Fibersonics Milestone Viewer™ Software Integration Guide

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Introduction

This document provides a comprehensive and detailed guide for integrating our Milestone integration software, Fibersonics Milestone Viewer™, with Milestone XProtect® VMS. This guide will take you through each stage of the process, from the initial installation to the final testing.

In this document, we will cover the complete process of installing and configuring Milestone XProtect VMS, along with the hardware and software required for the integration. This document provides a step-by-step guide to installing the Fibersonics Milestone Viewer software and testing the system to ensure that it is functioning optimally.

To get started, this document will first cover the basics of the Milestone XProtect VMS, including the implementation details, and the installation process. We will then move on to the

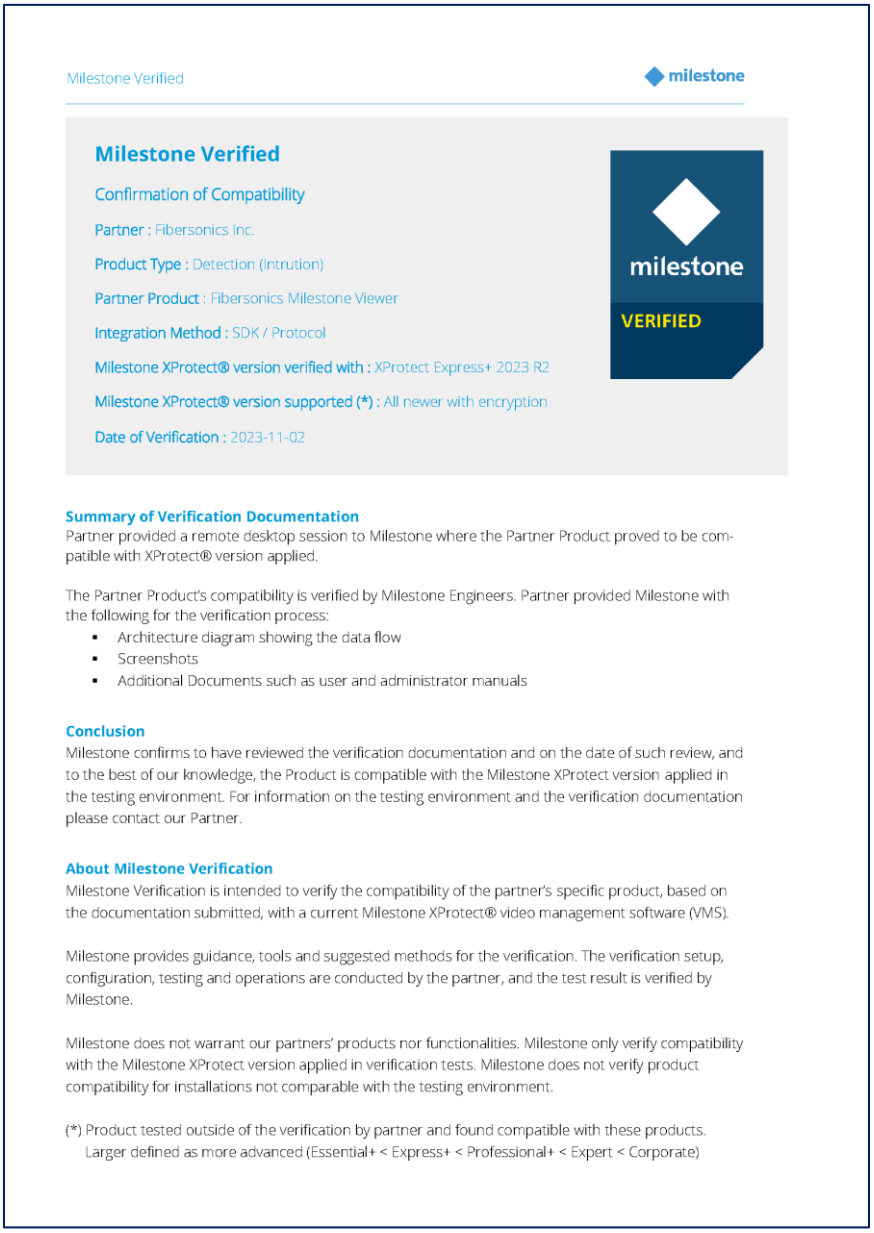
installation and configuration of our Fibersonics Milestone Viewer, detailing each step of the process and providing troubleshooting tips where necessary.

Once setup is complete, this document will walk through a series of tests to ensure that the system is working as expected, including verifying that the cameras are properly configured, the software is communicating correctly with Milestone XProtect VMS, and that all features of Fibersonics Milestone Viewer are fully functional.

We are confident that this documentation will provide all the information needed to integrate Fibersonics Milestone Viewer with Milestone XProtect VMS, and trust that it will serve as a valuable resource for anyone looking to improve their surveillance capabilities.

Milestone Verified Confirmation

The Fibersonics Milestone Viewer™ has been tested and verified to have confirmation of compatibility with all versions of Milestone XProtect VMS.



Milestone Verified

milestone

Milestone Verified

Confirmation of Compatibility

Partner : Fibersonics Inc.

Product Type : Detection (Intrution)

Partner Product : Fibersonics Milestone Viewer

Integration Method : SDK / Protocol

Milestone XProtect® version verified with : XProtect Express+ 2023 R2

Milestone XProtect® version supported (*) : All newer with encryption

Date of Verification : 2023-11-02

milestone
VERIFIED

Summary of Verification Documentation

Partner provided a remote desktop session to Milestone where the Partner Product proved to be compatible with XProtect® version applied.

The Partner Product's compatibility is verified by Milestone Engineers. Partner provided Milestone with the following for the verification process:

- Architecture diagram showing the data flow
- Screenshots
- Additional Documents such as user and administrator manuals

Conclusion

Milestone confirms to have reviewed the verification documentation and on the date of such review, and to the best of our knowledge, the Product is compatible with the Milestone XProtect version applied in the testing environment. For information on the testing environment and the verification documentation please contact our Partner.

About Milestone Verification

Milestone Verification is intended to verify the compatibility of the partner's specific product, based on the documentation submitted, with a current Milestone XProtect® video management software (VMS).

Milestone provides guidance, tools and suggested methods for the verification. The verification setup, configuration, testing and operations are conducted by the partner, and the test result is verified by Milestone.

Milestone does not warrant our partners' products nor functionalities. Milestone only verify compatibility with the Milestone XProtect version applied in verification tests. Milestone does not verify product compatibility for installations not comparable with the testing environment.

(*) Product tested outside of the verification by partner and found compatible with these products. Larger defined as more advanced (Essential+ < Express+ < Professional+ < Expert < Corporate)

Terminology

The document uses the following terms:

General

APU	A Fibersonics Alarm Processing Unit. Each APU is associated with a Fibersonics server computer.
Barrier	The barrier represents the structure that is being monitored by the Fibersonics Long Ranger™ system. This could be a fence, wall, embankment, ground, a pipeline, a cable, etc.
CCTV Camera	Close Circuit Television camera. CCTV cameras generally use coaxial cables and UTP cables as power and network cables.
IP Camera	Internet Protocol camera. An IP camera is a type of digital video camera that receives control data and sends image data via an IP network. IP cameras offer higher resolution video and better picture quality than CCTV cameras.
Milestone XProtect® VMS	The Milestone XProtect Video Management Software.
Segment	A Segment is a well-defined and discrete section of Barrier that is being monitored by the Fibersonics Long Ranger™ system. For example, Segment 1 could be the first 50m of fence being monitored. Segment 2 would be the second 50m of fence being monitored…and so on. Segments are sometimes referred to as “zones”.
TCP/IP	Transmission Control Protocol/Internet Protocol. TCP/IP is the language and set of rules that govern the connection of computer systems to access and use the internet. In this manual, it is assumed that the reader is familiar with TCP/IP networks.
Timestamp	A digital record of the time of occurrence of a particular event, usually giving date and time of day. Timestamps in the LRServer™ software are in UTC (Coordinated Universal Time) format. Timestamps in the Fibersonics Milestone Viewer™ and the Milestone XProtect VMS are in local time, according to the time set on the server computer that they are installed in.
VMS	Video Management Software. Video management software systems utilize hardware and software to enable users to automatically monitor events from any number of surveillance (CCTV or IP) cameras, alarms, or sensors.

Software

Fibersonics Milestone Viewer™	Fibersonics' software used to integrate with Milestone's XProtect product family.
GUI	Graphical User Interface
LRConfig™	Fibersonics' configuration software. LRConfig is the standard GUI used for setting up and tuning of the Long Ranger system once in an operational state. LRConfig is not usually monitored live by an operator after the system has been configured. It is used primarily for testing, configuration, and commissioning of the system. LRServer then continues the normal operation of the system.
LRServer™	Fibersonics' LRServer is the server software that manages and handles the configuration, operation, state, and communications of the Long Ranger™ system. It also manages many of the calculations and algorithms used by the proprietary Unified Algorithms. In addition, LRServer manages the messaging broadcast function that allows quick and easy integration of system and intrusion alarms to third-party GUI's or alarm management systems. LRServer runs in the background as a Windows Process.
LRServer™ Watchdog	The LRServer Watchdog is a Windows Service that keeps LRServer running at all times. This is normally set to start automatically with the Fibersonics server computer. With the watchdog running, the LRServer will always be running in the background and LRConfig will be available at any time without using the manual LRServer "Launch Server" tool.
MIP	Milestone Integration Platform SDK.
SDK	Software Development Kit. Software that allows other software to integrate with a product. Both Fibersonics and Milestone have their own forms of SDK.
Simple APU Reporter	The Fibersonics Simple APU Reporter is a software component of LRServer. Its function is to continuously transmit system, status and alarm messages to a specified computer, using a specified protocol (TCP or UDP) and port. The default is to send UDP messages to 127.0.0.1 (the IPv4 loopback) on port 10002. The Fibersonics Milestone Viewer receives the messages sent by the Simple APU Reporter and carries out the tasks necessary to integrate the information into the Milestone XProtect VMS with the MIP.
XProtect® Management Client	Milestone's XProtect Management Client. This is the main program used to configure the Milestone XProtect VMS.
XProtect® Smart Client	Milestone's XProtect Smart Client. This program monitors the Milestone XProtect VMS software as a client. Multiple clients may be configured to monitor the Milestone XProtect VMS.

General Concept and Approach

The general approach we have taken in integrating Fibersonics Milestone Viewer with Milestone XProtect VMS is to leverage the capabilities of Milestone XProtect VMS while adding significant value to the system through our software. Milestone XProtect VMS is an excellent video management software that provides advanced video analytics, and our software complements it by offering precise location detection of physical events.

One of the main benefits of Fibersonics Milestone Viewer is that it provides exact location data for events detected by the Fibersonics Alarm Processing Unit (APU). This precise location data is essential in identifying the source of any disturbance or event, and it can be displayed directly in the Milestone XProtect VMS user interface.

In addition, our software allows for the activation of cameras based on the location of the event, and the segments defined in our Fibersonics Milestone Viewer software. This feature is extremely useful for identifying events in large areas and for providing rapid and targeted responses to any incidents that occur.

Overall, our approach has been to build on the existing capabilities of Milestone XProtect VMS by adding precise location detection and camera activation features through our Fibersonics Milestone Viewer software. This approach allows us to offer an unparalleled level of accuracy and responsiveness, making our solution a valuable addition to any surveillance system.

Required Hardware

There are a few key components to the system. Most notably, the Fibersonics APU and associated server computer will be regularly broadcasting alarms and system reports over a TCP/IP network.

Those reports will need to be received by the computer that is running the Fibersonics Milestone Viewer software and then commands will need to be sent from there to the system that is running the Milestone software servers.

Given the above, the minimum hardware requirements are:

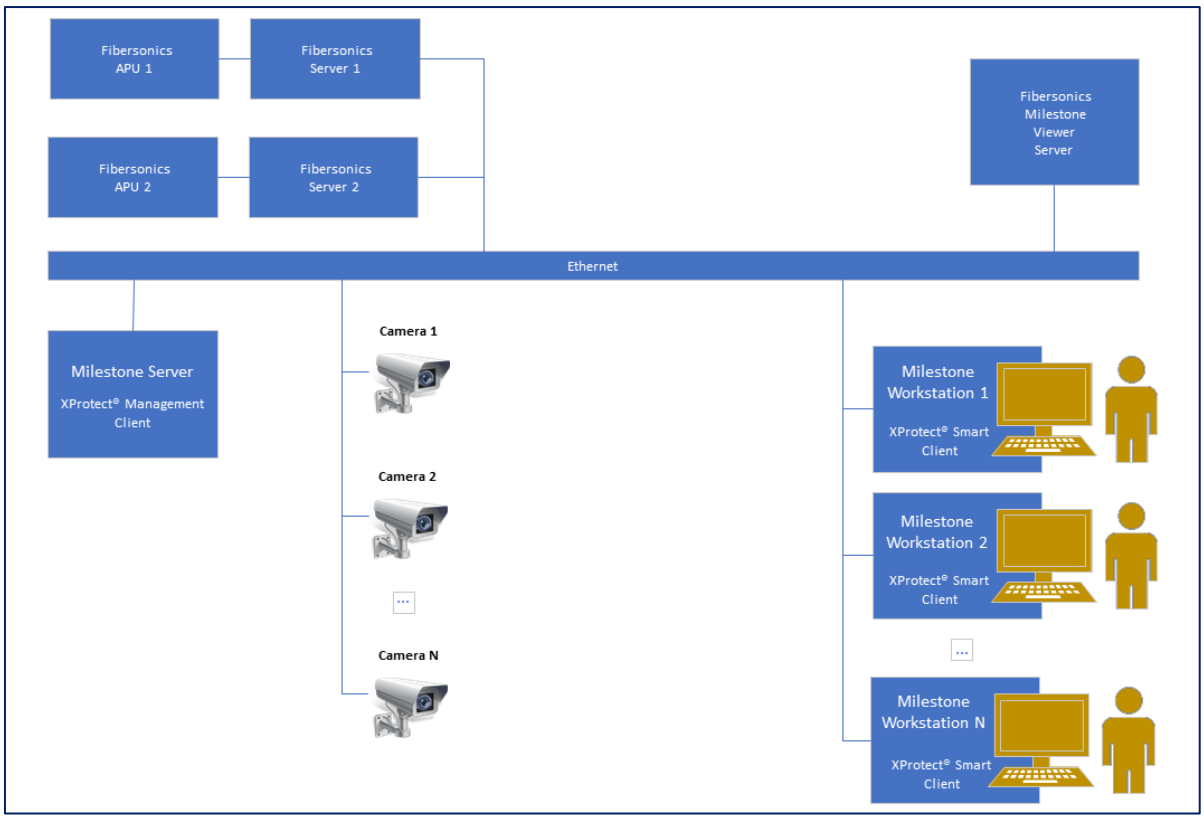
- A Fibersonics Long Ranger™ or Short Ranger™ APU and associated server computer.
- A computer system that can run the Fibersonics Milestone Viewer software and host the Milestone server software.
- Hardware and software that provides a TCP/IP network that is available to use by the Fibersonics and Milestone systems.

An alternative configuration could separate the Milestone server software and Fibersonics Milestone Viewer software into separate computers. Additionally, cameras, though not strictly required, are necessary to do any sort of CCTV recording operations.

