Monitoring of machinery and plants using network cameras

SIMATIC HMI Comfort Panels; KTP Mobile Panels; WinCC V16

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Contents

1 Introduction

Introduction

In many areas of industrial and manufacturing plants, it makes sense from a production and security point of view to monitor operations using a network camera.

Monitoring using a network camera is particularly useful in places where it is difficult for the operator to see the system or where local conditions prevent people from standing near the machine.

Another application case is the monitoring of several system parts from a central location. The operator can react more quickly to the possible cause of the fault if, for example, a workpiece is jammed in the machine, and take the appropriate tool along on the way to the machine for troubleshooting.

Overview of the automation task

The following figure provides an overview of the automation task:

Figure 1-1
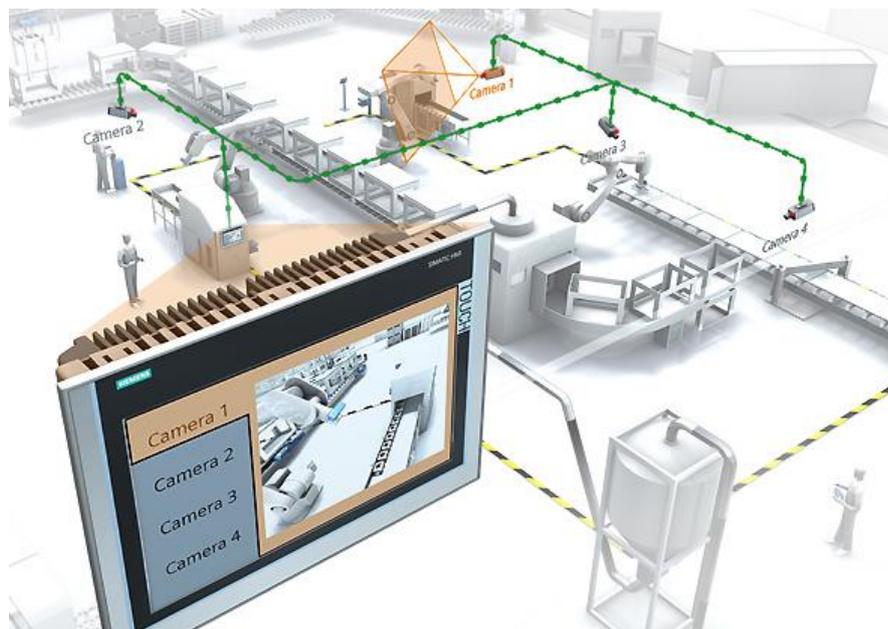
Description of the automation task

A large-scale plant is monitored by several network cameras.
You should be able to observe each part of the plant using the existing HMI device.

You should be able to display each camera image on a dedicated HMI screen.

The figure shows the layout, as an example.
You should be able to call up the "images" from the different network cameras using buttons. In the example, "Plant part 1" is monitored by "Camera 1" and displayed on the HMI device.

2 Solution

Overview

As of version WinCC Comfort V13 SP1, the "Camera display" control is available in the "Tools" task card as standard. Using this "Camera display" control, you can display images from a connected network camera.

You can find information on how to upgrade previous versions in Chapter 4.1

Notes If Camera Control is mentioned in this documentation, it will always refer to the "Camera display" control.

2.1 Overview of the overall solution

Schematic

The following figure shows the most important components of the solution schematically:

Figure 2-1
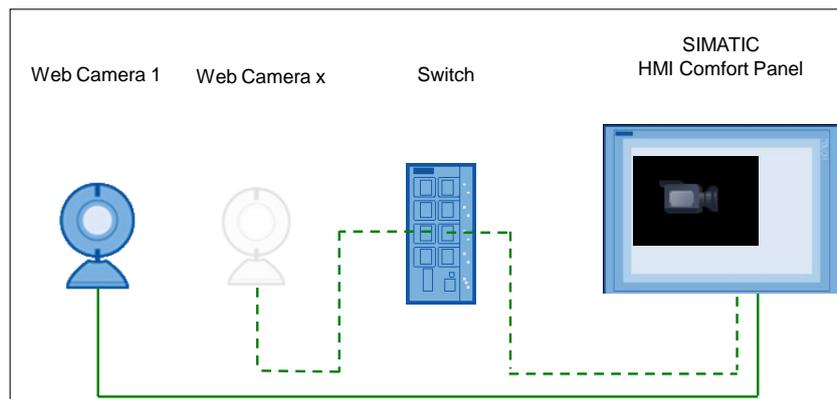
- Network camera Co
- "Camera display" control

Structure

All network cameras must be networked in an Ethernet network. The switch is used to connect the individual Ethernet participants to the network (optional).

Notes Many network cameras are supplied with power through the Ethernet cable. In this case, the switch must support "PoE" (Power over Ethernet).

The camera image is output via the Comfort Panel using the camera control.

The image from a network camera can be output via the camera control.

Advantages

The advantage of using a network camera is that it can be integrated into an existing network at any point. Cameras with USB cabling have a disadvantage in that such cameras cannot cover long distances.

2.1 Overview of the overall solution

Hardware requirements for network cameras

The network camera used must comply with the following items:

- Network protocol (streaming protocol):
  RTP/RTSP

- Video format:
  H.264 and MJPEG or H.264 and MPEG4

- Image resolution:
  640 x 480 / 1280 x 1024 / 1920 x 1080 (additional resolutions…)

- Frame transfer (Refresh rate / frame rate):
  Adjustable between 5 and 25/30 fps

- Two different "channels" that can be selected via the RTSP connection (two parameterizations)

To this end, check the technical documentation for your network camera.

Notes	**RTSP addressing**
	Partially, the description of the camera manufacturer regarding "RTSP addressing" does not provide a lot of detail. The only remedy in this case is to research the Internet.
	Better: Before you make a purchase, inquire about "RTSP addressing" specific to the camera model from the manufacturer of the network camera.

Notes	There is no guarantee that every network camera available on the market can be used, as the technical requirements vary depending on the manufacturer. In this regard, see Chapter 3.3.

2.1 Overview of the overall solution

Advantages

This application example offers you the following advantages:

- Simple integration of the camera control to output the camera image on the HMI device.
- The size of the camera image on the HMI device can be freely selected.
- Different network camera manufacturers can be used.

