## Purpose

The Sentry Technology SmartTrack and VideoRailway systems are custom camera and track implementations that provide streaming video and respond to Pelco-D commands that control camera PTZ and track movement. The exacqVision system, however, does not have a camera plugin that supports this combination of video and control functions. Video can be received by defining the camera as an exacqVision RTSP device, but the RTSP protocol has no support for PTZ functions. The *evSentry* integration was developed to provide this control via a graphical *SentryControl* interface that is displayed on the user's desktop alongside the exacqVision client. Navigation can be performed by using the mouse to select buttons that are mapped to directional movement or numbered presets. The interface also supports USB and serial joysticks and keyboard shortcuts.

Overview

The exacqVision *evSentry* integration runs as a Windows service (or Linux daemon) that monitors user mouse clicks in the exacqVision desktop client window. Specifically, when prompted by the *SentryControl* application to choose a camera, the user selects a camera by clicking on the **Sentry Control** association icon in the video window of that camera. After making a selection, all PTZ navigation, camera travel, and preset commands will be directed to that camera. The following diagram shows the system architecture:
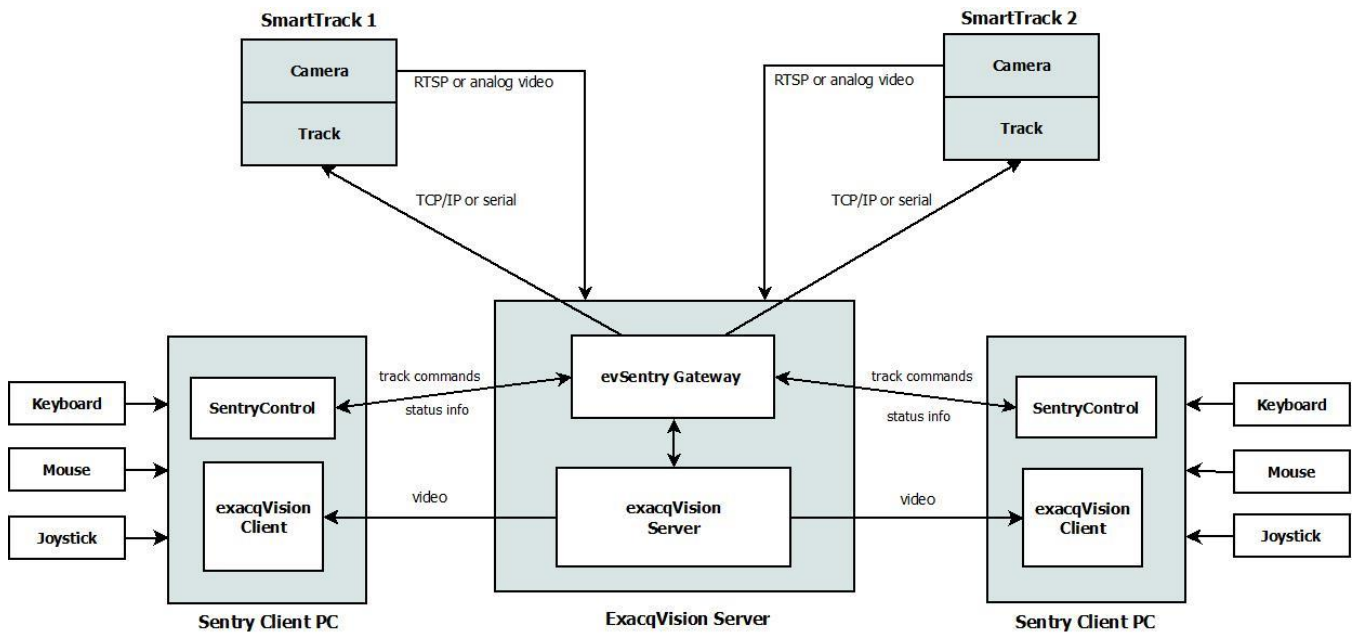
exacqVision SentryControl with SentryGateway
(2 Monitoring Stations, 2 Cameras)

Hardware/Software Requirements

Sentry Technology

Requires one or more SmartTrack and/or VideoRailway systems. The SmartTrack system uses 1 or 2 analog cameras mounted on a track, with PTZ and lateral movement being controlled by a serial connection to the server. The VideoRailway system is similar to the SmartTrack system, but uses an IP-based camera which provides RTSP video and is controlled by sending Pelco-D commands over the same IP connection.

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Requires exacqVision server and client software, version 8.0 or higher, running on a Microsoft Windows or Linux platform. The server and client may run on the same physical system, or be on separate systems.

Requires exacqVision *evSentry* integration software, installed as a service or daemon on a single, central server, such as the exacqVision server machine.

