Monitoring Machines and Plants with Network Cameras and SIMATIC HMI Comfort Panels

WinCC V11 Comfort

Application Description • October 2012
Siemens Industry Online Support

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Preface

Objective of this application

It is the aim of this application to show you the functionality and the integration of network cameras in connection with SIMATIC HMI Comfort Panels. The application describes all settings and configuration steps necessary to achieve this.

Core topics of this application

The following core points are discussed in this application:

- Installation of the “CamControlES” camera control for the HMI Comfort Panel (camera control to output camera images on the operator panel)
- Configuration of the “CamControlES” camera control
- Settings under WinCC Comfort V11
- Network camera settings

Validity

Prerequisite for the application is the software version from WinCC Comfort V11 with SP2 and Update 3.
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1 Task

Introduction

From the point of view of production and security, it is very useful for many areas of industry and production plants to monitor the plant through a network camera. Monitoring via network cameras lends itself especially in places where the view to the plant is difficult for the operator or where local conditions make the presence near machines impossible.

Another application case is the monitoring of several plant parts from one central location. The operator can quickly respond to a possible cause of malfunction and bring the respective tool on the way to the machine to remove the fault, e.g., a work piece being jammed in the machine.

Overview of the automation task

The figure below gives you an overview of the automation task.

Figure 1-1

Description of the automation task

A large plant is monitored via several network cameras. From each part of the plant it is to be possible to monitor the own, as well the other plant parts via the existing HMI operator panel.

Each camera image is to be output via its own HMI image.

In the displayed figure, for example, the front part of the “plant 3 (green) is to be output via the “HMI operator panel 1”.
2 Solution

2.1 Overview of the general solution

Schematic layout

The following figure gives a schematic overview of the most important components of the solution:

Figure 2-1

- Network camera
- Switch (optional)
- SIMATIC HMI Comfort Panel
- CamControlES
  (camera control to output the camera image on the operator panel)

Structure

All network cameras are integrated in an Ethernet network. The switch is used to connect the individual Ethernet nodes to the network (optional). The camera image is output via the connected comfort panel and the configured “CamControlES”. The image of one network camera each can be output via the camera control “CamControlES”.

For SIMATIC HMI Comfort Panels the “CamControlES” camera control was developed. Via this camera control, images from a connected network camera can be output.
2.1 Overview of the general solution

Hardware requirements of the network cameras
The network camera has to support the
- RTP/RTSP
  protocol (streaming protocol) and one of the video formats listed below.
- H264
- MPEG4
- MJPEG
For this purpose, refer to the technical documents of your network camera.

Note
It cannot be guaranteed that every network camera available on the market can be used, since the technical prerequisites differ, depending on the manufacturer. For this purpose, look at chapter 4.4.

Advantages
The application on hand offers you the following advantages:
- Easy integration of the camera control “CamControlES” to output the camera image on the control panel.
- The size of the camera image can be freely selected on the operator panel.
- Different network camera manufacturers can be used.

Topics not covered by this application
This application does not include a description of
- the network cameras used regarding optional setting possibilities. Only settings that are relevant for this application are described.
- the comfort panel used. This document describes only the steps that are necessary for this application.

Assumed knowledge
Basic knowledge on how to work with and how to operate a comfort panel and the camera used is assumed.
2.2 Description of the core functionality

The application describes …

• the steps to install the camera control “CamControlES”.
• the individual parameters of the camera control “CamControlES”.
• all the necessary settings at the control panel.
• settings of the network cameras used.

Furthermore it will be shown on several examples what effects the “CamControlES” settings have on Runtime.

Sample configuration

To test the application, you can use the configuration included.

The project includes a HMI configuration in which all described settings are stored. TP1200 Comfort is used as operator panel.

If you are using different network cameras than those listed here in the application or if you are using a different IP address, you have to adjust the address of the network camera as well as the addressing on the “CamControlES”. How this is done will be described in the further course of the application.

Overview and description of the user interface

The screenshot below shows the “CamControlES” and its parameters as an example. In the further course, the individual parameters are described in detail and it will be pointed out what you have to observe.