Notes	Use of the camera control is not suitable for positioning purposes or for monitoring fast-moving activity.
	Depending on the camera configuration, there may be delays in image transmission.

Delimitation

This application example does not provide a description of:

- the network cameras used with regard to setting options.
  Only the settings relevant for the application example are described.
- of the HMI devices used. Only the steps relevant for the application example are explained.

Required knowledge

Knowledge of the handling or operation of a SIMATIC HMI device and the camera used is assumed.

2.2 Description of the core functionality

The application example describes…

- the individual parameters of the camera control.
- all the necessary settings on the HMI device.
- Settings of the network cameras used.
- Furthermore, several examples are used to show how the parameterization of the camera control in WinCC (TIA Portal) affects the HMI device.

Notes	The descriptions always reference the used SIMATIC TP1200 Comfort Panel.

Overview and description of the interface

The following figure illustrates the camera control as an example. In the following section, the individual parameters will be discussed along with the details you need to pay attention to.

Figure 2-2
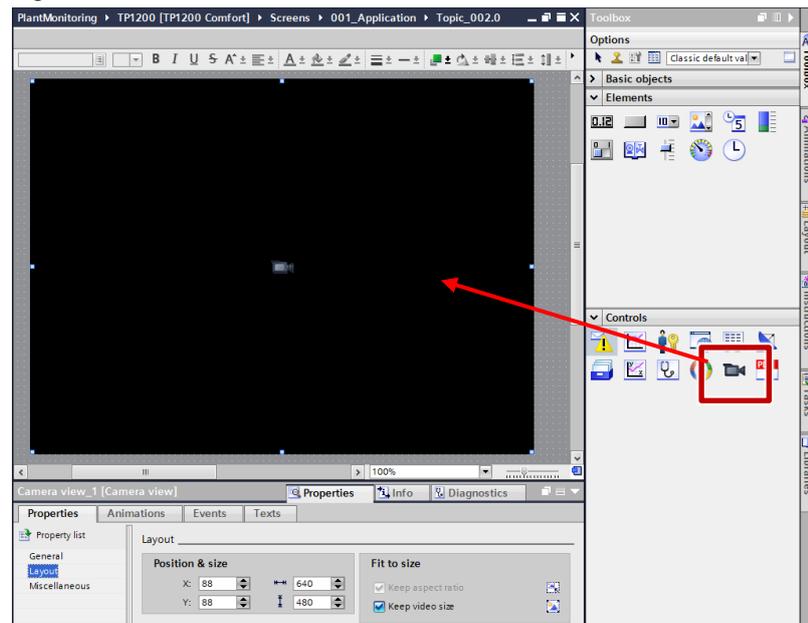
2.3 Hardware and software components used

The application example was created with the following components:

Hardware components

Table 2-1

Components	Qty.	MLFB / order number	Notes
TP1200 Comfort	1	6AV2124-0MC01-0AX0	For alternative HMI devices, see Chapter 2.4
Scalance X208	1	6GK5208-0BA10-2AA3	The use of a "switch" is optional. The network camera can also be connected directly to the Comfort Panel, for example.
Network cameras	--	---	See Chapter 3.3

Standard software components

Table 2-2

Components	Qty.	MLFB / order number	Notes
SIMATIC WinCC Comfort V16	1	6AV2101-0AA06-0AA5	Alternative: Specified components or higher.
Camera control for the output of the camera image on the HMI device	1	Integrated as of WinCC V13 SP1.	See Chapter 4.1
Network camera configuration software		Most network cameras have a web interface as standard, with which the camera can be configured. Alternative: Some of the network camera manufacturers partially offer their own software for configuring their cameras. Have a look at the manufacturer information in this regard.	

Sample files and projects

This application example consists of the following components.

Table 2-3

Components	File name
This document	62383298_WinCC_TIA_Camera_Control_DOC_v70_de.pdf

2.4 Supported HMI devices

The following table lists all Comfort Panels that support the camera control.

Table 2-4

No.	HMI device
1.	KP400 Comfort
2.	KTP400 Comfort
3.	KP700 Comfort
4.	TP700 Comfort
5.	KP900 Comfort
6.	TP900 Comfort
7.	KP1200 Comfort
8.	TP1200 Comfort
9.	KP1500 Comfort
10.	TP1500 Comfort
11.	TP1900 Comfort
12.	TP2200 Comfort
13.	KTP400F Mobile
14.	KTP700 Mobile
15.	KTP700F Mobile
16.	KTP900 Mobile
17.	KTP900F Mobile
18.	PC Runtime Advanced

3 Configuration and project planning

3.1 Preparatory measures for project planning

IP addresses used

Before you start with the parameterization, define the IP address for the individual hardware components.

Table 3-1

Device	IP Address / subnet
TP1200 Comfort	192.168.178.200 255.255.255.0
Network camera 1	192.168.178.101 255.255.255.0
Network camera 2	192.168.178.102 255.255.255.0
Network camera xy	192.168.178.10x 255.255.255.0

Passwords used for the cameras

To be able to make settings via the web browser of the network cameras, you usually need to log in.

If the password or the IP address of the camera is not known, the network camera must be reset to the delivery status. Refer to the manual of the respective network camera for this purpose.

| Notes	Change the manufacturer-specific password before commissioning the system.

3.2 Camera Control settings

The chapter describes the individual settings that can be made on the Camera Control in WinCC Comfort V16.

3.2.1 Adding Camera Control to the screen

Open "Tool catalog > Controls" and pull the Camera Control using "drag-and-drop" into the screen.
In the process, observe the following listed guidelines in "General notes on inserting the "Camera display" control.

