AN-329

Wisenet WAVE Integration with Protege GX

Application Note

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Introduction

The Protege GX Wisenet WAVE Video Service provides a seamless integration between Protege GX and a Wisenet WAVE Video Management System (VMS), enabling you to control cameras and view live and historical video footage from a single easy to use interface.

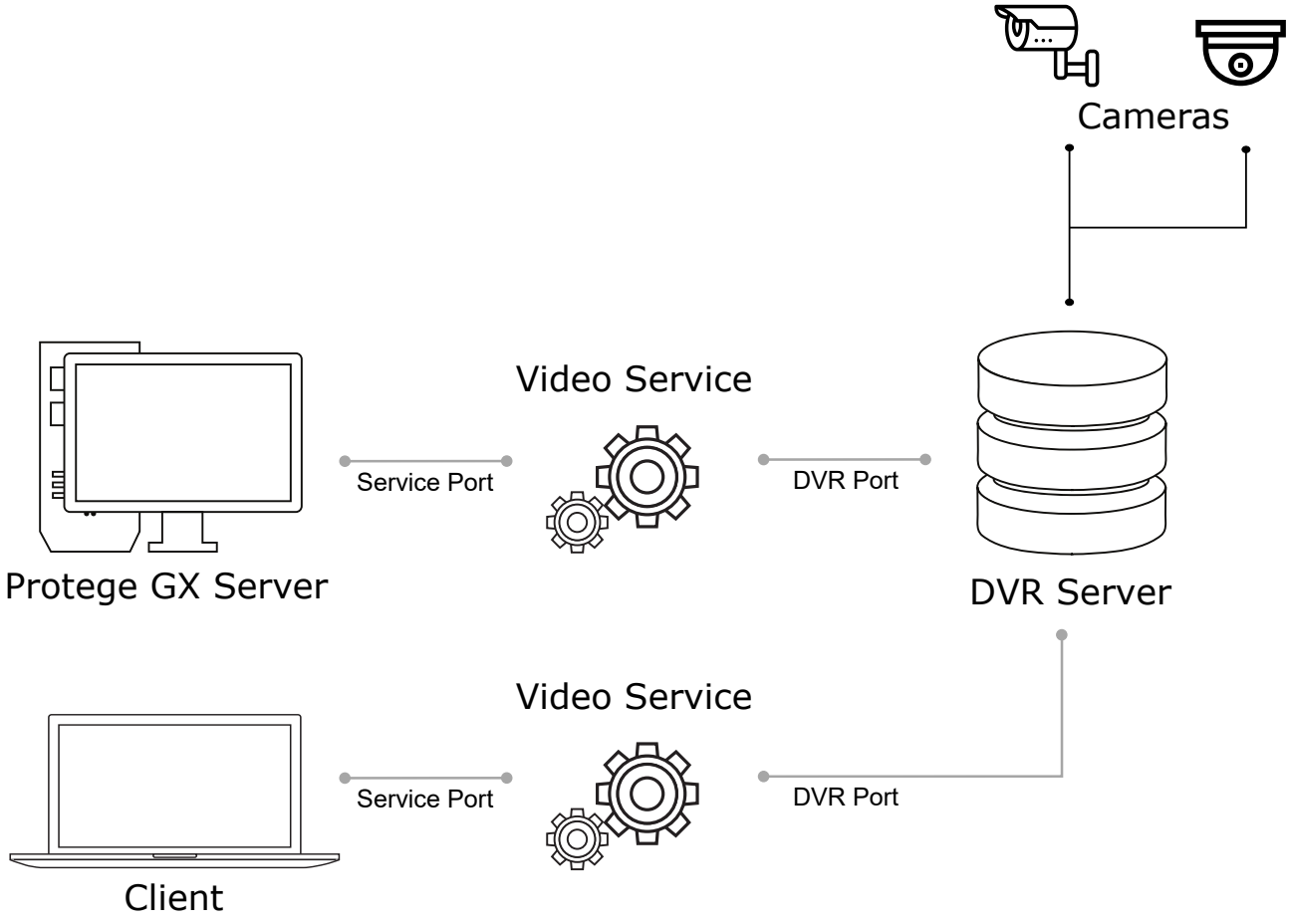
Cameras can be linked to doors, inputs, outputs and areas, allowing you to easily retrieve footage based on any change of status, such as when a PIR is triggered or a door is opened. An automatic popup can display a live video stream on any door event, allowing you to see when someone is at the door or when a door has been forced open.