Figure 2-2
2.3 Hardware and software components used

The application document was generated using the following components:

Hardware components

Table 2-1

<table>
<thead>
<tr>
<th>Component</th>
<th>Qty.</th>
<th>MLFB/order number</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP1200 Comfort</td>
<td>1</td>
<td>6AV2124-0MC01-0AX0</td>
<td>Alternative operator panels see chapter 2.4.</td>
</tr>
<tr>
<td>Scalance X208</td>
<td>1</td>
<td>6GK5208-0BA10-2AA3</td>
<td>The use of a “switch” is optional. The network camera can, for example, also be directly connected to the comfort panel.</td>
</tr>
<tr>
<td>SIEMENS IP box camera CCMS2025</td>
<td>1</td>
<td>S54561-C91-A5</td>
<td>Alternatively, a network camera that supports one of the following options can be used. Link</td>
</tr>
</tbody>
</table>

Standard software components

Table 2-2

<table>
<thead>
<tr>
<th>Component</th>
<th>Qty.</th>
<th>MLFB/order number</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>WinCC Comfort V11 SP2 and Update 3</td>
<td>1</td>
<td>6AV2101-0AA01-0AA5</td>
<td>Alternative: mentioned component or higher. WinCC Professional V11 SP2 and Update 3 or higher.</td>
</tr>
<tr>
<td>Camera control to output the camera image on the operator panel</td>
<td>1</td>
<td>Download info, see chapter 7.2</td>
<td></td>
</tr>
<tr>
<td>Network camera configuration software</td>
<td></td>
<td></td>
<td>Most network cameras have a web interface by default via which the camera can be configured. Alternative: Some network camera manufacturers provide independent software for the configuration of your camera. Please refer to the manufacturer information for this purpose.</td>
</tr>
</tbody>
</table>
2.4 Supported operator panels

The table below lists all comfort panels that support the camera control “CamControlES”.

Table 2-4

<table>
<thead>
<tr>
<th>No.</th>
<th>Operator panel</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>KP400 Comfort</td>
</tr>
<tr>
<td>2.</td>
<td>KTP400 Comfort</td>
</tr>
<tr>
<td>3.</td>
<td>KP700 Comfort</td>
</tr>
<tr>
<td>4.</td>
<td>TP700 Comfort</td>
</tr>
<tr>
<td>5.</td>
<td>KP900 Comfort</td>
</tr>
<tr>
<td>6.</td>
<td>TP900 Comfort</td>
</tr>
<tr>
<td>7.</td>
<td>KP1200 Comfort</td>
</tr>
<tr>
<td>8.</td>
<td>TP1200 Comfort</td>
</tr>
<tr>
<td>9.</td>
<td>KP1500 Comfort</td>
</tr>
<tr>
<td>10.</td>
<td>TP1500 Comfort</td>
</tr>
<tr>
<td>11.</td>
<td>TP1900 Comfort</td>
</tr>
<tr>
<td>12.</td>
<td>TP2200 Comfort</td>
</tr>
</tbody>
</table>
### 3 Installation

#### 3.1 “Camera Control Addon for TIA Portal V11” software

##### 3.1.1 Installation

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

The link for the “Camera Control Addon” download can be found in chapter 7.2.

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
<th>Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Saving file</td>
<td><img src="image1.png" alt="Image 1" /></td>
</tr>
<tr>
<td></td>
<td>• Unzip the “camcontrol_1_0_plus.zip” file in a folder.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Open the “SIMATIC_TIAP_COMFORT_PANEL_CamControl_V1_0.exe” file via double click. The “WinZip Self-Extractor” window opens up.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Starting installation wizard</td>
<td><img src="image2.png" alt="Image 2" /></td>
</tr>
<tr>
<td></td>
<td>Start the installation via the menu “Setup.exe”</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>License agreement</td>
<td><img src="image3.png" alt="Image 3" /></td>
</tr>
<tr>
<td></td>
<td>Read the note in the dialog and then click the “Next” button.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Confirming installation</td>
<td><img src="image4.png" alt="Image 4" /></td>
</tr>
<tr>
<td></td>
<td>The installation program is ready for installation. Start the installation via the “Next” button.</td>
<td></td>
</tr>
</tbody>
</table>
3 Installation

3.2 Installation of the application example

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
<th>Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Progress display</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>The dialog shows the progress of the installation.</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
</tbody>
</table>

| 6.  | Completing the installation | ![Image](image3.png) |
|     | Complete the installation with the "Close" button. | ![Image](image4.png) |

3.1.2 Uninstallation

Use the Windows control panel to uninstall the “Camera Control Addon for TIA Portal V11” software. Close the SIMATIC WinCC V11 software (Basic, Comfort, Advanced) before uninstalling.

