

Bosch Video Stitcher



BOSCH

en Software manual

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1 Introduction

The Bosch Video Stitcher is an application that provides stitching of multiple cameras into a single wide-angle video. The stitched video is then streamed as a stream of a virtual camera with PTZ control. You can add this virtual camera to Bosch VMS. The camera allows zooming into stitched zones and complete control of the navigation.

The Bosch Video Stitcher also provides static augmented reality inside the stitched view, giving the possibility to add contextual information into the video.

The Bosch Video Stitcher supports the current Bosch IP video cameras portfolio.

This manual describes the configuration and operation of the Bosch Video Stitcher. For detailed information on camera configuration and operation see the Bosch VMS Configuration manual and the Bosch VMS Operation manual or use the Bosch VMS Online help.

Furthermore we recommend to complete a training on the Bosch Video Stitcher. You can find an appropriate training on the Bosch Security Academy Web page under:
<https://academy.globalteach.com/ST>

Bosch Security Systems uses Open Source Software in the Bosch Video Stitcher. You can find the licenses of the Open Source Software components used by the Bosch Video Stitcher under:
<http://www.boschsecurity.com/oss/>

2 System overview

In the Bosch Video Stitcher Wizard you can stitch up to 16 cameras and save the stitched view as a scene. After having added the Bosch Video Stitcher to Bosch VMS, this scene will be displayed as a single camera in the Bosch VMS Operator Client. The operator can pan, tilt and zoom this camera.

You can add up to 2000 Bosch Video Stitcher instances as separate ONVIF cameras in Bosch VMS.

Note: Each Bosch Video Stitcher instance must be installed on a separate computer.

Note: Bosch video cameras that shall be added to the Bosch Video Stitcher must have an assigned fixed IP address and need to be preconfigured.

2.1 Hardware requirements

The hardware requirements for the Bosch Video Stitcher vary depending on the number of cameras and data that are managed simultaneously.

Minimum hardware requirements

- CPU: Quad Core @ 2.0GHz
- Memory (RAM): 4 GB
- Network: Gigabit Ethernet
- GPU: NVIDIA graphics card with Kepler or Maxwell architecture and 2 GB VRAM.

The minimum hardware requirements apply to small installations of up to 4 Full HD cameras, or a total bandwidth of 40 Mbit/s incoming to the Bosch Video Stitcher.

Recommended hardware

If the installation requires more cameras, for example up to 12 for a single instance, or a higher camera resolution, the following hardware is recommended:

- CPU: Quad Core @ 3.0GHz
- Memory (RAM): 4 GB
- Network: Gigabit Ethernet
- GPU: NVIDIA Quadro graphics card with Maxwell (or above) architecture and 4 GB VRAM.

2.2 License requirements

The following licenses are required to operate the Bosch Video Stitcher in Bosch VMS:

- 1 Stitching channel expansion license per camera
- 1 Augmented reality expansion license per 5 augmented reality tags



Notice!

In a Bosch VMS configuration with multiple instances of Bosch Video Stitcher, the number of licenses depends only on the total number of cameras and tags across all Bosch Video Stitcher instances, and not on the number of instances.

3 Installing Bosch Video Stitcher

**Notice!**

Installing the Bosch Video Stitcher is only allowed on computers, on which no other Bosch VMS components are installed.

To install the Bosch Video Stitcher:

1. Run the Setup file.
The Bosch Video Stitcher Setup Wizard is displayed.
2. Follow the instructions on the screen to install all required components. Bosch Video Stitcher, Bosch Video Stitcher Wizard and Bosch Configuration Collector will be installed.

4 Configuring Bosch Video Stitcher

The Bosch Video Stitcher Wizard allows you to configure the Bosch Video Stitcher quickly and conveniently.

To configure a scene proceed through the tabs from left to right.

System	Cameras	Layout	Tags	Preview
--------	---------	--------	------	---------

To go back or forward click on the desired tab or use the navigation buttons Back or Next.



Notice!

The Bosch Video Stitcher Wizard supports only Latin characters.

4.1 Starting the Bosch Video Stitcher Wizard

To start the Bosch Video Stitcher Wizard:

1. From the Start menu, select Programs > Bosch Video Stitcher > Bosch Video Stitcher Wizard or double click the Bosch Video Stitcher Wizard icon on your desktop:



The Stitcher credentials dialog box is displayed.

