OPERATING INSTRUCTIONS

SICK Milestone MIP plug-in

SICK
Sensor Intelligence.

Described Product

SICK Milestone MIP plug-in
Version 3.0

Manufacturer

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Germany

Legal information

Original document

This document is an original document of SICK AG.

Content

1 About this document

1.1 Information on the operating instructions

These operating instructions provide important information on how to use products from SICK AG.

Prerequisites for safe work are:

- Compliance with all safety notes and handling instructions supplied.
- Compliance with local work safety regulations and general safety regulations for product applications.

The operating instructions are intended to be used by qualified personnel and electrical specialists.

NOTE
Read these operating instructions carefully to familiarize yourself with the product and its functions before commencing any work.

The instructions constitute an integral part of the product and are to be stored in the immediate vicinity of the product so they remain accessible to staff at all times. Should the product be passed on to a third party, these operating instructions should be handed over with it.

These operating instructions do not provide information on operating the machine or system in which the product is integrated. For information about this, refer to the operating instructions of the specific machine.

1.2 Explanation of symbols

Warnings and important information in this document are labeled with symbols. The warnings are introduced by signal words that indicate the extent of the danger. These warnings must be observed at all times and care must be taken to avoid accidents, personal injury, and material damage.

DANGER
... indicates a situation of imminent danger, which will lead to a fatality or serious injuries if not prevented.

WARNING
... indicates a potentially dangerous situation, which may lead to a fatality or serious injuries if not prevented.

CAUTION
... indicates a potentially dangerous situation, which may lead to minor/slight injuries if not prevented.

NOTICE

... indicates a potentially harmful situation, which may lead to material damage if not prevented.

NOTE

... highlights useful tips and recommendations as well as information for efficient and trouble-free operation.

2 Safety information

2.1 Intended use

The SICK MIP plug-in is installed on a Milestone VMS System.

It is used for communication between SICK 2D LiDAR sensors of types LMSxxx, MRS1xxxx and TiM3xx.

With the plug-in, the Milestone VMS understand the switching signals of 2D LiDAR sensors transmitted via Ethernet connection.

The VMS can then execute defined actions based on the switching signals. This makes it possible for pan-tilt-zoom cameras (PTZ cameras) to, for example, move to a preset position if the associated monitoring field of the 2D LiDAR sensor is violated. Depending on the Milestone VMS version there are a lot of different more actions available.

The SICK MIP plug-in can furthermore create and deliver a mjpeg stream of the actual LiDAR data. This stream can then be recorded or viewed in live mode.

SICK AG assumes no liability for losses or damage arising from the use of the product, either directly or indirectly. This applies in particular to use of the product that does not conform to its intended purpose and is not described in this documentation.

2.2 Improper use

Any use outside of the stated areas, in particular use outside of the technical specifications and the requirements for intended use, will be deemed to be incorrect use.

- The device does not constitute a safety component in accordance with the respective applicable safety standards for machines.
- The device must not be used in explosion-hazardous areas, in corrosive environments or under extreme environmental conditions.
- Any use of accessories not specifically approved by SICK AG is at your own risk.

WARNING
Danger due to improper use!
Any improper use can result in dangerous situations.
Therefore, observe the following information:

- The product should be used only in accordance with its intended use.
- All information in these operating instructions must be strictly observed.

2.3 Cybersecurity

Overview

To protect against cybersecurity threats, it is necessary to continuously monitor and maintain a comprehensive cybersecurity concept. A suitable concept consists of organizational, technical, procedural, electronic, and physical levels of defense and considers suitable measures for different types of risks. The measures implemented in this product can only support protection against cybersecurity threats if the product is used as part of such a concept.

You will find further information at **www.sick.com/psirt**, e.g.:

- General information on cybersecurity
- Contact option for reporting vulnerabilities
- Information on known vulnerabilities (security advisories)

2.4 Limitation of liability

Relevant standards and regulations, the latest technological developments, and our many years of knowledge and experience have all been taken into account when compiling the data and information contained in these operating instructions. The manufacturer accepts no liability for damage caused by:

- Non-adherence to the product documentation (e.g., operating instructions)
- Incorrect use
- Use of untrained staff
- Unauthorized conversions
- Technical modifications
- Use of unauthorized spare parts, consumables, and accessories

With special variants, where optional extras have been ordered, or owing to the latest technical changes, the actual scope of delivery may vary from the features and illustrations shown here.

2.5 Modifications and conversions

NOTICE
Modifications and conversions to the device may result in unforeseeable dangers.

Interrupting or modifying the device or SICK software will invalidate any warranty claims against SICK AG. This applies in particular to opening the housing, even as part of mounting and electrical installation.

2.6 Requirements for skilled persons and operating personnel

WARNING
Risk of injury due to insufficient training.
Improper handling of the product may result in considerable personal injury and material damage.

- All work must only ever be carried out by the stipulated persons.

This product documentation refers to the following qualification requirements for the various activities associated with the product:

- **Instructed personnel** have been briefed by the operator about the tasks assigned to them and about potential dangers arising from improper action.
- **Skilled personnel** have the specialist training, skills, and experience, as well as knowledge of the relevant regulations, to be able to perform tasks delegated to them and to detect and avoid any potential dangers independently.
- **Electricians** have the specialist training, skills, and experience, as well as knowledge of the relevant standards and provisions to be able to carry out work on electrical systems and to detect and avoid any potential dangers independently. In Germany, electricians must meet the specifications of the BGV A3 Work Safety Regulations (e.g. Master Electrician). Other relevant regulations applicable in other countries must be observed.

The following qualifications are required for various activities:

Activities	Qualification
Mounting, maintenance	• Basic practical technical training • Knowledge of the current safety regulations in the workplace
Electrical installation, device replacement	• Practical electrical training • Knowledge of current electrical safety regulations • Knowledge of the operation and control of the devices in their particular application
Commissioning, configuration	• Basic knowledge of the Windows™ operating system in use • Basic knowledge of the design and setup of the described connections and interfaces • Basic knowledge of data transmission
Operation of the product for the particular application	• Knowledge of the operation and control of the products in their particular application • Knowledge of the software and hardware environment for the particular application

2.7 Operational safety and particular hazards

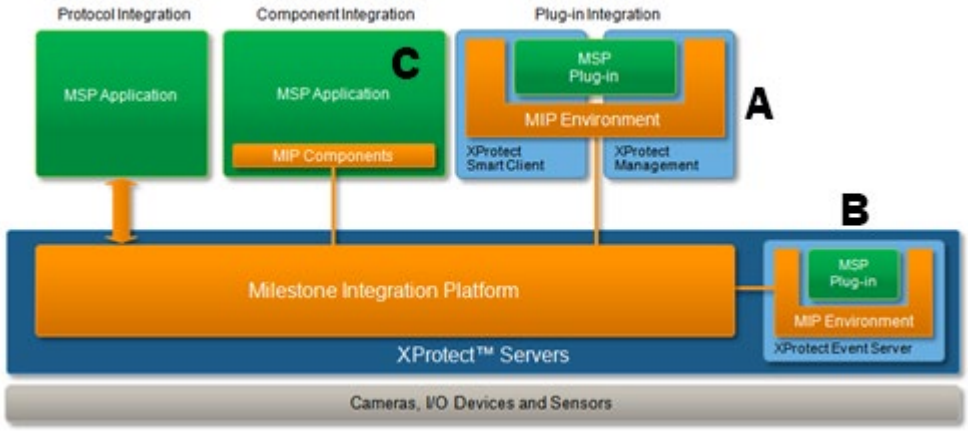
Detailed safety information can be found in the product documentation for the hardware. The product documentation is available for download on www.sick.com.

