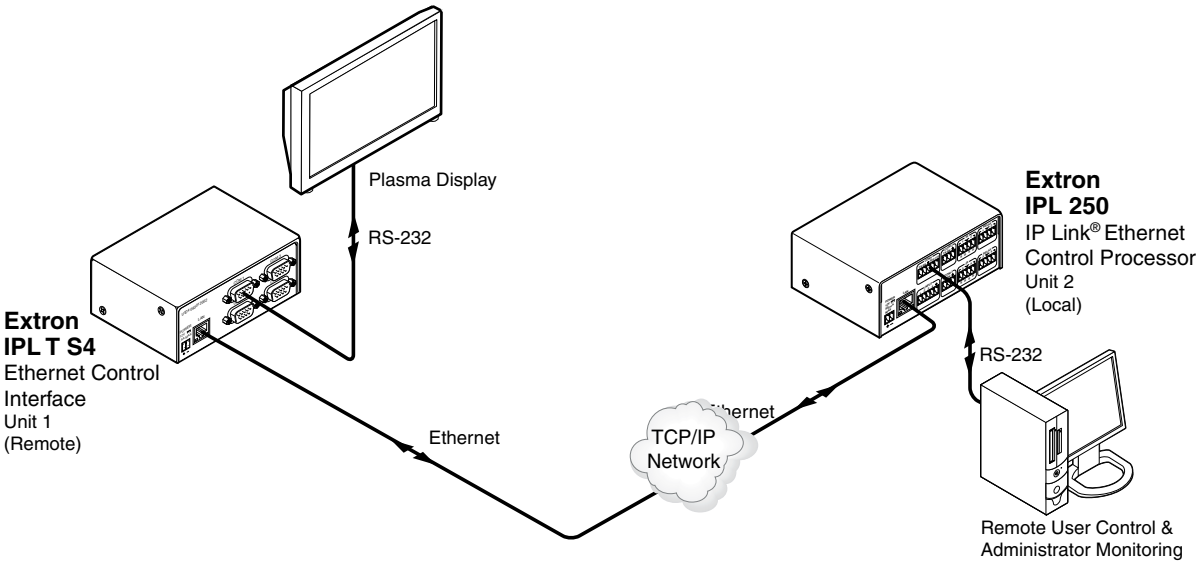
Serial bridging

Serial bridging mode creates a virtual serial connection (a "bridge") between two IPL units allowing serial data to be passed over a shared LAN to devices connected via the IPLs' COM ports. To use serial bridging, two IPL devices (one local and one remote) must be enabled to communicate with each other, providing PC, touchpanel, or controller access to a remote A/V device.

Hardware connection

To set up the hardware for serial bridging:

1. Verify that the protocol (baud rate, data bits, stop bits, parity) is identical for both serial ports that will be "bridged" (one port on each IPL unit).
2. For IPL unit 1 (the remote device), connect a serial cable to an A/V device (e.g., a display or projector).
3. Connect that same remote IPL (1) to the LAN.



Connections for serial bridging

4. For IPL unit 2 (the local device), make a serial connection to the PC or controller or touchpanel that will control the remote A/V device.
5. On the same device (2), follow the step 2 instructions.

You are now ready to configure IPL unit 2 for serial bridging mode.

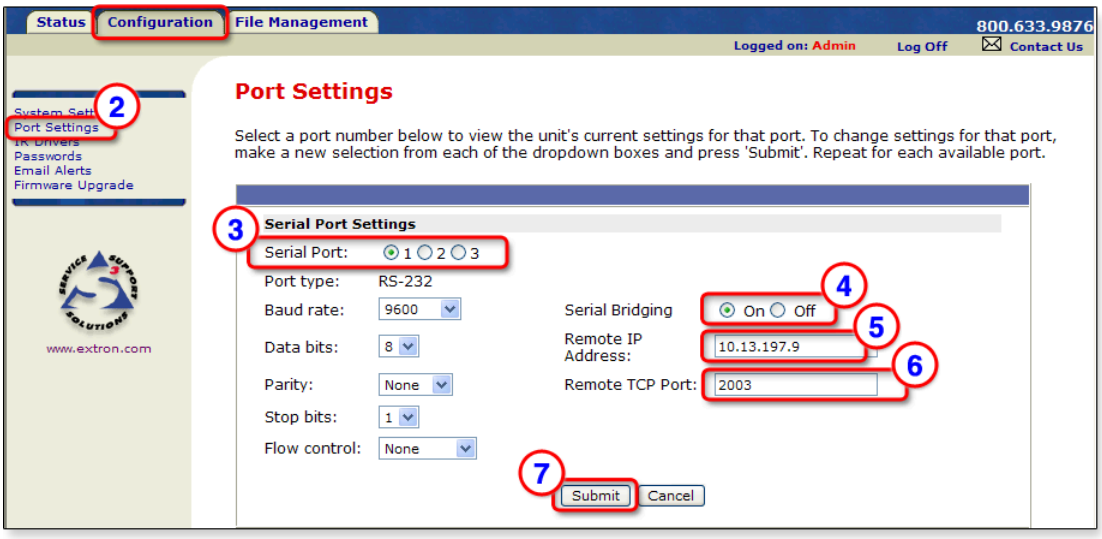
Serial bridge configuration

To allow both IPL units to communicate together, you must configure unit 2 to communicate with unit 1.

NOTE *If a serial (RS-232) driver was previously loaded (via Global Configurator) onto the IPL unit, serial bridging disables it.*

To configure unit 2 to communicate with unit 1:

1. Enter the IP address of unit 2 in the Internet browser's Address field at the top of the screen, and press the Enter key. The System Status page opens, showing the current IP and serial port settings of IPL 250 unit 2.
2. Access the Web server port setting screen by clicking the **Configuration** tab, then the **Port Settings** link on the left side of the window. The Port Settings page appears, as shown in the following figure.



Unit 2's Port Settings internal Web page

3. Choose the serial port (on the local IPL 250, unit 2) that you wish to communicate through.
4. For Serial Bridging, click the **On** radio button to activate bridging mode.
5. In the Remote IP Address field, type in the IP address of unit 1.
6. In the Remote TCP Port field, type in the number (2001-2003) for the serial port on unit 1 that is to be used in the virtual connection.
7. Click the **Submit** button.

The A/V device attached to remote unit 1 should now accept all serial commands from your PC, touchpanel, or controller.

Saving and uploading the configuration

This is not an advanced configuration function, but when you finish creating the configuration in Global Configurator, you must save the GC project and upload the configuration to one or more IPL 250 units. See chapter 3 of the *IPL 250 Setup Guide* (shipped with the IPL) or the *Global Configurator Help* file for instructions.

Controlling an IPL 250

You can control the IPL and devices connected to it by using a shared network and one or more of the following tools:

- the IPL's factory-embedded Web pages
- the GlobalViewer (GV) Web pages that are created when you upload the GC configuration to the IPL
- a TouchLink touchpanel with a customized graphical user interface (GUI), provided that the TouchLink is included in the IPL 250's configuration

Embedded Web pages

The IPL 250 features an embedded Web server, which includes factory-set Web pages. These pages can be replaced with user-designed files, but the default Web pages provide many basic features for monitoring, configuring, and controlling the unit via a Web browser. This section provides an overview of these Web pages, which provide some of the features of the configuration program.

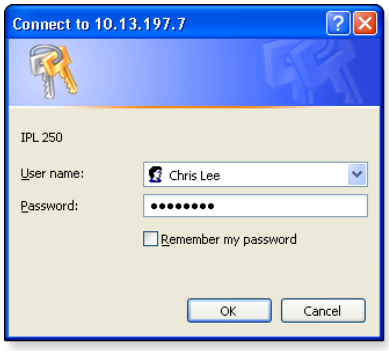
To access the embedded Web pages,

1. Launch a Web browser (Internet Explorer, Mozilla Firefox) on the connected PC, enter the IPL's IP address in the address field, and press the Enter key.

NOTE *After GlobalViewer Web pages have been uploaded to the IPL, the GV Web pages open by default (instead of the factory-set Web pages) if you enter just the IPL unit's IP address (e.g.* `10.13.197.7` *or* `http://10.13.197.7`*). To view the factory-set Web pages on a GV-enabled IPL unit, add* `/nortxe_index.html` *after the IP address before pressing Enter. For example, enter* `http://10.13.197.7/nortxe_index.html`*.*

2. In the Connect to <IP address> dialog box, shown at right, enter the IPL's IP address or text of your choice in the User Name field, type in the administrator password in the Password field, and click **OK**. The IPL's default Web page appears.

   If the IPL has not already been configured with a password, this password dialog box does not appear; the default Web page opens directly.



NOTE *Passwords must contain 4 to 12 alphanumeric characters. Symbols and spaces are not allowed and the passwords are case sensitive.*

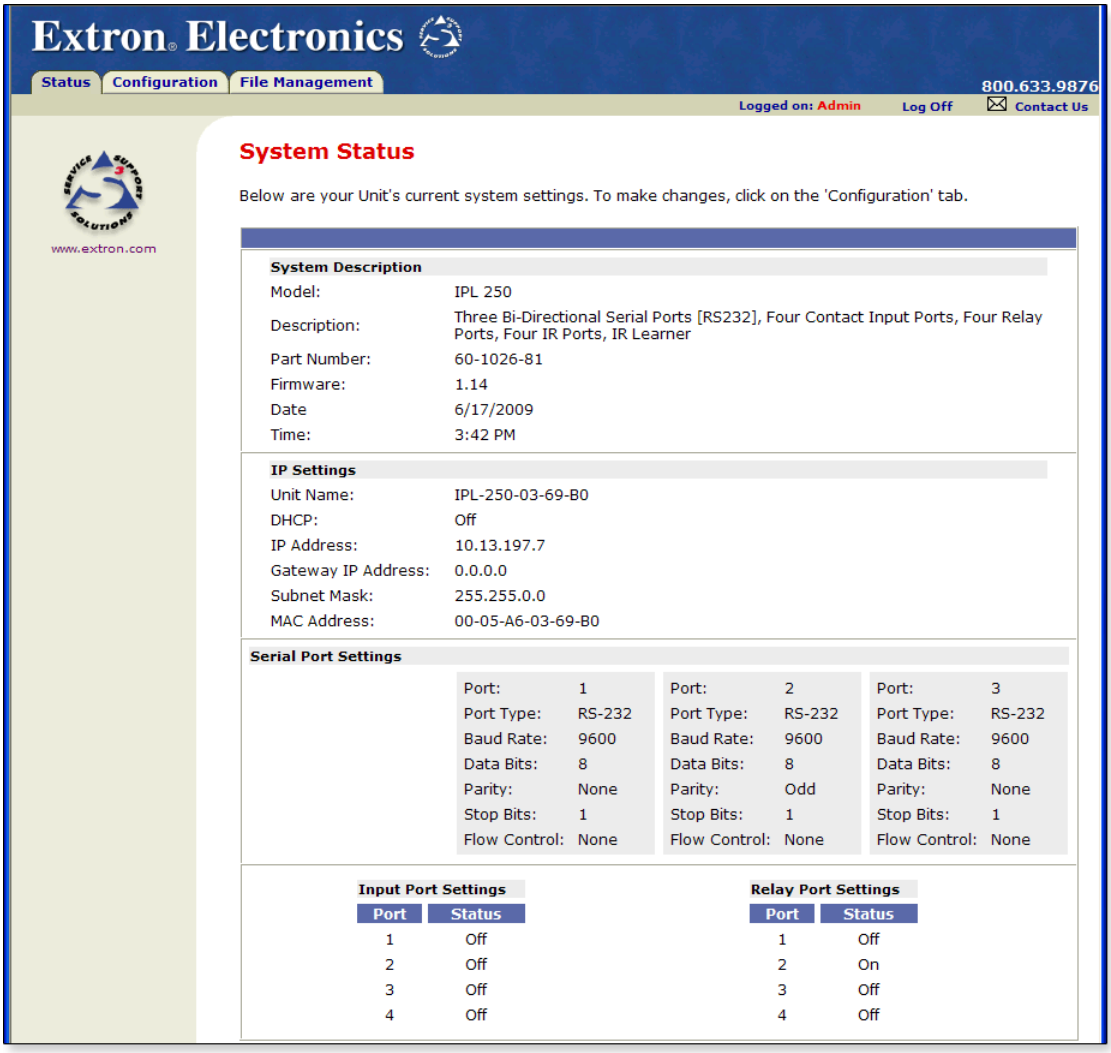
NOTE ***Administrators*** *have access to all of the Web pages and are able to make changes to settings.* ***Users*** *can access the* **System Status** *page only.*

Status

The Status Web page provides only settings information. Changes must be made via the **Configuration** Web page or via the Global Configurator software or SIS programming. Personnel who have user access can view these pages but do not have access to configuration pages.

System Status

The System Status page provides information about the IPL 250's model, part number, firmware level, port and IP settings, as shown in the following example. This information is useful when troubleshooting.



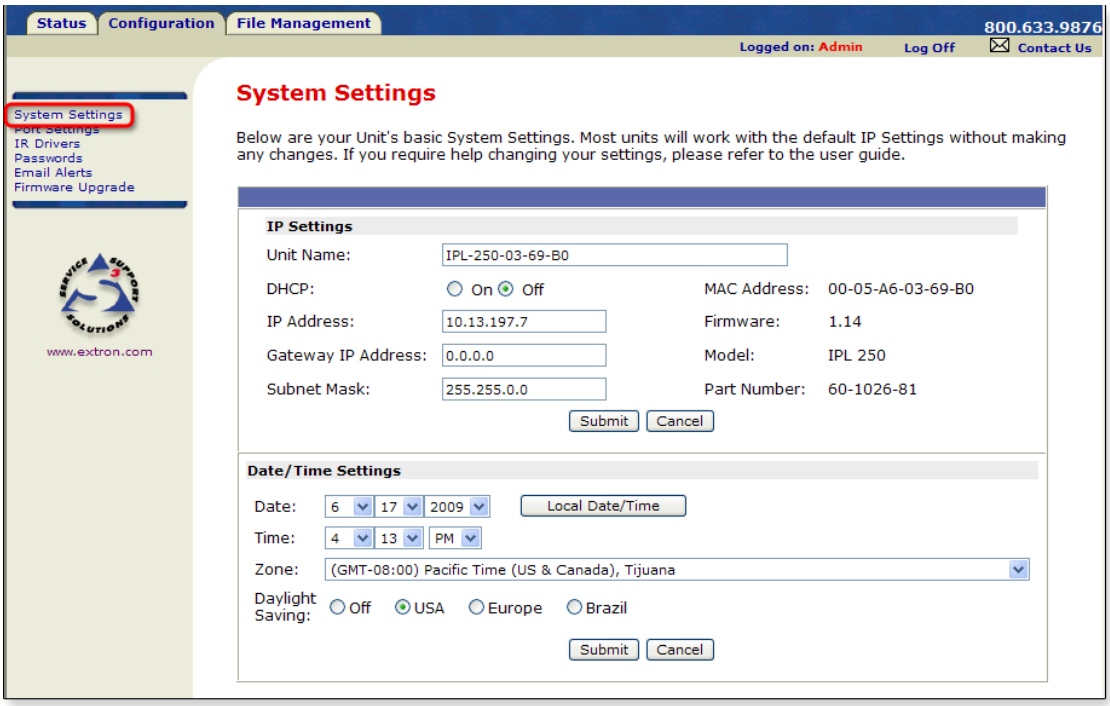
Configuration

There are six Configuration Web pages, which only administrators can access:

- System Settings
- Port Settings
- IR Drivers
- Passwords
- Email Alerts
- Firmware Upgrade

System Settings

This page is for IP and date/time setting changes.

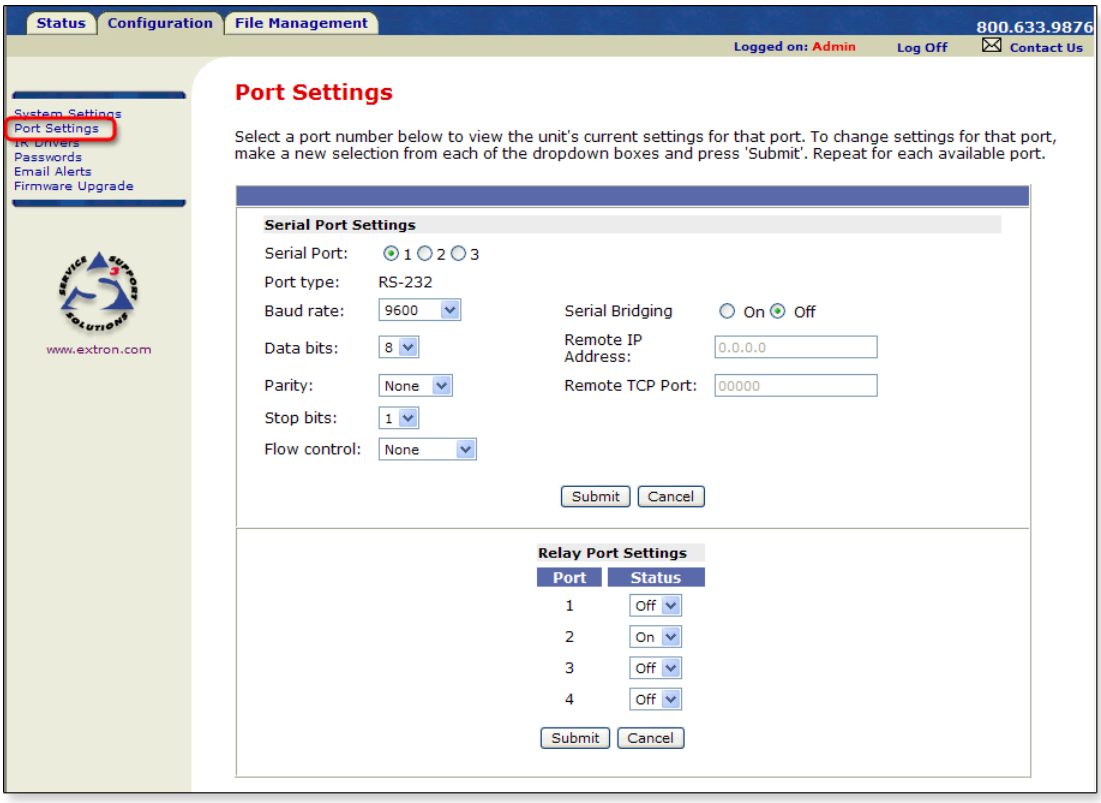


NOTE *Unit Name can be changed to your choice of up to 24 alphanumeric characters and hyphens (-). See "Using Global Configurator: helpful tips" in this chapter for examples.*

- *Spaces ( ) and underscores (_) are not permitted within a unit's name.*
- *Valid characters are A-Z, a-z, 0-9, and - (hyphen).*
- *The name cannot start with a number or hyphen. It cannot end with a hyphen.*

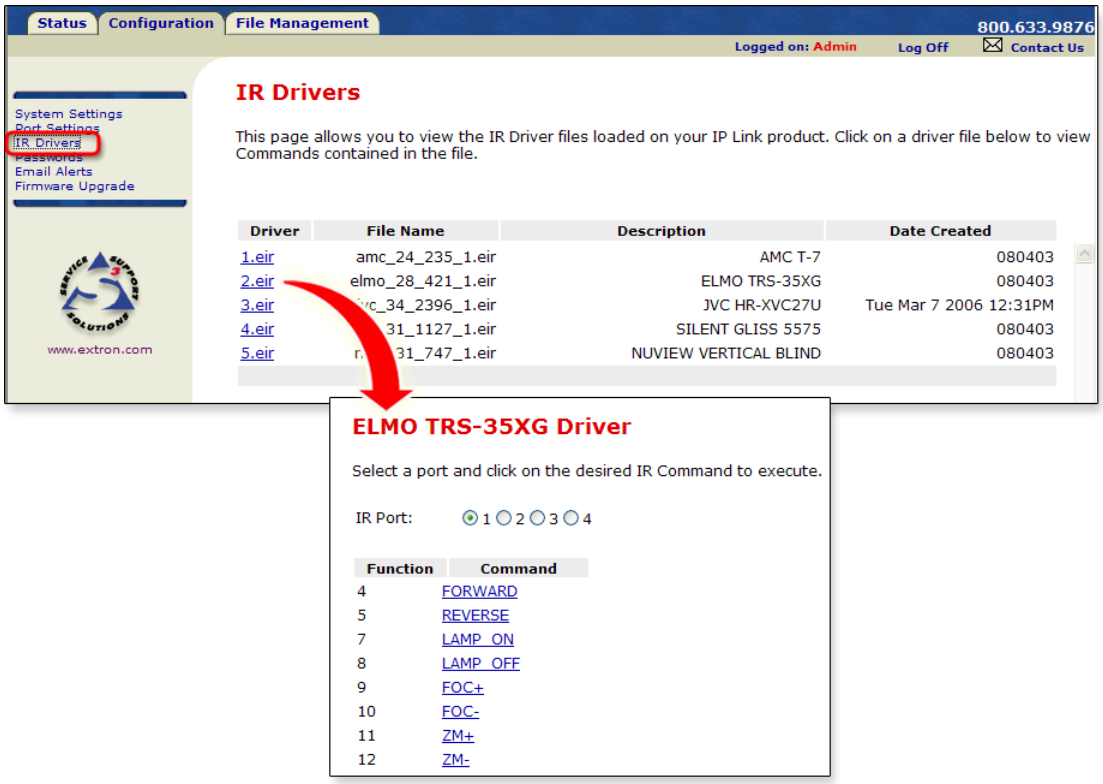
Port Settings

This page allows limited changes to serial (COM) port settings and to the on/off status of each relay port.