Requires the *SentryControl* application, which communicates with the *evSentry* service, to be installed on each user workstation where the exacqVision client is installed.
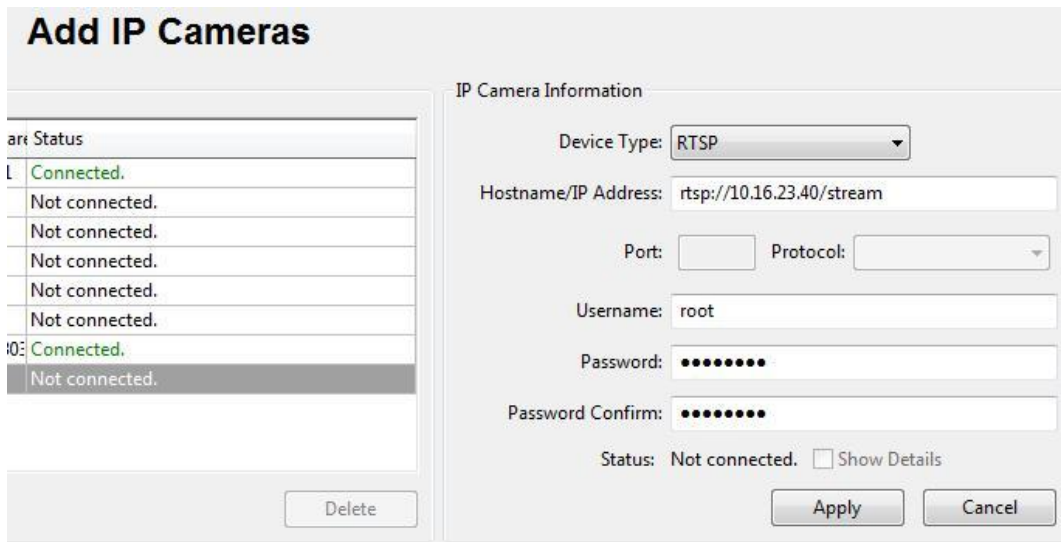
Link to evSentry Installation Files

Setup

exacqVision Client

VideoRailway (IP camera): The Sentry camera should be added to the exacqVision client as an RTSP device. To do this, go to the configuration page in the exacqVision client (click the "gears" icon at the top left of the main window) and navigate to the **Add IP Cameras** section of the exacqVision server. The **Add IP Cameras** panel will show a list of all cameras that have previously been defined for this server. To add our camera to the configuration, click the **New** button at the lower left, just below the **IP Camera List** section.

In the data entry area at the right of the page, create the new camera entry by choosing **RTSP** from the **Device Type** dropdown, then enter the camera's RTSP URL in the **Hostname/IP Address** field. Also supply the camera's username and password. When finished, click on the **Apply** button.

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SmartTrack (Analog camera): The legacy Sentry SmartTrack system uses 1 or 2 analog cameras per track, with PTZ and travel commands sent to the device via a local serial port interface. In the exacqVision interface, analog cameras are grouped together in their own category in the server's configuration tree. This group is labeled according to the name of the analog interface card, and may have a name like **EXACQ TDVR8016, DHVEC8016HB,** or **Stretch VRC7016LX DVR Card**. By default, analog video inputs are named "Input 1", "Input 2", etc. After having physically connected the SmartTrack camera(s) to the BNC connectors on the server's analog interface board, browse through the analog camera list to find the ones which correspond to your new camera(s). You may assign a different name to each input, if desired, by going to the camera's **Display** panel, editing the *Name:* field, and clicking the **Apply** button.

To set up the analog PTZ controls, first go to the server's **Serial Ports** configuration panel. This panel will display a table showing the known serial ports and permit options to be changed. From the dropdown selector in the **Use** column, choose *PTZ*, and from the Profile / Protocol dropdown, choose *Pelco-D*. Configure the remaining serial port parameters to match the camera's settings. Click on the **Apply** button when finished. Here is an example of the **Serial Ports** panel of a Linux server after configuration has been completed:

Next, go back to the camera's **Mechanical PTZ** panel, and choose the **Settings** tab. Here, select the *Serial Port:* value matching the serial port that is connected to the camera. Select the *Address:* value of the camera's internal address (this is generally configured on the camera via a DIP switch or other selector), and set the *Protocol:* to *Pelco-D.* Click on the **Apply** button when finished. At this point, the new settings may be tested by