3 Product description

3.1 Function and application

This plug-in is deeply integrated into the Milestone XProtect VMS Platform and does not require any additional software. MIP (Milestone Integration Platform) plug-ins are dynamically loaded from the Milestone Applications and Services, which makes them simple to install and configure. This document describes how to set up and configure your system to enable the Sick sensors in your Milestone VMS.

The architecture of the MIP plug-in is as follows:



The SICK MIP Plug-in consists of a server side plug-in, which is installed on the server and loaded by the Management Application (**A**) and by the Event Server (**B**).

The setup file includes all necessary files and installers for both plug-in parts. It installs all components and restarts the Event Server automatically.

Furthermore, there is an optional Video and Event Server service for high scalability (**C**). This extension can be used as a separated service that runs independently.

4 Installation

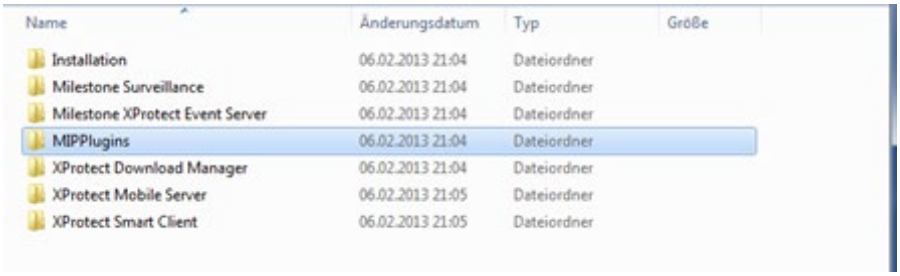
4.1 Installation of the plug-ins on the XProtect Event Server

The installation of the plug-in is packaged into a Setup Wizard, which will set up everything needed in your environment. Before you start with the installation, make sure that the Milestone Management Client Application is closed. The Setup Wizard will perform the following tasks:

- Install the plug-in directly on the master server if you are using XProtect Express, Professional or Enterprise.
- If you are using XProtect Corporate, the installer must be run on the XProtect Corporate Management Client PC and on the XProtect Event Server.
- Stop and restart the Event Server service to activate the plug-in in the Event Server

NOTE

The installer will copy the plug-in files into the following folder:
%ProgramFiles%\Milestone\MIPPlug-ins\ER.EventServer.Sick.



The MIP plug-in is dynamically loaded and used by the following XProtect Applications:

XProtect Application	Description	XProtect Version
Event Server	The Event Server will load the plug-in and execute the entire configuration-related logic. It opens the connection to the sensor device, reads the data and creates a MJPEG stream if required. It also triggers the configuration-related events.	All
Management Application	The Management Application loads the plug-in to provide the configuration GUI.	Express, Professional, Enterprise
Management Client	The Management Application loads the plug-in to provide the configuration GUI.	Corporate, Expert

5 Configuration and operation

5.1 Preparing the system / general functionality

If you plan to use several SICK 2D LiDAR sensors, you should use the Optional Processing Server Architecture.

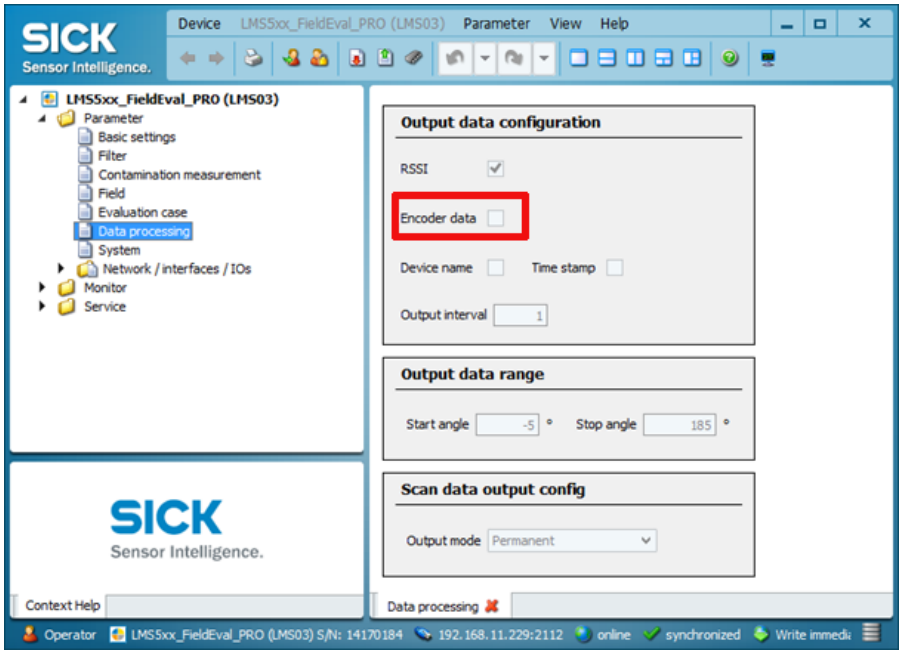
Please read more in Event configuration and assignment to get the processing server set up before you start adding sensors to the Event Server service.

When an alarm is detected, the system automatically triggers a user-defined event. This event can subsequently be used to trigger any activity inside the Milestone VMS through the rule system or the alarm definitions.