2. Enter the password and click Log on (**Note:** when you start the application for the first time, enter **admin** as password).

The Bosch Video Stitcher Wizard System page is displayed.

4.2 System page

On the System page you set the parameters of the Bosch Video Stitcher and of the stitched video.

Stitched camera parameters

These parameters define how the Bosch Video Stitcher is accessed by other devices or applications in the network, for example by Bosch VMS.

Stitcher Server

These parameters are the parameters of the computer where the Bosch Video Stitcher is running.

Parameter	Description
Name	Name of the Bosch Video Stitcher. The default name is Bosch Video Stitcher. It can be changed if desired.
IP address	IP address of the Bosch Video Stitcher. The IP address of the Bosch Video Stitcher is the IP address of the network interface of the computer where the Bosch Video Stitcher is running. The IP address changes depending on the network interface you have selected under Network (see below).

Parameter	Description
Port	<p>Port used for ONVIF connection. Port must be in the range from 1 to 65535. The default port is 80.</p> <p>Note: The port must be open before starting the configuration. If you use other ports than the default port, they also must be open before starting the configuration. To configure and activate the ports, you need an administrator account.</p>
Network	<p>Network interface used for the network connection. Select the desired network interface.</p> <p>Note: Make sure that the network interface you select is in the same subnet as the cameras you want to use for stitching. Otherwise no connection to the cameras is possible.</p>

Stitcher credentials

These are the credentials of the Bosch Video Stitcher virtual camera.

Parameter	Description
User name	<p>The default user name is admin. It can be changed if desired.</p> <p>Note: If you do not enter an user name, a warning is displayed and you will not be able to activate the configuration.</p>
Password	<p>The default password is admin. It is strongly recommended to change this for security reasons.</p> <p>Note: If you do not enter a password, a warning is displayed and you will not be able to activate the configuration.</p>

PTZ parameters

These parameters define how the operator can navigate through the stitched video in the Bosch VMS Operator Client using PTZ control.

Parameter	Description
Pan and tilt speed	Select the desired speed at which you can pan and tilt the Bosch Video Stitcher camera.
Zoom speed	Select the desired speed at which you can zoom in and out within the stitched video.

Rendering parameters

Here you set the parameters of the stitched video. They define how it will be displayed in the Image pane of the Bosch VMS Operator Client.

Parameter	Description
Width	<p>Enter the desired width for the stitched video.</p> <p>Note: The width must be in the range from 400 to 1920.</p>

Parameter	Description
Height	Enter the desired height for the stitched video. Note: The height must be in the range from 200 to 1080.
GOP size	Enter the desired GOP size for the stitched video. Note: The GOP size must be in the range from 1 to 60.
RTSP port	Enter the port to be used for video streaming. Note: The RTSP port must be in the range from 1 to 65535. Standard RTSP ports are 554 and 8554. Make sure the port you select is not used by any other process.
Bit rate	Enter the maximum bit rate (kbit/s) for the stitched video. Note: The bit rate must be in the range from 2000 to 12200.

Graphics card compatibility

After starting the Bosch Video Stitcher Wizard, the installed NVIDIA graphics card driver version and the OpenGL version are checked automatically.

If your graphics card is not compatible, a warning is displayed and you cannot configure the Bosch Video Stitcher.

Please install the required graphics card and the newest graphics card driver version.

4.3

Cameras page

On the Cameras page you add the desired cameras to use for stitching.

You can add up to 16 cameras and stitched them together to a single view.

To add a camera:

1. Click+ Add camera .
The Add camera dialog box is displayed with a list of all cameras detected by the network scan.
If a camera you want to use for stitching is not displayed in the list, click Rescan.
If the desired camera still cannot be found by the network scan, you can add the camera manually:
 - In the Add camera dialog box, click + Add camera manually .
The Add camera manually dialog box is displayed.
 - Enter the camera name and the IP address of the desired camera and click OK.
The camera is displayed in the list.
2. Select the desired cameras from the list and click OK.
The selected cameras are displayed on the Cameras page.
3. Enter user name and password for each camera.
Or
Click Edit default credentials to enter default credentials for all cameras.
 - In the Default credentials dialog box, enter user name and password.
 - Select Use default credentials to use the default credentials for all cameras, then click OK.
Note: The default credentials will be assigned to every new camera you add.
4. Select the desired High resolution stream and Low resolution stream for each camera.