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using the *Pan/Tilt* and *Zoom* controls found at the right of the screen. Lateral movement of the camera on the track should also be seen when the *Iris* control buttons are pressed. Repeat these configuration and testing steps for each analog camera. The settings for an analog camera should appear similar to the following:
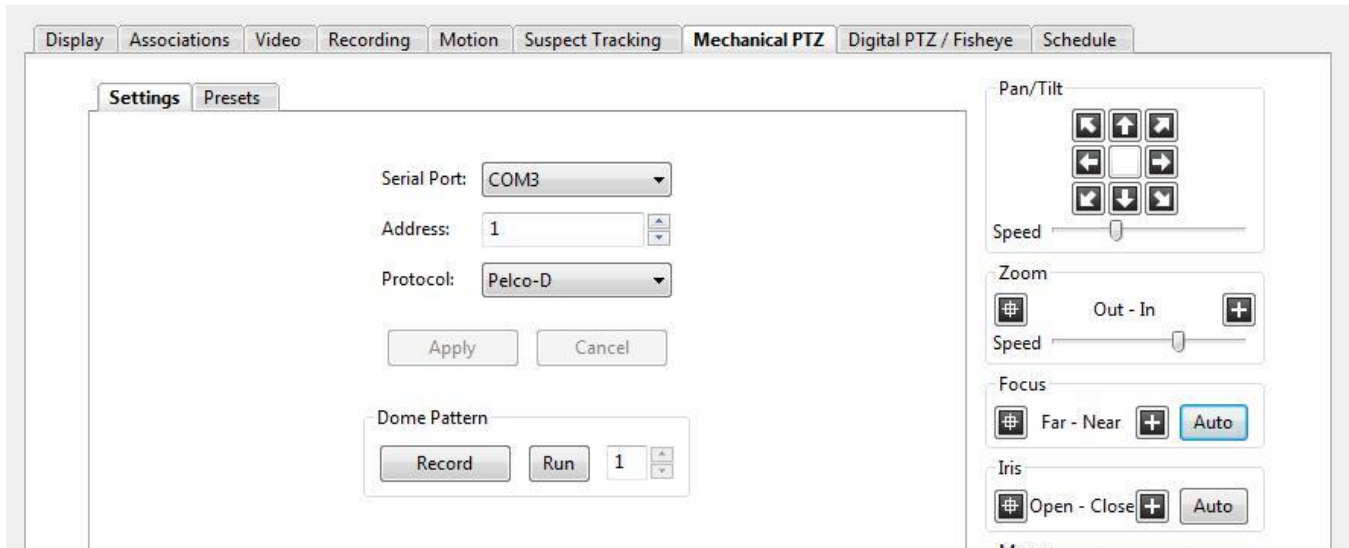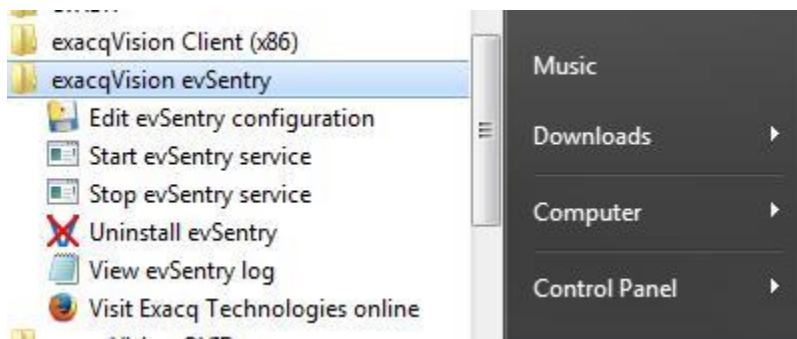

Because the control of a serial port may only be had by a single application at a time, we must now go back to the **Serial Ports** panel to set the value of the **Use** dropdown to *Unused*, so that the *evSentry* gateway service will be able to send commands to the port. Again, remember to click the **Apply** button to register the changes.

evSentry Installation

The *evSentry* service provides a gateway that opens a socket or local serial connection to each track camera in the video setup and accepts connections from one or more *SentryControl* clients. *evSentry* is normally installed on the exacqVision server hardware, but may be installed elsewhere if desired. (Note that installation on the server is required if there are analog track cameras in the setup.)

Windows: The *evSentry* installer installs the *evSentry* Windows service and its related files and adds an **exacqVision evSentry** folder to the Windows Start Menu. This folder contains several shortcuts, including links to allow editing of the configuration, and starting and stopping the *evSentry* service.

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Linux: To install *evSentry* on a Linux platform, open a terminal window and, with root privileges, execute the command

```
dpkg –install packagename.deb
```

where `packagename.deb` is replaced with the name of the Linux package file that was downloaded from the exacq.com web site. After installation and configuration have been completed, open a terminal window and, as root, start the service using the command
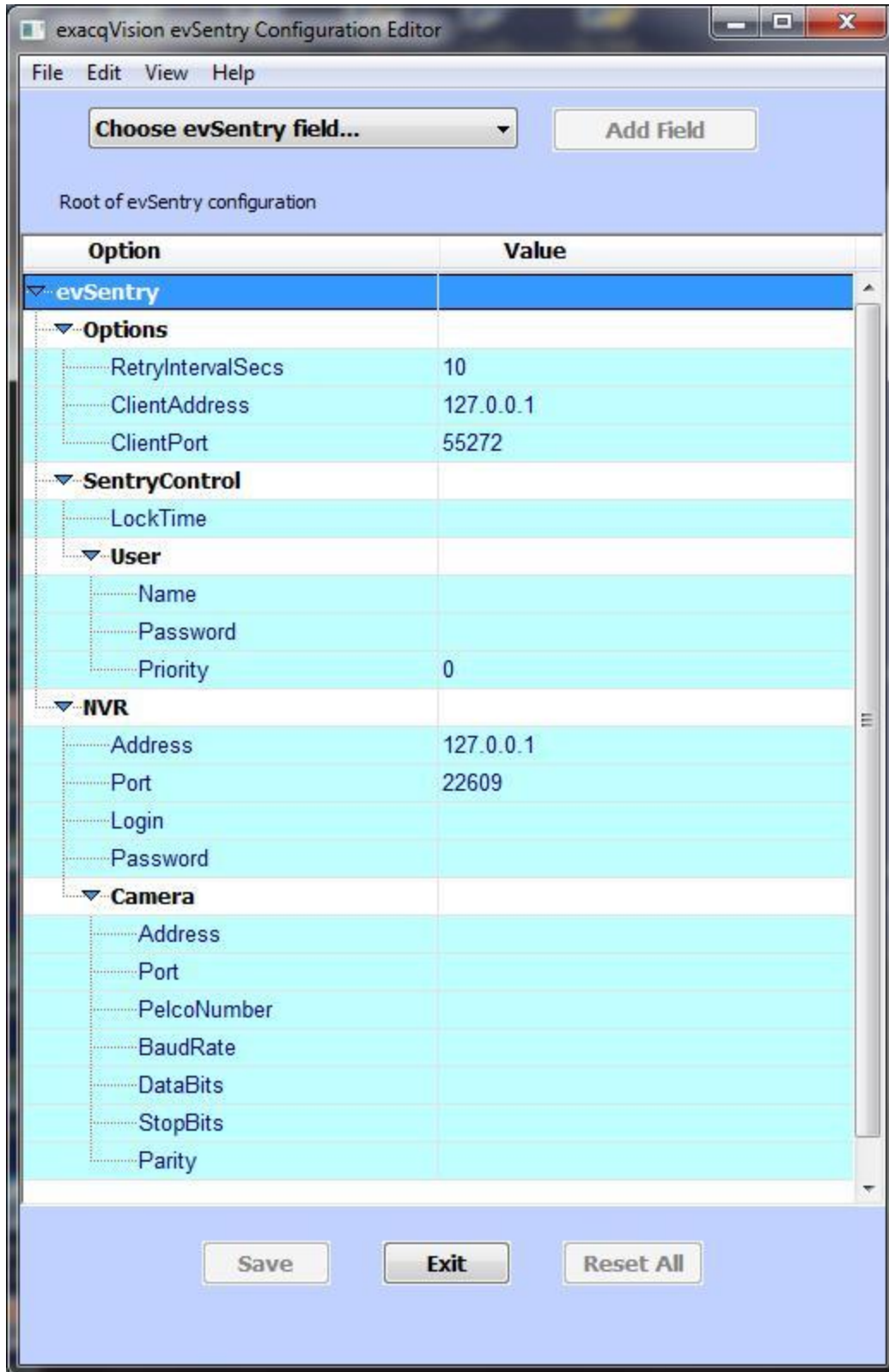
```
service evsentry start
```