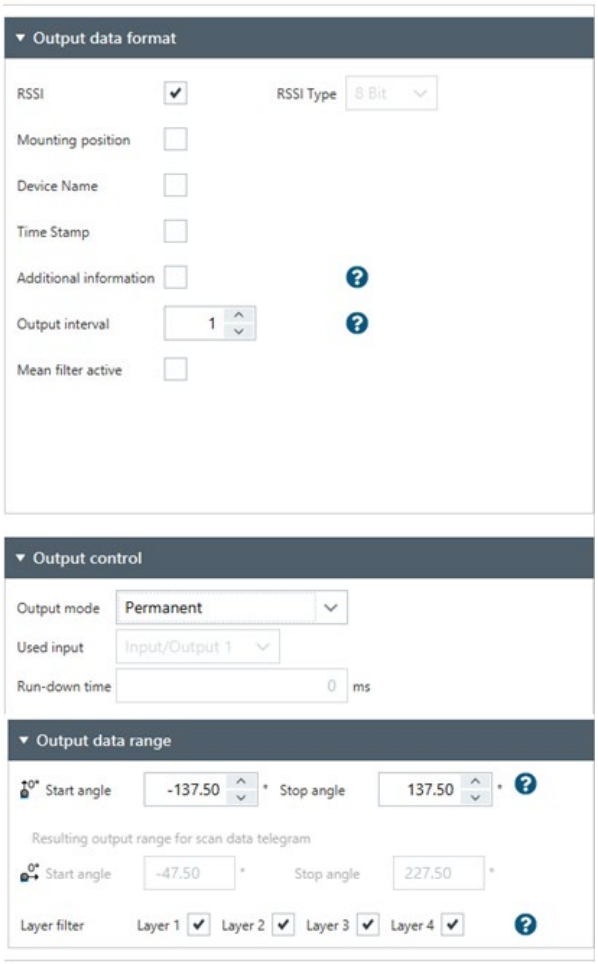
The event must previously have been created in the Management Application. Please refer to your Milestone VMS user manual for further information.

As there are several SICK LiDAR models supported by the plug-in which have different configuration and setup interfaces, the SICK LiDAR sensors must be configured as described in the model specific manual using the SOPAS Engineering Tool.

One thing you need to make sure is that on some devices you need to disable the “Encoder data” under the “Data processing” settings:



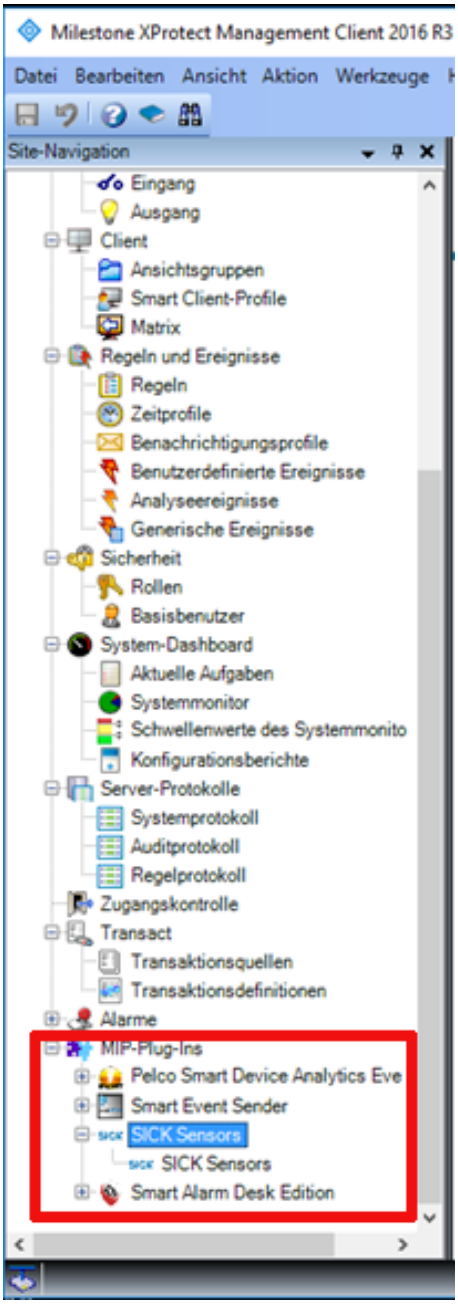
For MRS1xxx devices, you need to make sure the Output control properties in the Ranging menu are set to Permanent output and all layers are selected. The Output interval will also have an effect on the received data:


Output data format
RSSI
RSSI Type
8 Bit
Mounting position
Device Name
Time Stamp
Additional information
Output interval
1
Mean filter active
Output control
Output mode
Permanent
Used input
Input/Output 1
Run-down time
0
ms
Output data range
Start angle
-137.50
Stop angle
137.50
Resulting output range for scan data telegram
Start angle
-47.50
Stop angle
227.50
Layer filter
Layer 1
Layer 2
Layer 3
Layer 4

5.2 Configurating the plug-in in the Management Application

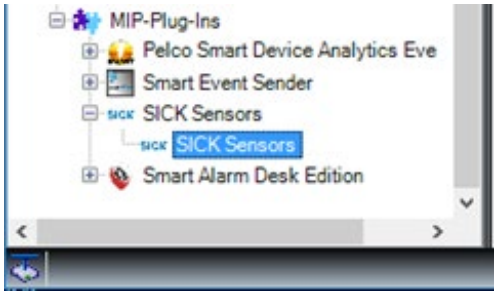
After successful installation, the Management Application can be started. The configuration interface of the SICK MIP plug-in appears at the bottom left under the MIP-Plug-Ins entry.

By selecting this entry, you will have access to the user manual and the application version.

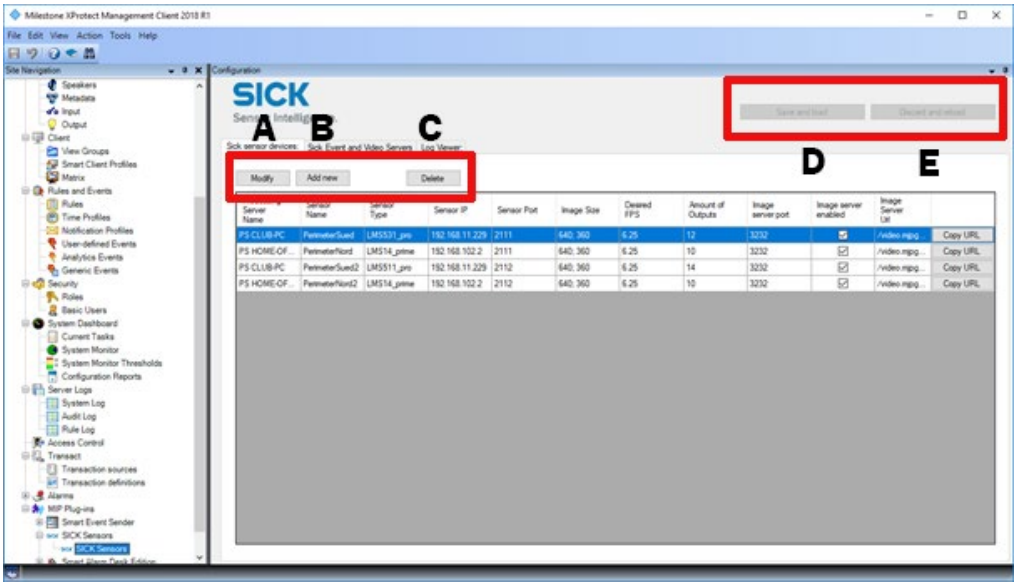


5.2.1 Adding SICK LiDAR sensors

After you have created the necessary user-defined events for your SICK LiDAR sensors outputs, you can add the devices.