The stitched video is usually streamed in a low resolution to reduce bandwidth load. When the operator zooms into a section of the stitched image in the Bosch VMS Operator Client, the resolution of the appropriate camera will change to high resolution.

Notice!

The high resolution and low resolution streams of each camera should first be configured in the Bosch VMS Configuration Client. Otherwise you are not able to select them in the Bosch Video Stitcher Wizard and the camera state is shown as Incompatible.

Do not use other tools than the Bosch VMS Configuration Client to configure the camera streams.

If you have not configured the streams in the Bosch VMS Configuration Client before you have started the Bosch Video Stitcher Wizard, close the Bosch Video Stitcher Wizard, configure the camera streams in the Bosch VMS Configuration Client and start the Bosch Video Stitcher Wizard again.

For more details on configuration of camera streams in Bosch VMS Configuration Client, please see the Bosch VMS Configuration manual.




Camera state

The State column displays the state of each camera:

State	Description
Connected	Shows that the camera is connected and compatible and can be used for stitching.
Disconnected	Shows that the camera is not connected. Possible reasons could be for example network issues or incorrect camera credentials.
Incompatible	Shows that the camera streams are not configured properly and the camera cannot be used for stitching. This happens for example when stream 2 does not have SD resolution or stream 1 has a bigger resolution than 4K.

To remove a camera from the list:

- ▶ Point to the desired camera and click . The camera is removed from the list.

4.4

Layout page

On the Layout page you can select the cameras to be added to the scene and stitch them together to the desired view.



Notice!

If you add more cameras to the scene than the stitching licenses activated in Bosch VMS you will not be able to see the stitched image in the Bosch VMS Operator Client. A "Not licensed" overlay will be displayed.





To add a camera to the scene:

- ▶ In the Cameras list, select the check box for the desired camera. The camera is placed in the middle of the configuration window.

The number of cameras added to the scene is displayed in the right upper corner above the configuration window.

To change the position of a camera and to modify the camera image, use the toolbar:



Tool	Function	Shortcut
	Move image horizontally and vertically Note: When you select a camera to be added to the scene, this tool is preselected.	M
	Scale image	S
	Rotate image	R
	Skew image	T

To stitch the selected cameras:

1. Select the desired camera.
A red frame appears around the camera image and the toolbar is displayed. The Move tool



is preselected.

2. To select another tool, use:
 - the mouse button
 - or
 - the respective shortcut
 - or
 - the Page Up and Page Down keys.
3. To modify the camera image, use:
 - the mouse button
 - or
 - the Arrow keys
 - or
 - Shift + Arrow keys.

Note: Using the Arrow keys changes the camera position in small steps.
Using Shift + Arrow keys changes the camera position in bigger steps.

▶ To undo the changes done with a tool, double-click the desired tool.

Scene navigation


- To zoom in or out within the scene use:
 - the wheel button
 - or

- the Plus (+) and Minus (-) keys
- or
- the slider



- To pan the scene use the right mouse button or the scroll bars.

To remove a camera from the scene:

1. Select the desired camera image and click .
Or:
In the Cameras list, clear the check box for the desired camera.
A warning is displayed.
2. Click Yes to confirm.

4.5

Tags page

On the Tags page you can add static augmented reality tags to the stitched scene. They will be displayed in the stitched image in the Bosch VMS Operator Client.

You can add up to 200 tags to the scene and enter up to 50 characters per tag.



Notice!

If you add more tags to the scene than the augmented reality licenses activated in Bosch VMS you will not be able to see the stitched image in the Bosch VMS Operator Client. A "Not licensed" overlay will be displayed.

To add a tag to the scene:

1. Click + Add tag.
The tag is placed in the middle of the configuration window.
2. Select the tab and drag it to the desired position.
Note: Tags must be placed on images otherwise they will not be saved and displayed.
If a tag is placed outside an image its color changes to orange and a warning is displayed.
3. Enter a proper name for the tag.
Note: Tags without names will be displayed in the Bosch VMS Operator Client as simple dots without text.