Figure 3-1
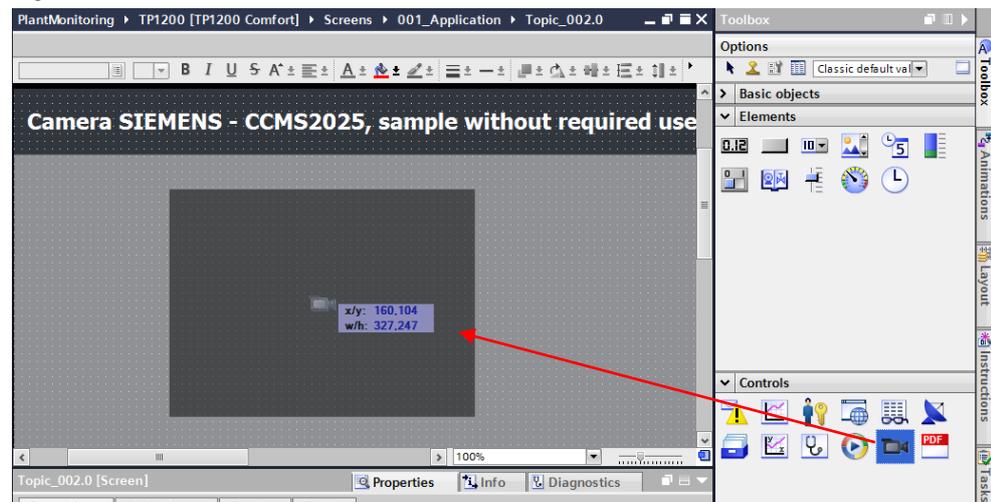
General notes on inserting the Camera Control

- **One** camera control can be inserted per screen.
- If a camera control is located on a screen, then no camera controls may be inserted
    - in a template screen
    - in a permanent window
    - in a slide-in image
    .
- If you use several pop-up windows with a camera control in a plant image, before you open a new Pop-up window, the previous window needs to be closed.

3.2.2 Network settings

Camera URL

"Settings > Properties > General"

- Enter the URL address of the network camera here.
  (URL = Windows file format for weblinks).

- The address always starts with "**rtsp://......**".

- You can find the addressing for the network camera in the network camera manual. Search for the term "**rtsp**" there.

Camera username

Here you can enter the user name that you entered when configuring the network camera. Alternatively, enter the user name together with the "URL".
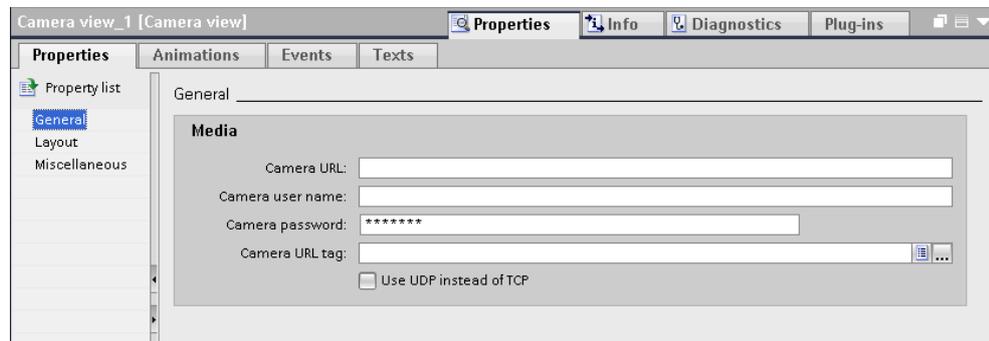
Camera password

Here you can enter the password that you entered when configuring the network camera. Alternatively, enter the password together with the "URL".

Camera URL tag:

Instead of a fixed IP address, you can assign a tag to the camera control
Which can be used to assign an IP address to the camera control at runtime.

Figure 3-2

Enter the URL including user and password (authentication)

In the camera settings, you can for example assign access rights to prevent unwanted access to the output of the camera image.

When entering the URL, you can take this into account and include the "user name" and the "password".

The default for the URL address usually begins with
"**rtsp://Username:password@......**".

Example (camera axis):

rtsp://root:1234demo@192.168.178.101/axis-media/media.amp?streamprofile=HH

> **CAUTION** | **Transmission of the authentication and the URL between the HMI device and the network camera takes place without encryption. Note the following information when networking your system with other parts of the system (see Chapter 4.2 section on "Precautionary measures").**

Use UDP instead of TCP

By activating this option, you specify the type of protocol to be used for data exchange between the panel and the network camera.

Activate this option if the network camera only supports "UDP" or if the "UDP" network protocol is to be used explicitly.

Check the information in the camera manual in this regard.

3.2.3 Adjusting to size

Properties > Properties > Presentation

In this menu item, you can specify various settings for the position and size of the camera control as well as the "aspect ratio" and the "video size". The following describes the individual combination options and how they affect the panel.

Position & size

Enter the position and size of the camera control in the "Position & size" parameter.

Notes | We recommend that for the size of the camera control, enter the value of the resolution set for the network camera. As a result, the resolution does not have to be converted from the camera to the camera control, which reduces the required panel computing power.
Example:
Selected resolution of the network camera: 640 x 480
Selected size for the camera control: 640 x 480

Keep aspect ratio

Figure 3-3
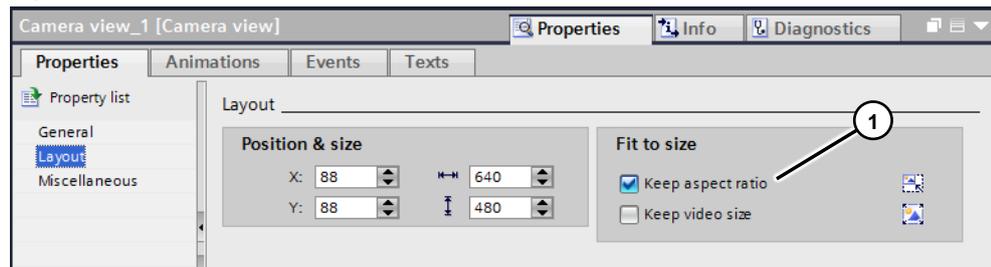
By selecting the option "Keep aspect ratio" (1), the aspect ratio of the recording medium (image from the network camera) is retained.

Notes | This option can only be selected if the "Keep video size" option has been deactivated.

3.2 Camera Control settings

The following two examples illustrate the way the option works:

Example 1:

Network camera setting: 4:3

Camera Control: 16:9

Table 3-2

Network camera (4:3)	Camera Control view (16:9)
Original image	The picture is scaled to the 16:9 format. The remaining areas are output as vertical black borders through the Camera Control.