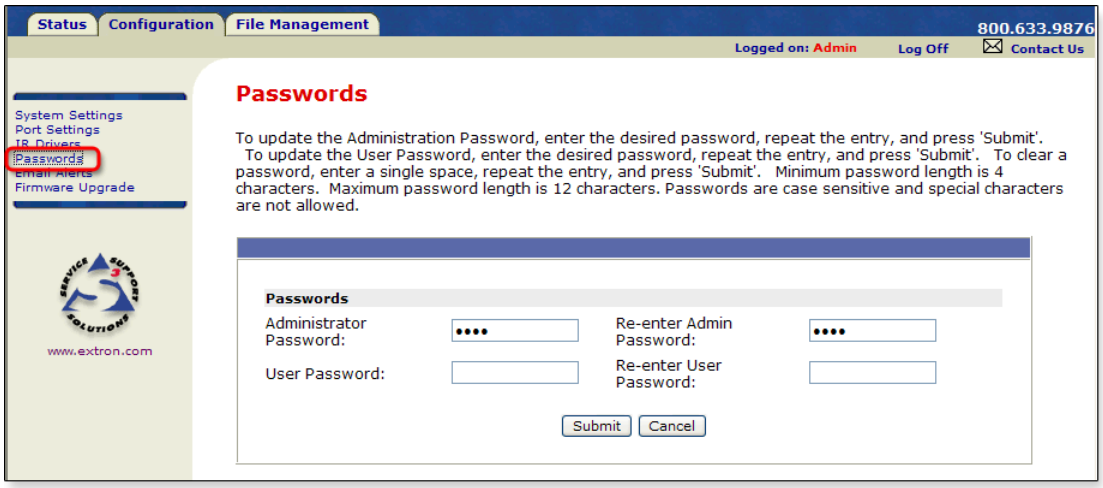
IR Drivers

Once the IPL 250 is configured and IR drivers have been uploaded to the unit and linked to specific IR ports, you can view a list of the uploaded drivers in this page. Click on the name of the driver file to switch to a view of the commands loaded for that driver. Clicking on a command name makes the IPL send that command out its linked IR port to the connected device.



Passwords

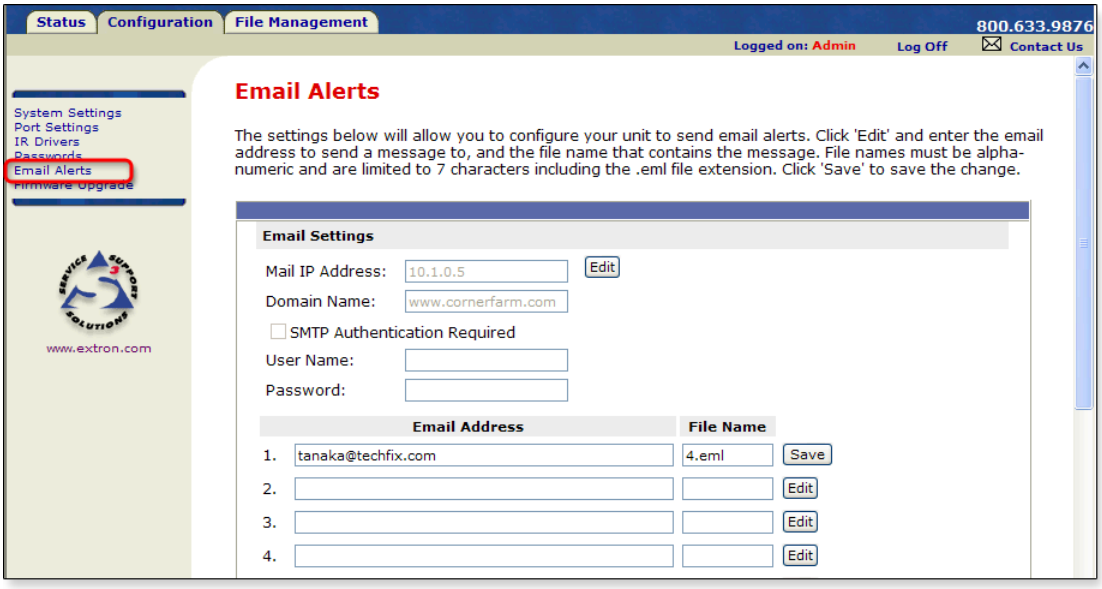
In the Passwords page you can change the administrator and/or user passwords.



NOTE *Passwords must contain 4 to 12 alphanumeric characters. Symbols and spaces are not allowed and the passwords are case sensitive. A minimum of 4 characters are required when creating passwords via the Web pages. Also, a user password cannot be assigned if an administrator password does not exist. And if the administrator password is cleared, the user password is also cleared.*

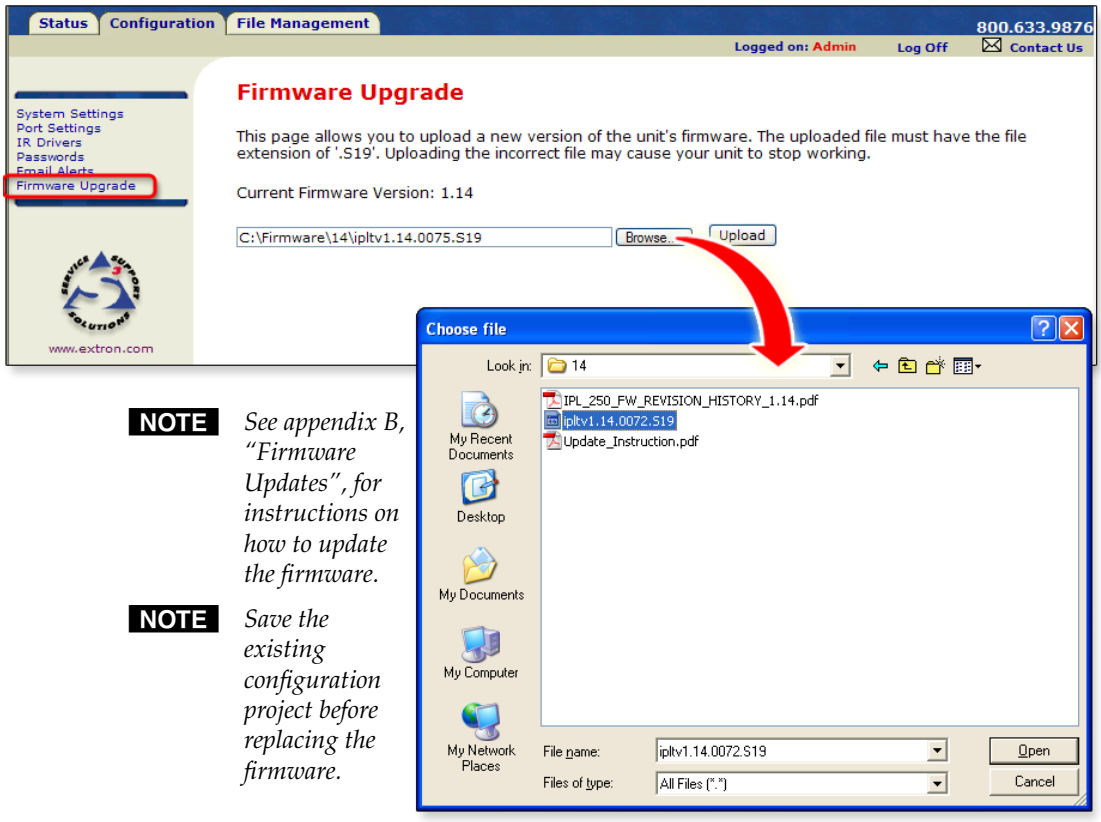
Email Alerts

In this page you can specify the Web server's IP address and domain name, set up SMTP verification credentials, and specify e-mail alert recipients' addresses and which e-mail file they will be sent.



Firmware Upgrade

Through this page you can locate and load new firmware to the unit.

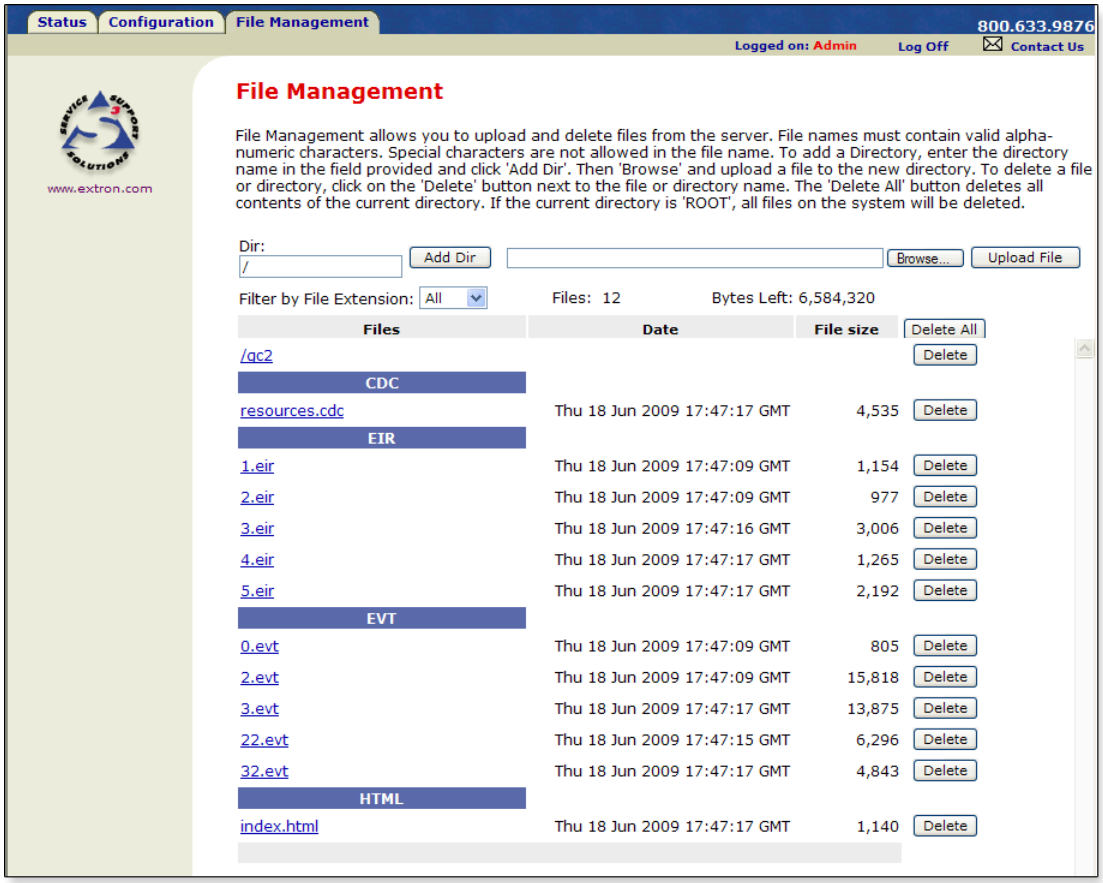


NOTE *See appendix B, "Firmware Updates", for instructions on how to update the firmware.*

NOTE *Save the existing configuration project before replacing the firmware.*

File Management

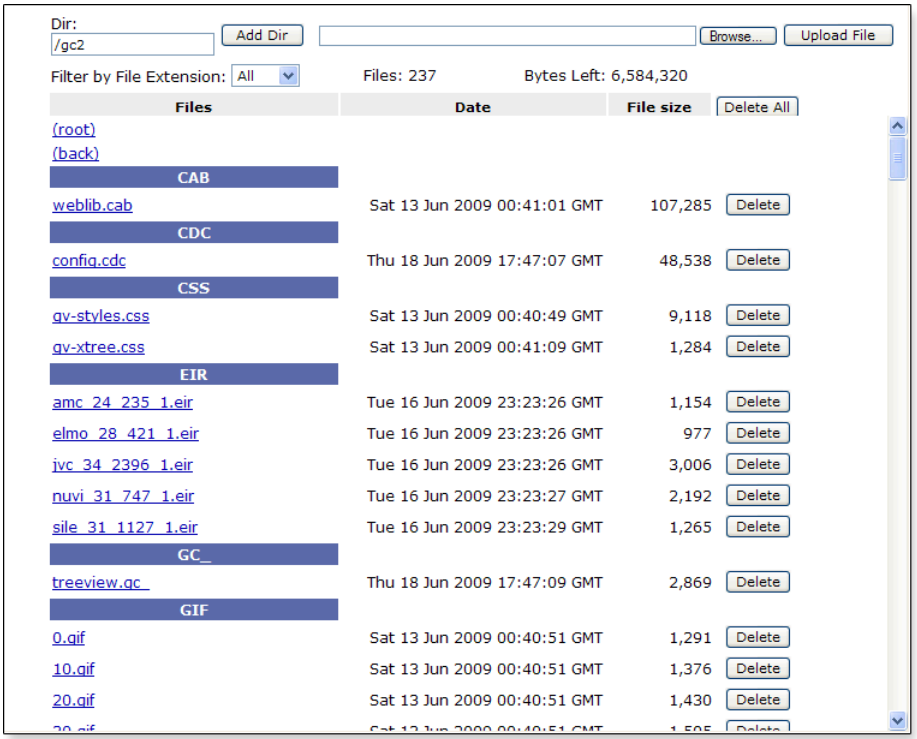
This Web page allows you to sort by file type (see the **Filter by File Extension** drop-down box). Personnel with administrator access can view these pages and make changes. Those with user-level privileges are not able to see this page. For an explanation of file types see appendix A.



CAUTION *Files with the .cdc extension (___.cdc files) should NOT be deleted.*

CAUTION *Event files (__.evt) should NOT be deleted. They are necessary for the controller's operation. Never delete the main event file (0.evt).*

You can also view files in subfolders, including those containing GlobalViewer files if they have been installed on the IPL 250. The following screen view shows an example of the file management page for subfolders.



GlobalViewer® Web Pages

The IPL 250 can be used as part of a network of devices based on Extron IP Link technology. Global Configurator (GC) is a Windows-based program used for configuring and customizing the Web browser-based GlobalViewer (GV) application for each IPL, System 5 IP, MLC, or other IP Link-based device on a network. Once an IPL 250 is configured, its GlobalViewer Web pages allow the user to manage, monitor, and control the IPL and the devices connected to it.

Refer to the Global Configurator help file and the *IPL 250 Setup Guide* for specific information on how to use the software and perform basic setup tasks.