TCP/IP Network Configuration

Typical Project Configuration

The following diagram illustrates a complete implementation configuration, typical of a practical project implementation:



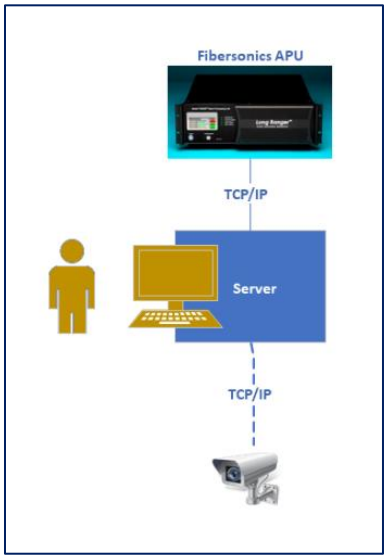
In this configuration, we have the following components:

- Fibersonics APU: A Fibersonics alarm processing unit. The APU is connected to the Fibersonics Server via a private Ethernet connection, separate from the main Ethernet network.
- Ethernet: An ethernet backbone, consisting of suitable routers, switches, and hubs. Ideally, this should be a fast (minimum 1Gbps) and reliable network with firewall settings that do not obstruct the connected computers from communicating with their peers.
- Fibersonics Servers: This server computer runs the Fibersonics server software suite (LRServer, LRConfig and Simple APU Reporter). There is one server per APU.
- Fibersonics Milestone Viewer Server: This server computer runs the Fibersonics Milestone Viewer software. The requirements for this server are minimal, and it can be merged with another server, or even be run on a virtual machine. It needs to be able to communicate with both the Fibersonics Server and the Milestone Server over the network. Even with multiple APUs, only one of these is needed.
- Milestone Server: The server computer for the Milestone XProtect VMS software.

- Milestone Workstations: These are computers running the Milestone XProtect Smart Client software. These are the computers directly used by the security personnel.
- Cameras: Any number of CCTV or IP cameras for use with the Milestone XProtect VMS. Other Milestone-compatible devices and sensors can be used as needed.

Demo Configuration

The following diagram illustrates a simple demonstration configuration:



In this configuration, we have the following components:

- Fibersonics APU: A Fibersonics alarm processing unit.
- Server: A Microsoft Windows-based server computer that will run all the software components that we need for a demo configuration, including:
  - Fibersonics LRServer
  - Fibersonics LRConfig
  - Fibersonics Milestone Viewer
  - Milestone XProtect VMS suite
- Camera: Any suitable CCTV or IP camera that is compatible with Milestone XProtect VMS.

Implementation Details

Milestone Integration Platform SDK

The Fibersonics Milestone Viewer software utilizes the Milestone Integration Platform SDK, commonly and hereafter called MIP SDK. MIP SDK contains libraries for use from .NET applications. The Fibersonics Milestone Viewer uses this SDK to integrate information from the Fibersonics sensing products into the Milestone XProtect VMS. Using MIP SDK, we can externally trigger many of the core features of Milestone XProtect. This would include sending events, creating alarms for specific cameras/devices, and starting or stopping recording.

Given that we are interacting directly with the Milestone server, the Fibersonics Milestone Viewer requires that you are authenticated when communicating with it. As such, a user login is initially required and further access to the server is needed.

The following web links provide further details:

Packages:

https://www.nuget.org/packages?q=milestonesystems

Sample Applications:

https://github.com/milestonesys/mipsdkmobile-samples-dotnet

TCP/IP Network Usage

Several components within the system need to communicate with each other over a TCP/IP network. This section describes how they do that:

- Each Fibersonics APU needs to send data back and forth with its Fibersonics Server. These devices are usually put on their own private Ethernet network. They could theoretically use the main Ethernet network, but this configuration is not recommended as it has not been evaluated for security implications. This communication is bidirectional, with the Fibersonics Server establishing the connections.
- The Fibersonics Server needs to send data to the Fibersonics Milestone Viewer. It usually does this over UDP using a custom protocol on port 10002. This communication is unidirectional, from the Server to the Viewer.
- The Fibersonics Milestone Viewer needs to communicate with the Milestone Server. It does this over HTTP, usually using port 80. This communication is bi-directional, with the Fibersonics Milestone Viewer establishing the connections.
- The Milestone Server needs to communicate with the cameras and other devices required for the installation. Milestone can use multiple connection mechanisms, both unidirectional and bidirectional, but in most (maybe all) cases, the Milestone Server establishes the connection.
- The Milestone Server needs to communicate with its workstations. These bidirectional connections use HTTP and are initiated by the workstation.

  For Milestone's documentation on TCP/IP ports used with the XProtect VMS, view the following weblink:

  https://supportcommunity.milestonesys.com/s/article/List-of-TCP-and-UDP-ports-used-in-XProtect-Advanced-VMS-products

Installation

This section describes how to install the Milestone XProtect VMS software on a server computer. Please note that Windows Home OS versions can be quite problematic and require advanced OS knowledge to install the software successfully. For issues encountered with the Milestone software installation, please refer to the Milestone website documentation. The enclosed instructions also provide more detail for implementing a test or demonstration system.

Installing the Milestone XProtect VMS

Milestone provides substantive and quite detailed documentation on their website. In most cases, we suggest that you first consult their documentation should confusion arise on a purely Milestone related portion of installation or configuration.

Before you begin, it is essential to ensure that your hardware and TCP/IP network meet the requirements for the Milestone XProtect VMS installation.

To install the Milestone XProtect VMS, follow these steps:

1. Go to the website https://www.milestonesys.com/.
2. Hover over and select "Download XProtect" (near the top of the screen) and select "Download Software" or "Download XProtect Trial" (under the "Support" header).
3. Select the version of XProtect software to install. For a demonstration configuration, select "XProtect Essential+" (this is a free license version, with some usage limitations, including the lack of the Alarm Server component). For a production system, you'll likely want one of the other licensed versions.
4. Enter your information into the form, then select the appropriate button to download the desired software.
5. Once the download finishes, start the installer. Most of the prompts are self-explanatory.
6. On "Select license file": For a demonstration configuration, download a free XProtect Essential+ license file. Please note that this version is limited to use with 8 cameras. For a production system, select your respective license file. Then press "Continue".
7. On "Select an installation type": For a demonstration configuration, select "Single Computer". For a production system, use whichever type is appropriate.
8. On "Components to be installed": For a demonstration configuration, select everything. For a production system, select what you need. Then press "Continue".
9. On "Specify recording server settings": For a demonstration configuration, the defaults are fine (although you might want to move the "media database"). For production, you'll likely need significant hard-drive space for the database.
10. On "Select encryption": For a demonstration configuration, just disable all the encryption options (make sure to scroll to the bottom). For production, you'll likely want encryption enabled; select appropriate certificates.
11. On "Select file location and product language": The default file location is likely fine, but you can change it if you want. Then press "Install".
12. When the installation is complete, it will provide a couple URLs, one for the "Web Client address" and one for the "Mobile Client address". Write these down; you may need them later.
13. On "Enter credentials for your hardware and select a protocol": For a demonstration configuration, leave this blank; we'll enter this later. For production, you might be able to save some time by using this.

14. On "Select the hardware to add to the system": If you left the previous screen blank, there is likely nothing here. Otherwise, you can select items here to add to the Milestone configuration.
15. On "Add users": For a demonstration configuration, add yourself as an administrator Windows user. To do this, click the icon at the right end of the "User name" field, enter your username into the box, then click "Check Names" (which will fill in the box with your full username), then click "OK". Finally, back on the original screen, click "Add", then "Continue". For production, you add the users you need and their type.
16. The installation process will then start the application XProtect Smart Client. You won't need this yet, so you can shut it down.
17. Please note, certain certificates are required in order to establish a secure connection with the XProtect VMS. When starting either the server management or the operator client software and you encounter an error message stating that a secure connection could not be established, it is likely that your computer is missing the required security certificate(s). To resolve this issue, we provide an explanation in this manual in the section titled "*Installation of Security Certificate(s) for the Milestone XProtect® VMS*", on how to install the required certificate(s).

For Milestone's documentation on installation, view the following weblink:

https://doc.milestonesys.com/latest/en-US/standard_features/sf_mc_gsg/sysarch_installyoursyste.htm#:~:text=Download%20the%20software%20from%20the,these%20and%20the%20unpacking%20continues

Configuring via Milestone XProtect® Management Client

XProtect Management Client handles the global configuration for the Milestone XProtect VMS. XProtect Management Client is the server software used to install Milestone 'elements' into a project installation and configuration. It is also used for the creation of "Rules" for the creation of "Alarms". For a demonstration configuration, perform the following steps:

1. Start the XProtect Management Client software.
2. Sign-in. If you followed the instructions above, the necessary fields will already be filled in and you can just press "Sign-in".
3. In the "Site Navigation" panel on the far left, select "Servers" / "Recording Servers". This will open a panel in the middle of the screen titled "Recording Servers".
4. In the "Recording Servers" panel, first ensure that the Milestone server name is detected. Then, right click on the name of the Milestone server, and select "Add Hardware..." from the dropdown menu. This will open the "Add Hardware" window.
5. Add a camera to the system. Some additional details are provided in the next section. However, the following Milestone weblinks provide further details:
    - *https://doc.milestonesys.com/latest/en-US/standard_features/sf_mc/sf_systemoverview/mc_hardwareexplained.htm?Highlight=add%20hardware%20in%20XProtect%20Management%20Client*

- *https://doc.milestonesys.com/latest/en-US/universaldriver/*adding_in_xprotect_management.htm?Highlight=add%20hardware%20in%20XProtect%20Management%20Client

6. Adding a Fibersonics APU status element is required in order to generate/receive system alerts for the Fibersonics APU and Server. To achieve this, add a 'Fibersonics APU' mock camera to the system, according to the following steps. The mock camera element will establish a connection with the XProtect VMS and provide status information as it becomes available from the Fibersonics Milestone Viewer.
    a. Start the XProtect Management Client software, and sign in.
    b. Under "Servers", select "Recording Servers".
    c. Under "Recording Servers" in the middle panel, right click the Milestone server computer name, and select "Add Hardware".
    d. In the "Add Hardware" window, select "Manual" then "Next".
    e. On the enter user credentials screen, just click "Next".
    f. Select the "Universal 1 channel driver" and unselect everything else, then press "Next".
    g. Enter a mock IP address for the mock camera. This can be any IP address that isn't used by any Milestone hardware or element on the network. For example, you could enter the IP address of the APU (not the APU server IP address).
    h. In the "Hardware model" field, select "Universal 1 channel driver". Then press "Next".
    i. This process may take a minute or two, but it should report a status of "Success". If it does not, you may have selected the wrong "hardware model"; if so, go back and fix it, then try again.
    j. After "Success" is displayed, press "Next".
    k. Then press "Next" again.
    l. On the "Hardware to Add" screen, press "Next" again.
    m. Change the "group" for the camera if desired, then press "Finish".
7. Close XProtect Management Client.

Important Features on the Server Side

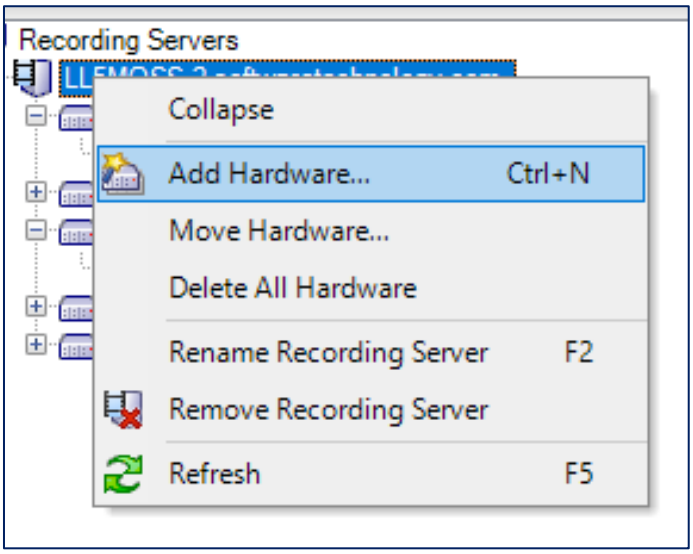
Probably the most important component when configuring Milestone XProtect VMS is the addition of hardware or devices to the server. The hardware represents real cameras or other compatible devices that are connected to the TCP/IP network. After configuration, these cameras/devices will be visible in both the management server and the operator client stations.

Adding Hardware to the Milestone XProtect® VMS

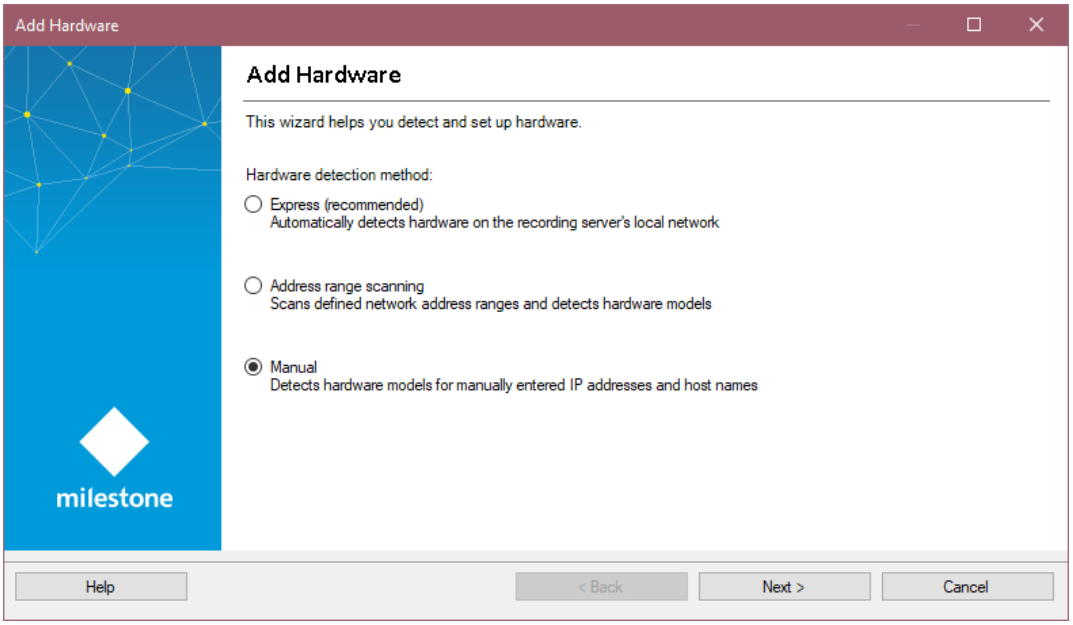
The procedure for adding hardware and devices to the Milestone XProtect VMS is similar for all types. Once the hardware/devices have been added, the configuration parameters for the hardware/devices are also managed on the server side in their respective "Settings" section.