Scene navigation

- To zoom in or out within the scene use:
 - the wheel button
 - or
 - the Plus (+) and Minus (-) keys
 - or
 - the slider



- To pan the scene use the right mouse button or the scroll bars.

To remove a tag from the scene:

- ▶ Select the desired tag and click .

4.6**Preview page**

On the Preview page you can open a preview window to see a preview of the configured scene and activate the configuration.

To see a preview of the configured scene:

- ▶ Click Open preview window.
The preview window is displayed for 2 minutes. Afterward a warning is displayed that the preview time is over and the preview window is closed.

In the preview window you can zoom in and out using the wheel button and pan by using the mouse button.

Note: When the preview window opens the augmented reality tags are displayed as simple dots without text. To see the text, zoom in into the image.

To activate the current configuration:

1. Click Activate configuration .
2. In the Scene name dialog box, enter a name for the scene, then click Save.
The configuration is saved and activated.

Note: If you do not enter a name for the scene, you cannot save it and a warning is displayed.


The Bosch Video Stitcher delivers now a virtual camera stream.

After having added the Bosch Video Stitcher to Bosch VMS, you can see the stitched scene in the Bosch VMS Operator Client.

Note:

In the Bosch VMS Operator Client you always see the last configuration you have activated.


To see another configurations which you have saved earlier, proceed as follows:

1. On the Bosch Video Stitcher Wizard Menu page , click Load to load the desired configuration.
2. On the Bosch Video Stitcher Wizard Preview page, click Activate configuration.
You see now the desired configuration in the Bosch VMS Operator Client.

To exit the Bosch Video Stitcher Wizard:

1. Click Exit.
A warning is displayed if there are unsaved changes.
2. In the Exit dialog box, click OK to exit the Wizard without saving the changes or click Cancel to continue with configuration.

4.7**Menu page**

On the Menu page  you can find information about the Bosch Video Stitcher Wizard and options for the configuration.

New

- ▶ Select this option to start a new configuration of the Bosch Video Stitcher.

Load

1. Select this option to load an existing scene.
The Load dialog box is displayed.
2. Select the scene to load and click Load.
The Layout page is displayed with the selected scene.

Save

1. Select this option to save the current configuration.
The Scene name dialog box is displayed.
2. Enter a name for the scene, then click Save.
Note: If you do not enter a name for the scene, you are not able to save it and a warning is displayed.

About

Here you find the License Agreement and the version number of the Bosch Video Stitcher Wizard.

Exit

1. Select this option to exit the Bosch Video Stitcher Wizard.
A warning is displayed if there are unsaved changes.
2. In the Exit dialog box, click OK to exit the Wizard without saving the changes or click Cancel to continue with configuration.

5 Adding Bosch Video Stitcher to Bosch VMS

To display the Bosch Video Stitcher virtual camera in the Bosch VMS Operator Client and to control it, you must perform following steps:

1. Activating stitching and augmented reality expansion licenses.
2. Adding Bosch Video Stitcher to Bosch VMS Configuration Client and configuring the required settings.

5.1 Activating stitching and augmented reality licenses

To activate the expansion licenses:

1. Start Bosch VMS Configuration Client.
2. On the **Tools** menu, click **License Manager...**
The **License Manager** dialog box is displayed.
3. Select the check boxes for the expansions that you want to activate and enter the number of licenses.
If you have received a Bundle Information file, click **Import Bundle Info** to import it.
4. Click **Activate**.
The **License Activation** dialog box is displayed.
5. Type the License Activation Key that you received from Bosch.
6. Click **Activate**.
The expansion licenses are activated.



Notice!


For more information on license activation, please see the Bosch VMS Configuration manual or use the Bosch VMS Online help.

5.2 Adding Bosch Video Stitcher to the Device tree


You can add the Bosch Video Stitcher to the Device tree of the Bosch VMS Configuration Client via scan or manually.

To add the Bosch Video Stitcher to the Device tree via scan:





1. Select **Devices**.
2. In the Device tree right-click  and click **Scan for Live Only ONVIF Encoders**.
The **Bosch VMS Scan Wizard** dialog box is displayed.
3. Select the appropriate check box for the Bosch Video Stitcher.
4. Click **Next >>**.
The **Authenticate Devices** dialog box of the Wizard is displayed.
5. Type in the credentials for the Bosch Video Stitcher (**Note:** these are the credentials set on the Bosch Video Stitcher Wizard System page).