NOTE *To work with GlobalViewer Web pages, you must use Microsoft Internet Explorer version 6.0 or higher with ActiveX enabled.*

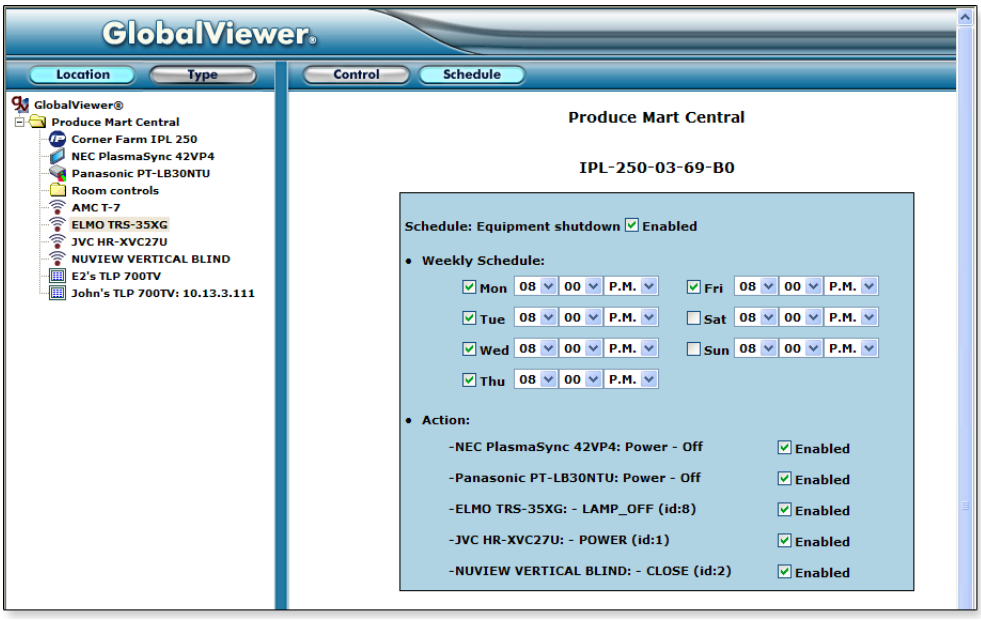
NOTE *If the IPL has been configured with passwords, the GlobalViewer Web pages are password protected. Although default embedded Web pages are accessible via the GlobalViewer Web pages, nonadministrators (people with only user access) are able to access only the Status default Web page and some GlobalViewer Control pages.*

Four screens for the IPL are available via Global Viewer: Control, Monitor, Schedule, and Info (

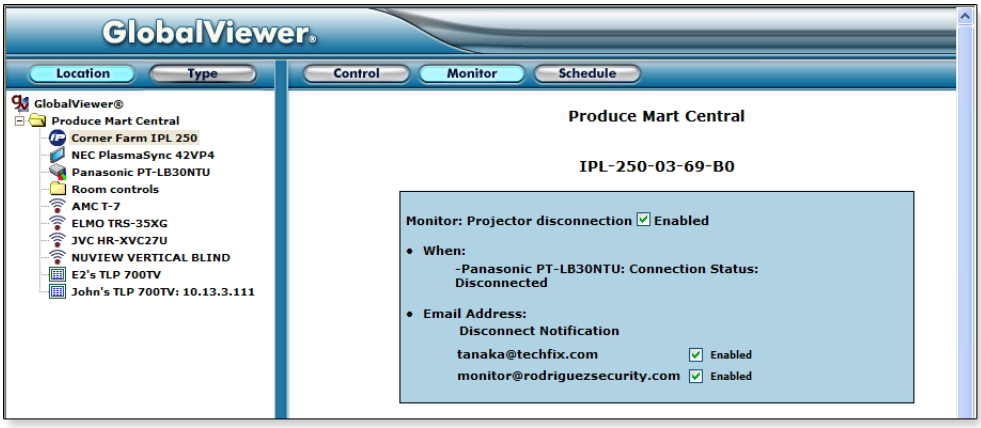
). Screens such as Monitor and Schedule appear only for ports and controlled devices that have been included in specific monitors or schedules you set up using GC. The Info screen appears for the overall system, not for specific connected devices.

Read the *Global Configurator Help* file for details on each screen and how to use the GlobalViewer pages.

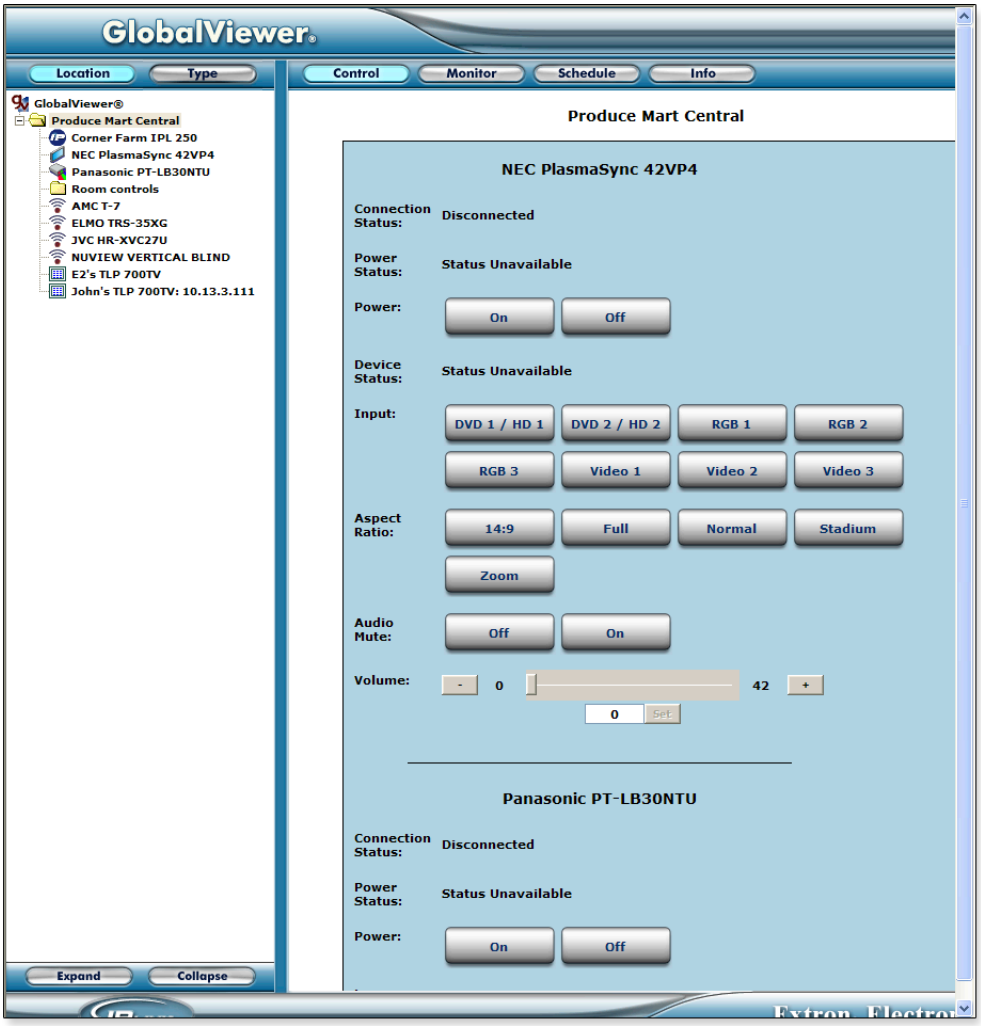
The following figures are examples of IPL 250 GlobalViewer pages.



A GlobalViewer Schedule page

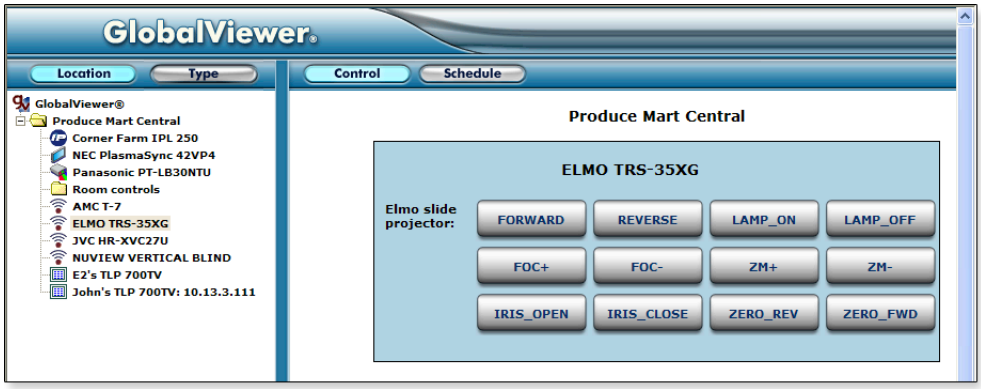


A GlobalViewer Monitor page



A GlobalViewer overall system page

If a device has been set up with an IR or RS-232 driver, click on the device's name on the left side of the GlobalViewer window to open a Control page that shows the available commands for the device. The following screen shot shows one example.



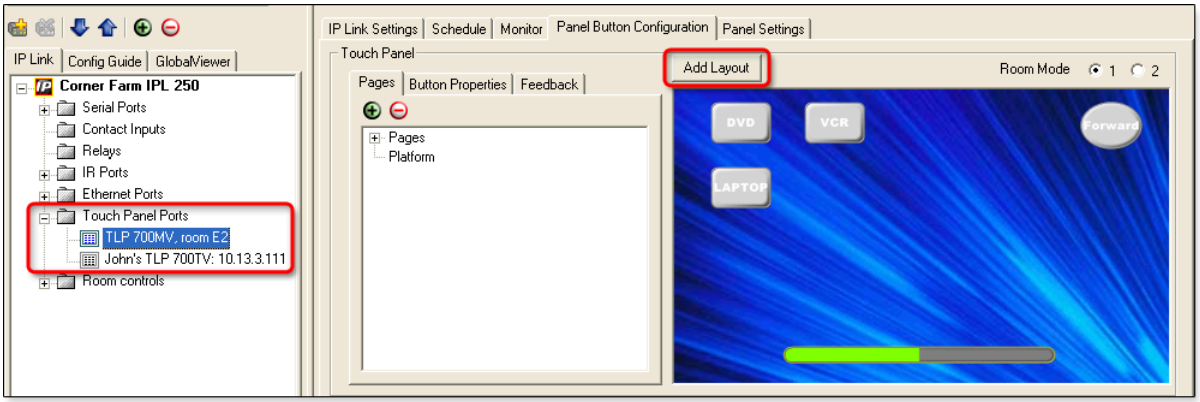
A GlobalViewer device control page

You can click the GlobalViewer's on-screen buttons to send the corresponding command from the IPL to that device.

Controlling the IPL 250 with a Touchpanel

After both devices are configured, the IPL 250 can be controlled with an optional Extron TLP touchpanel.

1. Set up each touchpanel's graphical user interface (GUI) by using the GUI Configurator software. Refer to the *GUI Configurator Help* file for details.
2. Connect the touchpanel(s) to the same network that the IPL 250 uses.
3. While configuring the IPL in Global Configurator, add each TLP to the Touchpanel ports. Connect to the TLPs and upload the GUI layout for each panel. Refer to the *Global Configurator Help* file for the procedure.



4. Use GC to configure the panel's on-screen and hardware buttons.
5. Upload the configuration to the IPL.
6. Test the system by pressing the touchpanel's buttons (or pressing/clicking the touchpanel's virtual buttons in the IPL 250's GlobalViewer Web page) and observing how the IPL and the other devices in the system react.
   - If everything works as it is supposed to, you may disconnect the PC or laptop from the IPL or the network and use just the touchpanels to control the IPL.
   - If the system components do not respond properly when you test the touchpanel, check and adjust the IPL's configuration using GC, then upload the revised configuration.

Customizing the IPL's Control Web Pages

Extron offers Web page templates that can be customized using standard HTML editing tools or third-party software such as Microsoft® FrontPage or Adobe® Dreamweaver® to provide a different interface to the user while still using GlobalViewer functions. An experienced Web developer can add images, modify text, and change background colors to create a look and feel that reflects your brand or your user's specific requirements. For example, a university with dozens of devices and rooms to control may wish to create customized Web pages with the university's school colors and logo. End users can control the system using these customized pages instead of the standard GV pages.

Alternatively, Extron can create a customized GUI for you to upload to each IPL 250 in the system. End users can view the Web pages of this customized GUI while administrators and installers still have access to the factory-set Web pages and the standard GV Web pages in addition to the customized ones.

For a small, one-time fee, Extron will turn the following items into files ready to upload to the unit:

- your GlobalViewer project file containing system configuration details
- your choice of available color schemes
- your choice of labels for panel buttons
- a company or institution logo

These customized Web pages, whether created by Extron or modified by an outside HTML developer from Extron-supplied templates used in the system.

Visit the Extron Web site (*http://www.extron.com/product/customgui.aspx*) or contact an Extron customer support representative for more information on this service and on available template options .

Troubleshooting

Turn on the input devices (DVD players, VCRs, PCs, and other sources), output devices (display screens, projectors), the IPL 250, and the PC and touchpanel. Touch a configured button on the touchpanel or (via PC) click a control button on the IPL's embedded Control Web pages.

If an input or output A/V device cannot be remotely controlled (does not respond as expected), check the following:

Power connections

1. Ensure that all devices are plugged in.
2. Make sure that each device is receiving power. The IPL's front panel Power LED lights if the device is receiving power.

Data connections

1. Check the cabling connections and make adjustments as needed. The Link LEDs on the IPL T and on the touchpanel or PC should be lit solid green if a network connection is detected. If these LEDs are not lit, either the cable is faulty or not plugged in, or the wrong type of cable is being used (see chapter 2, "Hardware Features and Installation").
2. Try to "ping" the unit by entering `ping 192.168.254.254` at the DOS command prompt, or use the IP or Web address provided to you by your system administrator. If you get no response:
   a. Make sure your unit is using the appropriate subnet mask (check with your system administrator).
   b. Make sure your PC and network do not have a software firewall program that might block the IP address of the IPL unit.
3. If contact is established with the unit, but the unit's Web pages cannot be accessed by your Web browser, verify (in the Options or Preferences menu) that your Web browser is configured for direct network connection and is not set up to use a proxy server.

Device control connections and configuration

1. Verify that ports are wired correctly and that ground (earthing) wires are connected to the proper pins on the IPL and, if applicable, on the controlled device.
2. Ensure that each IR emitter head is placed adjacent to or directly over the controlled device's IR pickup window.
3. Verify that the appropriate drivers were used while creating the GC configuration file and that the correct commands and signal types (IR or RS-232) are associated with the correct ports on the IPL and the other devices.

If you are still experiencing problems, call the Extron S³ Sales & Technical Support Hotline or the Extron S3 Control Systems Support Hotline.

4

Chapter Four

SIS™ Programming and Control

Host-to-IPL Communications

Commands and Reponses

SIS™ Programming and Control

The IPL 250 can be remotely controlled via a host computer, touchpanel, or other device (such as a control system) attached to a shared network.

The IPL must be configured before use. As shipped the controller/processor cannot control any other devices or interact with a touchpanel before being configured. Set up the IPL or control it by using Extron Simple Instruction Set (SIS™) commands or Extron Global Configurator software (version 3.0 or higher), via Ethernet LAN connection. See chapter 2 for pin assignments and protocol. For information on the software and the embedded Web pages, see chapter 3 and refer to the software's help files.

IPL 250 LAN port defaults:

- **IPL's IP address:** 192.168.254.254
- **gateway's IP address:** 0.0.0.0
- **subnet mask:** 255.255.0.0
- **DHCP**: off

Host-to-IPL Communications

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command sequence. When the IPL determines that a command is valid, it executes the command and sends a response to the host device. All responses from the IPL to the host end with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

IPL 250-initiated messages

If you are communicating with the IPL via a verbose Telnet connection, when a local event such as a selection via a touchpanel takes place, the IPL responds by sending a message to the host. No response is required from the host. The IPL-initiated messages are listed here).

```
(c) Copyright 2009, Extron Electronics, IPL 250, Vx.xx, 60-1026-81↵
Day, DD MMM YYYY  HH:MM:SS↵
```

Vx.xx is the firmware version number.

Example:

```
(c) Copyright 2009, Extron Electronics, IPL 250, V1.15, 60-1026-81
Wed, 29 Jul 2009 14:53:34
```

The IPL 250 sends the boot and copyright messages when you first open a Telnet connection to the IPL. You can see the day of the week, date, and time if the unit is connected via Telnet. If you use a Telnet connection, the copyright message, date, and time may be followed by a password prompt.

Additional messages may be sent by the IPL in response to changes made through the touchpanel and when scripts are executed during scheduled events.

Password information

The "↵Password:" prompt requires a password (administrator level or user level) followed by a carriage return. The prompt is repeated if the correct password is not entered.

If the correct password is entered, the unit responds with "↵Login Administrator ↵", "******↵Login Administrator↵", or "↵Login User↵", depending on the password entered. If passwords are the same for both administrator and user, the unit defaults to administrator privileges.

Error responses

When the IPL 250 receives a valid SIS command, it executes the command and sends a response to the host device. If the IPL is unable to execute the command because the command is invalid or it contains invalid parameters, it returns an error response to the host.

The error response codes and their descriptions are as follows:

E10 – Invalid command
E12 – Invalid port number
E13 – Invalid value (the number is out of range/too large) or parameter
E14 – Not valid for this configuration
E17 – System timed out
E22 – Busy
E24 – Privilege violation
E25 – Device is not present
E26 – Maximum number of connections has been exceeded
E27 – Invalid event number
E28 – Bad filename or file not found
E31 – Attempt to break port pass-through when not set (A user or software attempted to disable the port redirect feature when it wasn't already set or active.)

Error response references

The following superscripted numbers are used within the command descriptions on the following pages to identify commands that may respond as shown:

[14] = Commands that give an E14 (not valid for this configuration) response if the unit's current configuration doesn't support that command.

[22] = Commands that yield an E22 (busy) response.

[24] = Commands that give an E24 (privilege violation) response if you are not logged in at the administrator level.

[27] = Commands that may yield an E27 (invalid event number) response.

[28] = Commands that may give an E28 (file not found) response.

Commands and Reponses

Using the command/response tables

The IPL 250 can be controlled via a Telnet (port 23) connection using ASCII commands, or via a Web browser (port 80) connection using URL-encoded commands. The ASCII and URL commands listed in the tables starting on page 4-8 perform the same functions, but they are encoded differently to accommodate the requirements of each port (Telnet or browser).

The ASCII to hexadecimal (HEX) conversion table shown at right is for use with the command/response tables.

ASCII to Hex Conversion Table

Space →	20	!	21	"	22	#	23	$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
0	30	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	40	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	60	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	70	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

Esc 1B CR 0D LF 0A

ASCII to Hex conversion table

The command/response tables list valid ASCII command codes, the corresponding URL (uniform resource locator) encoded (for Web browsers) command codes, the IPL's responses to the host, and a description of the command's function or the results of executing the command.

Entering SIS commands: helpful tips

- Upper and lower case characters may be used interchangeably in the command field unless otherwise specified.
- Commands may be sent back-to-back without spaces (for example, 2!65V1Z).
- Numbers can be entered as 1, 2, or 3 digits, e.g., 8V = 08V = 008V.
- There are a few differences in how to enter the commands depending on whether you are using Telnet or a Web browser.
  - When using these commands through a Web browser, the URL reference is used to shorten the examples. "URL" refers to the full URL of the control interface and Web page reference including all path information (e.g., *http://192.168.100.10/myform.htm*).
  - To send any of the commands using a Web browser you must prefix them with the full URL followed by `?cmd=`.
  - For control via a Web browser, all **non-alphanumeric characters** must be represented as the hexadecimal equivalent, %xx, where xx represents the two-character hex byte. A comma (,), for example, would be represented as `%2C`.
    Characters such as **%**, **+**, and the space character ( ) *must* be encoded as hex bytes, or they will be misinterpreted by the IPL. For example, the ASCII command `+V` must be encoded as `%2BV` for Web browser use.
  - Some characters differ depending on the method you use to send the commands:

Telnet	**Web browser**
Escape (hex 1B)	W [must **not** be hex encoded]
Carriage return (hex 0D)	Pipe character (**|**) [must **not** be hex encoded]

NOTE *With Telnet you can use either an "Escape" (Esc) command or a "W" command, and the carriage return or the pipe character. With the Web browser, you are required to use a "W" command and the pipe character.*

In either method, {Data} = data that will be directed to a specified port and **must** be hex encoded if non-alphanumeric.

