

IMPORTANT:
Go to www.extron.com for the complete user guide, installation instructions, and specifications before connecting the product to the power source.

The Extron IPL EXP I/O Series control system expansion interfaces make it possible to easily expand the number and variety of ports available in an Extron IP Link® Pro xi control system. These expansion interfaces work in combination with IPCP Pro xi Series control processors. Once configured, these systems allow users to remotely control, monitor, and troubleshoot AV equipment, including display devices and switchers. All models include an embedded web server. Depending on the model, an expansion interface can include multiple bidirectional serial ports, an IR/serial port, digital I/O, digital I/O with VDC power output, an Extron eBUS port, or relay ports for use in applications that require control and monitoring of multiple devices within a large-scale AV system.



An eBUS port allows a variety of eBUS devices to be connected to a single control processor or expansion interface. eBUS devices include an array of button panels as well as power and signal hubs. eBUS devices are automatically recognized by the control system and can be added or removed at any time.

In this guide these products are referred to as the “IPL EXP,” “EXP,” or “expansion interface.”

This guide provides instructions for an experienced installer to install a control processor and to create a basic configuration.

Use Extron Toolbelt software to discover and manage the IPCP Pro xi control processor, the IPL EXP I/O expansion interfaces, and other Extron control products. Configure the control system using Extron Global Configurator® software running in Global Configurator Professional (GC Professional) or Global Configurator Plus (GC Plus) mode, or program the control processor using Extron Global Scriptor® (GS). The control system integrates seamlessly with Extron GlobalViewer® Enterprise (GVE) software and Extron Control apps for remote control applications. Each IPCP Pro xi control processor supports multiple TouchLink® Pro touchpanel interfaces, Network Button Panels (NBPs), and IPL EXP expansion interfaces over a standard Ethernet network. Global Configurator and other useful software applications are available at www.extron.com.

Setup Checklist: How to Proceed With Installation

Get Ready

- Familiarize yourself with the features of the IPL EXP Expansion Interface (see [Front Panel Features](#) on page 6, [Rear Panel Features](#) on page 6), and of any IPCP Pro xi Series control processors, TouchLink Pro touchpanels, or button panels that will be part of the system.
- Download and install the latest version of the following:
 - **Toolbelt software** — for discovering the control processor, expansion interface, and other control products on the network, for managing core settings, and for upgrading firmware when needed
 - **Global Configurator (GC) software** — for configuring the control system
 - **Global Scriptor software** — for programming the system (as an alternative to GC)
 - **GUI Designer software** — for designing layouts for Extron TouchLink Pro touchpanels and third-party touch interfaces
 - **IP Link Pro device drivers** — for use with GC, to make control of other AV devices possible

All are available from www.extron.com (see [Locating Software, Firmware, and Driver Files on the Extron Website](#) on page 13).

- Obtain network information for the unit from the network administrator. You also need the following details for each Extron Pro series Ethernet-enabled device:

<input type="checkbox"/> DHCP setting (on or off)	<input type="checkbox"/> Subnet mask	<input type="checkbox"/> Username
<input type="checkbox"/> Device (IPL EXP, TLP Pro, IPCP Pro or IPL Pro, NBP) LAN IP address	<input type="checkbox"/> Gateway IP address	<input type="checkbox"/> Passwords
<input type="checkbox"/> AV LAN IP address (for IPCP Pro Q xi models)		

NOTE: If DHCP is on, you do not need the IP addresses and subnet mask.

- Write down the MAC address of each network interface on each IP Link Pro device to be used.
- Obtain model names and setup information for devices the system will control.
- Each expansion interface and each control processor comes with a factory-installed Secure Sockets Layer (SSL) security certificate. If you intend to install a different SSL certificate, contact your IT department to obtain the certificate or for instructions on how to obtain one. See “Secure Sockets Layer (SSL) Certificates” in the *IPL EXP I/O Series User Guide* for requirements and guidelines regarding SSL certificates. IEEE 802.1X authentication is also supported once enabled (see “IEEE 802.1X Certificates” in the *IPL EXP I/O Series User Guide* for details).

IPL EXP I/O Series • Setup Guide (Continued)

Mount and Cable All Devices

- Mount the unit to a rack or furniture (see [Mounting](#) on page 4).
- Cable devices to the control processor (see [Cabling and Features](#) on page 7).
- Connect power cords and power on all the devices.

Set Up the Expansion Interfaces, Control Processor, Touchpanels, and Network Button Panels for Network Communication

- Connect the PC that you will use for setup, the LAN/PoE port of the expansion interface, the LAN (or AV LAN) port of the control processor, and the touchpanels or network button panels to the same Ethernet network. For expansion interface LAN connections, see [Control, Bidirectional – LAN/PoE \(Ethernet\)](#) on page 8.
- Start Toolbelt and use it to set the IP address, subnet, gateway IP address, DHCP status, and related settings. See the flowchart in [Network Communication Setup](#) on the next page.

NOTE: When setting up DHCP during network configuration or if using a host name instead of an IP address, the user must enter a qualified host name (*Username.HostName.Domain*). For example: `somename.extron.com`.

Configure or Program the Control Processor, Expansion Interfaces, Touchpanels, and Network Button Panels

The most basic steps are outlined below in the recommended order.

NOTE: See the *Toolbelt Help File*, *Global Configurator Help File*, *Global Scriptor Help File*, and *GUI Designer Help File* as needed for step-by-step instructions and detailed information. The help file for GC includes an introduction to the software and how to start a project and configuration.

- If TouchLink Pro or third party touchpanels are part of the system, start and use GUI Designer to **design, save, and build the graphical user interface (GUI) layout** for the touchpanels.

NOTE: To redeem (activate) a LinkLicense®, go to www.extron.com/llredeem and follow the online instructions.

- Using GC, create a new GC Professional or GC Plus project and configure the control processor, the expansion interface, and other IP Link Pro devices.** The configuration tells each control processor and expansion interface:
 - How its ports function
 - How to control other products
 - Which touchpanels to interact with
 - What to monitor
 - When to do things
 - Whom to notify, how, and under what circumstances
- Configure ports on the control processor:
 - Select device drivers and link them to each serial, IR/serial, or Ethernet port as needed.
 - Select settings (serial protocol, relay behavior, digital I/O or flex I/O settings) as needed.
- Add eBUS devices and set them up:
 - Ensure that the hardware address set on each device is distinct and matches the address used in the configuration.
 - Assign button functions as desired.
- Add Network Button Panels (NBPs) and set them up. Assign button functions as desired.
- Add IPL EXP expansion interfaces and configure their ports.
- Set up monitors, schedules, macros, and local variables.
- Add touchpanels and set them up:
 - Add the GUI configuration for each touchpanel to the GC project using Global Configurator.
 - Assign any appropriate functions, monitors, or schedules to the touchpanels and their buttons.