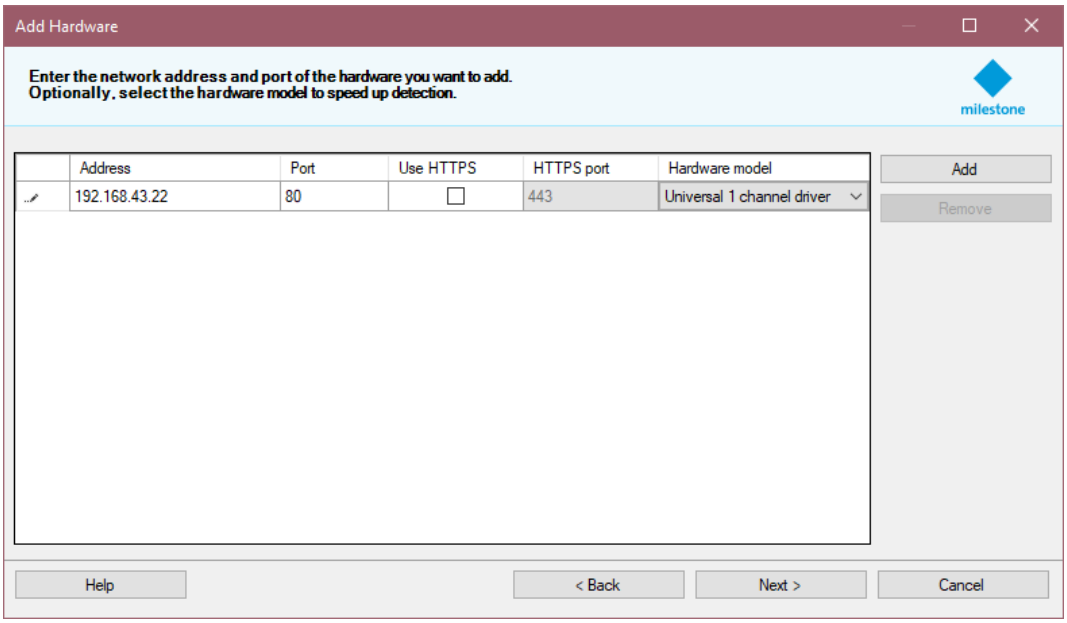
Following are the steps for adding hardware to Milestone XProtect VMS:

1. Begin by connecting the cameras or devices to your TCP/IP network. Ensure that they are properly configured and have the necessary power and network connections and permissions.
2. Start the Milestone XProtect Management Client and navigate to the “Servers” / "Recording Servers" tab in the center panel.
3. Right-click the server name and select the "Add Hardware" option to begin adding a new camera or device to the system.



4. Follow the prompts to add the camera or device. You will need to specify the manufacturer, model, and IP address of the device.





5. Once the device has been added, you can configure the device properties and settings. For cameras, this includes video quality, resolution, and frame rate. This can be performed by clicking on the desired element under "Devices" on the far-left panel, then selecting the device name in the center panel, and finally the “Properties” and/or “Settings” option in the far-right panel.
6. You can also configure the recording schedule and storage settings for cameras or devices. This is important to ensure that the video is being properly recorded and stored.

Adding an APU Status Element

Adding a Fibersonics APU status element is required in order to generate/receive system alerts from the Fibersonics APU and Server.

Proceed with the following step-by-step instructions for adding a mock element to Milestone XProtect VMS using the Universal Driver for use with the Fibersonics Milestone Viewer™:

1. Open the Milestone XProtect Management Client and navigate to the "Hardware" tab.
2. Click the "Add Hardware" button to begin adding a new camera or device to the system.
3. Select the "Universal 1 Channel" driver from the list of hardware models.
4. Specify an unoccupied IP address for the device. This IP address will be used to communicate with Fibersonics Milestone Viewer.
5. Configure any additional settings for the device as needed.
6. Save the device and exit the configuration screen.
7. The new device will be added to the Milestone XProtect VMS system, and it can be manipulated on the client side using Fibersonics Milestone Viewer.

Note, this element will not be attached to an actual video feed but can be used as a representation of the APU in order to create system status and health alerts.

Alternatively, it is also possible to utilize an add-on driver provided by Milestone called "StableFPS". The StableFPS driver simulates a connected IP camera by providing stable frame rates to the Milestone XProtect VMS by loading recordings from the hard drive.

For more information on StableFPS please refer to the following weblink:

https://doc.developer.milestonesys.com/html/gettingstarted/StableFPS.html

Configuring via Milestone XProtect® Smart Client

XProtect Smart Client is the client GUI typically used by the operators of the system. It also requires some configuration steps. For a demonstration configuration, perform the following steps:

1. Start the XProtect Smart Client software, and sign in.
2. Near the upper right corner, there is a button labeled "Setup". Click this button. The button will become orange to indicate that XProtect Smart Client is in setup (edit) mode.
3. In the far-left panel, in the "Views" section, open the "Default group".
4. Right click on "Default view group" and select "New View", then "4:3", then "2x2". This will create a display configuration for the operator (the operator GUI), with 2 panels in each dimension. These are the 'upper left view panel', 'upper right view panel', and so on.
5. In the far-left panel, in the 'System overview' section, select and then drag "Map" into the upper left view panel. In the "Set up map" dialog, browse to the map you want to use, then press "OK". This will put that map into that display panel.
6. In the Map panel you just created, there will be a floating tool bar. The upper left tool is for cameras. Click that button, then select "Camera 1" (or the name created for the desired camera to be used) from the list and drag it into the map.

7. In the far-left panel, in the "System overview" section, open the XProtect server computer name folder then select "Camera Group 1". Drag "Camera 1" into the lower left view panel.

8. Next, we will create an “Events” log window in the XProtect Smart Client in order to display the communications and APU status alerts from the Fibersonics Milestone Viewer. Follow these steps:
    a. Go into the XProtect Smart Client “Setup” mode.
    b. Create an “Alarm” window by selecting “System overview” / “Alarms” / “Alarm List”. Drag this selection into the desired GUI panel.
    c. Click in that window.
    d. In the far-left pane, find the “Properties” section at the bottom of the list.
    e. Change the “Data Source” from “Alarm” to “Event”. The window will now display all ‘events’ generated by the Fibersonics Milestone Viewer.
9. Next, we will create an “Alarm” window in the XProtect Smart Client in order to display the Alarm information received from the Fibersonics Milestone Viewer. Follow these steps.
    a. Go into the Smart Client “Setup” mode.
    b. Create an “Alarm” window by selecting “System overview” / “Alarms” / “Alarm List”. Drag this selection into the desired GUI panel. The window will now display all ‘alarms’ generated by the Fibersonics Milestone Viewer.
10. Once the desired configuration for the XProtect Smart Client GUI is completed, select the button labeled “Setup” near the upper right corner. This will exit the setup mode and enter the normal operational mode for the client GUI.

Important Features on the Client Side

The client side will largely deal with the creation of map and camera elements in order to create a visual representation of our Fibersonics Milestone Viewer configuration and the corresponding barrier that it is protecting.

Maps

Adding maps is a straightforward process:

1. Start the XProtect Smart Client software, and sign in.
2. Near the upper right corner, there is a button labeled “Setup”. Click this button. The button will become orange to indicate that XProtect Smart Client is in setup (edit) mode.
3. In the far-left panel, in the ‘System overview’ section, select and then drag the “Map” element into any available view panel. In the “Set up map” dialog box, browse to the map image file that you want to use, then press “OK”. This will put that map image into that display panel.
4. The image file should be a .jpg, .jpeg, .bmp, or .png file and must not exceed 25MB resolution.
5. Once the image file is uploaded, you can adjust the size and position of the image using standard-method mouse controls or right-click the mouse to display additional options.
6. Save the map when you are finished configuring it. The new map will be added to the Milestone XProtect VMS and can be accessed from the Maps tab.

7. Select the button labeled “Setup” near the upper right corner to exit the setup mode.

For Milestone’s documentation on maps, view the following weblink:

https://doc.milestonesys.com/latest/en-US/standard_features/sf_sc/sf_configuration/sc_configuringmaps.htm?tocpath=XProtect%20Smart%20Client%7CUser%20manual%7CConfiguration%7C_____17#Mapsconfiguration

Hotspots

After you have created a map and views in Milestone XProtect Smart Client, you can choose to add Hotspots to the views in the setup mode. A Hotspot is a particular position or area on the map for viewing magnified and/or high-quality camera images in XProtect Smart Client views. Hotspots can also be used as discrete regions on the map that are monitored for events and alarms. For example, they can be configured as “zones” for perimeter security monitoring system. The procedure for creating Hotspots is as follows:

1. Open the XProtect Smart Client and login.
2. Near the upper right corner, there is a button labeled “Setup”. Click this button. The button will become orange to indicate that XProtect Smart Client is in setup (edit) mode.
3. Select the map you want to add a Hotspot to or create a new map if one does not exist.
4. In the Map panel you just selected, there will be a floating tool bar. Select the option to “Draw a hot zone on the map” and move the mouse cursor over the map view.
5. Use your mouse cursor to click-and-draw the shape of the Hotspot on the map. You can adjust the size and position of the Hotspot using the standard-method mouse controls or right-click the mouse to display additional options.
6. Once the Hotspot is created, you can configure its properties, including its name, description, and associated cameras/devices. All changes are automatically saved.
7. Select the button labeled “Setup” near the upper right corner to exit the setup mode.

For Milestone’s documentation on adding hotspots, view the following weblink:

https://doc.milestonesys.com/latest/en-US/standard_features/sf_sc/sf_configuration/sc_configuringhotspots.htm

Cameras

After you have created a map, you can choose to add cameras to it in the Setup menu.

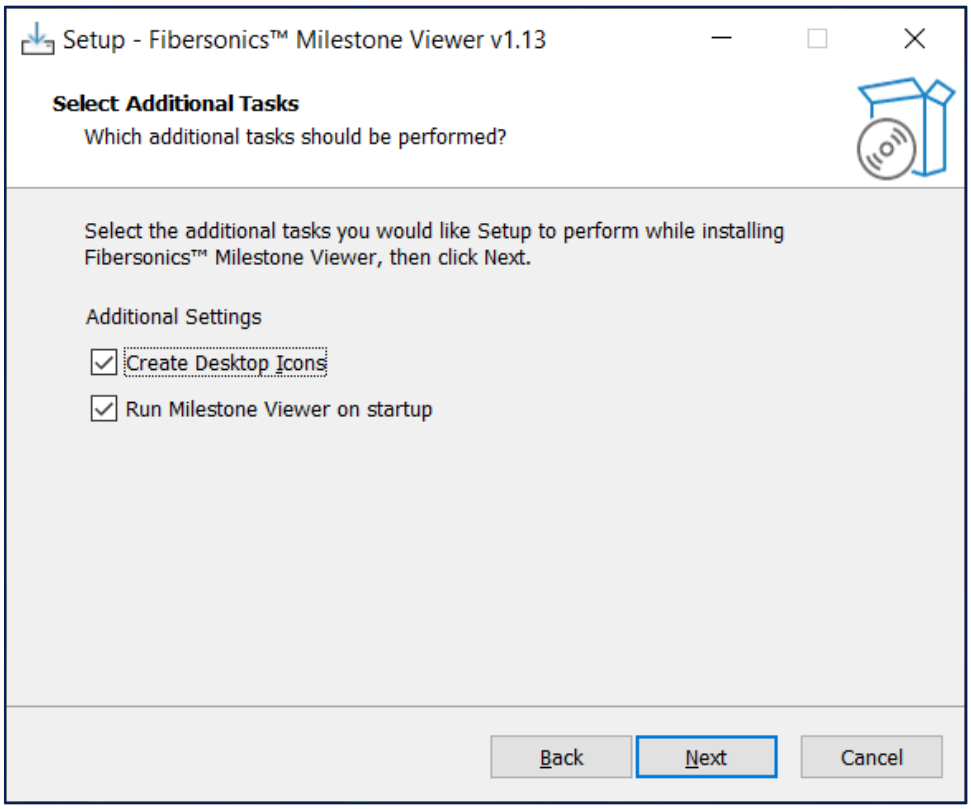
1. Open the XProtect Smart Client and login.
2. Near the upper right corner, there is a button labeled “Setup”. Click this button. The button will become orange to indicate that XProtect Smart Client is in setup (edit) mode.
3. Select the map you want to add a camera to or create a new map if one does not exist.
4. In the Map panel you just selected, there will be a floating tool bar. Select the option to “Add Camera” and move the mouse cursor over the map view. Click the left-mouse button to place the camera in the desired position on the map view. Cameras can be placed on the map to represent their physical location.

5. Once a camera is added, you can adjust its position and size using the standard-method mouse controls or right-click the mouse to display additional options.
6. You can also configure the camera's properties, including its name, description, and associated video feed.
7. All changes are automatically saved.
8. Select the button labeled “Setup” near the upper right corner to exit the setup mode.

Installing Fibersonics Milestone Viewer™

The Fibersonics Milestone Viewer has its own installer. Run this installer to install it on the required server computer.

The installer has a couple of options. It will always create an entry on the Start menu. Additionally, it can put an icon on the desktop, and it can be configured to automatically run when the computer is started.



After downloading, simply run the Fibersonics Milestone Viewer and you should be greeted with a login screen and are thus ready for your initial configuration.

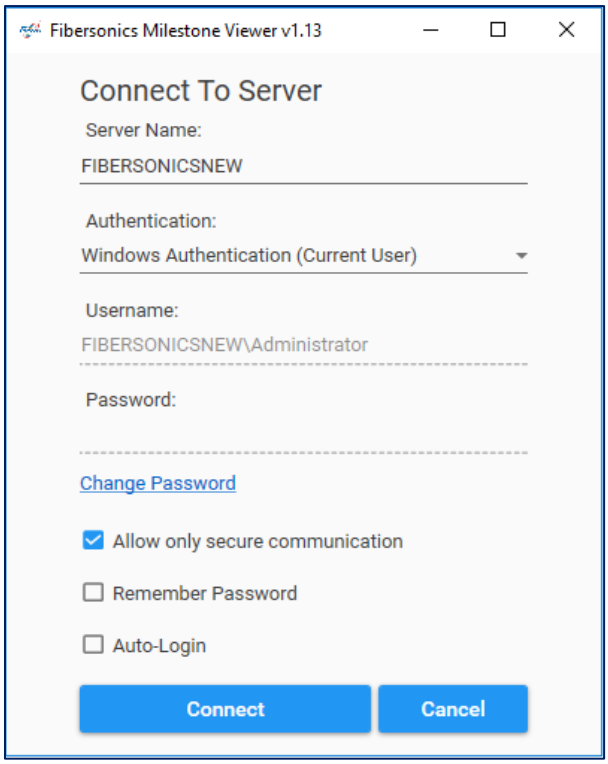
Configuring Fibersonics Milestone Viewer™

LRServer™ Configuration

Fibersonics Milestone Viewer listens for reports from the Long Ranger™ Server software (LRServer) on UDP port 10002. Please ensure that the port is accessible and that LRServer is addressing its reports to the system that the Fibersonics Milestone Viewer™ is operating on.

Login Configuration

During login, you will need to enter credential information, namely the server name (address) and the user information for a valid Milestone user.



The server name is the name of the server computer hosting the Milestone XProtect VMS software. Note, if the Milestone server is part of a Domain, then the server name may need to contain the Domain name to be recognized.

It's likely that the installation user was added to the Milestone server during installation. That user should be a valid windows login user for accessing Milestone XProtect VMS. If that is not an option, then a "private" user will need to be added via the Users tab of the XProtect Management Client.