- In the **Status** column, the successful logon is indicated with .
6. Click **Finish**.
The Bosch Video Stitcher is added to the Device tree.
 7. In the Device tree, select the Bosch Video Stitcher.
 8. On the **Stitching License** page, enter the number of stitching channels and augmented reality channels used by the Bosch Video Stitcher.

- Click  to save the settings.

To add the Bosch Video Stitcher to the Device tree manually:

- Select **Devices** .
- In the Device tree right-click  and click **Add ONVIF Encoder**.
The **Add ONVIF Encoder** dialog box is displayed.
- Fill in the following fields: **Network address**, **User name** and **Password**.
Note: These are the parameters set on the Bosch Video Stitcher Wizard System page.
- Click **Show password** to enable that the entered password is displayed. Be careful that nobody can spy out this password.
- Click **Test** to authenticate at the device with the credentials entered above.



The successful logon is indicated with .

- Click **OK**.
The Bosch Video Stitcher is added to the Device tree.
- In the Device tree, select the Bosch Video Stitcher.
- On the **Stitching License** page, enter the number of stitching channels and augmented reality channels used by the Bosch Video Stitcher.

- Click  to save the settings.






5.3 Adding Bosch Video Stitcher to the Logical tree

To add the Bosch Video Stitcher to the Bosch VMS Configuration Client Logical tree:

- Select **Maps and Structure** .
- In the Device tree, select the Bosch Video Stitcher and drag it to the Logical tree.
- Click  to save the settings.

5.4 Activating PTZ control

To activate PTZ control for the Bosch Video Stitcher camera:

- In the Bosch VMS Configuration Client, select **Cameras and Recording** , then select .
- In the Cameras table, select the desired Bosch Video Stitcher camera.
- In the  column, select the check box.
- Click  to save the settings.
- Click  to activate the configuration.

6 Operating Bosch Video Stitcher in Bosch VMS Operator Client



Notice!

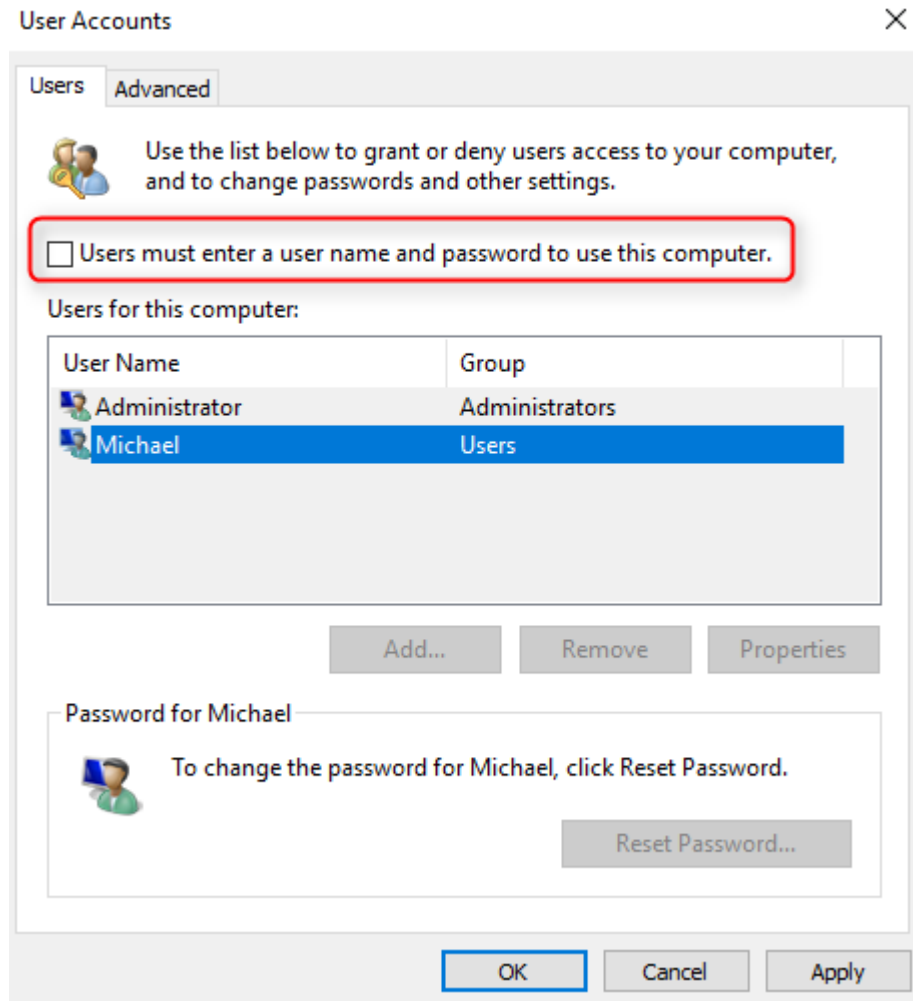
To run the Bosch Video Stitcher it is required that a Windows user is logged on to the Bosch Video Stitcher computer. Otherwise the stream of the Bosch Video Stitcher virtual camera is not displayed in the Bosch VMS Operator Client.