- If not using GC Professional or GC Plus, use Global Scripter** to program the control system as desired.
 - Program ports on the control processor:
 - Program each serial, IR/serial, or Ethernet port as needed.
 - Program relay behavior, digital I/O, and flex I/O settings as needed.
 - Add eBUS devices and set them up:
 - Ensure that the hardware address (eBUS ID) set on each device is distinct and matches the address programmed for it in the IPCP.
 - Program button functions as desired.
 - Add Network Button Panels and set them up. Program button functions as desired.
 - Add IPL EXP expansion interfaces and program their ports.
 - Add touchpanels and set them up:
 - Upload the GUI configuration for the touchpanels to the project.
 - Program functions, monitors, or schedules to the touchpanels and their buttons.
- Save the GC or GS project.
- Build and upload the system configuration to the control processor, expansion interfaces, and other system devices.

Test and Troubleshoot

- Test the system (see the *IPCP Pro Q xi and xi Series User Guide* and the *IPL EXP I/O Series User Guide* for an outline of the system testing procedure).
- Make adjustments to wiring or configuration as needed.

Network Communication Setup

Network setup is essential prior to configuration. Use the flowchart at right as a guide to setting up the expansion interface for network use.

NOTE: If using 802.1X security, see the *Extron 802.1X Technology Reference Guide* (available at www.extron.com) and the *Toolbelt Help* file for additional details on system setup.

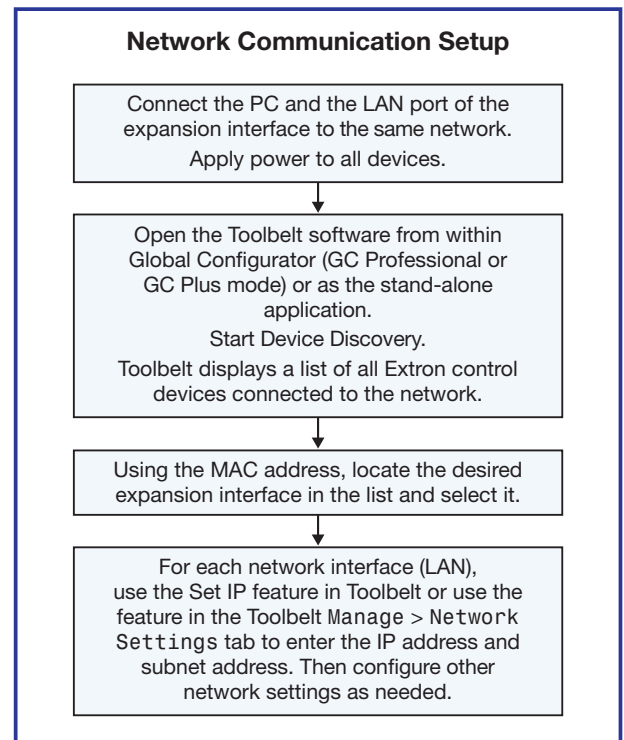


Figure 1. Network Setup

IPL EXP I/O Series • Setup Guide (Continued)

Mounting

Securely mount the control system expansion interface and other devices, and attach cables using the wiring section (see **Cabling and Features** on page 7) as a wiring guide. Optional 1U rack shelves are available for use with all IPL EXP models. Read the instructions and UL guidelines that come with the rack shelf or mounting kit for installation procedures.

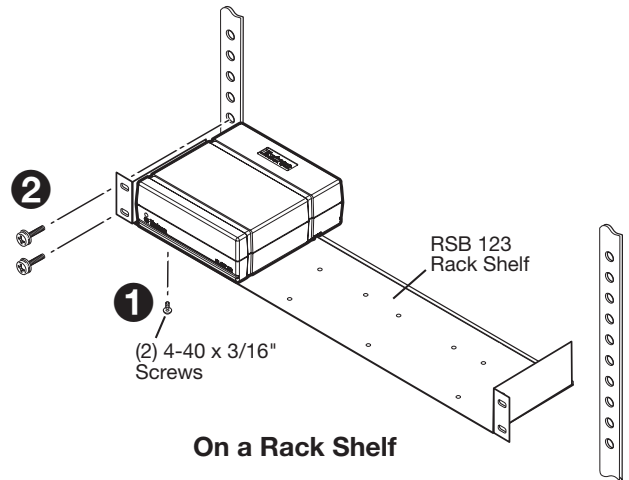
- Optional furniture mounting bracket kits are available for use with the IPL EXP RIO8 expansion interface.
- All other models come with a ZipClip 200 mounting bracket, which can be mounted to the following items:
 - tabletop
 - equipment rack rails
 - optional equipment rack shelf
 - furniture)

See the product-specific page at www.extron.com for a list of compatible accessories for mounting your expansion interface.

Rack Mounting

The IPL EXP units are one quarter rack wide. Up to four units can be mounted side by side directly onto a rack shelf.

1. Align the threaded holes in the bottom of the IPL EXP with the holes in an Extron rack shelf and fasten the unit to the shelf with two 4-40 x 3/16 inch screws (see **1** at right).
2. Bolt the rack shelf to the rack (see **2**).



Mounting an IPL EXP Expansion Interface With a ZipClip 200

These instructions apply to the IPL EXP 200, S5, and S2 models.

Using the ZipClip 200

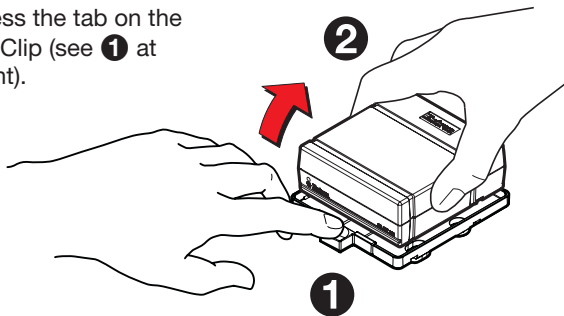
Attaching and removing the clip and IPL EXP

To attach the unit to the ZipClip 200 mounting clip:

1. Insert the bottom of the EXP down into the clip, starting with one end.
2. Pivot the other end down and press until the clip snaps into place.

