

# **Using Global Scripter**

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# Overview of Global Scripter

## Overview

Global Scripter (GS) is an Integrated Development Environment (IDE) used to program Extron control systems requiring advanced functionality and complex system logic.

The application includes a basic feature set for programming advanced control systems. For example, Global Scripter allows you to group together multiple IP Link® Pro controllers to work as a single, large system. This feature is beneficial for programming larger control systems that require more control ports than are available on a single controller. Controller groups also reduce the need for long RS-232 cable runs, as a group can span several rooms instead of being limited to a single room.

ControlScript is the Extron implementation of Python 3 on IP Link Pro and TouchLink® Pro hardware. ControlScript provides a set of Python 3 libraries for interfacing with the different ports on IP Link Pro processors and the different types of objects on TouchLink Pro touchpanels. ControlScript also allows programmers to leverage the power and flexibility of the Python 3 language to create robust AV control systems.

**NOTE:** Throughout this Help file, the use of GS refers to Global Scripter (v2.x onwards)

## Global Scripter Application Licensing

Global Scripter has two modes of licensing; a licensed **Developer Mode** (with full functionality) and an unlicensed **Deploy Mode** (with limited functionality).

- **Developer Mode**

- requires an Extron Insider Account
- requires that the user completes Global Scripter training and passes the associated exam (licensed)
- allows for the creation, editing, deployment, and debugging of GS projects
- can switch to Deploy Mode to help support unlicensed users without changing their account settings
- when logged in this mode, GS displays



in the status bar at the bottom right of the main software window

- **Deploy Mode**

- requires an Extron Insider Account.
- does not require the user to complete Global Scripter training and pass the associated exam (unlicensed)
- allows GS projects to be deployed, System Reports to be generated, and basic diagnostic functions to be performed while deploying GS projects
- when running GS in an unlicensed (deploy) mode,  
 is displayed in the status bar at the bottom right of the main software window
- some menus, sub-menus, and menu items are not available in Deploy mode

**NOTE:** To aide the unlicensed user easily navigate this Help file, use the [Deploy Mode Help Content](#) page that outlines and directly links all the features available in Deploy mode.

For a list of the main differences between the two modes, see the [Features — Developer v Deploy Modes](#) topic.

## Supported Products

Global Scripter supports the Extron range of IPL Pro control processors (for example, IPL Pro S3), TouchLink Pro touchpanels (for example TLP Pro 1020T), and interface devices (for example, TLI Pro 101).

The following device types are supported in Global Scripter:

- Control Processors — These are the IPL Pro and IPCP Pro devices
- TouchLink Pro Panels — These are the TLP Pro touchpanel or TLP Pro 101 interface devices
- TouchLink Interfaces — These are the TLI Pro devices

Full details, User guides, brochures, and white papers for each product are available at [www.extron.com](http://www.extron.com).

## What's New In Global Scripter version 2.3.1?

Global Scripter version 2.3.1 has the following new product support and features:

- **Extron Library** — The latest version (3.4r7) is now available. Click **Help > Extron Library** to view. New in this version is:
  - **Fixed Issue** (Originated in v2.8.5) – Allow blank passwords with SSH – Using EthernetClientInterface, a blank string may be used when the device does not require a password
  - **Fixed Issue** (Originated in v3.4.5) **Unexpected information in trace messages** – When interacting with the serial ports on the primary processor, the string “not remote” would appear in the trace output. The messages were only generated when trace was enabled. This issue has been resolved.
  - **Added Features**
    - SSL for Ethernet Server.— An SSLWrap() method has been added to EthernetClientInterface and EthernetServerInterfaceEx. The SSLWrap method wraps all connections in an SSL context
    - A method to get and unverified SSL context — The GetUnverifiedContext() method returns an unverified context for use with http clients when a valid certificate is impossible
  - **Documentation Fixes:**
    - Added Device/Port Interface Tables to identify which device and interface classes to use for each product
    - Corrected bytes terminology throughout documentation
    - Updated the supported firmware version

## Features — Developer Mode versus Deploy Mode

The items below highlights the main differences between running GS in Developer mode or in Deploy mode.

**NOTE:** Developer mode is licensed. Deploy mode is unlicensed.

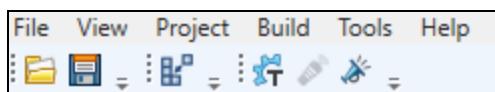
### Developer mode toolbar and menus



Menus available:

- **File** — New, Open, Download, Save, Save As, Recent Projects, Exit
- **Edit** —
- **View** — Toolbars, Formatting, Find Results, Messages, Program Log, Properties, Trace Messages, Variable, Watch Variable, Go to line Number, Bookmark
- **Project** — Project Properties, Generate Project Report
- **Build** — Build Project, build Code Only
- **Debug** — Start Program, Start Debugging, Continue Debugging, Stop Program/Debugging, Toggle Breakpoint, Delete All Breakpoints
- **Tools** — IR Learner Pro, Toolbelt, Firmware Uploader, Application Settings, Project Recovery
- **Help** — Global Scripter Help, Python Help, Extron Library, Application Licensing, What's New, About Global Scripter

### Deploy mode toolbar and menus



Menus available:

- **File** — Open, Download, Save, Save As, Recent Projects, Exit
- **View** — Toolbars, Messages, Program Log, Properties, Trace Messages
- **Project** — Generate Project Report
- **Build** — Build Project
- **Tools** — IR Learner Pro, Toolbelt, Project Recovery
- **Help** — Global Scripter Help, Application Licensing, What's New, About Global Scripter

See the [Deploy Mode](#) and [Developer Mode](#) sections for full details.

### Status bar indicator

- Developer mode



- Deploy mode



## System Building - Device Deployment

In this section, in an attempt to help the user understand how to build a system and set up their own devices, a series of videos (see the Note below) is provided to show an example of a deployment scenario.

**NOTE:** See the interactive WebHelp, *System Building - Device Deployment* section for an mp4 version.

### Example Scenario

A user is tasked with setting up a system by deploying and configuring/programming a project containing a primary controller, two TLP Pro touchpanels, and two secondary controllers. The primary controller and two devices are on-site and online, and two devices are not on-site yet. The user has knowledge of all device IP addresses and the System ID (from the project file).

### Initial Assumptions

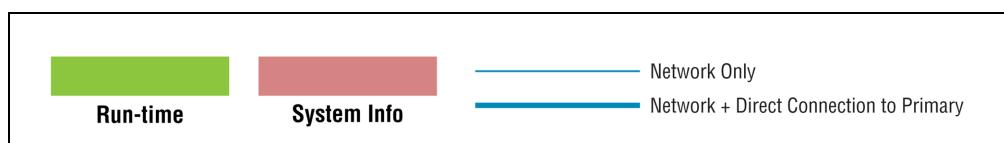
- the host computer running GCP/GS is on the same network as the online primary controller, the touchpanel, and the secondary controller.
- the primary controller and two of the devices are online (that is, all these devices are on the same network and are reachable)
  - primary controller - IPCP Pro 250
  - touchpanel - TLP Pro 1022M
  - secondary controller - IPCP Pro 250
- two devices are offline (devices are not reachable on the network).
  - touchpanel - TLP Pro 1520MG
  - secondary controller - IPCP Pro 350

### Terminology

- **System information** —this includes details about how each Extron control device in a system communicates with one another (for example, device IP address and System ID)
- **Run-time files** —these includes python files, layout files, and so on, for each of the touchpanels, secondary controllers, or network button panels in a system

Read the key before viewing the images

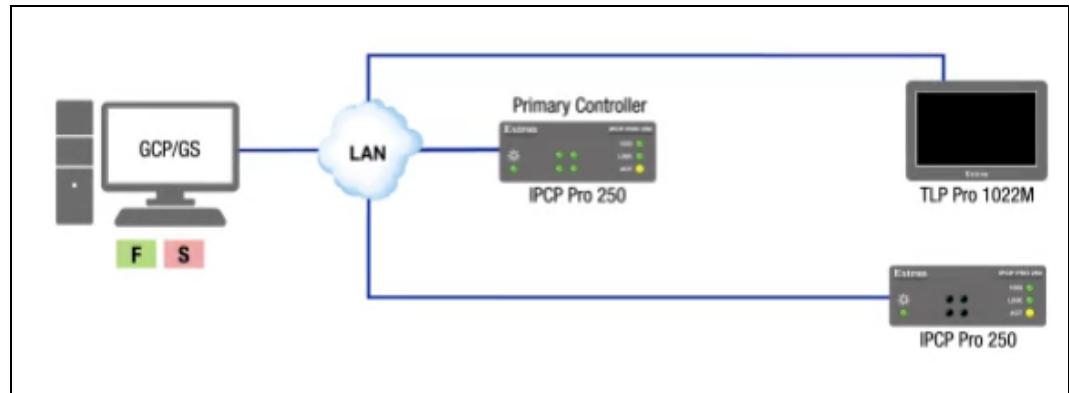
#### KEY:



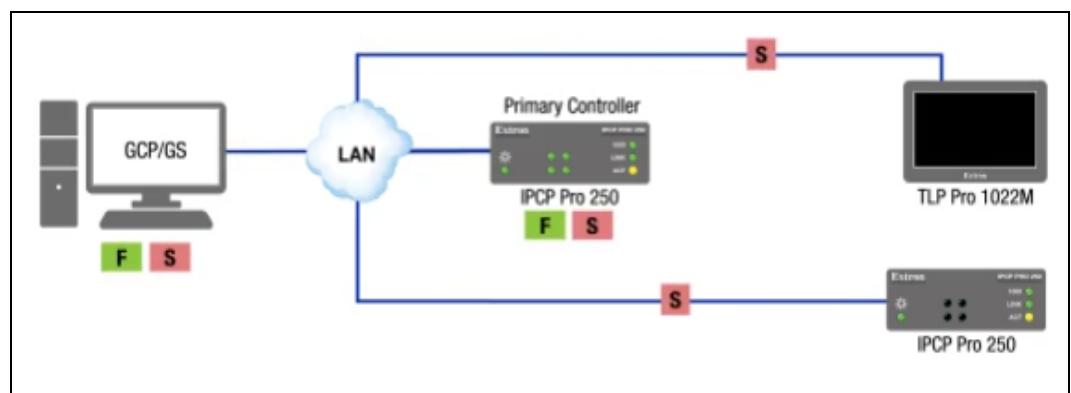
## Stage 1 System Configuration

### *Initial deployment*

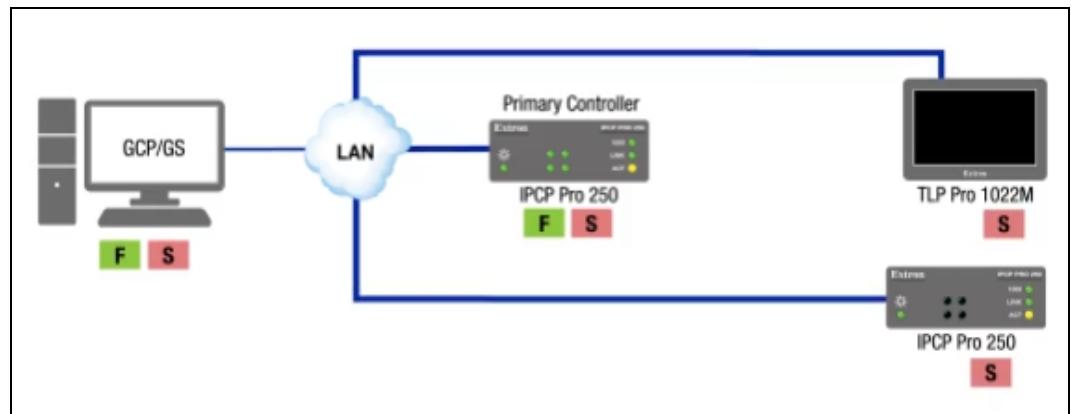
- The computer running GCP/GS, is on the same network as the online primary controller, the touchpanel (TLP Pro 1022M) and the secondary controller (IPCP Pro 250)



- During Build and Upload, GCP/GS sends system information **and** run-time files to the primary controller, but sends only the system information to the online touchpanel and secondary controller



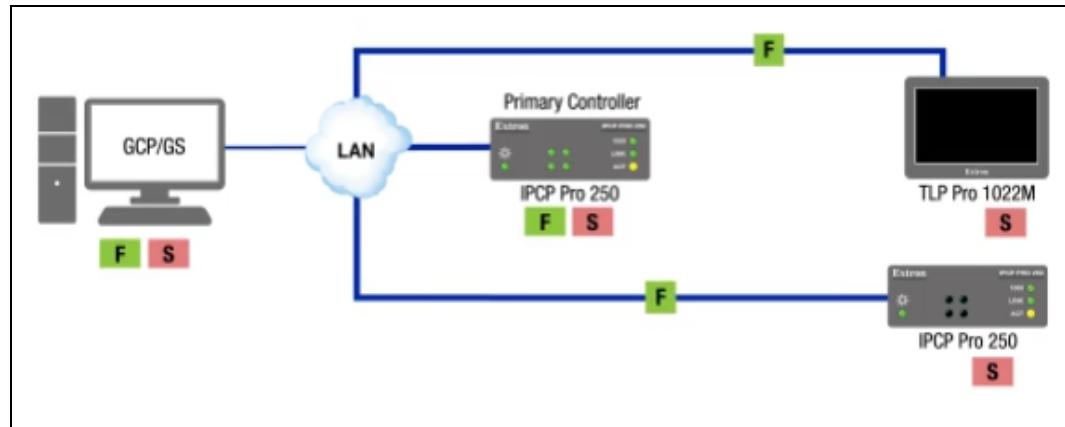
- The TLP Pro 1022M and IPCP Pro 250 are now paired with the primary controller.



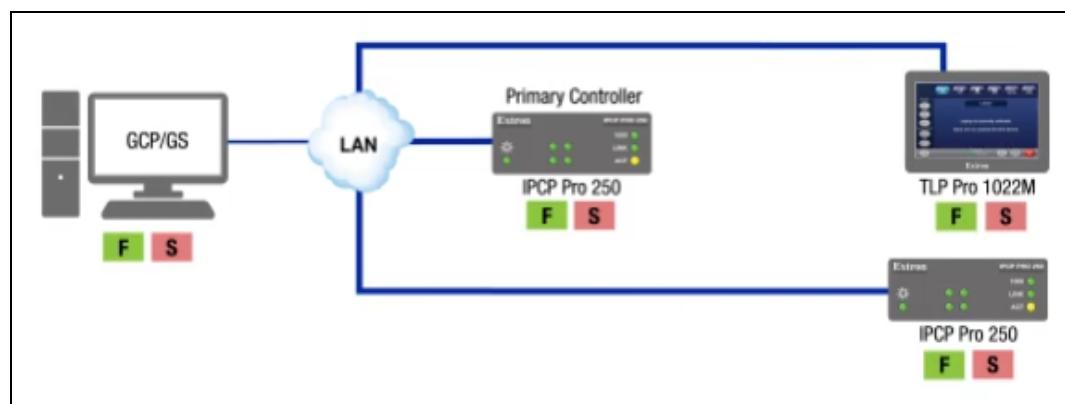
## Stage 2 - Communication with the Primary Controller

### *TLP and Secondary Controller Configuration*

- After pairing is completed, the primary controller sends run-time files to the touchpanel and secondary controller



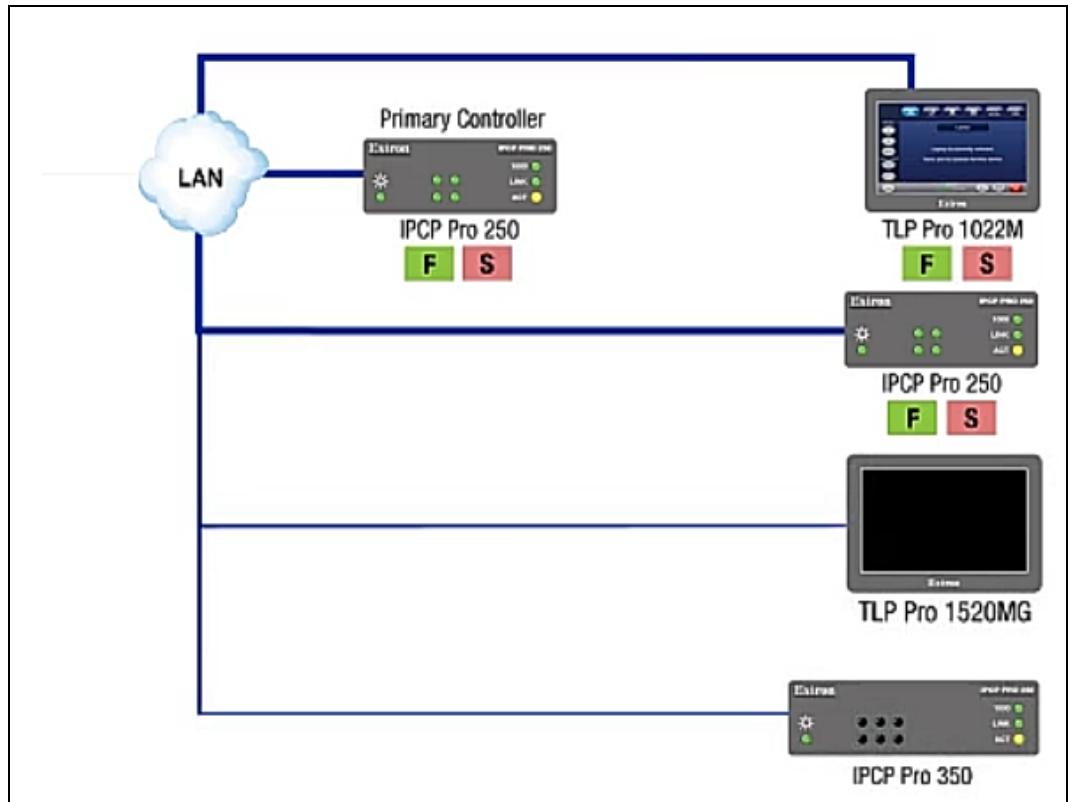
- The TLP Pro 1022M and IPCP Pro 250 are now paired and ready for use



## Stage 3 - New Device Setup

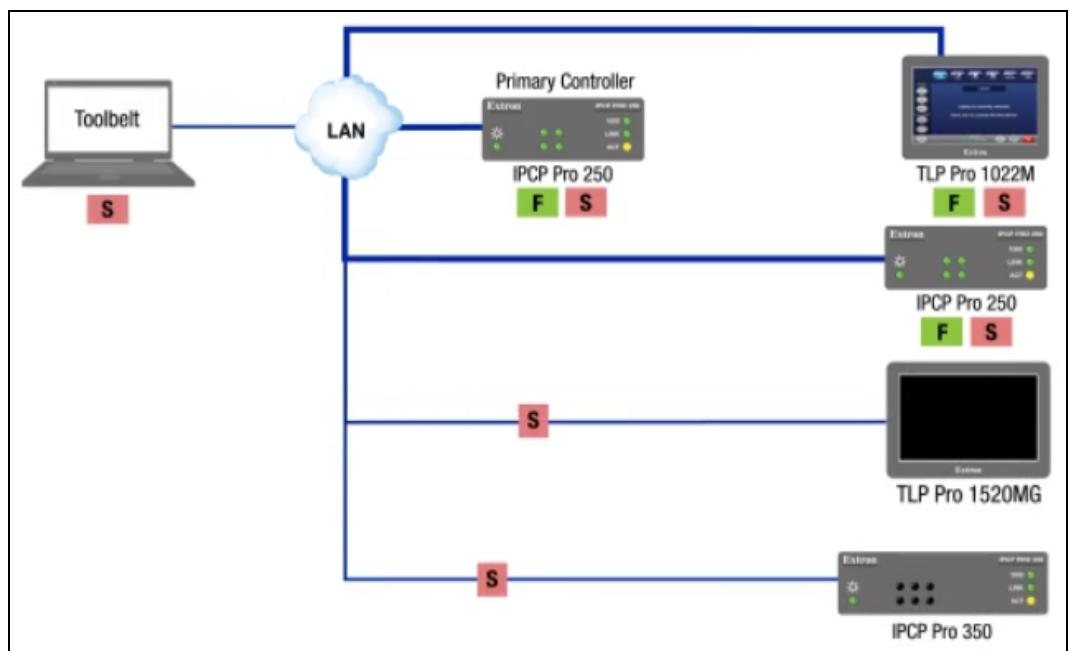
### *Deployment*

- Two devices have been paired with the primary controller and are ready for use (stages 1 and 2). The two new devices (TLP Pro 1520MG and IPCP Pro 350) have arrived on site, have been installed, are now online, but are not yet paired.



- Using **Toolbelt**, the user connects to the same network as the primary controller, discovers and manages the new devices, then provides the system information (via the System tab in Toolbelt).

**NOTE:** See the *Toolbelt Help File* for details.

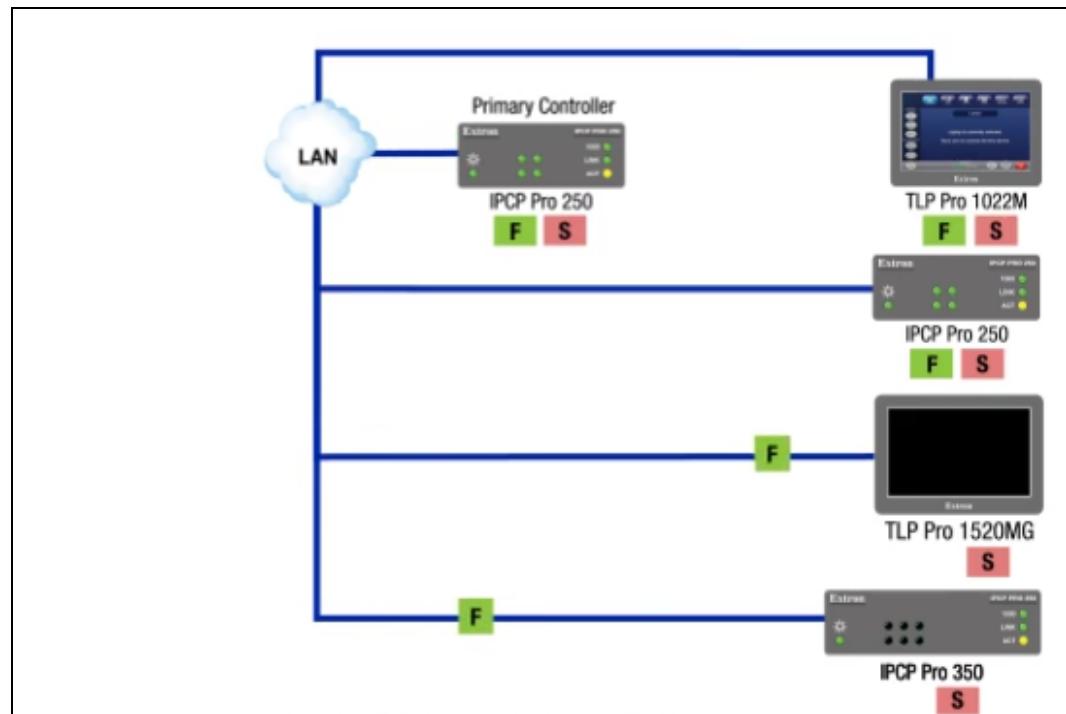


The two new devices are now paired with the primary controller.

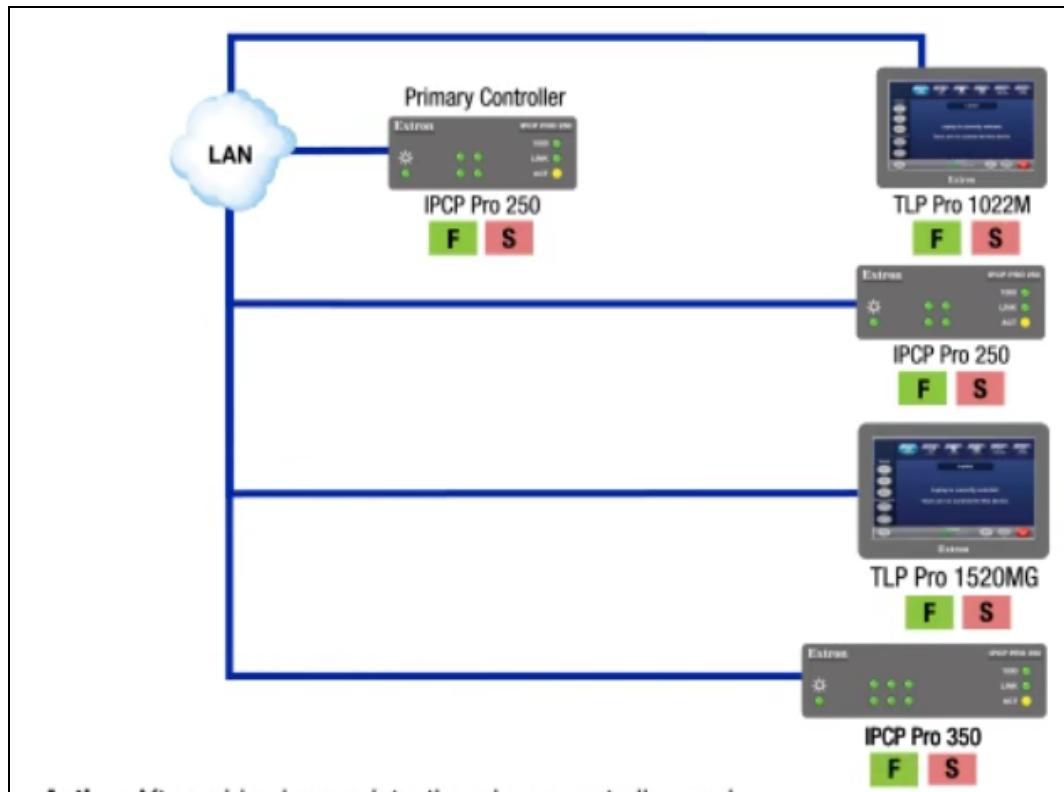
## Stage 4 - Communication with the Primary Controller

### New Device Configuration

- The primary controller sends run-time files to the new touchpanel and secondary controller



System deployment is now complete, all devices are paired and are ready to use.



## Preparing Controllers for a Network Connection

Each IP Link Pro controller must have an IP address set before it is usable on a network. If the controller has a default address or the address needs to be changed, this can be done using Toolbelt, a stand-alone application for Global Scripter. Toolbelt can still be accessed via the **Tools** menu within Global Scripter.

**NOTE:** It is strongly recommended that all devices are updated to the latest firmware, to use all the features of this release of Global Scripter and Toolbelt

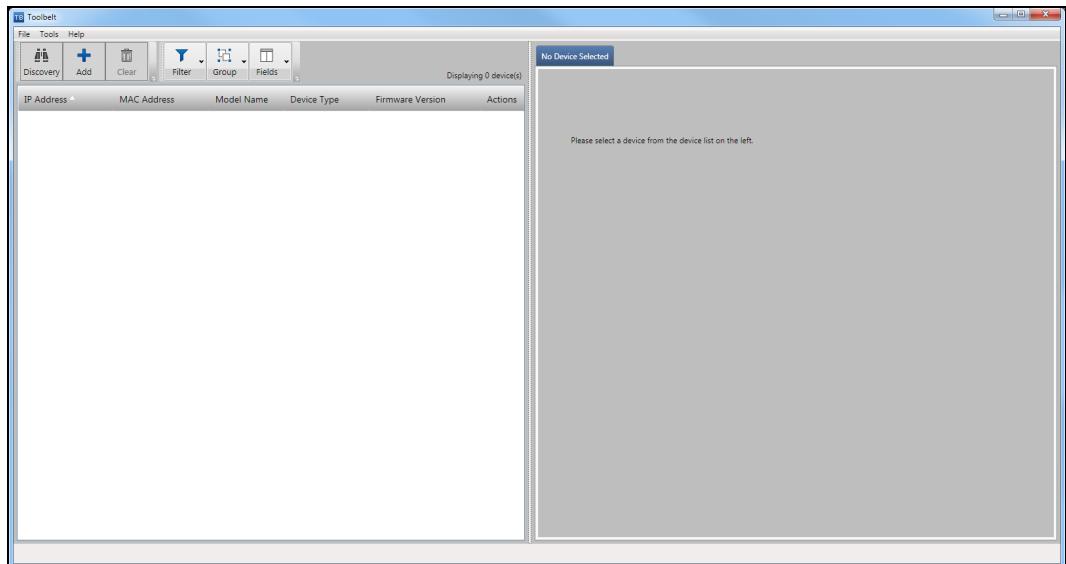
See the System Building topic for a basic visual guide.

### Setting the IP Address Using Toolbelt

**NOTE:** The IP Link Pro controller must be physically connected to the network with the factory default IP address (192.168.254.250) for this procedure to work. See the controller user guide for instructions on resetting the controller to its factory default condition.

To set the IP address using Toolbelt from Global Scripter:

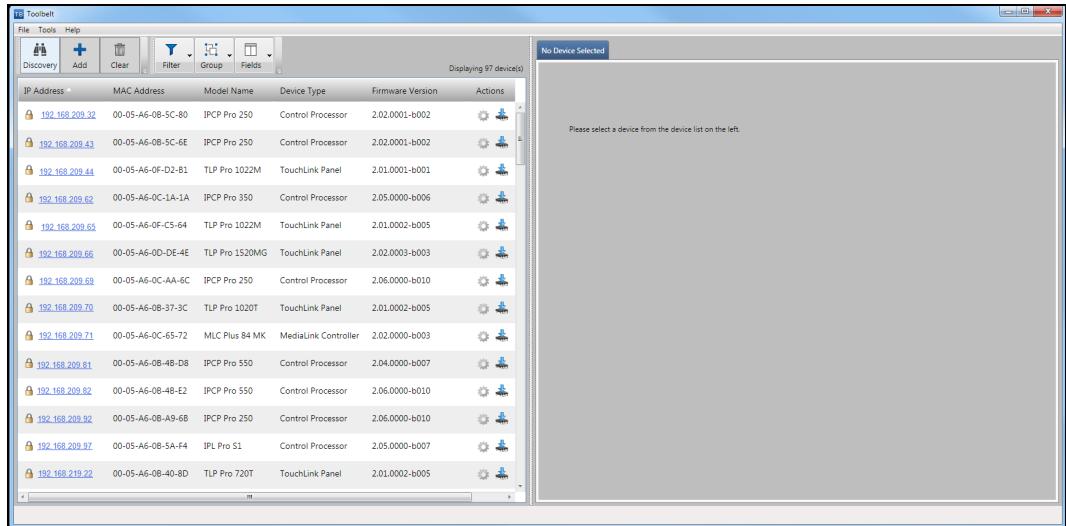
1. Click **Tools**, then **Toolbelt**. The Toolbelt dialog box opens.



2. Click the **Discovery** button (located top left) to enable discovery. The Device Discovery method polls the selected network and lists all the relevant devices.

**NOTE:** If another application is simultaneously running device discovery service, an

error message appears. Stop discovery in the other application, then try again.



The following column fields are shown on the device list:

- **Status icon** — showing the device is on the network and active (has been managed or not )
- **IP Address** — device IP address
- **MAC Address** — unique device identifier
- **Model Name** — device model
- **Device Type** — Control Processor, TouchLink Panel, TouchLink Controller, MediaLink Controller, Other, or TouchLink Interface.
- **Host Name** — device host name. The device model name plus the last three pairs of the device MAC address are used as the host name
- **Firmware Version** — current firmware version of the device
- **Serial Number** — device serial number
- **Actions** — Set IP , Manage device , or Discover AV LAN devices   
(control processors with an AV LAN port)
  - **Manage** allows users to see tabs available for selected device in the properties pane in order to manage or view the device settings.

#### NOTES:

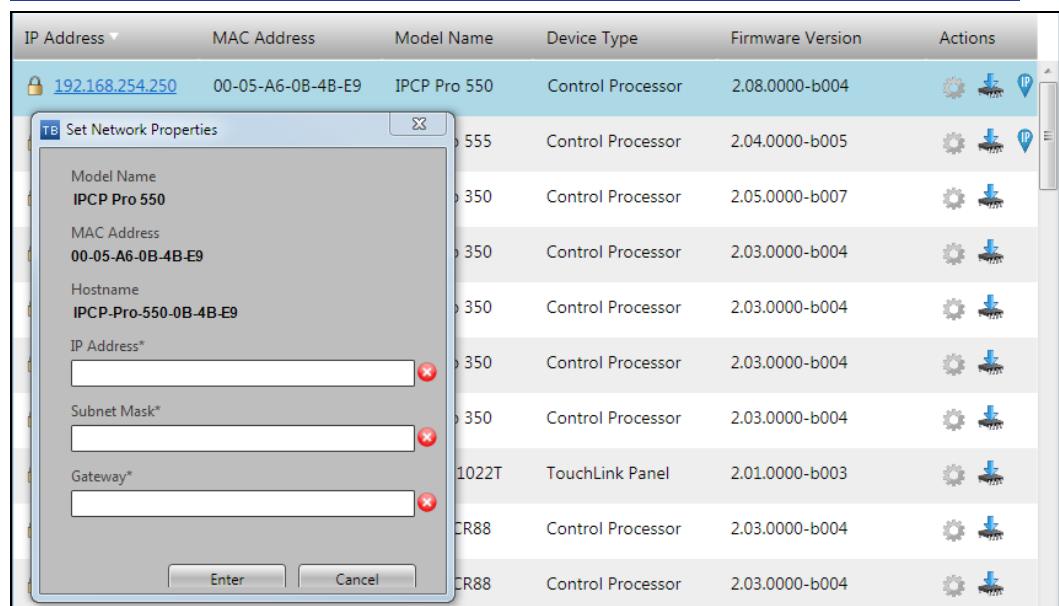
- **To select which fields are displayed**, click the **Fields** button, and check or uncheck the desired field boxes.
- **To filter the list**, click on the **Filter** button and select the desired filter. A dialog box opens for each filter chosen (except None).

3. Scroll down, select a device from the list and click the **Set IP** icon . A dialog box opens.

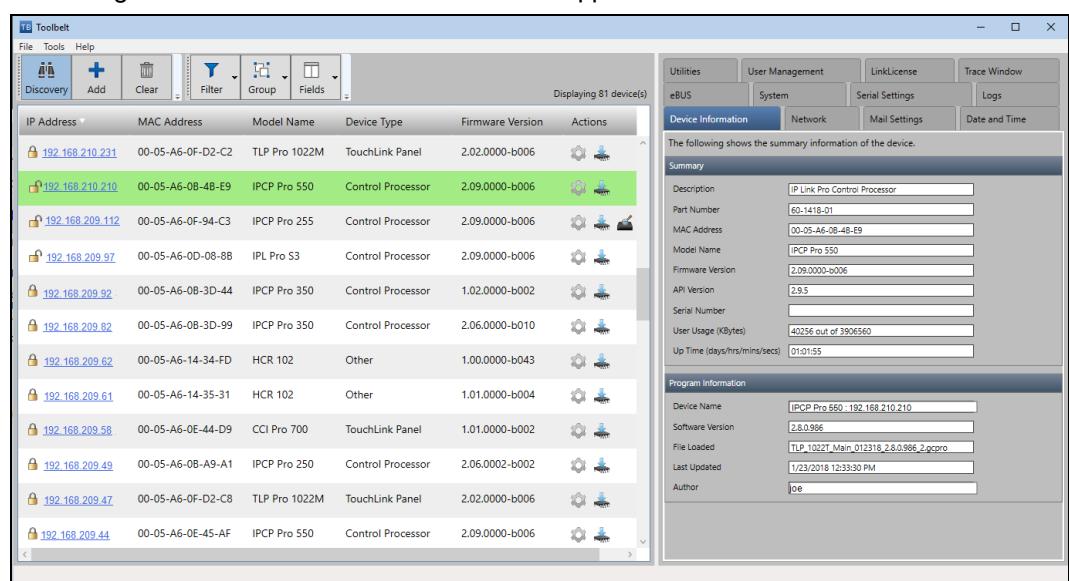
4. In the highlighted fields, enter the desired IP address, the subnet mask, and gateway addresses and click **Enter**.

**NOTES:**

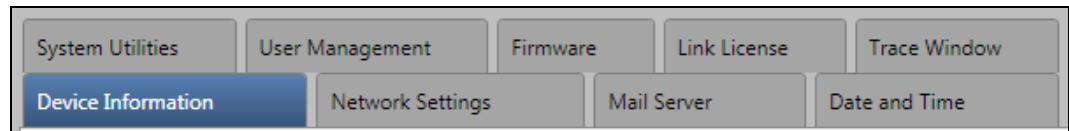
- For control processors with an AV LAN port, only the IP and Subnet address fields are available.
- A dedicated AV LAN safeguards AV systems from outside intrusion or interference by separating device control and or other network traffic from a corporate or campus network.  
To ensure that the Control Processor LAN and AV LAN connections (ports) are connected to separate networks, the LAN and AV LAN IP address schemes must be on different subnets.



5. The dialog box closes and the new IP address is applied and shown on the device list.



6. Click the **Manage device** icon  and select the desired tab to change or view details as needed.



7. Continue setting up the device as desired (see the Toolbelt help file for full details).

# User Modes

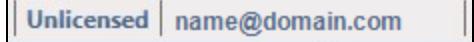
## Deploy Mode

### Deploy Mode — Content Overview

In Global Scripter (GS), Deploy mode is an unlicensed mode with limited features that allows the user to open or download existing projects. It also allows the user to save and build (upload to) projects.

This section allows the unlicensed user to go directly to the topic or feature discussed within the larger Help file.

#### Deploy Mode basics:

- requires an Extron Insider Account.
- does not require the user to complete Global Scripter training and pass the associated exam (unlicensed)
- only allows GS projects to be deployed, System Reports to be generated, and basic diagnostic functions to be performed while deploying GS projects
- when running GS,  is displayed in the status bar at the bottom right of the main software window

For a full list of features available in Deploy mode see the [menus and toolbar](#) list below.

**NOTE:** For a list of the main differences between the Deploy and Developer modes, see the [Features — Developer Mode versus Deploy Mode](#) section.

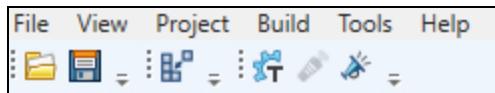
#### Deploy mode menus and toolbar icons

**NOTE:** Click on the links in the list to take you directly to the relevant Help file topic for method of use.

## Menus available:

- **File** — Open, Download, Save, Save As, Recent Projects, Exit
- **View** — Toolbars, Messages, Program Log, Properties, Trace Messages
- **Project** — Generate Project Report
- **Build** — Build Project
- **Tools** — IR Learner Pro, Toolbelt, Project Recovery
- **Help** — Global Scripter Help, Application Licensing, What's New, About Global Scripter

## Toolbar links (icons) available:



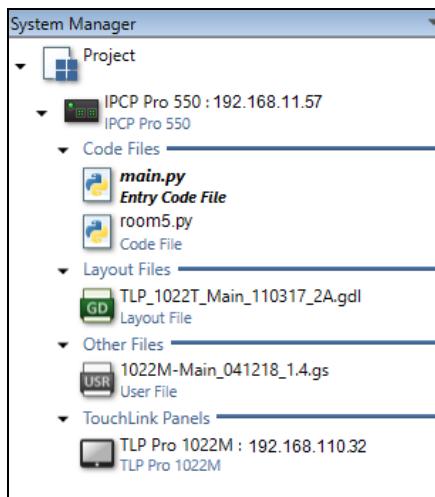
The Toolbar links available are:

- File — (Open, Save)
- Build — (Build Project)
- Tools — (Toolbelt, IR Learner)
- Help — (What's New)

## System Manager

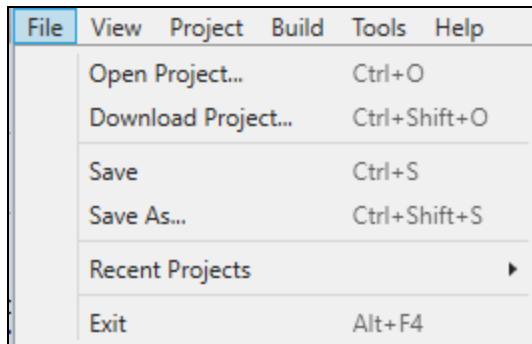
Each system in the System Manager is defined by its primary controller. All files, secondary controllers, and user interfaces (such as TouchLink touchpanels) associated with the System and the primary controller, are shown indented under the primary controller in the **System Manager** tree.

**NOTE: In Deploy mode,** files cannot be imported, exported, copied, moved, deleted or linked within the System Manager.



## Deploy File Menu

In Deploy mode, the Global Scripter **File** menu contains the following options:

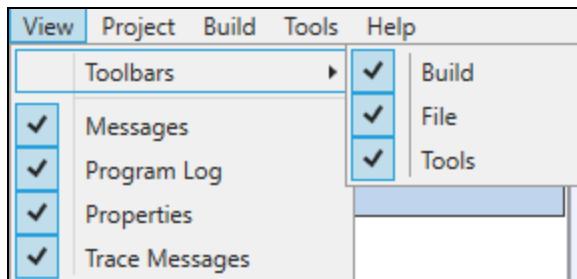


- [Open Project](#)
- [Download Project](#)
- [Save](#)
- [Save As](#)
- [Recent Projects](#)
- [Exit](#)

## Deploy View

### View Menu Overview

The Global Scripter **View** menu enables a user to customize some of their GS application by toggling (on or off) multiple items within the sub-menus.