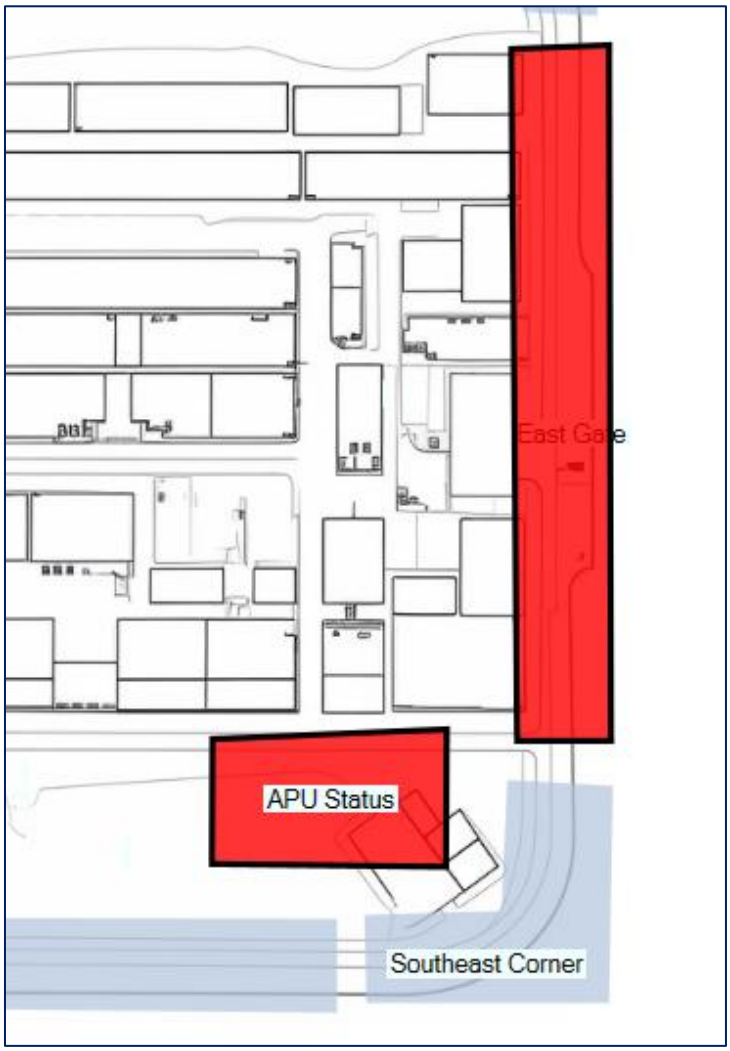
Segment Configuration

The details of segment configurations will be further covered throughout the feature description herein. However, we will provide only a high-level description here. Milestone's online documentation can provide more in-depth detail and information on segment (Hotspot) configuration, if needed.

The general idea is that we'll be mapping portions of the cable provided by the Long Ranger APU to discrete barrier segments (or Hotspots) that we define in Fibersonics Milestone Viewer. When the Long Ranger APU detects an event and its location, that information is transmitted to Fibersonics Milestone Viewer. The location of the event is defined in Fibersonics Milestone Viewer as "Fiber Distance" – the location along the fiber cable at which the event occurred. Using its calibration table configuration, Fibersonics Milestone Viewer will convert the "Fiber Distance" to the corresponding "Barrier Distance" for the barrier being monitored. The "Barrier Distance" is defined as the location along the barrier at which the event occurred. Fibersonics Milestone Viewer will then transmit the event information and the Barrier Distance

to the Milestone XProtect VMS, thus identifying and highlighting that an event (say, an alarm) has occurred and its position on the barrier being monitored.

Additionally, we'll be associating cameras with those given segments so that if an event occurs in a segment all associated cameras will be triggered. This will be clearly displayed in the Milestone XProtect Smart Client as shown below.



Though segments can be freely named, maintaining an organized list that correlates closely with the naming in Milestone will be beneficial and avoid confusion. For example, if multiple cameras are in a segment in Fibersonics Milestone Viewer, it makes sense to put them into a Hotspot in the Milestone XProtect VMS as well. Note, in the segment configuration window, we have provided two fields to help with the organization of segments - "segment ID" and "segment name". The "segment ID" can used to number the segments sequences as the user would use them, and the "segment name" for a description of the segment.

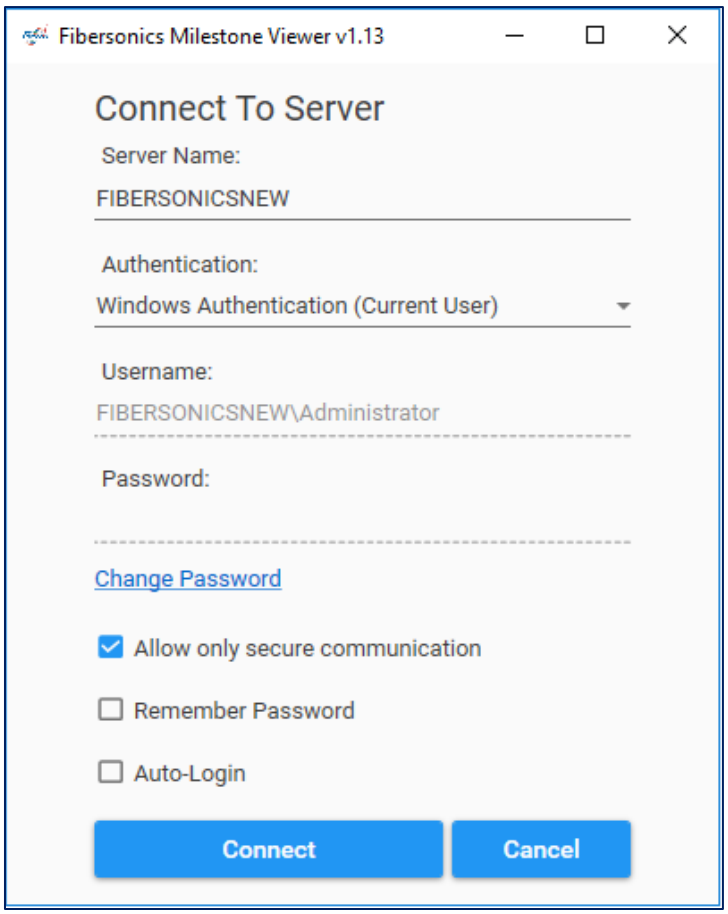
Note, however, that segments can be triggered and alerted even without an associated map.

We suggest creating a segment and using the "Test Alarm" feature in the Fibersonics Milestone Viewer to get a feel for how the system functions.

Fibersonics Milestone Viewer™ Feature Description

Login

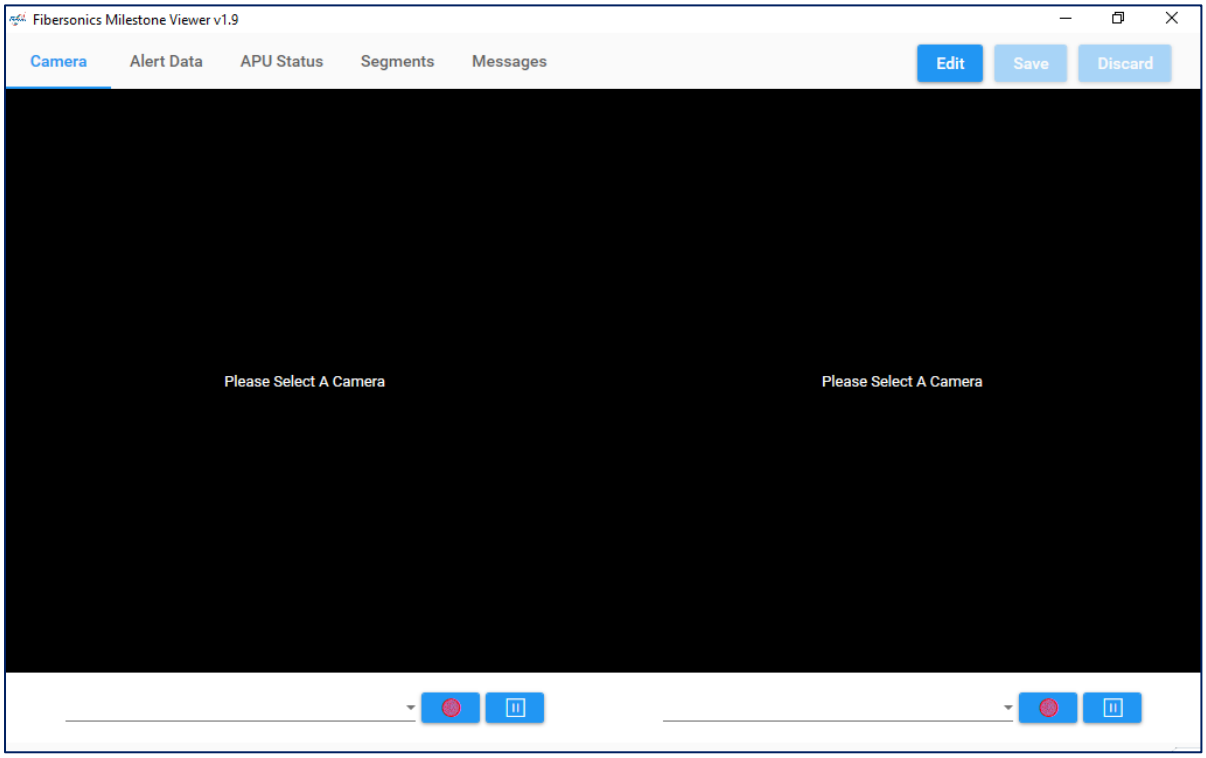
The login page is the entry point for the application and very closely mirrors the login you might find in the Milestone XProtect Smart client. The related options are:



- Server Name (Address): You will need to enter your Milestone server address in order to connect to it.
- Authentication Type: This is your choice of authentication type with Milestone. Milestone provides three options: Windows (current user), Windows generally, and basic user authentication. These users can be added in the Milestone server software.
- Username/Password: The expected username and password for the user logging in.
- Change Password: Links to the web admin so that a user can request to change their password.
- Allow only secure communication: Requires TSL/SSL when connecting to the server.
- Remember Password: Remembers the user's password for next time.
- Auto-Login: Automatically logs the user in next time they start the application.

Fibersonics Milestone Viewer™ GUI

After a successful login to the Fibersonics Milestone Viewer, the main GUI window will pop up.



The version of the Fibersonics Milestone Viewer software is displayed in the top-left corner of the screen.

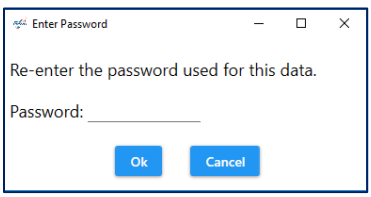
There are five accessible windows in the GUI:

- Camera
- Alert Data
- APU Status
- Segments
- Messages

Each window is described further in the following sections of this manual.

Buttons

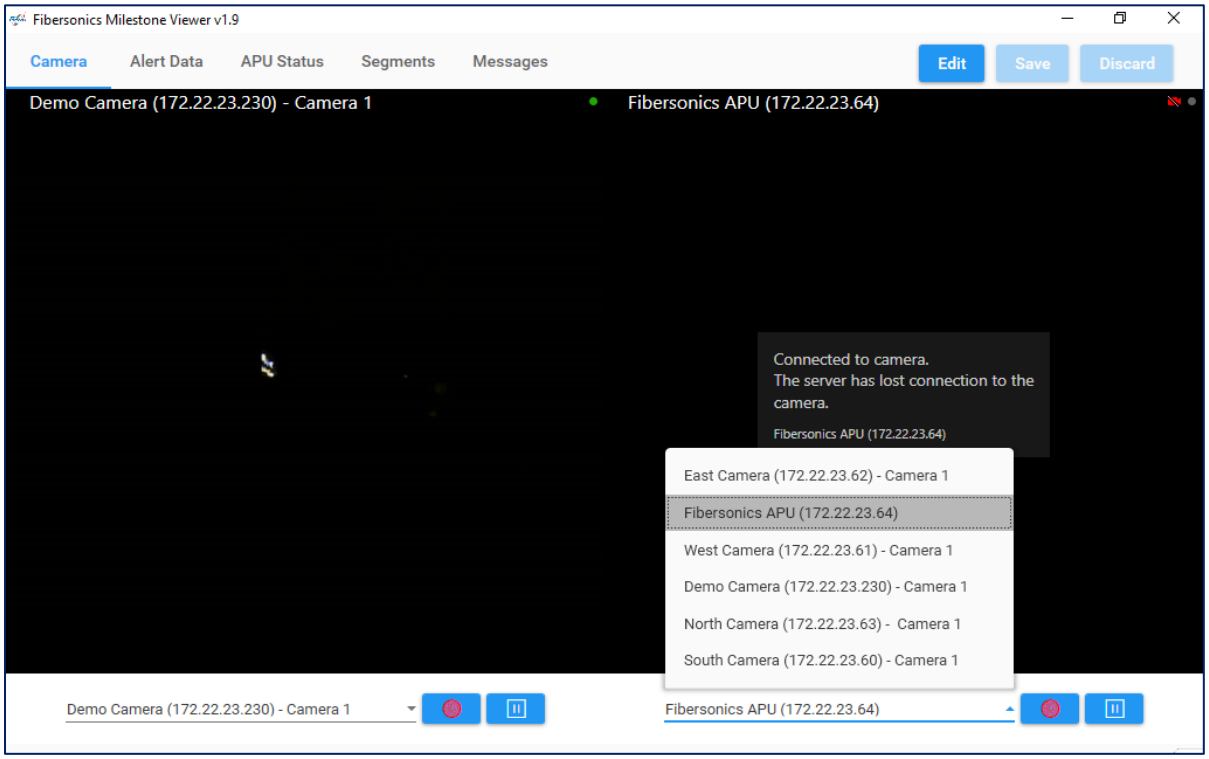
- Edit: Starts or stops edit mode. When entering edit mode, it will ask for a password. If this is the first time accessing the edit mode, the password specified by the user will be the password to use in the future. Otherwise, you'll need to enter the same password that was entered the first time. If the password is forgotten, it is possible to reset the password using the instructions in the Troubleshooting section of this manual.



- Save: Saves the current configuration. The configuration is saved in the server folder named “C:\ProgramData\LRMilestoneViewer” as a file named “Settings.json”.
- Discard: Discard unsaved changes and reload the previous configuration.

Camera

The Camera window enables the user a way to test out specific cameras that are set up in the Milestone server.