evSentry Configuration

General Instructions

When installing the *evSentry* application files, the installer will offer to run the *cfgedit* utility, which is a graphical tool that allows you to specify the exacqVision server(s) and Sentry camera(s) that will be part of the installation. For each exacqVision server, you will need to enter the IP address, port, user login, and user password. It is advisable to create a limited-access user account in the exacqVision server configuration for use by *evSentry*. You will also need to know the address and control port of each Sentry camera that will be included in the system. If you don't have all of this information available when you install *evSentry*, you can skip this step and run the *cfgedit* utility later to create the configuration. A shortcut to the *cfgedit* utility can be found in the Windows Start menu under

Start Menu → All Programs → exacqVision evSentry → Edit evSentry configuration

Here is an example of the *cfgedit* window:

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Default values are supplied for some fields, while others are left blank either because there is no default or use of the field is optional. Double-click on any cell in the **Value** column to enable editing of that value. Hit the

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Enter key or select another cell to edit as desired. Additional entries (e.g. more Users, NVRs or Cameras) can be added by selecting the parent entry and then choosing the desired addition from the **Choose field…** dropdown and then clicking on the **Add Field** button. When finished editing, click the **Save** button.

Creating SentryControl User Accounts

A user account must be created in the *evSentry* configuration for each user who will be running an instance of the *SentryControl* client. Requiring users to log in permits the controlling of access to the system's cameras and assignment of user control priorities.

User login

The *evSentry* service requires that one or more user logins be created in the *evSentry* configuration. Each user login entry must contain a non-empty user name, an optional password, and an optional priority. If no priority is assigned, the lowest priority (0) will be assigned.

User priority

The priority assigned to each user determines his or her ability to take control of a camera from another user who is currently controlling it. The default user priority, with a value of 0, is the lowest priority. A user with this priority level is unable to take control from another user, even if they have the same priority level. Users with a priority value greater than 0 are able to take immediate control of a camera from a lower priority user.

Control LockTime

The **LockTime** value in the *SentryControl* section of the *evSentry* configuration defines the number of seconds that a user may have exclusive control of a camera. If not defined, the value defaults to 5 seconds. Each time a command is sent to the camera, the lock timer is restarted. When the lock timer expires, the ability to control the camera is opened up to all users.

Starting the evSentry service

Windows: After the *evSentry* configuration has been created and saved, the *evSentry* service must be started. To do this, open the Services panel, scroll down to the **evSentry** entry, double-click on it, and click on the **Start** button. An application log file can be found in

```
C:\Program Files (x86)\exacqVision\evSentry\evSentry.log
```

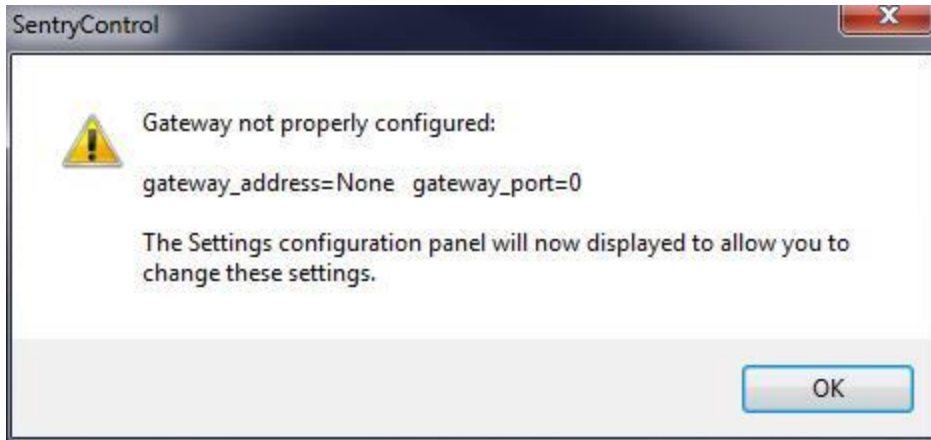**Linux:** From a terminal window, execute the command

```
service start evsentry
```