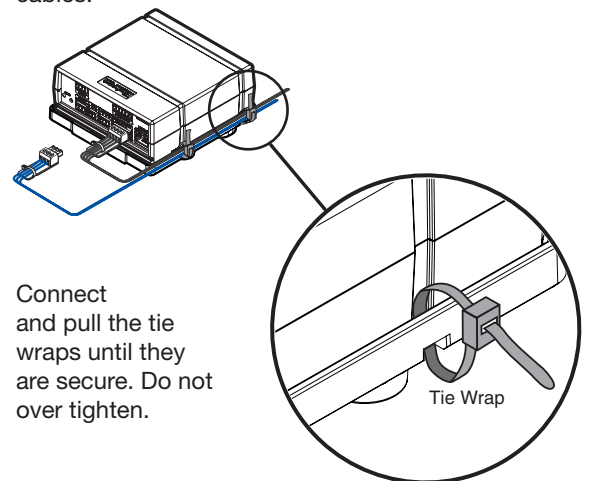
To remove the EXP from the ZipClip:

1. Press the tab on the ZipClip (see **1** at right).
2. Pivot the EXP and lift it out of the ZipClip (**2**).



Using tie wraps for cable strain relief

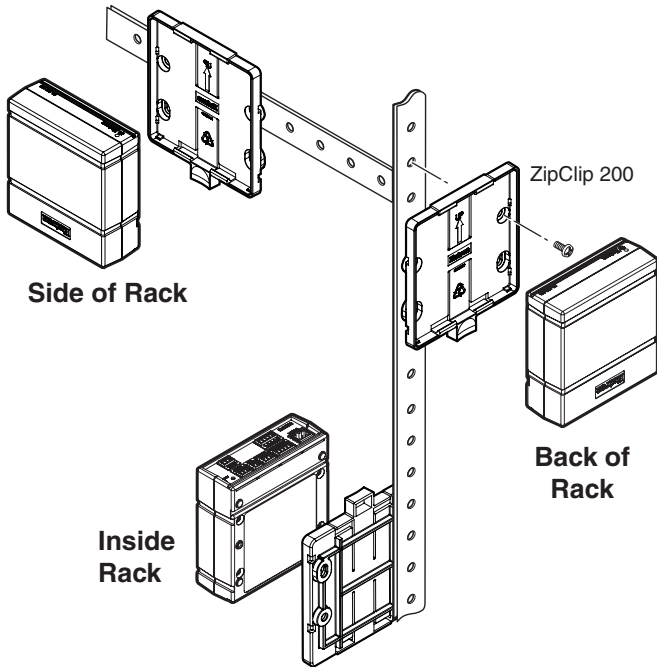
1. Attach the EXP to the ZipClip 200 mounting clip as described previously.
2. Fasten the cables to the ZipClip base.
 - a. Insert tie wraps (also called “zip ties”) along the notches on the side of the EXP and through the tie wrap anchor points on the ZipClip, then around the cables.



- b. Connect and pull the tie wraps until they are secure. Do not over tighten.

Mounting to rack rails using a ZipClip

1. Fasten the ZipClip 200 mounting clip to a rack rail using two rack screws as shown in the diagram below.

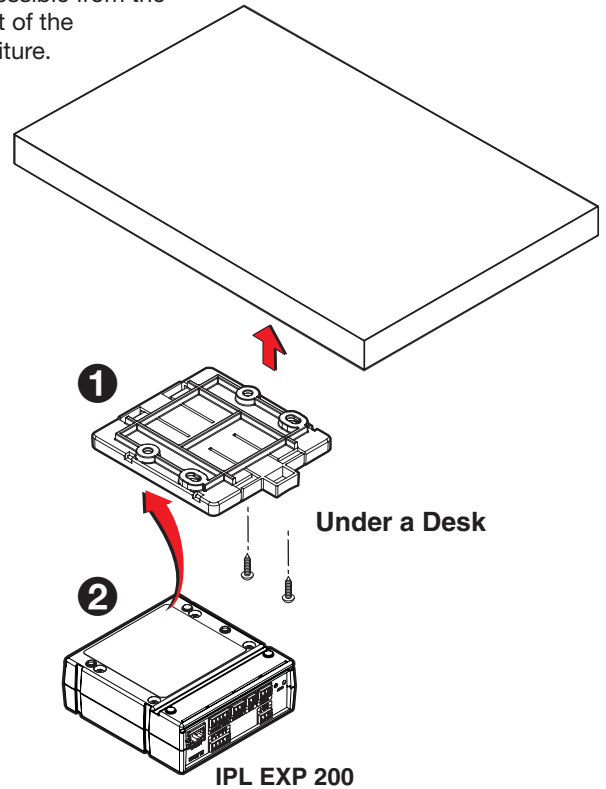


2. Insert the bottom of the EXP down into the clip, starting with one end.
3. Pivot the other end toward the clip and press until the clip snaps into place.

Furniture mounting

NOTE: The ZipClip is shipped with a set of four wood screws.

1. Attach the ZipClip to the mounting surface using two or more wood screws (see **1** below). Make sure the clip is oriented with the appropriate side facing the mounting surface of the furniture and with the tab accessible from the front of the furniture.



2. Insert the EXP into the ZipClip **2** as described previously and press to snap it into place.

IPL EXP I/O Series • Setup Guide (Continued)

Panels and Locations of Features

Location and quantity of LEDs and corresponding connectors vary by model, but the functions and port wiring are identical across models for each port type.

Front Panel Features



Figure 2. IPL EXP I/O Series Front Panels

Rear Panel Features

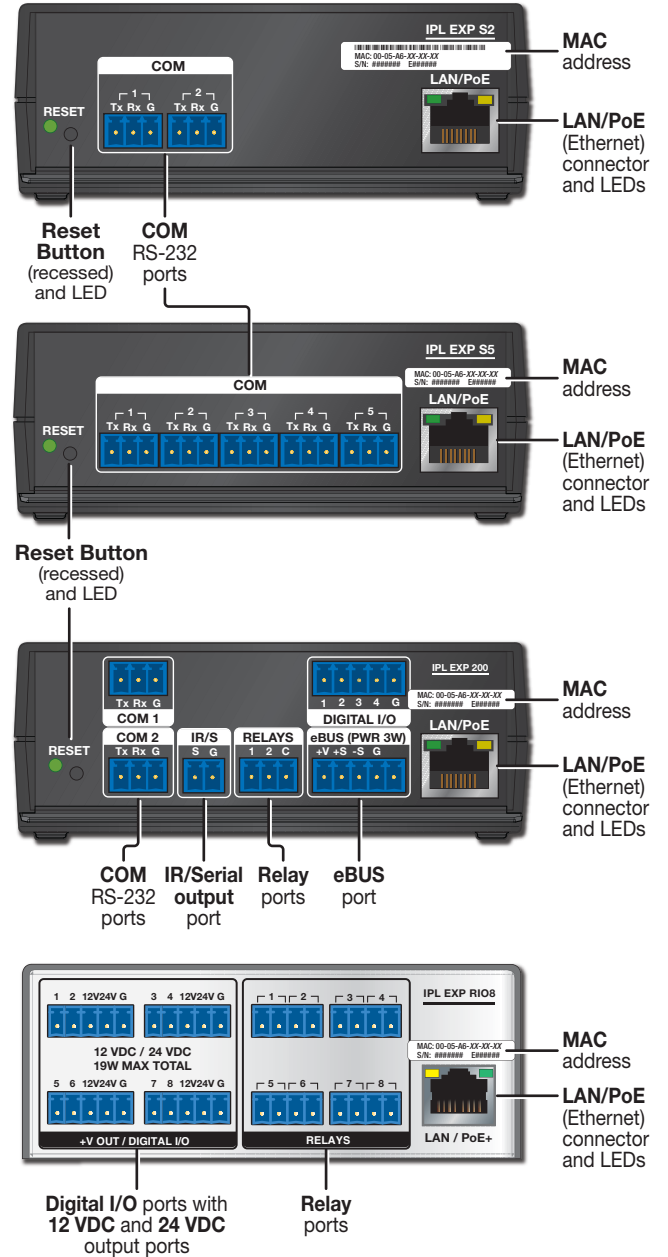


Figure 3. IPL EXP I/O Series Rear Panels

NOTE: For full reset mode information, see the *IPL EXP I/O Series User Guide*.