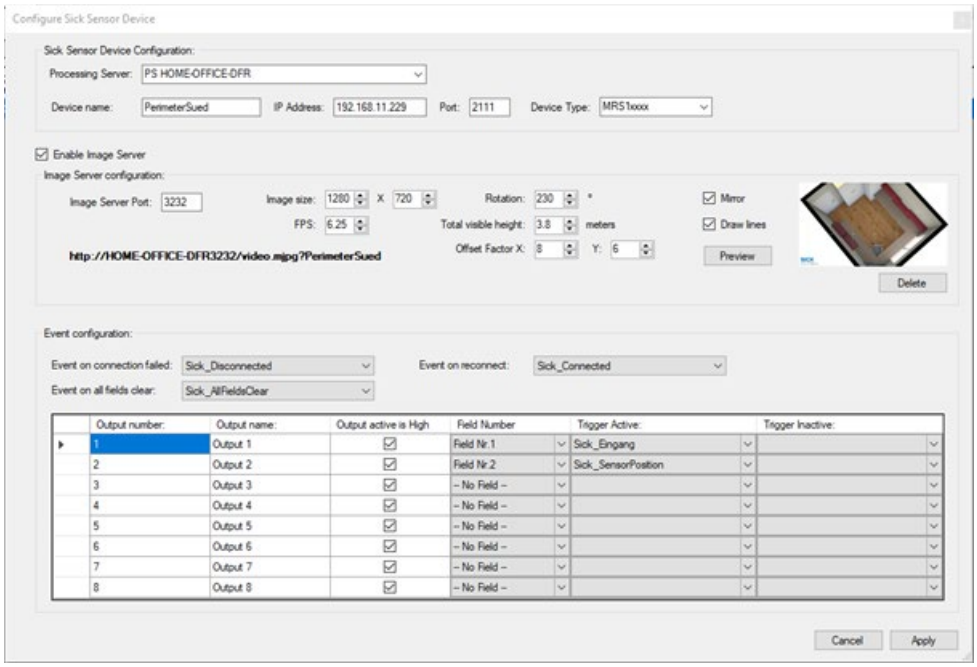
Select the SICK Sensors entry to switch to the Device Configuration tab:



	Button	Explanation
A	Modify	Opens the configuration window of the selected device to change settings
B	Add new	Opens the configuration window to create a new SICK sensor device.
C	Delete	Deletes the selected devices.
D	Processing Server Event Settings	Saves the configuration in the system and makes the new configuration available to the Event Server plug-in. The service will take about 10 seconds to reload the new configuration.
E	Discard and reload	Discards the configuration and loads the previous configuration.

5.2.2 Adding or modifying a SICK sensor device

Click “Add new” or “Modify” to open up the following window for configuring an individual SICK sensor device:



The following sections show the 3 main parts of the configuration and its function in detail.

General device configuration

The top area of the configuration window contains the device type and connection settings:

Button	Explanation
Processing Server	(Optional) Select the processing server for this device from the list. See the Optional Processing Server Service section for more information on processing servers
Device name:	The name of the device. This name appears in different places within the application and is used for identification.
IP Address	The IP address of your Ethernet connected device.
Port	The port of your Ethernet connected device.
Device Type	Select the device type of your SICK sensor. This setting is very important as it changes the output tab according to the device capabilities.

Image Server configuration MJPEG Stream

The middle area of the configuration window is used to configure the image server. The SICK MIP plug-in can create images from the LiDAR sensors data and provide them as an image stream.

Technically speaking, the MIP Plug-in loaded by the Event Server is providing a web server on which the MJPEG stream can later be acquired by the Milestone universal driver.

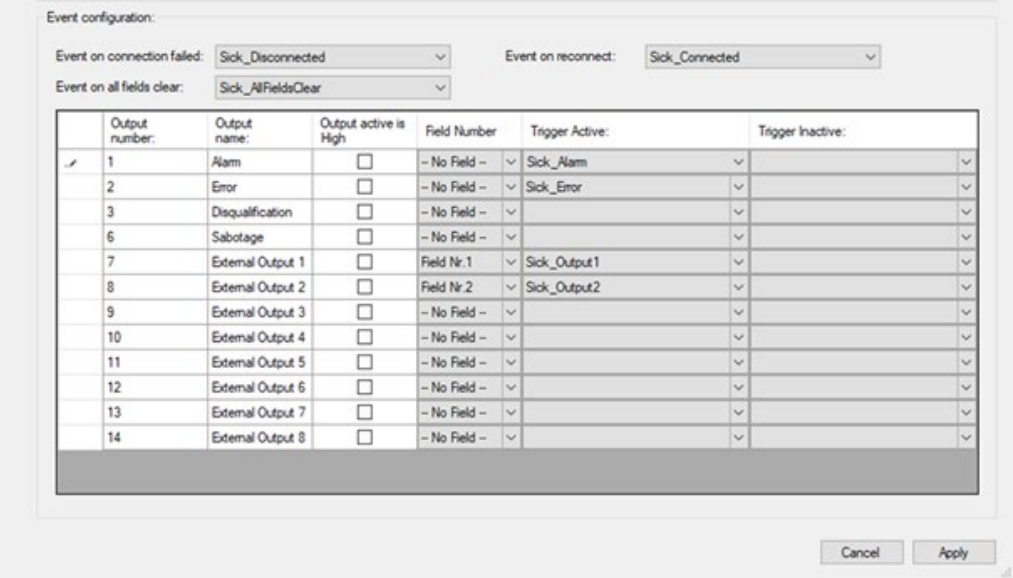
The universal driver is available as a single channel, 16-channel or 64-channel device. Each universal driver device connects to one web server, which means up to 64 SICK sensors can be accommodated on one image server port.

Button	Explanation
Enable Image Server	Enables or disables the image server for this device. Disable it if you do not need the sensor as an image channel in Milestone!
Image Server Port	The port on which the MJPEG stream can be retrieved. Each universal driver hardware needs its own port. E.g. if you have a 64-channel universal driver hardware you can use the same port for 64 different SICK sensors before you need to add a new web server and port.
Background Image	Click on the background image to change the appearance from the “Radar” based image to another background. Adjust the position of the scanned data using the Rotate, Mirror and Offset parameters.
Preview	 Click the Preview button located in the bottom right corner to open a Window showing the live stream. This is helpful for image setup because you can directly see the effect of each parameter as it is changed
Image Size	Sets the image size and aspect ratio. Choose this wisely as it will have an impact on the CPU usage of the system.
FPS	Sets the frames per second the MJPEG stream will use when

Button	Explanation
	creating and providing an image. Choose this wisely as it will have an impact on the CPU usage of the system.
Rotation	Sets the rotation of the image in degrees. E.g. 180° to flip the image
Mirror	This will mirror the image vertically. Use this if the sensor has been mounted upside down.
Total visible height	The visible height in meters of the LiDAR sensors data.
Offset Factors X and Y	Shifts the midpoint of the LiDAR sensor in the vertical direction (Y value). There are 10 settings available where 0 is the top point, 5 is midpoint and 10 the bottom point. The same applies for the X value in the horizontal direction where 0 is the rightmost point.
Draw lines	Enables/disables the lines between the measured points.