The included high level interface (HLI) enables the communication of PTZ triggers and alarm interfaces back to the VMS, providing bi-directional exchange of information. If desired, VMS events such as 'Motion Detected' can be monitored directly in Protege GX.

The following instructions outline how to install the Wisenet WAVE Video Service and configure the DVRs, cameras and doors within Protege GX.

Integration Architecture

In this integration Protege GX communicates with the DVR server via the integration's video service. This service monitors the two systems and sends any camera commands from Protege GX to the DVR server, and continuously transfers any events triggered in the DVR system to Protege GX.



Ports

As shown in the diagram above, the video service communicates with Protege GX via the **Service Port**, and with the DVR server via the **DVR Port**. These ports are configured in the Protege GX DVR programming.

The DVR port is determined by the third-party VMS. If required, the service port can be customized when installing the video service. It is recommended to use the default ports where possible.

The default ports can be found in the Port Settings section of the Protege GX DVR programming instructions.

Feature Support

This integration enables you to:

- View live video footage from programmed cameras.
- View historic and archived video footage.
- Embed cameras into a status page.
- Link a camera to a door, input, output or area.
- View live or archived video footage directly from an event associated with a camera.
- Automatically launch a camera view window when specific types of events occur.
- Send PTZ preset commands to the VMS in response to a Protege GX event filter.
- View the following HLI events directly within Protege GX:
  - Motion Detected
  - Video Analytics Event
  - Camera Input Activated
  - Camera Disconnected
  - Camera IP Conflict
  - Storage Full
  - Server Temperature Alarm

Prerequisites

Software Requirements

All prerequisite software must be installed and operational, unless otherwise stated.

Software	Version	Notes
Protege GX software	4.3.264 or higher	
Protege GX Wisenet WAVE Video Service	2.1.0.9 or higher	This service must be installed on the Protege GX server and every client machine that will use this integration. Instructions for installing this service can be found in the Installing the Video Service section (see page 9).
Wisenet WAVE	6.0.5.41290	This is the **only** tested and supported version for this integration.
Microsoft .NET Framework	4.6.2 or higher	

Supported cameras are determined by the Wisenet WAVE system.

It is the responsibility of the installation professional to verify the version of the proposed third-party system and supported components with the version listed in this document. ICT will not accept responsibility for the failure to verify integrated system versions and requirements.

Protege GX Licensing Requirements

License	Order Code	Notes
Protege GX Camera License	PRT-GX-CAM-10	1 license required per camera programmed in Protege GX. A single camera is included with the Protege GX standard license. The base Protege GX license includes an unlimited number of DVRs and DVR HLIs. HLIs allow bi-directional communication between Protege GX and the VMS. Note that this is separate to the live and archived video display that is covered by a camera license.
	PRT-GX-CAM-50	

Time Settings

VMS integrations rely on the time being accurately configured for both the hardware and the operating systems used in a site.

To ensure the system is keeping precise time, all devices should be set to synchronize with the same NTP time server. NTP servers work by sending accurate time information periodically to the system. Many corporate organizations have an NTP server running on the internal network, allowing you to simply enter the relevant IP address. Alternatively, you could use any public NTP server. Finding an NTP server relevant to your region is usually as simple as a quick web search.

The same time server must be used for all workstations, servers and controllers within the site. You can configure the time server for each computer in the Windows **Date and Time** settings, and set a time server for the controller in the **Sites | Controllers | Time update** settings in Protege GX.

Configuring Wisenet WAVE

Some specific configuration is required in Wisenet WAVE before you can integrate it with Protege GX.

Setting the Camera Logical IDs

To allow Protege GX to identify the cameras from the Wisenet WAVE server, each one must be assigned a unique **Logical ID**.

1. Log in to the Wisenet WAVE client software and select the server that will be integrated with Protege GX.
2. Right click on a camera and select **Camera Settings**.
3. Ensure that the camera's name does not include a pipe **|** character, as this is not supported by this integration.
4. In the **Expert** tab, set the **Logical ID** to any unique value.

   You may wish to record the IDs in a spreadsheet to help when adding or editing cameras in the future.
5. Click **OK** to save the setting.
6. Repeat to set a unique Logical ID for all cameras that will be integrated.