Cabling and Features

Attach cables using the following wiring diagrams as a guide. Full details are available in the *IPL EXP User Guide*.

ATTENTION:

- Installation and service must be performed by experienced personnel.
- L'installation et l'entretien doivent être effectués par du personnel expérimenté.

Power Input

ATTENTION:

- Always use a power supply supplied or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the unit.
- Utilisez toujours une source d'alimentation fournie ou recommandée par Extron. L'utilisation d'une source d'alimentation non autorisée annule toute certification de conformité réglementaire et peut endommager la source d'alimentation et l'unité.

IPL EXP I/O Series expansion interfaces accept power over Ethernet (PoE) through the LAN port in addition to network communication (see **Control, Bidirectional – LAN/PoE (Ethernet)** on page 8 for cabling and details).

- The IPL EXP RIO8 requires PoE+ power over Ethernet input of at least 48 VDC. The Extron PI 140 Power Injector and the IPCP Pro 360Q xi can provide appropriate PoE+ output to power the IPL EXP RIO8.

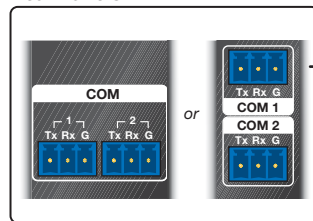
NOTE: The IPCP Pro 360Q xi offers Power over Ethernet+ (PoE+) output on AV LAN ports 2 and 3. These RJ-45 connectors, labeled "PoE+ Out," can output a maximum of 30 watts per port. It can be used to power the IPL EXP extension interface.

- The rest of the IPL EXP I/O Series expansion interfaces (IPL EXP 200, IPL EXP S5, IPL EXP S3) accept power over Ethernet (PoE) or PoE+ through the LAN port in addition to network communication.

See the *IPL EXP I/O Series User Guide* for more detailed information on input power requirements.

Control, Bidirectional – Serial (COM)

Rear Panels



Serial (COM) Ports

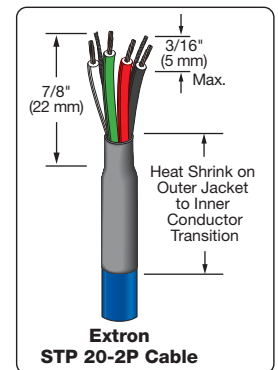
3-pole COM (RS-232)

Select protocol via software.

COM port default protocol:

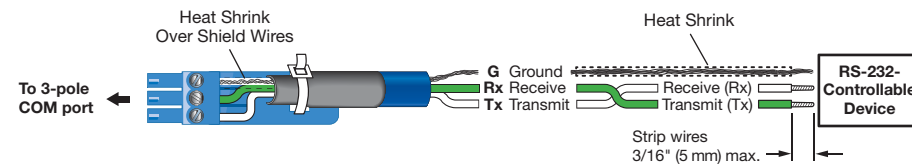
- 9600 baud
- 8 data bits
- 1 stop bit
- no parity
- no flow control

NOTE: The 3-pole COM ports support software flow control only.



Extron
STP 20-2P Cable

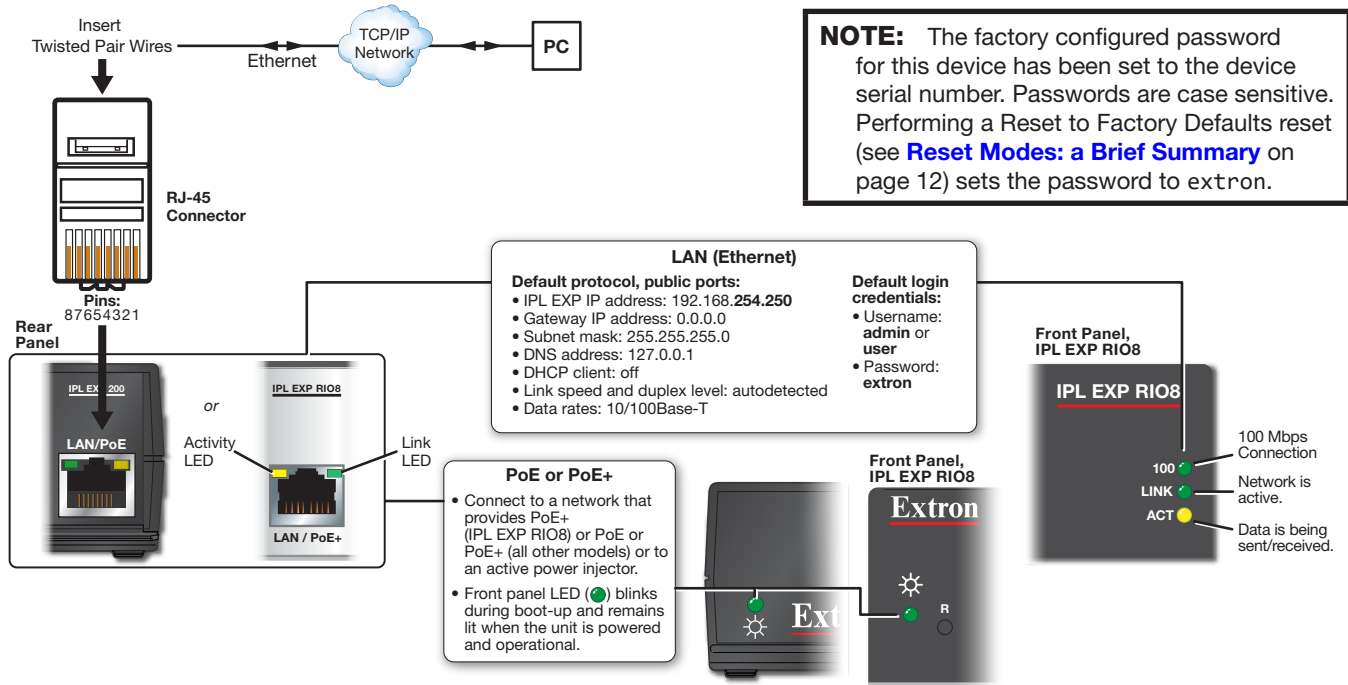
TIP: STP 20-2P cable, shown above, is recommended for these connections. For best results, insulate the common or drain wires using heat shrink.