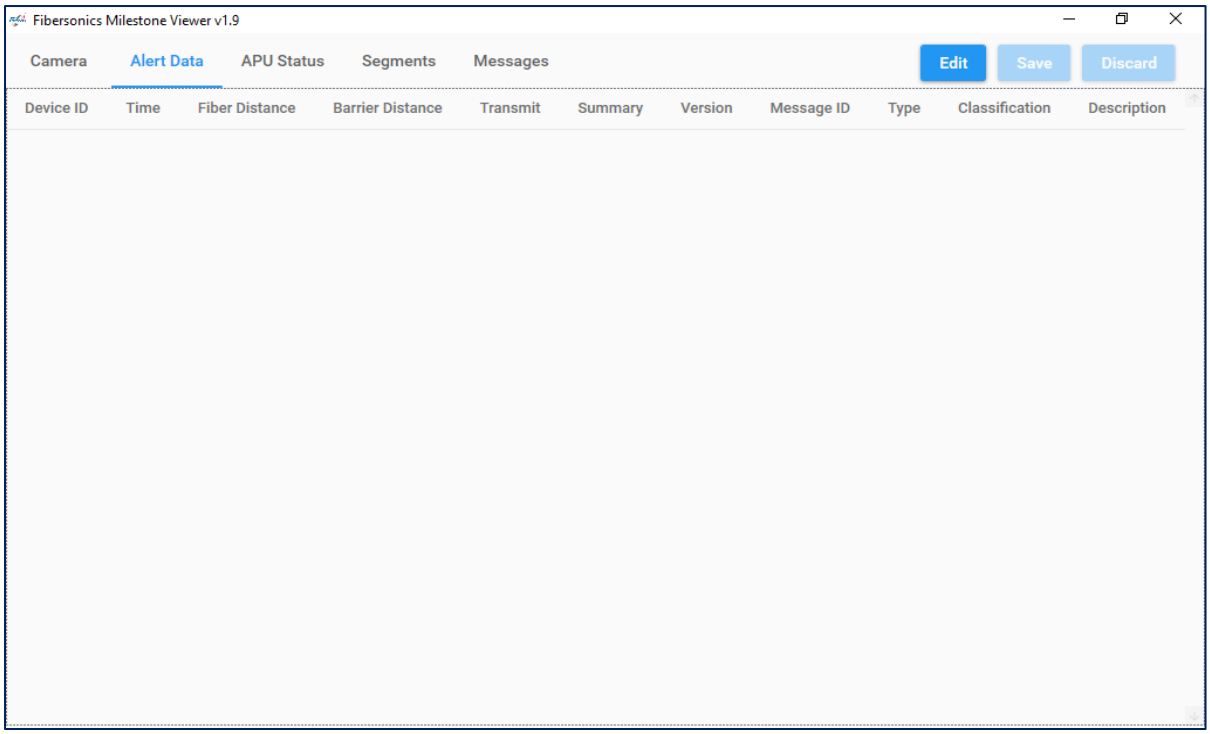
- The drop box offers the user a selection of cameras. When a camera is selected, the live feed from the camera is displayed in its associated window.
- The red button starts recording with the Milestone XProtect VMS with the selected camera.
- The pause button pauses the selected camera.

Alert Data

The Alert Data window displays real-time data that is coming directly from the connected APU(s), via LRServer and the Simple APU Reporter.

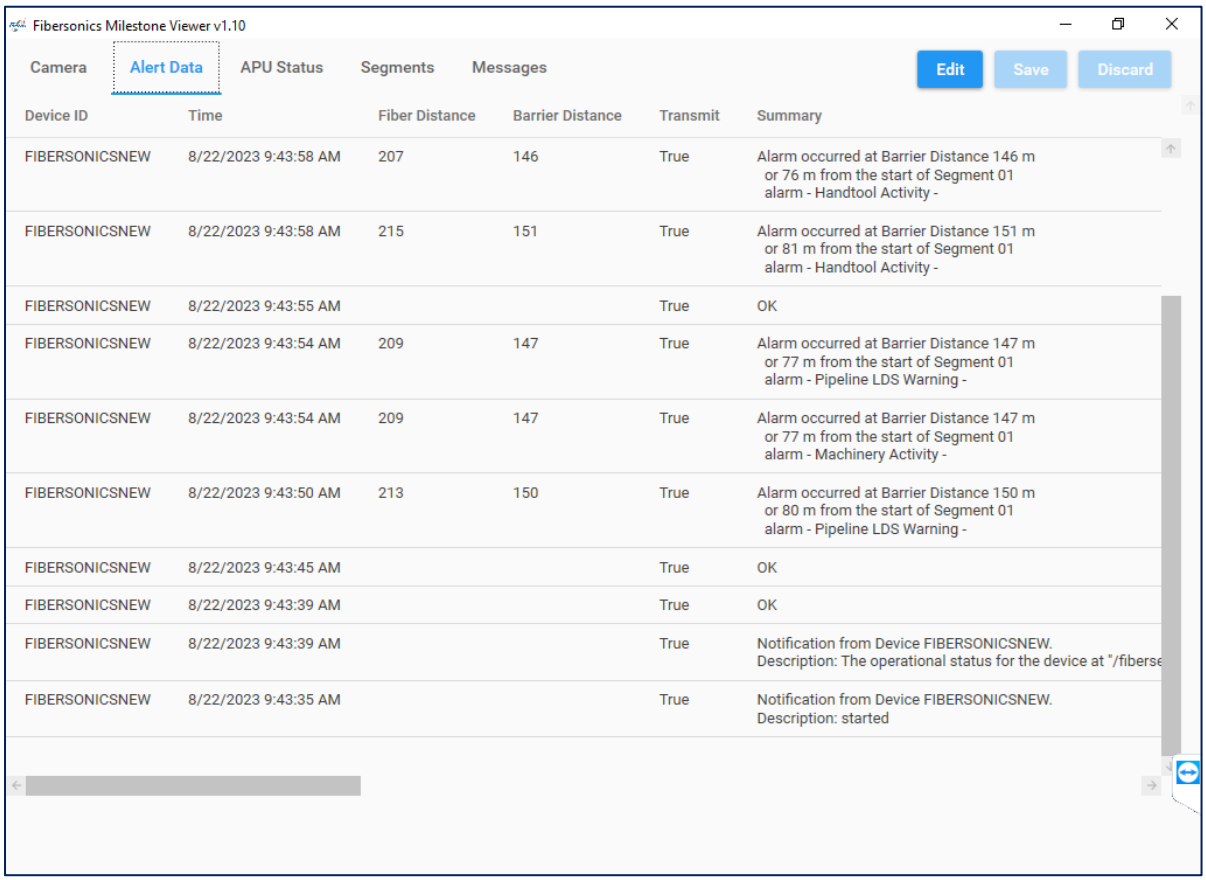
Each row represents a message received from the Simple APU Reporter. These can be system status, alarm or fault messages generated by LRServer. Device information and timestamps are also provided.

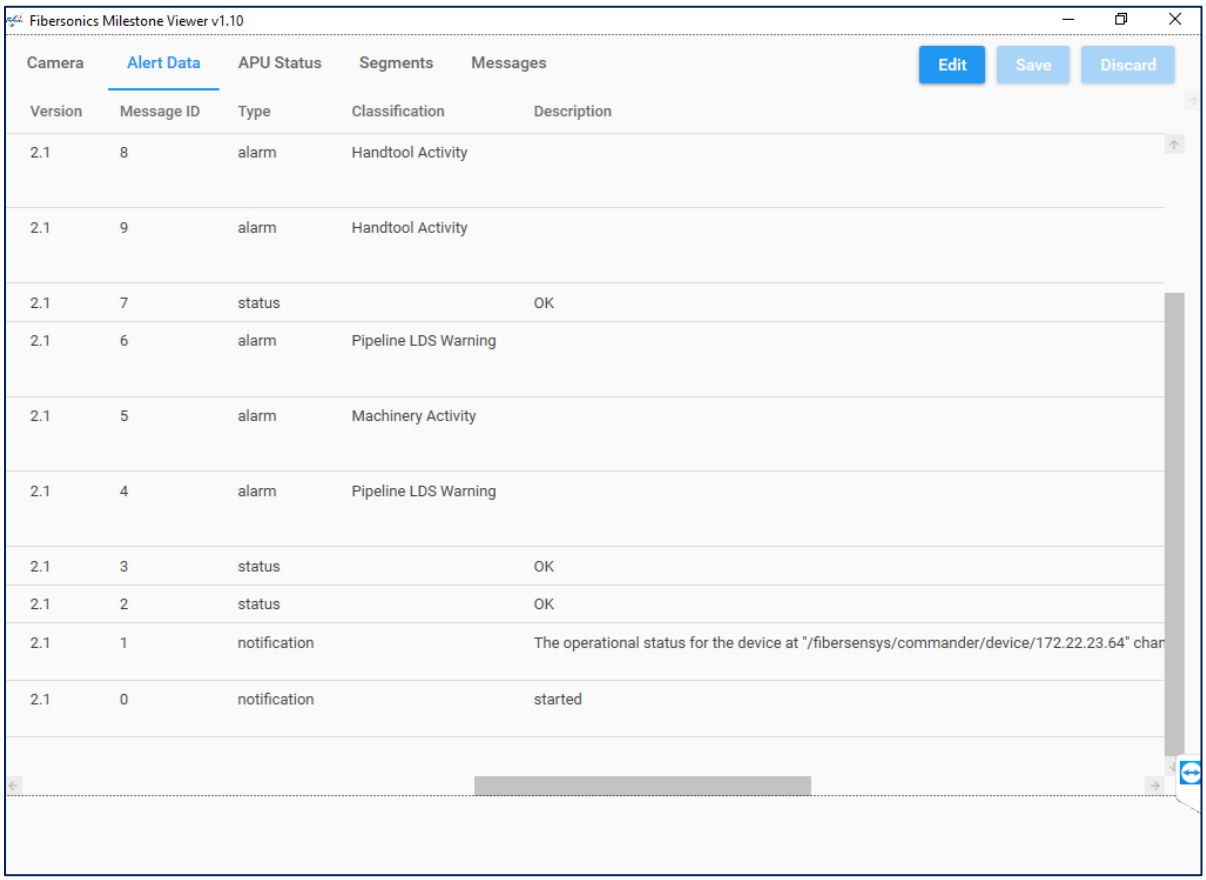
Each column displays a “field” component of the Simple APU Reporter messages. All fields of the received Simple APU Reporter messages are displayed, plus an additional “barrier distance” column (this is the barrier distance calculated by the Fibersonics Milestone Viewer) and a “summary” column that is controlled from the Messages window.



- Device ID: The name of the APU that is reporting the information.
- Time: The timestamp for when the data was reported.
- Fiber Distance: If available, the distance along the length of cable at which a disturbance was detected.
- Barrier Distance: If available, the location along the barrier at which the event occurred. Using its calibration table configuration, Fibersonics Milestone Viewer will convert the "Fiber Distance" to the corresponding "Barrier Distance" for the barrier being monitored. The calculation methodology is explained in the section named "*Calculation of Barrier Distance by Use of Linear Interpolation*" of this manual.
- Transmit: Confirmation of whether the message was transmitted.
- Summary: This column contains the format and content of the message that is transmitted to the Milestone XProtect VMS. This message is created according to the parameters/fields specified in the "Messages" window.
- Version: This is the version number of the Simple APU Reporter in operation.
- Message ID: Each message received is given a Message ID number, starting at 0 and increasing incrementally.
- Type: The event types that are transmitted by the Simple APU Reporter to Fibersonics Milestone Viewer. The types included are Status, Alarm, Warning, Alert, Fault, Notification and Info.
- Classification: The classification assigned to the event as determined by the LRServer configuration for event classification types.
- Description: Any additional information provided by the APU, including "Fault Codes" in case of a "fault" event type.

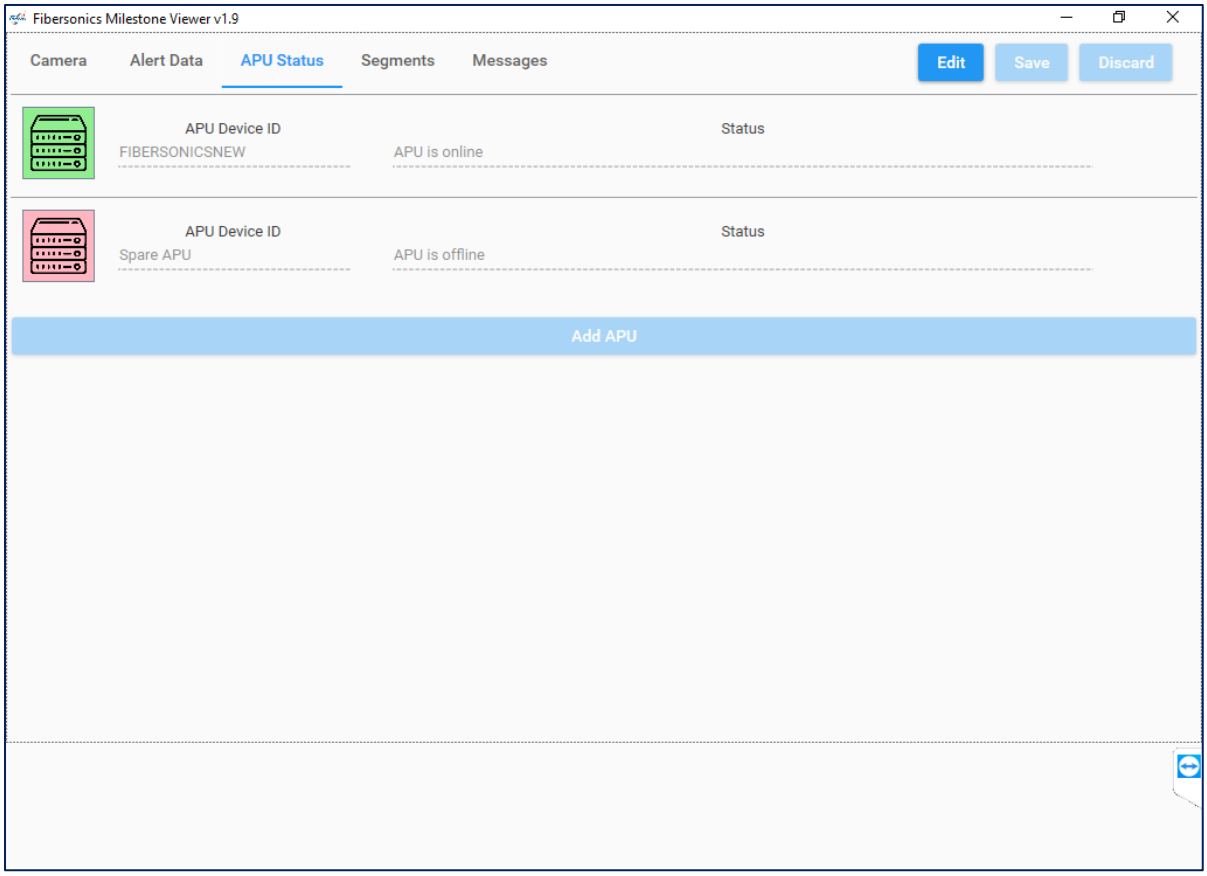
A sample Alert Data window populated with received messages is shown below:



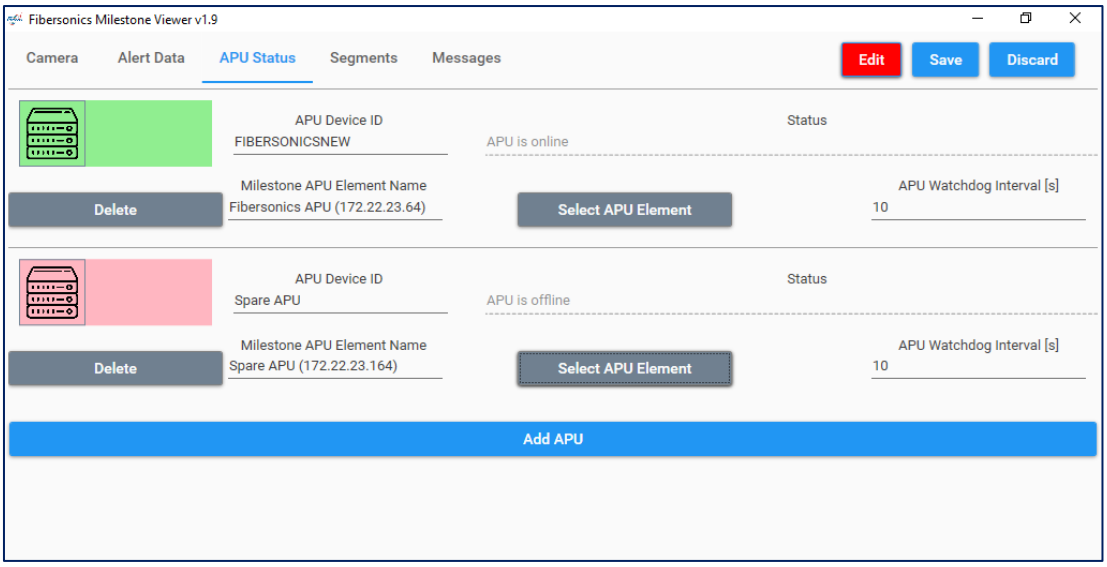


APU Status

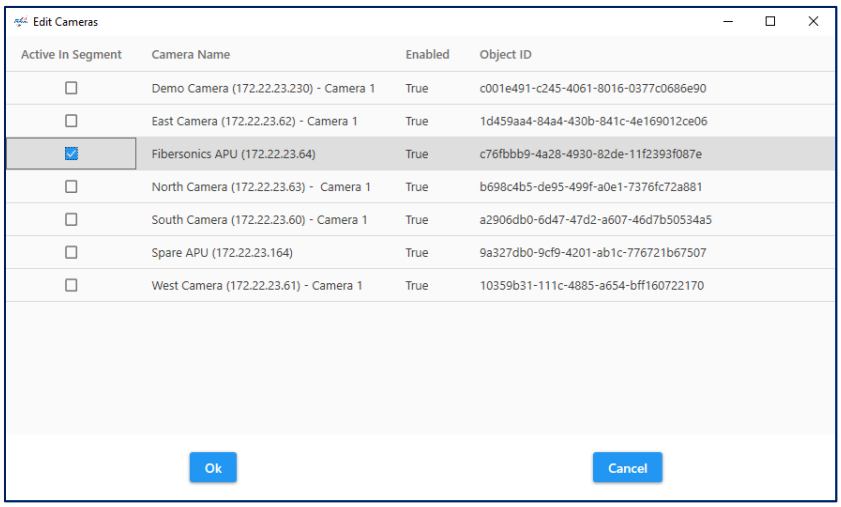
The APU Status section is where APUs can be added to the Fibersonics Milestone Viewer system. Immediately after adding an APU on this page, via the "Add" button, the system will start listening for reports from a device with the name given. Once it establishes a connection to an APU, the operational status of the APU will be tracked and properly displayed. Additionally, events relating to the APU status will be sent to the Milestone XProtect VMS on a regular basis using a 'Watchdog' function.



- APU Device ID: The APU device ID as configured from the APU side. This must match in order for the Watchdog function to properly report status.
- APU Status: The current connection status of the APU.
- Save: Saves the current configuration.
- Discard: Discard unsaved changes and reload the previous configuration.
- Edit: Allows editing of the APU connection settings, additionally granting access to the APU element assignment options.



- APU Watchdog Interval: The time interval that Fibersonics Milestone Viewer checks the status of the network connection to the respective APU.
- Add APU: Adds a new APU.
- Delete: Deletes the selected APU.
- Select APU Element: Allows for selection of a Milestone element that the APU can channel status updates through.

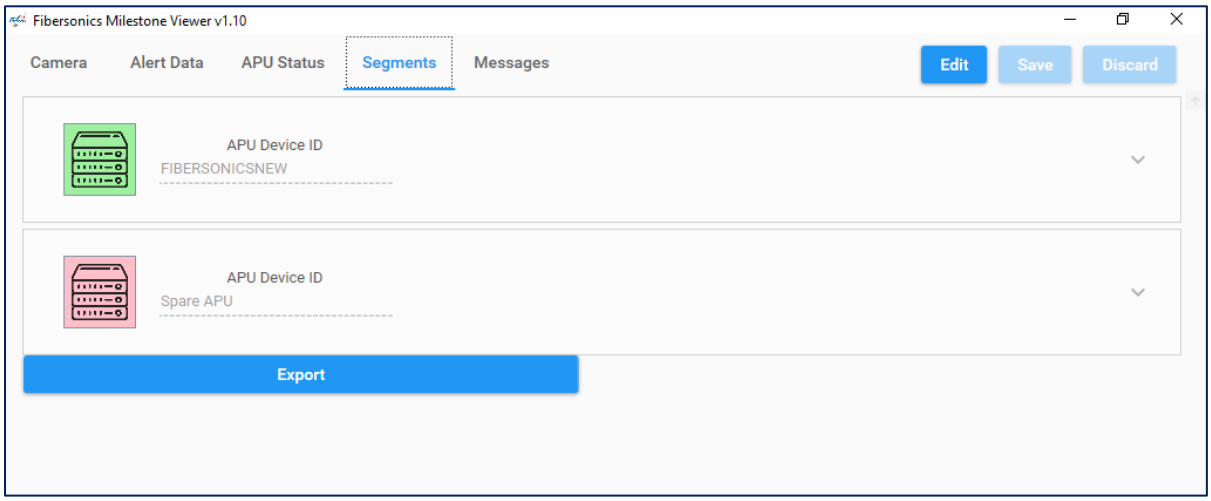


Segments

When the Long Ranger APU detects an event and its location, that information is transmitted to Fibersonics Milestone Viewer. The location of the event is defined in Fibersonics Milestone Viewer as “Fiber Distance” – the location along the fiber cable at which the event occurred. Using its calibration table configuration, Fibersonics Milestone Viewer will convert the “Fiber Distance” to the corresponding “Barrier Distance” for the barrier being monitored. The “Barrier Distance” is defined as the location along the barrier at which the event occurred. Fibersonics Milestone Viewer will then transmit the event information and the Barrier Distance to the Milestone XProtect VMS, thus identifying and highlighting that an event (say, an alarm) has occurred and its position on the barrier being monitored.

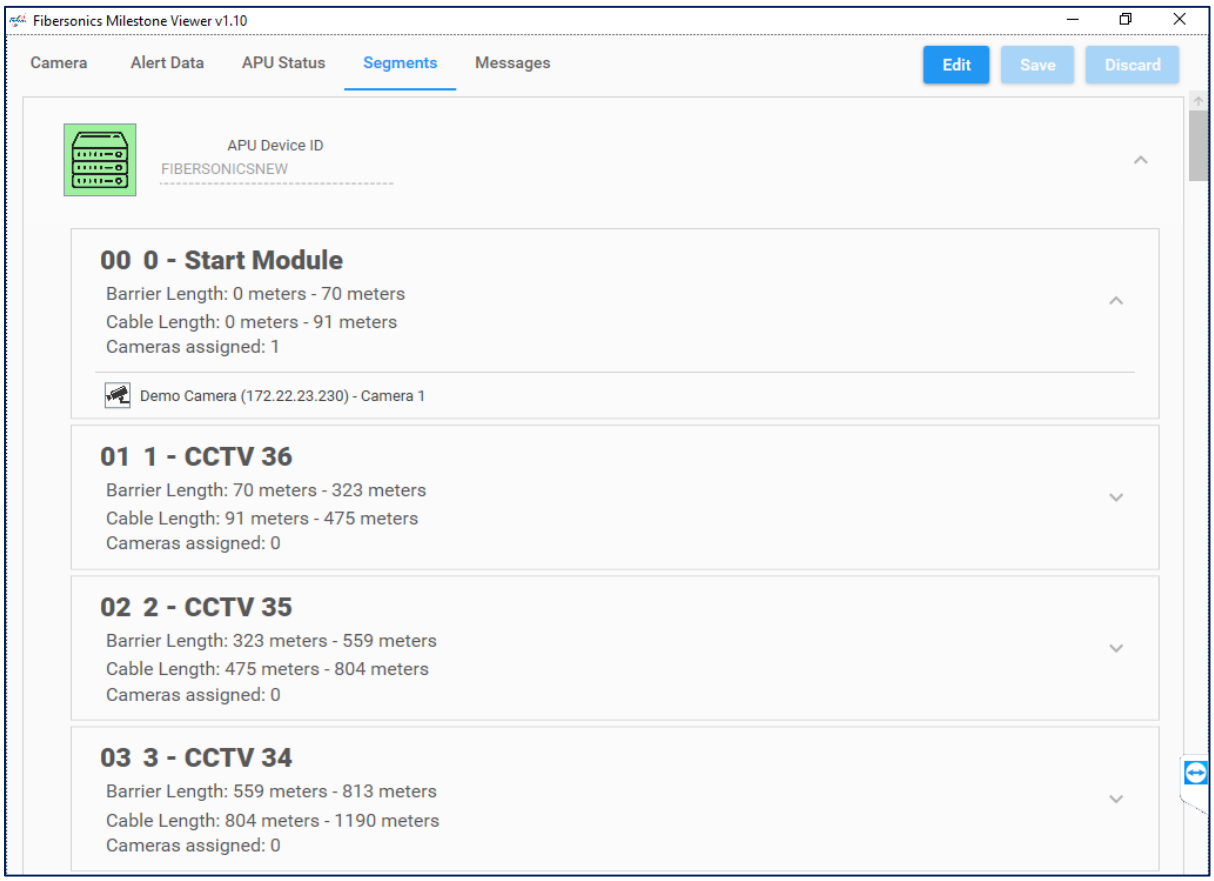
Additionally, cameras can be associated with given segments so that if an event occurs in a segment all associated cameras will be triggered.

The APU Segments screen is very important to the functioning of the Fibersonics Milestone Viewer, as this is where the user builds the segmentation and calibration table. Similar to the status screen, there is a standard view mode and an edit mode.

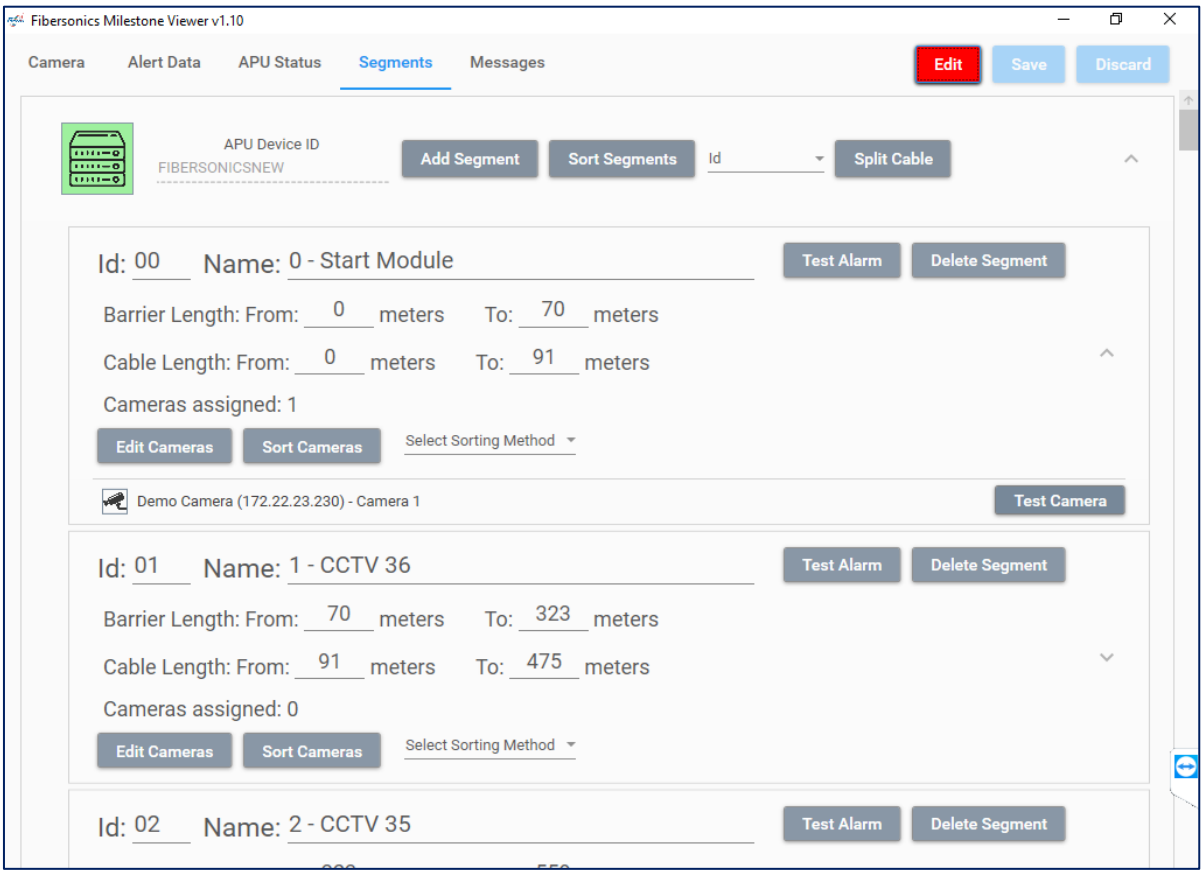


- APU Device ID: The APU device ID as configured from the APU side. The device ID must correspond with the name of the server computer running LRServer.

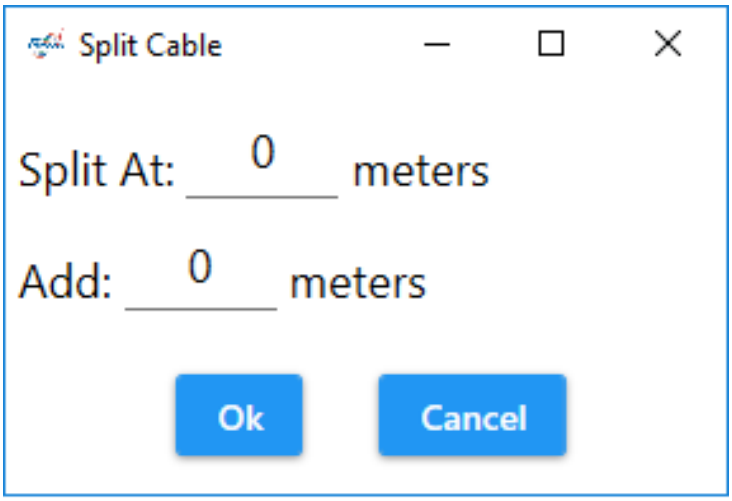
When a user clicks the mouse button over an APU Device, the segments previously configured for that APU are displayed.