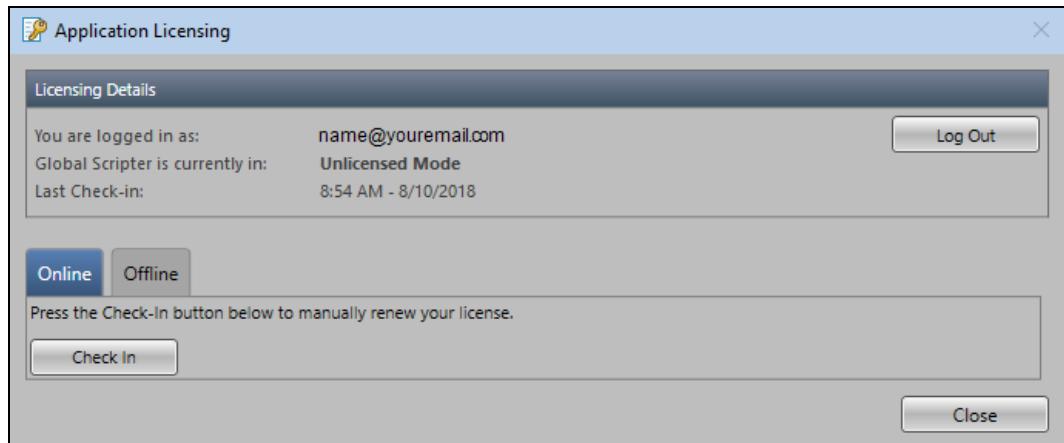
- [Toolbars](#) — toggles the items on the quick navigation bar
- [Messages](#)
- [Program Log](#)
- [Properties](#)
- [Trace Messages](#)

## Deploy Application Licensing

Click this item to re-access the Application Licensing window.

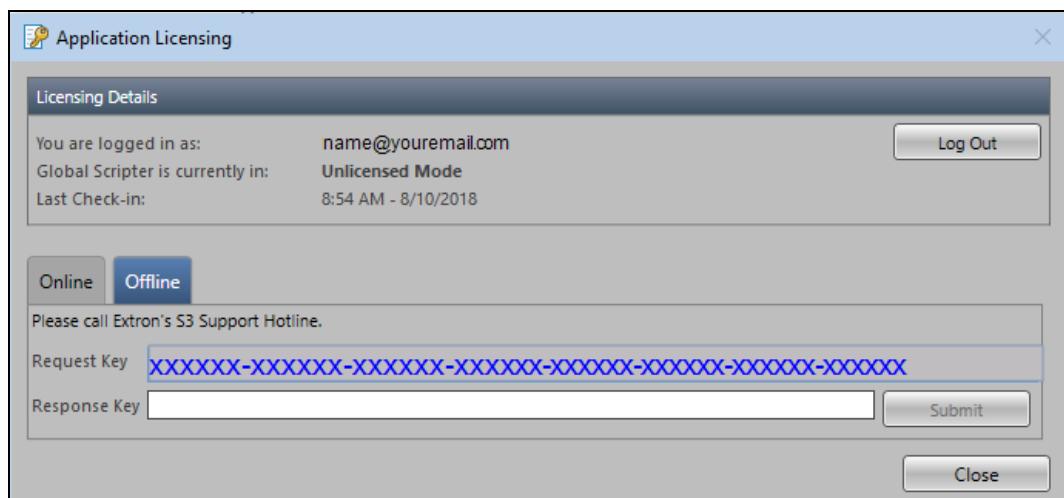
When Global Scripter is started, or after log-out from a previous session, an Application Licensing dialog box opens.

To use the software, use your Extron Insider login. When verified, the application starts (see [Global Scripter Application Licensing](#) for details).



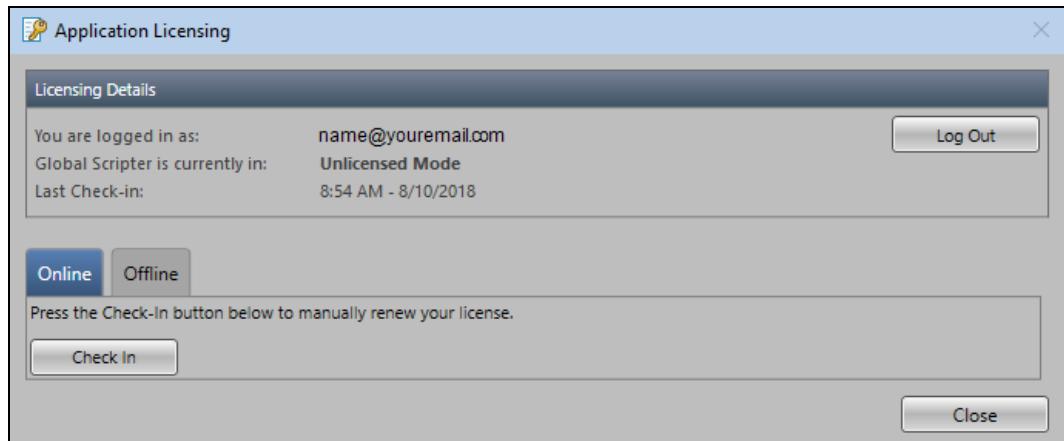
Alternatively, if you are not online, and are unable to link directly to a network, click the **Offline** tab.

An auto generated request key is given. Follow the instructions given in the dialog box to obtain a response key to activate to full functionality.

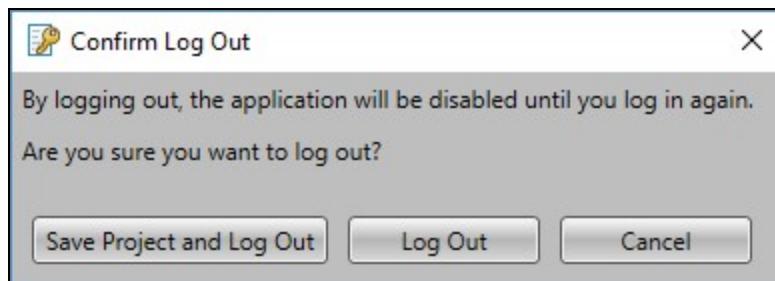


When a user is logged in, the **Licensing Details** shown are:

- User name logged in as
- Mode currently running in
- Date of last check-in



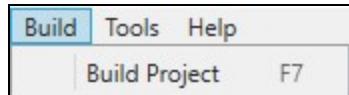
The user can log out from the session, which removes the saved credentials (Username and Password). If a user logs out a confirmation dialog box opens.



To log out and exit the application, click **Log Out** in the Confirm Log Out dialog box. Click **Cancel** to keep the session open.

## Deploy Build

In Deploy mode, the Global Scripter **Build** menu contains the one option, **Build Project**.



- **Build Project**

## Deploy Help

### Help Menu Overview

Click on the **Help** menu to access documentation and Application Licensing details.



- [Global Scripter Help](#)
- [Application Licensing](#)
- [What's New](#)
- [About Global Scripter](#)

## Deploy Messages

Click this to enable or disable the Messages diagnostic panel, located at the bottom of the main window. This panel shows warnings, errors and messages generated during a build and upload.

Messages			
	Time Stamp	Subject	Description
	14:26:17:7262	"My System" at "192.168.10.15"	System configuration validation complete
	14:26:17:7122	"My System" at "192.168.10.15" > UserInterfaces > "TLP Pro 1022M : 192.168.100.35"	Device hardware validation complete
	14:26:17:7043	"My System" at "192.168.10.15" > UserInterfaces > "TLP Pro 1022M : 192.168.100.35"	Hardware Not Found: The touchlink touchpanel was not found at 192.168.100.35. <a href="#">How to resolve</a>
	14:26:14:7439	"My System" at "192.168.10.15"	Device hardware validation complete
	14:26:14:7158	"My System" at "192.168.10.15"	Hardware Not Found: The controller was not found at 192.168.10.15. <a href="#">How to resolve</a>

**NOTE:** Warning messages have a [How to Resolve](#) the issue link, and action should be taken to complete a fully functional deployment.

## Deploy Program Log

Click this to enable or disable the Program Log diagnostic panel, located at the bottom of the main window.

The screenshot shows a 'Program Log' window with the following content:

```

Program Log
Refresh Clear Save
2018-06-29 14:22:38 INFO root Start primary API version 2.9.18
2018-06-29 14:22:38 INFO root loading script: main
2018-06-29 14:22:42 INFO root successfully loaded script: main

```

Below the log area are tabs for Properties, Trace Messages, Program Log (which is selected), and Messages.

## Deploy Project

In Deploy mode, the Global Scripter **Project** menu contains the one option, **Generate Project Report**

- [Generate Project Report](#)

## Deploy Properties

Click this to enable or disable the **Properties** diagnostic panel, located at the bottom of the main window.

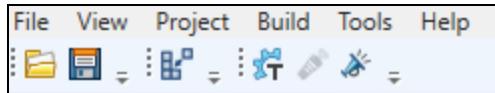
This panel displays the properties of a file or device selected in the System Manager panel. It also allows the user to change data within some of the property fields, such as the Device Alias name the primary controller uses at project start up.

The 'Properties' panel displays the following configuration:

<b>Connection</b>	
IP Address/Hostname	192.168.10.17
Password	*****
Username	admin
<b>General</b>	
Comments	
Device Alias	ProcessorAlias
Model	IPCP Pro 550
Name	IPCP Pro 550 : 192.168.10.17
<b>System Information</b>	
System ID	6366

## Deploy Toolbars Submenu

The icons and items in the **Toolbars** submenu can be toggled on or off for access via the Quick Navigation toolbar.



- **Build icon**



- **Build Project** — prepares, verifies, and uploads projects and settings to the Primary Controller and any connected hardware

**NOTE:** See the [Build Menu](#) topic for full details.

- **File**



- **Open** — opens an existing GS project file
- **Save** — save the current GS project file

**NOTE:** See the [File Menu](#) topic for full details.

- **Tools**



- **Toolbelt** — launches Toolbelt
- **IR Learner Pro** — launches IR Learner Pro

**NOTES:**

- See the [Toolbelt](#) section for full details.
- See the *IR Learner Pro Help File* within the IR Learner Pro application for full details

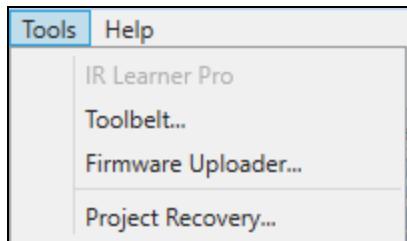
- ◦ **What's New** — launches the What's New window

**NOTE:** See the [What's New](#) section for details.

## Deploy Tools

### Tools Menu Overview

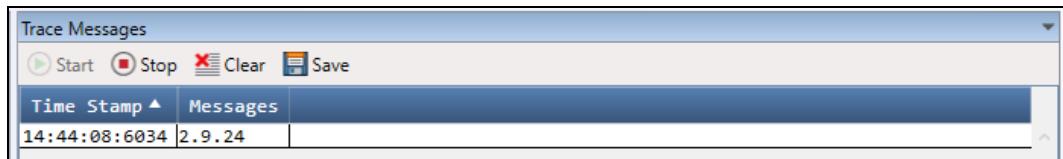
Click on the **Tools** menu to view and access the Tools options, such as opening Toolbelt, or Project Recovery.



- [IR Learner Pro](#)
- [Toolbelt...](#)
- [Firmware Uploader..](#)
- [Project Recovery...](#)

## Deploy Trace Messages

Click this to enable or disable the Trace Messages diagnostic panel, located at the bottom of the main window.



## Developer Mode

### Developer Mode — Content Overview

In Global Scripter (GS), Developer mode is a licensed mode allowing for full use of all features. This allows the user to, for example, to create a new project, change application settings, insert code, save and build (upload) projects to devices, debug projects, and so on.

The links in this section allows the licensed user to go directly to the topic or feature discussed within the Help file.

**NOTE:** For a list of the main differences between the Deploy and Developer modes, see the [Features — Developer Mode versus Deploy Mode](#) section.

#### Developer Mode basics:

- requires an Extron Insider Account
- requires that the user completes Global Scripter training and passes the associated exam (licensed)
- allows for the creation, editing, deployment, and debugging of GS projects
- can switch to Deploy Mode to help support unlicensed users without changing their account settings
- when logged in, displays in the status bar at the bottom right of the main software application window

For a full list of features available in Developer mode see the [menus and toolbar](#) list below.

## Developer mode menus and toolbar icons

**NOTE:** Click on any of the links in the list to take you directly to the relevant Help file topic for method of use.

### Menus available:

- [File](#) — New, Open, Download, Save, Save As, Recent Projects, Exit
- [Edit](#) — Undo, Redo, Cut, Copy, Paste, Select All, Find, Replace, Find in Files, Replace in Files, Insert Code, Blank Operations, Comment/Uncomment, Convert Case to, Indentation
- [View](#) — Toolbars, Formatting, Find Results, Messages, Program Log, Properties, Trace Messages Variable, Watch Variable, Go to line Number, Bookmark
- [Project](#) — Project Properties, Generate Project Report
- [Build](#) — Build Project, Build Code Only
- [Debug](#) — Start Program, Start Debugging, Continue Debugging, Stop Program/Debugging, Toggle Breakpoint, Delete All Breakpoints
- [Tools](#) — IR Learner Pro, Toolbelt, Firmware Uploader, Application Settings, Project Recovery
- [Help](#) — Global Scripter Help, Python Help, Extron Library, Application Licensing, What's New, About Global Scripter

### Toolbar links (icons) available:

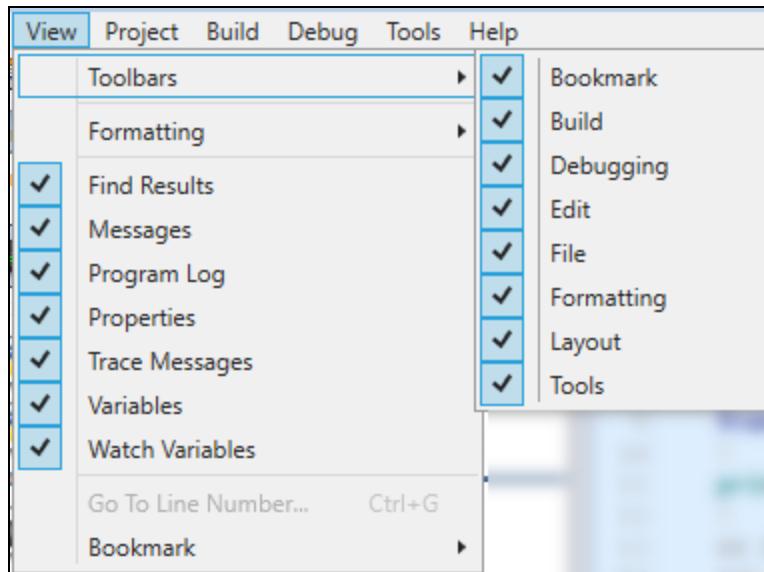


The Toolbar links (icons) available are:

- File — (New, Open, Save)
- Edit — (Cut, Copy, Paste, Undo, Redo, Comment, Uncomment, Increase Line Indent, Decrease Line Indent)
- View — (Toggle, Next, Previous, and Clear Bookmarks)
- Build — (Build Project, Build Complete)
- Debug — (Run Program, Start Debugging, Continue Debugging, Stop Program/Debugging)
- Formatting — (Show Formatting Symbols)
- Tools — (Toolbelt, IR Learner)
- Help — (What's New)
- Layout — (Toggle Developer, Toggle Deploy)

### Developer mode View Menu

From this menu, basic features and icons on the toolbar can be enabled or disabled (toggle the check boxes).



## Additional Developer Mode Features

In addition to the menus and features listed above, developer mode give a user full access to:

- [System Manager](#)
- [Code Editor](#)
- [Diagnostics Panel](#)
- [View Layout Windows](#)
- System Building - Deployment

For more details and methodology, click on each link to go the relevant Help file topic.

## Quick Start

The following is an overview of configuring controllers and devices in your system using Global Scripter.

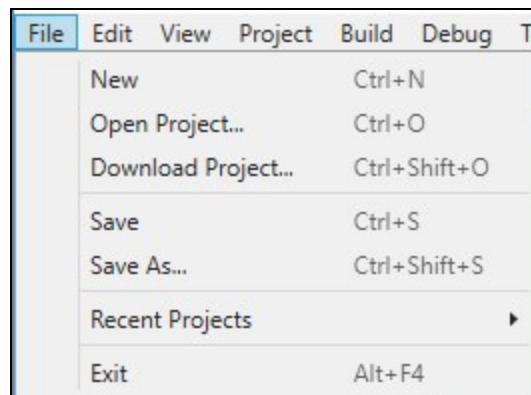
A valid license is required to create and edit projects in Global Scripter. Unlicensed users with a valid Extron Insider account are limited to Deploy Mode only.

1. Create a new Project in Global Scripter (see the [Creating a New Project](#)).
2. Add a controller to the GS project (see [Creating a New Project](#)).
3. Enter the controller IP Address and Device Alias in the Add Controller dialog box.
4. Add a User Interface to the GS project (see [Creating a New Project](#)).
5. Enter the user interface IP Address and Device Alias in the Add User Interface dialog box.
6. Assign a GUI Designer Layout to the user interface in the Add User Interface dialog box.
7. Double-click `main.py` to open the `main.py` program in the Code Editor.
8. Create instances of the `ProcessorDevice` object for the processor.
9. Create instances of the ports on the processor using the Interface libraries.
10. Create instances of the `UIDevice` object for the user interface.
11. Create instances of the buttons, levels and labels that appear in the GUI Designer Layout using the UI libraries.
12. Verify the hardware and configuration, build, and upload the project (see the Build Manager book).

## File Menu

### File Menu Overview

The Global Scripter **File** menu contains the following options:



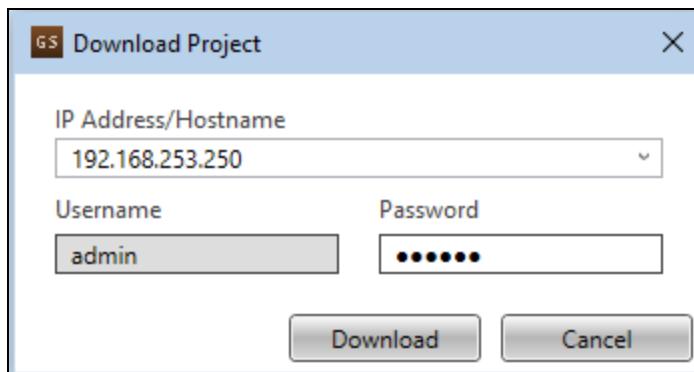
- [New](#)
- [Open Project](#)
- [Download Project](#)
- [Save](#)
- [Save As](#)
- [Recent Projects](#)
- [Exit](#)

## Download Project

Use the **Download Project** option to download an existing project file from a controller and save it for later opening using the **Open Project** option.

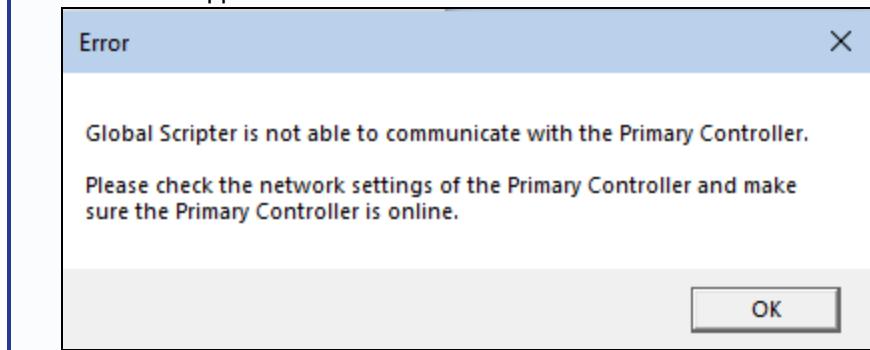
### To download a project from a Controller

1. From the **File** menu, select **Download Project**. A dialog opens prompting the user for the IP Address and Admin password for the controller.



2. Enter or select the IP Address of the desired controller and enter the Admin password.
3. Click **Download**.
4. Select the file location in the **Save As** dialog and enter a unique file name to identify the project.

**NOTE:** If a project does not exist at the selected controller, incorrect credentials are entered, or an incorrect IP address was entered (as shown below), an Error notification appears.



## Exit

Use the **Exit** option to close the Global Scripter application.

### Exiting Global Scripter

From the **File** menu, select **Exit**. If you have not saved the open project, the **Save** prompt opens.

If the Save prompt opens, click **Yes** to save the project.

If this is the first time saving the project file, the Save As dialog box opens (see the **Save** or **Save As** sections).

## New

Use the **New** option to start a new Global Scripter project.

**NOTE:** Opening a new project requires a Global Scripter license.

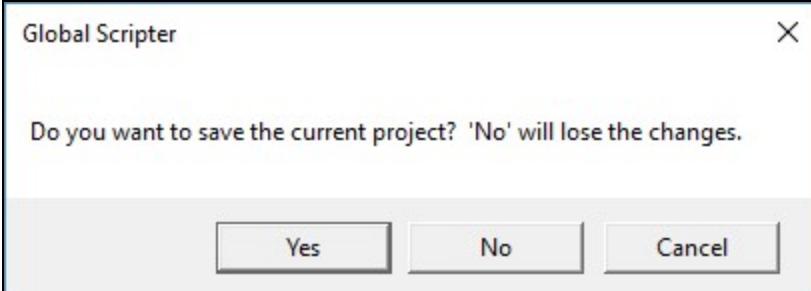
### Creating a new project

- From the **File** menu, select **New**.

**NOTE:** Alternatively, click the **New** **File** icon  or use the keyboard shortcut <Ctrl+N>.

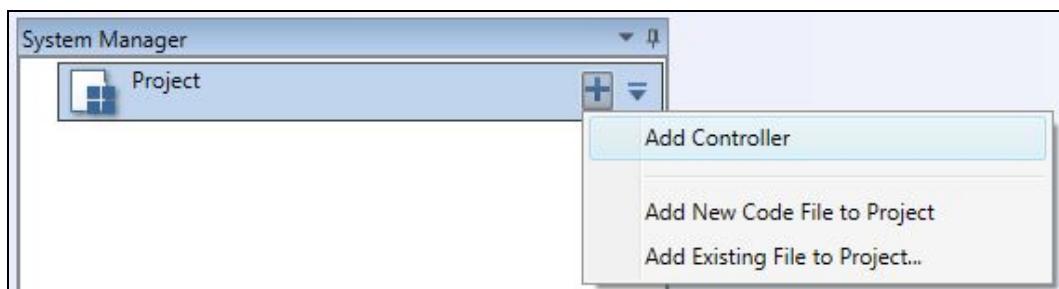
This creates a new project in the System Manager.

**NOTE:** If an existing project is open, a dialog box opens to confirm saving and close the current project.



Click **Yes**, **No**, or **Cancel**, as desired.

- Select **Add Controller** from the **Add Context** menu next to the **Project** icon in the System Manager.



- From the drop-down list, select the controller type and complete the address details for the controller.
- Enter a **Device Alias** for the controller. The **Device Alias** is a name for the controller that references the controller within the program.
- In the **IP Address/Host Name** field, enter a valid IP address for the controller.

**NOTE:** Host names must be qualified (for example, *someone.somehost.com*).

6. Complete the **Password** field.
7. Complete the details for the controller and click **Add**. A python file will be automatically added to the system under the Primary Controller.

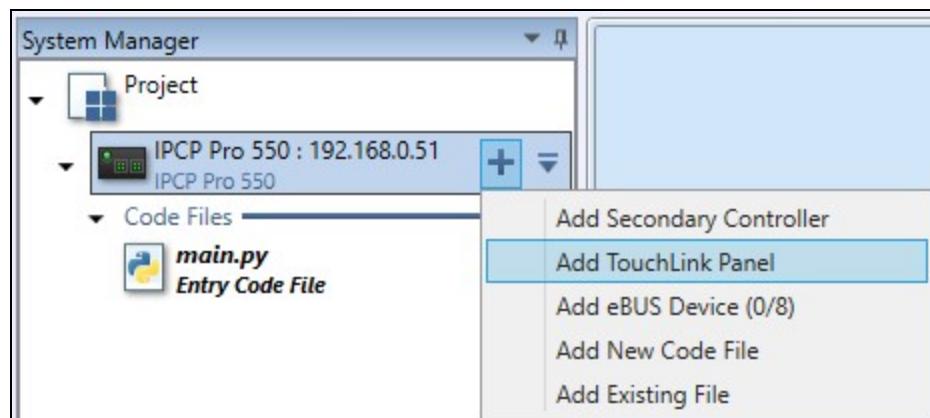


**NOTES:**

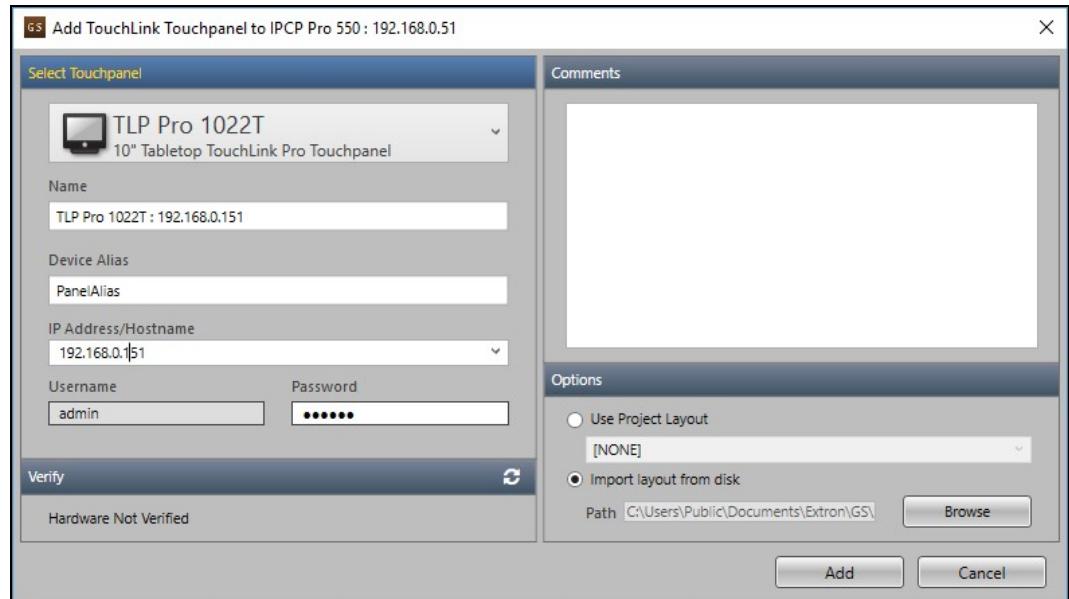
- When adding a control processor with an AV LAN port, the Add Controller dialog adds an additional field for the AV LAN IP address
- A dedicated AV LAN safeguards AV systems from outside intrusion or interference by separating device control and or other network traffic from a corporate or campus network. To ensure that the Control Processor LAN and AV LAN connections (ports) are connected to separate networks, the LAN and AV LAN IP address schemes must be on different subnets



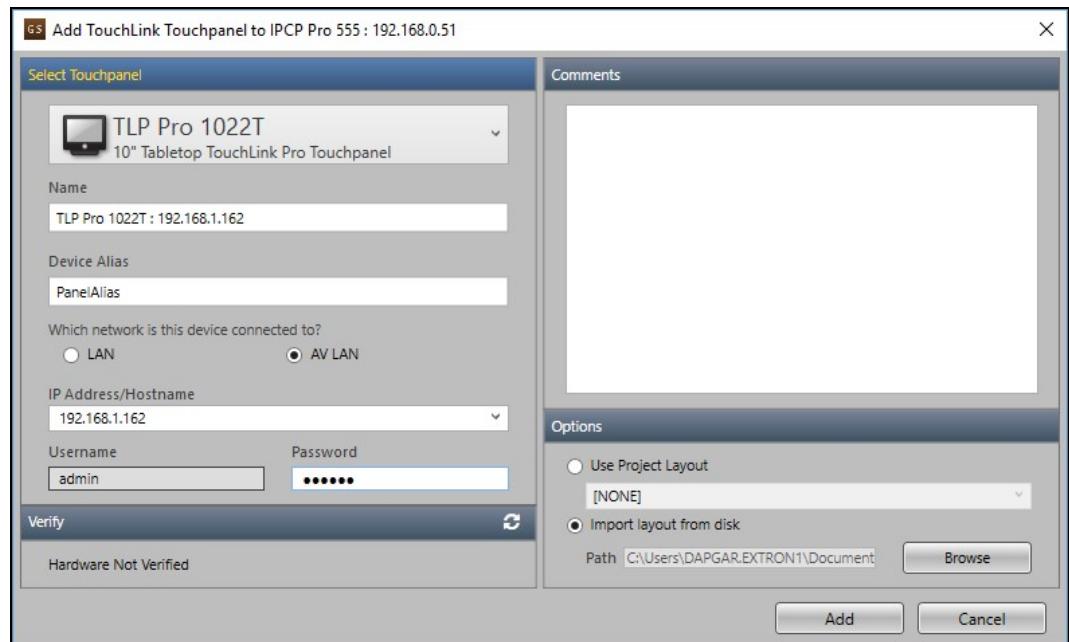
8. Select **Add TouchLink Panel** from the **Add Context** menu next to the Primary Controller icon in the System Manager.



9. From the drop-down list, select the touchpanel type and complete the address details for the touchpanel.



**NOTE:** For systems with a control processor with an AV LAN port, the dialog for **Add Controller** and **Add Touchpanel** add an additional field to select if the device is connected to the LAN side of the Primary Controller or the AV LAN side of the Primary Controller.



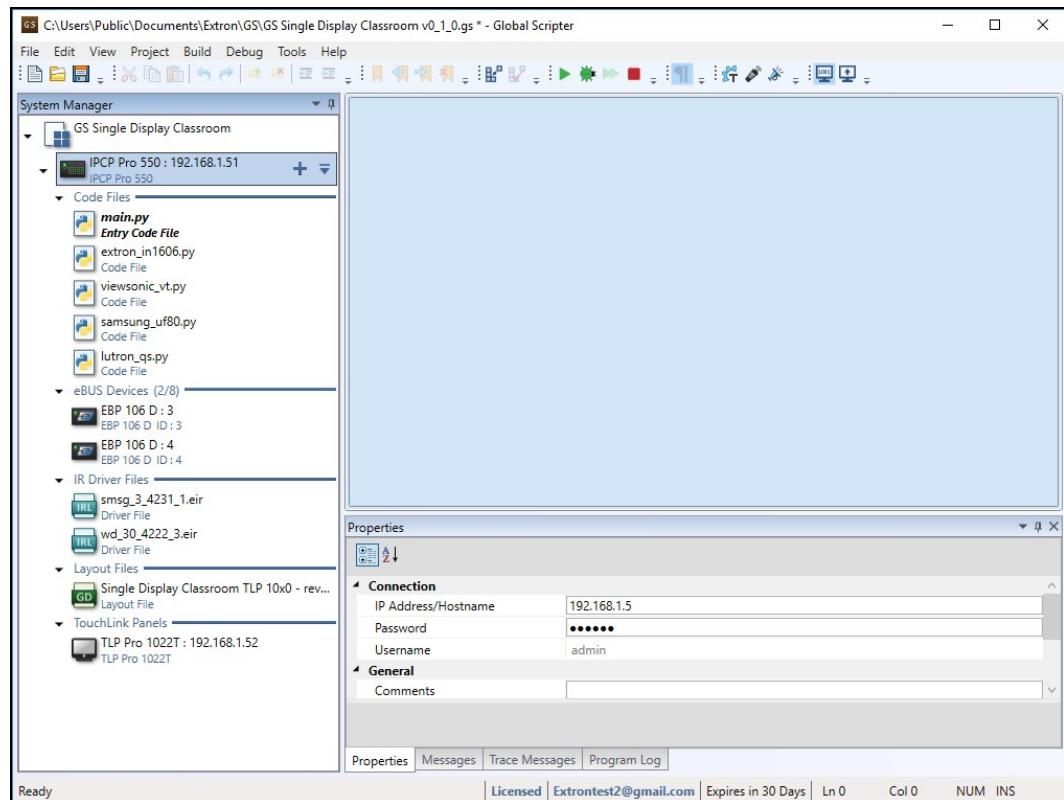
10. Enter a **Device Alias** for the touchpanel. The **Device Alias** is a name for the touchpanel that references the touchpanel within the program.
11. In the **IP Address/Host Name** field, enter a valid IP address for the touchpanel.
 

**NOTE:** Host names must be qualified (for example, *someone.somehost.com*).
12. Complete the **Password** field.
13. In the Options panel, select **Import Layout from disk** (if a desired layout has

not already been added to the system) or select **Use Project Layout** to choose from a list of projects that have already been added to the system, then click the **Browse** button and locate the relevant .gd1 layout file.

**NOTE:** If no layout is initially imported, a saved layout can be imported at a later stage if desired.

14. Click **Verify** to check the hardware before opening the project.
15. Click **Add** to add the touchpanel and layout file to the project.



The touchpanel and the layout file appear in the **System Manager** under the Primary Controller in the system. For further details, see the [System Manager](#) section.

## Open Project

Use the **Open Project** option to open an existing project file from a location a local PC.

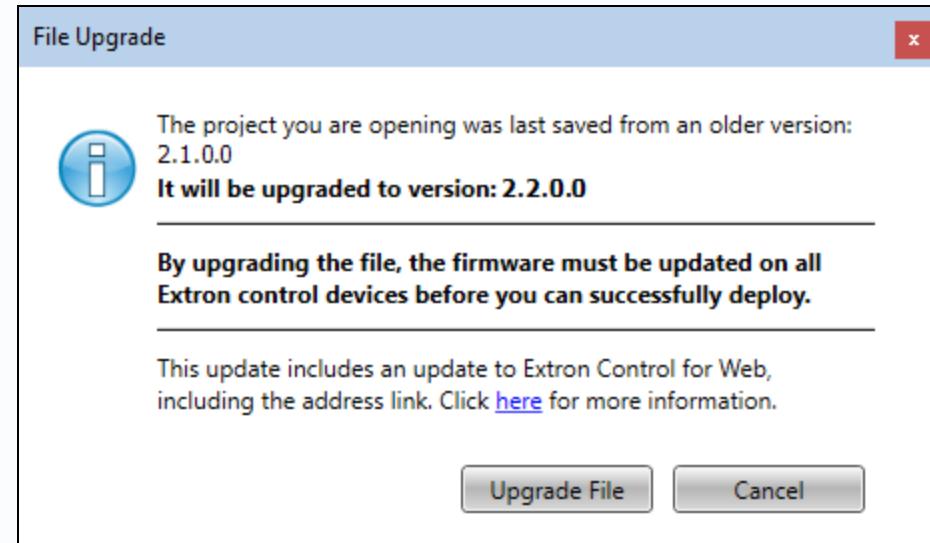
**NOTES:**

- Project files have a .gs extension.
- When attempting to open a project while an existing project is already open, a dialog box appears with options to save the existing project, close the existing project without saving, or cancel opening the new project. If the user clicks **No**, any unsaved changes made to the open project will be lost.

To open a new file:

1. Click **File > Open Project** or click on the **Open Project**  icon, or use the keyboard shortcut <[Ctrl]+O>.

**NOTE:** A **File Upgrade** dialog box appears if opening a file saved from an older version of GS.



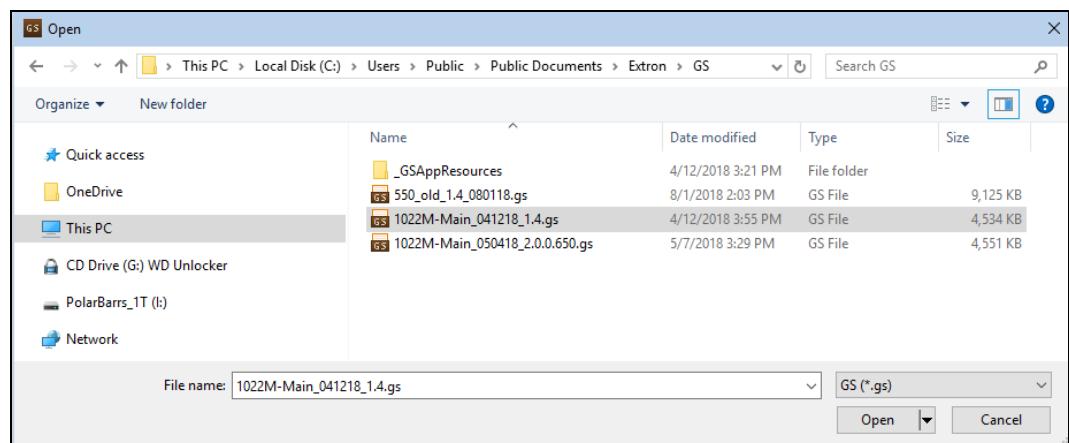
Device firmware must be updated to the latest versions to achieve a successful deployment.

When upgrading the file, a backup copy of the original file is created and named in the format *{original name}\_v{saved version number}.gs*.

If projects were built with GS versions 2.1.0 or less, the dialog box indicates that updating firmware also includes new ECW capabilities.

The upgraded file retains the original file name when upgraded.

2. Open window appears.



3. Browse to and select the desired GS project.
4. Click **Open**. The selected project opens.

## Recent Projects

A list of the 10 most recently opened projects is available from the **File** menu.

### Opening a Recent Project

1. From the **File** menu, locate the **Recent Projects** submenu.
2. From the **Recent Projects** submenu, select the desired project to open.

## Save As

Use the **Save As** option when first saving a project file or to save a project under a new name. Global Scripter project files have a .gs extension.

#### Saving a project as...

1. From the **File** menu, select **Save As** (or use keyboard shortcut <[Ctrl][Alt]+S>). The **Save As** dialog box opens.
2. Browse to the desired save location.
3. In the **File name** field, enter a unique name to identify the project file.
4. Click **Save**.

## Save

Use the **Save** option to save the current GS project file. GS project files have a .gs extension.

#### Saving a project.

From the **File** menu, select **Save**, (or use the keyboard shortcut <[Ctrl]+S>). The project file is saved.

#### NOTES:

If this is the first time saving the project file, the **Save As** dialog box opens.

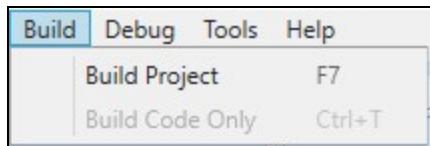
- Browse to the desired save location
- In the **File name** field, enter a unique name to identify the project file.
- Click **Save**.

## Build Menu

### Build Menu Overview

The Global Scripter **Build** menu has the following options:

- **Build Project**
- **Build Code Only**



## Build Code Only

**Build Code Only** uploads just the Python files associated with the project to the Primary Processor for files that are currently being edited.

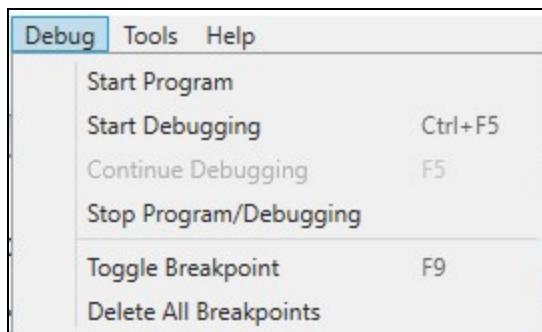
## Build Project

**Build Project** prepares all files in the project, verifies the hardware specified in the project is ready, and uploads all projects and settings to the Primary Controller and the appropriate hardware.

## Debug Menu

### Debug Menu Overview

Users have the ability to debug their Control Script programs. Click on the Global Scripter **Debug** menu to view the menu options.