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

IPL EXP I/O Series • Setup Guide (Continued)

Control, Bidirectional – LAN/PoE (Ethernet)



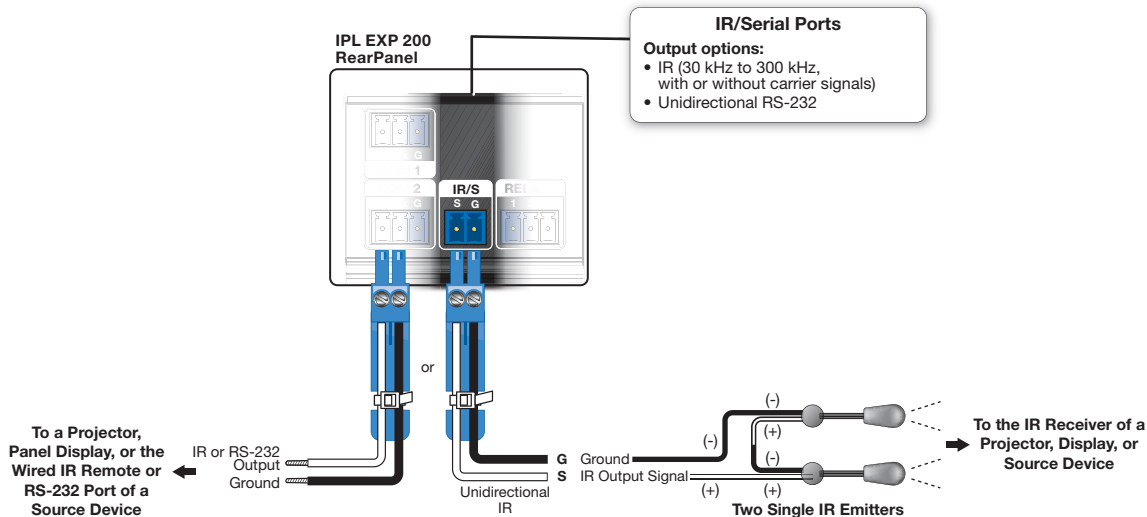
ATTENTION:

- Power over Ethernet (PoE) is intended for indoor use only. It is to be connected only to networks or circuits that are not routed to the outside plant or building.
- L'alimentation via Ethernet (PoE) est destinée à une utilisation en intérieur uniquement. Elle doit être connectée seulement à des réseaux ou des circuits qui ne sont pas routés au réseau ou au bâtiment extérieur.

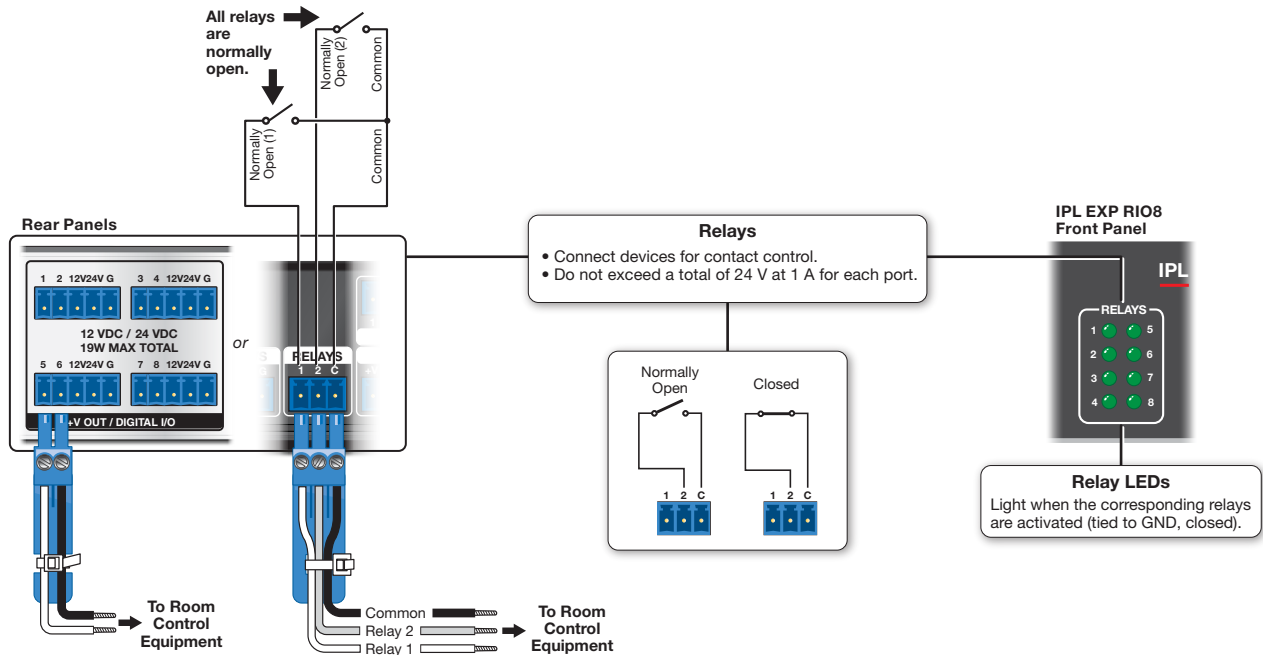
MAC address: Each IPL EXP expansion interface is assigned a unique user hardware ID number (MAC address) (for example, 00-05-A6-05-1C-A0). You may need this address during configuration. A label that indicates the MAC address is located on the rear of the unit.