Event configuration and assignment

As described in the Preparing the system / general functionality section, all Milestone "User-specified events" used must be preconfigured. If they are available, you can just select them from the corresponding drop-down list.



Button	Explanation
Event on connection failed / on reconnected	(Optional) Select the Milestone events that should be triggered if the SICK device connection is lost and/or reestablished.
Event on all fields clear	(Optional) Select the Milestone event that should be triggered when all fields go to status clear
Output number (FIX)	The number assigned to the SICK LiDAR sensor output
Output name (FIX)	The default name shown for this output inside the SICK SOPAS application.
Output active is high	Activate this if also activated in the SICK SOPAS application
Field Number	The field number that corresponds to this output
Trigger Active	The Milestone user-defined event to trigger when the output returns to inactive.

NOTE

If you are using a MRS-1xxx LiDAR sensor, the evaluation triggers the output. You can select one of the fields of the evaluation. All fields related to this evaluation will be connected to the selection.

Add the configured SICK LiDAR Sensor as a camera device in Milestone

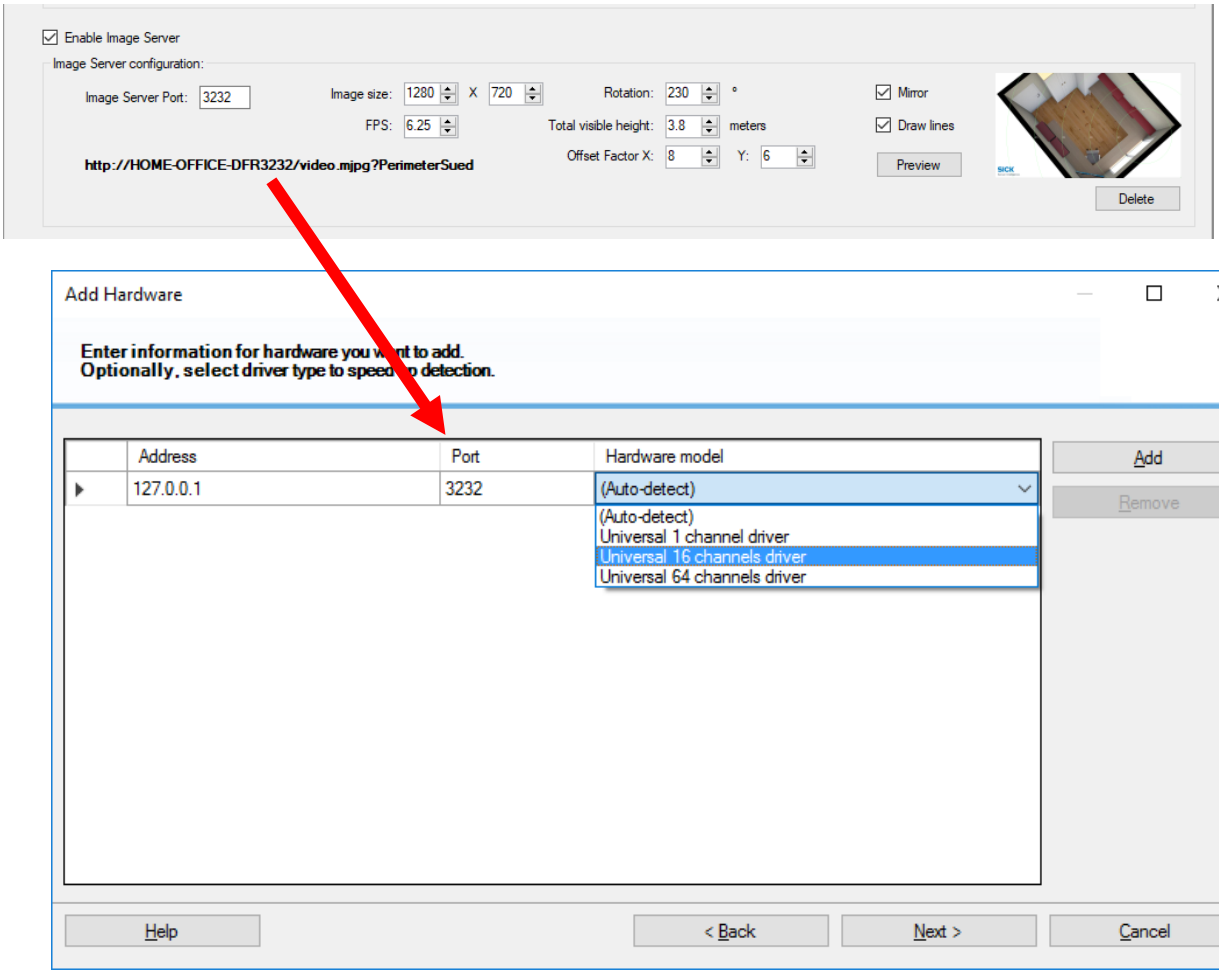
When the image server has been configured as described in the Image Server configuration MJPEG Stream section, the plug-in is providing a MJPEG stream which can be added as a camera device in Milestone.

First of all, you need to add a universal driver hardware. There are three different Milestone drivers available that provide a different number of channels. The following example shows how to do this on Milestone Advanced VMS. Please refer to the Milestone manual on how to add hardware for other Milestone versions.