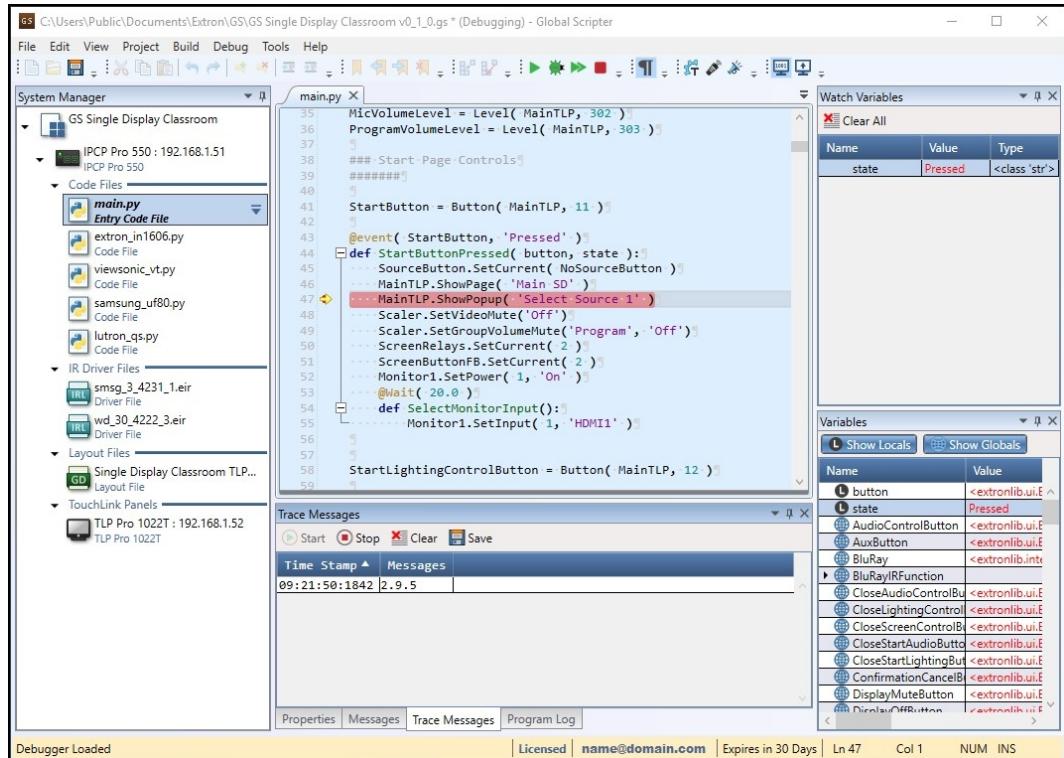


- [Start Program](#)
- [Start Debugging](#)
- [Continue Debugging](#)
- [Stop Program](#)
- [Toggle Breakpoints](#)
- [Delete All Breakpoints](#)

## Debugging with Global Scripter

Users have the ability to debug their Control Script programs using Breakpoints to break their program and view variable values at different point throughout their program.

Breakpoints can be set while the Code Editor is in Edit Mode or while the Code Editor is set in Debugging Mode.



Breakpoints can be set 3 ways:

- Click in the margin to the right of the line numbers
- Select **Toggle Breakpoint** from the Debug Menu
- Press <F9> while editing a Code File

#### To begin debugging:

Select **Start Debugging** from either the **Debug** menu or the **Debugging Toolbar**, or press <Ctrl+F5>.

#### Workflow

- Global Scripter verifies that the project data and files in the editor match the code files loaded on the Primary Processor. If the files do not match, GS prompts the user to proceed with synchronization or to cancel the debugging session. Clicking the **Proceed** button will build and upload the files necessary to start the debugging session
- GS changes the color of the status bar and appends the applications title bar to indicate that it is in Debug Mode
- The program on the Primary Processor runs normally in debug until a Breakpoint is reached. Once the program reaches a Breakpoint, the program is paused, and the processor updates Global Scripter with a list of all of the objects in the processors memory
- The complete list of objects is displayed in the **Variables** Panel. Objects that have a Local scope in the context of the breakpoint are shown with the **Local** icon. Objects that are have a global scope in the context of the breakpoint are shown with the **Global** icon.

The user can toggle the visibility of both local and global variables in the Variables panel by clicking on the **Show Locals** and **Show Globals** buttons respectively.

The list of objects displayed in the Variables panel can be long.

**NOTE:** To view only the objects the programmer wants to view, the objects should be copied to the Watch Variables panel.

**To shorten the list, either:**

- Right-click on a Variable in the Variables Panel and select **Add to Watch** or
- Click-drag a variable from the Variables panel into the Watch Variables panel.

Global Scripter retains the list for the current session, but shows an error for objects in the Watch Variables that are not in the context of the current breakpoint.

**To resume the program:**

- Select **Continue Debugging** from the **Debug** menu or the Debugging Toolbar, or press <F5>. The program continues running until the next Breakpoint is reached.

**To exit out of Debug Mode and return Global Scripter to the normal Edit Mode, either:**

- select **Start Program** from the **Debug** menu or Debugging toolbar or
- select **Stop Program** from the **Debug** menu or the Debugging Toolbar.

**NOTE:** Exiting Debug Mode returns the Status Bar and Title Bar back to their normal modes.

## Start Program

Click the **Start Program** function to start the program on the Primary Controller in the project. If the program is running, it is stopped first.

**NOTE:** All program initialization starts the run again, and any data stored in program variables is lost.

While in Debug Mode, clicking **Start Program** turns off the Debug Mode, all breakpoints are ignored, and editing is enabled in the Code Editor.

## Start Debugging

Click the **Start Debugging** function (or use keyboard shortcut <Ctrl+F5>), to start the program on the Primary Controller in Debug Mode. If the program is running, it will be stopped first.

**Start Debugging** checks and ensures that the code in Global Scripter and the code that is on the Primary Controller are in sync. It then starts the program in Debug Mode with the **Breakpoints** enabled.

**NOTE:** A Breakpoint is a marker that is set in a code file, and signals the program to break once the running program reaches that marker.

While in Debug Mode, code editing is disabled to ensure that the code in the processor matches the code in the Code Editor.

**To edit the code files:**

1. Stop the program, and make any changes
2. Click **Start Debugging**. Global Scripter synchronizes the code in the editor with the code on the processor.

## Continue Debugging

While in Debug Mode, Global Scripter breaks (pauses) the program running on the Primary Controller when Python reaches a break point set in the code editor.

Click on **Continue Debugging** (or use keyboard shortcut <F5>) to resume the program from the break point.

**NOTE:** **Continue Debugging** is only enabled when a break point has been reached.

## Stop Debugging

**ATTENTION:** Selecting **Stop Program** from either the **Debug** menu or the **Debugging Toolbar** stops the Python program running on the Primary Processor and leaves the system in a nonfunctioning state.

Click the **Stop Program** to stop the program that is currently running on the Primary Controller.

While in Debug Mode, **Stop Program** turns off the Debug Mode and if disabled, re-enables the Code Editor. It halts all Python programs running on the processor. The program is not automatically restarted, and the programmer must restart the program.

## Toggle Breakpoint

Click this option (or use keyboard shortcut <F9>) to toggle a breakpoints visibility and location within a Code File in the Code Editor.

Breakpoints can also be toggled by clicking in the margin to the right of the line numbers in the Code Editor.

## Delete All Breakpoints

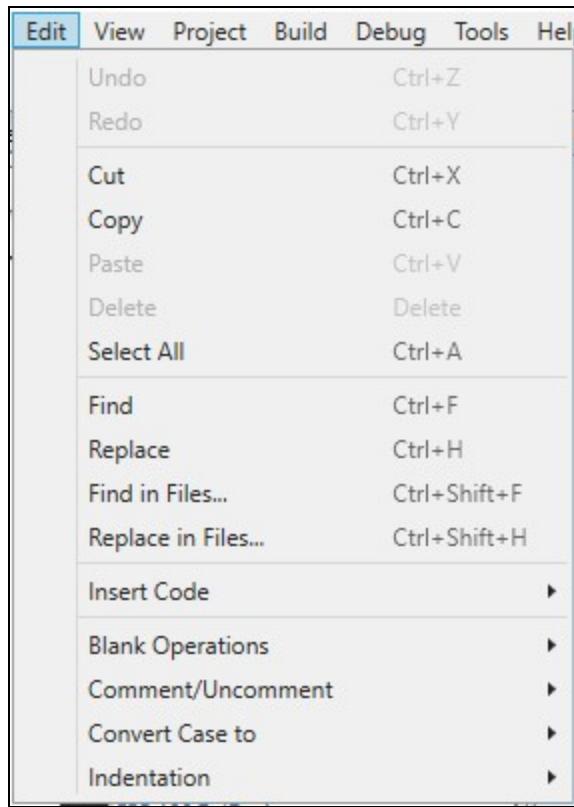
Click this to delete all breakpoints placed in all of the code files in the current project.

## Edit Menu

### Edit Menu Overview

The Global Scripter **Edit** menu has options that operate within the Code Editor window.

Click on **Edit** and select the operation as desired.



- **Undo** — undoes the last operation performed within the active Code Editor Window
- **Redo** — reapplies the last operation (undone by Undo) performed
- **Cut** — cuts (removes) and places text selected in the Code Editor onto a common clipboard for pasting
- **Copy** — copies and places text selected in the Code Editor, onto a common clipboard for pasting
- **Paste**
- **Delete**
- **Select All**
- **Find**
- **Replace**
- **Find in Files**
- **Replace in Files**
- **Insert Code**
- **Blank Operations**
- **Comment/Uncomment**
- **Convert Case to**
- **Indentation**

## Undo

The Undo option:

- is only enabled when there are operations in the Undo list to be undone
- undoes the last operation performed within the active Code Editor window
- maintains a list of operations for each Code Window in the Code Editor

**To Undo an operation:**

1. Click in the applicable row within the Code Editor
2. Click either **Edit > Undo**, or the Undo icon , or use the keyboard shortcut ([Ctrl]+Z).
3. Repeat as needed.

## Redo

The Redo option:

- is only enabled when there are operations in the Redo List to be reapplied
- reapplies the last operation performed within the active Code Editor Window that was undone by Undo
- maintains a list of operations undone for each Code Window in the Code Editor

**To Redo an operation:**

1. Click in the applicable row within the Code Editor
2. Click either **Edit > Redo**, or the Redo icon , or use the keyboard shortcut ([Ctrl]+Y).
3. Repeat as needed.

## Cut

The Cut option: ([Ctrl]+X)

- is only enabled when a file is open in the Code Editor
- removes and places text selected in the Code Editor into a common clipboard

**NOTE:** Text placed on the clipboard by **Cut** can be pasted into any Windows application that can accept simple text.

**To Cut text:**

1. Click in the applicable row within the Code Editor
2. Click either **Edit > Cut**, or the Cut icon , or use the keyboard shortcut <[Ctrl]+X>.
3. Repeat as needed.

## Copy

The Copy option:

- is only enabled when a file is open in the Code Editor
- copies and places text selected in the Code Editor, into a common clipboard

**NOTE:** Text placed on the clipboard by **Copy** can be pasted into any Windows application that can accept simple text.

#### To Copy text:

1. Click in the applicable row within the Code Editor
2. Click either **Edit > Copy**, or the Copy icon , or use the keyboard shortcut < [Ctrl]+C>.
3. Repeat as needed.

## Paste

The Paste option:

- is only enabled when a file is open in the Code Editor, and there is text in the clipboard
- places text from a common clipboard into the active Code Window at the location of the cursor

**NOTE:** Text can be placed on the common clipboard any Windows application that can cut or copy simple text, and pasted into a Global Scripter Code Window.

#### To Paste text:

1. Click in the applicable row within the Code Editor
2. Click either **Edit > Paste**, or the Paste icon , or use the keyboard shortcut < [Ctrl]+V>.
3. Repeat as needed.

## Delete

The Delete option: ([Delete])

- is only active when a block of text is selected in the active Code Window
- removes the selected text from the active Code Window

**NOTE:** The <**Delete**> key will remove the next character after the cursor, if there is not a block of selected text.

#### To Paste text:

1. Click in the applicable row within the Code Editor
2. Click either **Edit > Delete**, or use the keyboard shortcut <Delete>.
3. Repeat as needed.

## Select All

The Select All options:

- selects all of the text in the active Code Window
- is only enabled when a file is open in the Code Editor

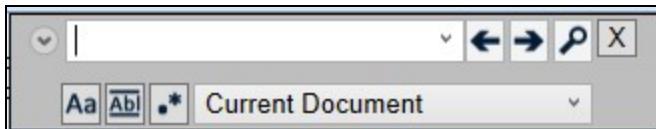
**To Select All text:**

1. Click in the applicable row within the Code Editor
2. Click either **Edit > Select All**, or use the keyboard shortcut <[Ctrl]+A>.
3. Repeat as needed.

## Find

**Find** (keyboard shortcut <[Ctrl]+F>) opens the Quick Find dialog in the upper right corner of the active Code Window. This allows you to search the active Code Window for a text sequence.

**NOTE:** **Find** is only enabled when a file is open in the Code Editor.



Hover the cursor over any icon to reveal the option name.

The Quick Find dialog has the following options:

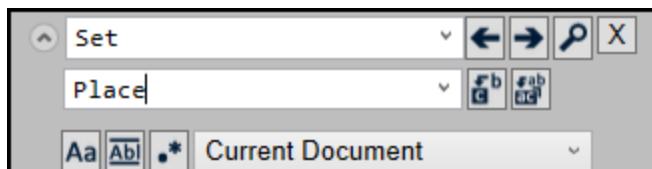
- **Toggle Replace Mode button** — or ([Ctrl]+[H]) changes the Quick Find dialog to its Replace Mode (see [Replace](#)).
- **Search Text field** — allows the user to enter a block of text that will be located within the active Code Window.  
It also:
  - lists recently searched blocks of text
  - is automatically populated if a block of text is selected when the Quick Find dialog is activated
  - offers up suggestions during typing, based upon previous searches that match the entered text sequence.
- **Find Previous** — or ([Shift]+[F3]) moves the cursor to the previous criteria match occurrence within the Code Editor search text.
- **Find Next** — or ([F3]) moves the cursor to the next match occurrence within the Code Editor search text.
- **Find All** — lists all of the occurrences of the search text in the [Find Results](#) diagnostics panel.
- **Close** — closes the Quick Find dialog

- **Match Case** — toggles the Match Case option for the text search.  
If Match Case is:
  - active, only occurrences of the search text sequence that match both the character and the case are found
  - not active, the case of the characters in the search text are ignored
- **Match Whole Word** — toggles the Match Whole Word option for the text search.  
If Match whole word is:
  - active, only occurrences of the search text sequence that are followed by a white space character (space or tab) or an end of line character are found.
  - not active, the search text sequence is found as whole words or within other words
- **Match by Regular Expression** — toggles the Match by Regular Expression option for the text search.  
If Match by Regular Expression is:
  - active, the search text sequence is evaluated as a Regular Expression and matches to that Regular Expression are found
  - not active, the search text sequence is not evaluated as a regular expression and the search text sequence is evaluated as a literal string
- **Find Scope** — the Find Scope box selects the scope of the Find operation. As a block of text is selected, the scope of the search can be either **Current Document** or **Selection**.  
If the scope selected is:
  - **Selection**, only the selected block of text is searched
  - **Current Document**, the entire code file is searched

## Replace

**Replace** (keyboard shortcut <[Ctrl]+H>) opens the Quick Find dialog in the upper right corner of the active Code Window. The Quick Find dialog allows you to search the active Code Window for a text sequence and replace it with another text sequence.

**NOTE:** Replace is only enabled when a file is open in the Code Editor.



Hover the cursor over any icon to reveal the option name.

The Replace Mode of the Quick Find dialog has the same options as the Find Mode plus the following options:

- **Toggle Find Mode button** — changes the Quick Find dialog to its Find Mode (see **Find**)

- **Replace Text field** — is a combo box that allows the user to enter a block of text that is used to replace the found instances of the Search Text.

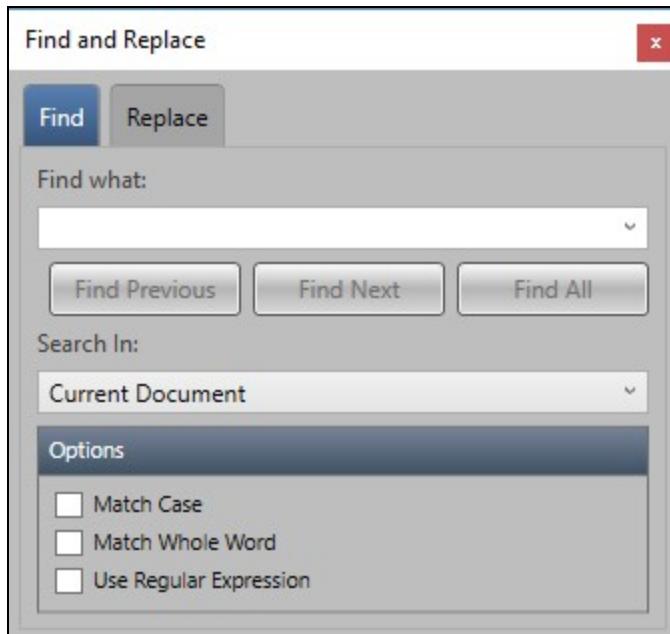
It also:

- lists recent replacement strings of text
- offers up suggestions during typing, based upon previous replacement strings that match the entered text sequence.

- **Replace button** —  replaces the currently selected instance of the search text with the replacement string of text
- **Replace All button** —  replaces all instances of the search text with the replacement string of text within selected search scope

## Find in Files

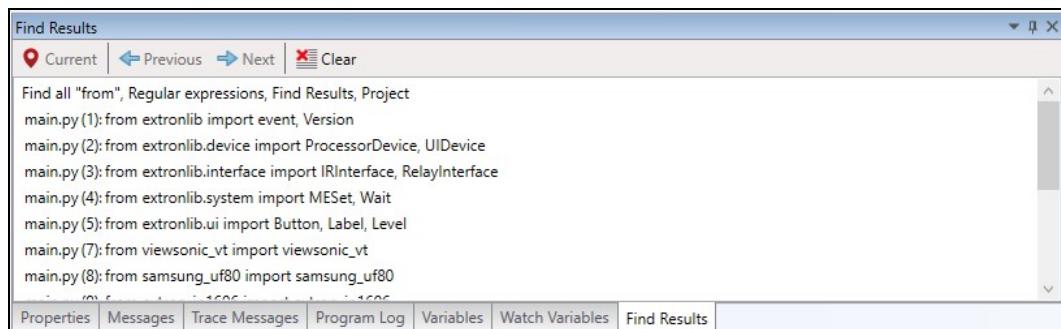
**Find in Files** (keyboard shortcut <[Ctrl]+[Shift]+F>) opens the Find in Files dialog within the Global Scripter workspace. The Find in Files dialog allows you to search for a text sequence in a broader scope than within the Quick Find dialog.



The Find in Files dialog has many of the same options as the Quick Find dialog, but has the following scope options:

- **Current Document** — searches for the search text sequence in the active Code Window

- **All Open Documents** — searches for the search text sequence in any code file open in the Code Editor
- **Project** — searches for the search text sequence in all Python files associated with the Global Scripter Project.
  - All instances of the search text sequence that are found within the selected scope are listed in the **Find Results** diagnostics panel.
  - Double-clicking on an item in the **Find Results** panel, will open the file (if closed) and jump to the location of the text item.

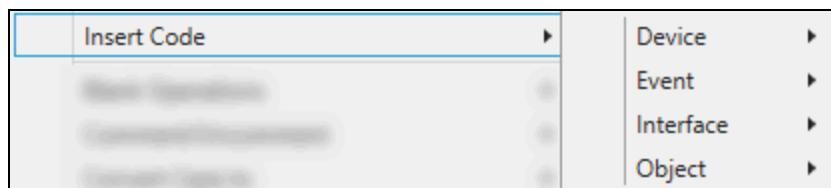


## Insert Code

This menu allows the developer to insert basic code into a file within the code editor window.

**NOTE:** Code is inserted at the cursor location within the open file in the Code Editor.

The code is separated into **Device**, **Event**, **Interface**, and **Object** criteria, each having its own submenu.



### Device

Device allows insertion of code for a specific device type:

- **eBUS** — inserts a block of code that instantiates the eBUS device class  
`EBP = eBUSDevice(Processor, 'eBUSAlias')`
- **Processor** — inserts a block of code that instantiates the Processor device class  
`Processor = ProcessorDevice('ProcessorAlias')`
- **User Interface** — inserts a block of code that instantiates the User Interface device class  
`TLP = UIDevice('PanelAlias')`

## Event

Event allows insertion of code for a specific event type:

- **Changed (Slider)** — inserts a block of code that defines a Changed Event, triggers when the slider value is changed by user interaction (i.e. after Pressed but before Released).

```
@event(ProgramAudio, 'Changed')
def handleProgramAudio(slider, state, value):
    if state == 'Changed':
        # Send new program audio level
```

**NOTE:** The callback takes three arguments. The first is the Slider instance triggering the event, the second is the state, and the third is the new slider value.

- **Generic Event** — inserts a block of code that defines a Generic Event

```
@event(Object, 'Event')
def EventHandler(object, data):
    pass
```

- **Held** — inserts a block of code that defines a Held Event

```
@event(ButtonObject, 'Held')
def ButtonObjectHeld(button, state):
    pass
```

- **Pressed** — inserts a block of code that defines a Pressed Event

```
@event(ButtonObject, 'Pressed')
def ButtonObjectPressed(button, state)
    if state == 'Pressed':
        pass
```

- **Pressed (Slider)** — inserts a block of code that defines a Pressed Slider Event, triggers when the slider is pressed.

```
@event(ProgramAudio, 'Pressed')
def handleProgramAudio(slider, state, value)
    if state == 'Pressed':
        # Send new program audio level
```

- **Released**—inserts a block of code that defines a Released Event

```
@event(ButtonObject, 'Released')
def ButtonObjectReleased(button, state):
    pass
```

- **Released (Slider)**—inserts a block of code that defines a Released Slider Event, triggers when the slider is released.

```
@event(ProgramAudio, 'Released')
def handleProgramAudio(slider, state, value):
    if state == 'Released':
        # Send new program audio level
```

- **Repeated**—inserts a block of code that defines a Repeated Event

```
@event(ButtonObject, 'Repeated')
def ButtonObjectRepeated(button, state):
    pass
```

- **Tapped** — inserts a block of code that defines a Tapped Event

```
@event(ButtonObject, 'Tapped')
def ButtonObjectTapped(button, state):
    pass
```

- **Turned** — inserts a block of code that defines a Turned Event

```
@event(ButtonObject, 'Turned')
def KnobObjectTurned(knob, direction):
    pass
```

## Interface

Interface allows insertion of code for a specific port type:

- **Contact Input Port** — inserts a block of code that instantiates the Contact Input port class

```
ContactInputPort = ContactInterface(Processor, 'CII1')
```

- **Circuit Breaker Interface** — inserts a block of code that instantiates the Circuit Breaker Interface class

```
CircuitBreakerInterface = CircuitBreakerInterface(Processor,
'CBR1')
```

- **Digital IO Port** — inserts a block of code that instantiates the Digital IO port class

```
DigitalIOPort = DigitalIOInterface(Processor, 'DIO1',
Mode='DigitalInput')
```

- **Digital Input Port** — inserts a block of code that instantiates the Digital Input port class

```
DigitalInputPort = DigitalInputInterface(Processor, 'DI11',
Mode='DigitalInput')
```

- **Ethernet Client Port** — inserts a block of code that instantiates the Ethernet Client port class

```
EthernetClient = EthernetClientInterface('IPAddress', 1025)
```

- **Ethernet Server Port** — inserts a block of code that instantiates the Ethernet Server port class.

```
EthernetServer = EthernetServerInterface(1025)
```

- **Flex IO Port** — inserts a block of code that instantiates the Flex IO port class

```
FlexIOPort = FlexIOInterface(dvProcessor, 'FIO1',
Mode='DigitalInput')
```

- **IR Port** — inserts a block of code that represents the IR port class

```
IRPort = IRInterface(Processor, 'IRS1', 'IrFileName.eir')
```

- **PoE Port** — Inserts a block of code that instantiates the PoE (Power over Ethernet) port class

```
PoEPoRt = PoEInterface(Processor, 'PoE2')
```

- **Relay Port** — Inserts a block of code that instantiates the Relay port class

```
RelayPort = RelayInterface(Processor, 'RLY1')
```

- **Serial Port** — inserts a block of code that instantiates the Serial port class

- `SerialPort = SerialInterface(Processor, 'COM1', Baud=9600)`
- **Switched AC Receptacle**— inserts a block of code that instantiates the Switched AC Receptacle Interface class  
`SWACReceptacle = SWACReceptacleInterface(Processor, 'SAC1')`
- **Switched Power Port**— inserts a block of code that instantiates the Switched Power port class  
`SWPowerPort = SWPowerInterface(Processor, 'SPI1')`
- **Volume Control Port**— inserts a block of code that instantiates the Volume port class  
`VolumePort = VolumeInterface(Processor, 'VOL1')`

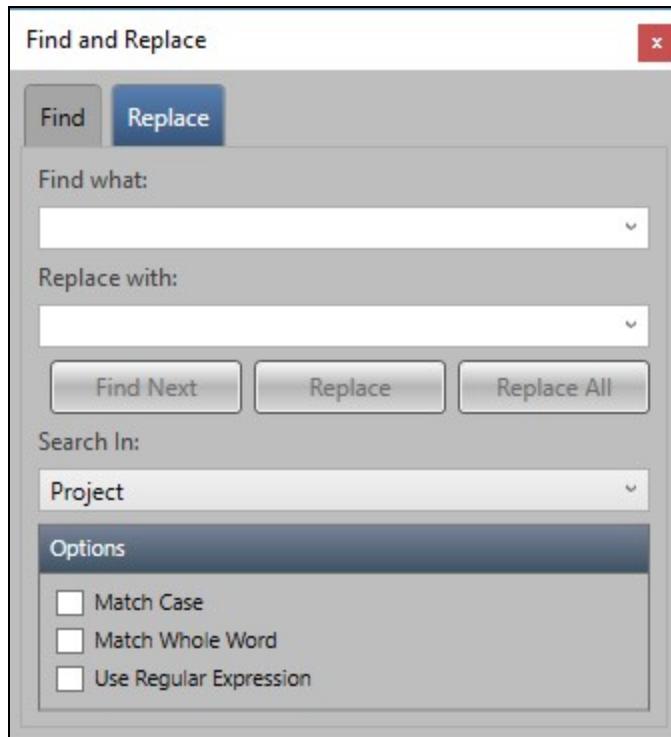
## Object

Object allows insertion of code for a specific device object

- **Button**— Inserts a block of code that instantiates the Button object class  
`ButtonObject = Button(UIHost, 1)`
- **Knob**— Inserts a block of code that instantiates the Knob object class  
`KnobObject = Knob(UIHost, 61001) # TLP Pro 320 uses ID 65501`
- **Label**— Inserts a block of code that instantiates the Label object class  
`LabelObject = Label(UIHost, 1)`
- **Level**— Inserts a block of code that represents the Level object class  
`LevelObject = Level(UIHost, 1)`
- **Slider**— Inserts a block of code that represents the Slider object class  
`SliderObject = Slider(UIHost, 1)`

## Replace in Files

**Replace in Files** (keyboard shortcut <[Ctrl]+[Shift]+H>) opens the **Find in Files** dialog within the Global Scripter workspace. The Replace in Files dialog allows you to search for a text sequence in a broader scope than within the Quick Find dialog and replace the text with another text sequence. The Replace in Files dialog has many of the same options as the Quick Find dialog, and has the same scope options as **Find in Files**.

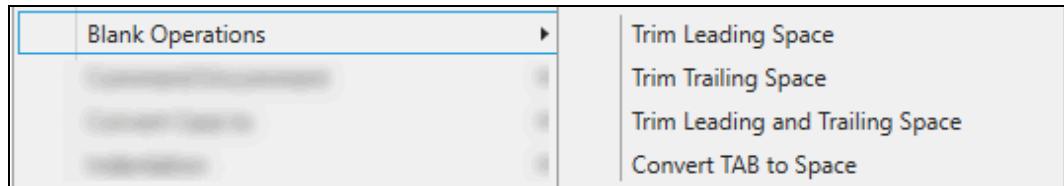


- **Replace in Files** opens any files in which text has been replaced.
- **Undo** function undoes file replacements on a per file basis.  
For example, if the text "add" is replaced with "set" for an entire project, and the text was replaced in 3 files, all three files will automatically be opened. To undo the replacement, it is necessary to select all three files individually and undo the replacement in each file.

## Blank Operations

The **Blank Operations** submenu allows the user to trim spaces within a code file, and to convert tabs to spaces.

**NOTE:** **Blank Operations** is only enabled when a file open in the Code Editor, and where the cursor is located within that file.



- **Trim Leading Space** — removes any space and tab characters from the beginning of a line to the first character of text in that line

- **Trim Trailing Space** — removes any space and tab characters from last character of text to the end of line
- **Trim Leading and Trailing Space** — removes any space and tab characters from the front of a line of text and the end of a line of text
- **Convert TAB to Space** — replaces any TAB characters with the number of spaces specified in the Global Scripter Preferences

## Comment/Uncomment

The **Comment/Uncomment** submenu allows the user to mark or unmark a line of text within a code file in the Code Window.

- **Comment** — adds a "#" character to the start of any selected line of text
- **Uncomment** — removes the "#" character from the start of a selected line of text

## Convert Case to

The **Convert Case to** submenu allows the user to convert the case within selected text in a code file in the Code Window.

- **lowercase** — converts all characters selected to lowercase characters
- **UPPERCASE** — converts all characters selected to UPPERCASE characters
- **Title Case** — converts selected text to Title Case, where the first character of every word is UPPERCASE and all other characters are lowercase

## Indentation

The **Indentation** submenu allows the user to increase or decrease text indentation in a code file in the Code Window.

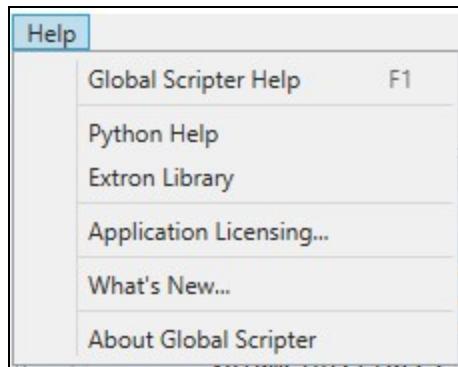
- **Increase Line Indent** — ([TAB]) inserts the number of spaces as specified in the Global Scripter Preferences to the beginning of all selected lines of text
 

**NOTE:** Increase Line Indent differs from the <TAB> key in that if no text is selected, the <TAB> key inserts the space characters at the current cursor location.
- **Decrease Line Indent** — ([Shift]+[TAB]) removes the number of spaces as specified in the Global Scripter Preferences, from the beginning of all selected lines of text

## Help Menu

### Help Menu Overview

Click on the **Help** menu to access documentation (GS Help, Python Help, and Extron lib API), and access Application Licensing details. In addition, the version details of GS can be viewed, and the What's New window can accessed.



- [Global Scripter Help](#)
- [Python Help](#)
- [Extron Library](#)
- [Application Licensing](#)
- [What's New](#)
- [About Global Scripter](#)

## Global Scripter Help

The **Global Scripter Help** option launches the Global Scripter help file.  
From the **Help** menu, select **Global Scripter Help**.

## Python Help

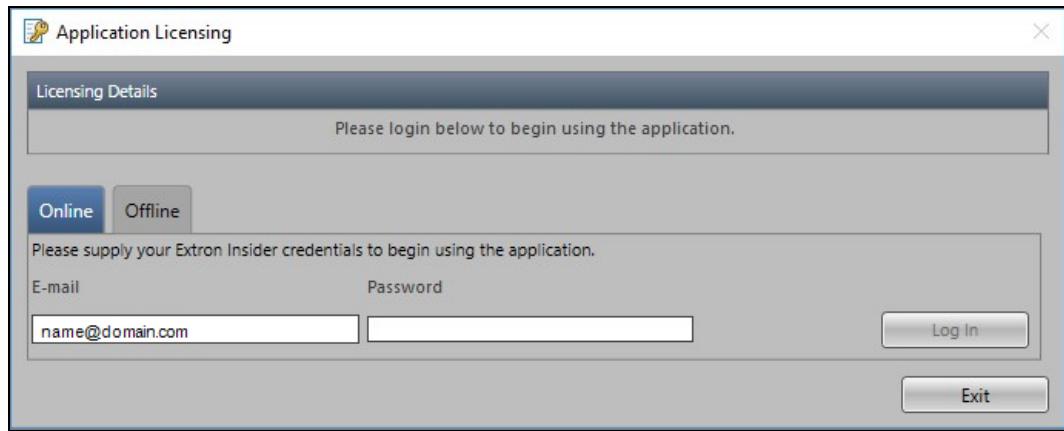
Click this item to launch the default Web browser and go to Python's Documentation Page (<https://docs.python.org/release/3.5.2/>).

## Extron Library

Click this menu item to launch the documentation for the Extron [extronlib API help file](#).

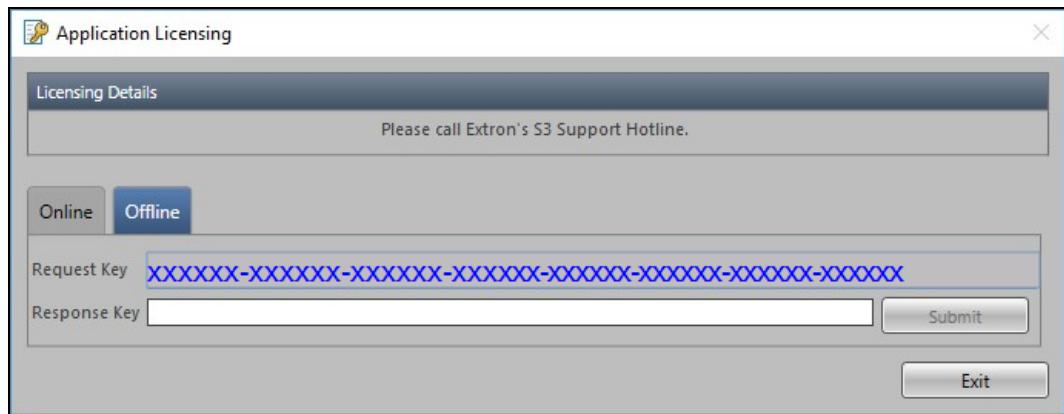
## Application Licensing

Click this item to re-access the Application Licensing window.  
When Global Scripter is started, or after log-out from a previous session, an **Application Licensing** dialog box opens.  
To attain full functionality of the software, use your Extron Insider login. When verified, the application restarts with full functionality.



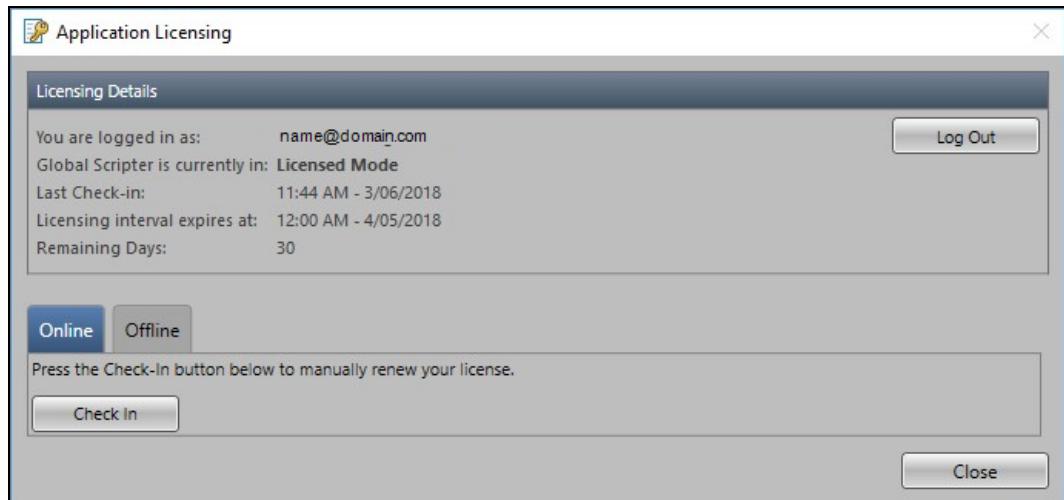
Alternatively, if you are not online, and are unable to link directly to a network, click the **Offline** tab.

An auto generated request key is given. Follow the instructions given in the dialog box to obtain a response key to activate to full functionality.

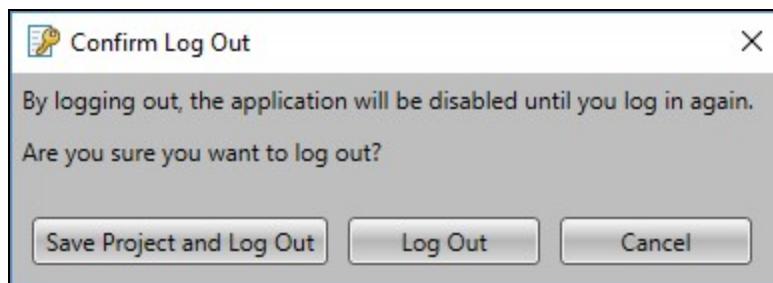


When a user is logged in, the **Licensing Details** shown are:

- User name logged in as
- Mode currently running in
- Date of last check-in
- Expiration date of current licensing interval
- Number of days remaining of current licensing interval



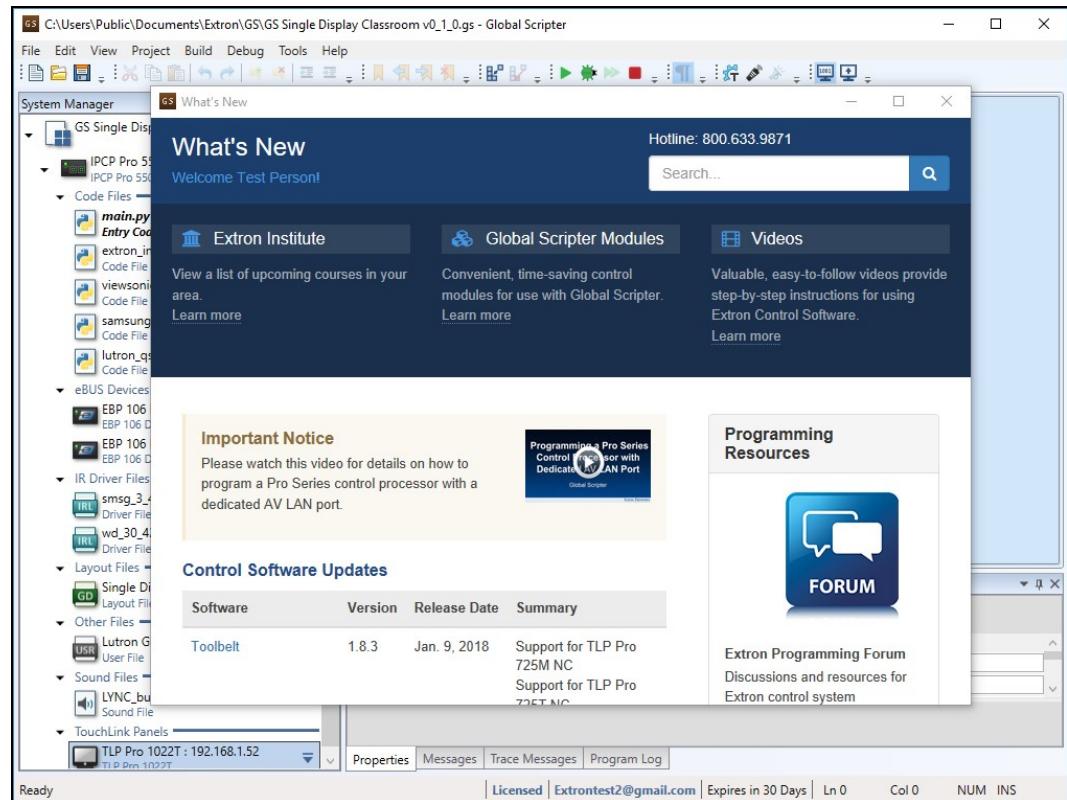
The user can log out from the session, which removes the saved credentials (Username and Password). If a user logs out a confirmation dialog box opens.



To log out and exit the application, click **Log Out** in the Confirm Log Out dialog box. Click **Cancel** to keep the session open.

## What's New

Click this option to open a window showing the latest information from Extron on Global Scripter software releases, firmware, and product releases and training information. This typically opens when Global Scripter is first launched.



Software	Version	Release Date	Summary
Toolbelt	1.8.3	Jan. 9, 2018	Support for TLP Pro 725M NC Support for TLP Pro 725T NC

#### Programming Resources

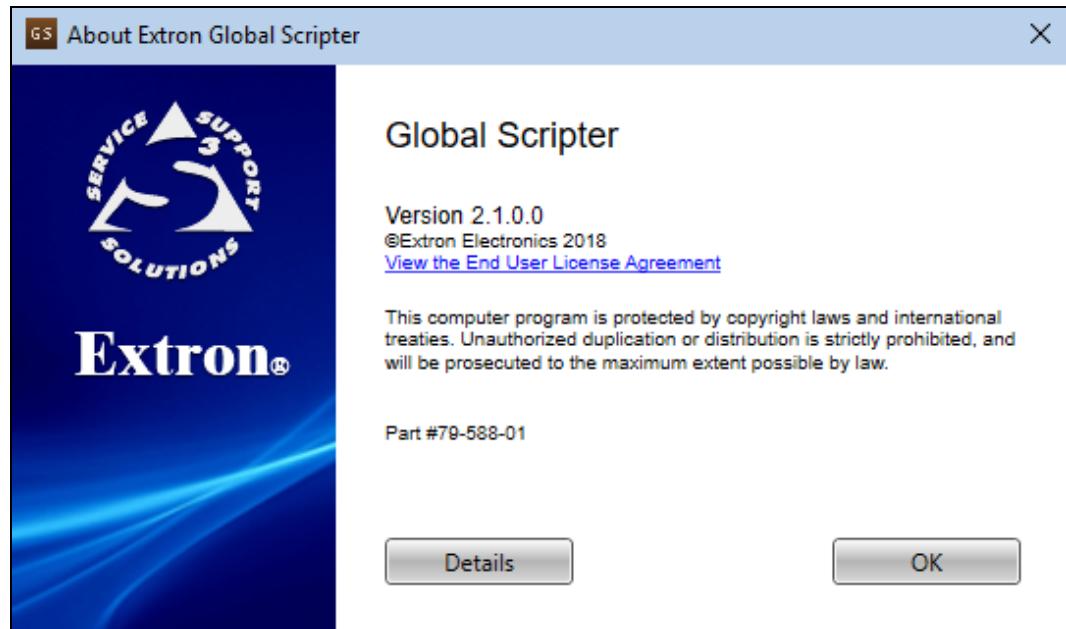


Extron Programming Forum  
Discussions and resources for  
Extron control system

Also, the What's New window can be opened at any time via the Toolbar icon .