Application log messages can be found in `/usr/local/exacq/evSentry/evSentry.log.`

The SentryControl Interface

The *SentryControl* application is designed to be run on each client machine where the exacqVision Client program is run. It provides a graphical interface to PTZ directional controls and presets that are not directly supported by the exacqVision Client.

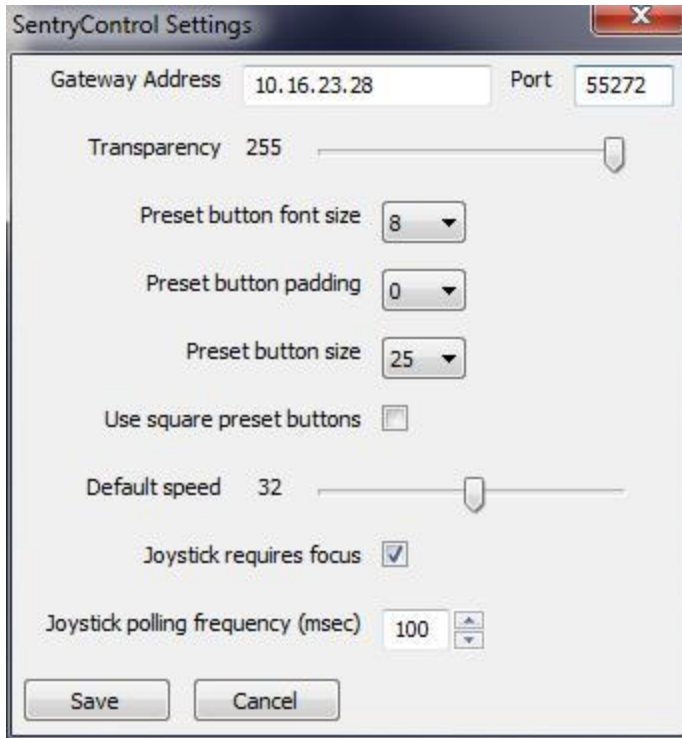When the *SentryControl* application is run for the first time, it will display this warning:

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After clicking on the **OK** button, the **Settings** dialog will be displayed. This is done so that the address and port of the *evSentry* gateway server may be set. The **Settings** dialog looks like this:
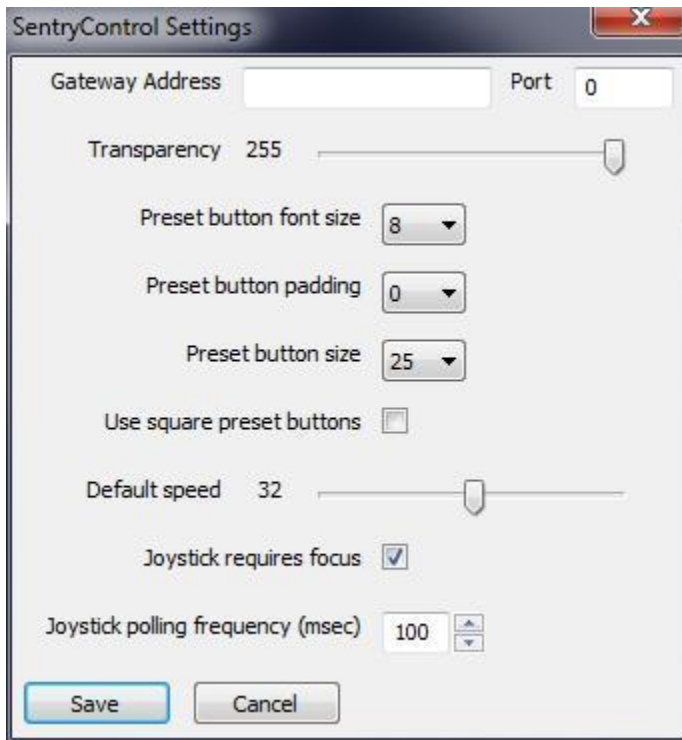
Here, provide the **Gateway Address** and **Port** values. These values should match the *ClientAddress* and *ClientPort* values that were used when configuring the evSentry gateway service (see above). The completed fields should look something like this:

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Finally, click the **Save** button and the application will exit. When restarted, it will use these values to connect to the *evSentry* gateway service and display the *SentryControl* **Login** dialog:
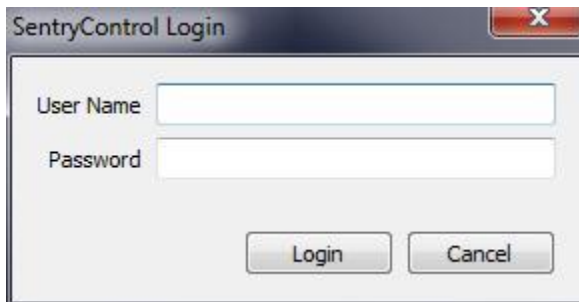
After successfully logging in to the server, it will display the **Choose camera** dialog:

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To choose a camera, go to the exacqVision Client program and click on the *Sentry Control* icon in the video window of the camera you wish to control. The *Sentry Control* icon looks like this:
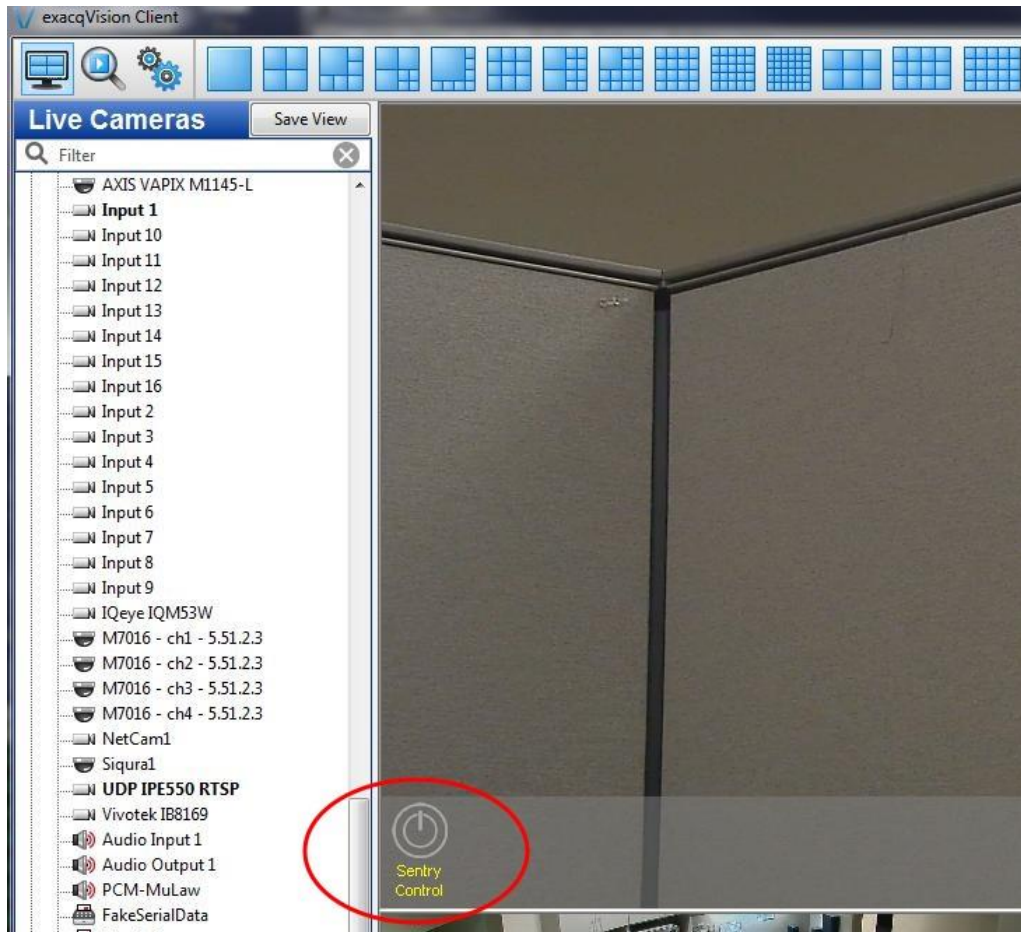
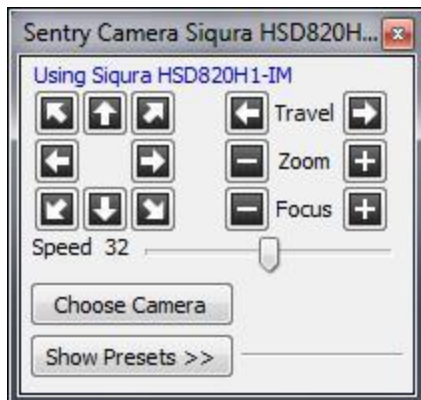This icon is created automatically by the *evSentry* service from information defined in the *evSentry* configuration file. If the icon should somehow happen to be deleted or reassigned, it will be recreated.

When a camera has been chosen, the *SentryControl* window displays the name or IP address of the camera in the title bar, and provides buttons to control camera PTZ actions as well as camera focus and movement along the track. The speed slider controls the speed value embedded in the Pelco-D commands that are sent to the camera/track. The speed value ranges from 0 (stopped) to 63 (fast).