Creating the Event Rules

This integration allows you to view a number of Wisenet WAVE camera events in Protege GX. Some configuration is required to allow the cameras to send HLI events to Protege GX.

1. In the Wisenet WAVE client, right click on any camera and select **Camera Rules**.
2. Click **Add** to add a new rule and set the following:
   - **When**: Select one of the supported Wisenet WAVE event types from the table below.
   - **At**: <Any Camera>
   - **Do**: Write to log

     Depending on the event, you can use When event starts or When event stops.
   - **Interval of action**: This setting determines how often Wisenet WAVE will perform the action—i.e. how often it will send the event to Protege GX. If the event occurs multiple times during this interval, only the first instance will be sent.

     The default interval is 60 seconds. You can set this value to any reasonable interval, or disable it to send all events immediately.

     If the longest interval is more than 60 seconds, you must modify event polling window in the config file for the video service. After you have installed the video service, see Configuring the Event Polling Window.
3. Repeat to enable all of the events that are required.

The following Wisenet WAVE events are mapped to specific Protege GX events:

Wisenet WAVE Event	Protege GX Event
Analytics Event	Camera Video Analytics Event
Motion on Camera (When event starts)	Camera Motion Detected
Motion on Camera (When event stops)	Camera Motion Ceased
Camera Disconnected	Camera Offline Event

Wisenet WAVE Event	Protege GX Event
Camera IP Conflict	Camera Diagnostic Event
Input Signal on Camera	Camera Input Activated
Storage Issue	DVR/NVR Storage Alarm
Server Fan Error Because this is a server event, you do not need to program a rule in Wisenet WAVE. It will be sent to Protege GX automatically.	DVR/NVR Temperature Alarm

Installing the Video Service

The Protege GX Wisenet WAVE Video Service must be installed on the server and each client machine that uses the integration. You must have administrator rights on each computer to complete the installation.

1. Run the Protege GX Wisenet WAVE Video Service.exe file to launch the Protege GX Wisenet WAVE Video service install wizard. Click **Next**.
2. Select **Complete** for the installation type then click **Next**.
3. Click **Install**.
4. Enter the **Service Port Number** to be used for the integration (8070 is the default) and click **Next**.
5. Click **Finish**.
6. If the Windows Defender Firewall is on, you will see a Windows Security Alert popup indicating that some features of the integration service have been blocked.

   To allow the service to function, check the boxes to allow the service to communicate on **Domain networks** and **Private networks** (or as appropriate for your installation). Then click **Allow Access**.

Check the Services are Running

The service used by the integration must be running so that Protege GX can communicate with the Wisenet WAVE system.

1. Open **Services** as an administrator:
   - Press the **Windows + R** keys.
   - Type **services.msc** into the search bar.
   - Press **Control + Shift + Enter**.
2. Navigate through the list of services and locate **Protege GX Wisenet WAVE Video Service**.
3. Ensure the service has started automatically (check the **Status** column to confirm that it is 'Running'). If not, right-click the service and select **Start**.
4. Ensure **Protege GX DVR Service B** is running.

Configuring the Event Polling Window

The video service polls Wisenet WAVE for new events every 5 seconds. The **Event Polling Window** determines how far back in time the video service will check when it polls for events.

The Event Polling Window must be **longer than or equal to** the longest Interval of Action that you have set in Wisenet WAVE (see page 7). If the Event Polling Window is shorter than the Interval of Action, some events will not be sent through to Protege GX because they occurred outside the polling window.

The Event Polling Window is set to **60 seconds** by default. If you have any event rules in Wisenet WAVE with a longer Interval of Action, you must increase the Event Polling Window. To modify the Event Polling Window:

1. In Services, right click on the **Protege GX Wisenet WAVE Video Service** and click **Stop**.
2. Open the File Explorer and navigate to C:\Program Files (x86)\Integrated Control Technology\GXVideoService_WisenetWAVE
3. Open GXVideoService_WisenetWAVE.exe.config in a text editor.

   Files in this directory require administrator permissions to edit. You may need to open the file as an administrator using an application like Notepad++, or make a copy in a different directory to edit and replace the original.