## About Global Scripter

The **About Global Scripter** option opens a dialog box displaying information about GS.



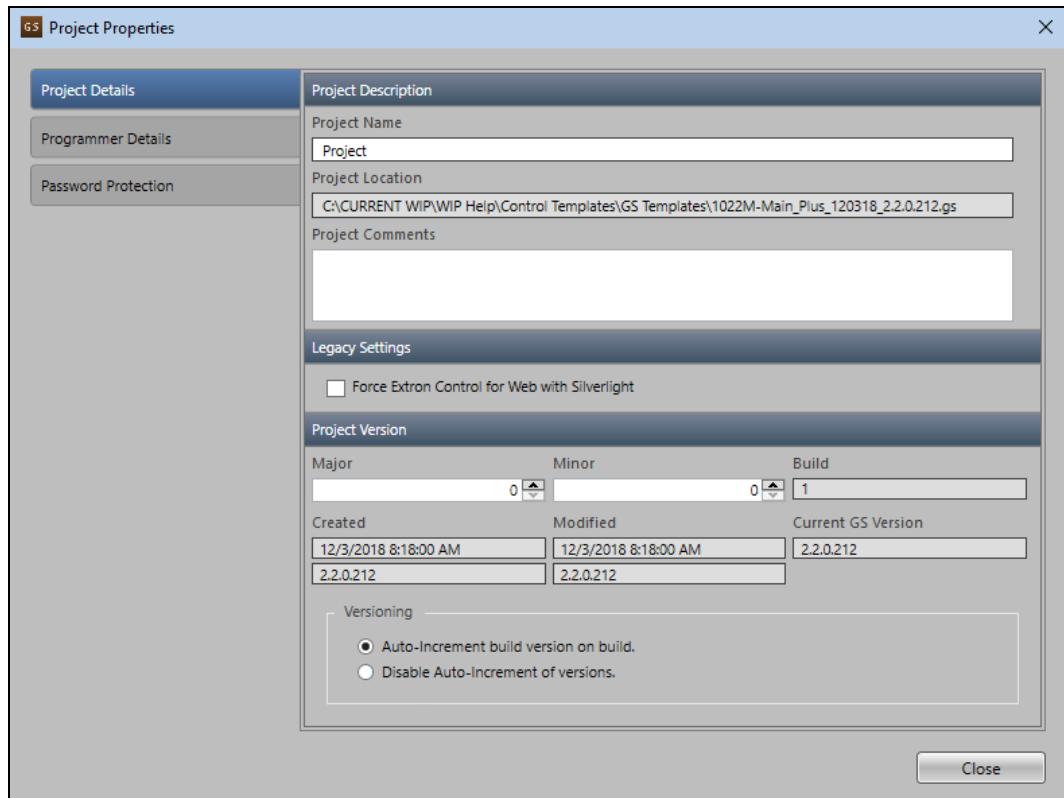
### To view information About Global Scripter

1. From the **Help** menu, select **About Global Scripter**. This opens a dialog box displaying the following information:
  - Name of the application
  - Currently installed version (number and year)
  - View End User License Agreement option
  - Copyright statement
  - Application part number
  - **Details** button (allows the user to view the Third Party listing)
2. Click **OK** to close this dialog box and return to the main Global Scripter window.

## Project Properties

Select the **Project Properties** menu to open a dialog box with three tabs: **Project Details**, **Programmer Details**, **Password Protection**.

Click on a tab to access the applicable features.



## Project Details tab

This tab is used to edit project description, set legacy settings for viewing project layout ECW v1.0 (Silverlight), add or edit any comments, and view or edit project version

### To update the Project Description and Comments:

1. In the **Project Name** field, enter a name for the project.
2. In the **Project Comments** field, enter additional notes about the project.
3. Click **Close**. The Project Properties dialog box closes.

### Legacy settings for Extron Control for Web

The layout (UI) of a TLP Pro device, Extron Control for Android, iOS or Web can be viewed in Extron Control for Web v2.0 or Extron Control for Web v1.0 (with Silverlight™), launched from within GS or Toolbelt (see *Toolbelt Help File* for method).

- In the Legacy Settings panel, leave the box unchecked to launch Extron Control for Web v2.0 to view the TLP Pro device, Extron Control for Android, iOS or Web layout, in HTML 5 format
- If the user prefers to use Extron Control for Web v1.0 with Silverlight, select the Force Extron Control for Web with Silverlight check box. Then when launching ECW from within GS or Toolbelt, it will open in an IE browser, using Silverlight

### To update the Project Version:

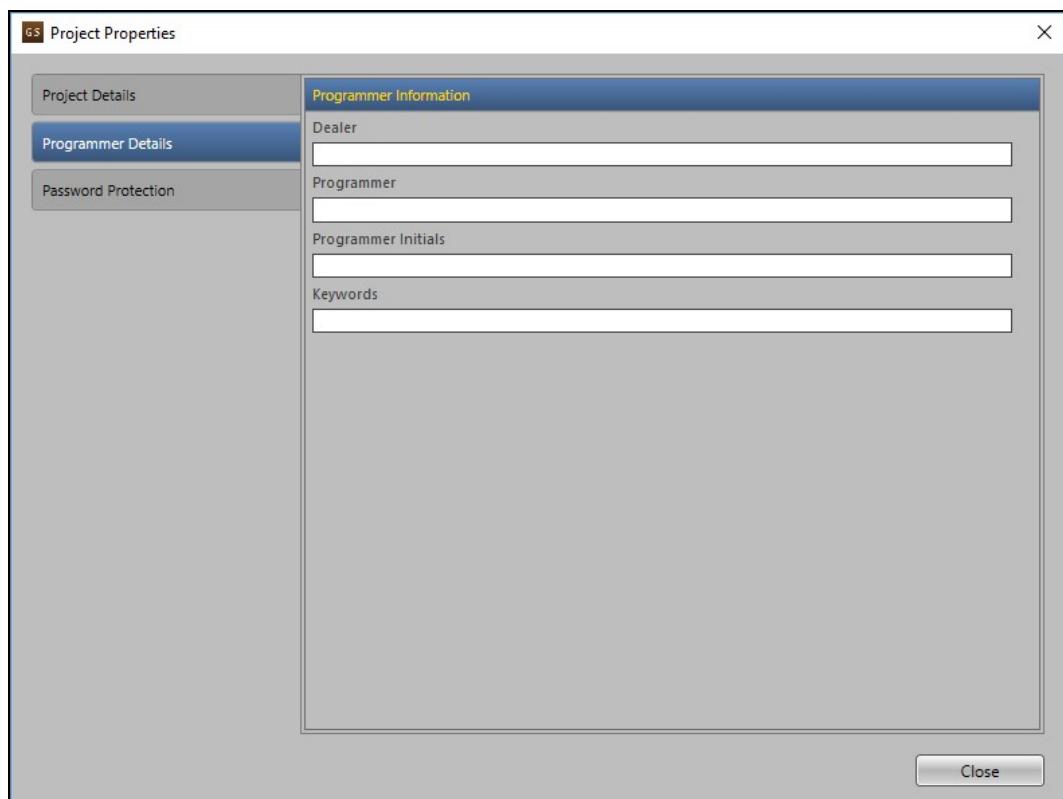
1. In the **Project Version** section (located below the Project Description panel), update the **Major** and **Minor** fields to add a version number to the project.
  - A build number is generated at each save when the **Auto-Increment build version on build** radio button is selected.
  - To manually enter a Build number, click **Disable Auto-Increment** of version on build and enter the desired build number in the **Build** field.
2. Click **Close**. The Project Properties dialog box closes.

The Project Version section also provides details regarding:

- **Project Creation Date** — the **Created** field shows the date and time that the project was initially created. It also shows the GS version that was used to create the project. These fields cannot be edited.
- **Project Modification Date** — the **Modified** field shows the date and time that the project was last modified. It also shows the GS version that was used to modify the project. These fields cannot be edited.
- **GS Version** — the **GS Version** field shows the version of Global Scripter that is currently being used in the project. This field cannot be edited.

## Programmer Details tab

This tab is used manage additional project information regarding the programmer and the Extron Dealer associated with the project. Also, keywords can be associated with the project that may help the user reference the project later.



To update the **Programmer Details**:

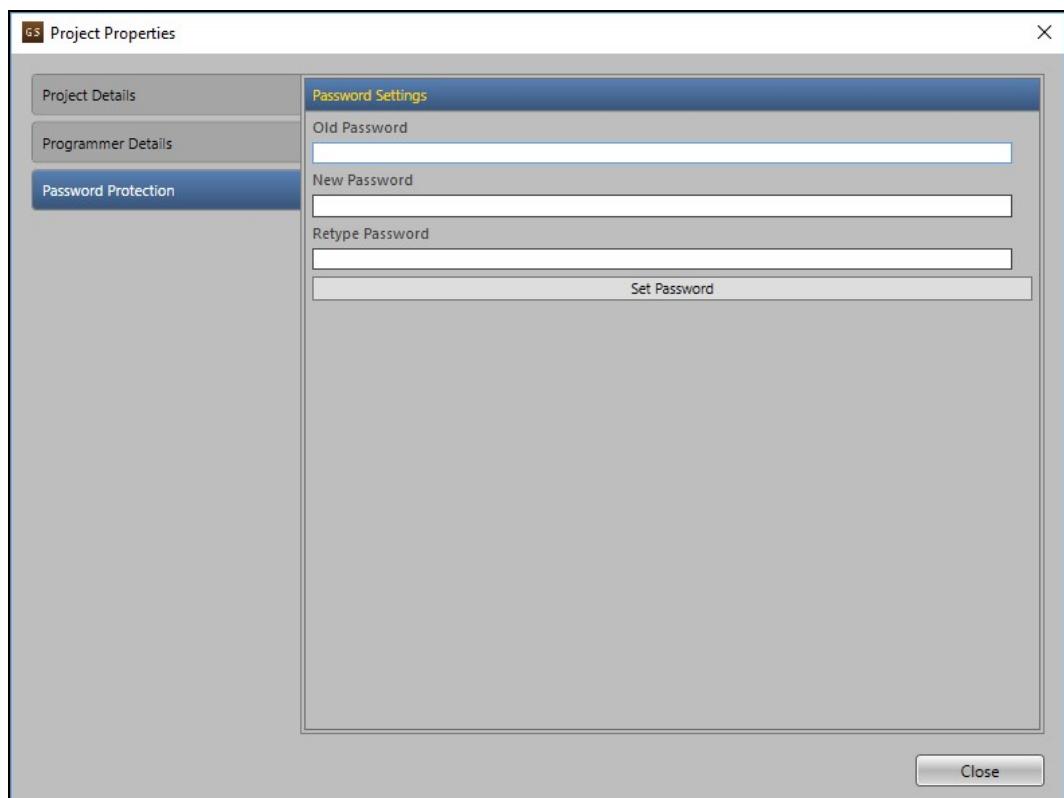
1. From the **Project** menu, select **Project Properties**. When the Project Properties dialog box opens, select the **Programmer Details** tab.
2. In the **Dealer** field, enter an Extron Dealer name associated with the project.
3. In the **Programmer** field, enter the name of the Programmer who programmed the project.
4. In the **Programmer Initials** field, enter the initials of the Programmer.
5. In the **Keywords** field, enter any keywords that you would like to associate with the project.
6. Click **Close**. The Project Properties dialog box closes.

## Password Protection tab

This tab is used to add or remove password protection to the project file.

The following points are key:

- if the **New Password** field is blank, the Project File is not password protected
- if a password is entered, unless the password protection is later removed, that password is required to edit the project



To update the Password Protection:

1. In the **Old Password** field, enter the current Password for the project file. If the project file is not currently password protected, leave this field blank.
2. In the **New Password** field, enter the new Password to assign to the project file. If you wish to turn off password protection, leave this field blank.
3. In the **Retype Password**, reenter the new Password as you typed it in the **New Password** field. Again, if you wish to turn off password protection, leave this field blank.
4. Click **Set Password**. If the **New Password** and **Retype Password** fields match, the password is now changed.

## Generate Project Report

The items in the **Generate Project Report** submenu create project report files based upon the information provided in the System Manager. The Project Reports contain the project name, dealer, programmer, project version, date and time last modified, and the project comments. The Project Report then lists the Extron hardware in the project including the name, model, IP address/hostname, eBUS IDs, system PIN, Extron control URLs and comments, as applicable to each device.

- **HTML File** — this option generates the Project Report file as an HTML file, and prompts the user to save the file. The HTML file can be viewed in any browser, and printed or saved as PDF file.
- **Comma Delimited (CSV) File** — this option saves the file as a comma delimited text format. The CSV file can be opened in any text editor or spreadsheet application.

To generate a report:

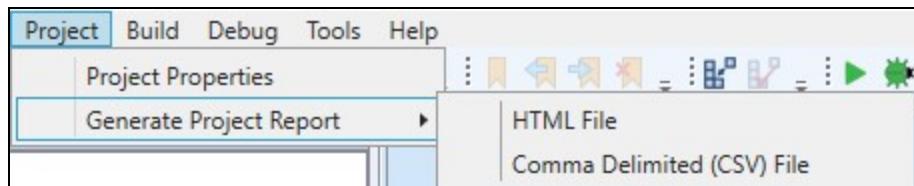
1. Click on the report type required.
2. Select a desired file storage location and enter an appropriate name in the **File Name** field.
3. Click **Save**. The report is generated and saved at the chosen location

## Project Menu

### Project Menu Overview

The Global Scripter **Project** menu gives access to the Project Properties settings window, and allows users to generate project reports.

Click on **Project** and select the menu operation as desired.

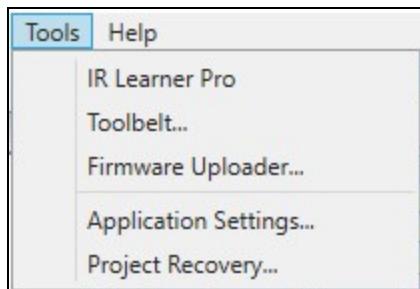


- **Project Properties**
- **Generate Project Report**

## Tools Menu

### Tools Menu Overview

Click on the **Tools** menu to view and access the Tools options, such as opening Toolbelt, or working with Application settings.



- [IR Learner Pro](#)
- [Toolbelt...](#)
- [Firmware Uploader..](#)
- [Application Settings...](#)
- [Project Recovery...](#)

## IR Learner Pro

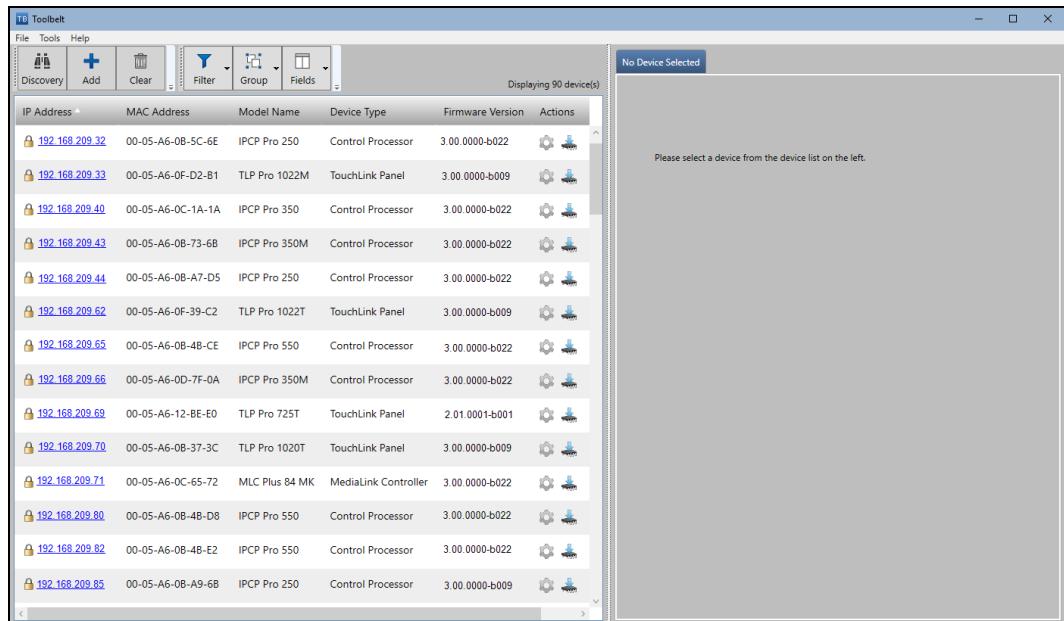
Click this icon to launch IR Learner Pro (see the *IR Learner Pro Help file* for application details).

**NOTE:** This option is only active when connected to a device that supports IR.

## Toolbelt



Click on the **Toolbelt...** icon to open a separate Toolbelt application. Toolbelt allows users to manage and view the settings for a selected device.



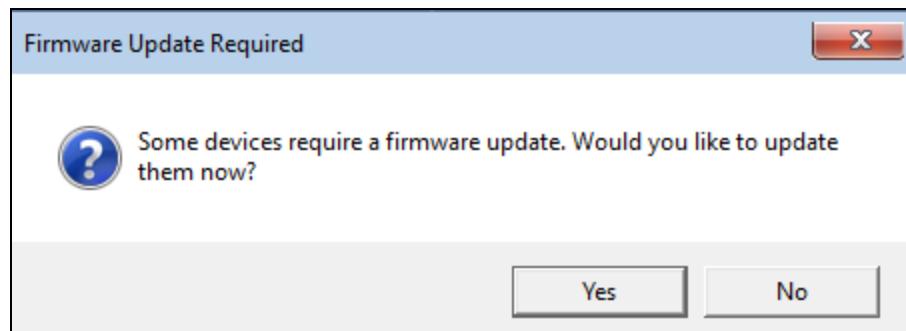
See the [Extron Toolbelt Utility](#) section for basic information. See the *Toolbelt Help* file for full details.

## Firmware Uploader

Click this icon to launch Firmware Uploader (see the [Firmware Uploader](#) section of the [Extron Toolbelt Utility](#) topic for details).

### Overview

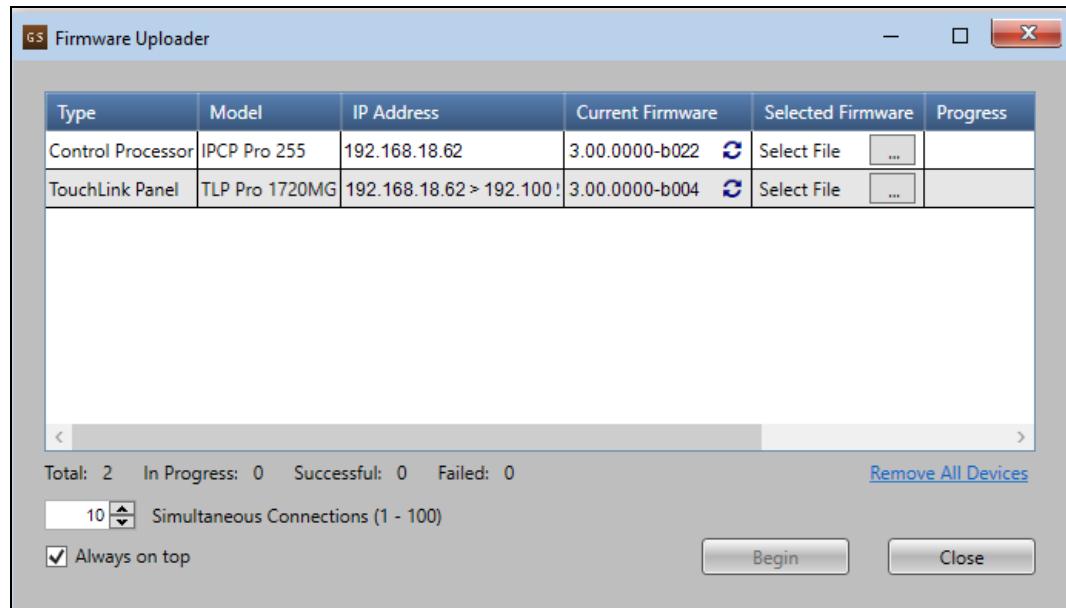
During device verification, for example in Build Manager, GS auto-checks the current device firmware, and if a device requires a firmware update, this option allows the user to update the device to the latest firmware, essential to use the full suite of GS features. If a firmware update is needed, the **Firmware Update Required** dialog window is launched.



**To upload firmware to the selected device:**

- From the open **Firmware Update Required** dialog box, click **Yes**. The **Firmware Uploader** window opens.

**NOTE:** Select **No** to close the **Firmware Update Required** dialog box and not update device firmware.



- Click on the browse button in the **Selected Firmware** column (for column details see the **Firmware Uploader details** section). This button opens an Windows Explorer window.
- Navigate to and select the applicable firmware file and click **Open**. The **Firmware Uploader** window populates with the selected firmware.
- Click **Begin**. **Firmware Uploader** begins to upload the selected firmware to the selected device.
- When the update process is complete, "remove" the successful devices from the queue. Note any unsuccessful process error messages, such as "device unreachable" in the case of a disconnected device. In this case, reconnect the device, enter the correct credentials, and reattempt the upload.
- When the update process is complete, "remove" the successful devices from the queue. Note any unsuccessful process error messages, such as "device unreachable" in the case of a disconnected device. In this case, reconnect the device, enter the correct credentials, and reattempt the upload.

## Application Settings

The **Application Settings...** option allows the user to select certain preferences for Global Scripter within the Editor, such as syntax highlighting, showing formatting symbols, and default project paths.

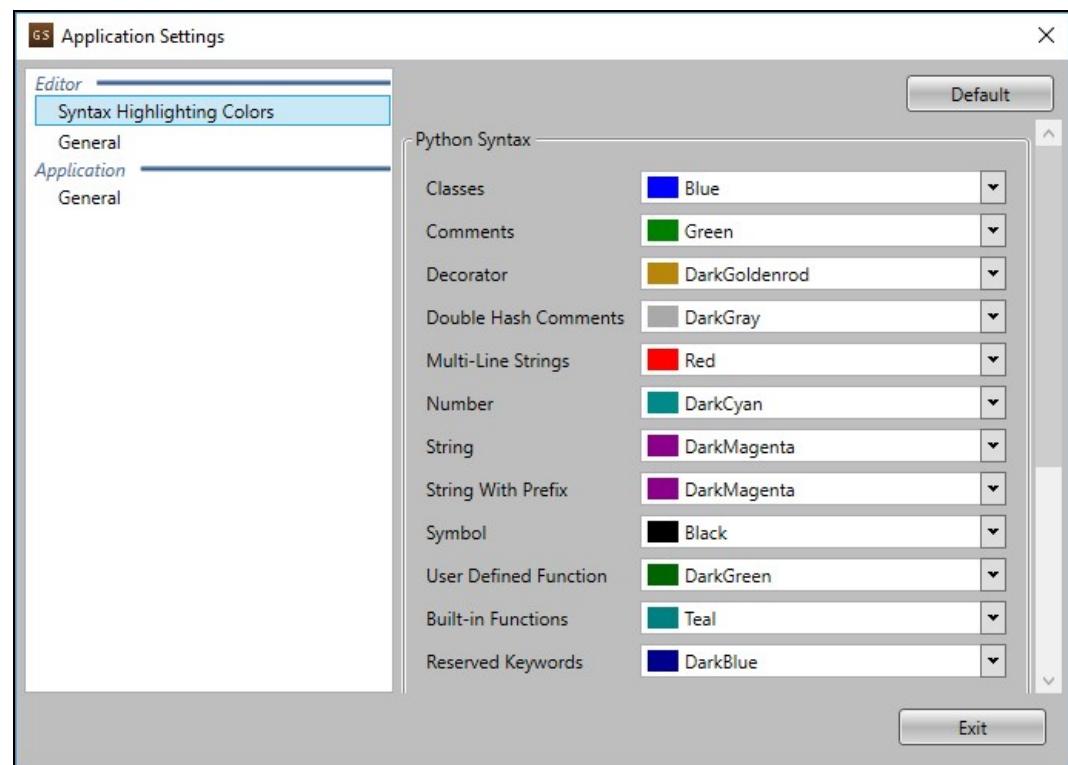
[Click to open the Application Settings dialog box.](#)

This has the following options:

### Editor menu

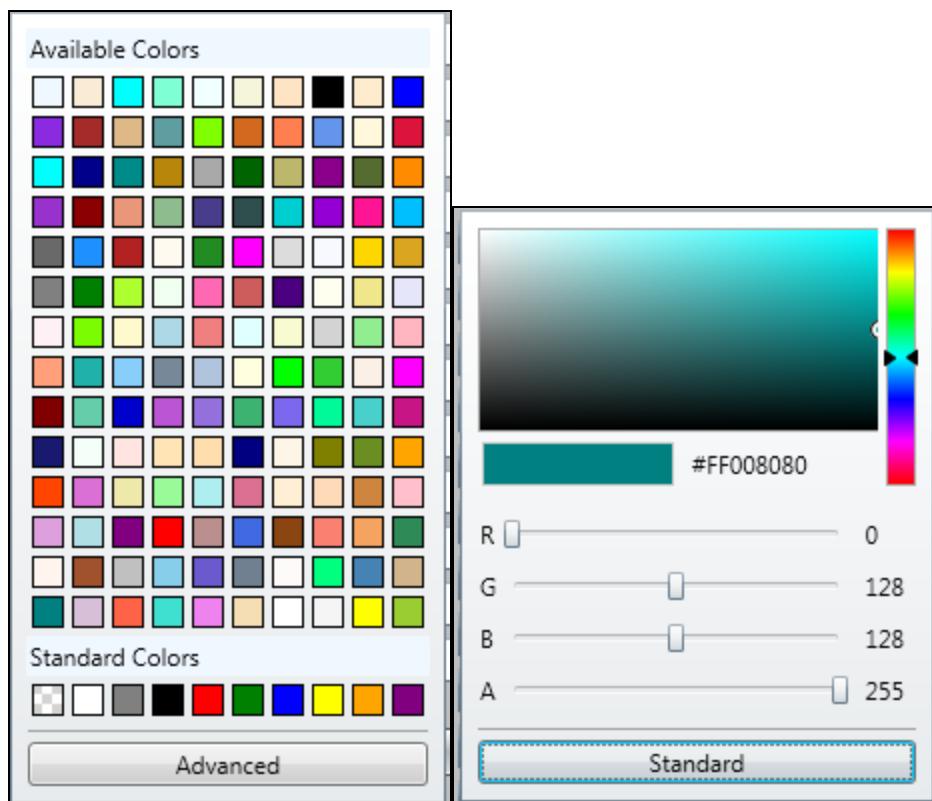
- [Syntax Highlighting Colors](#)

The **Settings Syntax Highlighting Colors** settings allow configuration of individual colors for Python syntax.



**To configure individual colors:**

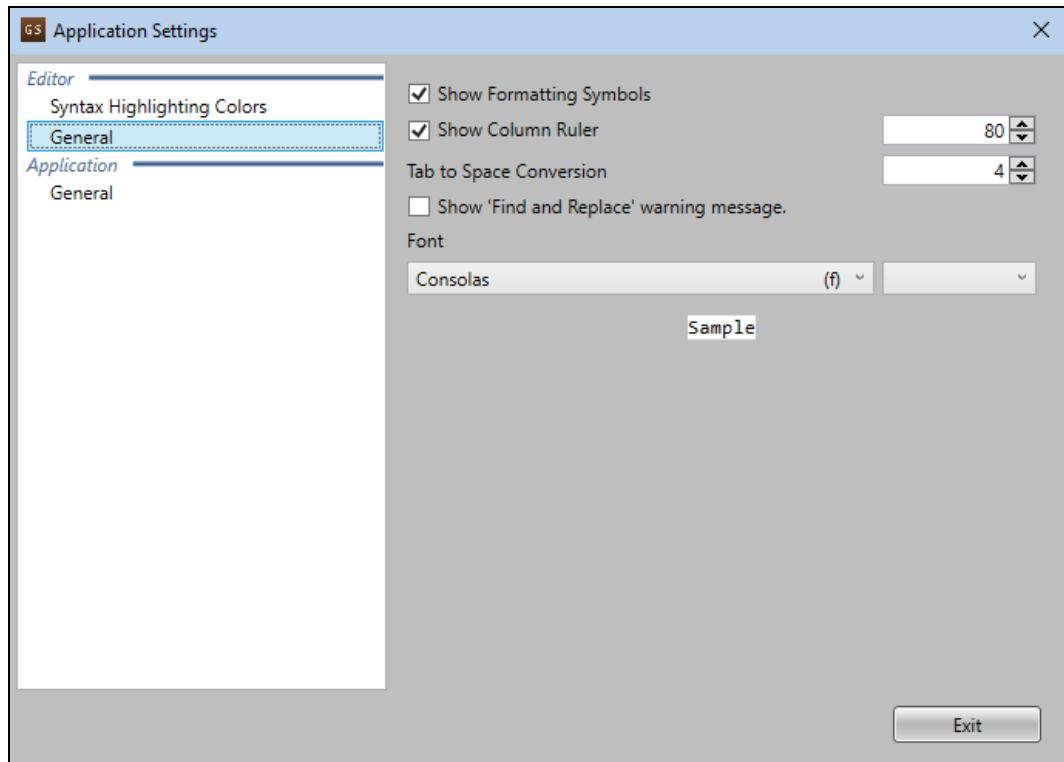
Select one of the combo boxes to display a palette of available colors or select **Advanced** and enter the RGB values of a custom color.



Select the **Default** button to return all of the Syntax Highlighting Colors to their default values.

- **General**

The **General** editor settings allow the user to set default values for the Cod Editor.



**To configure individual colors:**

Select a check box to show an applicable item and set values in the relevant fields.

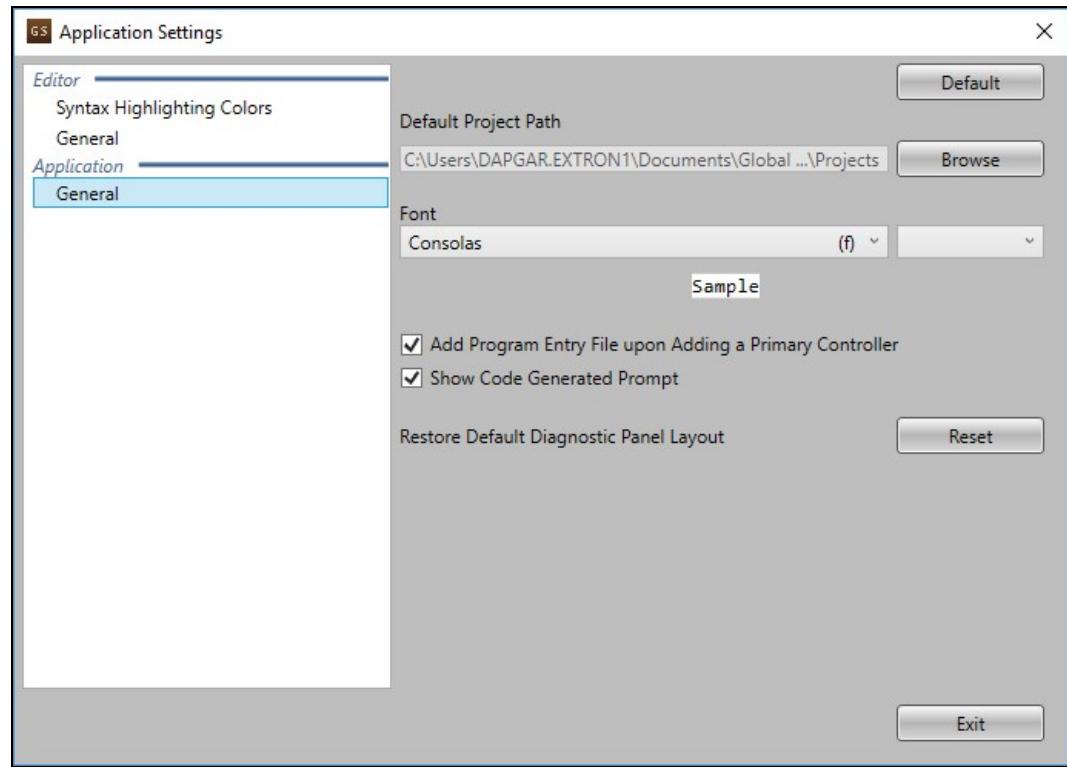
If applicable, select a font for the "Find and Replace" warning message.

**To hide items,** clear the check boxes.

## Application

- **General (Application)**

Use the **General** application settings to set default values for the project.



**To set values:**

Select the project path, select a desired font, and select check boxes as applicable.

## Project Recovery

In the event that the user has forgotten the Username or Password for a controller, this option accesses the primary controller to recover the current project.

**NOTE:** See recovery details for controllers with firmware builds of **1.4 or less**, or controllers with **1.5 or greater**.

**To recover a project:**

1. Click **Tools**, then **Project Recovery**. . . . A Recovery Mode window opens.



2. In the **IP Address/Hostname** field, enter the IP address or Hostname of the desired controller.

**NOTES:**

- Host names must be qualified (for example, *someone.somehost.com*).
- At any time during the recovery operation, click **Cancel** to abort the recovery process without connecting to the controller.

3. Click **Recover**. Global Scripter begins the connection process.



4. While in the "Connecting" mode, place the controller into a "Project Recovery" state (see the Controller User Guide available at [www.extron.com](http://www.extron.com), for method). When reset, the recovery process continues.
5. The controller must then be reset using the "Reset to Factory Defaults" method (see the controller user guide for details). A new user name and password must be set before the project can be uploaded.
6. Once the application has connected successfully, the project downloads and opens.

## Recovery details for primary controllers with firmware v1.4 or less

1. Click **Tools**, then **Project Recovery....**
2. Turn off the controller.
3. While re applying power to the primary controller, hold down the reset button until the power LED blinks twice, then release the reset button.
  - o The primary controller will enter Recovery mode for 20 seconds.  
GS automatically connects to the controller and attempts to retrieve the project.

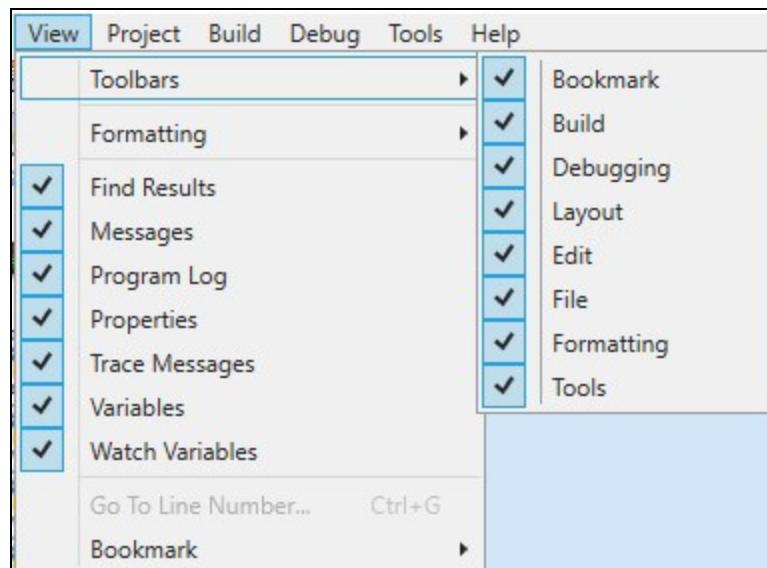
## Recovery details for primary controllers with firmware v1.5 or greater

1. Click **Tools**, then **Project Recovery....**
2. Press the reset button on the primary controller 3 times within 1 second.
  - o Once the power LED blinks rapidly, the primary controller has entered Recovery mode for 30 seconds.  
GS automatically connects to the controller and attempts to retrieve the project.

## View Menu

### View Menu Overview

The Global Scripter **View** menu enables a user to customize some of their GS application by toggling (on or off) multiple items within the sub-menus.



Click on **View** to open a series of drop down options:

- **Toolbars** — toggles the items on the quick navigation bar
- **Formatting** — toggles Formatting features such as Show Line Numbers, or Show UI Object IDs
- **Find Results**
- **Messages**
- **Program Log**
- **Properties**
- **Trace Messages**
- **Variables**
- **Watch Variables**
- **Go To Line Number...**
- **Bookmark** — toggles Bookmark features such as Previous, Next, and Clear Bookmarks.

**NOTE:** For Deploy mode View menu, see the [Deploy Mode Content](#) topic.

## Toolbars Submenu

The icons and items in the **Toolbars** submenu can be toggled on or off for access via the Quick Navigation toolbar.



**NOTE:** For the Deploy mode Toolbar and available icons, see the [Deploy Mode content](#) topic.

- **Bookmark icons**



- **Toggle Bookmark** — toggles (makes visible or hides) a bookmark location within a Code File in the Code Editor.
- **Previous Bookmark** — moves the cursor in the Code Editor to the previous bookmark location
- **Next Bookmark** — moves the cursor in the Code Editor to the next bookmark location
- **Clear Bookmark** — removes all bookmarks in the Code File currently being edited.

**NOTE:** See the [Bookmark](#) section below for full details.

- **Build icons**



- **Build Project** — prepares, verifies, and uploads projects and settings to the Primary Controller and any connected hardware
- **Build Code Only** — uploads only the Python files associated with the project

**NOTE:** See the [Build Menu](#) topic for full details.

- **Debug**



- **Start Program** — starts program on the Primary Controller in the project
- **Start Debugging** — starts the program on the Primary Controller in Debug Mode
- **Continue Debugging** — resumes the Debug program from the break-point.
- **Stop Program** — stops the program that is currently running on the Primary Controller

**NOTE:** See the [Debug Menu](#) topic for full details.

- **Edit**



- **Cut** — cuts (removes) and places text selected in the Code Editor onto a common clipboard for pasting
- **Copy** — copies and places text selected in the Code Editor onto a common clipboard for pasting
- **Paste** — places text from a common clipboard into the active Code Window at the cursor location
- **Undo** — undoes the last operation performed within the active Code Editor Window
- **Redo** — reapplies the last operation (undone by Undo) performed within the active Code Editor Window
- **Comment** — adds a "#" character to the start of a selected line of text in the active Code Window
- **Uncomment** — removes the "#" character from the start of a selected line of text in the active Code Window
- **Increase Line Indent** — inserts a set number of spaces to the beginning of all selected lines of text
- **Decrease Line Indent** — removes a set number of spaces from the beginning of all selected lines of text

**NOTE:** See the [Edit Menu](#) topic for full details.

- **File**



- **New** — starts a new GS project
- **Open** — opens an existing GS project file
- **Save** — save the current GS project file

**NOTE:** See the [File Menu](#) topic for full details.

- **Formatting**



- **Show Non-Printable Characters** — shows or hides characters for spaces, tabs, and line feeds in the Code Editor Window

**NOTE:** See the [Formatting](#) section below for full details.

- **Layout**



- **Developer Mode** — changes from Deploy mode to Developer mode
- **Deploy Mode** — changes from Developer mode to Deploy mode

**NOTE:** Changing to Deploy mode can be useful to help support unlicensed users without changing their account settings

- **Tools**



- **Toolbelt** — launches Toolbelt
- **IR Learner Pro** — launches IR Learner Pro

**NOTES:**

- See the [Toolbelt](#) section for full details.
- See the *IR Learner Pro Help File* within the IR Learner Pro application for full details

- **Help**

- **what's New** — launches the What's New window

**NOTE:** See the [What's New](#) section for details.

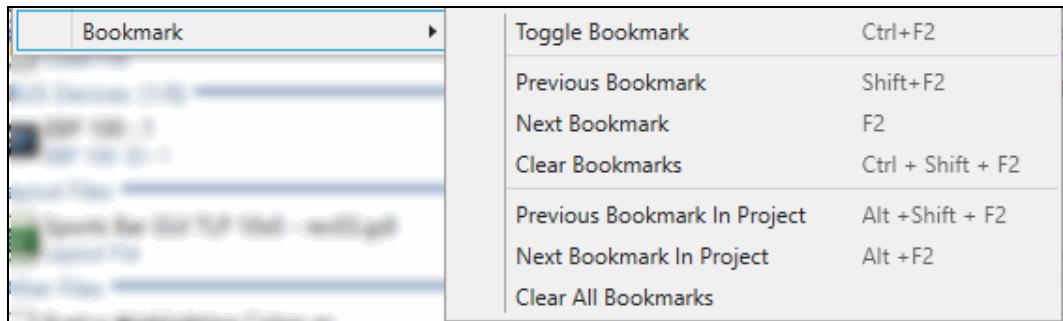
## Formatting Submenu

The items in the **Formatting** sub-menu toggle the corresponding items in the Code Editor Window.