NOTE *If you make adjustments, it will take up to 1 minute 40 seconds (100 seconds) for the data in the* IPL*'s RAM to be saved to flash memory. Do not remove power during that period.*

Symbol definitions

↵ = CR/LF (carriage return/line feed) (hex 0D 0A)

← = Carriage return (no line feed, hex 0D)
(for URL-encoded commands, use the pipe character, |, instead)

• = Space character

| = Pipe (vertical bar) character

* = Asterisk character (which is a command character, not a variable)

Esc = Escape key (hex 1B)
(for URL-encoded commands, use **W** instead of **Esc**)

X1 = Specific port number or relay number (01-99)
Serial ports:
01 = COM1 port
02 = COM2 port
03 = COM3 port

Relay ports:
01 = Relay port 1
02 = Relay port 2
03 = Relay port 3
04 = Relay port 4

IR ports:
01 = IR port 1
02 = IR port 2
03 = IR port 3
04 = IR port 4

00 = reserved or all ports

NOTE *Port numbers are two ASCII characters (2 bytes). For example, port 1 is represented as 01 (hex 30 31).*

X2 = Command data section.

NOTE ***For Web encoding only**: data will be directed to the specified port and **must** be encoded (URL encoding) if it is non-alphanumeric. Change any **non-alphanumeric** character (%, +, |, ←, etc.) within the data section into the corresponding hexadecimal equivalent, %xx, where xx represents the two-character hex byte. For example, a space (hex: 20) would be encoded as %20 (hex: 25 32 30) and a plus sign (hex: 2B) would be encoded as %2B or hex 25 32 42.*

X3 = Greenwich Mean Time (GMT) offset value (-12.00 to +14.00) represents the time difference in hours and minutes (+/-hh:mm) relative to Greenwich, England. The leading zero is optional. For example, 5:30 = 05:30. Do not use a plus (+) sign if the GMT offset is positive.

X5 = On/off status
0 = off/disable (default for DHCP)
1 = on/enable

X6 = "Dirty" status:
0 = contents of RAM have been saved to flash memory and it is ok to power off or reset the unit
1 = RAM contents need to be saved to flash memory

X11 = Version (typically listed to two decimal places, e.g., x.xx)

X12 = IPL 250's name. The name is a text string of up to 24 characters drawn from the alphabet (A-Z), digits (0-9), and minus sign/hyphen (-). No blank or space characters are permitted as part of a name. No distinction is made between upper and lower case. The first character **must** be a letter. The last character must **not** be a minus sign/hyphen.

X13 = **Local date and time format**

Set format (MM/DD/YY-HH:MM:SS). Example: *01/18/05-10:54:00*.

Read format (day of week, date month year HH:MM:SS). Example: *Tue, 3 Jul 2007 18:19:33*.

X14 = IP address (xxx.xxx.xxx.xxx). Leading zeros in each of four fields are optional in setting values, and they are suppressed in returned values.
IPL 250's default address: 192.168.254.254
Default broadcast address: 255.255.255.255.

X15 = E-mail domain name; for example, *extron.com*

X17 = Time in tens of milliseconds to wait until the *first* response character is received via a serial port before terminating the current receive operation. (Default = 10 = 100 ms, max. = 32767.) The response includes leading zeros.

NOTE *For commands that use both X17 and X20, both variables must be zero or both must be non-zero. In the RS (send data) command, X17 may be omitted as long as X20 is also missing.*

X18 = Hardware (MAC) address (xx-xx-xx-xx-xx-xx) (00-05-A6-xx-xx-xx) For the location of this address, see ⑧ MAC address in chapter 2.

X19 = Subnet mask (xxx.xxx.xxx.xxx). Leading zeros are optional in setting values in each of four fields, and they are suppressed in returned values. Default = 255.255.0.0.

X20 = Time in tens of milliseconds to wait *between characters* being received via a serial port before terminating the current command or receive operation. The response includes leading zeros.
(Default = 2 = 20 ms, max. = 32767)

NOTE *For commands that use both X17 and X20, both variables must be zero or both must be non-zero. In the RS (send data) command, X17 may be omitted as long as X20 is also missing.*

X21 = Parameter (#L or #D) to set either the **L**ength of message to receive or the **D**elimiter value. # = byte count (for L) or
= a single ASCII character expressed in decimal form (for D).
The parameter is case sensitive; you must use capital D or capital L.
Byte count # can be from 0 to 32767, default = 0.
The ASCII decimal # can be from 0 to 00255, default = 00000L.

Examples:
A 3-byte length = 3L.
A delimiter of ASCII 0A = 10D.
The response from the MLC includes

leading zeros.

X22 = Verbose/response mode status:
0 = clear, default for Telnet connections
1 = verbose mode is on
2 = send tagged responses for queries
3 = verbose mode is on and tagged responses are sent for queries

NOTE *If tagged responses are enabled, all read commands return the constant string + the data or value, the same as in responses for setting a value. For example, for* Esc **CN** ↵, *the response is* **Ipn•** X12 ↵ *rather than just the data (*X12 ↵*).*

X23 = Priority status for receiving timeouts:
0 = use *send data string* command parameters (0 = default)
1 = use *configure receive timeout* command parameters

X25 = Baud rate: 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600 (default), 14400, 19200, 28800, 38400, 57600, or 115200

X26 = Parity (only the first letter is needed):
O = odd
E = even
N = none (default)
M = mark
S = space

X27 = Data bits: 7, 8 (default = 8)

X28 = Stop bits: 1, 2 (default = 1)

X29 = Serial port type:
0 = RS-232 (the only serial protocol supported by the IPL 250)

X30 = Flow control (only the first letter is needed):
H = hardware
S = software
N = none

X31 = Data pacing (time between bytes) in miliseconds (0000 - 1000). 0000 (0 ms) is the default.

X33 = Password (minimum length = 4 characters, maximum length = 12 characters)
No special characters are allowed: use alphanumeric characters. Passwords are case sensitive.

NOTE *A user password cannot be assigned if no administrator password exists; the E14 error code will be returned. If the administrator password is cleared, then the user password is also removed.*

X34 = Daylight saving time (DST) is a region-specific 1-hour offset that begins in spring and ends in fall.
0 = off/ignore
1 = USA on – Starting in 2007, DST begins on the second Sunday of March at 2 AM and ends at 2 AM on the first Sunday of November. For example, time in California is GMT -8:00 from March to November and GMT -7:00 from November to March. However, DST should be turned off in Hawaii, American Samoa, Guam, Puerto Rico, the Virgin Islands, the eastern time zone portion of the state of Indiana, and the state of Arizona (excluding the Navajo Nation).
2 = Europe on – begins on the last Sunday in March, ends on the last Sunday in October. DST should be turned off for Iceland.

X35 = Event number: 0 - 99
This is valid only while events are running.

X36 = Event buffer:
0 = receive
1 = user (absolute, unified)
2 = user (relative, data)
3 = NVRAM

X37 = Event buffer offset: 0 - [max. buffer size]

X38 = Event data buffer size (only the first letter is needed):
b = bit
B = byte (8 bits)
S = short (16 bits)
L = long (32 bits)

NOTE *This parameter is case sensitive.*

X39 = Event data to write

X41 = Password to display on screen (response to password query or set). When the unit connects to a host device via RS-232, the password (X33), itself, is the response. When the connection is via IP, X41 is 4 asterisks (****) if a password has been assigned, or it is an empty field ( ) if a password hasn't been assigned.

X42 = Contact input state
0 = off (open)
1 = on (closed, shorted)

X44 = Number of bytes to read (1 - 27)

X45 = E-mail event number or mailbox (1 - 64). The response includes leading zeros.

X46 = E-mail recipient's address (e.g., *JDoe@extron.com*) for the person to whom messages will be sent. The e-mail address has a 31 character maximum.

X47 = Name (for CR commands) or numeral (1 - 999, for SM commands) of the e-mail file to be sent

NOTE *E-mail files must have a file extension of .eml. The first line of the file is the subject, the rest is the body of the e-mail.*

X49 = Default name: a combination of the model name and the last 3 pairs of the unit's MAC address (e.g., IPL-250-03-69-B0)

X50 = Redirection status:
0 = no redirection
1 - 3 = redirect serial port communication from the specified port (1 = COM1, 2 = COM2, or 3 = COM3) to allow a serial pass-through mode (See "Serial pass-through (redirect mode)" in chapter 3.)

X52 = Connection's security level:
0 = not logged in
11 = user
12 = administrator
The response includes leading zeros.

X53 = Timeout period in tens of milliseconds for serial data pass-through mode, after which event data can be inserted into the transmit buffer and the serial port is released to another source
(Default = 10 = 100 ms, range = 1 - 32767.)

The response includes leading zeros.

X54 = ASCII digit(s) representing the numeric value of the data element read from the event buffer (Leading zeros are suppressed.)

X57 = IR playback file number (0 to 99) (no extension). The response includes leading zeros.

X58 = IR playback function number (1 to 137). The response includes leading zeros. IR function numbers 0 and 127 or higher can return information only.
0 = return all data
129 = manufacturer
130 = model
131 = class
132 = remote
133 = creation date
134 = comments
137 = user file name (a descriptive name the user/installer gave the file)

X59 = IR playback mode
0 = play once
1 = play continuously
The response includes leading zeros.

NOTE *Send the command again with mode =0 to stop mode 1 playback.*

X63 = Pulse time in 20 ms increments. If this parameter is missing or = 0, then pulse length = default = 25 = 500 ms. 1 = 20 ms (minimum pulse time) to 65535 = 1310700 ms (maximum pulse time).

X69 = IP connection timeout period specified in 10-second steps (1 - 65000, default = 30 = 300 seconds). If no data is received during the specified period, the Ethernet connection closes. Responses are returned with leading zeros.

X70 = The number (0 - 65535) to insert into an email message if a ____.eml file has an embedded server-side include "<!--#echo var = "WCR|" -->" (the **Esc** CR← command with no parameters.) The numeral is a 16-bit number to be employed as the user defines.
This is an optional parameter. Use 0 as a placeholder if the optional **X47** variable is used but **X70** is not needed.
Maximum = 65535.

X73 = An e-mail account username of up to 31 characters. Do not use commas. This parameter is optional during setup and is used for SMTP authentication.

X74 = An e-mail account password (for SMTP authentication) of up to 31 characters. Do not use commas. This parameter is optional during setup. If a password is set, the response is not the actual password characters but asterisks (****).

Command/response table for SIS commands

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
Serial port configuration and use				
These commands apply to any port that uses RS-232 communication: both 1-way (output) and 2-way (bidirectional) RS-232 communication.				
Send data string	Esc X1 * X17 * X20 * X21 RS ← X2	W X1 %2A X17 %2A X20 %2A X21 RS | X2 *response from command* ↵		X1 = Specific port number (01-99): **Serial ports:** 01 = COM1 port 02 = COM2 port 03 = COM3 port 00 = reserved or all ports X2 = command data section (< 200 bytes). X17 = time in tens of ms for the IPL to wait until receipt of the first response character before terminating the current receive operation (default = 10 = 100 ms, max. = 32767). The response includes leading zeros. X20 = time in tens of milliseconds (ms) for the IPL to wait between characters being received via a serial port before terminating the current receive operation (default = 2 = 20 ms, max. = 32767). The response includes leading zeros. X21 = #L or #D. The letter parameter is case sensitive (requires a capital "D" or capital "L"). The response includes leading zeros. L = length of the message to be received. D = delimiter value. # = byte count (for L) or a single ASCII character expressed in decimal form (for D). Byte count # can be from 0 to 32767, default = 0. The ASCII decimal delimiter # value can be from 0 to 00255, default = 0L. *For #L, # is a regular ASCII (character) numeral. If the length is 50 bytes, # = 50.* *For #D, # can be any character(s) or number(s), but it is translated into decimal format for use in the command.* *Examples: A 3-byte message length = 3L.* *A delimiter of $ would be entered as 36D (36 is the decimal equivalent of the dollar sign).* *A delimiter of ASCII 0A = 10D (line feed).*
NOTE **X17*X20*X21 is optional. X17 may be omitted only if X20 is also missing. If these three variables are not specified, the default values are used. For this command, X17 and X20 must both a) equal zero or b) be nonzero, or c) both be omitted.*				
NOTE ***For Web encoding*** *for X2, convert nonalphanumeric characters to hex numbers. A space (hex = 20) is encoded as %20. A plus sign (hex = 2B) is encoded as %2B.* *Example:* Esc 05*4*7*3L RS ←<data>		W05%2A4%2A7%2A3L RS |<data> *response from command* ↵		
NOTE *The data string (X2) in this RS command is limited to 200 bytes.*				
NOTE *Use the ASCII to decimal table below to convert the byte count number for X21 when using a delimiter (D).*				

ASCII (Character) to Decimal Conversion Table

To find the decimal equivalent of the ASCII character, add the row heading and column heading numbers together.

	0	1	2	3	4	5	6	7	8	9
10	LF			CR						
20								Esc		
30			space	!	"	#	$	%	&	'
40	(	)	*	+	,	-	.	/	0	1
50	2	3	4	5	6	7	8	9	:	;
60	<	=	>	?	@	A	B	C	D	E
70	F	G	H	I	J	K	L	M	N	O
80	P	Q	R	S	T	U	V	W	X	Y
90	Z	[	\	]	^	_	`	a	b	c
100	d	e	f	g	h	i	j	k	l	m
110	n	o	p	q	r	s	t	u	v	w
120	x	y	z	{	|	}	~	Del		

Decimal

ASCII/ Character

LF = line feed
CR = carriage return (←)
Esc = escape
Del = delete

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
Configure serial port parameters[24]	Esc X1 * X25 , X26 , X27 , X28 CP ←	W X1 %2A X25 %2C X26 %2C X27 %2C X28 CP |	Cpn X1 •Ccp X25 , X26 , X27 , X28 ↵	X25 = baud rate (300-115200 baud, default = 9600 baud) X26 = parity (O = odd, E = even, N = none [default], M = mark, S = space) X27 = data bits (7 or 8) X28 = stop bits (1 or 2)
Example:	Esc 2*9600,N,8,1CP ←	W2%2A9600%2CN%2C8%2C1CP |	Cpn2•Ccp9600,N,8,1 ↵	Set port 2 for 9600 baud, no parity, 8 data bits, and 1 stop bit.
Configure mode[24]	Esc X1 * X29 CY ←	W X1 %2A X29 CY |	Cpn X1 •Cty X29 ↵	X29 = serial port type = 0 = RS-232. **NOTE** *There is no other mode option (no RS-422, for example) for the IPL 250*
View mode	Esc X1 CY ←	W X1 CY |	X29 ↵	The response is always 0↵ for the IPL 250.
Configure flow control	Esc X1 * X30 , X31 CF ←	W X1 %2A X30 %2C X31 CF |	Cpn X1 •Cfl X30 , X31 ↵	X30 = flow control (H = hardware, S = software, N = none) X31 = data pacing in miliseconds (0000 - 1000)
View flow control[24]	Esc X1 CF ←	W X1 CF |	X30 , X31 ↵	
View serial port parameters	Esc X1 CP ←	W X1 CP |	X25 , X26 , X27 , X29 ↵	X29 = serial port type = 0 = RS-232 (the only type the IPL supports)
Configure receive timeout[24]	Esc X1 * X17 * X20 * X23 * X21 CE ←	W X1 %2A X17 %2A X20 %2A X23 %2A X21 CE |	Cpn X1 •Cce X17 , X20 , X23 , X21 ↵	Set the time to wait (X17 = waiting time in tens of ms until receipt of the first response character before terminating the receive operation, X20 = waiting time in tens of ms between characters before terminating) and priority status (X23: 0 = default, use *send data string* command parameters; 1 = use *configure receive timeout* command parameters) **for port** X1. X21 = #L *or* #D (see previous page). The response includes leading zeros.

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
View receive timeout	Esc X1 CE←	W X1 CE |	X17,X20,X23,X21↵	
Configure serial pass-through mode[24]	Esc X1 * X50 * X53 * X21 CD←	W X1 %2A X50 %2A X53 %2A X21 CD |	Cpn X1 •Ccd X50,X53,X21↵	X1 = specific port number (01 - 03) X50 = Redirection status: 0 = no redirection 1 - 3 = redirect serial port communication from COM1, COM2, or COM3. (See "Serial pass-through (redirect mode)" in chapter 3.) X53 =Timeout period in tens of milliseconds (1 - 32767) for data pass-through mode. X21 = Parameter (#L or #D) to set either the **L**ength of message to receive or the **D**elimiter value. # = byte count (for L) or # = a single ASCII character expressed in decimal form (for D). The parameter is case sensitive. Byte count # can be from 0 to 32767, default = 0. The ASCII decimal # can be from 0 to 00255, default = 00000L.
Terminate serial pass-through mode[24]	Esc X1 *0 CD←	W X1 %2A 0 CD |	Cpn X1 •Ccd 00000,00000,00000L↵	End serial pass-through.
View serial pass-through mode	Esc X1 CD←	W X1 CD |	X50,X53,X21↵	
Ethernet port configuration and use				
Set current Ethernet connection timeout period[24]	Esc 0*X69 TC←	W 0 %2A X69 TC |	Pti0*X69↵	X69 = IP timeout period specified in 10-second steps (1 - 65000, default = 30 = 300 seconds). If no data is received during the specified period, the Ethernet connection closes. Responses include leading zeros.
	The current port timeout period applies to the currently open Telnet session only. When you start another Telnet session, it uses the default global port timeout period.			
View current connection timeout period[13]	Esc 0TC←	W 0TC |	X69↵	
Set global Ethernet connection timeout period[24]	Esc 1*X69 TC←	W 1 %2A X69 TC |	Pti1*X69↵	
View global connection timeout period	Esc 1TC←	W 1TC |	X69↵	

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
IR port use				
Send an IR command[28]	Esc X1, X57, X58, X59 IR ←	W X1 %2C X57 %2C X58 %2C X59 IR |	Irs X1, X57, X58, X59 ↵	Send an IR command via IR output port number X1. X1 = IR port number: 01 = IR port 1 02 = IR port 2 03 = IR port 3 04 = IR port 4 00 = reserved or all ports Port numbers are two ASCII characters (2 bytes). For example, port 1 is represented as 01 (hex 30 31). X57 = the IR file number (0-99), X58 = IR function number (1-137), X59 = IR playback mode (0 = play once, 1 = play continuously, 2 = stop). The response includes leading zeros.
Get IR command info[13, 28]	Esc X57, X58 IR ←	W X57 %2C X58 IR |	{descriptive text} ↵	The response to this command is the name/description (e.g., Power On, Power Off, Enter, Play, Stop, RGB, Menu) of the specific command you ask about.
	X57 = the IR file number (0-99), as in files *1.eir, 2.eir, 3.eir*, etc. stored in the controller. Each ___.eir file contains commands for a specific device.		X58 = IR playback function number (1-137), of a specific function/command set contained within the file. IR function numbers 0 and 127 or higher can return information only. 0 = return all data 129 = manufacturer 130 = model 131 = class 132 = remote 133 = creation date 134 = comments 137 = user file name (a descriptive name the user/installer gave the file)	
Example:	Esc 3,1IR ←	W3%2C1IR |	POWER ↵	Command/function 1 in file *3.eir* is the Power command.
Example:	Esc 3,2IR ←	W3%2C2IR |	E13 ↵	Command/function 2 in file *3.eir* is not defined or does not exist, so the controller returns E13, the invalid value error number.