We recommend to configure a Windows user automatic logon to make sure that after a restart of the Bosch Video Stitcher computer the user will be logged on automatically and the Bosch Video Stitcher will continue running.

Once you do that, make sure that the Bosch Video Stitcher computer is located in an area that can only be accessed by trusted personnel.

To configure a Windows user automatic logon:

1. Press Windows logo key + R.
The **Run** dialog box is displayed.
2. In the **Open** field, type **control userpasswords2**, then click **OK**.
The **User Accounts** window is displayed.



3. On the **Users** tab, in the users list, select the user for whom you want to configure the automatic logon and clear the check box above the users list.
4. Click **OK** to save the changes.

Note: To configure the Windows user automatic logon, you need a Windows administrator account.



Notice!

When you leave your Bosch Video Stitcher computer, lock your screen. We recommend to set your computer to lock your screen automatically. Set a screensaver that starts after 1 minute of inactivity.



Notice!

Bosch Video Stitcher and Bosch Video Stitcher Wizard run independently. While the Bosch Video Stitcher is running, you can configure and save a new scene in the Bosch Video Stitcher Wizard and activate it later.

Once you have activated the new scene, it will be displayed in the Bosch VMS Operator Client.




Notice!

If the Bosch Video Stitcher computer loses the connection to the Bosch VMS Management Server for longer than 48 hours, a "Not licensed" overlay is displayed in the Bosch VMS Operator Client.

To display the Bosch Video Stitcher virtual camera in the Bosch VMS Operator Client, make sure that the Bosch VMS Management Server is running again.

To display the Bosch Video Stitcher virtual camera in an Image pane:



1. In the Bosch VMS Operator Client, select .
2. To assign the Bosch Video Stitcher camera to an Image pane:
 - Drag the camera from the Logical Tree window to the desired Image pane. The camera is displayed in the Image pane.
 - Or:
 - Select an Image pane and double-click the Bosch Video Stitcher camera in the Logical Tree. The camera is displayed in the Image pane.

You can pan, tilt and zoom the Bosch Video Stitcher camera either in the PTZ Control window or in the Image pane.

Controlling/zooming in the PTZ Control window

1. Select the required Image pane.
2. Click the various control elements in the PTZ Control window to control the Bosch Video Stitcher camera.



Controlling/zooming using the in-window control

After you have assigned the Bosch Video Stitcher camera to an Image pane, you can use the camera control functions directly in this Image pane.

- Move the cursor on the Image pane which displays the Bosch Video Stitcher camera.
The cursor changes depending on the location in the Image pane.
- Move the cursor to the left side of the Image pane.
The cursor changes to an arrow.
Click to swivel to the left direction in a small step.
Keep the mouse button pressed to swivel continuously.
Drag to the outside direction to accelerate.
- Move the cursor to another direction and perform a corresponding tilt or swiveling task.
- Move the cursor to the center of the Image pane.
The cursor changes to a magnifying glass. In the upper area, use the zooming in function.
In the lower area, use the zooming out function.

**Notice!**

For more information on the Bosch VMS Operator Client and PTZ camera control, please see the Bosch VMS Operation manual or use the Bosch VMS Online help.

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