- **Show Line Numbers** — shows or hides the line numbers in the left margin of the Code Editor
- **Show Non-Printable Character** — shows or hides the placeholder character for spaces, tabs and line feeds in the Code Editor
- **Show UI Object IDs** — shows or hides the Object IDs in the View Layout Panels
- **Show UI Object Outlines** — shows or hides the Object's Outlines in the View Layout Panel

## Bookmark submenu

When a project code file (a .py file) is open the bookmarks sub-menu is available. The submenu allow a user to create, clear, and move between bookmark locations within the code file.

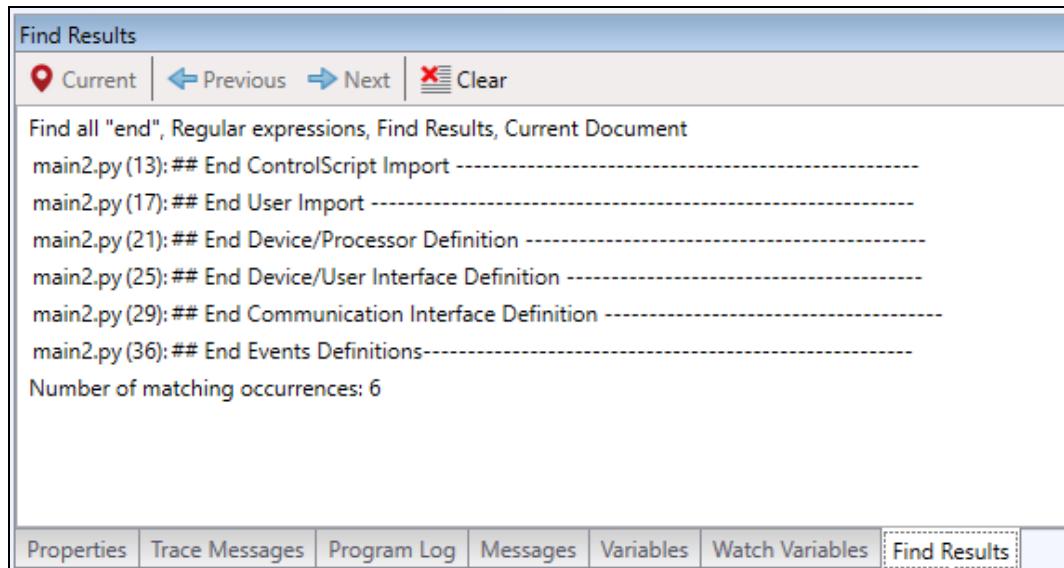


- **Toggle Bookmark** — <Ctrl+F2>, toggles a bookmarks visibility and location in a Code File in the Code Editor. Bookmarks can also be toggled by clicking in the margin to the left of the line numbers in the Code Editor
- **Previous Bookmark** — <Shift+F2>, moves the cursor to the first column of the previous bookmark location above or before the current cursor location. **Previous Bookmark** will loop within the Code File currently being edited.
- **Next Bookmark** — <F2>, moves the cursor to the first column of the next bookmark location below or after the current cursor location. **Next Bookmark** will loop within the Code File currently being edited.
- **Clear Bookmarks** — <Ctrl+Shift+F2>, removes all bookmarks in the Code File currently being edited
- **Previous Bookmark in Project** — <Alt+Shift+F2>, moves the cursor to the first column of the previous bookmark location above or before the current cursor location. If **Previous Bookmark** reaches the top of the current code file, it opens the previous code file that contains a bookmark, within the System Manager. **Previous Bookmark in Project** loops between all code files in the project if the top of the first Code file in the project is reached.
- **Next Bookmark in Project** — <Alt+F2>, moves the cursor to the first column of the next bookmark location below or after the current cursor location. If **Next Bookmark in Project** reaches the bottom of the current code file, it opens the next code file in the System Manager that contains a bookmark. **Next Bookmark in Project** loops between all code files in the project if the bottom of the last Code file in the project is reached.
- **Clear All Bookmarks** — removes all bookmarks in all of the Code Files in the Project.

## Find Results

Click this to enable or disable the **Find Results** diagnostic panel, located at the bottom of the main window.

This panel show the results of a **Find in Files** or **Replace in Files** request (see Edit topic, [Find in Files](#), for details)



## Messages

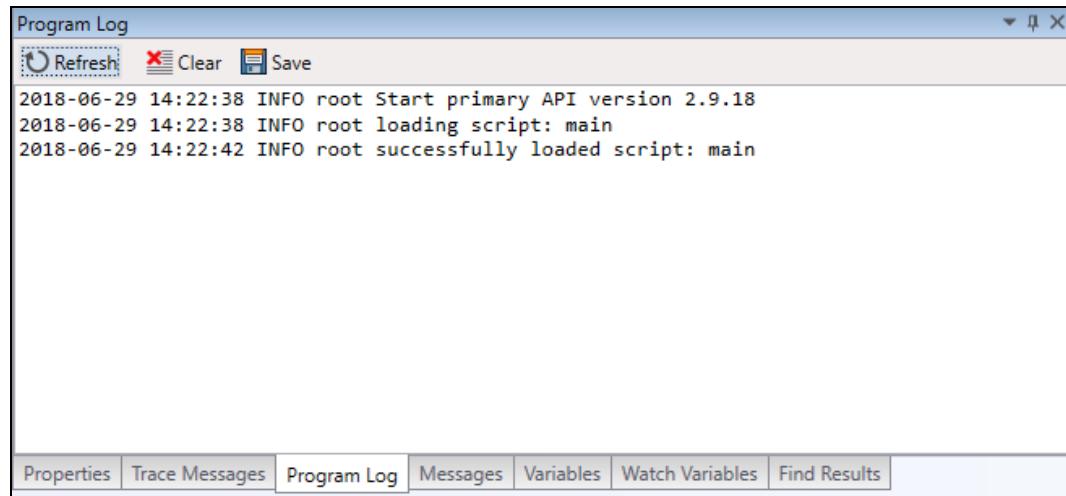
Click this to enable or disable the **Messages** diagnostic panel, located at the bottom of the main window. This panel shows warnings, errors and messages generated during a build and upload or a debugging session.

Messages		
	Errors (0)	Warnings (0)
	Messages (18)	Clear Save
1	14:17:08:7314	Debugging
1	14:16:59:2023	Starting Program in Debugging Mode
1	14:16:54:4419	"GS Project"
1	14:16:54:4374	"My System" at "10.113.118.65"
1	14:16:51:1979	"My System" at "10.113.118.65" > UserInterfaces > "TLP Pro 1022M : 10.113.118.76"
1	14:16:48:27	"My System" at "10.113.118.65"
1	14:16:17:5668	Device upload complete
1	14:16:17:5668	Scripts have been stopped
1	14:16:14:4712	"GS Project"
1	14:16:12:7917	Starting Upload
		System build complete

**NOTE:** Warning messages have a [How to Resolve](#) the issue link, and action should be taken to complete a fully functional deployment.

## Program Log

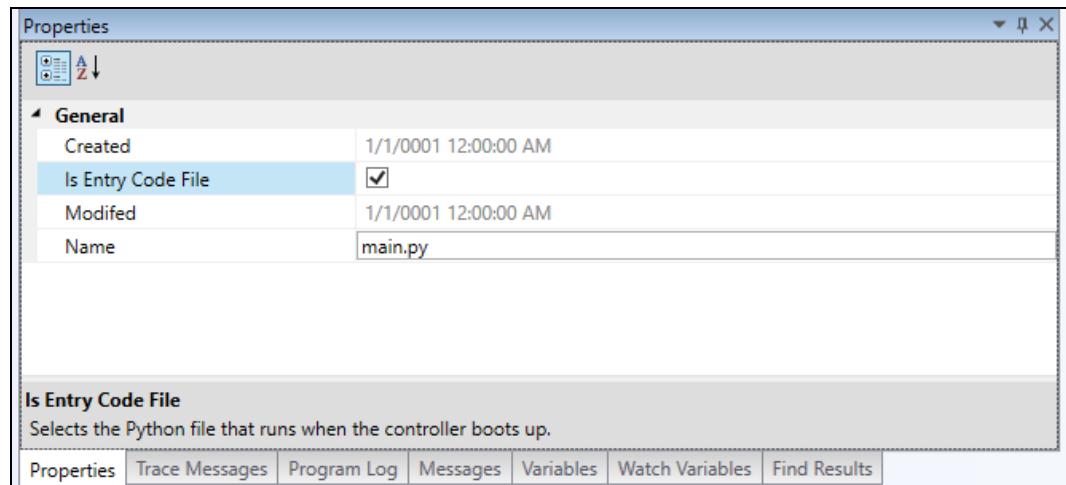
Click this to enable or disable the **Program Log** diagnostic panel, located at the bottom of the main window.



## Properties

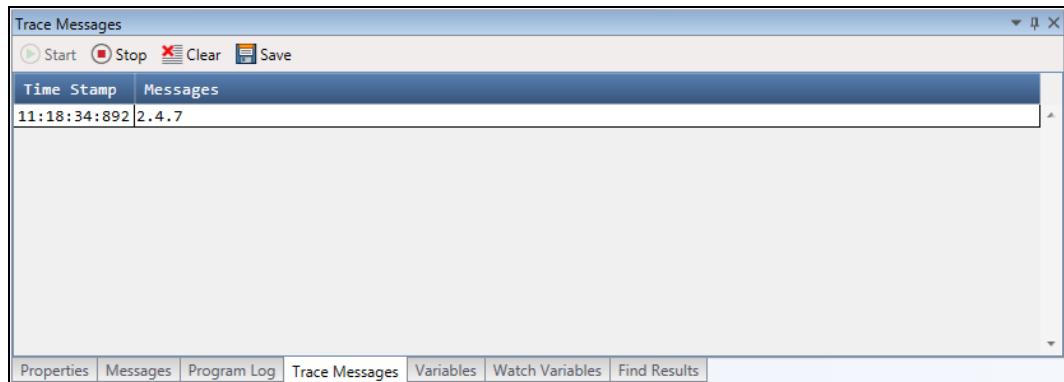
Click this to enable or disable the Properties diagnostic panel, located at the bottom of the main window. This panel displays the properties of a file or device selected in the System Manager panel. It also allows the user to change data within some of the property fields, such as the Entry Code (Python) file the primary controller uses at project start up.

For example, to change the Entry Code (Python) file the primary controller uses at start up, enter the file name and select the **Is Entry Code** file check box.



## Trace Messages

Click this to enable or disable the Trace Messages diagnostic panel, located at the bottom of the main window.



## Variables

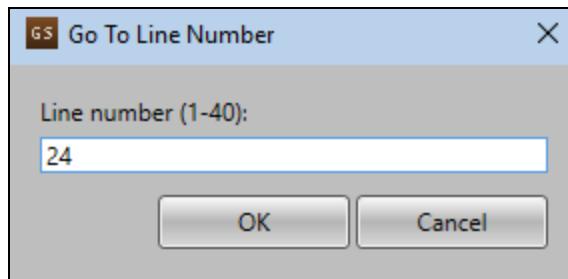
Click this to enable or disable the Variables diagnostic panel, located at the bottom of the main window.

## Watch Variables

Click this to enable or disable the watch variables diagnostic panel, located at the bottom of the main window.

## Go To Line Number ... ([Ctrl]+G)

Click the menu item (or press <Ctrl+G>) to open the Go To Line Number dialog box.



To go to a specific line in a project that is open in the Code Editor, enter a number in the field (within the range shown above it), and click OK or press <Enter>.

**NOTE:** If a line number is entered greater than the end of file, Go To Line Number will go to the end of the file.

Click Cancel at any time to close the dialog and leaves the cursor at its current position.

## Toolbars Submenu

The icons and items in the Toolbars submenu can be toggled on or off for access via the Quick Navigation toolbar.



- **Bookmark icons**



- **Toggle Bookmark** — toggles (makes visible or hides) a bookmark location within a Code File in the Code Editor.
- **Previous Bookmark** — moves the cursor in the Code Editor to the previous bookmark location
- **Next Bookmark** — moves the cursor in the Code Editor to the next bookmark location
- **Clear Bookmark** — removes all bookmarks in the Code File currently being edited.

**NOTE:** See the [Bookmark](#) section for full details.

- **Build icons**



- **Build Project** — prepares, verifies, and uploads projects and settings to the Primary Controller and any connected hardware
- **Build Code Only** — uploads only the Python files associated with the project

**NOTE:** See the [Build Menu](#) topic for full details.

- **Debug**



- **Start Program** — starts program on the Primary Controller in the project
- **Start Debugging** — starts the program on the Primary Controller in Debug Mode
- **Continue Debugging** — resumes the Debug program from the break-point.
- **Stop Program** — stops the program that is currently running on the Primary Controller

**NOTE:** See the [Debug Menu](#) topic for full details.

- **Edit**



- **Cut** — cuts (removes) and places text selected in the Code Editor onto a common clipboard for pasting
- **Copy** — copies and places text selected in the Code Editor onto a common clipboard for pasting
- **Paste** — places text from a common clipboard into the active Code Window at the cursor location
- **Undo** — undoes the last operation performed within the active Code Editor Window
- **Redo** — reapplies the last operation (undone by Undo) performed within the active Code Editor Window
- **Comment** — adds a "#" character to the start of a selected line of text in the active Code Window
- **Uncomment** — removes the "#" character from the start of a selected line of text in the active Code Window
- **Increase Line Indent** — inserts a set number of spaces to the beginning of all selected lines of text
- **Decrease Line Indent** — removes a set number of spaces from the beginning of all selected lines of text

**NOTE:** See the [Edit Menu](#) topic for full details.

- **File**



- **New** — starts a new GS project
- **Open** — opens an existing GS project file
- **Save** — save the current GS project file

**NOTE:** See the [File Menu](#) topic for full details.

- **Formatting**



- **Show Non-Printable Characters** — shows or hides characters for spaces, tabs, and line feeds in the Code Editor Window

**NOTE:** See the [Formatting](#) section below for full details.

- **Layout**



- **Developer Mode** — changes from Deploy mode to Developer mode
- **Deploy Mode** — changes from Developer mode to Deploy mode

**NOTE:** Changing to Deploy mode can be useful to help support unlicensed users without changing their account settings

- Tools



- **Toolbelt**—launches Toolbelt
- **IR Learner Pro**—launches IR Learner Pro

**NOTES:**

- See the [Toolbelt](#) section for full details.
- See the *IR Learner Pro Help File* within the IR Learner Pro application for full details

- **What's New**—launches the What's New window

**NOTE:** See the [What's New](#) section for details.

## Formatting

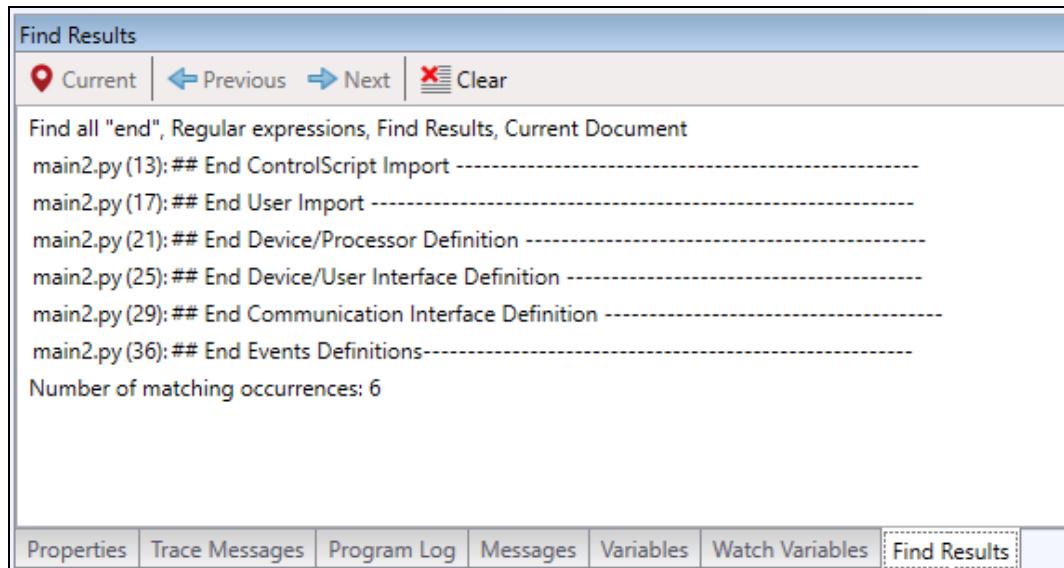
The items in the **Formatting** sub-menu toggle the corresponding items in the Code Editor Window.

- **Show Line Numbers**—shows or hides the line numbers in the left margin of the Code Editor
- **Show Non-Printable Character**—shows or hides the placeholder character for spaces, tabs and line feeds in the Code Editor
- **Show UI Object IDs**—shows or hides the Object IDs in the View Layout Panels
- **Show UI Object Outlines**—shows or hides the Object's Outlines in the View Layout Panel

## Find Results

Click this to enable or disable the Find Results diagnostic panel, located at the bottom of the main window.

This panel show the results of a Find in Files or Replace in Files request (see [Edit](#) topic, [Find in Files](#), for details)



## Messages

Click this to enable or disable the Messages diagnostic panel, located at the bottom of the main window. This panel shows warnings, errors and messages generated during a build and upload or a debugging session.

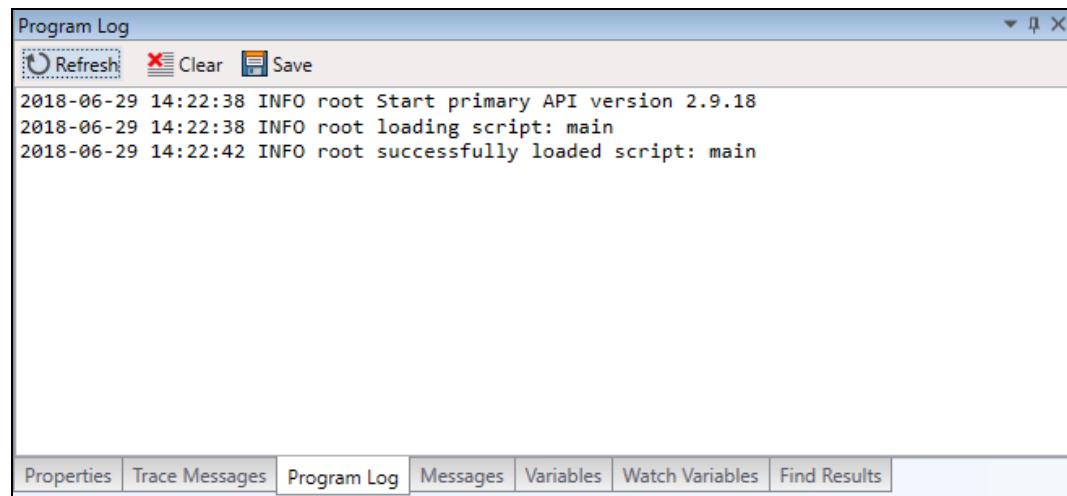
Messages		
	Time Stamp	Subject
(i)	14:17:08:7314	Debugging
(i)	14:16:59:2023	Starting Program in Debugging Mode
(i)	14:16:54:4419	"GS Project"
(i)	14:16:54:4374	"My System" at "10.113.118.65"
(i)	14:16:51:1979	"My System" at "10.113.118.65" > UserInterfaces > "TLP Pro 1022M : 10.113.118.76"
(i)	14:16:48:27	"My System" at "10.113.118.65"
(i)	14:16:17:5668	Scripts have been stopped
(i)	14:16:14:4712	"GS Project"
(i)	14:16:12:7917	Starting Upload
(i)	14:16:12:7917	System build complete

Below the table, there are tabs for Properties, Trace Messages, Program Log, Messages, Variables, Watch Variables, and Find Results.

**NOTE:** Warning messages have a How to Resolve the issue link, and action should be taken to complete a fully functional deployment.

## Program Log

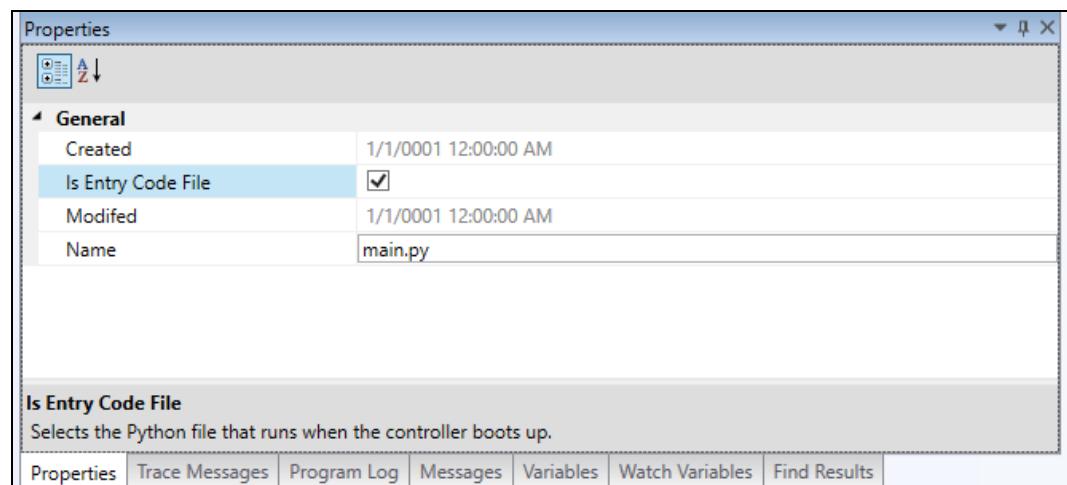
Click this to enable or disable the Program Log diagnostic panel, located at the bottom of the main window.



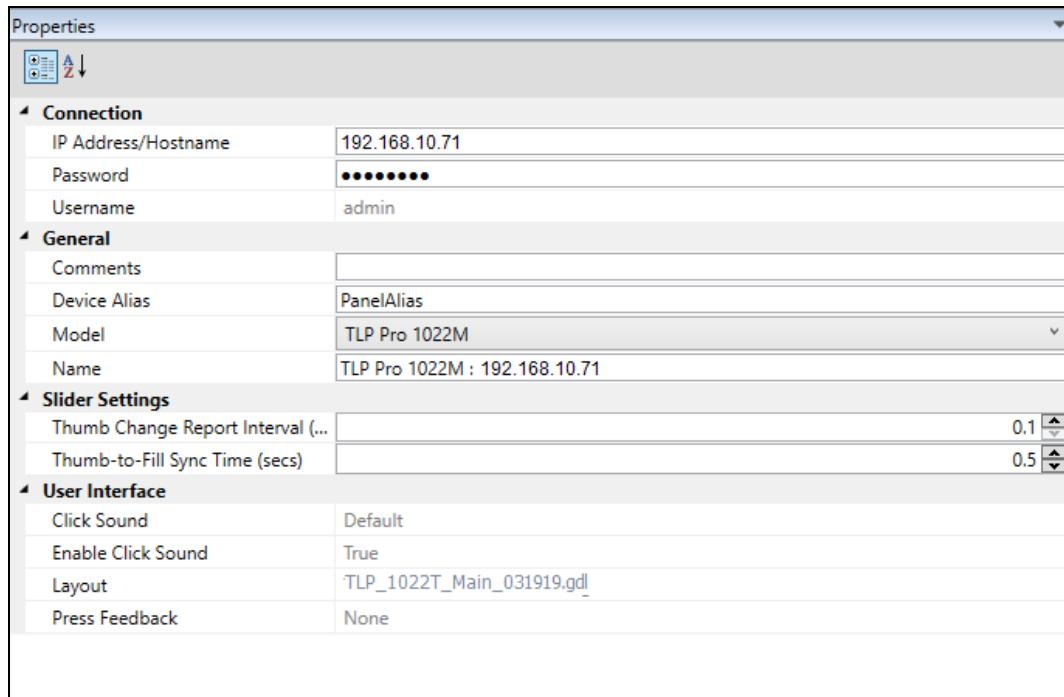
## Properties

Click this to enable or disable the Properties diagnostic panel, located at the bottom of the main window. This panel displays the properties of a file or device selected in the System Manager panel. It also allows the user to change data within some of the property fields, such as the Entry Code (Python) file the primary controller uses at project start up.

For example, to change the Entry Code (Python) file the primary controller uses at start up, enter the file name and select the **Is Entry Code** file check box.



In addition, when properties are shown for a selected TLP Pro device (see image below), the user can set two UI slider values (Thumb Change Report Interval and Thumb-to-Fill Sync Time).

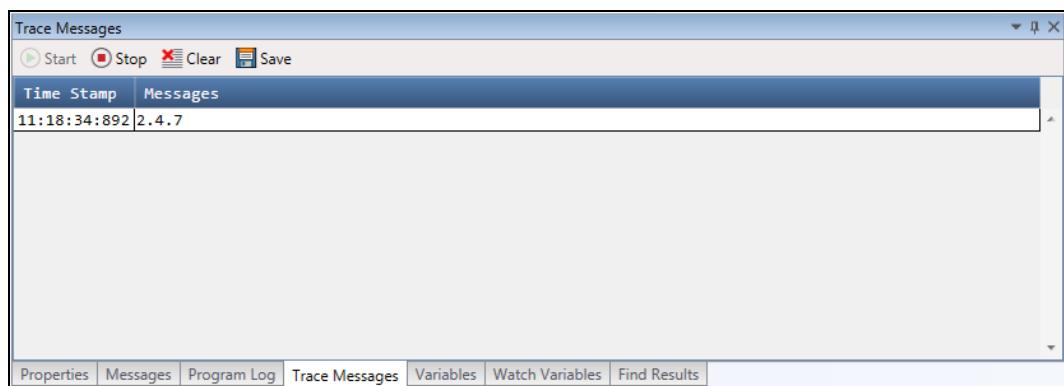


#### NOTES:

- **Thumb Change Report Interval (secs)** — The period (in seconds) between reports of new thumb position as the user moves the thumb along the track
- **Thumb-to-Fill Sync Time (secs)** — The period (in seconds) the slider waits before repositioning itself back to the feedback value

## Trace Messages

Click this to enable or disable the Trace Messages diagnostic panel, located at the bottom of the main window.



## Variables

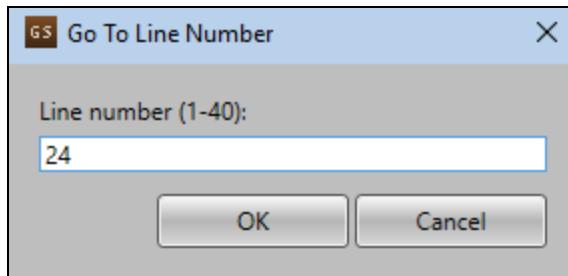
Click this to enable or disable the Variables diagnostic panel, located at the bottom of the main window.

## Watch Variables

Click this to enable or disable the Watch Variables diagnostic panel, located at the bottom of the main window.

## Go To Line Number

Click the menu item (or press <Ctrl+G>) to open the Go To Line Number dialog box.



To go to a specific line in a project that is open in the Code Editor, enter a number in the field (within the range shown above it), and click OK or press <Enter>.

**NOTE:** If a line number is entered greater than the end of file, Go To Line Number will go to the end of the file.

Click Cancel at any time to close the dialog and leaves the cursor at its current position

## Bookmark

When a project code file (a .py file) is open the bookmarks sub-menu is available. The submenu allow a user to create, clear, and move between bookmark locations within the code file.

The following options are available:

Bookmark	Toggle Bookmark	Ctrl+F2
	Previous Bookmark	Shift+F2
	Next Bookmark	F2
	Clear Bookmarks	Ctrl + Shift + F2
	Previous Bookmark In Project	Alt +Shift + F2
	Next Bookmark In Project	Alt +F2
	Clear All Bookmarks	

- **Toggle Bookmark** — `<Ctrl+F2>`, toggles a bookmarks visibility and location in a Code File in the Code Editor. Bookmarks can also be toggled by clicking in the margin to the left of the line numbers in the Code Editor
- **Previous Bookmark** — `<Shift+F2>`, moves the cursor to the first column of the previous bookmark location above or before the current cursor location. Previous Bookmark will loop within the Code File currently being edited.
- **Next Bookmark** — `<F2>`, moves the cursor to the first column of the next bookmark location below or after the current cursor location. Next Bookmark will loop within the Code File currently being edited.
- **Clear Bookmarks** — `<Ctrl+Shift+F2>`, removes all bookmarks in the Code File currently being edited
- **Previous Bookmark in Project** — `<Alt+Shift+F2>`, moves the cursor to the first column of the previous bookmark location above or before the current cursor location. If Previous Bookmark reaches the top of the current code file, it opens the previous code file that contains a bookmark, within the System Manager. Previous Bookmark in Project loops between all code files in the project if the top of the first Code file in the project is reached.
- **Next Bookmark in Project** — `<Alt+F2>`, moves the cursor to the first column of the next bookmark location below or after the current cursor location. If Next Bookmark in Project reaches the bottom of the current code file, it opens the next code file in the System Manager that contains a bookmark. Next Bookmark in Project loops between all code files in the project if the bottom of the last Code file in the project is reached.
- **Clear All Bookmarks** — removes all bookmarks in all of the Code Files in the Project.

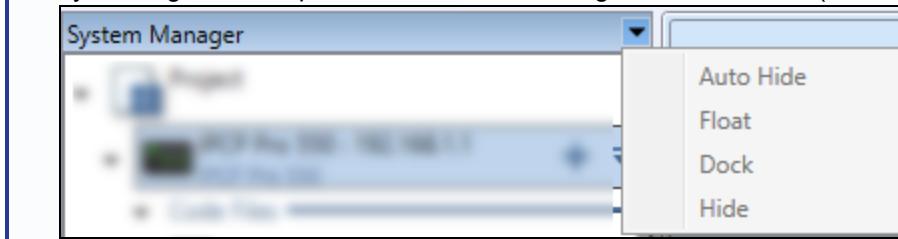
# Layouts and Panels

## System Manager

### System Manager Overview

The Global Scripter System Manager panel has 9 types of assets associated with the project; [Primary controllers](#), [Secondary controllers](#), [TouchLink Touchpanels](#), [eBUS Devices](#), [Network Button Panels](#), [Python code files](#), [Layout files](#), [Extron IR files](#), [Sound files](#), and [User files](#).

**NOTE:** The System Manager panel can be hidden or placed anywhere on your desk top by clicking on the drop down arrow and selecting the desired menu (default is docked).



### Types of Assets

The files associated with the project can be associated with the project on a system level or on the project level.

- Files added to the Project on the System Level are only available to the hardware associated with the same system
- Files added to the Project on the Project Level can be linked to any system in the project
- Any updates made to the files associated at the project file level are automatically passed up to the systems to which they are linked

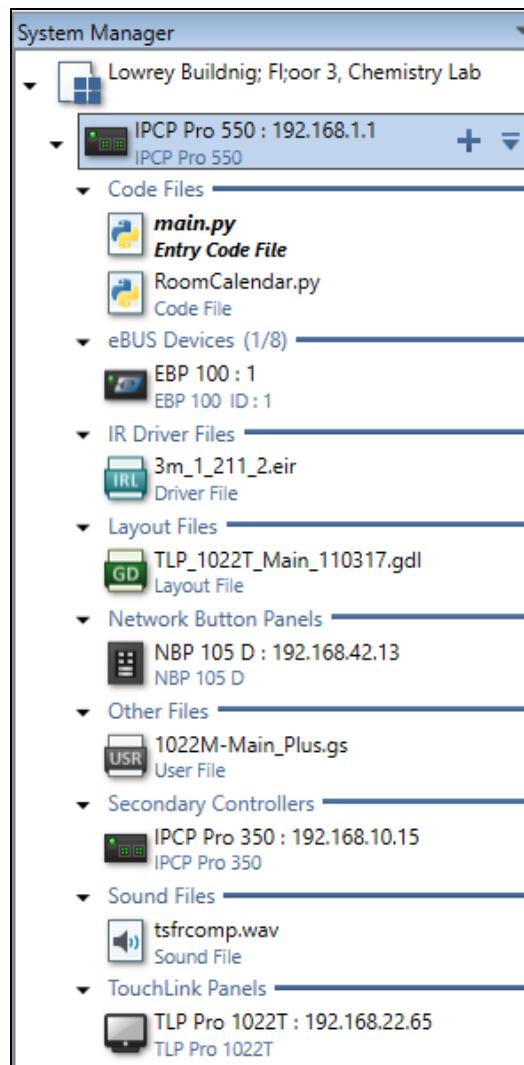


-  **Primary processors** — are Extron IP Link Pro controllers, and is the heart of the Extron Programmable Control System. The Primary Processor runs the python programs and hosts the Extron Virtual Touch Link sessions
-  **Secondary processors** — are Extron IP Link Pro secondary controllers. These are used for port expansion when the system requires more ports than are available on the Primary Processor. The Secondary Processors do not run any python programs
-  **TouchLink Touchpanels** — are Extron TouchLink Pro and Virtual TouchLink Devices. These require a GUI Designer Layout to be associated with the user interface, and are associated with the User Interface in either the Add TouchLink panel dialog or through the Properties Diagnostic panel
-  **eBUS devices** — are eBUS Button Panels and Control Modules that connect to an IPCP Pro Controller using the eBUS port of the controller. eBUS Devices are given a unique ID for the assigned controller that is physically set on the device using a series of DIP switches. IDs range from 1 to 63 and up to 8 eBUS devices can be connected to a single controller.
-  **NBP devices** — are Network Button Panels (NBP) that connect to an IPCP Pro Controller or an HC 400 series device. NBPs are fully-customizable AV system control interfaces, having soft-touch buttons that can be customized to perform a wide variety of AV system functions such as display On/Off, input switching, volume control, and so on.
-  **Python code files (.py files)** — are ASCII text files written in the Python 3 scripting language. Python Code Files can be added at either the Project Level or the System Level. Python Code Files can be added to a System using the **Add Script File** button in the System Manager, the **Project** toolbar button, or the **Primary Processor** context menu. Python Code files require the .py extension to run on the processor.
-  **Layout files (.gdl files)** — are files created and built with in the Extron GUI Designer application. GDL files can be added to a system through the Add User Interface dialog, or through the **Primary Processor** context menu by selecting **Add Existing File...** and selecting the GDL file.
-  **Extron IR files (.eir files)** — are Extron IR driver files created with the Extron IR Learner Application. EIR files that are added through the **Primary Processor** context menu by selecting **Add Item** and selecting the EIR file. Extron IR files display the attributes and the captured IR functions of the IR file in the Properties panel. The Name of the IR Functions can be copied to the computers clipboard by right-clicking on the desired function and selecting **Copy** from the context menu.

-  **Sound files (.wav files)** — are WAV files that are loaded to user interface devices and played through the UIDevice methods in the ControlScript program. Sound files can be added through the **Primary Processor** context menu by selecting **Add Existing File...** and selecting the appropriate file.
-  **User files** — are other files that can be added to System and are loaded to the Protected User File space on the Primary Processor. User files can be read by and written to by the ControlScript program. User Files added to the project will overwrite any user files on the Primary Processor during the build and upload operation.

## System Asset Lists

Each system in the System Manager is defined by its Primary Processor. All files, Secondary Processors and User Interfaces associated with the System and the Primary Processor are shown indented under the Primary Processor in the System Manager Tree.



Project Assets that are linked to a System are also shown indented under the Primary Processor in the System Manager Tree, with an icon indicating that they are linked.

## Project Asset List

Projects are defined by the Global Scripter project file (.gs), and can contain a collection of Systems, defined by their primary processors (controller). Project files can store files at the Project Level so that they can be linked to individual system. When a linked file is updated, each link to the system is automatically updated.

For example, if a project has two systems (System A and System B) and both systems use the same GUI Designer layout (GDL) file, and that file is added to each system at the system level, then GS stores two separate instances of the file.

- If the GDL file is added the project level **and is linked** to each system, GS only stores a single instance of the file. Any updates to the GDL file are automatically pushed to both System A and System B during Build and Upload.
- If the file is added to a project at the project level and **is not linked** to any system, the file is stored in the project file, but is never uploaded to a controller. Only files that are either added at the system level or are linked from the project level, are uploaded to the primary controller during Build and Upload

## Importing and Exporting Files in Global Scripter

**NOTE:** In Deploy mode, files cannot be imported, exported, copied, moved, deleted or linked within the System Manager.

Files can easily be imported to a project at the Project or System Level by dragging and dropping the file from MS Windows Explorer into the System Manager. Files dropped onto the Primary Processor are added to the Project at the System Level. Files dropped into the white space at the bottom of below the systems in System Manager are added at the Project Level.

Files can easily be exported from a Global Scripter Project by dragging and dropping the file from the System Manager onto the Windows Desktop or into a folder in MS Windows Explorer.

Files can be copied from one project to another by dragging and dropping the files between two instances of Global Scripter.

**NOTE:** Folders cannot be added to the System Manager.

Files can be copied, moved or linked within the System Manager using the following actions:

- **Drag & Drop between a System Level and Project Level, or between two systems or [Shift]-Drag** — Moves the file, but keeps only a single instance of the file in the project
- **[Ctrl]-Drag** — Copies the file then creates a second instance of the file in either the System or the Project
- **[Alt]-Drag** — Creates a link between the Project Level and the System Level. This keeps only a single instance of the file in the project

**NOTE:** If individual instances of a file are created in multiple systems or at the System Level and Project Level, each instance of the file would need to be updated if the file is changed.

## Deleting Files

**NOTE:** In Deploy mode, files cannot be deleted

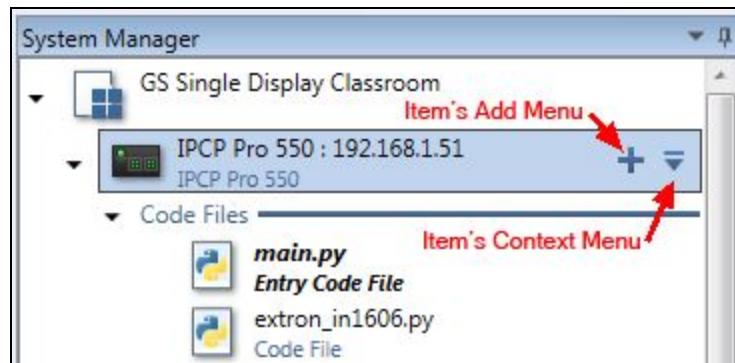
Files can be deleted from either the project level or system level by right-clicking on the file and selecting **Delete** from the context menu.

**WARNING:** Once a file is deleted from a project, it is not recoverable. **Undo** and **Redo** actions only apply to Code Editor Operations at this time.

## Context Menus

The System Manager contains Add and Item context menus.

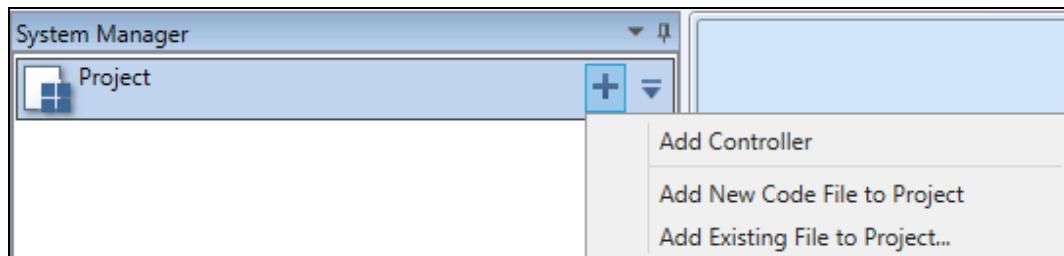
- **Add context menu** — is a Device based context menu, and lists what types of assets can be added under an item in the System Manager.
- **Item context menu** — provides a list of actions that can be performed on the selected item



To use any of the context menu options, select the Add or Context menu, then select the relevant option.