3.2 Installation of the application example

Transfer the enclosed application example to the TP1200 Comfort. Note the stored IP addresses for the panel and the used IP addresses for the network camera used. For this purpose, look at chapter 4.
4 Configuration and Settings

4.1 Preparatory measures for the configuration

4.1.1 Used IP addresses

Before you start with the configuration, determine the IP address of the individual hardware components.

The table below lists the IP addresses used for the application.

Table 4-1

<table>
<thead>
<tr>
<th>Device</th>
<th>IP address / subnet</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP1200 Comfort</td>
<td>172.16.34.200</td>
</tr>
<tr>
<td></td>
<td>255.255.0.0</td>
</tr>
<tr>
<td>Network camera SIEMENS CCMS2025</td>
<td>172.16.34.208</td>
</tr>
<tr>
<td></td>
<td>255.255.0.0</td>
</tr>
</tbody>
</table>

4.1.2 Passwords used for the cameras

In order to make settings via the web browser of the network cameras, you usually have to be registered.

If the password or the IP address of the camera is not known, the network camera has to be reset to factory settings. For this purpose, look at the manual of the respective network camera.

Below, is a list of the user and passwords used in the application.

Note

Before commissioning, change the manufacturer-specific password.

Table 4-2

<table>
<thead>
<tr>
<th>Camera</th>
<th>Default user / password</th>
<th>Application user / password</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIEMENS CCMS2025</td>
<td>Required for the registration via the web interface.</td>
<td>For the output of the camera image via the camera control.</td>
</tr>
<tr>
<td></td>
<td>User: admin&lt;br&gt;Password: admin</td>
<td>User: device1&lt;br&gt;Password: user1</td>
</tr>
</tbody>
</table>
4.2 Configuration of the “SIEMENS CCMS2025” camera

Below, you will find a detailed explanation of the settings for the SIEMENS camera CCMS2015 used. Please note that the described setting is only an example.

If the result of your settings is not satisfactory, please look at chapter 6 (Notes and Tips).

In chapter 4.4 the most important parameters of other network cameras are listed in order to output the camera image via the camera control “CamControlES”.

Camera “SIEMENS CCMS2025”

The camera was configured via the web interface of the camera.

Only the parameters and settings that are necessary for the application are listed. Details to individual parameters of the camera can be found in the manual.

Table 4-3

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
<th>Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Calling web interface</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Call the web interface of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the network camera via an</td>
<td></td>
</tr>
<tr>
<td></td>
<td>internet browser.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Enter the IP address of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the camera into the command</td>
<td></td>
</tr>
<tr>
<td></td>
<td>line.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The default IP address is:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IP address 192.168.0.10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subnet mask 255.255.255.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Enter user name and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>password.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The default name/password is</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Name admin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Password admin</td>
<td></td>
</tr>
</tbody>
</table>

Note:
If the IP address or the login name/password is not known, reset the camera to factory settings.
4.2 Configuration of the “SIEMENS CCMS2025” camera

Select the “Configuration” tab and select the item “Compression” from the list. You will be shown the following screenshot.

Parameters used in the application:

**Stream 1**
- **Image mode**: MPEG4
- **Resolution**: VGA (640 x 480)
- **Image rate**: 10
- **Rate control mode**: Constant bit rate

**Stream 2**
- **Image mode**: No streaming

For the other possible settings in this screenshot, the default values have been accepted.

Save the settings made via the “Save” button.

**Note:**
Regarding the parameters used, please look at the information in chapter 6 an.
4 Configuration and Settings

4.2 Configuration of the “SIEMENS CCMS2025” camera

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>Network settings</td>
</tr>
</tbody>
</table>

Select the “Network Settings > Basic” item from the list under the “Configuration” tab. You will be shown the following screenshot.

![Network Settings Screenshot]

Parameters used in the application:

**Network**

- **Mode**: Manual (use the following IP address manually)
- **IP address**: 172.16.34.208
- **Subnet mask**: 255.255.0.0.

For the other possible settings in this screenshot, the default values have been accepted.

Save the settings made via the “Save” button.

**Notice:**

If you are saving the settings, the camera is rebooted and the web page has to be refreshed afterwards. The camera can now only be reached via the reconfigured IP address.
4.2 Configuration of the “SIEMENS CCMS2025” camera

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
<th>Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td><strong>Network – RTSP settings</strong></td>
<td></td>
</tr>
</tbody>
</table>

Select “Configuration” from the tab. You will be shown the following screenshot.

![Network - RTSP Settings](image)

Parameters used in the application:

**Network – RTSP settings**
- Authentication: On
- Login ID: device1
- Password: user1

For the other possible settings in this screenshot, the default values have been accepted.