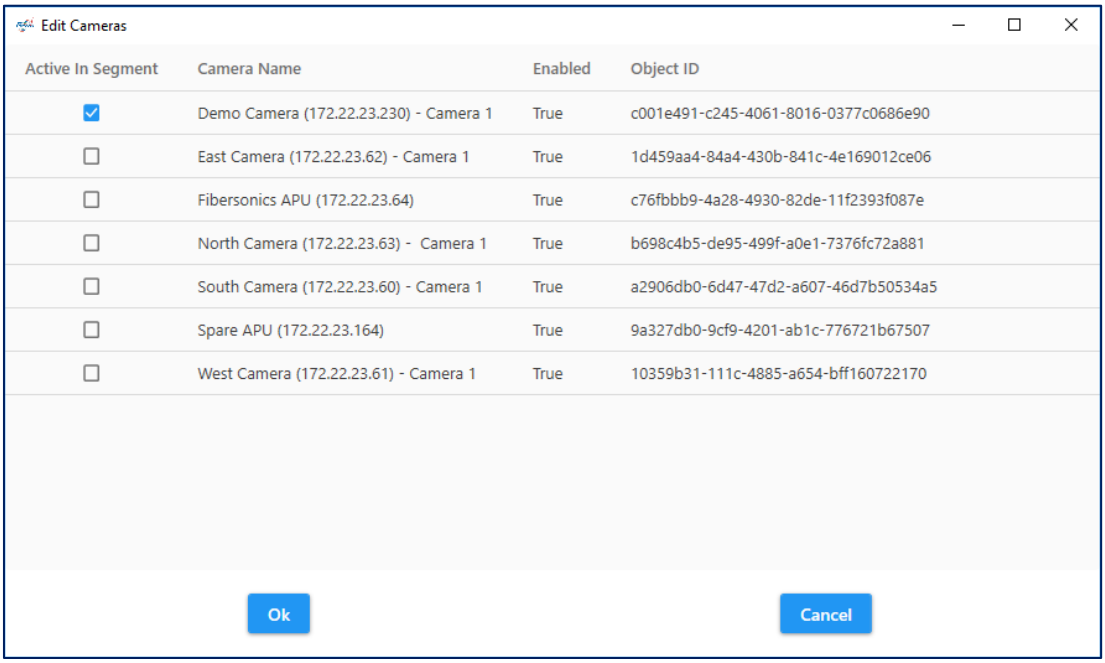
Edit Mode:



- Select the ‘Edit’ button to enter the Edit mode.
- Add Segment: Adds a new segment, which must be saved to persist.
- Sort Segment: Sorts the existing segments by the selecting sorting method. Options include alphabetical, by distance, and custom (Save the order of a custom sort to use it).
- Split Cable: If the user wishes to split a segment, they can select at which fiber location to split the cable and how many meters to add. The change will be propagated to all subsequent segments.



- ID: each segment can be assigned an ID number.
- Name: The name of a segment, used for organization and identification.
- Barrier Length: This is the physical length of the barrier that the segment corresponds to.
- Barrier From-To: Defines the range of the physical barrier the APU cable is attached to.
- Cable Length: This is the length of the cable that is attached to the barrier of a given segment.
- Cable From-To: Defines the length of cable that maps to a given barrier segment.
- Cameras Assigned: The number of cameras assigned to a segment.
- Test Alarm: Simulates a distance event coming in, centered at the range defined for the segment. The message received from this test can be seen in the log displayed in the "Alert Data" window.
- Delete Segment: Deletes the segment.
- Sort Cameras: Allows for sorting of cameras in the same way as segments.
- Edit Cameras: Opens a list of available Milestone cameras that can be added or removed by checking them off. Camera status and IDs are listed here, as well as indication if the camera is active in a segment.



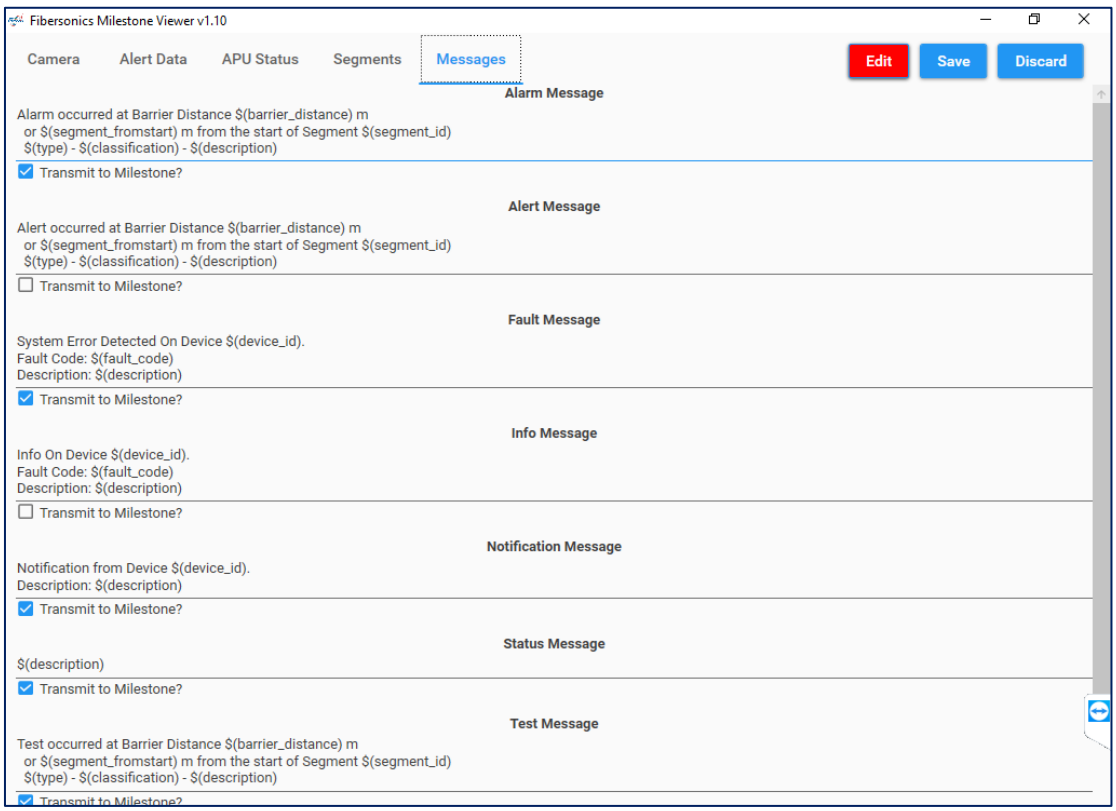
- Test Camera: If a camera is assigned to a segment and is active, selecting this button will pop up a live camera feed window for the associated camera that is installed in the Milestone XProtect VMS.

Messages

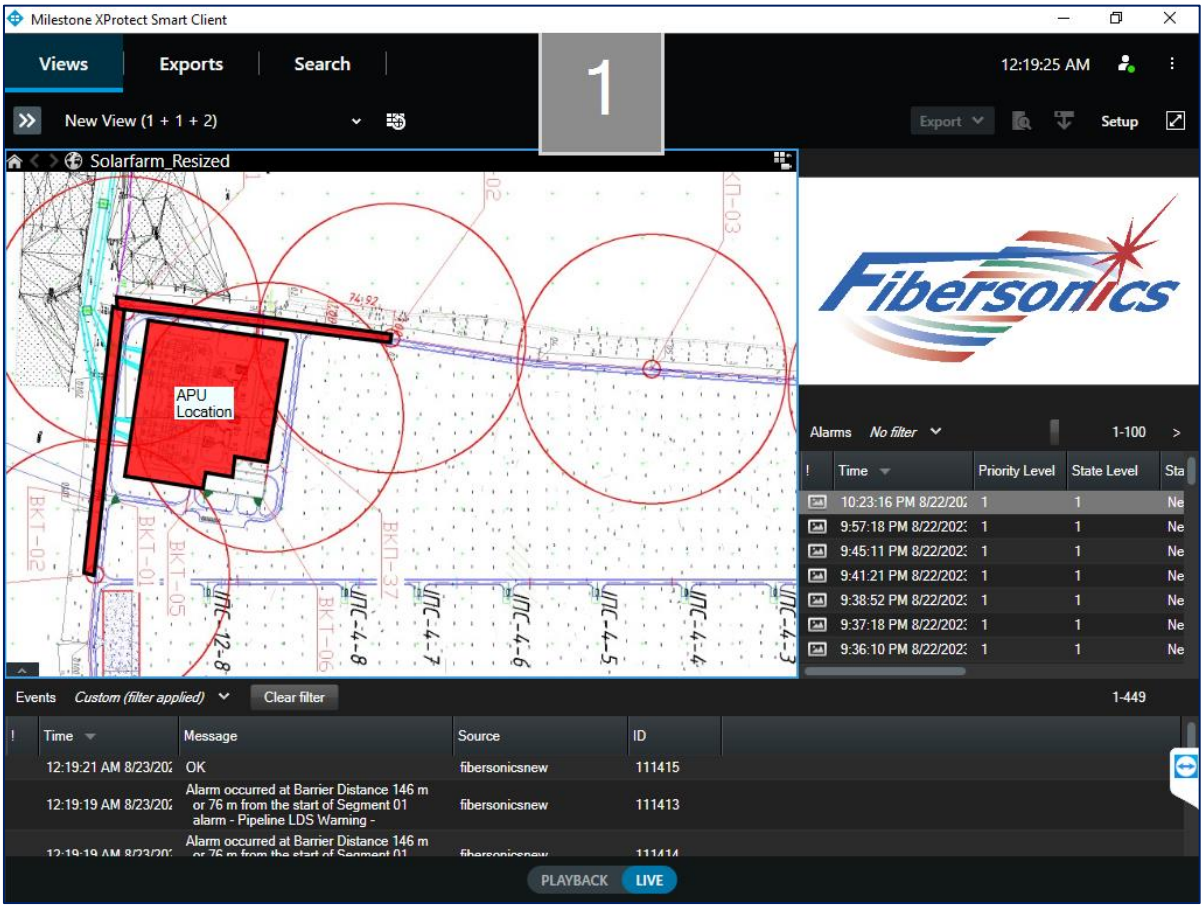
The Messages section is where a user can 'build' the format and content of the event message that is transmitted to the Milestone XProtect VMS. When an event is detected by LRServer, it will transmit the data to the Fibersonics Milestone Viewer via the Simple APU Reporter. The event types that are transmitted by the Simple APU Reporter to Fibersonics Milestone Viewer are:

Type	Description
Status	The status of APU and LRServer.
Alarm	If an alarm condition is detected by LRServer.
Warning	If a warning condition is detected by LRServer.
Alert	If an event is detected by LRServer that is not classified.
Fault	If a fault condition with the Fibersonics system is detected. A specific fault code is stated, which identifies the problem (see section titled "System Fault Codes" further in this document).
Notification	Operational information on the system is provided.
Info	Operational information on the system is provided, specifically with fault codes if a problem is encountered.
Other	Other is used by messages that do not have a known type.
Test	If a simulated test event is generated within the Fibersonics Milestone Viewer.

The Fibersonics Milestone Viewer then compiles the message into the format and content specified in the "Messages" window by the user. The message is simultaneously displayed in the Alert Data "summary" column and transmitted to the Milestone XProtect VMS. The XProtect Smart Client software will then display the message received in the "Events" and/or "Alarms" windows.



The message transmitted to the Milestone XProtect VMS is identical to the message shown in the Alert Data “summary” column. The message that is compiled can be viewed in the “summary” column of the “Alert Data” window and in the Milestone XProtect Smart Client software in the “Events” and/or “Alarms” windows.



- To ‘build’ each message, you can enter the following strings (received from the Simple APU Reporter) for substitution:
    - $(device_id)
    - $(message_id)
    - $(time)
    - $(type)
    - $(classification)
    - $(description)
    - $(fault_code)
    - $(version)
    - $(fiber_distance)
    - $(feature_distance)
    - $(raw_segment_id)
    - $(cctv_preset_id)
    - $(is_primary)
    - $(weight)
    - $(location_table_id)

- In addition, the following new strings are created by the Fibersonics Milestone Viewer and available for inclusion into messages:
    - $(barrier_distance) – the interpolated distance
    - $(segment_id) – the segment id
    - $(segment_name) – the segment name
    - $(segment_start) – the segment start position in barrier coordinates
    - $(segment_end) – the segment end position in barrier coordinates
    - $(segment_fromstart) – the distance from the start of the segment
    - $(segment_fromend) – the distance from the end of the segment
- The “Messages” tab contains a “Transmit to Milestone” checkbox for each type of message. If the checkbox is checked, the message will be transmitted to the Milestone XProtect VMS.
- If a report matches multiple segments, the data from the shortest segment that matches is used.
- For example, to get the message “...Alarm occurred at Barrier Distance BD m, ((BD-BS) m from the start of Segment XX).”, use “...Alarm occurred at Barrier Distance $(barrier_distance) m, ($(segment_fromstart) m from the start of Segment $(segment_id)).”
- Furthermore, the messages can be formatted such that the information is provided in multiple lines, such as:

    ********** ALARM **********
    $(classification) at $(barrier_distance) meters.
    $(segment_fromstart) meters into segment $(segment_id) ($(segment_name))

Testing the System

Generic Example

Given that you’ve followed the setup steps and have an operational and communicating system, then you are likely ready to create some segments and test them out. The following steps can be used to test and demonstrate the whole system:

1. First, press Edit and enter a password.
2. Go to the APU Status window and add an APU and save it. The name should match the name of the computer running LRServer for one of the APUs you have installed.
3. In the Segments window, add a new segment. Name it appropriately and set the segment distance to a range that you would like to test. In this case, we’ll be simulating it so it’s not critical.
4. Select the cameras that you would like alerted via the Edit Cameras button.
5. Once that is set you should be able to select “Test Alarm” button to simulate a report falling within the range of the segment you defined. That report will be visible from the Alert Data window. Note that LRServer is not required to be running to use the “Test Alarm” feature.

6. After you have used the "Test Alarm" feature to ensure Milestone is receiving the events and alarms properly, then you can start LRServer and run a physical test directly on the fiber cable to generate an actual alarm.
7. When an alarm is generated, feeds will also open for each camera you selected showing you their state change.
8. Additionally, if you would like to connect the APU with a dummy element you can follow the instructions in the Milestone Configuration section further above to create one and assign it to an APU. Then, if you wish to test the APU status and watchdog function, simply cut the connection to that APU after connecting once and it will report a system error to the Milestone XProtect VMS.

The above detailed demonstration process roughly emulates what would occur should a real disturbance occur in the range defined in a segment on an operational system.

Demonstration Example with Configuration Files Provided by Fibersonics

A configuration file of the APU and segments installation in Fibersonics Milestone Viewer can be exported to a .csv file on the server computer. Additionally, it is possible to import a .csv segment configuration file from a backup file.

To export the segment data to a .csv file:

1) In the "Segments" window, press "Export" and enter a file name for the export file.
2) This will create a file that contains the segment data in a .csv file. This file can be loaded into Excel or LibreCalc and modified.

To import segment data from a .csv file:

1) Enter "Edit" mode. You cannot import until you are editing the data.
2) In the "Segments" window, press "Import" and select the desired backup .csv file with the data.
3) Verify that the data has been loaded correctly, then press "Save".
4) This will replace all segments with the data from the export file. Any data not in the export file (such as the APU timeouts) will be created at its default value (25s, in the case of the watchdog timeout). Note that cameras likely will need to be reentered, since their IDs will change when copied to a different system.

The data can also be managed from a .json file named "C:\ProgramData\LRMilestoneViewer\Settings.json". This file contains all the segment data for the configuration in JSON format. If you keep the structure (e.g., properly close braces and brackets), you should be able to load the changed file. (Make a backup before starting.)

Demonstration Example of Setting-up a Working IP Camera

For a demonstration configuration, you will also need to load the map and cameras into Milestone XProtect. Use XProtect Management Client to include all of the desired cameras, then use XProtect Smart Client to set up the guard workstation with the map and camera views.