### Project Add menu

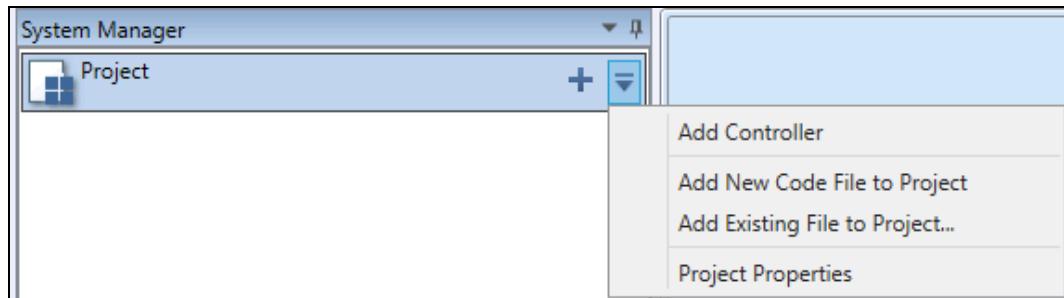
Has the following options:



- **Add Controller** — only visible when a Primary Controller can be added to the project, this adds a primary controller to the project
- **Add New Code File to Project** — creates and adds a new python script file to the project at the project level
- **Add Existing File to Project** — adds an existing file resources to the project at the project level

### Project Context menu

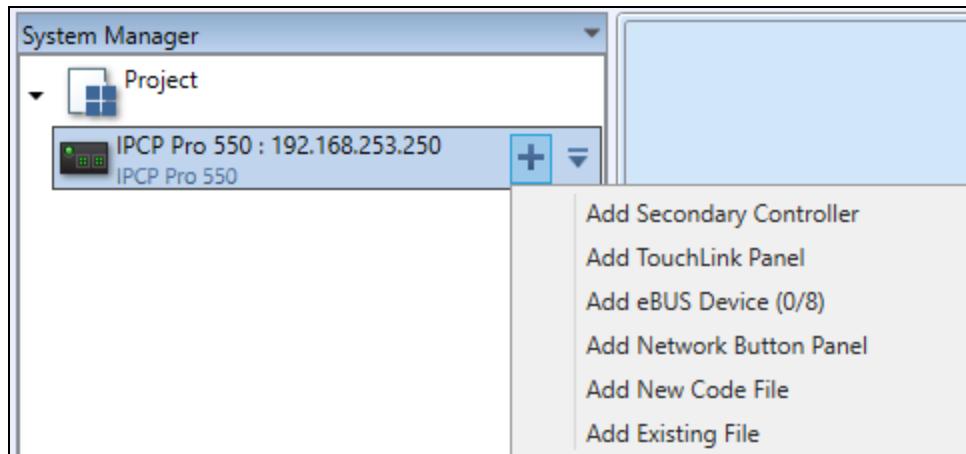
Has the same options as the Project Add menu, with the addition of Project Properties option



- **Project Properties** — opens the Project Properties dialog panel

#### Primary Controller Add menu

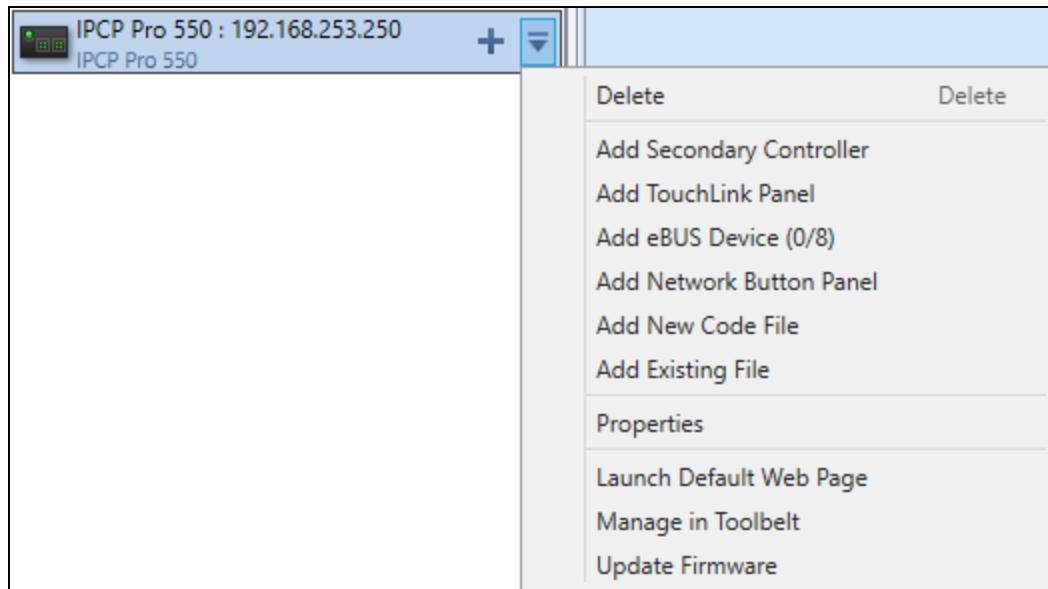
Has the following options:



- **Add Secondary Controller** — adds a secondary controller to the system
- **Add TouchLink Panel** — adds a TouchLink Panel or a Virtual TouchLink Panel to the system
- **Add eBUS Device (x/8)** — adds an eBUS Device to the system
- **Add Network Button Panel** — adds a Network Button Panel (NBP) to the system
- **Add New Code File** — creates and adds a new python script file to the project at the system level
- **Add Existing File** — adds an existing external file to the project at the system level

#### Primary Controller context menu

Has the same options as the Project Add menu, with the addition of Delete, Properties, Launch Default Web Page, Manage in Toolbelt, and Update Firmware options.



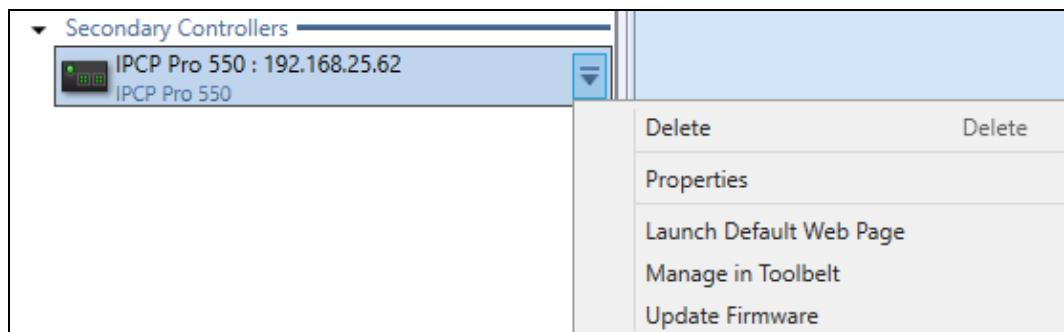
- **Delete** — deletes the primary controller and associated files and hardware from the project file.

**NOTE:** Deleting the primary controller and its resources from a project is not recoverable. Undo and Redo only applies to the Code Editor Operations.

- **Properties** — opens the Properties diagnostic panel
- **Launch Default Web Page** — opens the default web page in the default browser
- **Manage in Toolbelt** — opens Toolbelt and manages the primary controller
- **Update Firmware** — opens Toolbelt and updates the firmware for the primary controller

### Secondary Controller context menu

Has the following options:

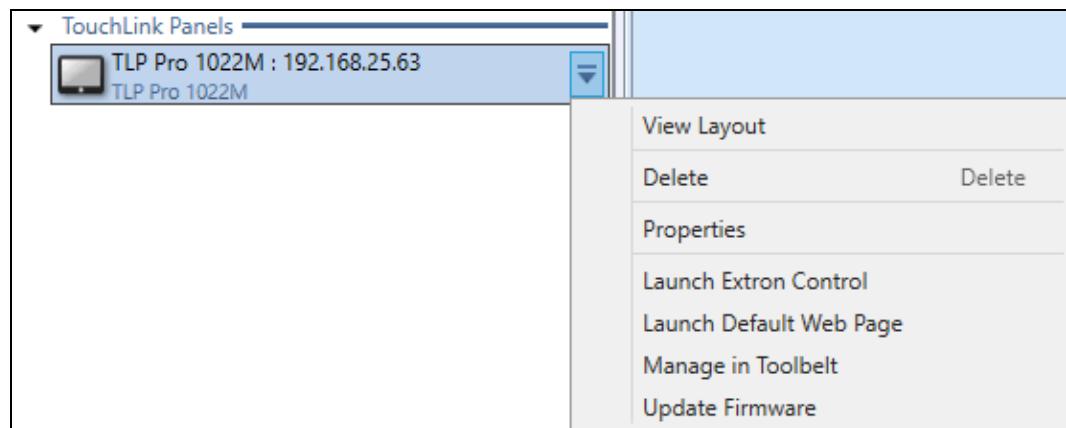


- **Delete** — deletes the secondary controller from the system and project file
- **Properties** — opens the Properties diagnostic panel
- **Launch Default Web Page** — opens the default web page in the default browser

- **Manage in Toolbelt** — opens Toolbelt and manages the secondary controller
- **Update Firmware** — opens Toolbelt and updates firmware for the secondary controller

#### TouchLink Panel context menu

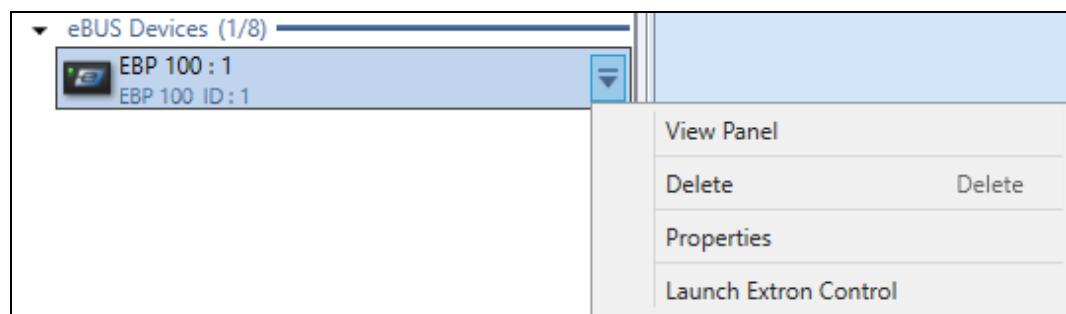
Has the same options as the Secondary Controller context menu, with the addition of View Layout, and Launch Extron Control options.



- **View Layout** — opens the TouchLink panel bezel and Layout file (a .gdl file) in the View Layout panel
- **Launch Extron Control** — opens the URL to the Extron Control for Web interface on the primary controller in Microsoft Internet Explorer

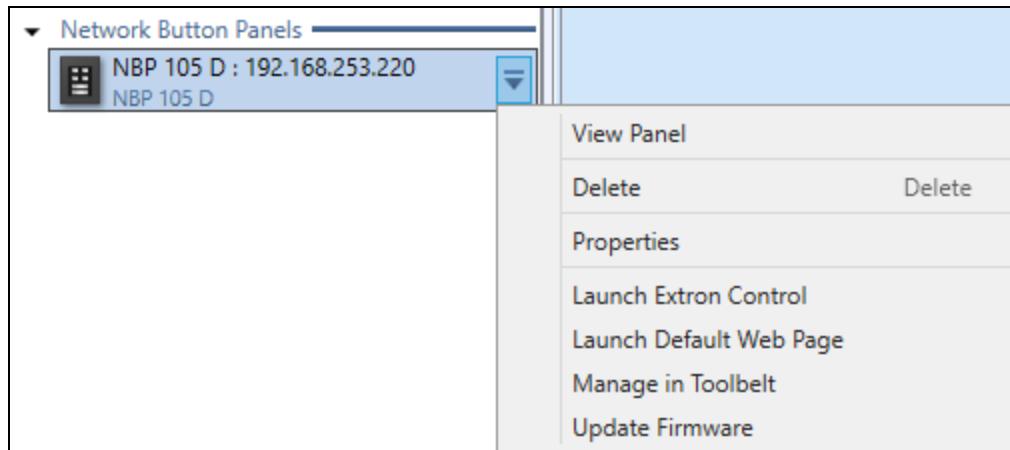
#### eBUS Device context menu

Has the same options as the TouchLink panels context menu, but does not have Launch Default Web Page, Manage in Toolbelt, and Update Firmware options.



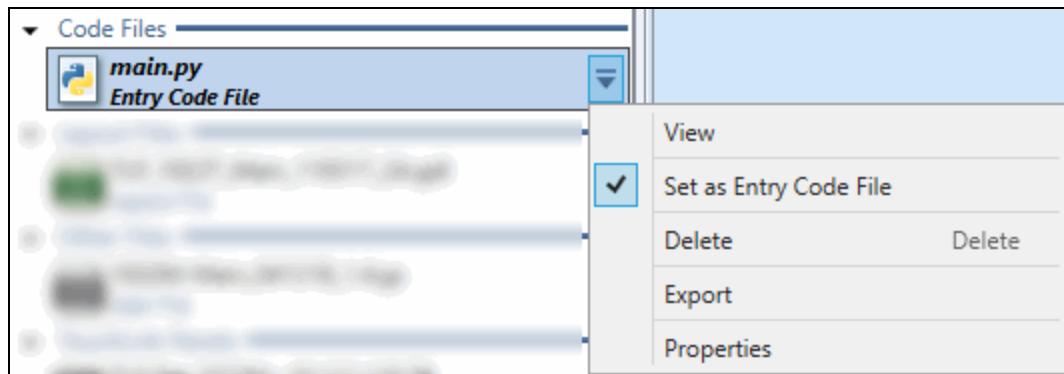
#### Network Button Panel context menu

Has the same options as the TouchLink panels context menu, with View Panel being the same as View Layout.



#### (Python) Code File context menu

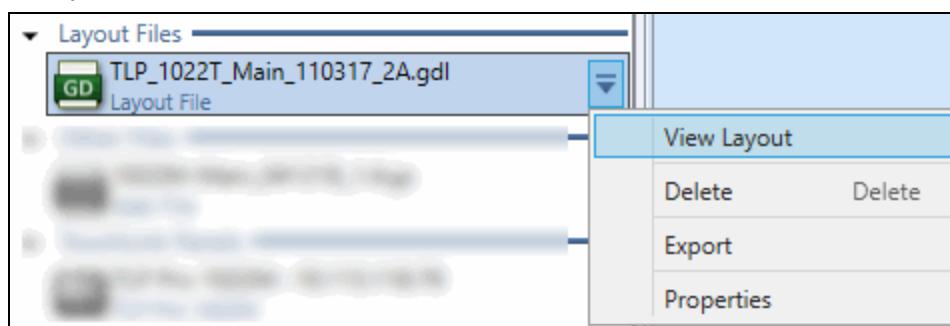
Has the following options:



- **View** — opens the Code File in the Code Editor window
- **Set as Entry Code File** — sets the Code File as the default file run when the primary controller restarts
- **Delete** — deletes the file from the system and project file
- **Export** — opens a Save As... dialog box to export and save the file under a desired name
- **Properties** — opens the Properties diagnostic panel

#### Layout File context menu

Has the same options as the Code file context menu, but does not have Set as Entry Code File option.



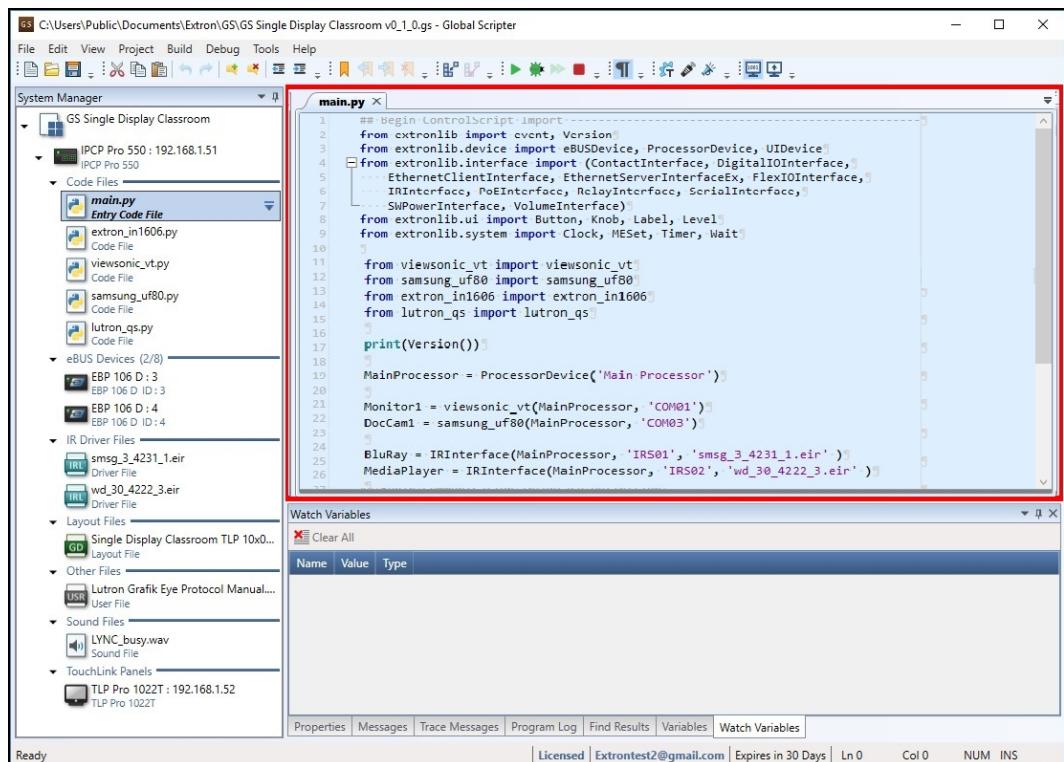
- **View Layout** — opens the TouchLink panel layout in the View Layout panel

### IR File, Sound File and User File context menus

These files all have the same options:

- **Delete** — deletes the file from the system and project file
- **Export** — opens a Save As... dialog box to export and save the file under a desired name
- **Properties** — opens the Properties diagnostic panel

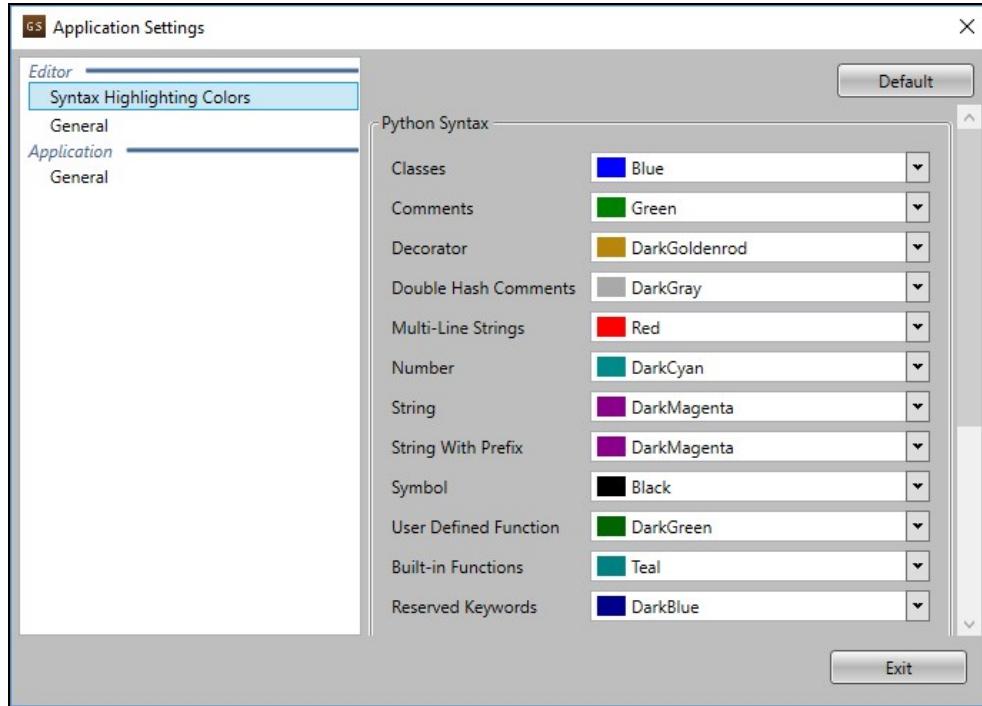
## Code Window



The Code Editor allows users to edit the Python code files associated with the Global Scripter project file. Multiple Python code files can be opened and edited at the same time in tabbed Code Windows. Code Windows can be docked with in Code Editor area of Global Scripter, or the Code Windows can be undocked from the main Global Scripter application and placed anywhere on the MS Windows desktop.

When the Python code files are opened, they are automatically opened in a new Code Window tab within the Global Scripter application. Global Scripter does not remember the undocked locations of Code Windows outside the Global Scripter application. The Code Editor includes two features that help the developer; **Syntax Highlighting** and **Code Folding**.

## Syntax Highlighting



Syntax Highlighting helps the programmer identify different elements in the python script file. The colors assigned to the different elements can be modified from within the Application Settings Dialog (see the [Syntax Highlighting](#) section in the Tools Menu topic for details).

## Code Folding

Code Folding allows the user to expand and collapse sections of the program to view more of the code than would otherwise be visible given their current screen size.

The Code Editor automatically sections off the foldable areas of the code based upon the indentation of the Python code.



Sections that are marked with a icon are expanded and can be collapsed by clicking on the icon (see line 4 in the image below).

```

1  ##.Begin.ControlScript.Import-----
2  from extronlib import event, Version
3  from extronlib.device import eBUSDevice, ProcessorDevice, UIDevice
4  [-]from extronlib.interface import (ContactInterface, DigitalIOInterface,
5  ... EthernetClientInterface, EthernetServerInterfaceEx, FlexIOInterface,
6  ... IRInterface, RelayInterface, SerialInterface, SWPowerInterface,
7  ... VolumeInterface)
8  from extronlib.ui import Button, Knob, Label, Level
9  from extronlib.system import Clock, MESet, Wait
10
11 print(Version())
12
13 ##.End.ControlScript.Import-----
14 ##
15 ##.Begin.User.Import-----
16
17 ##.End.User.Import-----
18 ##
19 ##.Begin.Device/Processor.Definition-----
20
21 ##.End.Device/Processor.Definition

```

Sections marked with a icon and end with the icon are collapsed, and can be expanded by clicking on either icon (see line 4 in the image below).

**NOTE:** Observe in the image below, that the line numbers in the left margin skip from 4 to 8, indicating that 4 lines of code have been collapsed.

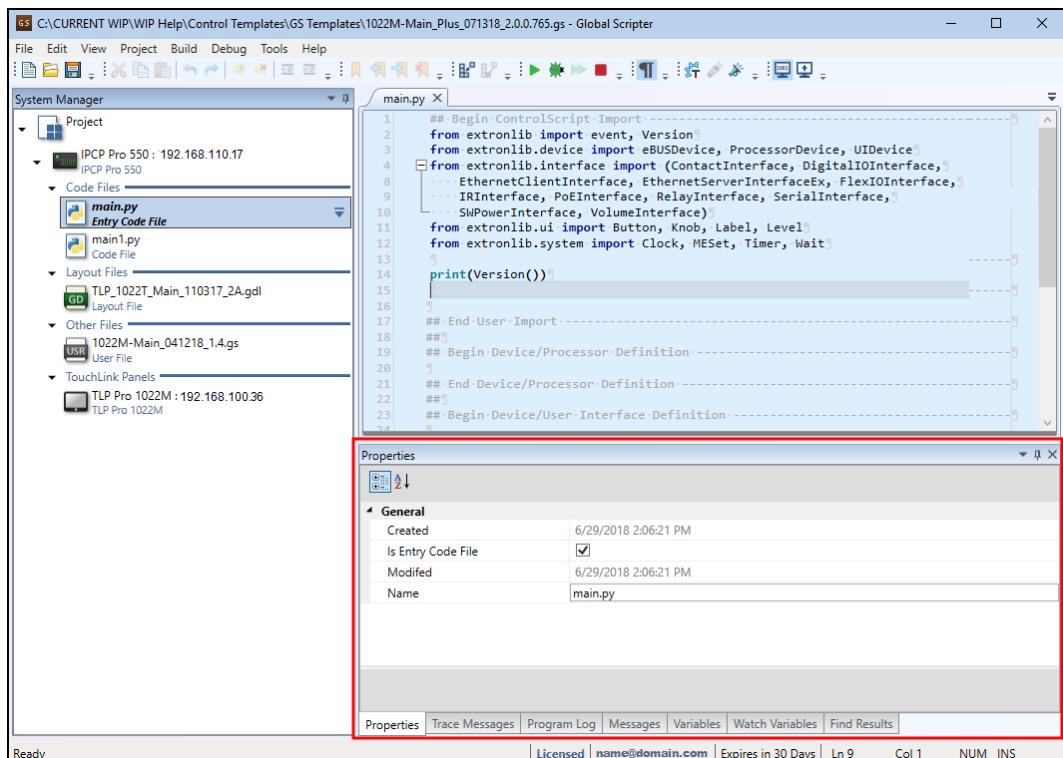
```

1  ##.Begin.ControlScript.Import-----
2  from extronlib import event, Version
3  from extronlib.device import eBUSDevice, ProcessorDevice, UIDevice
4  [+]-from extronlib.interface import (ContactInterface, DigitalIOInterface,...)
5  from extronlib.ui import Button, Knob, Label, Level
6  from extronlib.system import Clock, MESet, Wait
7
8
9
10
11 print(Version())
12

```

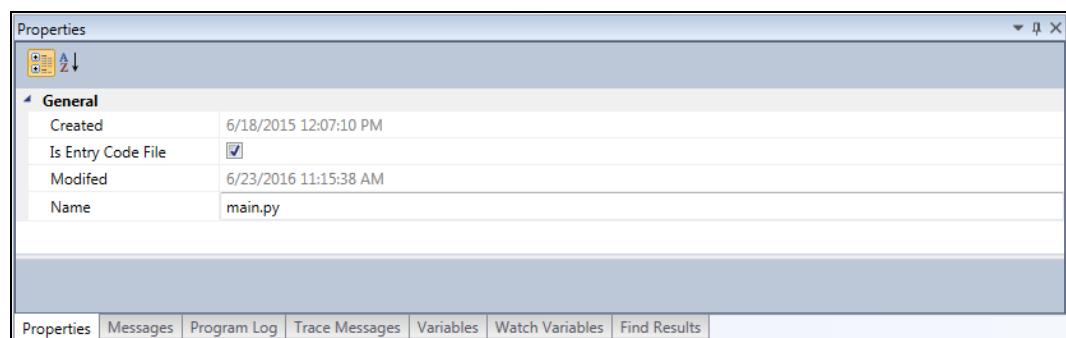
## Diagnostics Panel

The Diagnostic Panel is located either below the code editor panel, or for deploy mode, to the right of the System Manager. The visibility of the different tabs within the diagnostics panel are toggled from the **View** menu in the Global Scripter menu bar (see **View Menu** for full details). The full range of available tabs are: **Properties**, **Find Results**, **Trace Messages**, **Program Log**, **Messages**, **Variables**, and **Watch Variables**. Click on the link to see full details for each tab.



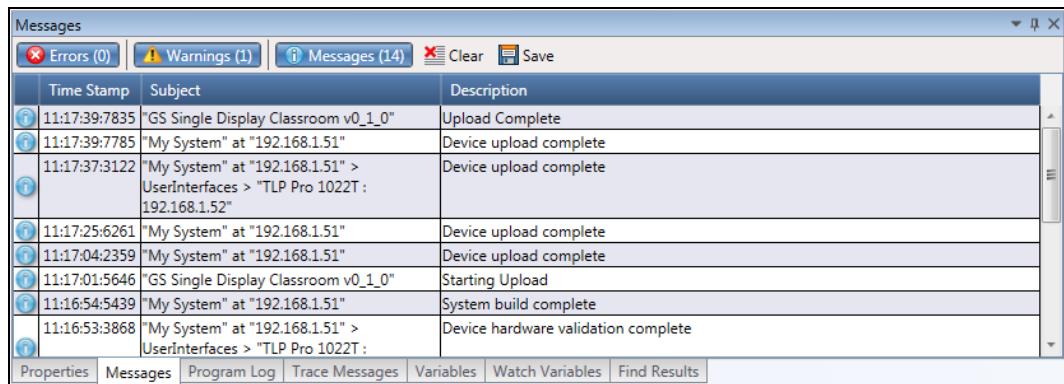
**NOTE:** The diagnostics panel can be pinned or unpinned within the GS Applications window, or individual tabs in the diagnostics panel can be docked in the diagnostics panel or placed anywhere (floated) on the MS Windows Desktop.

## Properties Panel



Click the **Properties** tab to open the Properties panel. This panel displays the various properties for Control Processors, User Interfaces, and files. Edits to the Properties panels are stored to the project when the project is saved.

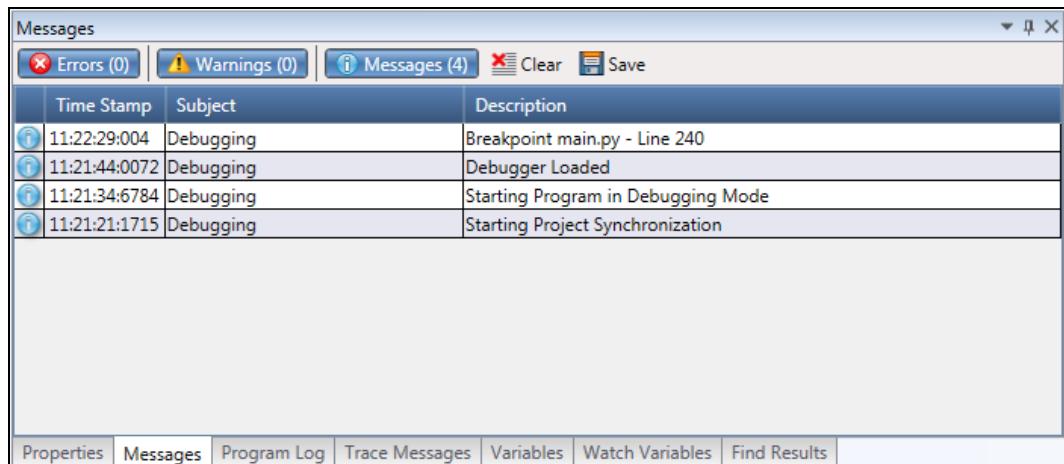
## Messages Panel



Messages		
Time Stamp	Subject	Description
11:17:39:7835	"GS Single Display Classroom v0_1_0"	Upload Complete
11:17:39:7785	"My System" at "192.168.1.51"	Device upload complete
11:17:37:3122	"My System" at "192.168.1.51" > UserInterfaces > "TLP Pro 1022T : 192.168.1.52"	Device upload complete
11:17:25:6261	"My System" at "192.168.1.51"	Device upload complete
11:17:04:2359	"My System" at "192.168.1.51"	Device upload complete
11:17:01:5646	"GS Single Display Classroom v0_1_0"	Starting Upload
11:16:54:5439	"My System" at "192.168.1.51"	System build complete
11:16:53:3868	"My System" at "192.168.1.51" > UserInterfaces > "TLP Pro 1022T :	Device hardware validation complete

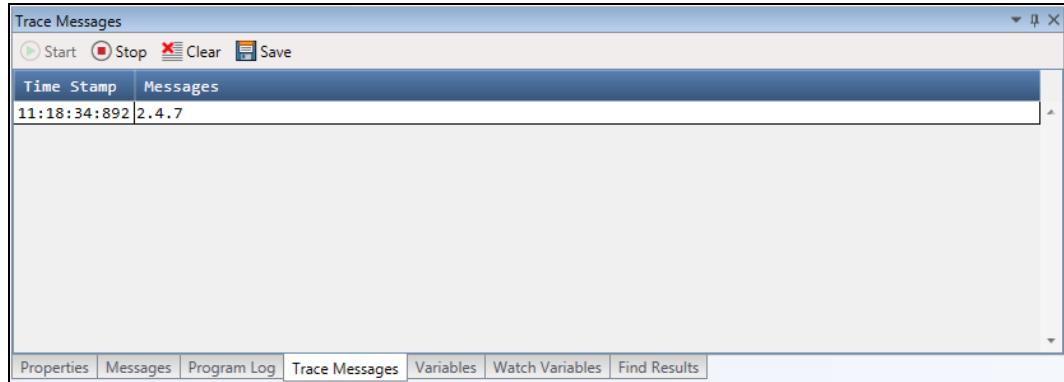
Click the **Messages** tab to open the Build Messages panel. This panel displays Errors, Warnings and Messages that are generated during the Build and Upload Process. The **Errors**, **Warnings** and **Messages** buttons filter the messages that are displayed in the panel. The **Clear** button removes all of the messages in the panel. The **Save** button saves the messages in the panel to an external file.

The Messages panel is also used to display Debug Messages when Global Scripter places the control processor into Debug Mode and returns it to normal operations.



Messages		
Time Stamp	Subject	Description
11:22:29:004	Debugging	Breakpoint main.py - Line 240
11:21:44:0072	Debugging	Debugger Loaded
11:21:34:6784	Debugging	Starting Program in Debugging Mode
11:21:21:1715	Debugging	Starting Project Synchronization

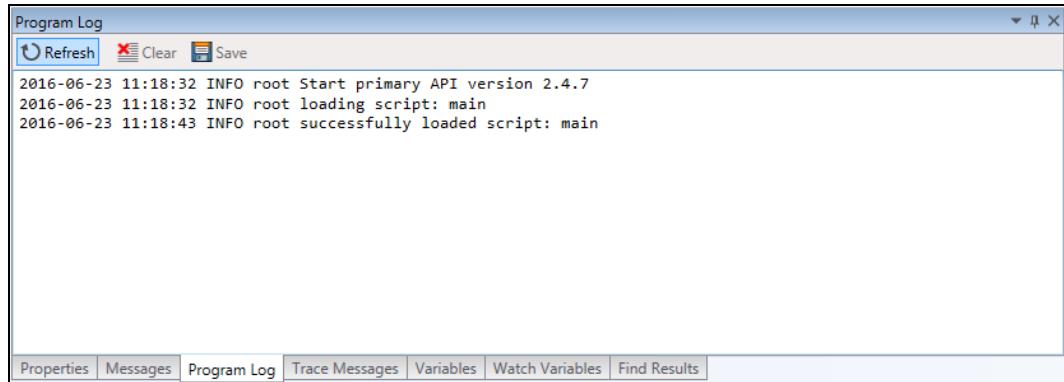
## Trace Messages Panel



Click the **Trace Messages** tab to open the Trace Messages panel. This panel displays messages generated by print statements in the Python program. User Trace Messages are also visible in the **Trace Window** tab in Toolbelt. The **Start** button places Global Scripter into a listen mode where user Trace Messages will be displayed. The **Stop** button stops the listen mode and subsequently stops displaying User Trace Messages. The **Clear** button removes any User Trace Messages displayed in the panel.

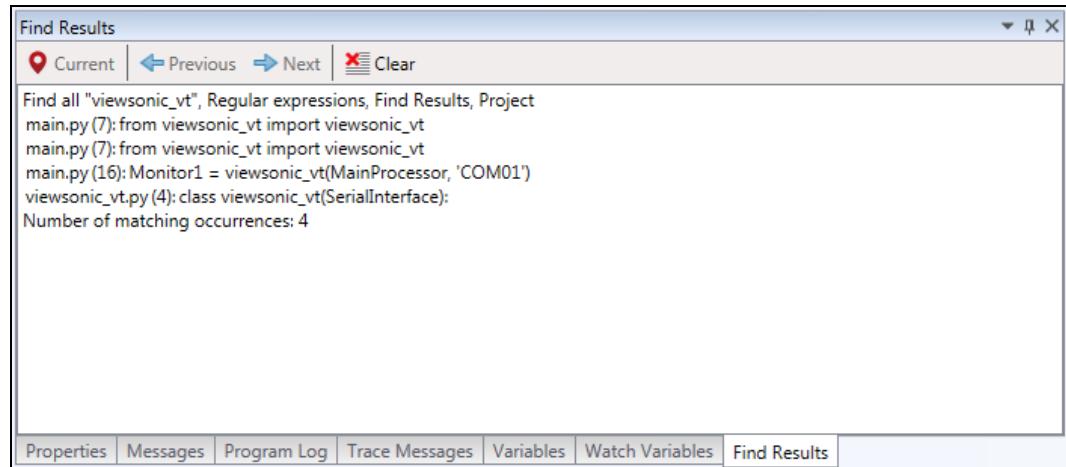
Message cells can be selected and copied to the computer clip board by right-clicking on the desired cell and selecting **Copy** from the context menu.

## Program Log Panel



Click the **Program Log** tab to display the Program Log panel. The Program Log panel retrieves and displays the Program Log from the Primary Processor. The Program Log displays diagnostic information about the Python program that is currently running on the processor. Any runtime errors within the program are written to the Program Log.

## Find Results Panel



The **Find Results** panel lists the results from the **Find/Replace in Files** function. The user can double-click on the results in the **Find Results** panel and the Code Editor will jump to the selected instance. The **Current** button jumps to the selected instance in the Code Editor. The **Previous** button jumps to the previous instance in the **Find Results** panel. The **Next** button jumps to the next instance in the **Find Results** panel. The **Clear** button removes any data in the **Find Results** panel.

## Status Bar



The **Status Bar** in Global Scripter provides basic information about the Global Scripter application and the Code Editor environment.



The **Status Bar** displays a different color scheme when Global Scripter is in Debug Mode. When Global Scripter returns to Edit Mode, the **Status Bar** returns to its default color scheme.

## Global Scripter Application Licensing

The **Status Bar** displays the current Application Licensing information for the current instance of Global Scripter. The Status Bar displays the License Status (Licensed or Unlicensed), the Extron Insider email address, and time remaining until a check-in is required.

## Code Editor Cursor Location

The **Status Bar** displays the current location of the cursor in the Code Editor. Both the Line Number (Ln) and Column Number (Col) are displayed.

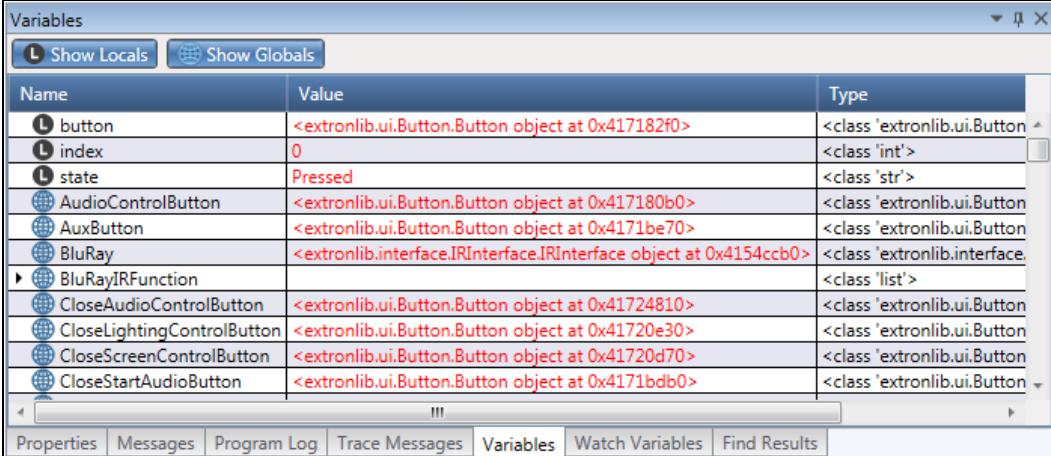
## Caps Lock, Num Lock, Insert/Overwrite Status

The Status Bar displays the current status of the <Caps Lock>, <Num Lock>, and <Insert> on the computer. If the <Num Lock> is currently On, NUM is displayed. If the <Num Lock> is Off, NUM is hidden. If the <Caps Lock> is On, CAPS is displayed. If the <Caps Lock> is Off, CAPS is hidden. If <Insert> is On, INS is displayed. If <Insert> is off, INS is hidden.

## Global Scripter Status Messages

The left side of the Status Bar is reserved for status messages from the Global Scripter Application.

## Variables Panel



Name	Value	Type
button	<extronlib.ui.Button.Button object at 0x417182f0>	<class 'extronlib.ui.Button'
index	0	<class 'int'>
state	Pressed	<class 'str'>
AudioControlButton	<extronlib.ui.Button.Button object at 0x417180b0>	<class 'extronlib.ui.Button'
AuxButton	<extronlib.ui.Button.Button object at 0x4171be70>	<class 'extronlib.ui.Button'
BluRay	<extronlib.interface.IRInterface.IRInterface object at 0x4154ccb0>	<class 'extronlib.interface.IRInterface'
BluRayIRFunction		<class 'list'>
CloseAudioControlButton	<extronlib.ui.Button.Button object at 0x41724810>	<class 'extronlib.ui.Button'
CloseLightingControlButton	<extronlib.ui.Button.Button object at 0x41720e30>	<class 'extronlib.ui.Button'
CloseScreenControlButton	<extronlib.ui.Button.Button object at 0x41720d70>	<class 'extronlib.ui.Button'
CloseStartAudioButton	<extronlib.ui.Button.Button object at 0x4171bdb0>	<class 'extronlib.ui.Button'

The Variables panel lists all of the local and global objects in the context of the current Breakpoint, in Debug Mode.

The **Show Locals** button toggles the visibility of the objects in the local scope. The **Show Globals** button toggles the visibility of the objects in the global scope.

Dictionaries, lists, sets and tuples can be expanded by clicking on the triangle in the left margin of the panel.

Objects can be copied to the Watch variables panel by right-clicking on an object and selecting **Add to Watch**.

Numeric objects can be displayed as decimal or hexadecimal values by right clicking on the object and selecting **Hexadecimal Display**.