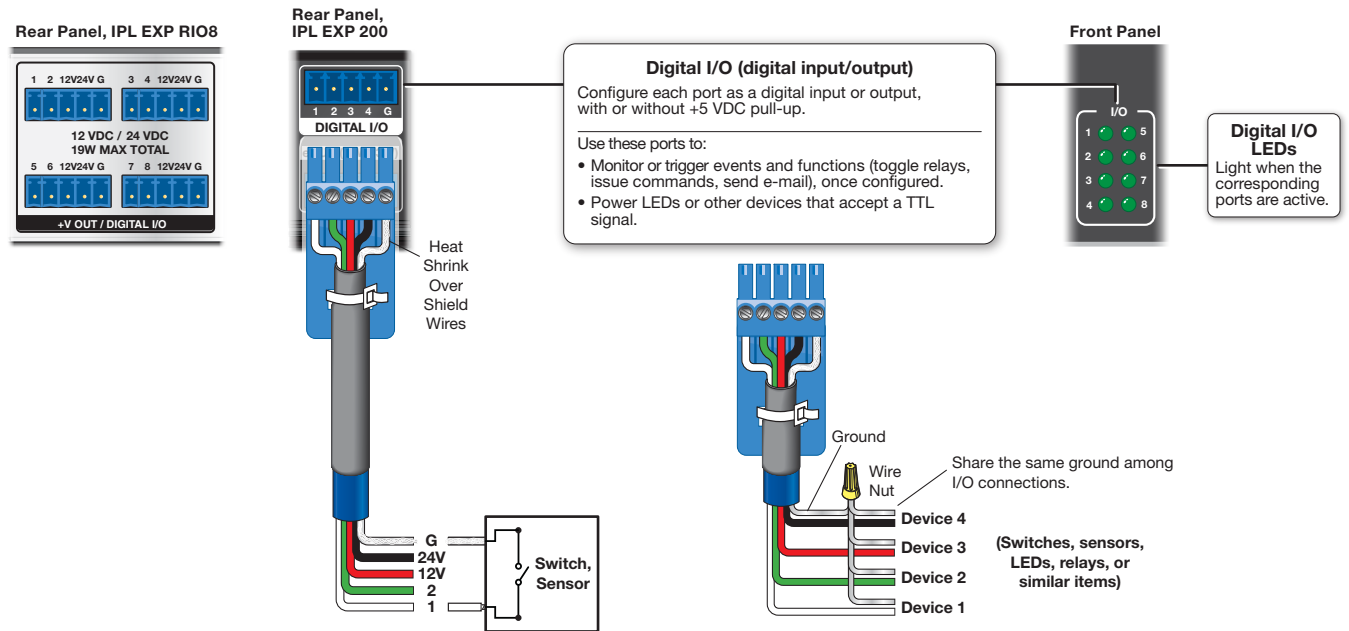
Control, Unidirectional – IR/Serial



Control, Unidirectional – Relays

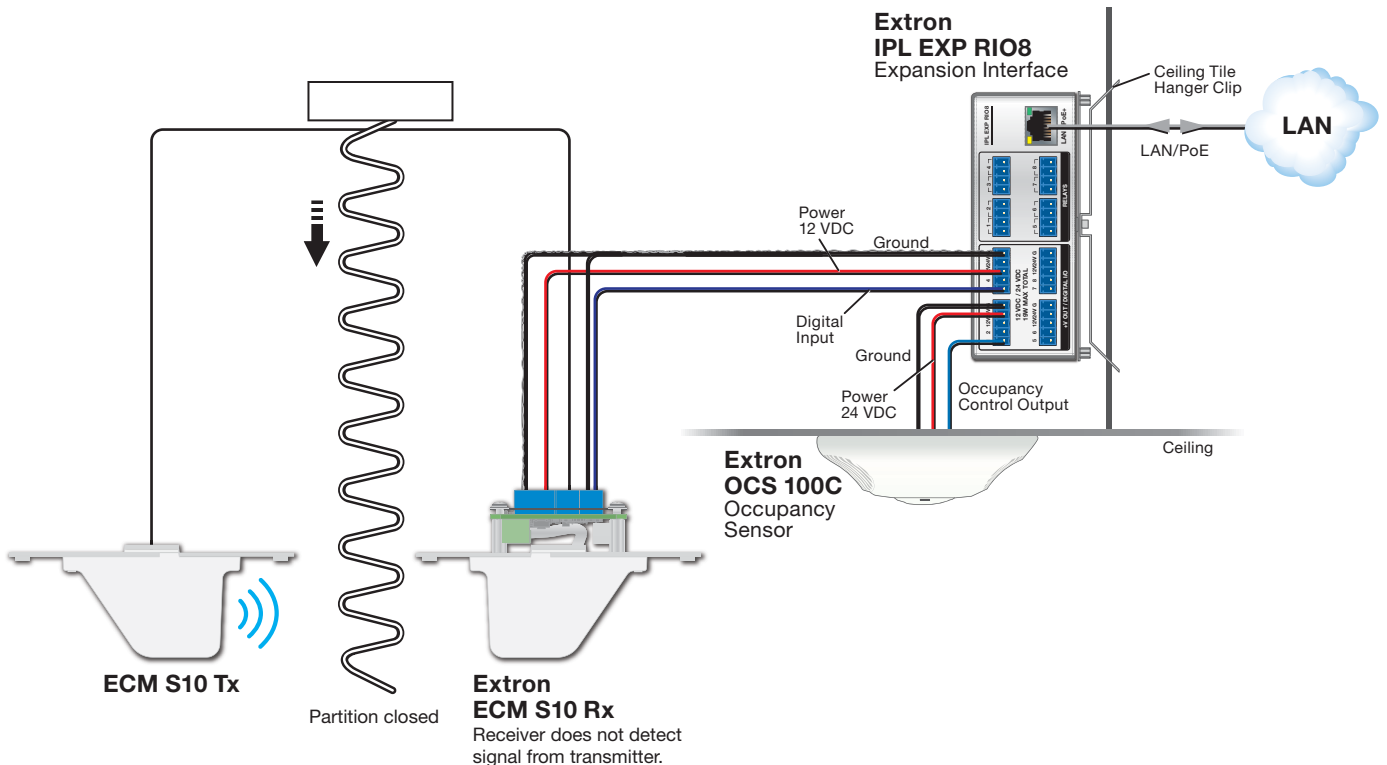
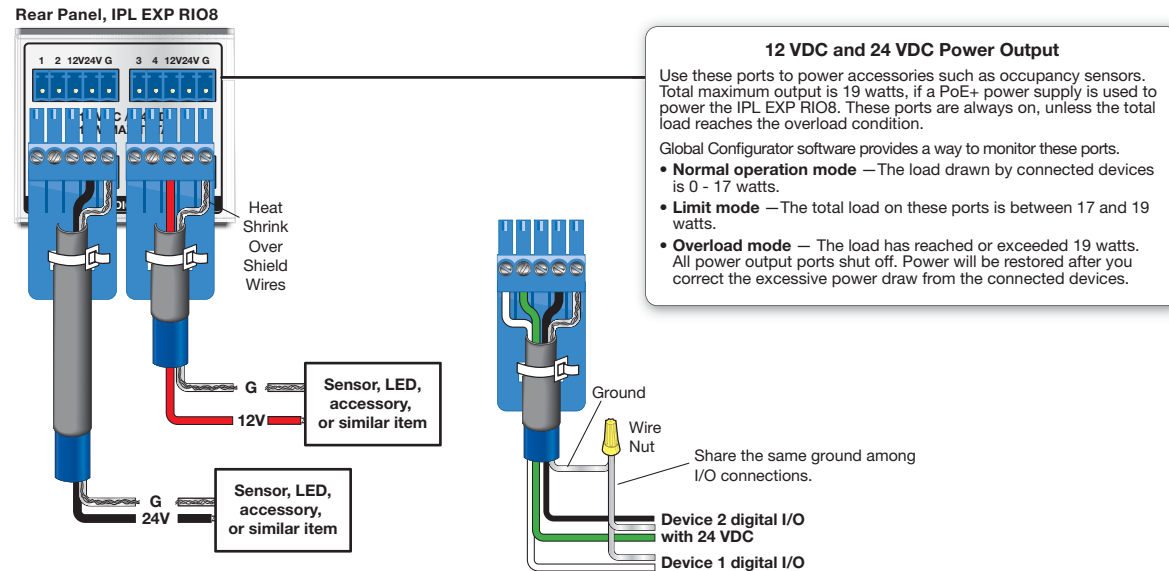


Control, Unidirectional – Digital I/O



IPL EXP I/O Series • Setup Guide (Continued)

Power output (IPL EXP RIO8 only)



The IPL EXP RIO8 includes both 12 VDC and 24 VDC output ports for use together with the digital I/O ports to provide power to small accessories. They remain on as long as there is no overload condition.