Save the settings made via the “Save” button.

**Notes:**
- The authentication has the effect that only authorized people have access to the camera image. This has to be observed when assigning an URL address at the “Camera OCX” (see Link).
- The transfer of the authentication between the comfort panel and the network camera is done **without** encryption. Note the following information, when networking your plant with other plant parts (Link).

5. **Additional settings**

You can make other settings. However, they are not required for the implementation of the application.
4.3 Configuring the “CamControlES” camera control

4.3.1 Calling the “CamControlES”

After the installation of the “Camera Control Add on for TIA Portal V11” software, the camera control “CamControlES” is displayed under the “Additional Controls” task card.

Drag the camera control via drag & drop into the image.

Figure 4-1

Notes

- Per image one camera control can be inserted.
- If a camera control is inserted into the “template image” or the “permanent window”, then no other camera controls must be inserted in the other images.

Below, the individual objects are described.
4.3.2 Parameters of the “CamControlES” - General

Open the properties of the “CamControlES”.

Note

The “SIEMENS - CCMS2025” camera was used as configuration example.

Camera URL:

Enter the URL address of the network camera (URL = Window file format for web links).

The address always starts with “rtsp://......”.

The addressing for the network camera can be found in the manual for the network camera. Search for the term “rtsp”.

For the SIEMENS - CCMS2025 network camera the URL address, for example, has to be specified as follows. “rtsp://<IP address>”

With regard to the application example, the complete URL address is: “rtsp://172.16.34.208”

Entering the URL incl. user and password (authentication):

Under the camera settings you can, for example, assign access rights to prevent unintended access to the output of the camera image. When entering the URL you have to observe this and also enter the “user name” and the “password”.

Specifying the URL address starts with “rtsp://username:password@......”.

Regarding to the application example, the complete URL address for the “SIEMENS - CCMS2025” network camera incl. user name and password is: “rtsp://device1:user1@172.16.34.202”

NOTICE

The transfer of the authentication and the URL between the comfort panel and the network camera is done without encryption. Note the following information, when networking your plant with other plant parts (Link).
4 Configuration and Settings

4.3 Configuring the “CamControlES” camera control

**Maintaining aspect ratio:**

With the “Maintain aspect ratio” option, the aspect ratio of the recording medium (image of the network camera) is maintained.

**Note**

The option can only be selected when the “Maintain video size” option was disabled.

In chapter 4.3.5 you find an instruction regarding this topic on how you can calculate the aspect ratio. Therefore you can estimate in advance what the effect of the scaling regarding the selected resolution will have, when the resolution of the network camera is different to the size of the camera control.

The two examples below illustrate the functionality of the option.
### Example 1:
Network camera setting: 4:3  
Camera control: 16:9  

<table>
<thead>
<tr>
<th>Network camera (4:3)</th>
<th>Camera control (16:9) view</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Original image" /></td>
<td><img src="image2" alt="The image is scaled to the 16:9 format. The free areas are output as vertical black borders above the camera control." /></td>
</tr>
</tbody>
</table>

### Example 2:
Network camera setting: 16:9  
Camera control: 4:3  

<table>
<thead>
<tr>
<th>Network camera (16:9)</th>
<th>Camera control (4:3) view</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3" alt="Original image" /></td>
<td><img src="image4" alt="The image is scaled to the 4:3 format. The free areas are output as horizontal black borders above the camera control." /></td>
</tr>
</tbody>
</table>
4 Configuration and Settings

4.3 Configuring the “CamControlES” camera control

**Maintaining video size:**

Figure 4-4

With the “Maintain video size” option, the size of the recording medium (image size of the network camera) is maintained.

**Note**

By selecting the option, the “Maintain aspect ratio” option is automatically disabled.

The two examples below illustrate the functionality of the option.
4.3 Configuring the “CamControlES” camera control

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 4-6

<table>
<thead>
<tr>
<th>Network camera (16:9)</th>
<th>Camera control (16:9) view</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original image</td>
<td>Due to the smaller dimensions of the camera control only a section of the “original image” is output via the camera control.</td>
</tr>
</tbody>
</table>

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 4-7

<table>
<thead>
<tr>
<th>Network camera (16:9)</th>
<th>Camera control (16:9) view</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original image</td>
<td>The larger dimensions of the camera control has the effect that the free areas are output as horizontal and vertical black borders above the camera control.</td>
</tr>
</tbody>
</table>
4 Configuration and Settings

4.3 Configuring the “CamControlES” camera control

Deselecting the “Maintain aspect ratio” and “Maintain video size” options:

If neither of the options “Maintain aspect ratio” or “Maintain video size” are selected, then the image of the network camera is output without special adjustment via the camera control.