NOTE *An IR driver must be loaded into the IPL before IR command information can be read.*

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
Contact closure input port				
View contact input port state	X1]	X1%5D	X42↵	X42 = Contact input setting: 0 = off/open, 1 = on/closed
Relay port use				
Pulse relay	X1*3*X63O	X1%2A3%2AX63O	CpnX1 • RlyX5↵	X1 = Relay port number: 01 = Relay port 1, 02 = Relay port 2, 03 = Relay port 3, 04 = Relay port 4 X63 = Pulse time in 20 ms increments. If this parameter is missing or = 0, then pulse length = default = 25 = 500 ms. 1 = 20 ms (minimum pulse time) to 65535 = 1310700 ms (maximum pulse time).
Turn relay off (open)	X1*2O	X1%2A2O	CpnX1 • RlyX5↵	
Turn relay on (close)	X1*1O	X1%2A1O	CpnX1 • Rly1↵	
Toggle relay	X1*0O	X1%2A0O	CpnX1 • Rly0↵	
View relay state	X1O	X1O	X5↵	X5 = On/off status: 0 = off, 1 = on
Firmware version, part number and information requests				
NOTE *In a query response, an asterisk (*) after the version number indicates the version that is currently used. A question mark (? or ?.??) indicates that the factory default firmware is the only firmware loaded in the IPL 250. A carat (^) indicates the version of firmware that should be running, but, since a mode 1 reset was performed, the factory default firmware version is loaded and running instead. An exclamation point (!) indicates that the firmware is corrupted.*				
NOTE *Responses to commands differ depending on which, if any, verbose response mode the IPL is in. See the CV command (Esc X22CV↵) under IP setup commands later in this table.*				
Query firmware version number	Q *or* 1Q	Q *or* 1Q	X11↵ *or* Ver01*X11↵	Show the IPL's firmware version (X11) to two decimal places. This query yields the number of the currently running version of the user-updatable firmware
Example:	1Q	1Q	1.01 *or* Ver01*1.01	
Query verbose firmware version information	0Q	0Q	{response from 2Q}–{response from 3Q}–{response from 4Q}↵ *or* Ver00*{response from 2Q}–{response from 3Q}–{response from 4Q}↵	Show the bootstrap, factory-installed, and updated firmware versions. See 2Q, 3Q, and 4Q below.
Example:	0Q	0Q	2.20-1.14(1.77-IPL Series -Wed, 16 Jan 2003 00:00:00 GMT)-1.14*(1.77-IPL Series -Tue, 16 Jun 2009 16:51:43 GMT)↵	
Query firmware version	1Q	1Q	X11↵ *or* Ver01*X11↵	This command shows the currently-running firmware.

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
Query bootstrap firmware version	2Q	2Q	X11↵ *or* Ver02*X11↵	The bootstrap firmware is not user-replaceable, but you may need this information during troubleshooting.
Example:	2Q	2Q	2.20↵	
Query factory firmware version	3Q	3Q	X11(kernel version–model description–date time of upload)↵ *or* Ver03*X11(kernel version–model description–date time of upload)↵	Factory-installed firmware is different from the bootstrap firmware, but it is also not user-replaceable. This firmware was installed at the factory; it is the version the controller reverts to after a mode 1 reset (see chpt. 2).
Example:	3Q	3Q	1.14(1.77-IPL Series -Wed, 16 Jan 2003 00:00:00 GMT)↵	In this example the factory firmware version is 1.14 and the IP Link kernel version is 1.77 for the IPL 250, dated 16 January 2003.
Query updated firmware version	4Q	4Q	X11 (kernel version–model description–date time of upload)↵ *or* Ver04*X11(kernel version–model description–date time of upload)↵	Use this command to find out which version of the firmware, if any, was uploaded into the controller after it left the factory
Example:	4Q	4Q	1.15*(1.78-IPL Series -Fri, 17 Jul 2009 21:47:29 GMT)↵	In this example the current firmware version is 1.15, the IP Link kernel version is 1.78, for the IPL unit, and the last firmware upload was on July 17, 2009.
NOTE *Responses to commands differ depending on which, if any, verbose response mode the IPL is in. See the CV command (*Esc X22CV↵*) under IP setup commands later in this table.*				
Request the IPL's part number	N	N	60-1026-81↵ *or* Pno 60-1026-81↵	Show the IPL's part number.
Request the model name	1I	1I	IPL•250↵ *or* Inf01*IPL 250↵	IPL 250.
Request the model description	2I	2I	Three Bi-Directional Serial Ports [RS232], Four Contact Input Ports, Four Relay Ports, Four IR Ports, IR Learner↵ *or* Inf02* Three Bi-Directional Serial Ports [RS232], Four Contact Input Ports, Four Relay Ports, Four IR Ports, IR Learner↵	

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
Request system memory usage	3I	3I	# bytes used out of # of kbytes↵ *or* Inf03*# bytes used out of # of kbytes↵	Show amount of memory used and total available memory for system operations.
Example:	3I	3I	Inf03*12800 Bytes Used out of 1024 KBytes↵	
Request user memory usage	4I	4I	# bytes used out of # of kbytes↵ *or* Inf04*# bytes used out of # of kbytes↵	Show amount of user memory used and total available user memory.
Example:	4I	4I	1203712 Bytes Used out of 7360 KBytes	
IP setup commands				
Set the unit name[24]	Esc X12 CN↵	W X12 CN |	Ipn• X12 ↵	Change the IPL's name to one of your choosing (X12), such as "AuditoriumMLC", "Rm316-AVcenter", or "exec-boardroom-ctrl". The name consists of up to 24 alphanumeric characters (and the minus sign). The first character must be a letter, the last character cannot be a minus sign (hyphen). Either case (upper, lower) is OK.
Set unit name to factory default[24]	Esc •CN↵	W%20CN |	Ipn•X49 ↵	X49 = the name the IPL was shipped with: IPL-250-##-##-##, a combination of the model name and the last 3 pairs of hex numbers in the controller's MAC address (e.g., IPL-250-02-74-62).
Read the unit name	Esc CN↵	WCN |	X12 ↵ *or* X49 ↵	X12 is the IPL's current, user-defined unit name. X49 is the IPL's factory default name.
Set date/time[24]	Esc X13 CT↵	W X13 CT |	Ipt• X13 ↵	X13 = Local date and time format. The **set** format is *MM/DD/YY-HH:MM:SS*. *Example: 07/17/09-10:54:00*.
Read date/time	Esc CT↵	WCT |	X13 ↵	X13 = Local date and time format. The **Read** format is *day of week, DD month year HH:MM:SS*. *Example: Fri, 17 Jul 2009 15:17:40*.

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
Set GMT offset[24]	Esc X3 CZ ←	W X3 CZ |	Ipz X3 ↵	Set the Greenwich Mean Time (GMT) offset value (X3) for the IPL's location. GMT offset (-12.00 to +14.00) represents the time difference in hours and minutes (+/-hh:mm) relative to Greenwich, England. The leading zero is optional. For example, 5:30 = 05:30. Do not use a plus (+) sign if the GMT offset is positive.
Read GMT offset	Esc CZ ←	WCZ |	X3 ↵	
Set daylight saving time[24]	Esc X34 CX ←	W X34 CX |	Ipx X34 ↵	
	X34 = Daylight saving time (DST) is a region-specific 1-hour offset that begins in spring and ends in fall. **0 = off/ignore** **1 = USA on** – Starting in 2007, DST begins on the second Sunday of March at 2 AM and ends at 2 AM on the first Sunday of November. For example, time in California is GMT -8:00 from March to November and GMT -7:00 from November to March. However, DST should be turned off in Hawaii, American Samoa, Guam, Puerto Rico, the Virgin Islands, the eastern time zone portion of the state of Indiana, and the state of Arizona (excluding the Navajo Nation). **2 = Europe on** – begins on the last Sunday in March, ends on the last Sunday in October. DST should be turned off for Iceland.			
Read daylight saving time	Esc CX ←	W CX |	X34 ↵	
Set DHCP on[24]	Esc 1 DH ←	W1DH |	Idh 1 ↵	
Set DHCP off[24]	Esc 0 DH ←	W0DH |	Idh 0 ↵	
NOTE *Changing DHCP from on to off also resets the IP address to the factory default (192.168.254.254).*				
View DHCP mode	Esc DH ←	WDH |	X5 ↵	X5 = 0 (off) or 1 (on).
Set IP address[24]	Esc X14 CI ←	W X14 CI |	Ipi• X14 ↵	X14 = IP address (xxx.xxx.xxx.xxx). Leading zeros in each of the four fields are optional in setting values.
Read IP address	Esc CI ←	W CI |	X14 ↵	Leading zeros in each of the four fields are suppressed in returned values.
Read hardware address (MAC)	Esc CH ←	WCH |	X18 ↵ *or* Iph• X18 ↵	X18 = hardware (MAC) address (xx-xx-xx-xx-xx-xx).
Set subnet mask[24]	Esc X19 CS ←	W X19 CS |	Ips• X19 ↵	X19 = subnet mask (xxx.xxx.xxx.xxx). Syntax is the same as for IP addresses. Leading zeros are optional in setting values.
Read subnet mask	Esc CS ←	WCS |	X19 ↵	Leading zeros are suppressed.
Set gateway IP address[24]	Esc X14 CG ←	W X14 CG |	Ipg• X14 ↵	X14 = IP address (xxx.xxx.xxx.xxx). Leading zeros are optional.

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
Read gateway IP address	Esc CG ←	WCG |	X14 ↵	
Set verbose response mode on/off[24]	Esc X22 CV ←	W X22 CV |	Vrb X22 ↵	Enable or disable the verbose mode via this command. For X22: 0 = clear, default for Telnet connections; 1 = verbose mode is on 2 = send tagged responses for queries 3 = verbose mode is on and tagged responses are sent for queries.
NOTE *If tagged responses are enabled, all read commands return the constant (tagged) string + the data or value, the same as in responses for setting a value. For example, for Esc CN ←, the response is* **Ipn•** X12 ↵ *rather than just the data (*X12 ↵*)*				
NOTE *Verbose mode is a communication mode in which the device responds with more information than it usually would—more than the device, itself, requires. For example, the IPL can send out unsolicited information (such as notice of a change in some setting). That is an example of a verbose (wordy) relationship between the controller and a connected device. Verbose mode creates more network traffic than usual, which can slow down network performance. Verbose mode is usually enabled for troubleshooting and disabled for daily use.* • *By default, when the IPL is connected via Ethernet, verbose mode is disabled in order to reduce the amount of communication traffic on the network.* • *If you want to use the verbose mode other than mode 0 with a controller, this mode must be set to "on" each time you reconnect to the controller.*				
Read verbose mode status	Esc CV ←	WCV |	X22 ↵	
Get a connection listing	Esc CC ←	WCC |	{number of connections}↵ *or* Icc{number of connections}↵	Display the number of currently active IP clientconnections.
Example:	Esc CC ←	WCC |	002↵	*Example:* This shows two client connections.
Password and security settings				
Read connection's security level	Esc CK ←	WCK |	X52 ↵ *or* Pvl X52 ↵	For X52: 0 = not logged in 11 = user 12 = administrator. The response includes leading zeros.
Set administrator password[24]	Esc X33 CA ←	W X33 CA |	Ipa• X41 ↵	Set the administrator access password (X33, 4 to 12 alphanumeric characters). The password is case sensitive. Special characters (spaces, symbols) are not allowed. X41 = Password to display on screen (response to password query). X41 is 4 asterisks (****) if a password has been assigned, or it is an empty field ( ) if a password hasn't been assigned.
Clear administrator password[24]	Esc • CA ←	W%20CA↵	Ipa• ↵	Clear/remove all passwords (administrator and user).
NOTE *A user password cannot be assigned if an administrator password does not exist. Also, if the administrator password is cleared, the user password is also cleared.*				
Read administrator password	Esc CA ←	WCA |	X41 ↵	

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
Set user password[14, 24]	Esc X33 CU ←	W X33 CU |	Ipu• X41 ↵	Set the user password (X33 is 4 to 12 alphanumeric characters). The password is case sensitive. Special characters (spaces, symbols) are not allowed. X41 = Password to display on screen.
NOTE *A user password cannot be assigned if an administrator password does not exist. Also, if the administrator password is cleared, the user password is also cleared.*				
Clear user password[24]	Esc •CU ←	W%20CU |	Ipu• ↵	This clears the user password only.
Read user password	Esc CU ←	WCU |	X41 ↵	
Remapping port designations				
For security reasons the network administrator may wish to assign new/different port numbers to the controller's Telnet, Web browser, and direct access ports or to disable one or more ports. Typically Telnet uses port 23, Web access is via port 80 (HTTP), and direct access is via port 2001.				
CAUTION *Do **not** set two or more ports to the same port number. Setting two ports to the same number could cause networking conflicts and will also result in an E13 (invalid parameter) error.*				
NOTE *If you remap a port, you must set the port number to 1024 or higher, unless you reset the port to the default number or disable the port by setting it to 0.*				
Set the Telnet port map[24]	Esc *port#*MT ←	W*port#*MT |	Pmt *port#* ↵	Select a number (*port#*) for the port that will not conflict with any other ports.
Reset the Telnet port map[24]	Esc 23MT ←	W23MT |	Pmt 00023 ↵	This resets the Telnet port to port 23.
Disable the Telnet port map[24]	Esc 0MT ←	W0MT |	Pmt 00000 ↵	Setting the port number to 0 disables the port.
Read the Telnet port map	Esc MT ←	WMT |	*port#* ↵	
Set the Web (HTTP) port map[24]	Esc *port#*MH ←	W*port#*MH |	Pmh *port#* ↵	
Reset the Web (HTTP) port map[24]	Esc 80MH ←	W80MH |	Pmh 00080 ↵	This resets the Web port to port 80.
Disable the Web (HTTP) port[24]	Esc 0MH ←	W0MH |	Pmh 00000 ↵	
Read the Web (HTTP) port map	Esc MH ←	WMH |	*port#* ↵	
Set the Direct Access port map[24]	Esc *port#*MD ←	W*port#*MD |	Pmd *port#* ↵	
Reset the Direct Access port map[24]	Esc 2001MD ←	W2001MD |	Pmd 02001 ↵	This resets the direct access port to port 2001.
Disable the Direct Access port[24]	Esc 0MD ←	W0MD |	Pmd 00000 ↵	
Read the Direct Access port map	Esc MD ←	WMD |	*port#* ↵	

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
Directory commands				
Change or create a directory	Esc *path/directory/* CJ ←	W *path* %2F *directory* %2F CJ |	Dir • *path/directory/* ↵	The directory's name must be composed of alphanumeric characters and may include the minus sign (hyphen, -) and the colon (:). The first character must be a letter. Case does not matter. No blank or space characters are permitted in the name. Include the **full path**, not just the name of the directory. Nonalphanumeric characters in the path (e.g. /) must be encoded to hex. characters for use with a Web browser.
NOTE *A directory does not fully exist until a file has been copied into that path. Also, the IPL operates differently from PC operating systems: files stored in and directories created in the IPL may have the same names.*				
Example:	Esc *majordirectory/subdirectory/next-level/* CJ ←	W *majordirectory* %2F *subdirectory* %2F *next-level* %2F CJ |	Dir • *majordirectory/subdirectory/next-level/* ↵	In this case, the path is *majordirectory/subdirectory/*. The directory that was just created or changed to is called *next-level*.
Example:	Esc *custompages/HTMLfiles/* CJ ←	W *custompages* %2F *HTMLfiles* %2F CJ |	Dir • *custompages/HTMLfiles/* ↵	This example just created a subdirectory for storing the user's custom-made HTML files. The directory that was just created is called *HTMLfiles*.
Example:	Esc oak/CJ ←	W oak %2F CJ |	Dir • oak ↵	
Change back to the root directory	Esc /CJ ←	W %2F CJ |	Dir • / ↵	
Go up one directory level	Esc .. CJ ←	W %2E %2E CJ |	Dir • *path/directory/* ↵	
View the current directory	Esc CJ	W CJ |	*path/directory/* ↵	
NOTE *The current directory is determined on a per-connection basis. At the beginning of each IP connection/session, the current directory is selected as the root directory.*				
File handling commands				
Erase the user-supplied Web page and files[24,28]	Esc *filename* EF ←	W *filename* EF |	Del • *filename* ↵	
Erase the current directory and its files[24,28]	Esc /EF ←	W %2F EF |	Ddl ↵	
Erase the current directory and its subdirectories[24,28]	Esc //EF ←	W %2F %2F EF |	Ddl ↵	

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
List files from the current directory	Esc DF↵	W DF|	[filename 1]• [day, date time of upload] GMT • [file size 1 in bytes]↵ [filename 2]• [day, date time of upload] GMT • [file size 2 in bytes]↵ [filename 3]• [day, date time of upload] GMT • [file size 3 in bytes]↵ … [filename *n*]• [day, date time of upload] GMT • [file size *n* in bytes]↵ [space remaining (to 7-digits)] • Bytes Left ↵↵	Retrieve a list of files stored in the controller. Each line of the response lists a different filename and its corresponding file size. The last line of the response indicates how much available file space there is.
When working with the IPL 250's embedded Web pages, the response visible in a JavaScript™ server-side include (inserted between `<script> </script>` tags into HTML source code) follows this structure:			var file=new Array(); file[1]="[filename 1],[day, date time1 of upload] GMT,[file size 1 in bytes]";↵ file[2]="[filename 2],[day, date time2 of upload] GMT,[file size 2 in bytes]";↵ file[3]="[filename 3],[day, date time3 of upload] GMT,[file size 3 in bytes]";↵ … file[*n*]="[filename *n*],[day, date time*n* of upload] GMT,[file size *n* in bytes]";↵ file[*n*+1]="[space remaining (to 7-digits)],Bytes Left";↵↵	
Example (via Telnet or HyperTerminal):	Esc DF↵	W DF|	4.evt Tue, 01 Mar 2005 02:03:07 GMT 42233↵ 1.eml Tue, 01 Mar 2005 02:03:34 GMT 200↵ 2.eml Tue, 01 Mar 2005 02:03:34 GMT 300↵ 2.eir Tue, 01 Mar 2005 02:03:34 GMT 1683↵ 6.evt Tue, 01 Mar 2005 02:03:36 GMT 17956↵ 4.eir Tue, 01 Mar 2005 02:03:47 GMT 6849↵ IPLmain.sc Tue, 01 Mar 2005 02:03:52 GMT 8515↵ 0.evt Tue, 01 Mar 2005 02:03:56 GMT 34413↵ 99.eml Tue, 01 Mar 2005 02:04:19 GMT 178↵ buttons.xml Tue, 01 Mar 2005 02:04:19 GMT 17214↵ IPL.cfg Wed, 16 Mar 2005 21:34:45 GMT 7188↵ 6568448 Bytes Left↵↵	
List files from the current directory and its subdirectories	Esc LF↵	WLF|	(See responses to Esc DF↵, above.)	The response is the same except that the path/directory precedes filenames for files within the subdirectories.