4. Locate this line in the config file:

```
<appSettings>
...
    <add key="EventPollingWindowSeconds" value="60" />
</appSettings>
```

   If this line does not exist, add it just before **</appSettings>** as indicated above.

5. Set the **value** to a time equal to the longest Interval of Action (in seconds).
6. Save the file.
7. In Services, right click on the video service and click **Start**.

Programming Cameras in Protege GX

Port Settings

To configure the DVR in Protege GX you will need to enter the DVR port and service port settings, as described in the Integration Architecture section. It is recommended to use the default ports where possible.

- Default **DVR Port**: 7001
- Default **Service Port**: 8070

Adding the DVR

You must add a DVR record to represent the Wisenet WAVE system.

Even if the Wisenet WAVE system has multiple servers, you only need to add one DVR record in Protege GX. Typically this is the server that has the most stable network connection to the Protege GX server. All cameras in the system will be available, regardless of which servers they are connected to.

From the main menu, navigate to **Monitoring | Setup | DVRs**. Add a DVR record and configure the following options:

1. Enter the **IP address** and **DVR port** of the DVR server.

   The DVR port is determined by the third-party VMS and will depend on the configuration of the DVR itself.

2. Set the **DVR type** to Custom.
3. Set the **Service port** that was configured during the video service installation. This option is only visible once the **DVR type** is set to Custom.

   The service port must be defined for the integration to work correctly. If necessary, it can be changed in the config file for the service.

4. Enable the **Monitor events from this DVR/NVR** option to start logging HLI events from the DVR in Protege GX. The operator can right click any HLI event to view the footage archived at the time the event was logged.

   For camera motion events, the **Monitor events** option must be enabled in the camera settings in Protege GX. Note that motion detection must also be enabled for that camera in the VMS.

5. If required, enable the **Connect to this DVR/NVR on start up** option. When this option is enabled, Protege GX will send a login request to the DVR when the client starts up. Otherwise, Protege GX will not connect to the DVR until it needs to request a camera list or footage.
6. If logging in to the VMS requires authentication, enable **Login required** and enter the **Username** and **Password** required to access the VMS.

   The pipe character | is not supported in these fields.

Adding the Camera(s)

Once the DVR has been configured, you can add a record for each of the installed cameras, enabling you to view live and historical (archived) video feeds directly from a status page or floor plan.

1. From the main menu, navigate to **Monitoring | Setup | Cameras**. Add a new camera with a descriptive name.
2. Set the **Type** to DVR and select the **DVR** you created earlier.
3. On the **DVR camera name** row, select the **[...]** button to open the **Select camera** window.

The pipe character | is not permitted in the **DVR camera name**. You may need to change the camera's name in the third-party system.

4. The window will display a list of cameras connected to the selected DVR. Highlight the camera you want to use and click **Select**.
5. Set the required display options:
   - **Show sidebar controls in status page**: When this option is enabled, PTZ controls are displayed by default when the camera feed is viewed on a status page. When this option is disabled the control sidebar can be opened but will not be displayed by default.
   - **Stretch image**: When this option is enabled the camera image will be stretched to fill the tile where it is displayed. This may not preserve the aspect ratio.
   - **Floor plan**: The floor plan the camera belongs to. This allows you to right click on a camera event in the event log and open the floor plan associated with the camera.
6. Enable the **Monitor events** option if you wish to log HLI events from the DVR system.
   This setting must be used in conjunction with the **Monitor events from this DVR** option of the DVR record. It enables certain camera events, such as motion detected, to be logged from the DVR/NVR. The operator can then right click the event and select the camera to view the footage archived from the time the event was logged.

Linking a Camera to a Record

Linking a camera to a record enables you to view a live or archived feed by right clicking a record or any associated event. Cameras can be linked to doors, inputs, outputs or areas, allowing you to track any status changes, such as when a PIR is triggered or an area is disarmed.

If an event has a camera associated with it, a small yellow camera icon appears to the left of the event. Right-clicking the event allows you to view the archived footage from the camera at the time the event was logged.

If the door auto camera popup settings are enabled, Protege GX will automatically display a window with the live camera feed whenever a door event is triggered, or if a door is forced open.