Example 2:

Network camera setting: 16:9

Camera Control: 4:3

Table 3-3

Network camera (16:9)	Camera Control view (4:3)
Original image	The image is scaled to the 4:3 format. The remaining areas are output as horizontal black borders through the Camera Control.

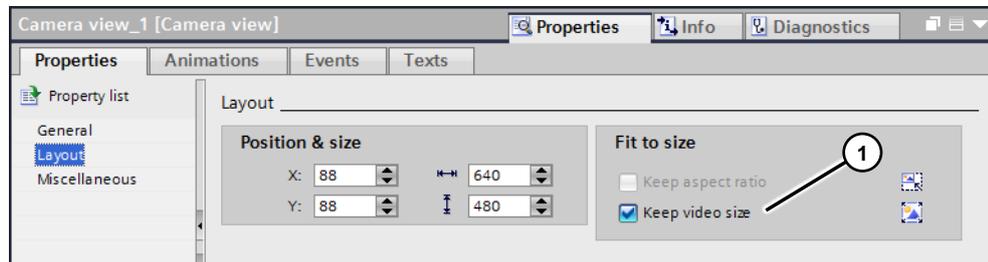**Keep video size**

Figure 3-4

By selecting the option "Keep video size" (1), the size of the recording medium (image size from the network camera) is retained.

3.2 Camera Control settings

The following two examples illustrate the way the option works:

Example 1:

Network camera setting: 16:9

Camera Control: 16:9

The dimensions (layout) of the Camera Control are **smaller** than the resolution of the network camera.

Table 3-4

Network camera (16:9)	Camera Control view (16:9)
Original image	Due to the smaller dimensions of the Camera Control, only a section of the "original image" is reproduced via the Camera Control.

Example 2:

Network camera setting: 16:9

Camera Control: 16:9

The dimensions (layout) of the Camera Control are **larger** than the resolution of the network camera.

Table 3-5

Network camera (16:9)	Camera Control view (16:9)
Original image	Due to the **larger** dimensions of the Camera Control, the remaining areas are displayed as horizontal and vertical black borders through the Camera Control.

3.2 Camera Control settings

"**Keep aspect ratio and video size" deselected**

Figure 3-5
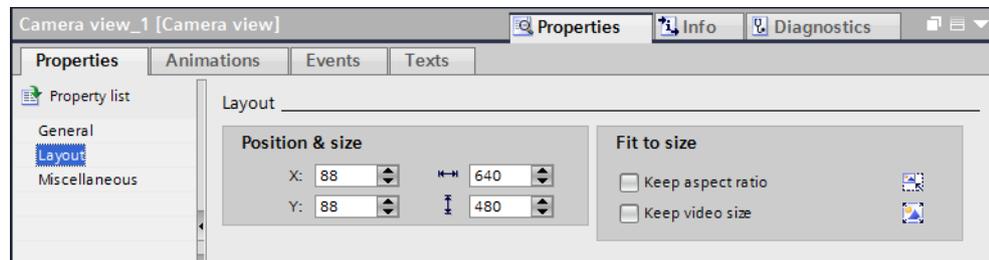
If neither of the two options "Keep aspect ratio" and "Keep video size" are selected, the image from the network camera is output through the Camera Control without any special adjustment.

3.2 Camera Control settings

The following two examples illustrate the way the option works.

Example 1:

Network camera setting: 16:9 (640 x 360)

Camera Control: 4:3 (480 x 360)

The dimensions (layout) of the Camera Control are **smaller** than the resolution of the network camera.

Table 3-6

Network camera (16:9)	Camera Control view (16:9)
Original image	Due to the **smaller** dimensions of the Camera Control, the image output through the Camera Control will be "**distorted**".

Example 2:

Network camera setting: 16:9 (640 x 360)

Camera Control: 4:3 (640 x 480)

The dimensions (layout) of the Camera Control are **larger** than the resolution of the network camera.

Table 3-7

Network camera (16:9)	Camera Control view (16:9)
Original image	Due to the **larger** dimensions of the Camera Control, the image output through the Camera Control will be "**distorted**".

3.2 Camera Control settings

Summary of the possible options

Table 3-8

Image from the network camera		Function
Maintain AspectRatio	**Maintain OriginalSize**	
☑	Not selected	The aspect ratio of the web camera image is retained when it is output through the camera control. Because the aspect ratio is retained, any possible remaining areas are displayed as horizontal or vertical black borders through the Camera Control. The image display may be distorted due to zoom effects.
Not selectable	☑	The image size of the web camera is output 1:1 via the Camera Control. The image is not scaled. If the Camera Control is **smaller** than the selected resolution of the web camera, only a corresponding section of the camera image is output via the Camera Control. If the Camera Control is **larger**, remaining areas are displayed as horizontal or vertical black borders through the Camera Control.
☐	☐	The image of the network camera is fully adapted to the size of the Camera Control. The image display may be distorted due to zoom effects.

3.3 Parameterization examples for different network cameras

To achieve the best possible image quality, you usually have to try several settings (make changes to the resolution, frame rate, bit rate, etc.).
We are unable to provide a general recommendation at this point. Check the information in the manufacturer manual in this regard.
To for example determine the "URL address", search for the term "**rtsp**".

The following table shows parameterization examples for various network cameras to output the camera image through the camera control.

Notes	The cameras used have not been specially system-tested. They have only been used successfully with the settings listed in the table and with the camera control and serve as a **reference point** for parameterization.
	Note that the playback of the camera image through the Camera Control is usually delayed. The behavior of the camera is specific to each manufacturer. Check the information in the camera manufacturer's manual in this regard.