The two examples below illustrate the functionality.
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 4-8

<table>
<thead>
<tr>
<th>Network camera (16:9)</th>
<th>Camera control (16:9) view</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original image</td>
<td>The smaller dimension of the camera control &quot;distorts&quot; the image output via the camera control.</td>
</tr>
</tbody>
</table>

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 4-9

<table>
<thead>
<tr>
<th>Network camera (16:9)</th>
<th>Camera control (16:9) view</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original image</td>
<td>The larger dimension of the camera control &quot;distorts&quot; the image output via the camera control.</td>
</tr>
</tbody>
</table>
4 Configuration and Settings

4.3 Configuring the “CamControlES” camera control

Using UDP instead of TCP:

Enter the protocol type via the “Use UDP instead of TCP” parameter via which the data exchange between the panel and the network camera is to take place. Enable this option if the network camera only supports “UDP” or if the “UDP” network protocol is to be explicitly used. For this purpose, look at the information in the manual of the network camera.

Summary of the possible options

Table 4-10

<table>
<thead>
<tr>
<th>Image of the network camera</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintain aspect ratio</td>
<td>The aspect ratio of the web camera image is to be maintained when the output is via the camera control. Maintaining the aspect ratio has the effect that possible free areas are output as horizontal or vertical black borders via the camera control. Zoom effects can cause distortions when displaying the image.</td>
</tr>
<tr>
<td>Not selectable</td>
<td>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 the respective section of the camera image is output via the camera control. If the camera control is bigger, the free areas are output as horizontal or vertical black borders via the camera control. The image of the network camera is fully adjusted to the size of the camera control. Zoom effects can cause distortions when displaying the image.</td>
</tr>
</tbody>
</table>
4.3.3 Parameters of the “CamControlES” - layout

Open the properties of the “CamControlES”.

Layout

Figure 4-7

Enter the position and size of the camera control via the “layout” parameter. For the size of the camera control it is recommended to enter the value for the set resolution of the network camera.

Example:
Selected resolution of the network camera: 640 X 480
Selected size for the camera control: 640 X 480

4.3.4 Parameters of the “CamControlES” - Misc

Open the properties of the “CamControlES”.

Miscellaneous

Figure 4-8

Specify the name of the camera control. Furthermore, you can assign a level to the object.
4.3.5 Calculating of the aspect ratio

You can select the “Maintain aspect ratio” option under the “General” parameter under the properties of the camera control. With the option, the aspect ratio of the recording medium (image of the network camera) is maintained.

With the instruction below, you can calculate the aspect ratio. Therefore, you can estimate in advance what the effect of the scaling regarding the selected resolution will have, when the resolution of the network camera is different to the size of the camera control.

Overview

The image shows that the camera control has a size of 16:9. Via this size the image of the network camera is to be output with a ratio of 4:3.

By scaling of the network camera image, the “free” areas on the left and right to the image are output in black.

The two example calculations below illustrate how the image of the network camera is displayed after scaling.
Calculating of the aspect ratio

**Example 1:**

Camera control Size 1280 x 720 (16:9)
Network camera Resolution 640 x 480 (4:3)

**Step 1:** Minimum value specification (Min_Value_Fixing)
- Width of “Camera control”: Width of “network camera” = 1280 / 640 = 2
- Height of “camera control”: Height of “network camera” = 720 / 480 = 1.5

**Step 2:** Calculating the new aspect ratio
- Width “network camera” x “Min_Value_Fixing” = 640 * 1.5 = 960
- Height “network camera” x “Min_Value_Fixing” = 480 * 1.5 = 720

**Assessment:**
After scaling, the image of the network camera is output with a size of 960 x 720 via the “camera control”.
In relation to the size of the camera control that has a size of 1280 x 720, a black border of 160 each will be seen on the left and right of the image ((1280 - 960) / 2).