1. Select the door, input, output or area you wish to link the camera to (from the appropriate **Programming** menu).
2. In the **General** tab, scroll down to **Graphics**. Set the **Camera** which is monitoring that physical space.
   For doors, you can set a **Camera (entry)** and **Camera (exit)**. Depending on where the camera is located, you may wish to use the same camera for both entry and exit, or select a different camera for each.
3. For doors, you can set the following **Auto popup options**:
   - **Auto camera popup on any door event**: When enabled, displays a popup window showing a live camera feed when any door event is triggered.
   - **Auto camera popup on door forced event**: When enabled, displays a popup window showing a live camera feed when a forced door event is triggered.
   - Select the **Camera** to be displayed in the popup window.
4. Save your changes.
5. To view the camera feed, right click on the record in the programming window or status list and click the **Camera** button. Right click any events associated with that record to view either live footage or archived footage from the time of the event.

Including a Camera in a Status Page

A camera can also be included in a status page for live viewing of video footage while monitoring a site.

1. Open the **Status page editor** (**Monitoring | Setup | Status page editor**). Select an existing status page to update, or create a new status page by clicking **Add** and choosing a layout.
2. Select the panel where you wish to display the camera and set the **Type** to Camera.
3. For the **Record**, select the camera that you wish to display.
4. Save your changes.
5. Navigate to **Monitoring | Status page view** to view the camera feed on your status page. Click the arrow button on the upper right of the panel to display PTZ arrows, which can be used to pan, tilt and zoom a PTZ camera.

You can also include camera HLI events on a status page. You can do this by including a panel that displays All Events. Alternatively, you can create an event report that displays only camera HLI events, and display that on the status page:

1. Navigate to **Events | Event filters** and create a new event filter which will filter for camera HLI events.
2. In the **Event types** tab, disable **Include all event types**.
3. Click **Add** and expand the **All PC events** section. Scroll down to the Camera events, select the desired HLI events and drag and drop them onto the main window. **Save** the event filter.
4. Navigate to **Reports | Setup | Event** and create a new event report to display the HLI events.
5. **Add** the event filter created above.
6. Finally, to display the event report on a status page, navigate to **Monitoring | Setup | Status page editor**. Select an existing status page to update or create a new status page.
7. Select a panel and set the **Type** to Event windows. Set the **Record** to the event report created above.
8. Save your changes and navigate to **Monitoring | Status page view** to view the events on your status page. You can right click the events to open the camera window to the time of the event.

Note: Some HLI events require the corresponding camera feature to be enabled in the VMS (such as motion detection).

Programming Camera Actions

Actions in Protege GX are triggered in response to particular events, as defined by an event filter. There are two actions related to cameras: sending PTZ commands and popping up a camera feed window.

Send PTZ Command on Event

Through the HLI, Protege GX can send PTZ commands to connected cameras in response to particular events. This allows the system to physically move PTZ cameras to preset positions to get the best view of the situation.

Before you begin, ensure that any cameras have PTZ enabled and the PTZ preset commands are programmed in the VMS. Note down the **Command string** for each PTZ preset that you wish to use. This is usually the name or index of the PTZ preset in the VMS.

See the documentation for your VMS for information on programming PTZ presets and viable command strings. These cannot be programmed directly in Protege GX.

1. Navigate to **Monitoring | Setup | PTZ commands** and create a new PTZ command.
2. Under **Configuration**, select the **Camera** that the command will be sent to.
3. Enter the **Command string** that represents the PTZ preset.
4. Navigate to **Events | Actions** and create a new action.
5. Set the **Event filter** to define the events that will trigger the action. If required, click the ellipsis **[...]** button to break out the event filter programming window and create a relevant event filter.

6. Select the **PTZ command** created above.
7. Click **Save**.

Pop Up Camera Window on Event

Actions can be used to automatically trigger a live popup window when specific events occur, such as when a door is left open or when an area alarm is triggered.

1. Navigate to **Events | Actions** and create a new action.
2. Set the **Type** to Popup camera window.
3. Set the **Event filter** to define the events that will trigger the action. If required, click the ellipsis **[...]** button to break out the event filter programming window and create a relevant event filter.
4. Select which camera to use. You can choose from:
   - Default camera associated with event
   - Door entry camera
   - Door exit camera
   - Select camera from list
5. Click **Save** to create the action.

Enabling Camera Popups on Alarm

Operator alarms send a popup window to Protege GX operators (such as security guards) when selected events occur in the system. Along with the event information, you can also include a camera popup window which displays footage from the camera associated with the relevant door, area, input or output.