3.3 Parameterization examples for different network cameras

3.3.1 TRENDNET Type "TV-IP1313PI"

Table 3-9

No.	Panel	Settings	
1.	**General:** • URL address: rtsp:/User name**:**Password@IP-Address/Streaming/Channels/1 (PC) • URL address: rtsp:/User name**:**Password@IP-Address/Streaming/Channels/2 (Panel) • Audio: Off		
2.	Comfort Panel 4"	• Image mode: • Camera Control resolution: • Camera resolution: • Video quality: • Frame rate: • Max. bit rate: • Image delay (sec.):	MPEG4 320 x 240 320 x 240 Medium 8 fps 1024 Kbps <1
3.	Comfort Panel 7" – 12"	• Image mode: • Camera Control resolution: • Camera resolution: • Video quality: • Frame rate: • Max. bit rate: • Image delay (sec.):	MPEG4 640 x 480 640 x 480 Medium 8 fps 1024 Kbps <1
4.	Comfort Panel 15" – 22"	• Image mode: • Camera Control resolution: • Camera resolution: • Video quality: • Frame rate: • Max. bit rate: • Image delay (sec.):	H.264 1280 x 720 1280 x 720P Highest 25 fps 1024 Kbps <1
5.	KTP Mobile 7" – 9"	• Image mode: • Camera Control resolution: • Camera resolution: • Video quality: • Frame rate: • Max. bit rate: • Image delay (sec.):	MPEG4 320 x 240 320 x 240 Medium 8 fps 1024 Kbps <1
6.	RT Advanced	• Image mode: • Camera Control resolution: • Camera resolution: • Video quality: • Frame rate: • Max. bit rate: • Image delay (sec.):	H.264 1280 x 720 1280 x 720P Highest 25 fps 1024 Kbps <1

3.3 Parameterization examples for different network cameras

3.3.2 Reolink RLC 423

Table 3-10

No.	Panel	Settings	
1.	**General:** • URL address: rtsp:/User name**:**Password@IP-Address**:**Port//H264Preview_01_main (for Clear = high resolution) • URL address: rtsp:/User name**:**Password@IP-Address**:**Port//H264Preview_01_sub (für Fluent = niedrige Auflösung) • Port = 554		
2.	Comfort Panel 4" **Note**: Recommended only to a limited extent. The image partially shows "cluster formation" "MPEG4" is not supported.	• Image mode: • Camera Control resolution: • Camera resolution: • Video quality: • Frame rate: • Max. bit rate: • Image delay (sec.):	H.264 320 x 240 320 x 240 Base 7 fps 64 Kbps <1
3.	Comfort Panel 7" – 12" **Note**: Recommended only to a limited extent. The image partially shows "cluster formation" "MPEG4" is not supported.	• Image mode: • Camera Control resolution: • Camera resolution: • Video quality: • Frame rate: • Max. bit rate: • Image delay (sec.):	fluent 640 x 480 640 x 480 Base 15 fps 128 Kbps <1
4.	Comfort Panel 15" – 22" **Note**: Recommended only to a limited extent. The image partially shows "cluster formation" Delayed display structure.	• Image mode: • Camera Control resolution: • Camera resolution: • Video quality: • Frame rate: • Max. bit rate: • Image delay (sec.):	fluent 640 x 480 640 x 480 Base 15 fps 128 Kbps <1
5.	KTP Mobile 7" – 9" **Note**: Not suitable. The camera image is not restructured after a page change. Restart of the camera is required.	• Image mode: • Camera Control resolution: • Camera resolution: • Video quality: • Frame rate: • Max. bit rate: • Image delay (sec.):	fluent 320 x 240 640 x 480 Base 7 fps 160 Kbps <1
6.	RT Advanced **Note**: Recommended only to a limited extent. Greater image delay with higher resolution. Image delay with 640 x 480 > 1 second.	• Image mode: • Camera Control resolution: • Camera resolution: • Video quality: • Frame rate: • Max. bit rate: • Image delay (sec.):	fluent 640 x 480 640 x 480 Base 15 fps 128 Kbps >1

3.3 Parameterization examples for different network cameras

3.3.3 Levelone FCS-5059

Table 3-11

No.	Panel	Settings	
1.	**General:** • URL address: Substream: rtsp://\<IP-Address\>/streaming/channels/2 Main Stream: rtsp://\<IP-Address\>/streaming/channels/1 • Audio: Off		
2.	Comfort Panel 4"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	Substream H.264 352 x 288 352 x 288 10 fps <0.5
3.	Mobile F Panels 4"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	Substream H.264 352 x 288 352 x 288 10 fps <0.5
4.	Comfort Panel 7" – 12"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	Substream H.264 640 x 360 640 x 360 10 fps <0.5
5.	Comfort Panel 15" – 22"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	Substream H.264 1920 x 1080 1920 x 1080 12 fps <0.5
6.	KTP Mobile 7" – 9"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	Substream H.264 640 x 360 640 x 360 8 fps <0.5
7.	RT Advanced	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	Substream H.264 1920 x 1080 1920 x 1080 25 fps <0.5

3.3 Parameterization examples for different network cameras

3.3.4 D-Link DCS-7513

Table 3-12

No.	Panel	Settings	

1.	**General:**
	• URL address:
	  rtsp://<IP-Address>:554/live1.sdp
	  rtsp://<IP-Address>:554/live2.sdp
	• Audio: Off		

2.	Comfort Panel 4"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	Video profile 2 H.264 320 x 176 320 x 176 9 fps <0.5
3.	Mobile F Panels 4"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	Video profile 2 H.264 320 x 176 320 x 176 9 fps <0.5
4.	Comfort Panel 7" – 12"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	Video profile 2 H.264 640 x 360 640 x 360 9 fps <0.5
5.	Comfort Panel 15" – 22"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	Video profile 2 H.264 1280 x 720 1280 x 720 9 fps <0.5
6.	KTP Mobile 7" – 9"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	Video profile 2 MJPEG 640 x 360 640 x 360 9 fps <0.5
7.	RT Advanced	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	Video profile 2 H.264 1920 x 1080 1920 x 1080 25 fps <0.5

3.3 Parameterization examples for different network cameras

3.3.5 AXIS M2025-LE

Table 3-13

No.	Panel	Settings	
1.	**General:** • URL address: rtsp://User:Password@IP-Address/axis-media/media.amp?streamprofile=myprofile **Notes:** myprofile => you can specify your own name in the configuration of the camera for example Device01 rtsp://User:Password@IP-Address/axis-media/media.amp?streamprofile=Device01 If you have made changes to the parameters of the camera, you need to update the HMI image using the camera OCX (call it up again)		
2.	Comfort Panel 4"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Compression • Image delay (sec.):	MJPEG 320 x 240 320 x 240 8 fps 5 [0..100] <0.5
3.	Comfort Panel 7" – 12"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Compression • Image delay (sec.):	MJPEG 480 x 360 480 x 360 9 fps 5 [0..100] <0.5
4.	Comfort Panel 15" – 22"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Compression • Image delay (sec.):	MJPEG 1024 x 768 1024 x 768 8 fps 40 [0..100] <0.5
5.	KTP Mobile 7" – 9"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Compression • Image delay (sec.):	MJPEG 480 x 360 480 x 360 15 fps 10 [0..100] <0.5
6.	RT Advanced	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Compression • Image delay (sec.):	MJPEG 1024 x 768 1024 x 768 9 fps 40 [0..100] <0.5