**Example 2:**

Camera control Size 640 x 480 (4:3)
Network camera Resolution 1280 x 720 (16:9)

**Step 1:** Minimum value specification (Min_Value_Fixing)
- Width of “Camera control”: Width of “network camera” = 640 / 1280 = 0.5
- Height of “camera control”: Height of “network camera” = 480 / 720 = 0.66

**Step 2:** Calculating the new aspect ratio
- Width “network camera” x “Min_Value_Fixing” = 1280 * 0.5 = 640
- Height “network camera” x “Min_Value_Fixing” = 720 * 0.5 = 360

**Assessment:**
After scaling, the image of the network camera is output with a size of 640 x 360 via the “camera control”.
In relation to the size of the camera control that has a size of 640 x 480, a black border of 60 each will be seen on the top and bottom of the image ((480 - 360) / 2).
4.4 Configuration examples of different network cameras

In order to achieve the best possible image quality, you usually have to try out several settings (making changes in resolution, image rate and bit rate). A general recommendation cannot be made here. Also refer to the information in the manufacturer’s manual for this purpose.

To detect, for example, the “URL address”, search for the term “rtsp”.

The table below shows configuration examples of various network cameras to output the camera image via the “CamControlES” camera control.

---

**Note**

The cameras used have **not** been specifically tested by the system. They have only been successfully used with the settings listed in the table and the camera control “CamControlES” and serve as a reference point for the configuration.

Please note that the reproduction of the camera image via the camera control is usually delayed. This behavior of the camera depends on the manufacturer. For this purpose, look at the information in the manual of the camera manufacturer.

---

### Table 4-11

<table>
<thead>
<tr>
<th>No.</th>
<th>Camera</th>
<th>Settings</th>
</tr>
</thead>
</table>
| 1.  | Manufacturer: SIEMENS Type: “CCMS2025” | In general:  
• URL address: rtsp://<IP address>  
• Image mode: MPEG4  
• Audio: Off  
KTP400 Comfort:  
• Camera resolution: 320 x 240  
• Camera format OCX: 320 x 240  
• Image rate: 10 fps  
• Bit rate: 512 Kbits  
TP1200 Comfort:  
• Camera resolution: 640 x 480  
• Camera format OCX: 640 x 480  
• Image rate: 10 fps  
• Bit rate: 2000 Kbits  
TP1900 Comfort:  
• Camera resolution: 1920 x 1080  
• Camera format OCX: 1280 x 720  
• Image rate: 10 fps  
• Bit rate: 2000 Kbits |
### 4 Configuration and Settings

#### 4.4 Configuration examples of different network cameras

<table>
<thead>
<tr>
<th>No.</th>
<th>Camera</th>
<th>Settings</th>
</tr>
</thead>
</table>
| 2.  | Manufacturer: AXIS  
Type: “207MW” | **In general:**  
- URL address: `rtsp://<IP address>/mpeg4/media.amp`  
- Image mode: MPEG4  
- Audio Off  
  **KTP400 Comfort:**  
  - Camera resolution: 160 x 90  
  - Camera format OCX: 320 x 240  
  - Image rate: 10 fps  
  - Bit rate: 512 Kbits  
  **TP1200 Comfort:**  
  - Camera resolution: 640 x 480  
  - Camera format OCX: 640 x 480  
  - Image rate: 10 fps  
  - Bit rate: 2000 Kbits  
  **TP1900 Comfort:**  
  - Camera resolution: 1280 x 720  
  - Camera format OCX: 1280 x 720  
  - Image rate: 10 fps  
  - Bit rate: 2000 Kbits |
| 3.  | Manufacturer: AXIS  
Type: “M1011-W” | **In general:**  
- URL address: `rtsp://<IP address>/axis-media/media.amp`  
- Image mode: MPEG4  
- Audio Off  
  **KTP400 Comfort:**  
  - Camera resolution: 160 x 120  
  - Camera format OCX: 320 x 240  
  - Image rate: 10 fps  
  - Bit rate: 512 Kbits  
  **TP1200 Comfort:**  
  - Camera resolution: 640 x 480  
  - Camera format OCX: 640 x 480  
  - Image rate: 10 fps  
  - Bit rate: 512 Kbits  
  **TP1900 Comfort:**  
  - Camera resolution: 640 x 480  
  - Camera format OCX: 640 x 480  
  - Image rate: 10 fps  
  - Bit rate: 2000 Kbits |
### 4.4 Configuration examples of different network cameras

<table>
<thead>
<tr>
<th>No.</th>
<th>Camera</th>
<th>Settings</th>
</tr>
</thead>
</table>
| 4.  | Manufacturer Level One Type “FCS-0040” | **In general:**  
- URL address: rtsp://<IP address>/myURL  
- Image mode: MPEG4  
- Audio: Off  