To include a specific IP camera into a demonstration configuration, follows the steps:

1. Ensure that you are using an IP camera that is compatible with Milestone XProtect. If you are using an IP camera that does not have a specific software driver for Milestone XProtect, ensure that the camera is compatible with the Milestone "Universal 1 channel driver".
2. Configure the IP camera to work on the same TCP/IP network as the Milestone XProtect software. Also ensure that the camera is using an IP address that is accessible by the Milestone XProtect software.
3. For the purpose of this demonstration configuration, we are using a D-Link DCS-930LB IP camera. Details on this camera can be found at the following weblink:

   https://www.dlink.com/en/consumer/cameras
4. Start the XProtect Management Client.
5. In the "Hardware model" field, select "Universal 1 channel driver".
6. Press "Next".
7. Select Server, Devices/Camera (not Recording Servers!!).
8. Select the camera being used.
9. In the right-most panel, near the bottom, select "Settings", and change the following:
   - General/Retrieval mode: Snapshot
   - Video stream 1/Codec: MJPEG
   - Connection URI: image/jpeg.cgi
   - Frames per second: 30
   - Streaming mode: HTTP

   Note that other connection types may be available according to:

Type	Protocol	Path
FFMPEG	rtsp://	live3.sdp
JPEG	http://	image/jpeg.cgi
MJPEG	http://	video.cgi?resolution=VGA

Additional Feature Configurations

Fibersonics-Side Configuration

Calculation of Barrier Distance by Use of Linear Interpolation

When the Long Ranger APU detects an event and its location, that information is transmitted to Fibersonics Milestone Viewer. The location of the event is defined in Fibersonics Milestone Viewer as "Fiber Distance" – the location along the fiber cable at which the event occurred. Using its calibration table configuration, Fibersonics Milestone Viewer will convert the "Fiber Distance" to the corresponding "Barrier Distance" for the barrier being monitored. The "Barrier Distance" is defined as the location along the barrier at which the event occurred. Fibersonics Milestone Viewer will then transmit the event information and the Barrier Distance

to the Milestone XProtect VMS, thus identifying and highlighting that an event (say, an alarm) has occurred and its position on the barrier being monitored.

The Barrier Distance is calculated by the following formula:

$$\mathbf{BD - BS = (BE-BS) \times \frac{(FD-FS)}{(FE-FS)}}$$

Where:

FD – Fiber Distance from Start Module to position detected by LRServer

FS – Fiber distance from Start Module to Start of Segment

FE – Fiber distance from Start Module to End of Segment

BS – Barrier distance from Start Module to Start of Segment

BE – Barrier distance from Start Module to End of Segment

BD – Barrier Distance from Start Module to position calculated by linear interpolation

Barrier distance from the start of segment is (BD-BS).

Cluster Mitigation

Cluster Mitigation is a feature of Fibersonics LRServer that reduces the number of alarms reported to a third-party product. All alarms are still reported and archived internally within LRServer and stored in the Fibersonics server.

To configure Cluster Mitigation for use with the Fibersonics Milestone Viewer follow the steps:

1. If LRServer is currently running, stop it. To stop it, use Windows task Manager to stop the LRServer Watchdog Service and the three associated LRServer Processes.
2. Open the LRServer Launcher application via the link on the desktop or the Windows Start menu. This starts a program called “Long Ranger Server Launcher”.
3. Select “Configure Server”.
4. Near the end of this screen there are three fields with labels starting “Cluster Mitigation”. These are the configuration fields that control this feature.
5. “Cluster Mitigation Mode” selects how cluster mitigation works. There are three options:
    a. “Disabled: Report all events.”: This will disable cluster mitigation mode and cause all events to be reported externally. When this is selected, the other two fields will not matter.
    b. “Simple: Ignore clusters around start event.”: This will not report events that occur too close to the initial event reported in both time and space.
    c. “Extended: Reset timer for each event in cluster.”: This will not report events that occur too close to the initial event reported in both time and space, plus events that occur too close to a previous (ignored) event in time and space.
6. “Cluster Mitigation Time Interval”: This is the maximum duration (in seconds) between two events for them to be considered too close in time.

7. "Cluster Mitigation Distance": This is the maximum distance between two events for them to be considered too close in space. Note that distance is measured along the cable, not in a user-defined coordinate space. If there is a 100-meter loop of cable then two points 10 meters on opposite sides of that loop are 120 meters apart, not 20 meters.
8. After the desired parameters are set, select the "Finish" button and then press the "Exit" button to close the Long Ranger Server Launcher.
9. Lastly, use Windows task Manager to start the LRServer Watchdog Service and verify that the three associated LRServer Processes have been started.

Milestone-Side Configuration

Installation of Security Certificate(s) for the Milestone XProtect® VMS

Certain software certificates are required in order to establish a secure connection with the Milestone XProtect VMS. If you encounter an error message during the start-up of the Milestone management or client software, stating that a secure connection could not be established, it is possible that your computer is missing the required security certificate(s). To install the required certificate(s), please follow the steps provided:

Depending on what gets installed for IIS, you may or may not need some of the following steps. To install the certificate Milestone/IIS is using, perform the following steps:

1. Find the certificate used by IIS. To do this, go into a web browser (e.g. Chrome) and type 'https://localhost/'. You'll get one of three responses:
    a. Not Found. If the website isn't found, you don't have IIS installed on the standard https port (443).
    b. Success. If it pulls up the website, then the certificate is likely fine. This would mean there is a certificate, it is trusted, and it has the correct domain name.
    c. Certificate Error. The browser will say "Your connection is not private" or something similar. It should also tell you the specific error. When this occurs, find the certificate for the site. How to do this depends on your browser. In Chrome, click the "Not Secure" button to the left of the URL, then click the option that displays the certificate (the name varies, but the tooltip says it displays the certificate). You'll probably need one of the fingerprints (keep the screen open while you use MMC).
2. Find and Export the certificate in MMC.
    a. Launch MMC (Start / Run / MMC).
    b. Install and Use the Certificate Add-On. MMC is really confusing, so read the online instructions.
    c. Search the certificate stores for the certificate. You can do this by searching for the first few characters of the SHA-1 fingerprint.
    d. Export the certificate to a file.
3. Import the certificate into the Trusted Store.
    a. In the MMC Certificate Add-On…

b. Open the Trusted Certificate Store.

c. Add a Certificate.

d. Browse the file you exported above.

Microsoft provides the following basic instructions:

https://learn.microsoft.com/en-us/skype-sdk/sdn/articles/installing-the-trusted-root-certificate

Troubleshooting

My cameras aren't showing in the Milestone XProtect Smart Client or Fibersonics Milestone Viewer

It's likely you may just need to log out and log back in. Milestone server doesn't live update when changes are made.

My APU status is not updating / I'm not receiving reports

Ensure that the device name you've specified under APU Status is correct and that LRServer is pointing its reports to your IP address at port 10002.

I can't seem to login

Ensure that the Milestone server is currently running and that the user you are trying to login to exists in the Milestone XProtect Management Client.

For Milestone's documentation on Logging in troubleshooting, view the following weblink:

https://doc.milestonesys.com/latest/en-US/standard_features/sf_sc/sf_troubleshooting/sc_loggingintroubleshoot.htm?tocpath=XProtect%20Smart%20Client%7CXProtect%20Smart%20Client%20user%20manual%7CTroubleshooting%7C____2

I forgot my password

To recover a lost or forgotten password, you need to know where the data is stored (default is in folder named "C:\Program Data\LRMilestoneViewer"). There are three options:

1. Delete the "Setting.json" file. This will allow you to start over. The next step would be to import the segment data from a backup file, then you will have to enter anything not included in the import (more than 4 cameras for a segment plus any changed timeouts).
2. Edit the "Settings.json" file directly. If you know what you need to change, it isn't particularly difficult. You just need to make sure the result remains in valid JSON format.
3. Remove the "EncryptedPassword" field from the "Settings.json" file. If this field does not exist, it will prompt you for a new password which can be saved. (This field is currently the last field in the file. Make sure you remove the comma before it as well or the resulting file may not be valid.)

System Fault Codes

Below follows a list of the LRServer system fault codes which currently exist:

ID	Fault Name	Severity	Description
-3	SIMPLE APU REPORTER - SAFEMODE	Info	The APU is in safe mode, but LRServer was not able to determine the fault code. Action Required: Correct the underlying problem, then re-enable the APU using LRConfig.
-2	SIMPLE APU REPORTER - NOT CONNECTED	Info	LRServer is not currently connected to the APU.
-1	SIMPLE APU REPORTER - STARTING	Info	LRServer is still starting and does not yet have status information.
0	SIMPLE APU REPORTER - OK	Info	The system is functioning correctly.
2	TEC OUT OF RANGE	Restart	TEC loop out of range. The APU will reboot automatically. (May cause 121 faults as well.)
97	REBOOT	Info	System Rebooting
98	INFO	Info	General Informational Message. This message sometimes indicates that too many faults have caused the APU to go into safe mode. Action Required: If the APU is in safe mode: Correct the underlying problem, then re-enable the APU using LRConfig.
99	INVALID	Unknown	Undefined Fault Code.
100	ALL OK	Info	All OK. System is operating and reporting normally.
101	FARADAY PING TIMEOUT	Restart	Faraday Failed to respond to ping command. The APU will reboot automatically.
102	FARADAY RELAY TIMEOUT	Restart	Failed to create relay connection to Faraday. The APU will reboot automatically.
103	FARADAY METRIC TIMEOUT	Restart	Did not receive a metric update from Faraday. The APU will reboot automatically.
104	VERIFY TEC TIMEOUT	Retry	Failed to get stable TEC at laser operating temp. APU will restart control loop, operator should POPO APU.

105	OPTIMIZE MODULATION	Restart	Took too long to balance modulation depth. The APU will reboot automatically.
106	MODULATION MIN	Fault	Depth modulation reached min whilst balancing 1 & 2 MHz signals. The APU will reboot automatically.
107	MODULATION MAX	Fault	Depth modulation reached max whilst balancing 1 & 2 MHz signals. Action Required: Manually restart system - boundary condition.
108	FAST OFFSET TIMEOUT	Fault	Fast offset loop failed to get stable signals. The Control loop will restart - boundary condition.
109	ATTENUATION REACHED MIN MZ	Fault	Detector 2's attenuation reached its minimum value without getting reasonable signal amplitude. Action Required: Check there is enough signal on detector 2.
110	ATTENUATION REACHED MIN MI	Fault	Detector 1's attenuation reached its minimum value without getting reasonable signal amplitude. Action Required: Check there is enough signal on detector 1.
111	ATTENUATION REACHED MAX MZ	Fault	Detector 2's attenuation reached its maximum value without getting the signal in range. Action Required: Add attenuator to detector 2.
112	ATTENUATION REACHED MAX MI	Fault	Detector 1's attenuation reached its maximum value without getting the signal in range. Action Required: Add attenuator to detector 1.
113	NO LASER SIGNAL	Fault	Laser Cavity Sensor indicates no laser activity. Laser is not turned on. Action Required: Manually reboot APU.
114	NO CLOCK LOCK	Fault	Failed to verify correct data sequence from ADC. Clock signals corrupted - APU will reboot automatically.
115	OPTIMIZE ATTENUATION	Fault	Took too long to optimize attenuation. Control loops will restart (should not happen - maybe the cable has a problem?).
116	RT OPT OFFSET	Fault	Took too long to optimize the runtime offset. Control loops will restart (should not happen - maybe the cable has a problem?).

117	FPGA VERSION	Unknown	Failed to read version from FPGA.
118	OFFSET REACHED MAX MZ	Unknown	Failed to correct offset after max attenuation detector 2.
119	OFFSET REACHED MAX MI	Unknown	Failed to correct offset after max attenuation detector 1.
120	TEC NO LOCK FILE	Fault	Could not find TEC lock file. APU will reboot automatically.
121	TEC LOCK FILE GONE	Fault	TEC 'lockfile' gone. Usually, a result of a type 2 fault; can be ignored.
122	DAC WRITE ERROR	Unknown	When writing to the high-speed DAC, the written value did not take, even after several tries. This is a serious issue and should be investigated. Possible hardware problem or fault.
123	CABLEBREAK	Fault	The system has detected a cable break.
201	CHANGE ME	Unknown	UPS battery requires changing.
202	COMM FAILURE	Unknown	Lost comms with UPS.
203	COMM OK	Unknown	Regained comms with UPS.
204	OFF BATTERY	Unknown	Off Battery.
205	ON BATTERY	Unknown	On Battery
206	BATT ATTACH	Unknown	Battery Attach.
207	BATT DETACH	Unknown	Battery Detach.
208	DO SHUTDOWN	Unknown	Do shutdown
209	EMERGENCY	Unknown	Emergency
210	FAILING	Unknown	Failing
211	LOADLIMIT	Unknown	Load Limit
212	MAINS BACK	Unknown	Mains Back
213	POWER OUT	Unknown	Power Out
214	RUN LIMIT	Unknown	Run Limit
215	TIMEOUT	Unknown	Time Out
216	START SELF TEST	Unknown	Start Self-Test
217	END SELF TEST	Unknown	End Self-Test

218	ERR UPDATE DISKSPACE	Fatal	Update Script: Not enough disk space on / for update file $f. Update failed.
219	ERR UPDATE RENAME	Error	Update Script: Failed to rename $update file; Update incomplete - rolling back.
220	ERR INI ERROR	Error	INI file: a parsing error occurred (e.g., section not found).
300	SRIO DOORBELL SYNC FAIL	Fault	The system isn't synchronizing to the incoming SRIO Stream. This condition may be temporary. The APU will automatically reboot if the errors become frequent enough.
301	RTOS UNRECOVERABLE SYS CALL ERR	Fault	The system suffered an operating system error that it can't recover from. APU will reboot (Indicates unknown bug - very rare).
302	SRIO DOORBELL INTERVAL OUT OF RANGE	Fault	A SRIO doorbell is arriving at an interval that is out of range of the expected rate. APU will reboot.
303	IPC ERR	Fault	Blocking Sockets Unrecoverable inter process communication error of some sort.
304	FARADAY CORE HANGUP	Fault	Unrecoverable error within the Faraday where one of the cores hangs-up. The unit will reboot automatically.
305	SRIO BRINGUP	Fault	The SRIO chain failed to initialize properly. The unit will reboot and try again.
306	ERR POST UPDATE CRASH	Error	Update Script: Crashed on first reboot after update.
307	ERR UNPLANNED REBOOT	Error	Update Script: Unplanned reboot detected (file /etc/lr/plannedreboot does not exist).
308	ERR APP CRASH	Error	Crash Script: An application Crashed and the PCD is requesting a reboot.
309	INFO SAFEMODE	Info	Control Loops: Safe mode.
500	INFO RUNMODE	Info	Control Loops: Reached run mode. System is functioning properly.
501	INFO LOGDIR CLEAN	Info	Update Script: Log directory cleaned after a successful update was performed.
502	INFO POST LOGDIR CLEAN REBOOT	Info	Update Script: Reboot after clean procedure.
503	INFO UPDATE START	Info	Update Script: Started update to v$new_version.

504	INFO UPDATE DONE	Info	Update Script: Update to v$new_version completed.
505	INFO DOWNGRADE START	Info	Update Script: Downgrading from version $old_version.
506	INFO PLANNED REBOOT	Info	Reboot Script: Planned reboot.
507	INFO PLANNED HALT	Info	Halt Script: Planned halt.
508	INFO TRIGGER CONNECTED	Info	frobber-server: External trigger connection accepted.
509	INFO TRIGGER DISCONNECTED	Info	frobber-server: External trigger connection closed.
510	INFO TRIGGER DECLINED	Info	frobber-server: External trigger connection declined.
511	INFO TRIGGER EXCEPTION	Info	frobber-server: Trigger Exception.
512	INFO M1 M2 SWAPPED	Info	Control Loops: M1 and M2 reversed? Check that Input1 and Input2 patch-cords were installed in correct optical receptacles, not reversed.
513	INFO ADD ATTN	Info	Control Loops: STruntimeOptimizeAttenuation ran into an issue where the attenuation and offset cannot be optimized. Adding additional attenuation to the APU Laser port will help with this issue.