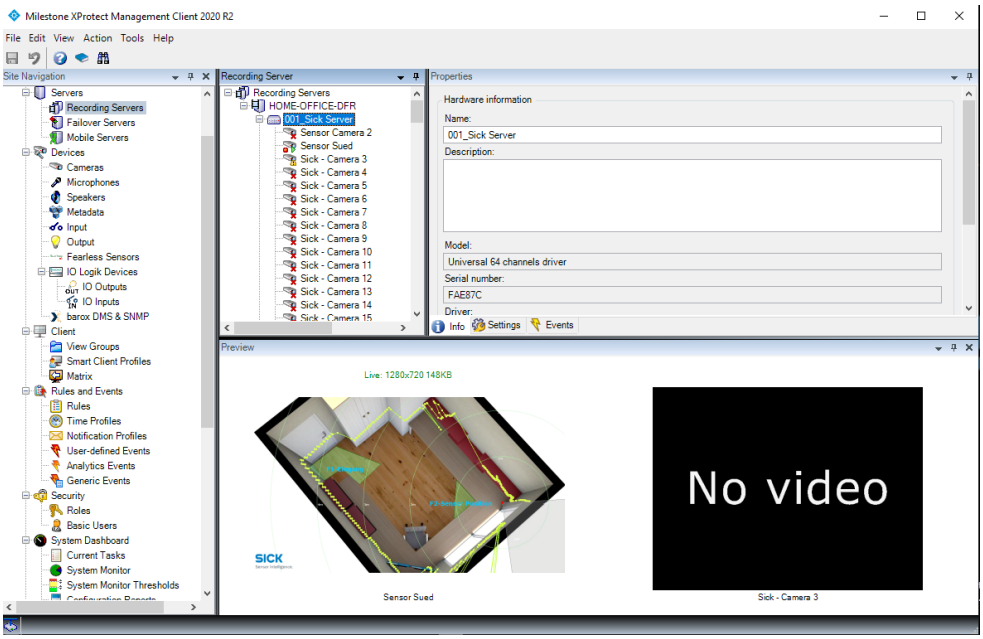
1. Select add Hardware → Manual
2. Use the default credentials
3. Select the Universal driver with the number of channels you need and enter the address and port.

NOTE

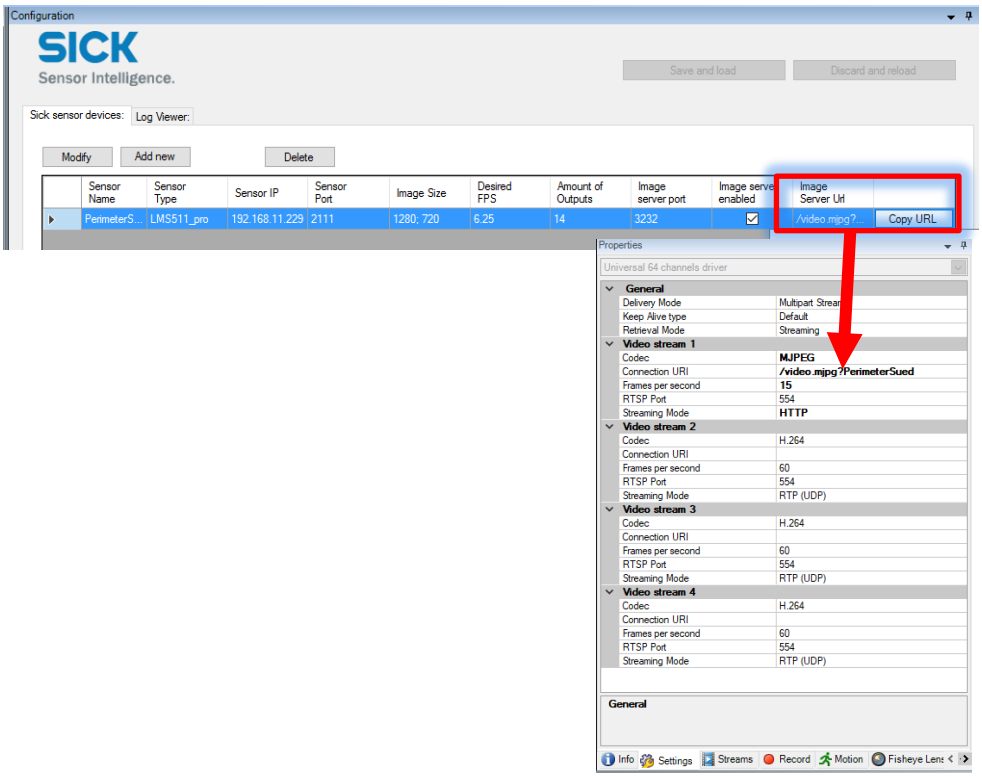
The IP Address is the address of the Milestone Event Server (or optional processing Server) and the port is the one you configured as Image Server Port. Please keep in mind that you configure the new device from the perspective of your recording server.
127.0.0.1 Targets your Recording Server and not the Event Server!
Also don't forget to create a dedicated firewall rule if this is running on an external server.



▶ Press ***Next >*** and add your hardware to the recording server:



▶ After adding the hardware, you need to configure the camera itself. Go to the plug-in configuration page and copy the URL.



▶ Go back to your hardware and select the channel for which you want to configure your SICK device and paste the URL into the connection URI under the settings page.

- Set the streaming mode to HTTP.
- Select JPEG in the streams settings page and save your device.
- After the camera is retrieving images and you can start configuring the recording mode and all other camera settings as usual.