**KTP400 Comfort:**  
- Camera resolution: 320 x 240  
- Camera format OCX: 320 x 240  
- Image rate: 10 fps  
- Bit rate: 512 Kbits  

**TP1200 Comfort:**  
- Camera resolution: 640 x 480  
- Camera format OCX: 640 x 480  
- Image rate: 10 fps  
- Bit rate: 2000 Kbits  

**TP1900 Comfort:**  
- Camera resolution: 640 x 480  
- Camera format OCX: 640 x 480  
- Image rate: 10 fps  
- Bit rate: 2000 Kbits  

| 5.  | Manufacturer: ACTi Type: “TCM-4301” | **In general:**  
- URL address: rtsp://admin:123456@<IP address>:7070 (-> with authentication)  
- Image mode: MPEG4  
- Audio: Off  

**KTP400 Comfort:**  
- Camera resolution: 160 x 112  
- Camera format OCX: 320 x 240  
- Image rate: 10 fps  
- Bit rate: 512 Kbits  

**TP1200 Comfort:**  
- Camera resolution: 640 x 480  
- Camera format OCX: 640 x 480  
- Image rate: 10 fps  
- Bit rate: 512 Kbits  

**TP1900 Comfort:**  
- Camera resolution: 640 x 480  
- Camera format OCX: 1280 x 720  
- Image rate: 10 fps  
- Bit rate: 2000 Kbits  


5 Operating the Application

5.1 Overview

An example configuration is enclosed with the application. The settings made relate to the “SIEMENS - CCMS2025” network camera used in the application. The purpose of the configuration is to get an idea on how the various settings are displayed on the TP1200 Comfort regarding

- the size of the camera control and resolution of the network camera
- the possible options of the camera control

Calling example application

Table 5-1

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
<th>Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Calling example application</td>
<td></td>
</tr>
<tr>
<td></td>
<td>After starting Runtime the image on the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>right is displayed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select “Sample project” here.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>You get to the “Overview” image.</td>
<td></td>
</tr>
</tbody>
</table>

| 2.  | “Overview” image                           |        |
|     | You can now navigate to the example        |        |
|     | application via the “Overview” image.      |        |
|     | For this purpose click the                 |        |
|     | “Configuration example (1)” or             |        |
|     | “Configuration example (2)”.               |        |
5.2 Configuration examples (1)

The configuration of the network camera under “Configuration example (1)” is performed once **without** and once **with** “User and password”.

The call of the two images only differs in the configuration of the “URL address”.

**Table 5-2**

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
<th>Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Camera without user / password</strong></td>
<td><img src="url" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>By clicking the “Configuration example (1)” button, the “Camera SIEMENS - CCMS2025 without user / password” page is called.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>When addressing the “URL address”, no user and password is stored.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>You get to the example for calling a network camera image where a “user/password” is stored, via the “To example with user/password” button.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>At the “control unit” with different buttons, no functions are stored.</td>
<td><img src="url" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> No image is output if “authentication” was selected in the configuration of the camera.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td><strong>Camera with user / password</strong></td>
<td><img src="url" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>When addressing the “URL address”, a user and a password is stored.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>You get to the example for calling a network camera image where no “user/password” is stored, via the “To example without user/password” button.</td>
<td><img src="url" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>At the “control unit” with different buttons, no functions are stored.</td>
<td><img src="url" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> An image is also output if “authentication” was deselected in the configuration of the camera.</td>
<td><img src="url" alt="Image" /></td>
</tr>
</tbody>
</table>
5.3 Configuration examples (2)

Various options can be selected on the “CamControlES” camera control. You can look at the behavior of the individual options via the configured images under “Configuration example (2)”. Also refer to the descriptions in chapter 4.3.2 for this purpose.

The images have no special headings. Please look at the specifications highlighted in the graphics. They correspond to the configuration made.

Via the “next” button you get to the next image and via the “back” button you get to the previous image.