3.3 Parameterization examples for different network cameras

3.3.6 AXIS P1365 MK II

Table 3-14

No.	Panel	Settings	

7.	**General:**
	• URL address:
	  rtsp://\<IP-Address\>/axis-media/media.amp
	  rtsp://\<IP-Address\>/axis-media/media.amp
	• Audio: Off
	• If you have made changes to the parameters of the camera, you need to update the HMI image using the camera OCX (call it up again)		

8.	Comfort Panel 4"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	---- H.264 320 x 180 320 x 180 9 fps <0.5
9.	Mobile F Panels 4"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	---- H.264 320 x 180 320 x 180 9 fps <0.5
10.	Comfort Panel 7" – 12"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	---- H.264 640 x 360 640 x 360 9 fps <0.5
11.	Comfort Panel 15" – 22"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	---- H.264 1280 x 720 1280 x 720 9 fps <0.5
12.	KTP Mobile 7" – 9"	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	---- H.264 640 x 360 640 x 360 9 fps <0.5
13.	RT Advanced	• Stream Type: • Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	---- H.264 1920 x 1080 1920 x 1080 25 fps <0.5

3.4 Archived camera parameterization examples

Due to the high innovation cycles at camera manufacturers, network cameras are often no longer available after a short time. To make sure that the information regarding previously used cameras is not lost, the data has been recorded in this chapter. This does not exclude the possibility that the cameras could still be purchased.

SIEMENS type: "CCMS2025"

Table 3-15

No.	Panel	Settings	
1.	**General:** • URL address: rtsp://<IP-Address> • Audio: Off		
2.	Comfort Panel 4"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	MPEG4 320 x 240 320 x 240 10 fps <1
3.	Mobile F Panels 4"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	MPEG4 320 x 240 320 x 240 10 fps <1
4.	Comfort Panel 7" – 12"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	MPEG4 640 x 480 640 x 480 10 fps <1
5.	Comfort Panel 15" – 22"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	H.264 640 x 480 640 x 480 10 fps <1
6.	KTP Mobile 7" – 9"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	H.264 320 x 240 320 x 240 10 fps <1
7.	RT Advanced	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	MJEPG 800 x 600 800 x 600 SVGA 10 fps <1

3.4 Archived camera parameterization examples

TRENDNET Type "TV-IP310PI"

Table 3-16

No.	Panel	Settings	
1.	**General:** • URL address: rtsp://\<IP-Address> • Audio: Off		
2.	Comfort Panel 4"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	MPEG4 320 x 240 320 x 240 2 fps <4
3.	Mobile F Panels 4"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	MPEG4 320 x 240 320 x 240 10 fps <1
4.	Comfort Panel 7" – 12"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	MPEG4 640 x 480 640 x 480 2 fps <1
5.	Comfort Panel 15" – 22"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	H.264 640 x 480 640 x 480 10 fps <1
6.	KTP Mobile 7" – 9"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	H.264 640 x 480 640 x 480 10 fps <1
7.	RT Advanced	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	H.264 640 x 480 640 x 480 SVGA 25 fps <1

3.4 Archived camera parameterization examples

TRENDNET Type "IR HD 720p"

Table 3-17

No.	Panel	Settings	
1.	**General:** • URL address: rtsp://<IP-Address> • Audio: Off		
2.	Comfort Panel 4"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	MPEG4 320 x 240 320 x 240 10 fps <1
3.	Mobile F Panels 4"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	MPEG4 320 x 240 320 x 240 10 fps <1
4.	Comfort Panel 7" – 12"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	MPEG4 640 x 480 640 x 480 10 fps <1
5.	Comfort Panel 15" – 22"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	H.264 640 x 480 640 x 480 10 fps <1
6.	KTP Mobile 7" – 9"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	H.264 320 x 240 320 x 240 10 fps <1
7.	RT Advanced	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	MJEPG 800 x 600 800 x 600 SVGA 10 fps <1

3.4 Archived camera parameterization examples

TP-link Type "TL-SC3171G"

Table 3-18

No.	Panel	Settings	
1.	**General:** • URL address: rtsp://<IP-Address>/video.mp4 • Audio: Off		
2.	Comfort Panel 15" – 22"	• Image mode: • Camera Control resolution: • Camera resolution: • Frame rate: • Image delay (sec.):	H.264 640 x 480 640 x 480 10 fps <1

Notes	You can find more recommended cameras and settings in the WinCC online help (TIA Portal). As a search term, use "Supported network cameras and settings". Due to the short production cycles of network cameras, we cannot guarantee that all the listed network cameras are readily available.

4 Notes and Tips

4.1 Upgrade existing configuration

This chapter is relevant to you only if you have an existing configuration with a Camera Control that was created using a version prior to WinCC V13 SP1 and should now to be used with WinCC V13 SP1 (or higher).

Introduction

To be able to use the Camera Control for SIMATIC Comfort Panels, in versions WinCC V11 to WinCC V13 the software with the "CamControlES" camera control also had to be installed.

The software can be downloaded from the support pages \5\.

In WinCC V13 SP1, the Camera Control is integrated in WinCC (TIA Portal).

Upgrade configuration

Case 1

- The configuration was created using a version prior to WinCC V13 SP1.
- The "CamControlES" camera control is **not** installed on the PC.
- The configuration will be opened using WinCC V13 SP1 (or higher).
    - The configured camera control will **not** be displayed in the images.

Case 2

- The configuration was created using a version prior to WinCC V13 SP1.
- The "CamControlES" camera control is installed on the PC.
- The configuration will be opened using WinCC V13 SP1 (or higher), **without** upgrading the version on the Panels.
    - The configured camera control will be displayed in the images.