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When the **Show Presets** button is clicked, the window is expanded to show 99 preset buttons, along with an **Edit** button that allows new presets to be created:

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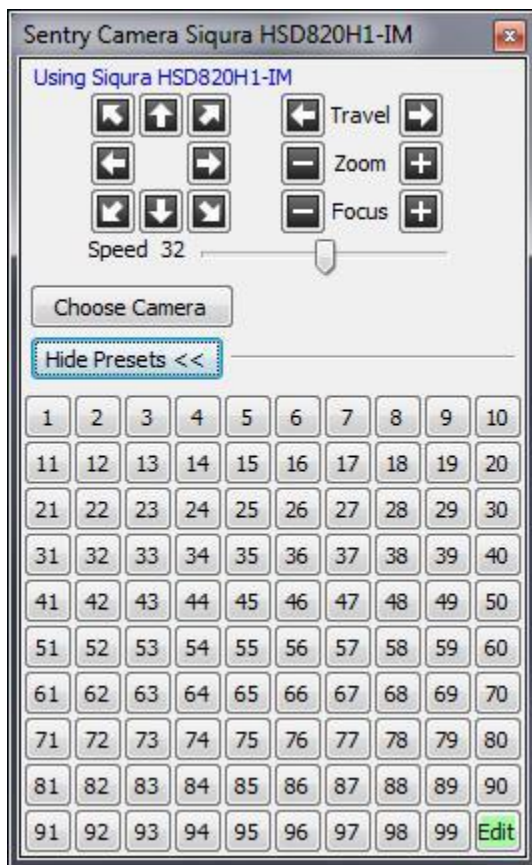
Some display settings can be customized by the user by right-clicking in the *SentryControl* window and selecting **Settings...** from the popup menu:

This will display the **Settings** dialog and allow editing of the application settings:

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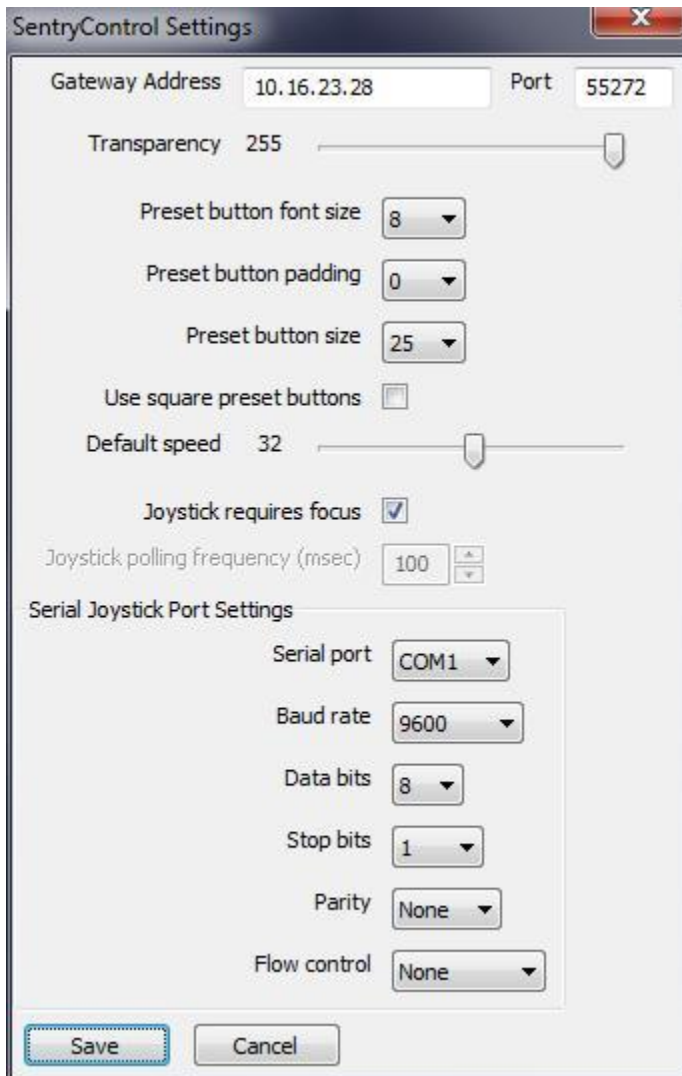
Changes to the transparency and preset button settings will update the display in real time, allowing the user to immediately see the effect of any changes.

The **Joystick requires focus** checkbox controls the behavior of the joystick, if one is attached. When checked, joystick commands are ignored unless either the *SentryControl* window or its related video window have the focus. When unchecked, all joystick commands are recognized regardless of which desktop window has the focus.

Customizations may be saved by clicking the **Save** button, which creates a file named `SentryControl.cfg` in the user's home directory.
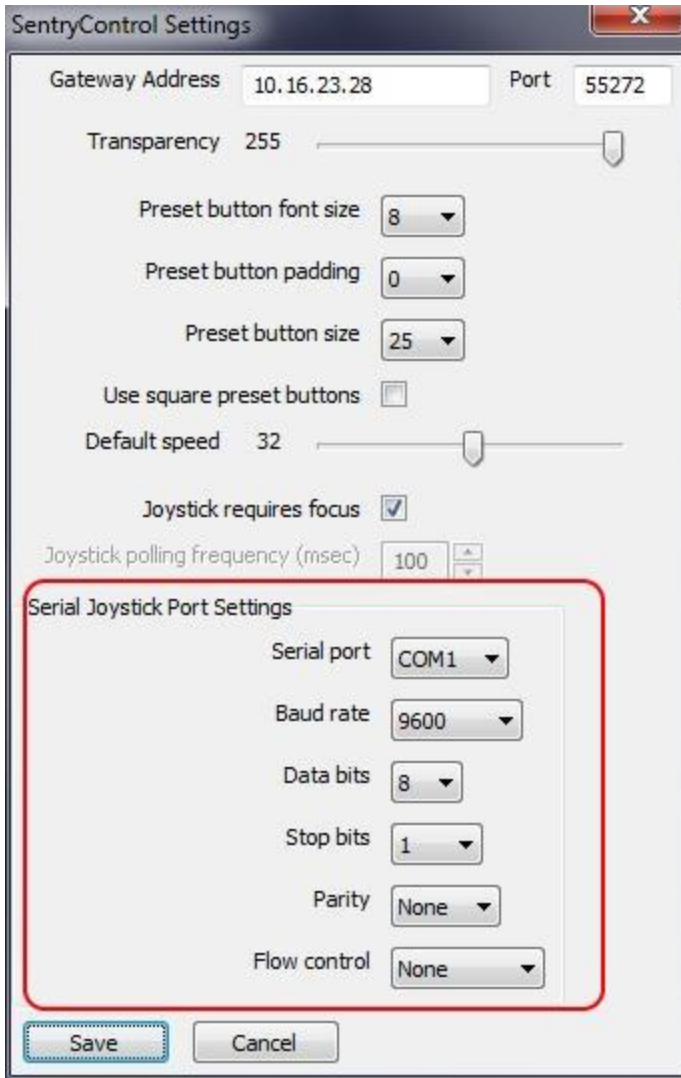
Joystick Support