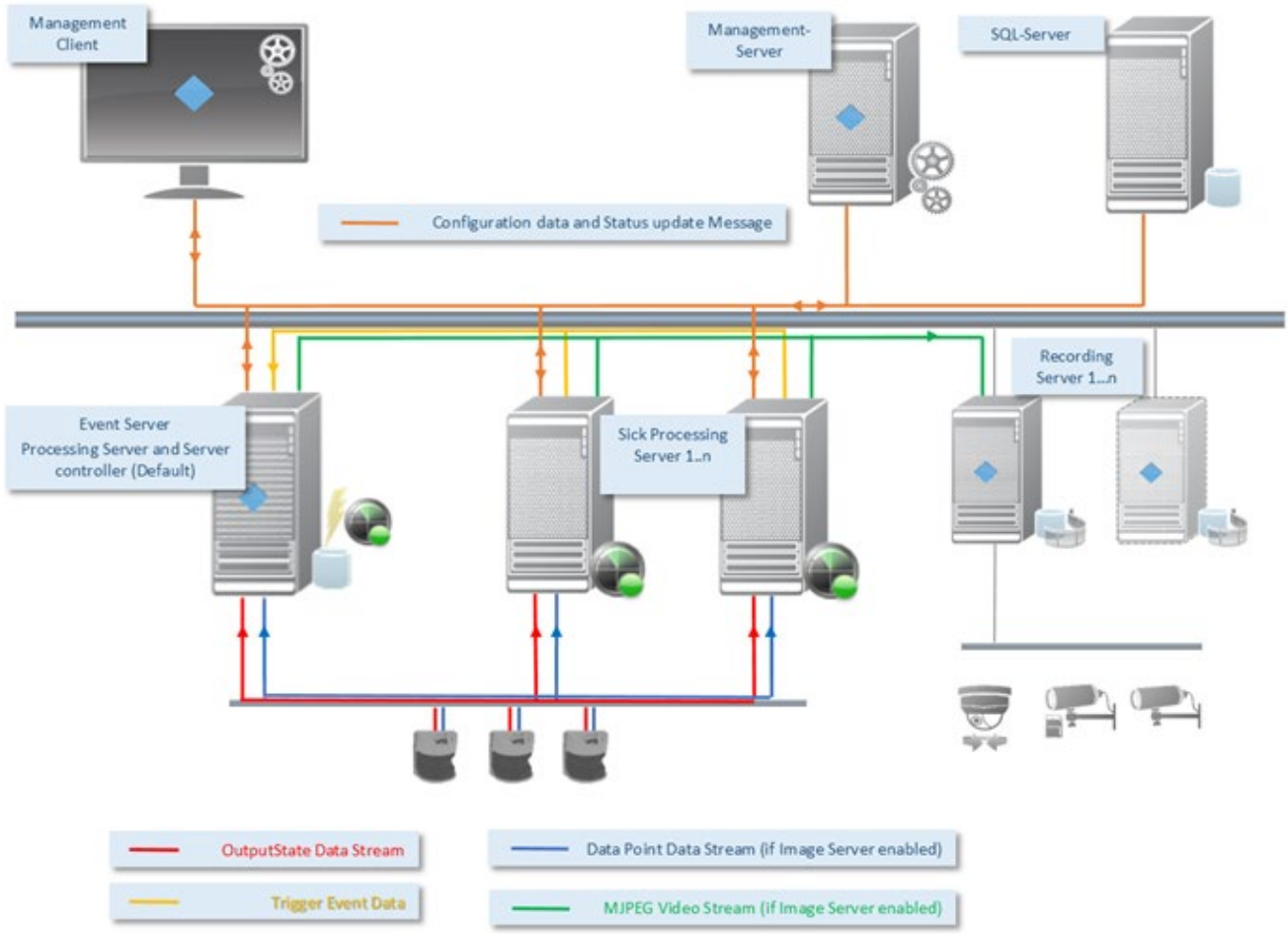
5.3 Optional Processing Server Service

To have a more scalable solution when adding a lot of sensor devices, we recommend using the optional Processing Server service available for version 2.0 and above of the plug-in.

Optional Processing Server services can easily be attached later by installing a new processing server. The configuration of previous plug-in versions is compatible and the already configured SICK sensors can be moved to any other instance using the “Move to Hardware” feature.

5.3.1 Architecture of an extended processing server environment

The following diagram shows the architecture of a multi-processing server environment and its data flow:



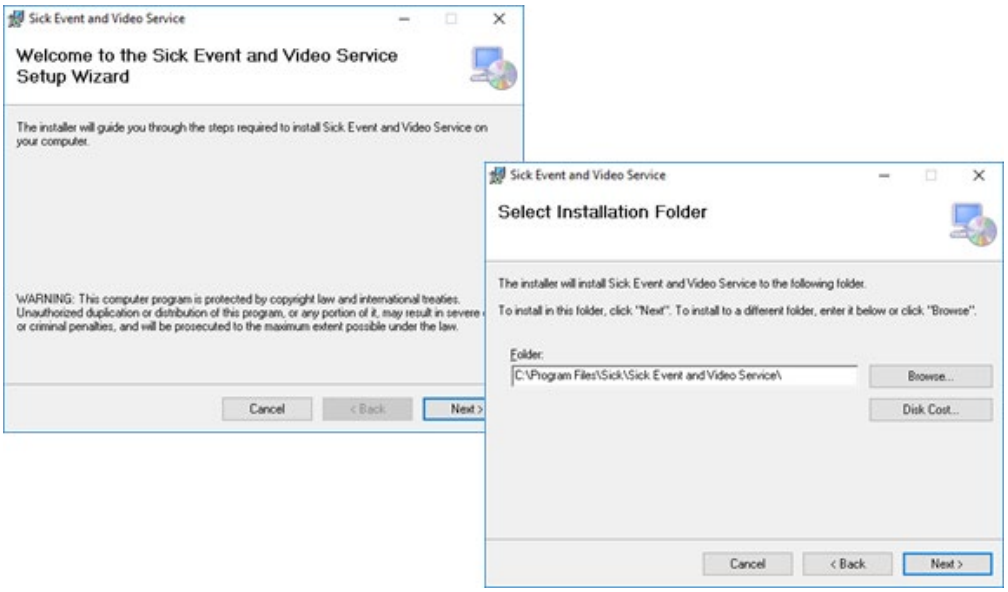
As you can see, the difference between a single server and an extended processing server environment is just the additional SICK processing servers. The Event Server

plug-in also contains a processing server instance, which can be used in smaller systems up to a few sensors.

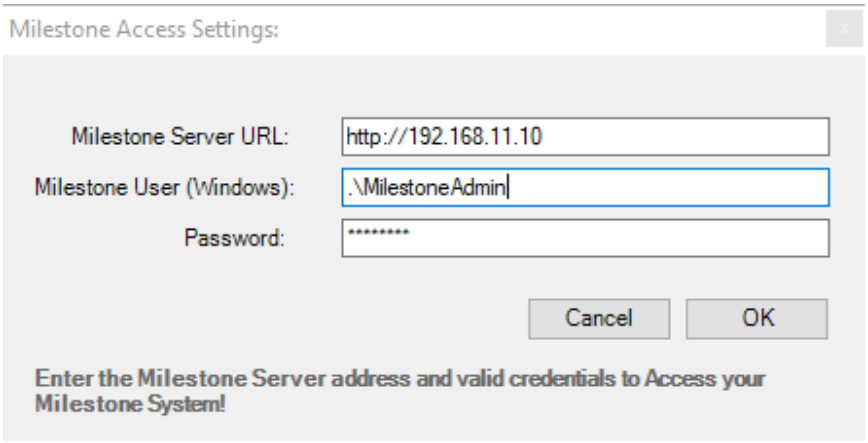
5.3.2 Installing the processing servers

The processing server is installed as an independent Windows service, which then connects to the Milestone VMS system. When started for the first time, it will be initialized and automatically registered and available in the SICK MIP plug-in inside the Management Client.

The installer will guide you through the installation including the connection parameters for the Milestone VMS:



Enter the Milestone connection parameters to access the VMS. The installer will proceed if the address and credentials are valid.

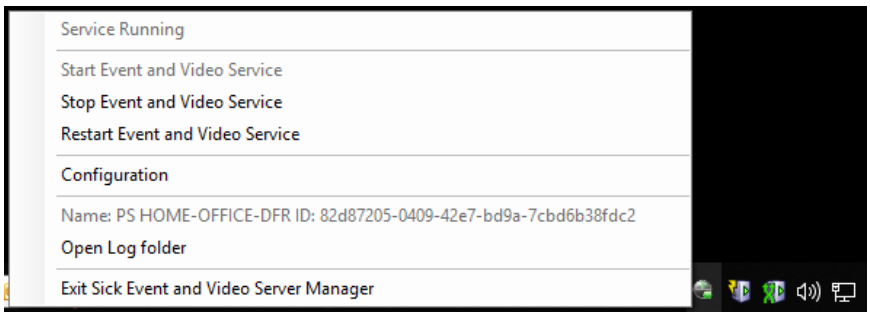


NOTE
It might be necessary to add ".\" as a domain to the user field as shown in the screenshot.