## Watch Variables Panel

Watch Variables		
Clear All		
Name	Value	Type
index	0	<class 'int'>
BluRayIRFunction		<class 'list'>
0	PLAY	<class 'str'>
1	STOP	<class 'str'>
2	PAUSE	<class 'str'>
3	F_CHAP	<class 'str'>
4	R_CHAP	<class 'str'>
5	FFWD	<class 'str'>
6	REW	<class 'str'>
7	None	<class 'NoneType'>
8	None	<class 'NoneType'>
9	None	<class 'NoneType'>

The **Watch Variables** panel lists the local and global objects that have been added from the **Variables** panel. Values for the objects are updated when a Breakpoint has been reached. Dictionaries, lists, sets and tuples can be expanded by clicking on the triangle in the left margin of the panel.

Objects that are not in the context of the current breakpoint are shown in an error state as undefined within the current context. Objects can be copied to the **Watch Variables** panel by right-clicking on an object and selecting **Add to Watch**, or by dragging an object in the **Variables** panel into the **Watch Variables** panel.

Numeric objects can be displayed as decimal or hexadecimal values by right clicking on the object and selecting **Hexadecimal Display**.

Individual objects can be removed from the **Watch Variables** panel by right-clicking on an object and selecting **Delete Watch**. The **Watch Variables** panel can be cleared either by right-clicking an object and selecting **Clear All**, or by selecting the **Clear All** button.

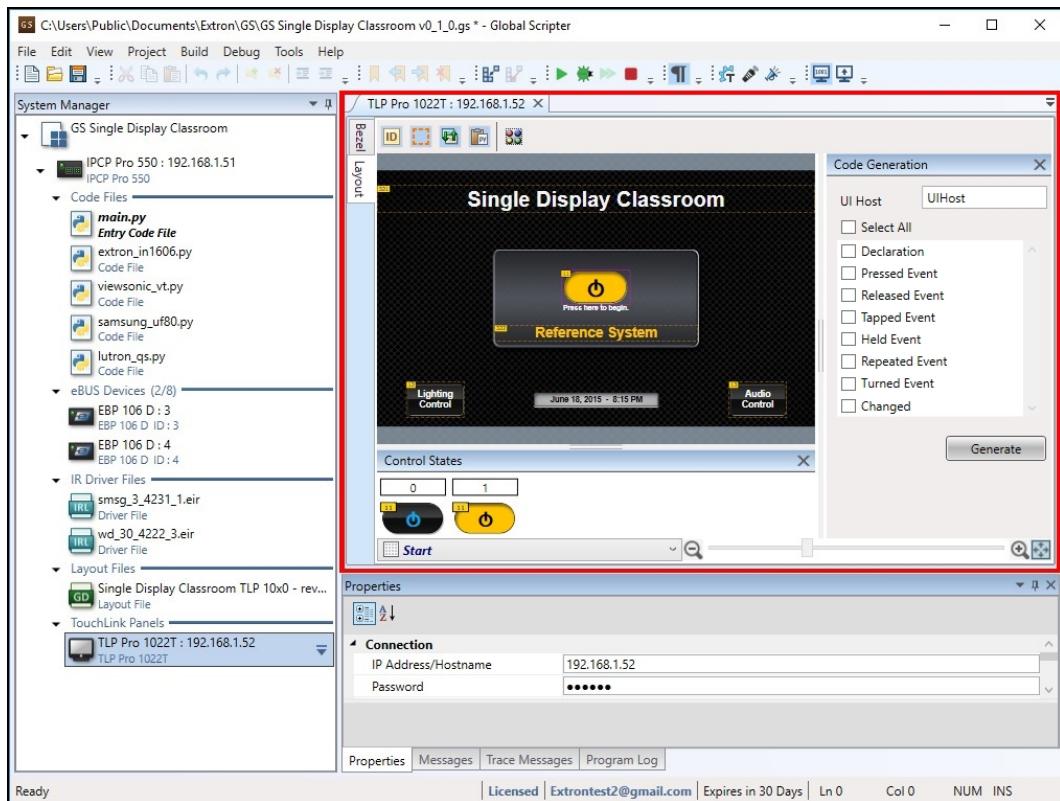
Variables in the **Watch Variables** panel that are not defined in the namespace or scope of the current breakpoint are shown as errors.

▶	BluRayIRFunction	error: name 'BluRayIRFunction' is not defined	<error>
	index	error: name 'index' is not defined	<error>

## View Layout

### View Layout Windows

The View Layout window allows users to view the Bezels and Layout files associated with the selected TouchLink Panel, Virtual TouchLink Panel, or eBUS Device in their project. A **Layout** window opens in the Code Editor region of Global Scripter when the user either selects **View** from the User Interface context menu or double-clicks on the User Interface in the System Manager. The window has three sections; **Layout Window**, **Control States**, and **Code Generation**.



### Layout Window

The Layout Window contains two tabs; **Bezel** and **Layout** and a **Layout toolbar**.

- **Bezel tab** — this displays the Plastic Bezel for the selected User Interface and shows the IDs and names for the hard buttons, levels, knobs and LEDs.

**NOTE:** The **Bezel** Tab is not available for User Interfaces that do not have a bezel, such as the TLI Pro 101 and Virtual TouchLink panels.

- **Layout tab** — this displays the Pages, Pop-up Pages and Modal Pop-up Pages for the Layout File associated with the selected User Interface.

**NOTE:** If the User Interface does not have a Layout File (.gdl) associated with the User Interface, or if the User Interface is an eBUS Device, the **Layout** tab is not available.

- **View Layout Toolbar** — this contains a series of shortcut icons:

-  **Show UI Object IDs** — toggles the visibility of the Object IDs assigned in GUI Designer and associated with the objects in the Layout panel
-  **Show UI Object Outlines** — toggles the visibility of the Objects border outline, which is defined by the objects location and size attributes.
-  **Show Control States** — toggles the visibility of the Control States panel
-  **Show Code Generation Pane** — toggles the visibility of the Code Generation panel
-  **Select All** — selects all of the objects in the Layout panel

## Control States Panel

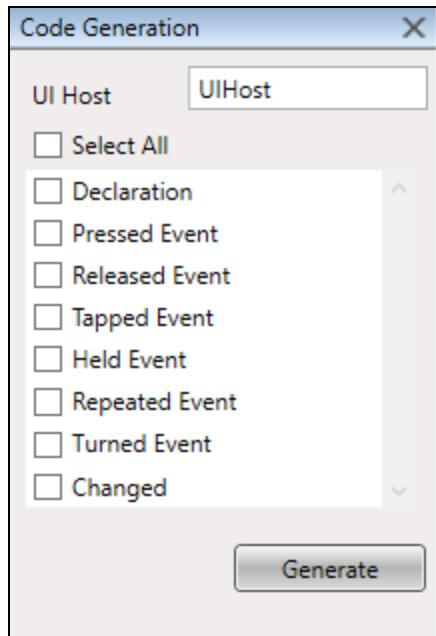


The Control States panel in Global Scripter is similar to the Control States panel in GUI Designer. The Control States panel displays the different states of the object selected in the View Layout window. If multiple objects are selected the states of the first object selected will be displayed in the Control States panel.

The index of the Control States are displayed above the object's states. The indexes may not be in numeric order and may not be continuous. The index numbers are set and arranged in GUI Designer.

## Code Generation Panel

The Code Generation panel allows users to generate blocks of Python code based upon the Name and ID in the Layout File for the objects selected in the **Bezel** and **Layout** tabs of the View Layout window.



- **UI Host Text Box** — assigns the Python Identifier to be used by the Code Generation pane when creating declarations for Buttons, Labels, Levels and Knobs.
- **Select All Checkbox** — selects/deselects all objects in the list of items below.
- **Declaration Checkbox** — generates an object declaration.
- **Pressed Event Checkbox** — generates a Pressed event
- **Released Event Checkbox** — generates a Released event.
- **Tapped Event Checkbox** — generates a Tapped event
- **Held Event Checkbox** — generates a Held event
- **Repeated Event Checkbox** — generates a Repeated event
- **Turned Event Checkbox** — generates a Turned event
- **Changed Event Checkbox** — generates a Changed event (for example, when selecting a UI Slider object)
- **Generate Button** — generates the Python code for the selected objects and snippets and places the code on the Clipboard. Users can then paste the code to any location in the Code Editor or outside the Global Scripter environment.

**NOTE:** Global Scripter only generates the appropriate code for the objects and code snippets selected. For example, if the user selects a button, a label, and a level, then selects **Declaration**, and then **Pressed Event**, GS generates object Declarations for all three objects, but will only create a Pressed Event for the button. Only the blocks of code relevant to the UI host object are copied.

#### To generate and place code into a code file:

1. Select a button or item in the layout window
2. Select the check box of the code type to be generated. and click **Generate**. When code is generated it is placed on the clipboard.
3. Place the cursor in an appropriate code file and press [Ctrl+V] to paste the code in from the clipboard.

## Page List Box

The Page List Box displays a list of all of the pages, pop-up pages and modal pop-ups defined within the User Interface File. Selecting an item from the list box will display the associated page in the Layout Tab of the Layout Window.

- **Toggle Fit to Page**—Toggles the View Layout window's Fit To Page mode. When active, the entire bezel or layout will be sized to fit in the View Layout window. When the **Fit to Page Mode** is turned off, the **Zoom In/Out** buttons and **Zoom** slider are enabled.
- **Zoom In/Out** buttons and **Zoom** slider (when enabled)—Change the scale of the bezel and layout being displayed in the View Layout window. When zoomed in, the user can use the scroll bars to move the visible area of the panel, or the user can click and drag in the View Layout window to move the visible area of the bezel or layout.

# Reference

## Toolbelt

### Basic Overview

**NOTE:** See the *Toolbelt Help* file for complete information on all Toolbelt features.

The Toolbelt application allows the user to select a device (for example, a controller, a touchpanel, or a TLI) and then manage, configure, or view the device settings.

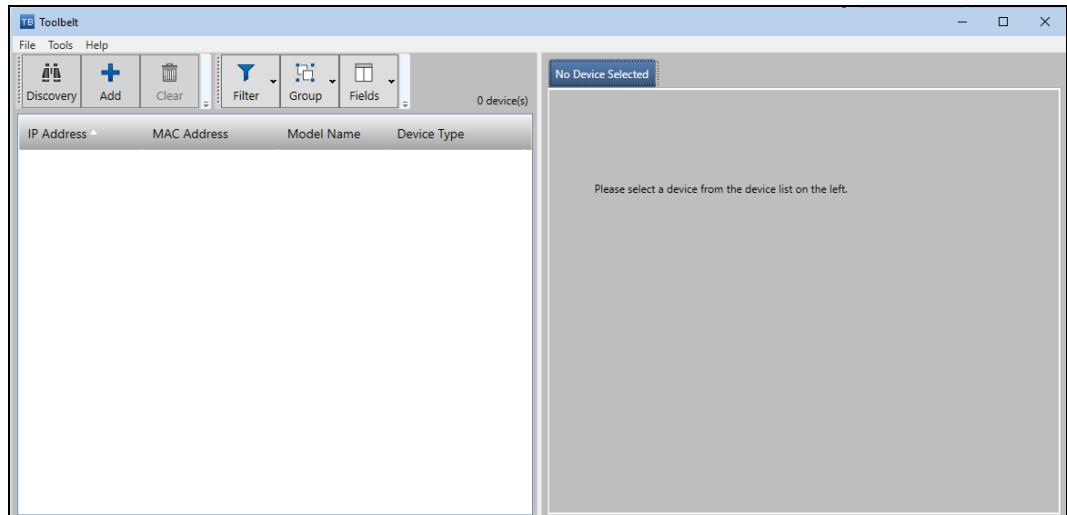
See the topics in the following Toolbelt sections for basic information on the features listed below.

- [Device Discovery](#)
- [System](#)
- [Network Settings](#)
- [Date and Time](#) — (available only when connected to a controller)
- [Device Information](#)
- [Mail Settings](#) — (available only when connected to a controller)
- [User Management](#)
- [LinkLicense](#) — (available only when connected to an IPCP Pro controller)
- [Utilities](#)
- [Trace Window](#) — (available only when connected to a controller)
- [Firmware Uploader](#)

### Device Discovery

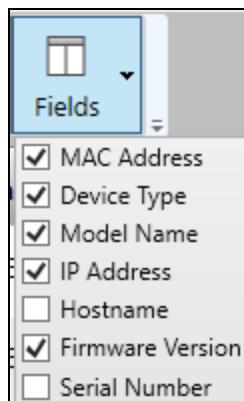
To discover connected devices on a network:

1. Click **Tools**, then **Toolbelt**. The Toolbelt dialog box opens.

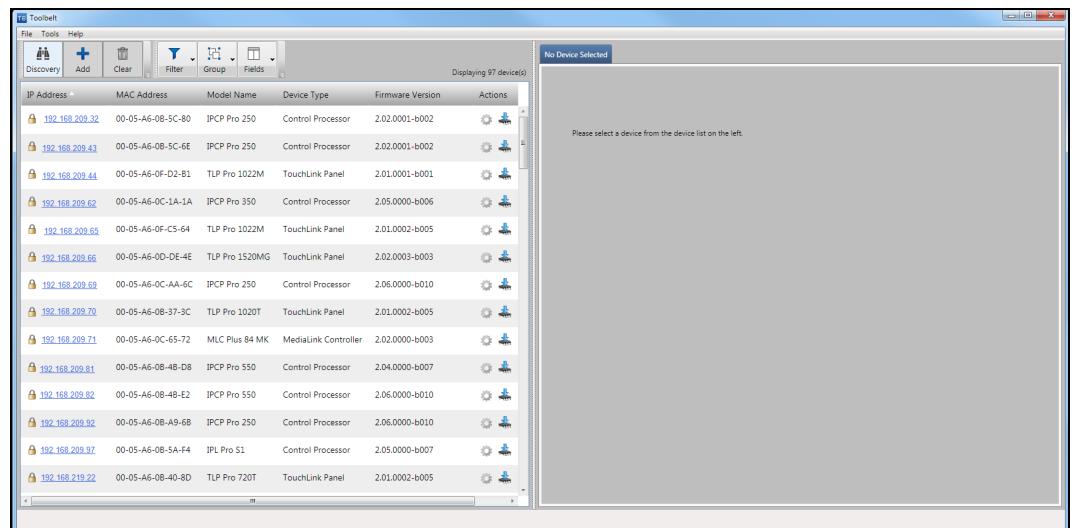


2. Click the **Discovery** button to enable discovery. The button changes color and the software searches for all available IP Link Pro devices and TouchLink touch panels on the selected network, and displays them in the device list. The list is continuously updated for as long as the device discovery mode is running.

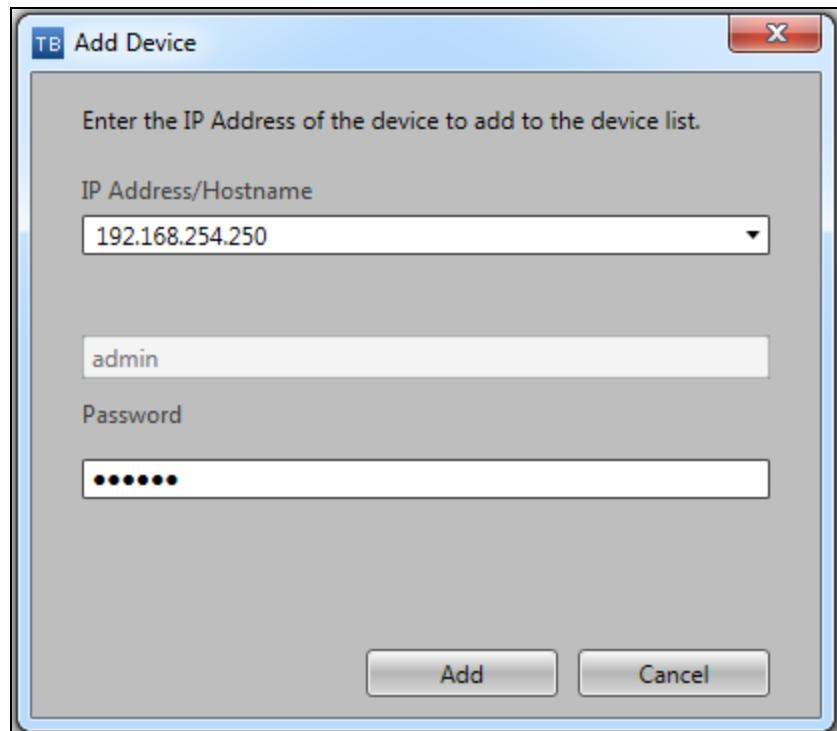
The list fields can be turned on or off by clicking the **Fields**



**NOTE:** The list can be sorted using one of the filters (Device Type..., IP Address Range..., MAC Address Range...). The list can also be grouped by one of the available groupings (Device, Model, Firmware Version, or Status).



Alternatively, to add a single device where the IP address is known, click **Add** and type in the IP address in the relevant field.



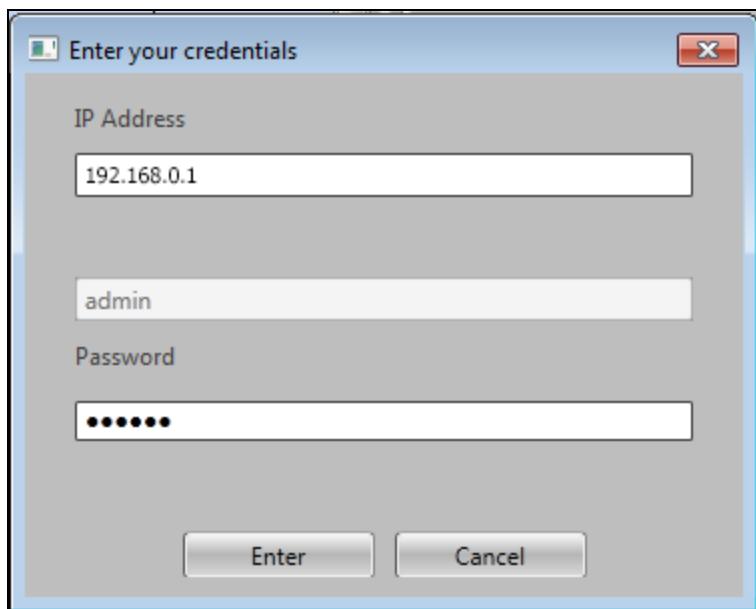
**NOTE:** Host names must be qualified (for example, someone.somehost.com)

Enter a Username and password if needed. The single device appears in the list.

Toolbelt					
Discovery		Add	Clear	Filter	Group
IP Address	MAC Address	Model Name	Device Type	Firmware Version	Actions
<a href="#">192.168.182.25</a>	00-05-A6-0B-4B-E9	IPCP Pro 550	Control Processor	2.08.0000-b004	

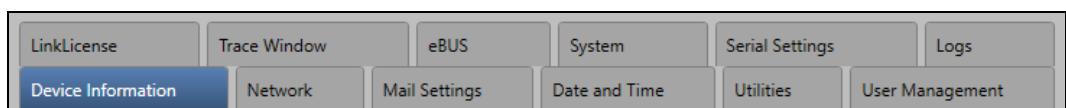
### To manage a device:

1. Select a device from the list and click **Manage**. A dialog box opens.



Complete the details as required and click **Enter**. The Toolbelt window populates with the device details.

2. Select the tab (see image below) with the details you wish to change or view.



3. Continue setting up the controller or panel as desired. See the topics in the Toolbelt help file describing the function and use for each of the tabs shown above.

**NOTE:** A TouchLink Interface (TLI) tab (not shown above) is also available after connecting to a TouchLink Interface. See the *Toolbelt Help* file for details.

## System

**NOTE: Please update all devices to the latest firmware to enable access to the System tab**, which shows the System ID information and the System Health details, and facilitates pairing, as described below.

## Overview

New deployment methods recently introduced in Global Configurator (GC) v3.0.0.x and Global Scripter®(GS) v2.0, allow users to deploy a **system** with only the primary controller needing to be online (see the *Global Configurator* or *Global Scripter Help Files* for full deployment details). TouchLink Pro touchpanel or secondary controllers can be connected to the system post deployment.

The **System tab** allows users to see the system's health, and **pair** (connect) secondary controllers or touchpanels to the primary controller post deployment.

## Terms

**System** — a group of Extron devices that consists of a primary controller and zero or more TouchLink Pro touchpanels or secondary controllers

**System ID** — a four digit number that allows a primary controller and a TouchLink Pro touchpanel or secondary controller to communicate with each other

**Pairing:** — The process of establishing communication between a primary controller and a networked device such as a secondary controller or touchpanel

The following information is required to pair secondary controllers or touchpanel devices with the primary controller:

- **System ID** — see definition above
- **Primary Controller address**— the IP or hostname of the primary controller that the secondary controller or touchpanel device intends to communicate with  
The device tries to connect and pair with the primary controller using the primary controller's IP address or hostname along with the correct System ID.  
The primary controller address and system ID can be found in the project file (from the primary controller System Settings in GC or GS).

## System Tab for a Primary Controller

The System tab for a primary controller has two sections, **System Information** and **System Health**. These provide the ability for users to see the health of the system and troubleshoot the system.

### NOTE:

A system consists of a primary controller with zero or more connected devices, such as secondary controller and TouchLink Pro touchpanels (see [above](#) for details).

- **System Information** — provides the **System ID** that is needed for **pairing** a secondary controller or touchpanel device to a primary controller
- **System Health** — shows the status of all the devices belonging to the same system as specified in the Global Configurator or Global Scripter project. If there are any issues with those devices, those issues are **shown**, enabling the user to troubleshoot and **resolve** the issues

## System Information

For a primary controller, this section only contains the read-only System ID (see image below). This ID can also be found in the project file within GC or GS.

The screenshot shows a software interface with a navigation bar at the top containing tabs: LinkLicense, Trace Window, eBUS, System (which is highlighted in blue), Serial Settings, and Logs. Below the navigation bar is a section titled "System Information". Inside this section, there is a message: "Use the System ID below to connect [peripheral devices](#) with this primary controller". To the right of this message is a large, bold, black "System ID" label followed by the number "2620".

## System Health

The System Health pane shows the status of all the devices belonging to the same system specified in the Global Configurator or Global Scripter project. Toolbelt checks for any existing issues, and indicates the status in the Issues column.

### *Devices with no issues found*

**Example:** The image below shows a paired peripheral device having no issues.

The screenshot shows a "System Health" interface. At the top, it says "Status of all devices within the system". Below this is a table with two columns: "Project Settings" and "Issues". The first row shows a green checkmark icon next to the text "TLP Pro 1720MG : 192.168.120.17", with "No issues found" in the "Issues" column. The second row shows the text "TLP Pro 1720MG" and "192.168.120.17 on LAN" without any issues listed.

Project Settings	Issues
TLP Pro 1720MG : 192.168.120.17 TLP Pro 1720MG 192.168.120.17 on LAN	No issues found

### *Devices with issues found*

If connected devices within the system have any issues, messages indicating the issue type is shown as an error or a warning message, depending on the level of severity.

**Example:** The image below shows connected devices having various issues.

System Health	
Status of all devices within the system	
Project Settings	Issues
 IPCP Pro 255 :192.168.924.18 IPCP Pro 255 192.168.924.18 on LAN	 <a href="#">Not Connected to Primary Controller</a>  <a href="#">Hardware Offline, Invalid Pairing Information, or Minimum Firmware not Met</a>  <a href="#">File Transfer Status: Unknown</a>
 TLP Pro 1022M : 192.168.254.131 TLP Pro 1022M 192.168.254.13 on AVLAN	 Hardware Incompatible. Found IPL Pro S1  File Transfer Unknown
 TLP Pro 720T : 192.168.254.32 TLP Pro 720T 192.168.254.32 on AVLAN	No issues found
 IPCP Pro 350 : 192.168.254.45 IPCP Pro 350 192.168.254.45 on AVLAN	 Hardware Mismatch. Found IPCP Pro 550

In all cases, the reason for the message must be resolved for a system to be fully functional (see [Troubleshooting](#) section).

The information fields (columns) shown in the System Health pane are:

- [Overall Device Status](#)
- [Project Settings](#)
- [Issues](#)

### ***Overall device status***

These are:

-  — healthy (devices have no issues),
-  — system device(s) has [errors](#)
-  — system device(s) has [warnings](#)

### ***Project Settings***

**NOTE:** The information given here is the device specified information.

This device specified information consists of :

- Device friendly name (for example, TLP Pro 520M: 192.168.118.64)
- Model (for example, TLP Pro 520M)
- Device Address and Network Location (for example, 192.168.118.64 on LAN)

## Issues

Any device issues are shown (as error or warning), based on the level of severity.

- A warning message indicate that the device might be functional, and issue does not stop deployment.
- An error message indicate that the device is not functional, and the issue will cause deployment to fail.

These issues should be **resolved** for the system to be fully functional.

## Network Settings

The following shows the network settings related to the device.

**Hostname**

Communicate to this device via a friendly-name.

**Network Interfaces**

Settings related to the Network Interface Card.

Use DHCP (Obtain IP Address Automatically)

IP Address\*

Subnet Mask\*

Gateway\*

DNS Server

Search Domains

The Network Settings page shows the network settings for the selected device. It also allows the user to change the settings as desired.

**NOTE:** The **Host Name** field can always be edited whether DHCP is enabled or disabled.

## Configuring the Network Settings

### *Using DHCP mode:*

1. Select **Use DHCP** check box to obtain an IP address automatically for the device.

Network Interfaces

Settings related to the Network Interface Card.

Use DHCP (Obtain IP Address Automatically)

IP Address\* [ ]

Subnet Mask\* [ ]

Gateway\* [ ]

DNS Server [ ]

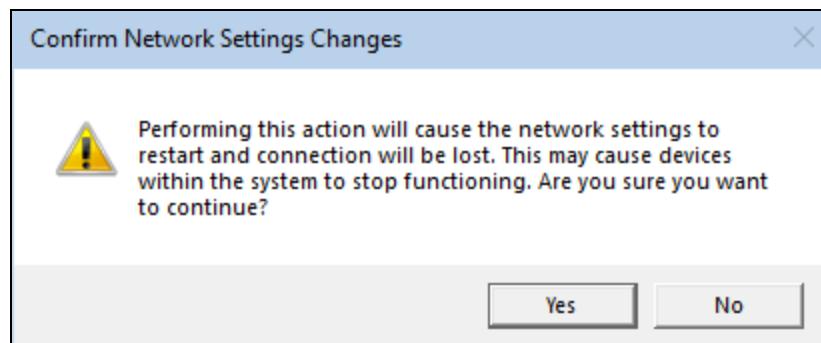
Search Domains [extron.com,example.com]

Apply Cancel

2. If not already entered, enter a valid Host Name in the **Host Name** field.

**NOTE:** A valid Host Name must be entered before applying any changes. All other fields cannot be edited when DHCP mode is enabled.

3. Click **Apply**. A dialog box opens confirming the restart network settings request.



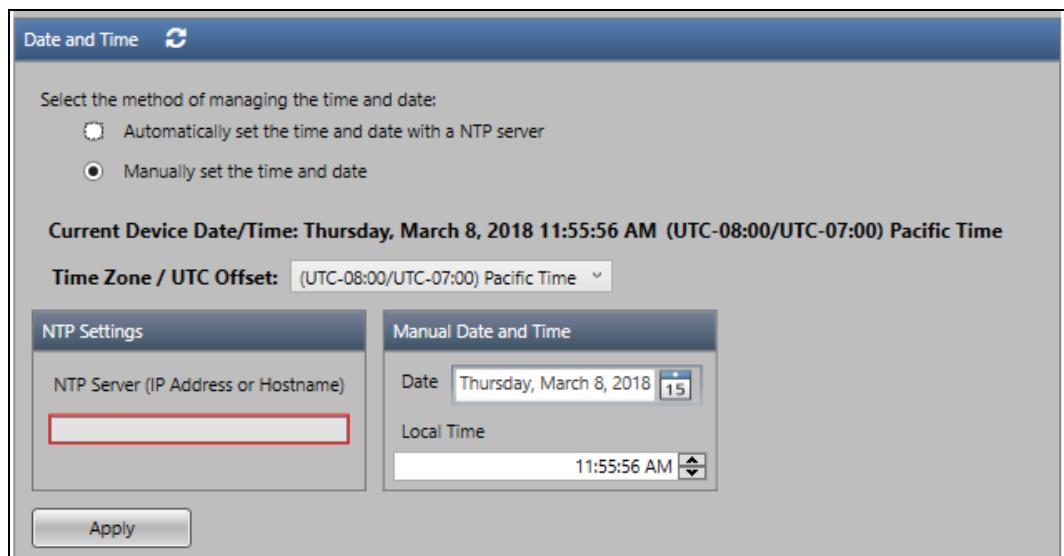
4. Click **OK** to confirm, or click **Cancel** to exit without saving any changes. When confirmed, the network automatically assigns an IP address and restarts network settings. All existing connections are lost and need to be re-established.

### **With DHCP disabled**

1. Deselect the **Use DHCP** check box if already checked.
2. In the **Host Name** field, enter a valid host name.
3. In the **IP Address** field, enter the desired IP address for the device.
4. In the **Subnet Mask** field, enter the subnet address for the device.
5. In the **Gateway** field enter the address for the device.
6. Complete the **DNS Server** details if applicable.
7. Click **Apply** to save the configuration with the new settings, or click **Cancel** to exit without saving any changes.

**NOTE:** All fields (except **DNS**) must be completed and valid before applying any changes. The user may need to obtain the relevant information for steps 1-6 from their system administrator.

## **Date and Time**



The Date and Time page allows the user to set or change the local date and time for the system as necessary.

### **Setting Up Date and Time**

Select the radio button for date and time setting by either Automatic with an NTP server or by manual selection.

#### **Automatic**

In the open address field, type in the NTP server IP address or host name. This automatically sets the local time zone based on the server.

## **Manual**

Select the date (from the calendar if required), select the local time zone and set the current hour.

After setting the date and time by either method click **Apply**.

## **Device Information**

The following shows the summary information of the device.

Summary	
Description	IP Link Pro Control Processor
Part Number	60-1418-01
MAC Address	00-05-A6-14-4B-52
Model Name	IPCP Pro 550
Firmware Version	3.00.0000-b020
API Version	2.9.25
Serial Number	A1QP304
User Usage (KBytes)	35680 out of 3864064
Up Time (days/hrs/mins/secs)	03:15:46

Program Information	
Device Name	IPCP Pro 550 : 192.168.10.17
Software Version	3.0.0.1205
File Loaded	TLP_1022M_Main_081818_1.4.gs
Last Updated	8/15/2018 2:17:12 PM
Author	another

The Device Information page gives a summary of information on the selected device.

**NOTE:** This page is read only.

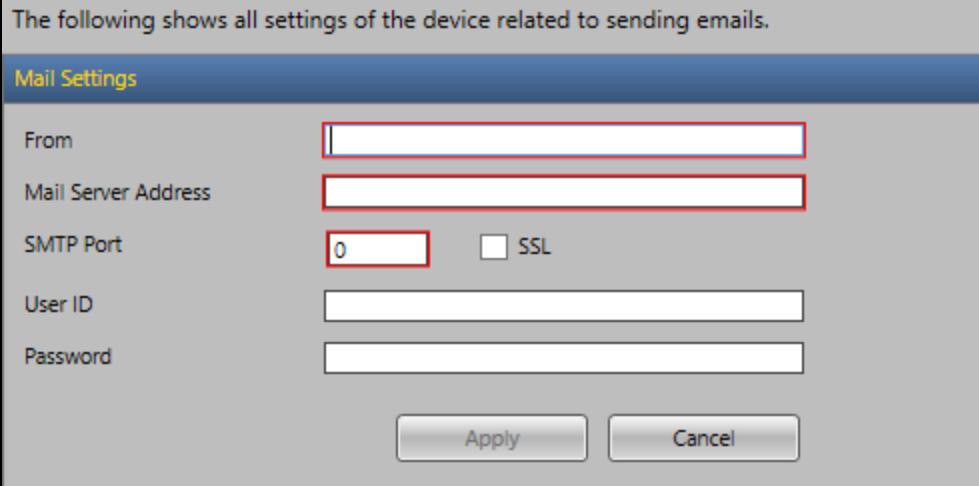
## Mail Settings

The following shows all settings of the device related to sending emails.

**Mail Settings**

From	<input type="text"/>
Mail Server Address	<input type="text"/>
SMTP Port	<input type="text" value="0"/> <input type="checkbox"/> SSL
User ID	<input type="text"/>
Password	<input type="text"/>

**Apply** **Cancel**



The Mail Settings page shows the mail SMTP settings for the device, and allows the user to configure them as needed.

### Configuring the Mail Server Settings

1. Click in the **Mail Server Address** field and complete the applicable details for your mail server as needed.
2. In the **SMTP Port** field enter the applicable port number.
3. Select **SSL** as desired.
4. If required, fill in the **User ID** field.
5. If required, fill in the **Password** field. Contact the system administrator to verify password usage.
6. Click **Apply** to update the system with the details, or click **Cancel** to exit without saving any changes.

## User Management

The following shows the login credentials on the device.

**Accounts**

Admin	User
Current Password <input type="password"/>	Current Password <input type="password"/>
New Password <input type="password"/>	New Password <input type="password"/>
Confirm Password <input type="password"/>	Confirm Password <input type="password"/>
<b>Admin password must have minimum length of 1 character</b>	
<input type="button" value="Change Password"/>	

The User Management page show the account log-in credentials for the selected device. It also allows an administrator to set and change the admin and user passwords.

**NOTE:** The default administrator account user name is "admin", and the default administrator password is "extron".

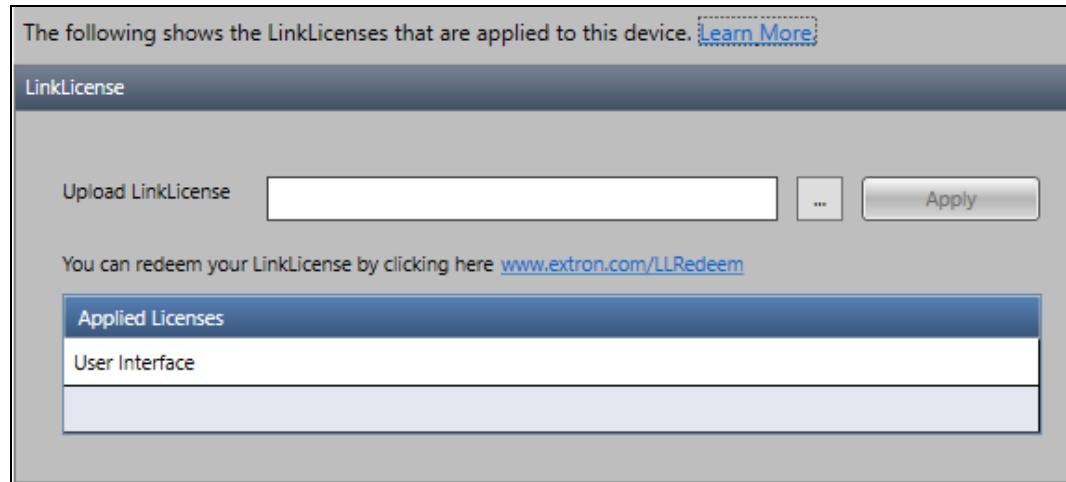
The default user account user name is "user", and the user password is left blank. All user names and passwords should be entered initially in lowercase letters.

### Changing Account Settings

1. Enter the new admin or user password.
2. Enter it again in the **Confirm Password** field.
3. Click **Change Password** for the new password to take effect.

**NOTE:** A User Password cannot be set unless an Admin Password already exists.

## LinkLicense™



The LinkLicense page shows the license details for your installation of Global Scripter. Applying a LinkLicense to your controller allows you to run Extron Control without a physical touchpanel.

**NOTE:** If you don't have a LinkLicense file yet, you may redeem your LinkLicense at [www.extron.com/liredeem](http://www.extron.com/liredeem).

### Applying a LinkLicense

1. Browse to the location where the license details are saved.
2. Click **Apply**.

## Utilities

The Utilities page provides tools for troubleshooting the device such as **Proxy Ping**, **Reset**, **Reboot**, and **Enter Setup** (only available for TouchLink Pro devices). It also allows the user to view and upload Security Sockets Layer (SSL) certificates to a managed device.

**Proxy Ping**

IP Address:  Ping Clear

**System Commands**

Reset: This action will remove all user loaded files and reset the device settings while maintaining IP settings and user accounts.

Reboot: This action will perform a reboot of the device.

**SSL Certificate**

View and upload SSL certificates

Browse:  ... Apply

Passphrase:

Property	Value
Valid From	1/27/2002 12:10:20 PM
Valid To	6/13/2029 1:10:20 PM
Thumbprint	9F096942A2BF7E5487C6E339CA88D0AE7DE67CE7
Thumbprint Algorithm	sha1
Signature Algorithm	sha256RSA
Version	3
Serial Number	00BA059D570046FF4E
Email	"sales-usa@extron.com"
Common Name	IPLP
Organization Unit	ControlSystems
Organization	ExtronElectronics
Locality	Anaheim
State	CA
Country	US

The Utilities page provides tools for troubleshooting the device such as **Proxy Ping**, **Reset**, **Reboot**, and **Enter Setup** (only available for TouchLink Pro devices). It also allows the user to view and upload Security Sockets Layer (SSL) certificates to a managed device.

### Using the Utilities

#### Proxy Ping

Proxy Ping allows tests the network connectivity between the controller and another network device.

To test network connectivity, enter an IP address of a network device and click **Ping**. The controller pings that device.

### ***Clear***

Click **Clear** to clear any previously returned information from Proxy Ping.

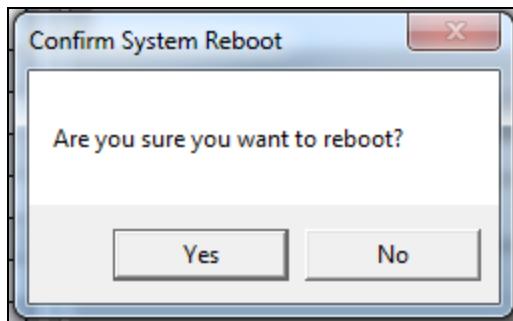
### ***Reset***

To reset the device click the **Reset** button. This removes all user loaded files and resets the device settings, but keeps the IP settings and user account settings.

**NOTE:** Use the **Reset** option with caution.

### ***Reboot***

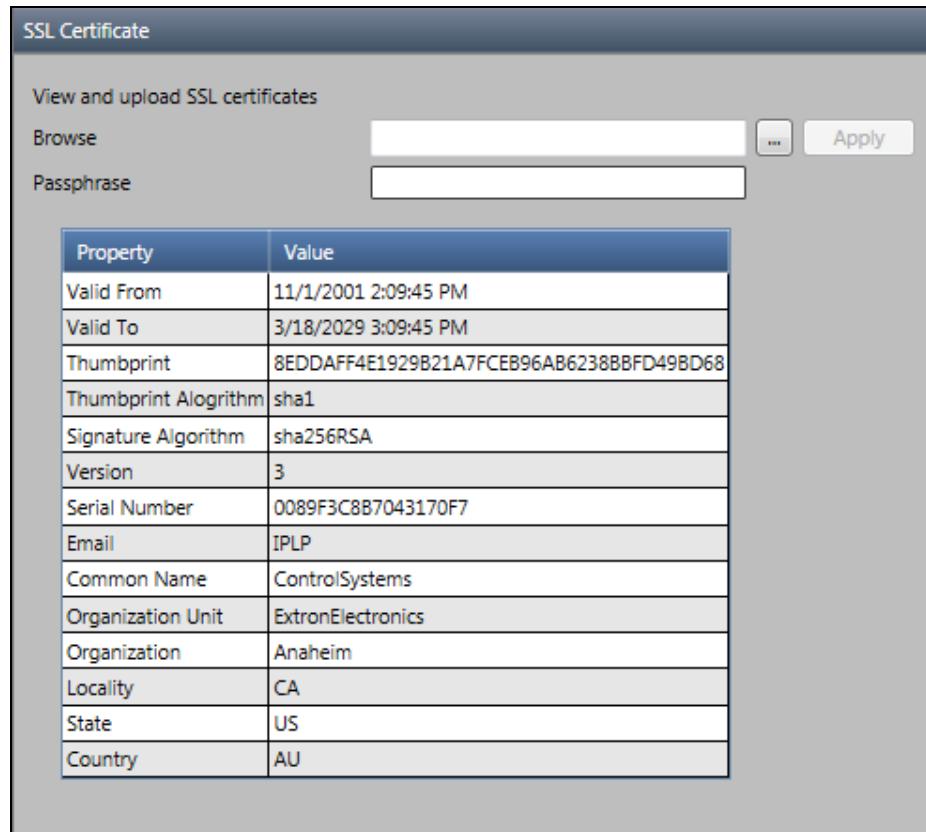
To reboot the device, click the **Reboot** button. A confirmation dialog box opens.



Click **Yes** to reboot the device, or click **No** to cancel without rebooting the device.