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
File streaming commands				
NOTE *File streaming commands should be used by advanced programmers only.*				
Load a file to user flash memory via Telnet or RS-232[24, 28]	Esc + UF *filesize, filename* ↵	{raw, unprocessed data in a file of up to *filesize*}	Upl↵	
NOTE *If the IPL has insufficient memory available to store the sent file, it responds with* Fld↵ *(failed) instead of with* Upl↵.				
NOTE *Firmware can be updated by using this command to upload an ____.s19 file to the IPL. If the IPL determines that the file is not intended for its model, the* Upl↵ *response is followed by a* Fwm↵ *(firmware mismatch) response.*				
Retrieve a file from user flash memory via Telnet or RS-232[28]	Esc *filename* SF ↵	{4 bytes of *filesize*, and then raw data from the file}		
Load a file to user flash memory via port 80 (HTTP, Web)	Send a Post command on port 80 followed by the delimited data to be written to the file in flash memory.			
Retrieve a file from user flash memory via port 80 (HTTP, Web)	Send a Page Get command on port 80 followed by WSF |		{The response is raw data from the file.}	
Example:	http://192.168.254.254/mypage.html?cmd=WSF |		{data from the file *mypage.html*.}	
Web browser-specific commands				
Read response from last URL command	Esc UB↵	WUB |	{response from command}↵	
E-mail commands				
Configure e-mail events (mailbox)[24]	Esc X45, X46, X47 CR↵	W X45%2C X46%2C X47CR |	Ipr X45, X46, X47↵	X45 = e-mail event number (1 - 64). X46 = e-mail recipient's address (e.g., JDoe@extron.com) for the person to whom messages will be sent. This address is limited to 31 characters. X47 = name of e-mail file to be sent (*1.eml, 2.eml, ... 64.eml)* (first line of the file = the subject, the rest = the body of the e-mail).
Example:	Esc 5, jdoe@extron.com, 7.eml CR↵	W 5%2Cjdoe%40extron%2Ecom%2C 7%2Eeml CR |	Ipr 5, jdoe@extron.com, 7.eml↵	For e-mail event 5, send file *7.eml* to jdoe@extron.com.

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
Read/view e-mail events	Esc X45 CR←	W X45 CR |	X46,X47↵	
Send e-mail file specified in the e-mail event configuration[24]	Esc X45 SM←	W X45 SM |	Eml X45↵	X45 = e-mail event number (1 - 64).
Send a different e-mail file (one not configured in an e-mail event)[24]	Esc X75,X45,X70,X47 SM←	W X75%2C X45%2C X70%2C X47 SM |	Eml X45↵	X75 is an optional string for a destination e-mail address in the form of *test@extron.com*. X70 = The number to insert into an e-mail message if a ____.*eml* file has an embedded server-side include "<!--#echo var = "WCR|" -->" (the Esc← command with no parameters.) The numeral is a 16-bit number to be employed as the user defines. This is an optional parameter. Use 0 as a placeholder if the optional X47 variable is used but X70 is not needed. X47 = *xxx*, where *xxx* = a number 1 to 999 corresponding to the e-mail's filename (*xxx.eml*). If *xxx* = 0 or no parameter is given, the unit sends the file that was set via the CR command.
NOTE *If file X47.eml is not found when the SM command is executed, the IPL sends a default e-mail message.*				
Set e-mail server IP address and user domain name[24]	Esc X14,X15,X73,X74 CM←	W X14%2C X15%2C X73%2C X74 CM |	Ipm•X14,X15,X73,X74↵	X14 = IP address (xxx.xxx.xxx.xxx). Leading zeros are optional in setting values. Leading zeros are suppressed in returned values. X15 = E-mail domain name, e.g., *extron.com* X73 = An e-mail account username (for SMTP authentication) of up to 31 characters. Do not use commas. This parameter is optional during setup. X74 = An e-mail account password (for SMTP authentication) of up to 31 characters. Do not use commas. This parameter is optional during setup. In a response, instead of the actual password, X74 is displayed as 4 asterisks (****) if a password has been set up or as nothing ( ) if it has not.
Read/view e-mail server IP address and user domain name	Esc CM←	W CM |	X14,X15,X73,X74↵	

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
Event control				
NOTE *The "F" must be capitalized in these event commands.*			**NOTE** *The IPL's responses to event read/write commands include binary data.*	
Read event buffer memory[27]	Esc X35, X36, X37 X38 E↵	W X35 %2C X36 %2C X37 X38 E |	X54↵	X54 = ASCII digit(s) representing the numeric value of the data read from the event buffer (Leading zeros are suppressed.)
	X35 = Event number: 0 - 99. X36 = Event buffer: 0 = receive 1 = user (absolute, unified) 2 = user (relative, data) 3 = NVRAM. X37 = Event buffer offset: 0 - [max. buffer size].		X38 = Event data buffer size (case-sensitive parameter): b = bit B = byte (8 bits) S = short (16 bits) L = long (32 bits).	
Write event buffer memory[24,27]	Esc X35, X36, X37, X39 X38 E↵	W X35 %2C X36 %2C X37 %2C X39 X38 E |	Evt X35, X36, X37, X39↵	X39 = Event data to write. **NOTE** The response includes leading zeros (5 digits each for X35, X36, X37; 10 digits for X37.)
Read string from event buffer memory[27]	Esc X35, X36, X37, X44 FE↵	W X35 %2C X36 %2C X37 %2C X44 FE |	{*string*}↵	{*string*} is the event data string.
Write string to event buffer memory[24,27]	Esc {*string*}* X35, X36, X37 FE↵	W {*string*} %2A X35 %2C X36 %2C X37 FE |	Evt X35, X36, X37 {*string*}↵	
Start events[24,27]	Esc 1AE↵	W 1AE |	Ego↵	Start all events.
Stop events[24,27]	Esc 0AE↵	W 0AE |	Est↵	Stop running all events.
Query quantity of events running	Esc AE↵	W AE |	#####↵ *or* Enm #####↵	The response is the quantity of currently running events, and it includes leading zeros. For example, if two events are running, the response is 00002↵.
Reset (zap) commands and erase commands				
Erase the flash memory[24]	Esc ZFFF↵	W ZFFF |	Zpf↵	
Reset all device settings to factory defaults[24]	Esc ZXXX↵	W ZXXX |	Zpx↵	The "reset all settings" command does <u>not</u> affect IP settings or flash memory.

Command/response table for SIS commands (continued)

Command	ASCII (Telnet) (host to IPL)	URL Encoded (Web) (host to IPL)	Response (IPL to host)	Additional description
NOTE *The ZXXX command does not reset any IP-related settings such as the IP address, subnet mask, and gateway IP address. It also does not affect user files stored in flash memory.*				
NOTE *Contact input ports are reset to open position, relays are set to open, receive timout perids are reset to defaults, port redirection settings are cleared and ended.*				
Reset all device settings and delete files[24]	Esc ZY ←	W ZY |	Zpy ↵	
NOTE *This command is intermediate between the ZXXX and ZQQQ commands. It is an absolute system reset **excluding** IP settings (IP address, subnet mask, gateway IP address, unit name, DHCP settings, port mapping). This allows you to maintain communication with the IPL. Files, file directories, and passwords are erased by this command. This reset is recommended after you perform a firmware update.*				
Absolute system reset[24] (mode 5 reset)	Esc ZQQQ ←	W ZQQQ |	Zpq ↵	Reset all settings/memories. The ZQQQ command resets everything (all settings, adjustments, the IP address, and subnet mask) to the factory default values. Files in flash memory are also erased by this command. The firmware version does not change. The IP address is reset to 192.168.254.254, the subnet mask is reset to 255.255.0.0.
NOTE *This command is identical to **reset mode 5**, discussed in "Resetting the Unit" in chapter 2.*				

Chapter Five

Special Applications

Customizing HTML Files to Control Devices, Modify Embedded Web Pages, and Send E-mail Alerts

Special Applications

There are numerous ways to use an IP Link to control and monitor A/V systems. The *Global Configurator Help* file and chapters 3 and 4 of this manual cover typical uses and features. This chapter shows you how to set up the IPL 250 for a few specialized applications.

Before configuring the IPL 250,

1. Connect cables between the IPL 250, the controlled devices, an optional touchpanel, and the PC as described in chapter 2
2. Install and start the Global Configurator software, create or open a GC project, and add an IPL 250 to the project, if that hasn't already been done. For instructions, refer to chapter 3 of the *IPL 250 Setup Guide*, steps 1, 2, and 3.
3. In Global Configurator, add device drivers and assign them to the appropriate ports. For instructions on these tasks, refer to the *Global Configurator Help* file.

Customizing HTML Files to Control Devices, Modify Embedded Web Pages, and Send E-mail Alerts

This section discusses methods that someone familiar with HTML can use to make the IPL 250 perform customized functions or to alter the IPL 250's embedded Web pages. One option is to create server-side includes (SSIs) to send commands to the IPL 250, itself, or to devices connected to its control ports. Another is to write query strings and insert them into Web pages stored on the IPL. Or you can put a server-side include command into an e-mail file to customize alert e-mails sent out by the IPL.

First we will detail SSIs and query strings, then show you how to integrate them into HTML files to upload into the IPL 250.

NOTE *Before attempting to develop new Web pages, the user should have a working knowledge of JavaScript, HTML, and Server Side Includes.*

Creating and using server side includes (SSIs)

About server side includes and the IPL 250

The IPL's embedded Web pages, GlobalViewer Web pages, and e-mails include device- or situation-specific content such as projector connection status or lists of available driver commands. How does the IPL 250 know which information to use and when to use it?

The IPL processes SSIs, which are a type of HTML instructions that dynamically tell the unit what material or files to include in the contents of a Web page or e-mail or to send out one of the IPL 250's ports. SSIs can include embedded instructions (scripts) and style sheets (to set up the page layout), and also specify what information to insert into the Web pages. These instructions run on the IPL's internal Web server.

To give the IPL 250 customized instructions for creating e-mails and adding content to Web pages, you can create your own server side includes and place them within an HTML page or an e-mail file. These SSIs use Extron Simple Instruction Set (SIS) commands to ask for and display information from the IPL 250, itself. When a Web page is requested, the Web server (the IPL) replaces the SSI command with the response to the SIS command.

When planning your installation, be aware that customized SSIs may reduce the server processor speed.

NOTE *For the IPL and most other Web servers, an SSI-enabled HTML file must have a file extension of .shtml.*

SSI command types and syntax

Host vs. remote commands

SIS commands for IPLs and other IP Link-enabled devices fall into two categories: host or remote.

- **Host** commands instruct the IPL 250, itself, to act or respond.
- **Remote** commands send data to an external control port on the IPL 250.

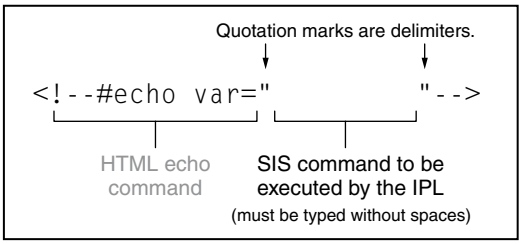
Command syntax

Basic syntax for server side includes is as follows:
`<!--#directive parameter=x parameter=x -->` where

- "directive" is an instruction to the server such as `include file` (to include/insert the content of one document into another file) or `echo var` (to display a particular HTTP variable)
- the variable (`x`) is one or more SIS commands enclosed in quotation marks ("x")

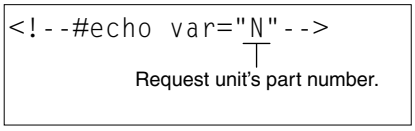
For IP Link-enabled devices including the IPL 250, see the following examples of the basic SSI command format.

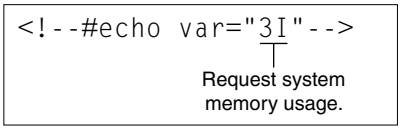
Server Side Include (SSI) Syntax for a Host SIS Command

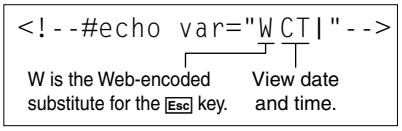


The results of the echo command are displayed in the IPL's Web page(s) or in the event-triggered e-mail.

Examples:





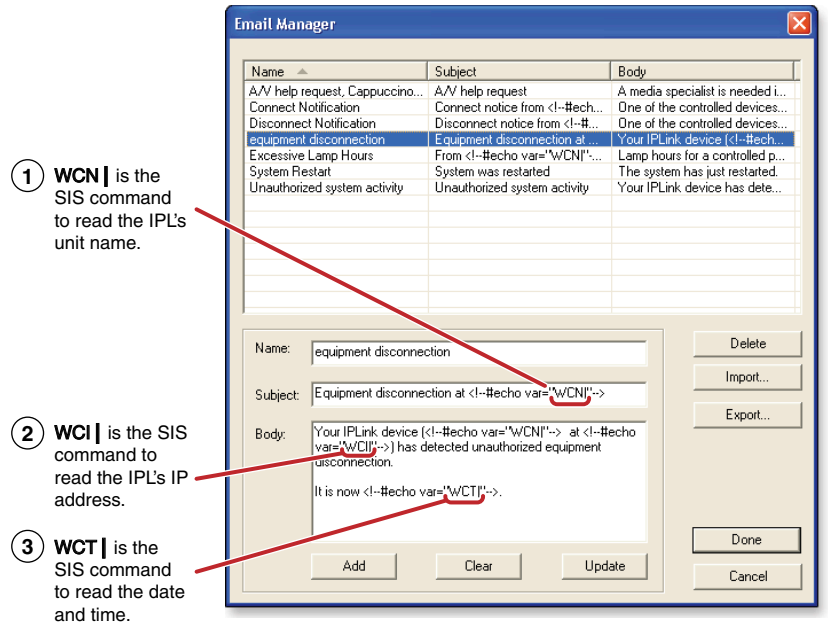


NOTE *Do not use spaces between SIS commands. Do use Web encoding. See "Entering SIS commands: helpful tips " in chapter 4 for details about how to encode SIS commands for Web use.*

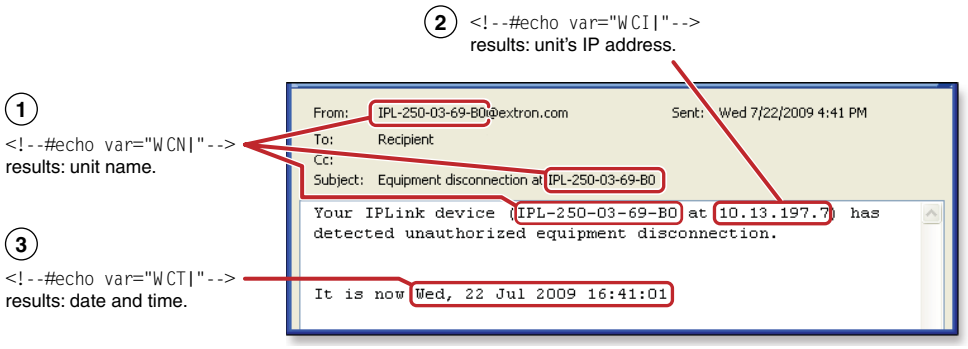
Example: SSI use in notification e-mails

One simple way to use host SSI commands is to customize e-mail messages that the IPL 250 sends in response to a monitored condition or event. In the example shown below, the disconnection e-mail uses SSIs to insert the unit name, IP address, and time into an e-mail that is sent when the IPL 250 detects that a device attached to it has been disconnected or when a switch connected to a contact input port closes or opens. For more information on commands, see the Command/response table for SIS commands in chapter 4.

How these commands are typed into the Global Configurator Email Manager:



Resulting e-mail that is sent out upon equipment disconnection:



SSI use in an IPL's Web page

Reference notes:

An __.shtml file can be uploaded to the IPL 250 by using one of the following:

- the **File Management** tab of the factory embedded Web page (http://<*unit's IP address*>/nortxe_index.html)
- an SIS command (see "File streaming commands" in the SIS tables in chapter 4)

via Telnet or HyperTerminal or DataViewer

- a Web browser by sending a Post command on port 80 followed by the delimited data in the .shtml file

Creating and using query strings

A query string is a command that contains parameters or instructions for the Web server (the IPL 250) to execute. The query string is contained after the question mark within a reference URL (Web address). (See the syntax section below.)

When a link is accessed on a Web page, the URL is sent to the Web server (IPL) to tell it which Web page to return to the browser. Upon receiving the URL, the IPL 250's internal Web server locates the query string within the URL and executes the command it contains.

Query string command types and syntax

Host vs. remote commands

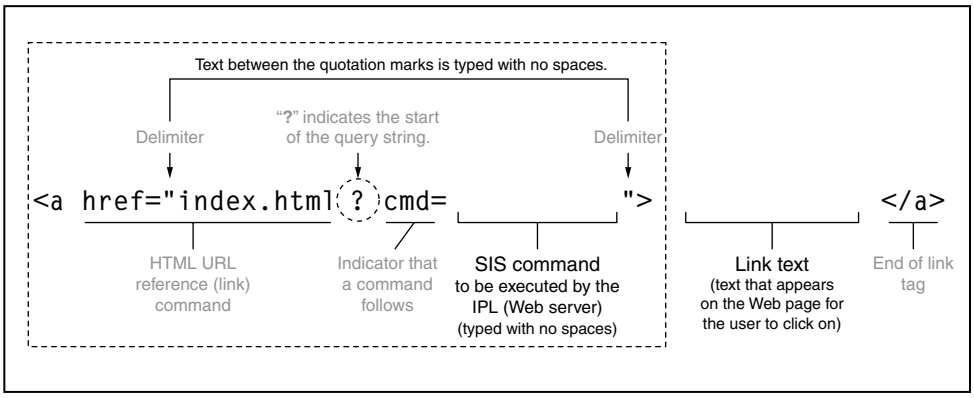
As with SSI formatted commands, query strings can use any valid SIS command of either type (host or remote).

- **Host** commands instruct the IPL 250, itself, to act or respond.
- **Remote** commands send data to an external control port on the IPL 250.

Command syntax

The basic format for a query string within a link is as follows:
`<a href="index.html?cmd=`*x*`">`*linked text*`</a>` where *x* is the SIS command to be executed.