- The 12 VDC ports supply 12 VDC to devices such as the Extron ECM S10 partition sensor.
- The 24 VDC port supplies 24 VDC to devices such as the Extron OCS 100 occupancy sensor.

Output power capacity on these ports has an aggregate limit of 19 watts, maximum, total for all 12 VDC and 24 VDC ports. These ports are monitored continuously for total power draw.

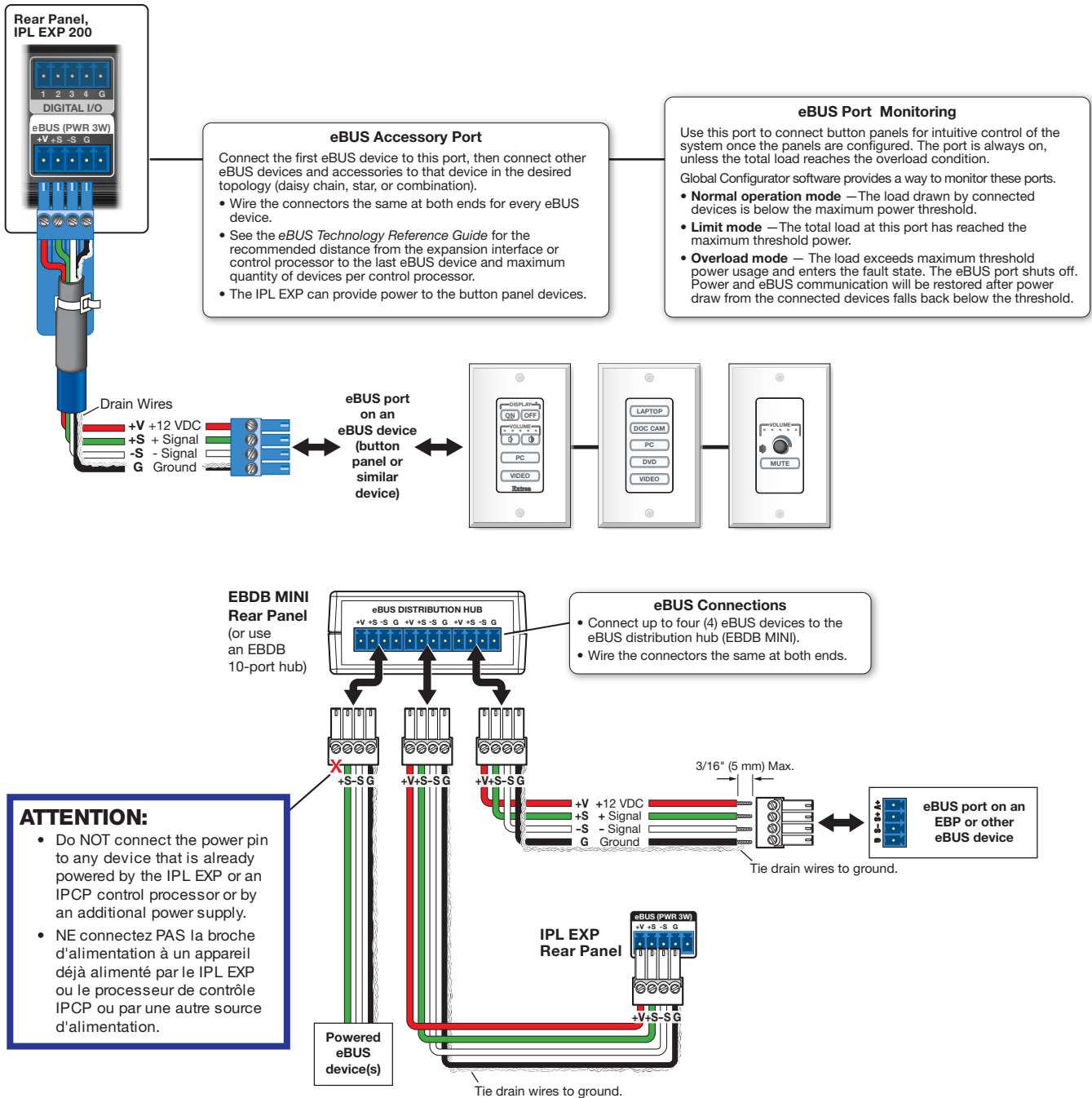
- When the total power draw exceeds a threshold of 17 watts but is still below 19 watts, the IPL EXP RIO8 enters the **limit mode**. The Limit condition is indicated within Global Configurator, and the ports are operational. If you have configured the unit to do so, the IPL EXP RIO8 can issue a power overcurrent notice.
- If power draw exceeds a second, higher threshold (19 watts), the unit enters **overcurrent mode**. Power is disabled on all 12 VDC and 24 VDC ports, and the Over condition is indicated within Global Configurator.

Once ports are disabled, the user must disconnect or fix the attached devices to correct the problem. If the power draw is still excessive, the ports remain off.

NOTES:

- The IPL EXP RIO8 provides a maximum output of 19 watts, combined, for all the DC output ports together.
- The IPL EXP RIO8 requires a PoE+ source that provides at least 48 watts (see **Power Input** on page 7 and see the more detailed information on power input requirements in the *IPL EXP I/O Series User Guide*).
- See the *Global Configurator Help File* for details on the Limit and Over conditions.

Control – eBUS



Reset Modes: a Brief Summary

The expansion interfaces offer the following reset modes:

- **Run Factory Boot Code:** Press and hold the **Reset** button while applying power to the unit. Keep holding the button down until the Power or Reset LED blinks twice, or for 6 seconds, then release the button. The LED blinks slowly during bootup. The expansion interface runs the factory boot code (rather than full firmware). Upload new firmware to the unit (see “Updating the Firmware” in the user guide for details).
 - Use this mode to temporarily boot up the unit running only the factory boot code, then install the desired firmware.
 - Use this in the event that a firmware update has failed or if incompatibility issues arise with user-loaded firmware.

NOTES:

- **Do not** continue to operate the expansion interface using only the factory boot code. The unit requires a full firmware package in order to be fully operational. If you want to use the firmware version with which the unit shipped, you must upload that version again (see the *Global Configurator Help File* or *Toolbelt Help File* for firmware upload instructions).
- To return the unit to the firmware version that was running prior to the reset, cycle power to the unit instead of installing new firmware.

- **Toggle DHCP Client:** Press the **Reset** button five times (consecutively). Release the button. Do not press the button within 3 seconds following the fifth press. Use this mode to enable or disable the DHCP client for the LAN port.
 - The Power or Reset LED blinks 6 times if the DHCP client is enabled.
 - The Power or Reset LED blinks 3 times if the DHCP client is disabled.