Case 3

- The configuration was created using a version prior to WinCC V13 SP1.
- The "CamControlES" camera control is installed on the PC.
- The configuration will be opened using WinCC V13 SP1 (or higher), **and** the version on the Panels will be upgraded.
    - The configured camera control will **not** be displayed in the images.

Recommendation

- Install the "CamControlES" camera control on the PC.
- Before you upgrade the panel (case 2), make a note of the camera control settings.
- Once you upgrade, use the integrated Camera Control and enter the settings you previously noted there.

4.2 Commissioning

Test the RTSP connection using VLC Player.

To test the URL address in advance, you can for example use VLC player.

In the "Media> Open network streams ..." menu, you can specify a network address in the "Network" tab, such as "rtsp://root:siemens1234@192.168.178.105/axis-media/media.amp".

Then press the "Play…" button. If the camera image is displayed, then the configured network address of the selected camera is correct.

Passwords used

The password used or the URL for outputting the image from the network camera is stored unencrypted in the configuration files of the HMI device and on the configuration PC.
Due to the open nature of the password, no standard password or password for high access levels should be used (RT-Admin, administrator of the Windows domain, admin password of the camera, etc.).

The password used should only authorize you to view the live stream.

Performance Overview

Depending on the settings made on the Camera Control and the settings for the network camera, the HMI device must for example make scaling calculations. This computing power differs depending on the HMI device used.

Comfort Panel example
The statements refer to the output of the camera image through the Camera Control.

Figure 4-1
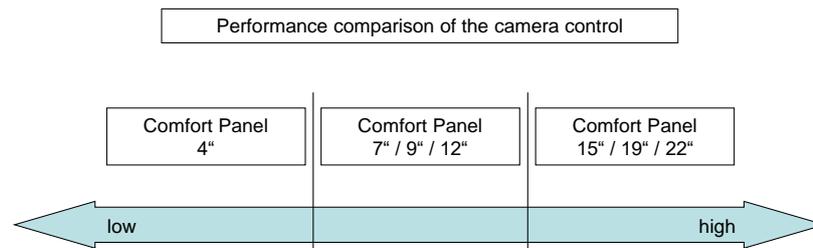
Network camera resolution <-> Camera Control size

If the resolution of the network camera differs from the configured size of the Camera Control, the panel must perform a scaling operation depending on the setting selected on the Camera Control.

If possible, choose a setting that does not require the panel to perform unnecessary scaling.

4.2 Commissioning

You will achieve the best performance when the resolution of the network camera is the same as that of the configured Camera Control.

Making changes to the settings of the network cameras

If you make changes to the settings of the network camera, you should first disconnect the network connection between the network camera and the HMI device. Otherwise, depending on the network camera used, undefined states may occur when the camera image is output.

Poor picture quality / update

If the image update is too slow, try increasing the frame rate (fps) of the network camera.

If the image tends to "cluster" (large pixels / poor color gradient), then try increasing the "bit rate" (kbit/s).

Try several settings to determine the best image quality.

Note:
A slight delay in the playback of the camera image via the HMI device cannot be avoided.

Interruption of the Ethernet connection

If the connection between the network camera and the HMI device is interrupted during operation, the camera image is output as a black screen through the Camera Control.

There is **no** message issued that the connection has been interrupted.

The system automatically tries to reconnect over an approx. 15 minute timeframe. If the connection between the network camera and the HMI device is restored within this timeframe, the image is automatically updated on the HMI device.

If the connection is not established within 15 minutes, the page with the Camera Control must be updated by calling up the image again.

Power supply interruption

If power supply to the network camera is interrupted during operation, the camera image is output as a black screen through the Camera Control.

There is **no** message issued that the power supply to the network camera is down!

If power supply is restored within an approx. 15 minute timeframe, the image is automatically updated on the HMI device.

If power supply is not restored within 15 minutes, the page with the Camera Control must be updated by calling up the image again.

4.2 Commissioning

Connection monitoring / voltage monitoring

Some network cameras offer configurable outputs through which certain signals/operating states of the camera can be output. Check the information in the manufacturer manual in this regard.

Refresh time Camera <-> Camera Control (HMI device)

Depending on the settings selected on the network camera side and the Camera Control, there is a certain time delay when the camera image is output via the HMI device. This behavior cannot be avoided.

The camera image is displayed in Internet Explorer, but not on the Camera Control

If your camera supports several "streams" and you have specified/parameterized one of these "streams", then it needs to be specified in the address field of the Camera Control in "Camera URL".

Example: SIEMENS IP Camera CCPW3025-IR

Port rtsp: 554

Stream URL: stream1

Camera URL: rtsp**:**//<IP-Address>**:**554/stream1

Safety precautions

The functions and solutions described in this article confine themselves to the realization of the automation task predominantly. Please take into account furthermore that corresponding protective measures have to be taken up in the context of Industrial Security when connecting your equipment to other parts of the plant, the enterprise network or the Internet. Further information can be found under the item ID 50203404.
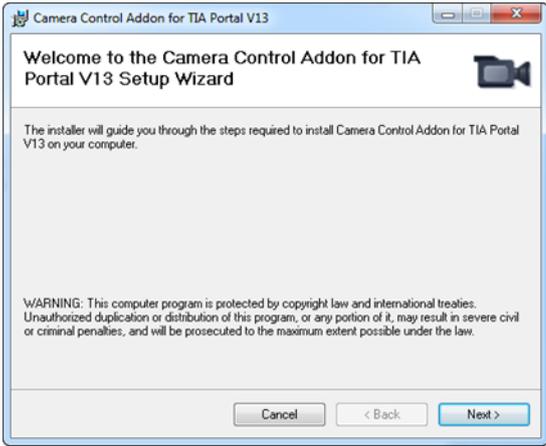
https://support.industry.siemens.com/cs/ww/en/view/50203404
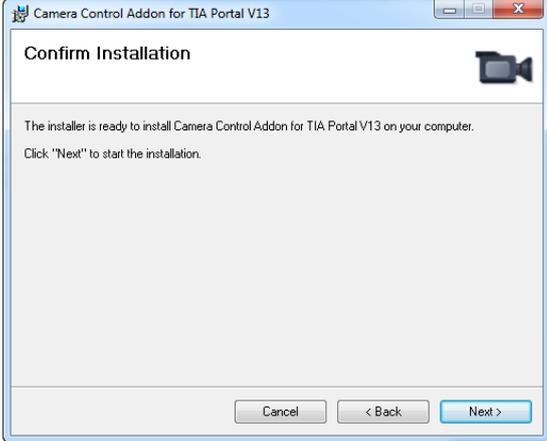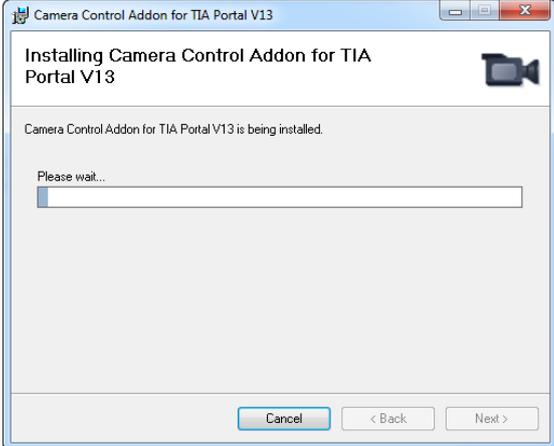
5 Camera Control "CamControlES"