Syntax for a URL Containing a Query String



Appendix A

Reference Material

Specifications

Part Numbers

Glossary

File Types: a Key to Extron-specific File Names

Reference Material

Specifications

Connectors	1 RJ-45 female connector
Data rate	10/100Base-T, half/full duplex with autodetect
Protocols	ARP, ICMP (ping), IP, TCP, UDP (port 3121, audio), DHCP, HTTP, SMTP, Telnet
Default settings	Link speed and duplex level = autodetected IP address = 192.168.254.254 Subnet mask = 255.255.0.0 Gateway = 0.0.0.0 DHCP = off
Web server	Up to 200 simultaneous sessions 7.25 MB nonvolatile user memory
Program control	Extron Global Configurator 3 for Windows® Extron Simple Instruction Set (SIS™) Microsoft® Internet Explorer®, Telnet
Global Viewer requirements	Microsoft® Internet Explorer ver. 6 or higher

Serial control interface

Quantity/type	3 bidirectional RS-232
Connectors	(1) 3.5 mm captive screw connector, 5 pole (2) 3.5 mm captive screw connectors, 3 pole
Baud rate and protocol	300 to 115200 baud Default settings (adjustable): 9600 baud, 8 data bits, 1 stop bit, no parity

NOTE *The 5-pole port supports both hardware and software flow control. The 3-pole ports support software flow control.*

Pin configurations

Serial, 5-pole captive screw	Pin 1 = TX, 2 = RX, 3 = GND, 4 = RTS, 5 = CTS
Serial, 3-pole captive screw	Pin 1 = TX, 2 = RX, 3 = GND

IR control interface

Quantity/type	4 IR (carrier and non-carrier)
Connectors	(2) 3.5 mm captive screw connectors, 4 pole
IR output carrier frequency	30 kHz to 1 MHz
Pin configurations	Pins 1, 3, 5, 7 = IR signal ports 1, 2, 3, 4 (respectively) Pins 2, 4, 6, 8 = GND
IR learning carrier frequency	30 kHz to 1 MHz
IR learning capture distance	2" (5.1 cm) to 12" (30.5 cm) from the front panel

Relay control interface

Quantity/type	4 normally open relays
Relay control connectors	(2) 3.5 mm captive screw connectors, 4 pole
Relay control contact rating	24 V, 1 A

Contact closure control interface

Quantity/type	4 contact closure inputs
Contact input control connector	(1) 3.5 mm captive screw connector, 5 pole
Contact closure (input only)	
Input voltage range	0 to 5 VDC, clamped at +5.1 V
Input impedance	10k ohms
Threshold	1.6 VDC
Pin configuration	Pins 1, 2, 3, 4 = inputs 1, 2, 3, 4; pin 5 = GND

General

Power	Supplied by an included external power supply
External power supply	100 VAC to 240 VAC, 50-60 Hz, external; to 12 VDC, 1 A, regulated
Power input requirements	12 VDC, 0.5 A
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling	Convection, no vents
Mounting	
Rack mount	Yes, with optional 1U rack shelf
Furniture mount	Under-furniture mountable with optional kit
Projector mount	Yes, with optional projector mount kit
Enclosure type	Metal
Enclosure dimensions	1.7" H x 4.3" W x 3.0" D (1U high, quarter rack wide) (4.3 cm H x 10.9 cm W x 7.6 cm D) (Depth excludes connectors.)
Product weight	0.7 lbs (0.3 kg)
Shipping weight	2 lbs (1 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Regulatory compliance	
Safety	CE, c-UL, UL, meets UL 60950 for safety.
EMI/EMC	CE, C-tick, FCC Class A, ICES, VCCI
Environmental	Complies with the appropriate requirements of RoHS, WEEE
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *All nominal levels are at ±10%.*

NOTE *Specifications are subject to change without notice.*

Part Numbers

Included parts

These items are included in each order for an IPL 250 controller:

Included parts	Replacement part number
IPL 250	60-1026-81
Rubber feet	
PS 1210 C 12 VDC, 1A external power supply	70-775-01
3.5 mm captive screw connectors, 2 pole	100-455-01
3.5 mm captive screw connectors, 3 pole	100-456-01
3.5 mm captive screw connectors, 5 pole	100-457-01
Tweeker (small screwdriver)	
IPL 250 Setup Guide	
Extron Software Products Disc	

Accessories

These items can be ordered separately:

Mounting accessories	Part number
MBU 123 Mini Under-Desk Mount Kit	70-212-01
PMK 100 ¼ Rack Width Pole Mount Kit	70-217-01
RSF 123 1U 3.5" Deep Rack Shelf Kit	60-190-20
RSB 123 1U 3.5" Deep Basic Rack Shelf	60-604-20, -21
RSU 126 1U 6" Deep Universal Rack Shelf Kit	60-190-10
RSB 126 1U 6" Deep Basic Rack Shelf	60-604-11
RSU 129 1U 9.5" Deep Universal Rack Shelf	60-190-01
RSB 129 1U 9.5" Deep Basic Rack Shelf	60-604-01, -02

Control accessories	Part number
IR Emitter and shield kits (single, dual)	70-283-01, -02
Two contact closure switch AAP (momentary, single pole, double throw with LED - to solder tabs) (black, white, RAL9010 white)	70-614-02, -03, -05
Two contact closure switch AAP (momentary, single pole, double throw with LED - to solder tabs) (black, white)	70-613-02, -03
CCR 204 four-button contact closure remote AAP	60-794-02
TLP 700MV TouchLink™ 7" Wall Mount Touchpanel	60-546-02
TLP 700TV TouchLink™ 7" Tabletop Touchpanel	60-548-02
TLP 350CV TouchLink™ 3.5" Cable Cubby® Touchpanel	60-1017-02*xx* (*xx* varies with surface finish type)

Cables

Use the cables listed below for connecting an IPL 250 to accessories such as relay switches or communications ports:

CTL Series (Comm-Link) cables	Part number
CTLP/1000 plenum (1000 feet/300 meters)	22-119-03
CTL/1000 non-plenum (1000 feet/300 meters)	22-148-03

NOTE *These cables are also available in 500 foot (150 m) lengths.*

Glossary

10/100Base-T is Ethernet which uses unshielded twisted pair (UTP - CAT 5, etc.) cable, where the amount of data transmitted between two points in a given amount of time is equal to either 10 Mbps or 100 Mbps.

ARP (Address Resolution Protocol) is a protocol which assigns an IP address to a device based on the device's MAC or physical machine address.

Custom Web page is any file that can be loaded into an IPL 250 and served by the MLC's internal Web server. The IPL 250 can be used for various Web-based tasks. The Web page provides a way to control the IPL and other devices attached to it without use of the software, and with or without an accompanying event script. Any number and size of graphics can be used. If they are too large to fit in the IPL 250's nonvolatile memory, Web pages can be created so that they can be served from another Web server using Microsoft Internet Information Services (IIS).

DHCP (Dynamic Host Configuration Protocol) is a standardized communications protocol that enables network administrators to locally and automatically manage the assignment of IP addresses in an organization's network.

Driver is a software package that controls the interface between the controller and peripheral devices.

Ethernet is a network protocol that uses MAC addresses instead of IP addresses to exchange data between computers. Using ARP (see above) with TCP/IP support, Ethernet devices can be connected to the Internet. An Ethernet LAN typically uses unshielded twisted pair (UTP) wires. Ethernet systems currently provide transmission speeds of 10 Mbps or 100 Mbps.

Event script is a program that controls an IP Link product. Event scripts are written in the "Extron C" language (.sc), and compiled into a machine-readable event script file (.evt). The Global Configurator program performs this compilation and uploads the compiled event file onto the IPL 250. The Extron C language is similar to ANSI C, with some differences. As long as event scripts are turned on, they run continuously on the unit.

HTTP (HyperText Transfer Protocol) is a Web protocol based on TCP/IP that is used to fetch HyperText objects from remote Web pages.

IP (Internet Protocol) is the protocol or standard used to send information from one computer to another on the Internet.

IP address is a unique, 32-bit, binary number (12 digit decimal number, xxx.xxx.xxx.xxx) that identifies each device or device port (an information sender and/or receiver) that is connected to a LAN, WAN, or the Internet. IP addresses can be static (see static IP) or dynamic (see DHCP).

IP net mask/subnet mask — See subnet mask.

MAC (Media Access Control) Address is a unique hardware number given to devices that connect to a network such as the Internet. When a computer or networking device (router, hub, interface, etc.) is connected to a LAN or the Internet, a table (see ARP) relates the device's IP address to its corresponding physical (MAC) address on the LAN.

Ping is a utility/diagnostic tool that tests network connections. It is used to determine if the host has an operating connection and is able to exchange information with another host.

Port number is a preassigned address within a server that provides a direct route from the application to the transport layer or from the transport layer to the application of a TCP/IP system.

SSI (server side include) is a type of HTML instruction set that tells the IPL 250 (or some other Web server) dynamically which material to include in the contents of a Web page or e-mail. SSI files typically have a file extension of *.shtml*.

Static IP refers to an IP address that has been specifically (instead of dynamically—see DHCP above) assigned to a device or system in a network configuration. This type of address requires manual configuration of the actual network device or system and can only be changed manually or by enabling DHCP.

Subnet — See **subnetwork**.

Subnet address is the portion of an IP address that is specifically identified by the subnet mask as the subnetwork.

Subnet mask is a 32-bit binary number (12 digit decimal number, xxx.xxx.xxx.xxx) used on subnets (smaller, local networks) to help routers determine which network traffic gets routed internally (within the subnetwork) to local computers and which network traffic goes out to the rest of the network or the Internet. It is an address mask used to identify the bits of an IP address that are used for the subnet address. Using a mask, the router does not need to examine all 32 bits, only those selected by the mask.

Subnetwork is a network that is part of a larger IP network and is identified by a subnet address. Networks can be segmented into subnetworks to provide a hierarchical, multilevel routing structure.

TCP (Transmission Control Protocol) is a connection-oriented protocol defined at the Transport layer of the OSI reference model. It provides reliable delivery of data.

TCP/IP (Transmission Control Protocol/Internet Protocol) is the communication protocol of the Internet. Computers and devices with direct access to the Internet are provided with a copy of the TCP/IP program to allow them to send and receive information in an understandable form.

Telnet is a standard terminal emulation utility/protocol that allows a computer to communicate with a remote user/client. A user who wishes to access a remote system initiates a Telnet session using the address of the remote client. The user may be prompted to provide a user name and password if the client is set up to require them. Telnet enables users to log in on remote networks and use those resources as if they were locally connected.

Tool tip is text that appears when the mouse pointer hovers over a button or other item on screen.

UDP (User Datagram Protocol) is an Internet protocol for sending short packets of information quickly between networked devices. It is faster than TCP and is often used for broadcast and multicast communication, but it does not include data verification to ensure that all packets arrived at their destination.

URL (Uniform Resource Locator) is the address (such as *www.extron.com*) that lets a resource on the internet be identified, located, and accessed.

Verbose refers to a wordy way of speaking. For the IPL 250 and other IP-enabled products, verbose mode is a communication mode in which the device responds with more information than it usually would—more than the device, itself, needs to send. Verbose mode is usually enabled for troubleshooting and disabled for daily use. Verbose mode creates more network traffic than usual and can slow down performance.

File Types: a Key to Extron-specific File Names

You must have a basic understanding of the types of files used by the IPL 250 controller in order to decide what (if anything) to do with them.

___.cdc — These are compressed device configuration files created and used by Global Configurator.

CAUTION *___.cdc files should NOT be deleted.*

___.eir — These are IR driver files containing infrared commands. There is a separate ___.eir file for each device the IPL 250 controls via infrared communication. This is the type of file created during IR learning. Via Global Configurator, these files can be imported and associated with one of the controller's IR ports.

___.eml — E-mail template files have the .eml extension. These files are used to generate e-mail messages such as those regarding projector disconnection and excessive projector lamp hours. The first line of the file is the subject. The rest of the file contains the body of the e-mail. For the MLC 104 IP Plus, these files are numerically named (1 through 64). For example, *1.eml*, *2.eml*, *3.eml*,... *64.eml*.

___.evt — These are event files, the most important files for the functioning of the IPL 250. Almost everything the IPL 250 does is coordinated by the scripts in the main event file, *0.evt*. The other event files perform device driver functions.

CAUTION *Event files should NOT be deleted. They are necessary for the IPL's operation. Never delete the main event file (*0.evt*).*

_____.gc2 or _____.gcz — These are configuration files that are used by Global Configurator only, not by the IPL 250. They contain configuration settings that must be processed by Global Configurator to create device configuration and event files for the IPL 250. Global Configurator 3 is capable of loading all GC2 project files from GC version 2.0.3.3 and up. GCZ files can be opened by clicking **File** > **Open**, by clicking the toolbar icon, or by double-clicking on the GCZ file. GC2 and GCC files must be imported, however.

_____.s19 — This is an Extron-supplied firmware update file. This file is not displayed on the File Manager page. See appendix B for details on firmware updates. Firmware can't be updated by loading an ___.s19 file through the file manager.

B

Appendix B

Firmware Updates

Determining the Firmware Version

Updating the Main Firmware

Firmware Updates

If the need arises, you can replace the IPL 250's main firmware without opening the unit or changing firmware chips.

Determining the Firmware Version

There are several ways to check which version of firmware the controller is using:

- the IP Link Settings tab within Extron Global Configurator software
- the System Status or the System Settings page of the controller's embedded Web pages
- the Info page of GlobalViewer® Web pages
- the Version column within Extron IP Link® Device Manager software
- the response from the IPL 250 to an SIS command of 1Q or 0Q (See chapter 4.)

Using the Global Configurator software

1. Via RS-232 or Ethernet, connect a PC (on which the Global Configurator program has been installed) to the IPL 250.
2. Start the Global Configurator (GC) program and open a project. (See the *IPL 250 Setup Guide* and chapter 3 of this manual for details.)
3. In the window on the left side of the GC screen, click on the name of the IPL 250 for which you want to check the firmware level.
4. In the right side of the GC screen, click the **IP Link Settings** tab.
5. Click the **Refresh** button. The firmware version is listed in the System Description area.

Using a Web browser

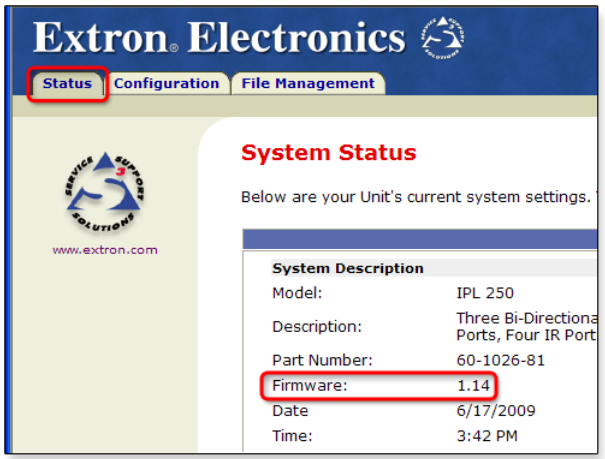
The IPL 250 controller comes with a set of factory default embedded Web pages. Also, if the IPL 250 is used as part of a network of devices based on Extron IP Link® technology, such as IP Link interfaces and MediaLink controllers, the GlobalViewer application could be installed in the IPL 250 as well as in other IP Link devices within the network. Refer to the Global Configurator help file for information on how to use that software and the resulting Web pages.

1. Connect the controller to a PC via an Ethernet connection, or connect the controller and the PC to a network/LAN. See chapters 2 and 3 of this manual and read the *IPL 250 Setup Guide* for details.
2. Start a Web browser program (such as Microsoft® Internet Explorer®).
3. Type the IPL 250's IP address into the browser's address area and log on to the internal Web page (see chapter 3) or to the optional GlobalViewer Web page stored in the IPL. (See the Global Configurator help file for details.)

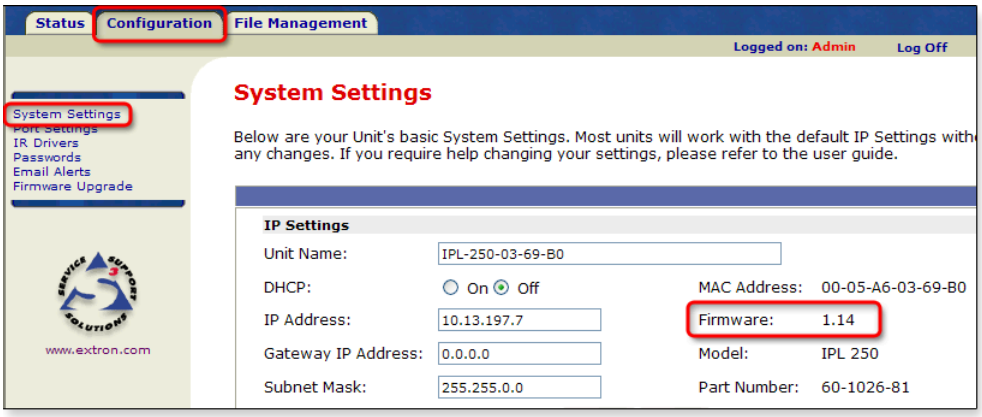
NOTE *If GlobalViewer is installed in the IPL 250, the GlobalViewer Web pages appear by default.*

- *GlobalViewer Web pages are supported by Internet Explorer, but not by other browsers. GlobalViewer features may not work properly when viewed via Navigator, Mozilla® Firefox®, or other browser programs.*
- *To reach the factory default Web pages on a controller that has been set up for GlobalViewer, type* **http://**<*IP address*>**/nortxe_index.html** *into the browser's address area, substituting the unit's actual IP address for "<IP address>". For example,* http://10.13.196.42/nortxe_index.html.

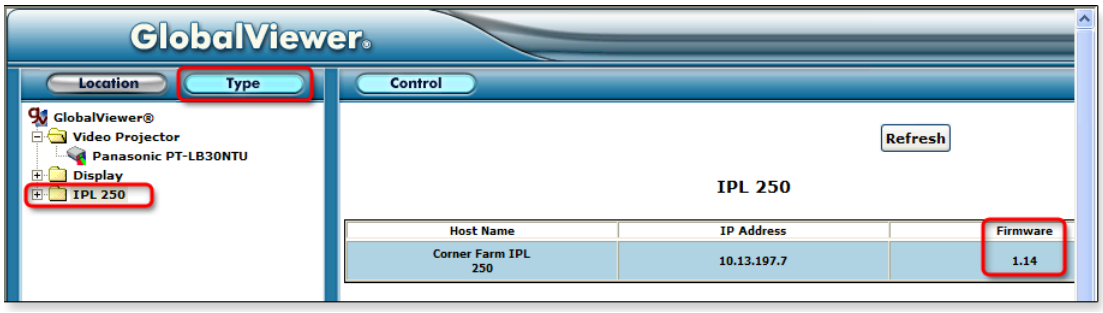
4. In the factory default Web pages, select the **Status** tab. The firmware version is listed in the System Description area, as shown below.



Or select the **System Settings** page within the **Configuration** tab. The firmware version is listed in the IP Settings area, as shown below.



If using the GlobalViewer pages, click on the **Type** button and click on the **IPL 250** folder. The firmware version is listed in the Control window, as shown in the following picture.