This approach is similar to using the Popup camera window action but has the additional benefit that the camera popup obeys alarm routing rules, allowing it to be routed to particular workstations and passed on if it is not acknowledged. It may also be more efficient to program if the alarms are already being used in the system.

For more information on programming alarms, see Application Note 332: Setting up Event Notifications in Protege GX.

1. Assign cameras to doors, areas, inputs and outputs as required (see page 12).
2. Navigate to **Events | Alarms** and create a new alarm.
3. Set the **Event filter** to define the events that will trigger the alarm. If required, click the ellipsis **[...]** button to break out the event filter programming window and create a relevant event filter.
4. Enable **Allow camera popup**.
5. Click **Save**.

Now when an alarm popup appears, if any device associated with the alarm has a camera assigned to it that camera window will pop up as well.

The Camera Window

The camera window displays a split view showing archived and live camera footage. It can be opened by right clicking on a record or event associated with a camera.

- The **top left pane** displays a 5 second looping video centered 2 seconds either side of the time of the event.
- The **top right pane** displays a 30 second controllable window centered 15 seconds either side of the time of the event. Drag the slider to adjust the image to any point within the 30 second period.
- The **main lower pane** displays the live camera view.

- The **Archive view controls** allow you to select any date and time in the past.
- The **Live view controls** provide PTZ camera control buttons, allowing you to physically control a PTZ enabled camera.

- The options on the **right** provide control over the main view:
  Select the tab on the side to switch between the two views as required.

Troubleshooting

Some events are visible in Wisenet WAVE, but not in Protege GX

This can occur when the Event Polling Window is shorter than the Interval of Action in Wisenet WAVE. Any events that occur outside of the Event Polling Window will not be sent to Protege GX.

To resolve this issue, update the Event Polling Window in the config file for the video service—see Configuring the Event Polling Window.

When viewing multiple live feeds, some feeds do not load or drop after loading

This occurs when the **Max amount of HTTP connections** is set too low in the Wisenet WAVE settings. This value is 2 by default, so may need to be increased if you want to use status pages with multiple camera feeds in Protege GX. To edit this setting:

1. On the Wisenet WAVE server, open the advanced server settings. You can do this by entering the following URL in a web browser:
   https://localhost:7001/#/settings/advanced
   If the port for the web interface has been customized, replace 7001 with the port your system is using.
2. Locate the **Max amount of HTTP connections** setting (`maxHttpTranscodingSessions`).
3. Increase the value to the maximum number of video feeds that Protege GX will display concurrently.
4. Save and restart the server if prompted.

Too many simultaneous HTTP connections (i.e. transcoding sessions) can overload the Wisenet WAVE server's CPU. Ensure that the server hardware can handle the number of HTTP connections you set.

Warnings in Windows Event Viewer

You can see warnings and messages for this video service in the Windows Event Viewer. To troubleshoot issues, navigate to **Windows Logs > Application** and look for events from WisenetWAVE Video Service Integration.

Some relevant events:

Message	Cause	Solution
EventPollingWindowSeconds not set in config	The Event Polling Window setting is missing from the config file. This can occur after upgrading from an older version.	Add the setting manually, as outlined in Configuring the Event Polling Window.
EventPollingWindowSeconds has invalid value	The Event Polling Window value is blank, negative or not a number.	Set a valid value for the Event Polling Window, as outlined in Configuring the Event Polling Window.

Release History

This release history covers feature improvements and bug fixes to the video service.

It is assumed that the installation is using the prerequisite version of Protege GX (see page 5). Fixes and features in the integration service may not be available with earlier versions of Protege GX.

Version 2.0.0.3

- Resolved an issue where the camera list did not show the correct cameras in multi-server Wisenet WAVE systems.

  From this version onwards, you only need to add one DVR record for the entire Wisenet WAVE system. All cameras in the system will be displayed in the camera list, regardless of which servers they are connected to.
- Resolved an issue where special characters could not be used in the **DVR password**.

Version 2.1.0.9

- Updated the video service to support Wisenet WAVE version 6.
- Added support for the Camera Motion Stopped event (see page 7).
- Resolved an issue where some events were showing in Wisenet WAVE, but not in Protege GX.
- Changed the default Service Port set by the installer to 8070 to match the VMS default.

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