NOTES:

- By default DHCP is off for the LAN port and the unit uses a static IP address.
- If DHCP has been enabled, when you disable DHCP, the unit reverts to using the previously-set static IP address.

- **Reset All IP Settings:** Press and hold the **Reset** button until the Power or Reset LED blinks once at 3 seconds and twice at 6 seconds. Release and momentarily press the **Reset** button within 1 second. The LED blinks 3 times in quick succession upon successful reset.

Use this mode to reset all network settings to factory default values without affecting user-loaded files. This reset mode also stops any running programs, disables 802.1X authentication, and turns DHCP off.
- **Reset to Factory Defaults:** Press and hold the **Reset** button until the Power or Reset LED blinks once at 3 seconds, twice at 6 seconds, and three times at 9 seconds. Release and momentarily press the **Reset** button within 1 second. The Power or Reset LED blinks 4 times in quick succession upon successful reset.

Use this mode to return the unit to factory default settings. This mode also deletes all user-loaded files and configurations (except LinkLicense files), and it clears messages in the event logs table. User-loaded digital certificates are deleted. The unit continues to run the user-loaded firmware.

For detailed information on each mode and its use, see the *IPL EXP I/O Series User Guide* at www.extron.com.

Resources

Obtaining Control Drivers

Extron provides an extensive selection of device drivers available on the Extron website. If the system requires a control driver that is not already available, you can request a new serial (RS-232) or Ethernet driver from Extron.

Obtaining Instructions, Information, and Assistance

A checklist of basic setup steps is provided at the beginning of this guide. For additional information see the help files and the *IPL EXP I/O Series User Guide*, available at www.extron.com.

If you have questions during installation and setup, call the [Extron Sales & Technical Support Hotline](tel:18006339877) or the Extron S3 Control Systems Support Hotline (1.800.633.9877).

Locating Software, Firmware, and Driver Files on the Extron Website

There are three main ways to find software, firmware, and device drivers within www.extron.com:

- Via links from the web page for the specific product
- Via the [Download](#) page (Click on the **Download** tab at the top of any page within www.extron.com.)
- Via links from search results

NOTES:

- For some software you have the option to click the **Download Now** button to begin downloading the software file. For other software there is a link for contacting an Extron support representative who can provide you access to the latest version. To obtain Extron control product software, you must have an Extron Insider account. Extron provides training to our customers on how to use the software. Access to the full features of Global Configurator Professional is available to those who successfully complete Extron Control Professional Certification.
- **IP Link Pro Series RS-232 and Ethernet drivers are required.** You must use serial and Ethernet drivers developed specifically for the IP Link Pro platform. With the exception of IR device drivers, drivers used for the previous generation IP Link (non-Pro) control processors are not compatible.

Overall Configuration Procedure for the Control Processor and Expansion Interfaces

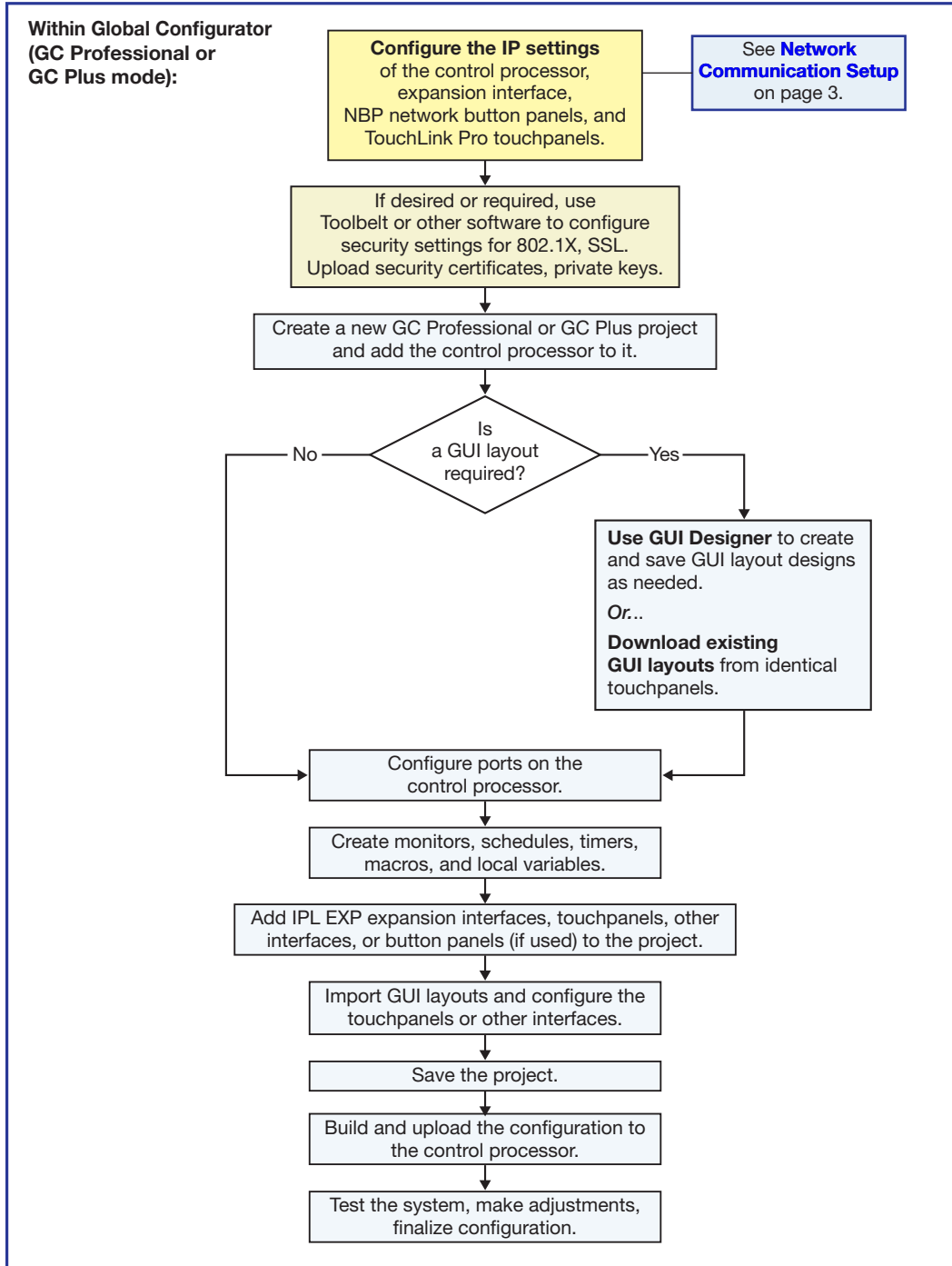


Figure 4. Overall Configuration Steps

For information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the [Extron Safety and Regulatory Compliance Guide](#) on the Extron website.