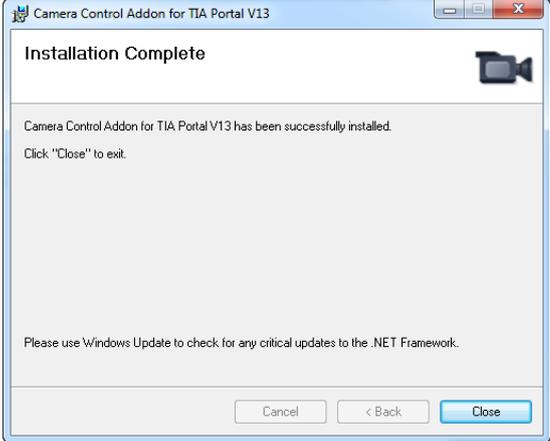| Notes	You need the "CamControlES" camera control only if you want to continue to edit an existing configuration that was created with software versions up to and including WinCC (TIA Portal) V13 and that contains a camera control.

Installation

The individual steps for installing the software package are described below.

You can find the link for downloading the "CamControlES" camera control here \5\.

Table 5-1

No.	Action
1.	**Save file.** • Unzip "SIMATIC_TIAP_V13_COMFORT_PANEL_CamControl_V2_1.zip" to a folder of your choice. • Double-click on the "SIMATIC_TIAP_COMFORT_PANEL_CamControl_V2_1.exe" file to open it. The "WinZip Self-Extractor" window opens.
2.	**Start the installation wizard.** Start the installation via "**Setup.exe**"
3.	**License agreement** Read through the note in the dialog and then click the **"Next"** button.

No.	Action
4.	**Confirm the installation** The installation program is ready for installation. Click the **"Next"** button to start the installation. ![Confirm Installation dialog - Camera Control Addon for TIA Portal V13. The installer is ready to install Camera Control Addon for TIA Portal V13 on your computer. Click "Next" to start the installation. Buttons: Cancel, < Back, Next >]
5.	**Progress display** The dialog shows the progress of the installation. ![Installing Camera Control Addon for TIA Portal V13 dialog. Camera Control Addon for TIA Portal V13 is being installed. Please wait... Buttons: Cancel, < Back, Next >]

No.	Action
6.	**Finish the installation** Click the "**Close**" button to close the installation.

Uninstallation

Use the Windows Control Panel to uninstall the "Camera Control Add-on for TIA Portal" software. Close WinCC (TIA Portal) before uninstalling.

6 Appendix

6.1 Service and support

Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks:

support.industry.siemens.com

Technical Support

The Technical Support of Siemens Industry provides you fast and competent support regarding all technical queries with numerous tailor-made offers – ranging from basic support to individual support contracts.

Please send queries to Technical Support via Web form:

support.industry.siemens.com/cs/my/src

SITRAIN – Digital Industry Academy

We support you with our globally available training courses for industry with practical experience, innovative learning methods and a concept that's tailored to the customer's specific needs.

For more information on our offered trainings and courses, as well as their locations and dates, refer to our web page:

siemens.com/sitrain

Service offer

Our range of services includes the following:

- Plant data services
- Spare parts services
- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in the service catalog web page:

support.industry.siemens.com/cs/sc

Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for iOS and Android:

support.industry.siemens.com/cs/ww/en/sc/2067

6.2 Industry Mall

The Siemens Industry Mall is the platform on which the entire siemens Industry product portfolio is accessible. From the selection of products to the order and the delivery tracking, the Industry Mall enables the complete purchasing processing – directly and independently of time and location:
mall.industry.siemens.com

6.3 Links and literature

Table 6-1

	Subject area	Title
\1\	Siemens Industry Online Support	http://support.industry.siemens.com
\2\	Download page for this article	Link to the article page of the application example https://support.industry.siemens.com/cs/ww/en/view/62383298
\3\	Application example	Monitoring of machines or systems via live video in the TIA Portal https://support.industry.siemens.com/cs/ww/en/view/58074046
\4\	Manual	SIMATIC HMI devices - Comfort Panels https://support.industry.siemens.com/cs/ww/en/view/49313233
\5\	Camera Control	https://support.industry.siemens.com/cs/ww/en/view/65647473

6.4 Change documentation

Table 6-2

Version	Date	Change
V1.0	10/2012	First edition
V2.0	02/2012	Terms and designations in the document adapted
V3.0	08/2013	Adaptation to WinCC Comfort V12
V3.0	01/2014	Expansion Camera TP-link TL-SC3171G
V4.0	10/2014	Adaptation to WinCC Comfort V13
V5.0	03/2016	Adaptation to WinCC Comfort V13 SP1
V6.0	07/2017	Adaptation to WinCC Comfort V14 SP1 Additional network cameras tested.
V7.0	03/2021	Adaptation to WinCC Comfort V16 Additional network cameras tested.