The *SentryControl* interface has been tested with both a USB-based (exacqVision joystick) and a serial-based (Pelco KBD300) joystick. While the behavior of each is similar, the configuration of these peripheral devices differs.

Serial Joystick

A serial joystick that generates Pelco-D commands may be connected to the local workstation where the *SentryControl* application is running. Commands emitted by the joystick will be received by *SentryControl* and transmitted to the *evSentry* gateway, which will forward them to the currently-selected camera. Configuration of the device is made in the **Serial Joystick Port Settings** section of the *SentryControl* **Settings** panel:

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USB Joystick

When using a USB joystick, such as the exacqVision joystick, the device will only be recognized if the **Serial port** selector is set to **None**. No other configuration settings are needed.

Keyboard Shortcuts

The *SentryControl* application recognizes the following keyboard shortcuts:

Key	Action
Left Arrow	Travel Left
Right Arrow	Travel Right
Up Arrow	Zoom In
Down Arrow	Zoom Out
Keypad Home / 7	Tilt Up Left
Keypad Up Arrow / 8	Tilt Up
Keypad PgUp / 9	Tilt Up Right

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Keypad Left Arrow / 4	Pan Left
Keypad Right Arrow / 6	Pan Right
Keypad End / 1	Tilt Down Left
Keypad Down Arrow / 2	Tilt Down
Keypad PgDn / 3	Tilt Down Right
Keypad -	Decrease Speed
Keypad +	Increase Speed
F	Focus Far
N	Focus Near

Key presses are recognized whenever the window focus is on the *SentryControl* application or when the mouse is hovering over the video window of the currently-selected camera.

SentryControl Operation

In an ideal setup, there should be one instance of the *evSentry* gateway service running on the exacqVision server hardware or another highly-available system. Each user workstation should have installed the exacqVision client program and the *SentryControl* client program.

Command line options

When run with no command line arguments, *SentryControl* will use the stored configuration settings to connect to the *evSentry* service and will display the login dialog. The application will also accept user login information as command arguments. If the user name is provided, but without a password, the login dialog box will be displayed with the **User name** already filled in. The user must then type in the password in order to complete the login. If both the user name and password are provided on the command line, no login dialog will be displayed, and the login request will be submitted automatically.

The SentryControl application also accepts the single command line argument –c to invoke configuration mode. This will display the Settings dialog to allow configuration changes to be made. The application then exits when the dialog is closed. Configuration mode is also invoked if any of these arguments are used:

```
/c  -config  --config   config  /config
```

When invoked with the –h command line argument, usage information is displayed. Any of the following will also display the usage help:

```
/h  /?  -help  --help  help  /help
```

Choosing a different camera

The *SentryControl* application has the ability to control any camera in the *evSentry* configuration, but it can only control one camera at a time. The name of the currently-selected camera can be seen in the titlebar of the *SentryControl* window. To select a different camera, click on the **Choose Camera** button in the *SentryControl* application window. This will cause the **Choose camera** dialog to be displayed, after which the user should click on the **Sentry Control** icon in the video window of the desired camera. After a choice is made, a "Using…"

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message will be displayed in the *SentryControl* message area, and the name of the camera in the window's title bar will be that the newly-chosen camera.

Troubleshooting

If things don't work as expected, here are some common issues and tips on diagnosing the situation:

- The evSentry service dies at startup
    - o Examine messages in the evSentry log file for errors.
- The SentryControl program will not run or dies
    - o Examine messages in the SentryControl.log file, which is found in your home directory.
- SentryControl displays only the splash screen that says "Connecting to evSentry gateway…". It never displays the login dialog.
    - o This means that SentryControl and the evSentry service are not communicating.
        - ▪ Check that the evSentry service is running
        - ▪ Check the evSentry log file for errors.
        - ▪ Check the evSentry configuration to be sure that the ClientAddress is set to an interface that is visible to the computer where SentryControl is being executed.
        - ▪ Check that the ClientPort value in the evSentry configuration is set to a valid port number that is not being used by another application.
        - ▪ Check that the Gateway address and Port values in the SentryControl settings match the ClientAddress and ClientPort values used by evSentry.

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