### ***Secure Sockets Layer (SSL) Certificates***

The SSL Certificate option allows the user to view and upload SSL certificates for the selected device.



#### To apply an SSL to the device:

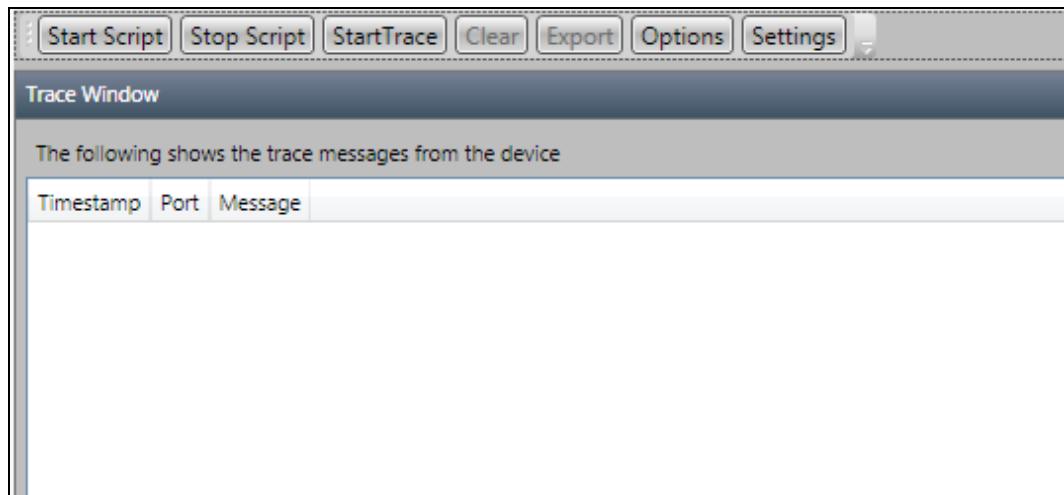
1. In the SSL Certificate pane, click on the **Browse** button, and browse to the location where the SSL certificates are saved.
2. Select the applicable certificate and click **Open**.
3. If required, in the **Passphrase** field, type in the pass phrase for the selected SSL certificate.

**NOTE:** If a pass phrase is required but not entered, or is entered incorrectly, an error message appears.

4. Click **Apply**. If the application of the SSL Certificate is successful, a confirmation notification appears.
5. Click **OK**.

**NOTE:** If the application of the new or updated SSL Certificate is not successful, a notification appears. Click **OK**, then check that the right file is selected, and repeat steps 1-3.

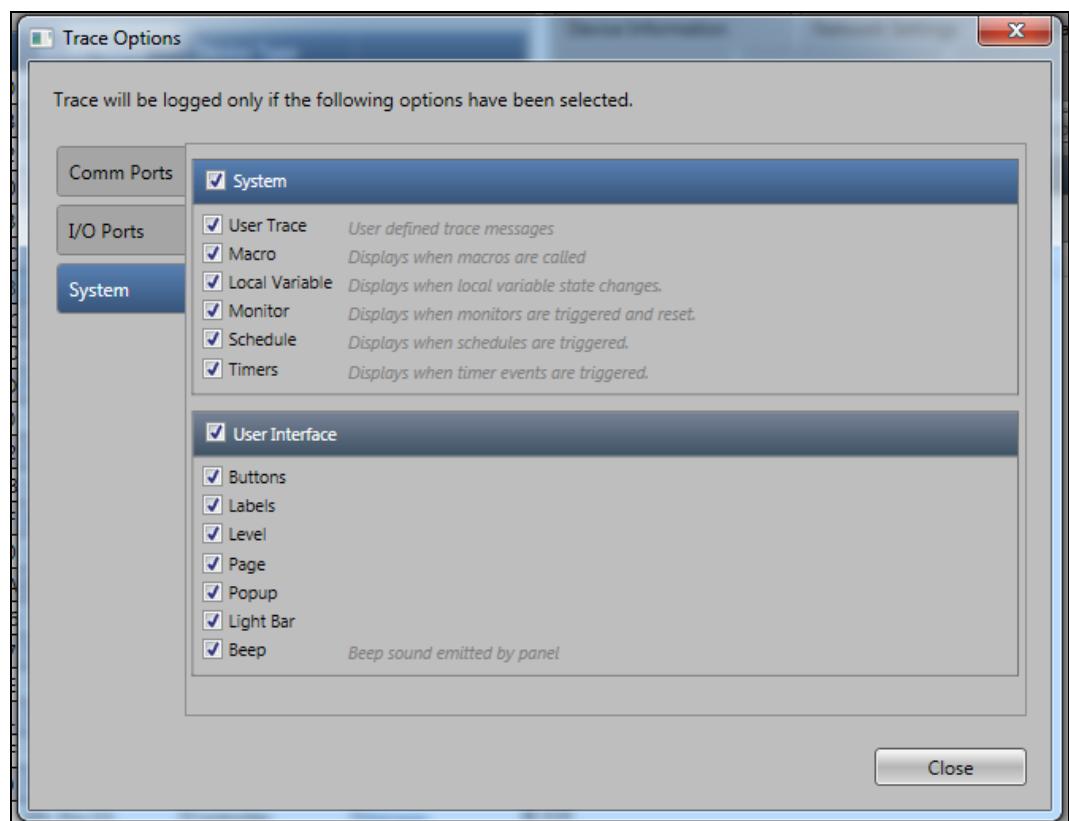
## Trace Window



The Trace Window page shows trace message from the selected device.

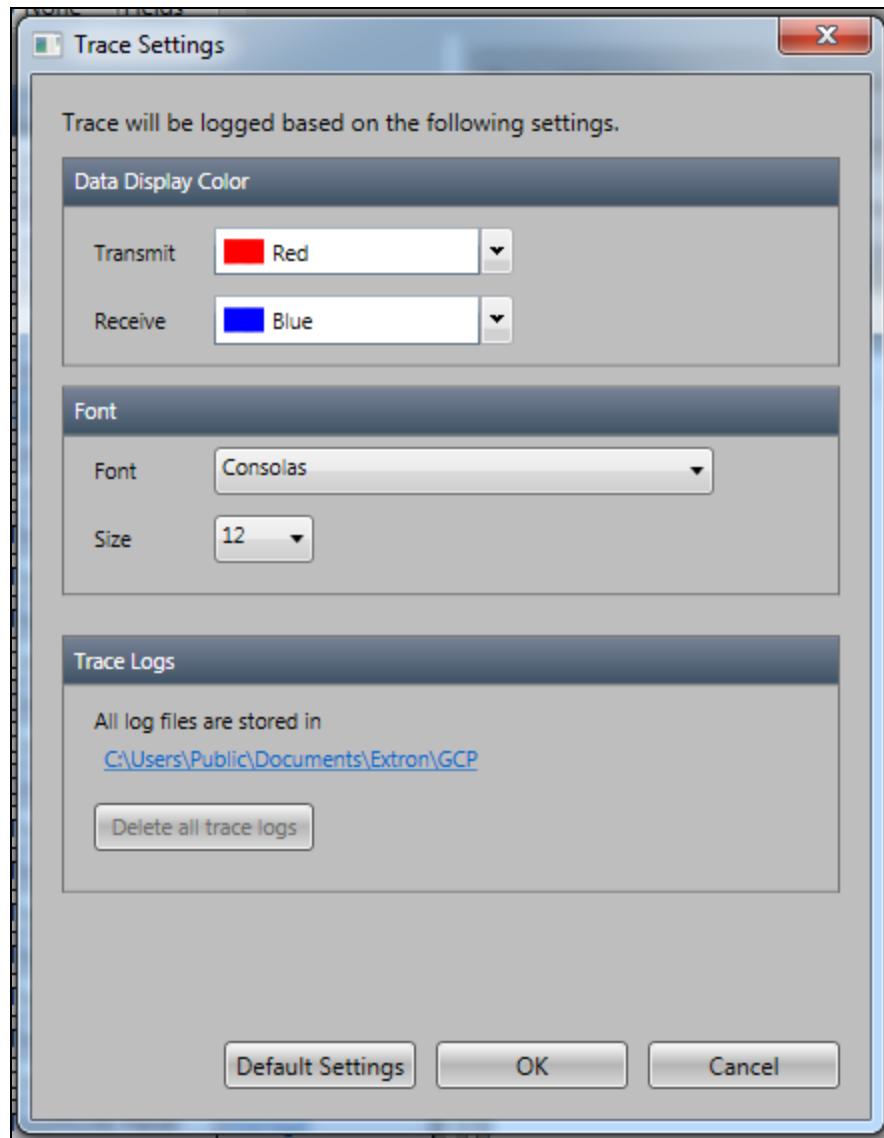
### Using the Trace Window

1. Click **Options** and set the options for the trace messages. This includes comm ports and system settings.



Select the desired options.

2. Click **Settings** and set the color and font settings for the trace messages.



3. Click **Start Trace** to run the trace logging. The button changes to **StopTrace**.
4. Click **Start Script** to run a script in the trace logging.
5. Click **Stop Script** to stop the script.
6. Click **Stop Trace** to stop the trace logging.
7. Click **Clear** to clear any recorded trace log.
8. Click **Export** to export the log to a saved file.

## Firmware Uploader

From the Toolbelt >Tools menu, Firmware Uploader allows the user to update the firmware for a single device or for multiple devices simultaneously.

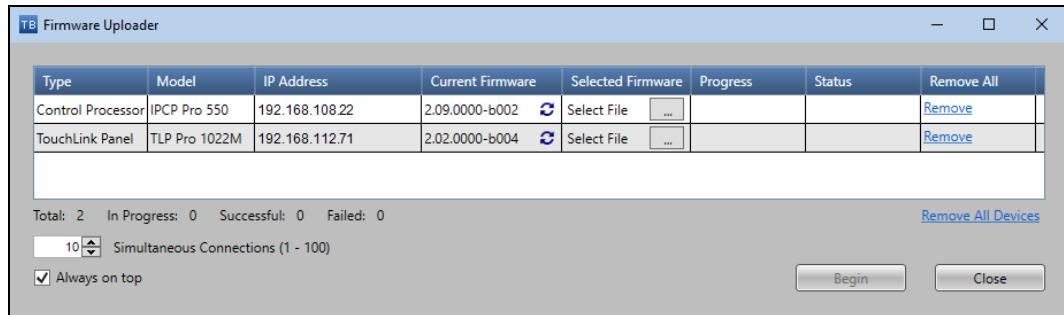
## Updating the Firmware

1. In the main Toolbelt window, click **Tools>Firmware Uploader**.... This opens the **Firmware Uploader** window, a non modal window that allows users to queue devices for firmware updating. Users are still able to perform other tasks in Toolbelt with devices not in the firmware update queue. If the selected device is in Manage mode, the user will be asked if they wish to remove the device from the Manage mode.

### NOTES:



- Alternatively, click on the shortcut icon in the Actions field of any applicable product, to open the **Firmware Uploader** window and initiate firmware updating for that selected product.
- AV LAN devices must be **discovered**, before they can be added to a **Firmware Uploader** queue.



2. Download the latest device firmware from the Extron website and save to the connected PC.
3. Click the browse button and browse to location where the firmware update file has been saved.
4. Navigate to and select the applicable firmware file and click **Open**. The **Firmware Uploader** window populates with the selected firmware.
5. Click **Begin**. **Firmware Uploader** begins to upload the selected firmware to the selected device(s).

The update process goes through the following states:

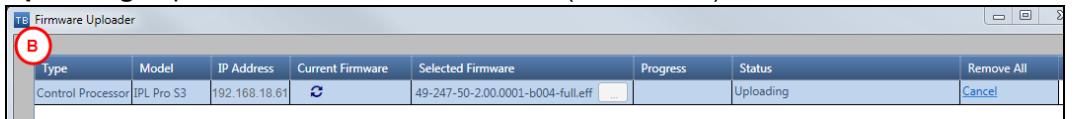
- **Idle** — no upload taking place, **Remove** available (see A below)



The screenshot shows a table with columns: Type, Model, IP Address, Current Firmware, Selected Firmware, Progress, Status, and Remove All. A red circle labeled 'A' highlights the 'Status' column for the first row, which contains 'Control Processor', 'IPL Pro S3', '192.168.18.61', '1.05.0001-b001', '49-247-50-2.00.0001-b004-full.eff', an empty progress bar, 'Idle', and a 'Remove' button.

Type	Model	IP Address	Current Firmware	Selected Firmware	Progress	Status	Remove All
Control Processor	IPL Pro S3	192.168.18.61	1.05.0001-b001	49-247-50-2.00.0001-b004-full.eff		Idle	Remove

- **Uploading** — pre-installation, **Cancel** available (see B below)



The screenshot shows a table with columns: Type, Model, IP Address, Current Firmware, Selected Firmware, Progress, Status, and Remove All. A red circle labeled 'B' highlights the 'Status' column for the first row, which contains 'Control Processor', 'IPL Pro S3', '192.168.18.61', '1.05.0001-b001', '49-247-50-2.00.0001-b004-full.eff', an empty progress bar, 'Uploading', and a 'Cancel' button.

Type	Model	IP Address	Current Firmware	Selected Firmware	Progress	Status	Remove All
Control Processor	IPL Pro S3	192.168.18.61	1.05.0001-b001	49-247-50-2.00.0001-b004-full.eff		Uploading	Cancel

- **Verification** — start of installation, Cancel not available (see C below)



The screenshot shows a table with columns: Type, Model, IP Address, Current Firmware, Selected Firmware, Progress, Status, and Remove All. A red circle labeled 'C' highlights the 'Status' column for the first row, which contains 'Control Processor', 'IPL Pro S3', '192.168.18.61', '1.05.0001-b001', '49-247-50-2.00.0001-b004-full.eff', an empty progress bar, 'Verifying', and a 'Cancel' button.

Type	Model	IP Address	Current Firmware	Selected Firmware	Progress	Status	Remove All
Control Processor	IPL Pro S3	192.168.18.61	1.05.0001-b001	49-247-50-2.00.0001-b004-full.eff		5% 	Verifying

- **Installation** — installing selected firmware version on device, Cancel not available (see D below)



The screenshot shows a table with columns: Type, Model, IP Address, Current Firmware, Selected Firmware, Progress, Status, and Remove All. A red circle labeled 'D' highlights the 'Status' column for the first row, which contains 'Control Processor', 'IPL Pro S3', '192.168.18.61', '1.05.0001-b001', '49-247-50-2.00.0001-b004-full.eff', a progress bar at 50%, 'Installing', and a 'Cancel' button.

Type	Model	IP Address	Current Firmware	Selected Firmware	Progress	Status	Remove All
Control Processor	IPL Pro S3	192.168.18.61	1.05.0001-b001	49-247-50-2.00.0001-b004-full.eff	50% 	Installing	Cancel

- **Completion** — firmware upload successful, **Remove** available (see E below)

#### NOTES:

- During the pre-installation stages (see A and B above), the user can cancel the process by clicking on **Remove** or **Cancel**, within the **Remove All** column.
- Once installation has begun (see C-D above) the updating process is "active", and the **Cancel** option is unavailable. Once started the firmware installation must be allowed to go to completion.
- Devices cannot be added to the firmware update list once the update process has begun (see C-D)
- **Remove** — Individual devices can be removed from the firmware queue by clicking **Remove**. The removal of any device can **only** be done before firmware upload has started (see A), or after the whole firmware update process is completed (see E above).
- **Remove All** — Alternatively, to remove all the devices at the same time, either click **Remove All** at the top of the list, or click the **Remove All Devices** link below the queue. A **confirmation to remove all devices** opens. The **Remove All** and **Remove All Devices** links are only active when all devices in the firmware queue are **not** in the updating process.

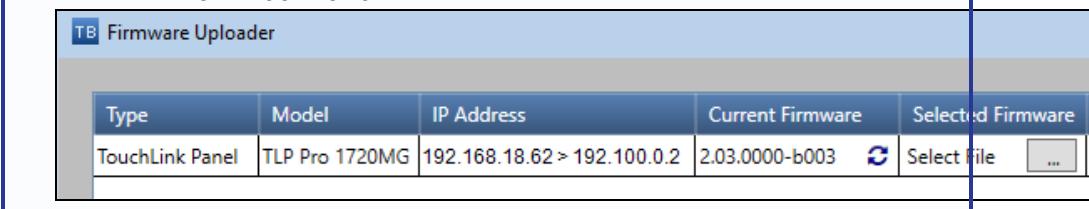
6. When the update process is complete, "remove" the successful devices from the queue. Note any unsuccessful process error messages, such as "device unreachable" in the case of a disconnected device. In this case, reconnect the device, enter the correct credentials, and reattempt the upload.
7. After removing all devices from the queue, click **Close**. The Firmware Uploader window close

## Firmware Uploader window details.

### Columns

- **Type** — shows the device type (for example, Control Processor, TouchLink Panel, or MediaLink Plus Controller)
- **Model** — shows the model (for example, IPCP Pro 550, TLP Pro 1022M, MLC Plus 200)
- **IP Address** — displays the device IP address

**NOTE:** If the selected device is on an AV LAN network, the IP address displays the DUAL NIC controllers LAN IP address of the [[[Undefined variable MyVariables.exDUALNIC]]] first, then the selected devices AV LAN address. In the example shown below, a TLP Pro 1720MG with AV LAN IP address 192.100.0.2 is connected, via the controller AV LAN port, to a DUAL NIC controller[[[Undefined variable MyVariables.exDUALNIC]]] having a LAN address of 192.168.18.62.



Firmware Uploader				
Type	Model	IP Address	Current Firmware	Selected Firmware
TouchLink Panel	TLP Pro 1720MG	192.168.18.62 > 192.100.0.2	2.03.0000-b003	  

- **Current Firmware** — displays the current firmware of the device. After updating, this can be refreshed (click the refresh button) to verify the upload was successful.
- **Selected Firmware** — This contains a browse button. Click this to initiate searching for the new firmware. After selection, it displays the firmware version that is to be uploaded to the device.
- **Progress** — displays the percentage progress of the active firmware update for each device.
- **Status** — gives the current status of the process (for example, Uploading, Verifying, Installing).
- **Remove All** — a user action column that allow the user to cancel the process or to remove devices from the list.

### Other Features

#### Firmware statistics

- **Total** — shows the total number of devices in the firmware queue to be updated.
- **In Progress** — shows the number of updates currently in progress.
- **Successful** — shows the number of successful device updates.
- **Failed** — shows the number of failed device updates.

#### Simultaneous Connections

- **Simultaneous Connections** — shows the number of simultaneous connections (1-100, default is 10) in operation. See [Simultaneous Connections](#) section for more details.

#### Always on top check box

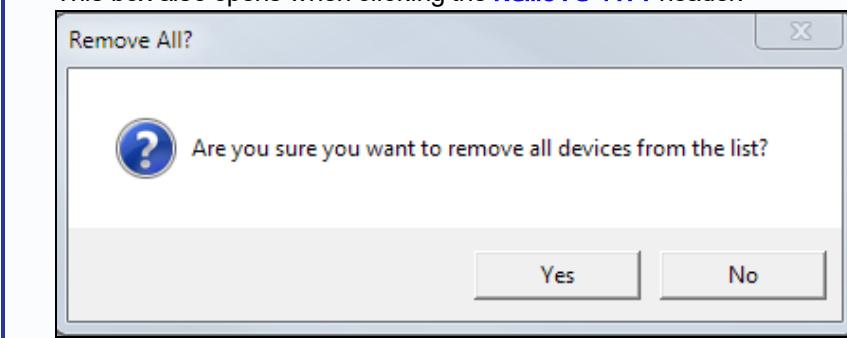
- **Always on top** check box — select this check box to keep the Firmware Uploader window on top of all other open windows. This is the default setting. Deselect this if you do not wish to have the Firmware Uploader window on top of all open windows.

#### Remove All Devices link

- **Remove All Devices** link — select this link to remove all the devices from the queue. The **Remove All Devices** link is only active when all devices in the firmware queue are not in the updating process.

**NOTE:** When clicking **Remove All Devices**, a confirmation dialog box opens.

Click **Yes** to remove all devices, or **No** to leave all devices in the queue.  
This box also opens when clicking the **Remove All** header.

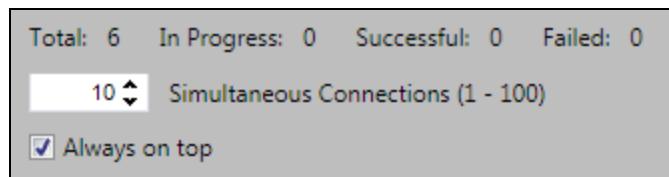


#### Buttons

- **Begin** button — click **Begin** to start the update. The button is disabled until firmware is selected for all devices in the queue. After the update has started, the button changes to **Cancel**.
- **Cancel** button — click **Cancel** to cancel any remaining devices that have not yet finished firmware upload process (see **A** and **B** below). The **Cancel** button becomes **Begin** after the firmware update process has finished.
- **Close** button — click **Close** to close the Firmware Uploader window. If closed during device firmware updating, it can be reopened by selecting **Tools** then **Firmware Uploader**....

### Simultaneous Connections

At the bottom left of the **Firmware Uploader** window is the **Simultaneous Connection** field. This shows the number of device that can be updated simultaneously, ranging from 1-100 (default is 10).



By directly entering a number or using the up and down arrows, this field can be changed at any time during the updating process. This allows the user to increase or decrease the number of devices being updated at the same time.

**NOTE:** If you are experiencing poor network quality, low bandwidth, or slow systems, it may affect the maximum number of devices that you can simultaneously update to successfully. You may receive error messages such as "device unreachable" during the update operation. To remedy this, try adjusting the number of devices as needed, to find the optimum number for your system, network, and installation.

Any changes made by the user to the **Simultaneous Connections** are saved and reloaded the next time **Firmware Uploader** is opened or used.

# Troubleshooting

## Minimum Firmware Requirements Not Met

**Reason:** The device does not have the required minimum firmware.

The device must have minimum firmware for Global Scripter to build and upload to it.

### *How to Resolve:*

#### **Primary Controller minimum firmware not met:**

- a. Update the Primary Controller firmware to the latest version (via Global Scripter or Toolbelt). Refer to the Firmware Upgrader section in the relevant Help file.
- b. Perform another **Build and Upload**

#### **Secondary controller or touchpanel minimum firmware not met:**

- a. Update the Secondary controller or touchpanel firmware to the latest version (via Global Scripter or Toolbelt). See the **Firmware Upgrader** section in the relevant Help file.
- b. Perform another **Build and Upload**

## Minimum Firmware Requirements Not Met to Support Sliders Feature

**Reason:** Device does not have minimum firmware version required to support the Sliders feature

The device must have minimum firmware for the Sliders feature to function correctly, when Global Scripter builds and uploads to the device.

### *How to Resolve:*

#### **Primary Controller minimum firmware for Sliders not met:**

- a. Update the Primary Controller firmware to the latest version (via Global Scripter or Toolbelt). Refer to the Firmware Upgrader section in the relevant Help file.
- b. Perform another **Build and Upload**

#### **Secondary controller or touchpanel minimum firmware not met:**

- a. Update the Secondary controller or touchpanel firmware to the latest version (via Global Scripter or Toolbelt). See the **Firmware Upgrader** section in the relevant Help file.
- b. Perform another **Build and Upload**

## Hardware Not Found

**Reason:** The device at the specified address cannot be found on the network.

For the system to work properly, all hardware must be cabled, correctly addressed, online and reachable on the network. Global Scripter cannot build and upload to a device unless it is online and reachable on the network.

### How to Resolve

**Primary Controller not found:**

- Check connections, and when the Primary Controller is back online and reachable, perform another [Build and Upload](#)

**Secondary controller or touchpanel not found:**

**Either:**

- Check connections, and when the secondary controller or touchpanel is back online and reachable, perform another [Build and Upload](#)

**or**

- Manually [pair](#) the device with the Primary Controller and perform a [Build and Upload](#)

## Incorrect Login Credentials

**Reason:** Device's specified credentials (username and password) are incorrect.

### How to Resolve

**Primary Controller incorrect credentials:**

- Correct the credentials for the Primary Controller, then perform another [Build and Upload](#)

**Secondary controller or touchpanel incorrect credentials:**

**Either:**

- Correct the credentials for the secondary controller or touchpanel, then perform another [Build and Upload](#)

**or**

- Manually [pair](#) the secondary controller or touchpanel with the Primary Controller using the Primary Controller address and the [System ID](#) in Toolbelt.

## Hardware Mismatch

**Reason:** The configured model does not match the live model.

*For example:* Configured device is an IPCP Pro 250, but live device is an IPCP Pro 550.

### **How to Resolve:**

- Connect the configured device to the Primary Controller and perform a **Build and Upload**

## **Incompatible Hardware**

**Reason:** The configured model is not compatible with the live model.

*For example:* Configured device is an IPCP Pro 250, but live device found is TLP Pro 720T.

### **How to Resolve:**

**Either:**

- a. Correct the configured model type
- b. Perform another **Build and Upload**

**or**

- Manually **pair** the secondary controller or touchpanel with the Primary Controller using Toolbelt (see the System tab section in the *Toolbelt Help File* on how to pair)

# Appendix

## Controller Ports

The following chart shows the available port types for each controller model.

Controller Model	Serial	IR	IR/ Serial	Relay	Digital Input	Digital I/O	Flex I/O	Switched Power	Contact Input	Volume Control
IPL Pro S1	1	0	0	0	0	0	0	0	0	0
IPL Pro S3	3	0	0	0	0	0	0	0	0	0
IPL Pro S6	6	0	0	0	0	0	0	0	0	0
IPL Pro CR88	0	0	0	8	0	0	0	0	8	0
IPL Pro IRS8	0	0	8	0	0	0	0	0	0	0
IPL Pro 250	2	0	1	2	0	4	0	0	0	1
IPCP Pro 350	3	0	2	4	0	4	0	0	0	0
IPCP Pro 550	8	0	8	8	0	0	4	4	0	0
IPCP Pro 555	8	0	8	8	0	0	4	4	0	0

## Keyboard Shortcuts and Navigation

### Hot Keys

Keyboard shortcuts (Hot Keys) available in Global Scripter are described below. These keyboard shortcuts achieve the same commands as those which can be accessed through any of the application menus.

**NOTE:** General and F-Hot Keys trigger the associated command from anywhere within the application.

### F-keys

Hot Key	Command/Action
F1	Launch Global Scripter Help File
F2	Next Bookmark
[Shift]+F2	Previous Bookmark
[Ctrl]+F2	Toggle Bookmark
[Alt]+F2	Next Bookmark in Project

<b>Hot Key</b>	<b>Command/Action</b>
[Ctrl]-[Shift]+F2	Clear Bookmarks in file
[Alt][Shift]+F2	Previous Bookmark in Project
F3	Find Next
[Shift]+F3	Find Previous
[Alt]+F4	Shut Down Global Scripter
[Ctrl]+F5	Start Debugging
F5	Continue Debugging
F7	Build and Upload All
F9	Toggle Breakpoint

### **Code Editor hot keys**

<b>Hot Key</b>	<b>Command/Action</b>
[Ctrl]+A	Select All
[Ctrl]+C	Copy
[Ctrl]+F	Find
[Ctrl]+G	Go to Line
[Ctrl]+H	Replace
[Ctrl]+K	Comment
[Ctrl][Alt]+K	Uncomment
[Ctrl]+N	New Project
[Ctrl]+O	Open Project
[Ctrl]+S	Save
[Ctrl][Shift]+S	Save As...
[Ctrl]+T	Build & Upload Code
[Ctrl]+U	lowercase
[Ctrl][Shift]+U	UPPERCASE
[Ctrl][Alt]+U	Title Case
[Ctrl]+V	Paste
[Ctrl]+W	Close Code File
[Ctrl]+X	Cut
[Ctrl]+Y	Redo
[Ctrl]+Z	Undo

### ***Navigation hot keys (within Code Editor)***

<b>Hot Key</b>	<b>Command/Action</b>
TAB	Increase Indent
[Shift]+TAB	Decrease Indent
Delete	Delete Selected Text
Home	Go to Start of Line
[Shift]+Home	Move Selection Mark to Start of Line
[Ctrl]+Home	Go to Start of File
End	Go to End of Line
[Shift]+End	Move Selection Mark to End of Line
[Ctrl]+End	Go to End of File
Page Up	Page Up
[Shift]+Page Up	Move Selection mark 1 Page Up
Page Down	Page Down
[Shift]+Page Down	Move Selection Mark 1 Page Down
Arrow	Move Cursor Position Up/Down/Left/Right
[Shift]+Arrow	Move Selection Mark Up/Down/Left/Right
[Ctrl]+Up/Down Arrow	Scroll Window 1 Line Up/Down
[Ctrl]+Left/Right Arrow	Move Cursor 1 Word Left/Right
[Ctrl][Shift]+Up/Down Arrow	Move Line 1 Line Up/Down
[Ctrl][Shift]+Left/Right Arrow	Move Selection Mark 1 Word Left/Right
[Alt][Shift]+Arrow	Column Select Up/Down/Left/Right

### **Licensed Third-Party Software used in Global Scripter (Within Code Editor)**

The following table lists the licensed third-party software libraries used by Global Scripter.

<b>Library</b>	<b>License</b>
Avalon Edit	MIT License
SSH.NET	New BSD License
Extended WPF Toolkit	Microsoft Public License
MVVM Light Toolkit	MIT License

# Glossary

<b>Address Resolution Protocol (ARP)</b>	A protocol for assigning an IP address to a device based on the device MAC (Media Access Control) address or physical machine address, that maintains a table showing the correlation between the two.
<b>Build</b>	As it pertains to Global Scripter, the term "build" signifies to compile a Global Scripter project file so that it can be uploaded to and used by an IP Link Pro Controller.
<b>Contact Input</b>	Contact Input ports can receive 0 to 5 VDC TTL input signals from devices such as screens, timers, lights, and motion sensors in order to track the status of such devices.
<b>ControlScript</b>	The Extron implementation of the Python 3 language and Extron proprietary Python libraries.
<b>Controller</b>	The element of an AV system that manages the other devices in the system.
<b>Controller Group</b>	Multiple IP Link Pro controllers can be added to a location in order to add more hardware ports to a system.
<b>Control processor with an AV LAN port</b>	An IPCP Pro Controller with a LAN and one or more AV LAN ports. The LAN port typically connects to the corporate or end-user network and the AV LAN connects to a separate physical network for AV devices that the end-user does not want placed on the corporate network.
<b>Data Bits</b>	The number of bits used to represent one character of data in serial communication. Data bits can either be 7 or 8, but most devices use 8.
<b>Default Web Pages</b>	To access the default web pages, prior to having uploaded a Global Scripter file to the controller, open an Internet browser on the same network as the controller and enter the IP address of the controller in the Address field of the browser.  To access the default web pages, after having uploaded a Global Scripter file to the controller, open an Internet browser and, in the Address field, enter <a href="http://&lt;IPaddress&gt;/nortxe_index.html">http://&lt;IPaddress&gt;/nortxe_index.html</a> .

<b>Deploy Mode</b>	The layout for Unlicensed Users of Global Scripter. Deploy Mode allows GS projects to be deployed, System Reports to be generated, and basic diagnostic functions to be performed while deploying GS projects. Licensed Users can switch to Deploy Mode to help support Unlicensed Users without changing their account settings.
<b>Developer Mode</b>	The default layout for Global Scripter and Licensed Users. Developer Mode allows for the creation, editing, deployment, and debugging of Global Scripter projects.
<b>DHCP</b>	Dynamic Host Configuration Protocol. A standardized client-server IP networking protocol that enables network administrators to centrally and automatically manage the assignment of IP addresses to devices in an organization's network.
<b>Digital I/O</b>	Digital I/O ports can be configured as a digital input, digital input with pullup, digital output, or digital output with pullup.
<b>Dynamic IP Address</b>	An IP address that is automatically assigned to a client station in a TCP/IP network, typically by a DHCP server. Network devices that serve multiple users, such as servers and printers, are usually assigned static (unchanging) IP addresses.
<b>Ethernet</b>	A Local Area Network (LAN) standard officially known as IEEE 802.3, Ethernet and LAN technologies are used for interconnecting computers, printers, workstations, terminals, servers, and such, within the same building or campus. Ethernet operates over twisted pair and over coaxial cable at speeds starting at 10 Mbps. For LAN interconnectivity, Ethernet is a physical link and data link protocol reflecting the two lowest layers of the OSI Reference Model.
<b>Firmware</b>	Fixed, typically small, program that internally controls electronic devices. Firmware is responsible for telling the hardware how to respond to higher level programs.
<b>Flex I/O</b>	Flex I/O ports allow IP Link controllers to accept an input voltage and then send out a serial command or trigger another event. These ports can be configured as analog in, digital in, or digital out and can interface with a variety of devices such as sensors, switches, LEDs, and relays.
<b>Global Configurator</b>	Global Configurator is a configuration software for advanced configurable control systems. Global Configurator is ideal for Pro based control systems requiring enhanced functionality and advanced configuration.

<b>Global Scripter</b>	Global Scripter is an Integrated Development Environment for programming advanced control systems. Global Scripter is ideal for systems that require complex logic or advanced capabilities that may be difficult in the context of a configured control system.
<b>GUI</b>	Graphical User Interface. GUIs are seen in computer applications, websites, and touchpanel interfaces.
<b>GUI Designer</b>	A software application used for the design, creation, and maintenance of Extron TouchLink Pro user interfaces.
<b>Host Name</b>	This is a unique name by which a device is known on a network. It identifies a particular host in electronic communication.
<b>Hot Key</b>	A hot key is a keyboard sequence that can be used as a shortcut to launch a task within an application such as Global Scripter.
<b>HTML</b>	Hypertext Markup Language. A formatting computer language used to create web pages.
<b>HTTP</b>	HyperText Transfer Protocol. A web protocol based on TCP/IP that is used to retrieve hypertext objects from remote web pages.
<b>I/O</b>	Input/Output. Refers to the flow of information or signals (in or out) with respect to a particular device.
<b>IEEE</b>	Institute of Electrical and Electronic Engineers. The IEEE is an industry organization that undertakes the development of standards for electronic interfaces, wireless and wired networks, and related technologies.
<b>IEEE 802.11</b>	The Institute for Electrical and Electronics Engineers standard for wireless Ethernet networks. IEEE 802.11 applies to wireless LANs and provides 1 or 2 Mbps transmission in the 2.4 GHz band using either frequency hopping spread spectrum (FHSS) or direct sequence spread spectrum (DSSS).
<b>IEEE 802.3</b>	The Institute for Electrical and Electronics Engineers standard for Ethernet networks.
<b>Infrared Control</b>	A wireless medium of remote control, which sends signals to a device via pulses, transmitted in the infrared light spectrum. Its use is restricted to equipment within line-of-sight or reflections off a wall or ceiling. This is sometimes called IR remote.

<b>IP</b>	Internet Protocol. Internet Protocol defines addressing methods and structures for datagram encapsulation allowing delivery of packets from a source to a destination based purely on addressing.
<b>IP Address</b>	A unique, 32-bit binary number (12-digit decimal number — xxx. xxx.xxx.xxx) based on version 4 of the Internet Protocol (IPv4) that identifies each sender and each receiver of information connected to a LAN, WAN, or the Internet. IP addresses can be static (see <b>Static IP Address</b> ) or dynamic (see <b>DHCP</b> ).
<b>IP Link Pro</b>	IP Link Pro technology is the Extron high performance IP integration technology specifically engineered to meet the needs of professional AV environments.
<b>IR Learning</b>	The ability of a device to receive and store infrared commands for other devices, such as a projector. Each command is assigned to a system operation (such as selecting an input). When an operation is executed, the associated (learned) command is then transmitted through an IR emitter or broadcaster to the projector, where it is executed. For example, if input 3 is S-video, selecting that input also sends a signal to the projector to switch to S-video mode.
<b>IR Library</b>	Sets of infrared commands for video projectors are available at <a href="http://www.extron.com">www.extron.com</a> .
<b>LAN</b>	Local Area Network. Supplies networking capability to a group of IP-enabled devices in close proximity to each other such as in an office building, a school, or a home. A LAN is useful for sharing resources like files, printers, games, or other applications. A LAN, in turn, often connects to other LANs and to the Internet or other WAN.
<b>Local Variable</b>	This is a user-defined variable that can be used to track a state within a controller or controller group in Global Configurator Pro.
<b>MAC Address</b>	Media Access Control. A unique hardware number given to devices that connect to the Internet. When your computer or networking device (such as a router, hub, or interface) is connected to the Internet, a table (see "ARP") relates the IP address of the device to its corresponding physical (MAC) address on the LAN.
<b>Parity (or Parity Checking)</b>	An error detection technique that tests the integrity of the digital data being sent. Parity can be set to None, Even, Odd, Mark, or Space in serial communication.

<b>PING</b>	This command is used to test connectivity between IP devices. The Internet Control Message Protocol (ICMP) echoes Ethernet packets to determine whether a network device is active and what the bidirectional delay is in communicating with it.
<b>PoE</b>	Power-Over-Ethernet. A standard (IEEE 802.3af) that provides power to network devices by utilizing the existing Ethernet connection, thereby eliminating the need for additional, external power supplies.
<b>Port</b>	A connection for an input or output device. Typical ports found on a computer include serial, parallel, USB, disk drive, video, and keyboard ports.
<b>Port Number</b>	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.
<b>Relay</b>	A device that acts like a switch and is controlled by a current. The relay switch opens or closes to control another circuit to pass a signal. Most relays are either solid state or electromagnetic.
<b>RS-232</b>	An Electronic Industries Association (EIA) serial digital interface standard specifying the characteristics of the communication path between two devices using either DB-9 or DB-25 connectors. This standard is used for relatively short-range communications and does not specify balanced control lines. RS-232 is a serial control standard with a set number of conductors, data rate, word length, and type of connector to be used. The standard specifies component connection standards with regard to the computer interface. It is also called RS-232-C, which is the third version of the RS-232 standard, and is functionally identical to the CCITT V.24 standard.
<b>RS-422</b>	An EIA serial digital interface standard that specifies the electrical characteristics of balanced (differential) voltage, digital interface circuits. This standard is usable over longer distances than RS-232. This signal governs the asynchronous transmission of computer data at speeds of up to 920,000 bits per second.
<b>RS-485</b>	An EIA standard for multipoint communications. It is similar to RS-422, but can support several nodes per line because it uses lower impedance drivers and receivers and allows for addressing.

<b>Serial Data</b>	A way to transfer information by breaking the characters of a word into bits, which are then transmitted sequentially along a single line. Compare to parallel, which uses more than one line.
<b>Serial Port</b>	An input/output connection on a device that allows it to communicate with other devices in a serial fashion with data bits flowing on a single pair of wires.
<b>Simple Instruction Set (SIS™)</b>	A set of commands developed by Extron that allows RS-232/USB/IP(Telnet) control of certain Extron products with a minimal number of characters in the commands and responses.
<b>Single NIC Controller</b>	An IPCP Pro Controller that can only communicate with one network. The Single NIC controller may have a network hub with multiple ports, but all ports connect to the same network.
<b>Static IP Address</b>	An IP address that has been specifically (instead of dynamically [see <a href="#">DHCP</a> ]) 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.
<b>Stop Bits</b>	The bit or bits transmitted that signal the end of a character. Typically set to 1.
<b>Subnet Mask</b>	Number of bits of the network address used to separate the network information from the host information in a Class A, Class B, or Class C IP address, allowing the creation of sub-networks. In binary notation, a series of 1s followed by a series of contiguous 0s. The 1s represent the network number; the 0s represent the host number. Use of masks can divide networks into sub-networks by extending the network portion of the address into the host portion. Sub-netting increases the number of sub-networks and reduces the number of hosts.
<b>Switched Power Port</b>	A switched power port provides controllable power output for AV devices and power usage feedback.
<b>System ID</b>	A unique, 4-digit numeric ID assigned to a Primary Controller. The System ID works as a shared key between the Primary Controller and Secondary controller or TouchLink Pro touchpanels. The System ID is used to pair those devices in the <b>System</b> tab of Toolbelt.
<b>TCP/IP</b>	Transmission Control Protocol/Internet Protocol. The communication protocol of the Internet. Computers and devices with direct access to the Internet are provided with a copy of the TCP/IP software stack to allow them to send and receive information in an understandable form.

<b>Telnet Port</b>	Most controllers support Telnet and use port 23 as the communication port to receive or issue commands.
<b>Touchpanel</b>	A control panel with a flat surface (usually with graphic divisions or buttons) that functions as a switch or control. Also called a touchscreen.
<b>Upload</b>	As it pertains to Global Scripter, the term "upload" signifies to deliver a compiled Global Scripter project file to a GlobalViewer host, where it can be launched and used to monitor and control all of the devices on an AV network.
<b>WAN</b>	Wide Area Network. A computer network that covers a broad area such as a link across a metropolitan, regional, or national boundary.
<b>WLAN</b>	Wireless Local Area Network. A form of local area network that uses radio waves to transmit data between nodes rather than through cable. Mobile devices, such as laptop computers and personal digital assistants, have helped spawn the "plugless" connection to WLANs. The IEEE 802.11 standard specifies the technologies for wireless LANs.

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