Updating the Main Firmware

Most firmware upgrade tools require the PC and the controller to both be connected to an Ethernet network. The instructions for each method of updating the IPL's firmware assume you have installed the appropriate software on your PC first.

NOTE *You should save the existing configuration to a file (see chapter 3) before replacing the firmware. If the file is saved, the configuration can be restored to the IPL 250 later using Global Configurator.*

NOTE *Check the Extron Web site (www.extron.com) for firmware-related documents, instructions, patch files, and new firmware files before loading new firmware into the controller. We recommend that you read the firmware release notes (available from www.extron.com) before beginning the firmware update.*

Locating and downloading the firmware

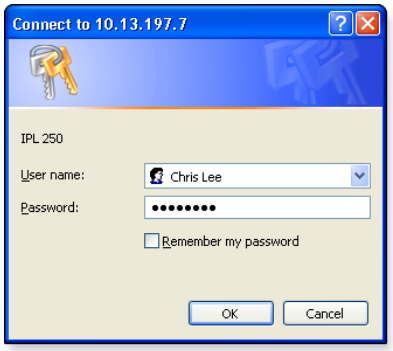
1. Visit the Extron Web site (www.extron.com) to find the latest firmware file for the IPL 250.
2. Download the executable installer file (*.exe) from the Web site and run the installer program. The program automatically stores the firmware file on the PC in **C:\Program Files\Extron\Firmware\IPL_250\xx** (a folder specific to that version).
3. Write down the firmware filename and location for later use. The filename ends in *.s19* such as **IPL_T_Series_19_1364_50_vxx_xx.s19** where xx_xx is the version number (xx.xx) or **IPLtvx.x.x.S19** where x.x.x indicates the version number.

NOTE *The firmware update file must have a filename extension of .s19. If the file does not have that extension, it will not work properly.*

Updating firmware via the IPL 250's embedded Web page

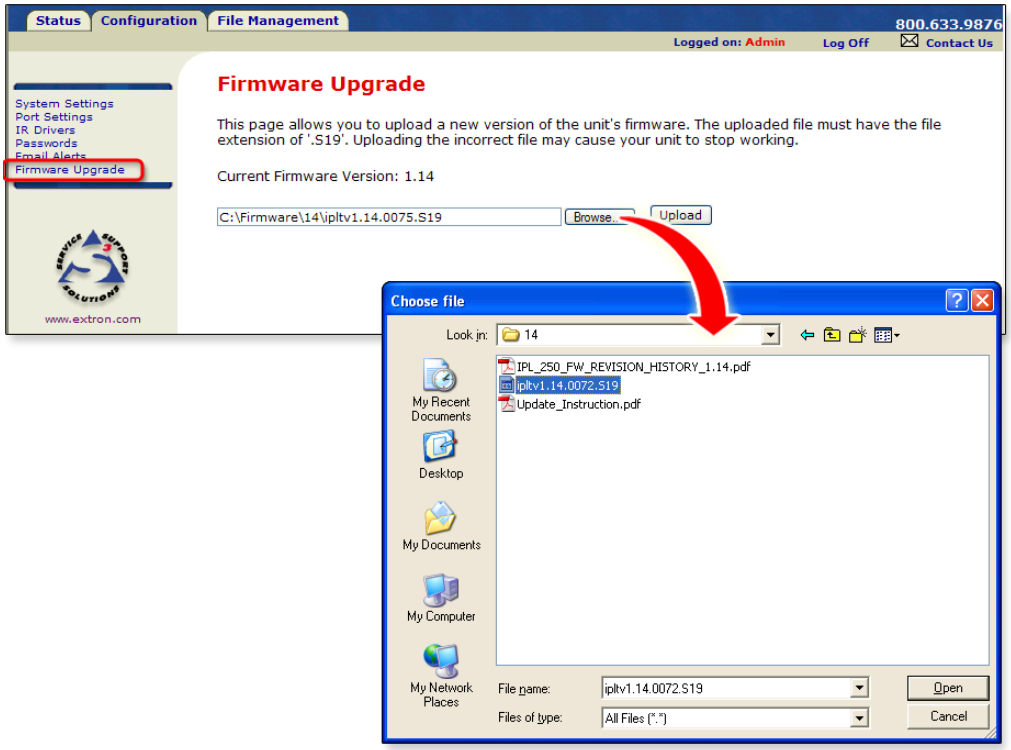
Firmware uploads may be performed via a Web browser and the IPL's internal Web page. This method allows you to update one IPL at a time via an IP connection.

1. Download the firmware file.
2. Launch a Web browser (Microsoft Internet Explorer) on the connected PC and type the controller's IP address in the address area.
3. If a password was previously set for the IPL, an Enter Network Password or Connect to... dialog box appears. Type the controller's IP address or text of your choice in the User Name area, type in the administrator password in the Password area, and click **OK**. The IPL 250's default Web page appears.



NOTE *Passwords must contain 4 to 12 alphanumeric characters. Symbols and spaces are not allowed, and the passwords are case-sensitive.*

4. Click on the **Configuration** tab, then select **Firmware Upgrade** from the list on the left of the screen. A screen like the one on the following page appears.
5. Click on the **Browse** button.



6. In the Choose file dialog box, locate and select the firmware file (*.s19) you downloaded to **C:\Program Files\Extron\Firmware\IPL_250\xx**, and click the **Open** button.
7. Click on the Web page's **Upload** button to upload the firmware into the controller. It takes a while to load the file into the IPL. You will not see any on-screen indication when the upload has finished. Once the firmware upload is completed, the IPL performs a reset.
8. Follow the instructions in "Resetting the IPL and restoring its configuration" later in this chapter.

Updating firmware via Extron Firmware Loader software

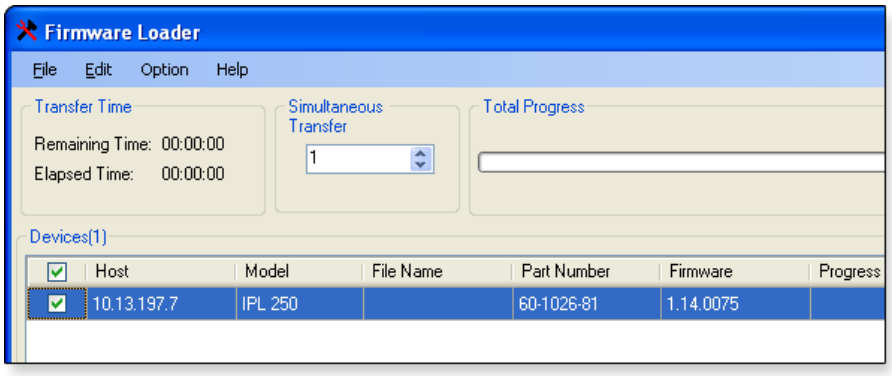
This method allows you to update one IPL 250 at a time via IP communication.

NOTE *The IPL 250 requires Firmware Loader version 5.0 or higher.*

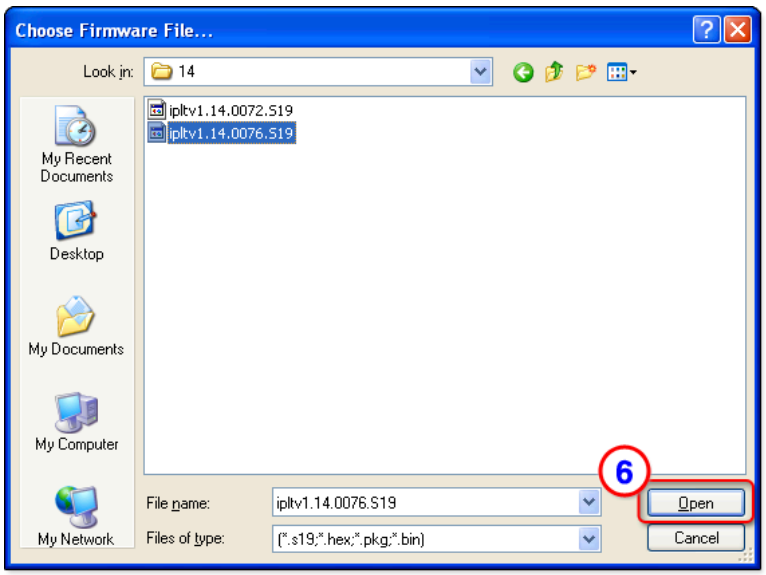
1. Download the firmware file.
2. Start the Firmware Loader (FWLoader,) software on the connected PC.
3. Choose the communication type (select **TCP/IP**) and set the communication settings. Enter the unit's IP address, verify or change the Telnet port number, and enter an administrator password if a password has been set for the unit.

NOTE *Passwords must contain 4 to 12 alphanumeric characters. Symbols and spaces are not allowed, and the passwords are case-sensitive.*

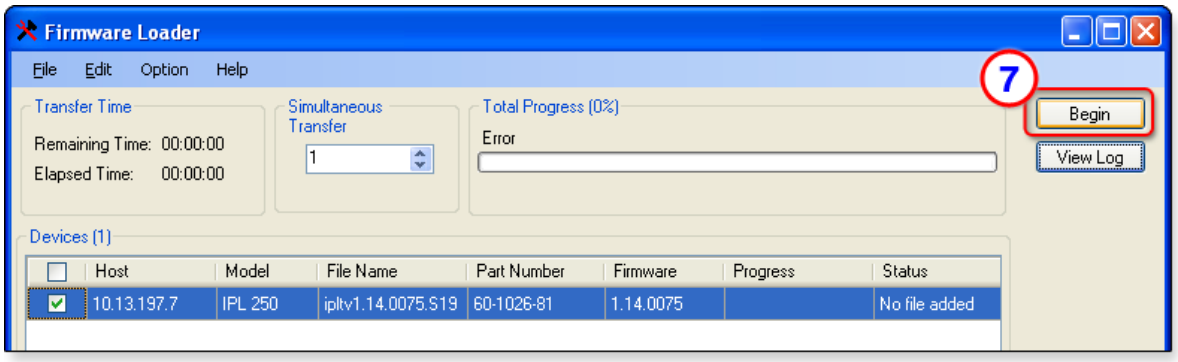
4. Click the **OK** button. A window like the one shown below appears. It shows the firmware version currently used by the IPL 250.



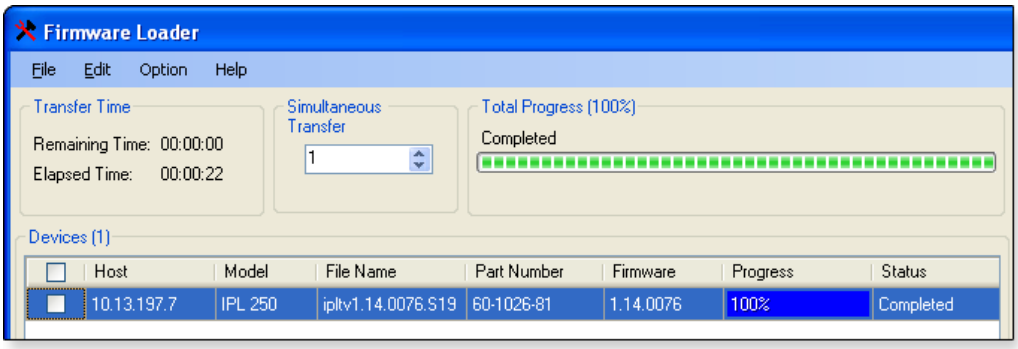
5. Click. **File** > **Open**. The Choose Firmware File window appears



6. Locate and select the firmware file on your PC that you down-loaded for the IPL, then click the **Open** button. The Choose Firmware File window closes.
7. Click **Begin** in the Firmware Loader window. The PC uploads the new firmware into the IPL 250. Once the firmware is uploaded, the IPL restarts events.



The Firmware Loader displays the new firmware version, as shown here:

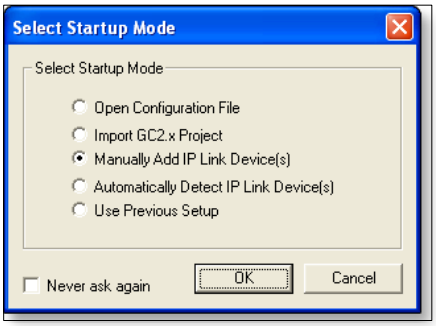


8. Close or exit Firmware Loader.

Updating firmware via Extron IP Link™ File Manager software

This is the **recommended method** for updating an IPL's firmware. It allows you to update one or several IPLs at a time via an IP connection.

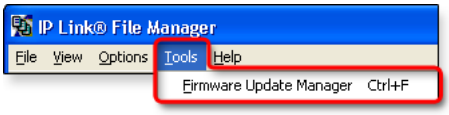
1. Download the firmware file.
2. Start the IP Link File Manager (IPLFileManager) software on the connected PC. The main IP Link File Manager window appears on screen, as does the smaller Select Startup Mode window, shown below at right.
3. Click one of the Select Startup Mode buttons to choose how to add an IPL 250 to the firmware update list, and follow any on-screen instructions to add IPLs.



- Open Configuration File — Select this mode to open an existing configuration file.
- Import GC2.x Project **(recommended)** — Select this mode to import a GC2.x project file and the names and IP addresses of the devices in it.
- Manually Add IP Link Device(s) — Select this mode to add IPLs individually by IP address.
- Automatically Detect IP Link Device(s) — Select this mode to scan the network for IP Link devices, including IPLs. You may need to provide administrator passwords for some units.
- Use Previous Setup — Choose this to show IP Link devices from your previous session of IP Link File Manager.

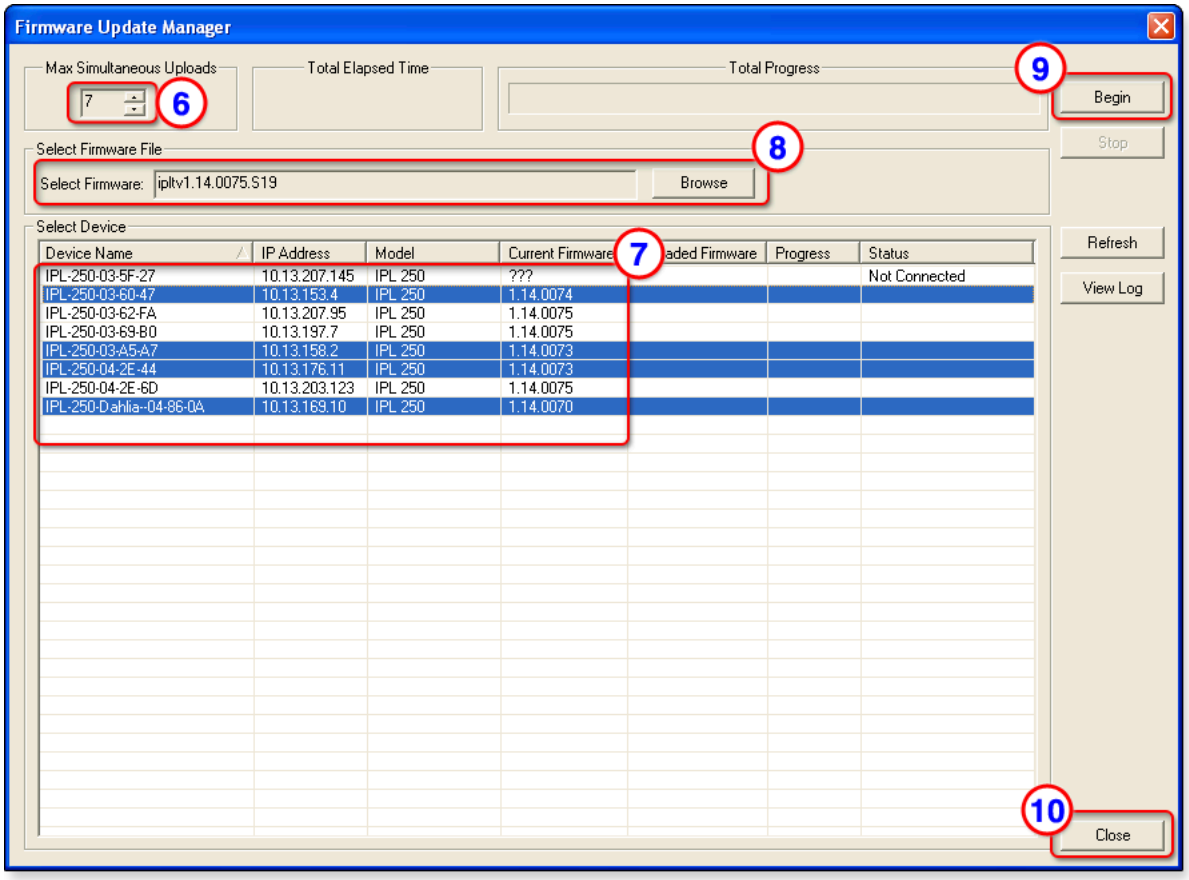
Refer to the IP Link File Manager's help file if you need additional details on how to use any of those modes.

4. Click on the **Options** menu and select **Reset Device After Firmware Update**. This option causes the IPL 250 to perform a ZY reset, which resets all device settings and deletes all files from the IPL after the firmware is updated. See chapter 4 for ZY command details.
5. Click on the **Tools** menu and select **Firmware Update Manager**.



The Firmware Update Manager window appears.

6. Set the maximum number of firmware uploads that can take place at the same time. The firmware files are uploaded to batches of this many units at a time until all units listed in the Select Device list have received new files. The default is 5 uploads at a time, and the upper limit is the total number of units shown in the Select Device list.



7. Select the devices for the firmware update.
   - Ctrl-click on the name(s) of the unit(s) to select (or deselect) more than one unit in the list.
   - Click on one unit's name and Shift-click on the name of another unit to select those two IPL 250s and the IPLs listed between them.
8. Click **Browse**, then locate and select the firmware file you downloaded.
9. Click **Begin**, then confirm that you want to start uploading the firmware. The software displays the progress and status of the firmware upload for each unit, then performs a firmware validation before finishing. If uploading fails, you can view the error log by clicking on **View Log**. If uploading is successful, the Status column indicates success for each unit.
10. Click **Close**.
11. Close the IP Link File Manager software.

Appendix C

Index

Index

Symbols

A

B

C

D

E

F

G

H

I

L

M

P

Q

R

S

T

U

V

W

Z

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:
Extron Electronics
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

Japan:
Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe, Africa, and the Middle East:
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Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:
Extron Asia
135 Joo Seng Road, #04-01
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Singapore 368363
Singapore

Middle East:
Extron Middle East
Dubai Airport Free Zone
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United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Extron **USA - West**
Headquarters

+800.633.9876
Inside USA / Canada Only

+1.714.491.1500
+1.714.491.1517 FAX

Extron **USA - East**

+800.633.9876
Inside USA / Canada Only

+1.919.863.1794
+1.919.863.1797 FAX

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+81.3.3511.7656 FAX

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Inside China Only

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+86.21.3760.1566 FAX

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+971.4.2991800
+971.4.2991880 FAX