5.3.3 Initial configuration of a processing server

After the installation, there will be a system tray icon in the taskbar to control the service or to change the configuration:

Tray Symbol	Meaning
	SICK Video and Event Server Service is running
	SICK Video and Event Server Service is starting or stopping
	SICK Video and Event Server Service is stopped

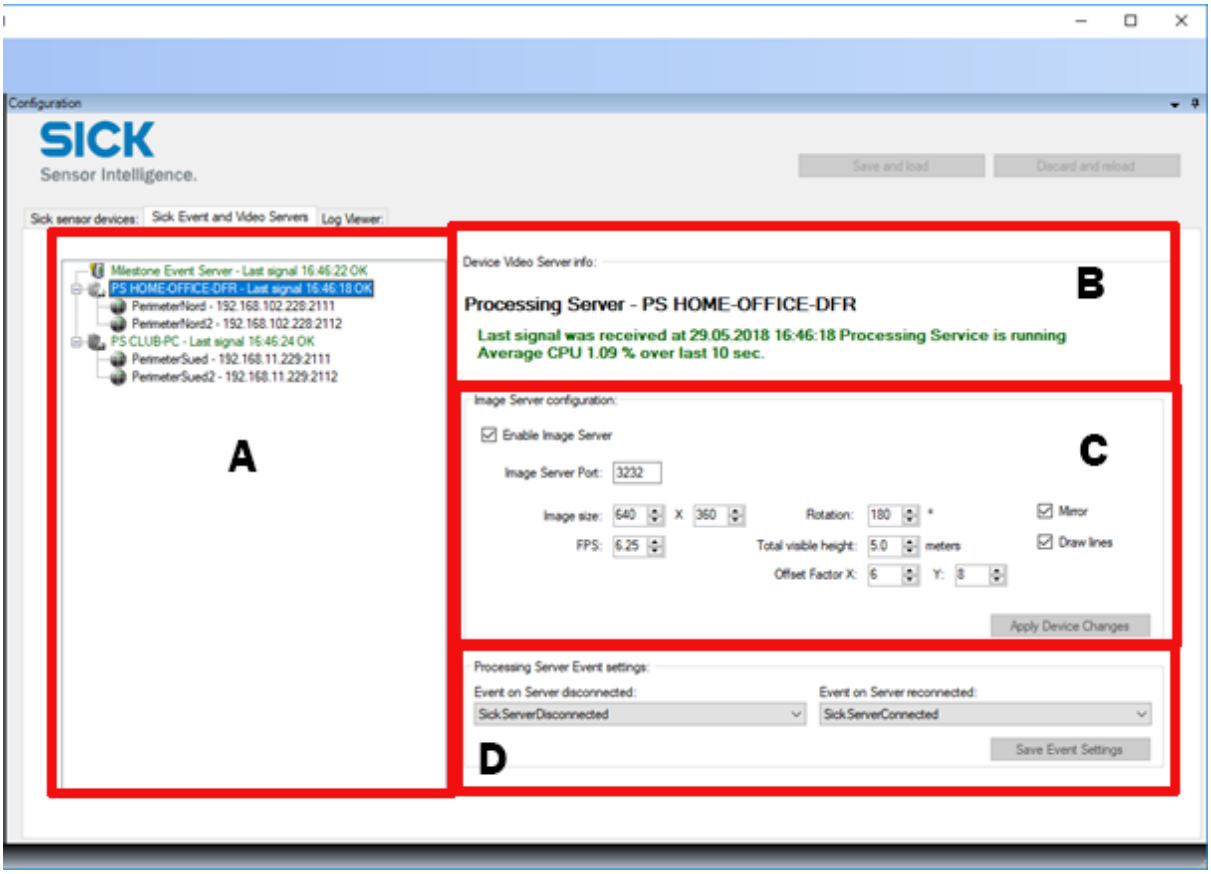


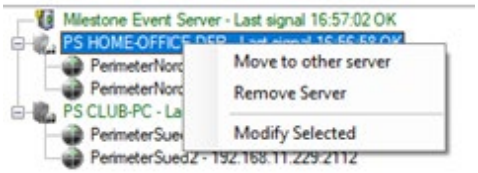
After the first start, the service will create an ID and will provide its information to the system. You can see the processing server initialization data under the read only item Name: PS... entry in the context menu.

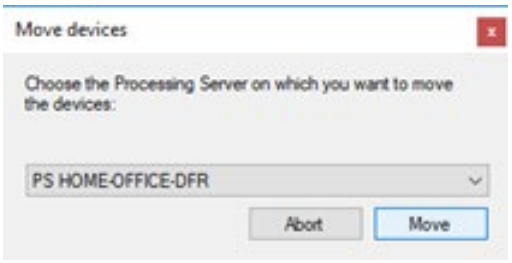
After you have successfully installed and started your SICK Event and Video Server service, you can start to use it directly from the Management Client.

5.3.4 Configuring the SICK sensors using processing servers

Select the SICK Event and Video Servers tab to configure and see your processing servers and their status:



	Button	Explanation
A	Processing Servers and Sensors Tree View	All the processing servers are listed in the tree view including all associated sensor devices. This gives you a complete overview of the system. The right mouse context menu provides the following functions:  **Move to other server:** This function is used to move the selected sensor device to another server. After selecting the processing server, all the attached sensor devices are moved. This is useful when you start expanding to multiple processing servers or if you want to replace a processing server.

	Button	Explanation
		 **Remove Server:** This removes the server from the configuration. Please note that the following conditions must be met in order to remove a server: The Milestone Event Server Instance cannot be removed as it serves as the controller for all other processing servers. The processing server must be empty and all SICK sensor devices moved to another server beforehand. **Modify Selected:** Opens the SICK sensor device configuration Window (see 5.2.2 Adding or modifying a SICK sensor device)
B	Processing Server Status	This section shows some information about the processing server status. The plug-in listens for the status update message from each server and updates the last signal received as well as the average CPU load used by the Processing Server service over the last 10 seconds. This is useful for determining the server load when you have a lot of sensor devices rendering the image streams. Additionally, you can see how the parameters of the image server configuration (C) affect the CPU load of the server.
C	Processing Server Image Server configuration	Using the image server configuration gives you the possibility to adjust all rendering parameters for one device or all devices attached to the selected processing server. • Please note that the performance depends directly on these parameters, whereby the image size is the most important. We recommend a resolution of 640x360 as a good compromise between performance and quality. • A frame rate between 3.0 and 6.25 should be sufficient You can use the Apply Device Changes button to save the configuration and the Save and load button to transmit the configuration changed message to all processing servers.
D	Processing Server Event Settings	Configure the events triggered by a server responding / not responding Status. Please note that the Event Server plug-in controls the update status messages from all servers and triggering those events. Use the Save Event Settings button to confirm the configuration.

8025899/ 1GTH/ 2022-07

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