Table 5-3

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
<th>Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Configuration example (2), image 1:</td>
<td><img src="image1.png" alt="Image 1" /></td>
</tr>
<tr>
<td></td>
<td>Resolution of the network camera:640 x 480</td>
<td><img src="image2.png" alt="Image 2" /></td>
</tr>
<tr>
<td></td>
<td>Resolution of the network camera:640 x 360</td>
<td><img src="image3.png" alt="Image 3" /></td>
</tr>
<tr>
<td></td>
<td>Settings made at the camera control:</td>
<td><img src="image4.png" alt="Image 4" /></td>
</tr>
<tr>
<td></td>
<td>Maintain aspect ratio: Yes</td>
<td><img src="image5.png" alt="Image 5" /></td>
</tr>
<tr>
<td></td>
<td>Maintain video size: No</td>
<td><img src="image6.png" alt="Image 6" /></td>
</tr>
<tr>
<td>2.</td>
<td>Configuration example (2), image 2:</td>
<td><img src="image7.png" alt="Image 7" /></td>
</tr>
<tr>
<td></td>
<td>Resolution of the network camera:640 x 360</td>
<td><img src="image8.png" alt="Image 8" /></td>
</tr>
<tr>
<td></td>
<td>Resolution of the network camera:512 x 600</td>
<td><img src="image9.png" alt="Image 9" /></td>
</tr>
<tr>
<td></td>
<td>Settings made at the camera control:</td>
<td><img src="image10.png" alt="Image 10" /></td>
</tr>
<tr>
<td></td>
<td>Maintain aspect ratio: Yes</td>
<td><img src="image11.png" alt="Image 11" /></td>
</tr>
<tr>
<td></td>
<td>Maintain video size: No</td>
<td><img src="image12.png" alt="Image 12" /></td>
</tr>
</tbody>
</table>
5 Operating the Application

5.3 Configuration examples (2)

<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
<th>Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>Configuration example (2), image 3:</td>
<td><img src="image3.png" alt="Image 3" /></td>
</tr>
<tr>
<td></td>
<td>Resolution of the network camera: 640 x 480</td>
<td><img src="image3.png" alt="Image 3" /></td>
</tr>
<tr>
<td></td>
<td>Layout camera control &lt; layout network camera.</td>
<td><img src="image3.png" alt="Image 3" /></td>
</tr>
<tr>
<td></td>
<td>Settings made at the camera control:</td>
<td><img src="image3.png" alt="Image 3" /></td>
</tr>
<tr>
<td></td>
<td>Maintain aspect ratio: No</td>
<td><img src="image3.png" alt="Image 3" /></td>
</tr>
<tr>
<td></td>
<td>Maintain video size: Yes</td>
<td><img src="image3.png" alt="Image 3" /></td>
</tr>
<tr>
<td>4.</td>
<td>Configuration example (2), image 4:</td>
<td><img src="image4.png" alt="Image 4" /></td>
</tr>
<tr>
<td></td>
<td>Resolution of the network camera: 640 x 480</td>
<td><img src="image4.png" alt="Image 4" /></td>
</tr>
<tr>
<td></td>
<td>Layout camera control &gt; layout network camera.</td>
<td><img src="image4.png" alt="Image 4" /></td>
</tr>
<tr>
<td></td>
<td>Settings made at the camera control:</td>
<td><img src="image4.png" alt="Image 4" /></td>
</tr>
<tr>
<td></td>
<td>Maintain aspect ratio: No</td>
<td><img src="image4.png" alt="Image 4" /></td>
</tr>
<tr>
<td></td>
<td>Maintain video size: Yes</td>
<td><img src="image4.png" alt="Image 4" /></td>
</tr>
<tr>
<td>5.</td>
<td>Configuration example (2), image 5:</td>
<td><img src="image5.png" alt="Image 5" /></td>
</tr>
<tr>
<td></td>
<td>Resolution of the network camera: 640 x 480</td>
<td><img src="image5.png" alt="Image 5" /></td>
</tr>
<tr>
<td></td>
<td>Layout camera control &lt; layout network camera.</td>
<td><img src="image5.png" alt="Image 5" /></td>
</tr>
<tr>
<td></td>
<td>Settings made at the camera control:</td>
<td><img src="image5.png" alt="Image 5" /></td>
</tr>
<tr>
<td></td>
<td>Maintain aspect ratio: No</td>
<td><img src="image5.png" alt="Image 5" /></td>
</tr>
<tr>
<td></td>
<td>Maintain video size: No</td>
<td><img src="image5.png" alt="Image 5" /></td>
</tr>
<tr>
<td>6.</td>
<td>Configuration example (2), image 6:</td>
<td><img src="image6.png" alt="Image 6" /></td>
</tr>
<tr>
<td></td>
<td>Resolution of the network camera: 640 x 480</td>
<td><img src="image6.png" alt="Image 6" /></td>
</tr>
<tr>
<td></td>
<td>Layout camera control &gt; layout network camera.</td>
<td><img src="image6.png" alt="Image 6" /></td>
</tr>
<tr>
<td></td>
<td>Settings made at the camera control:</td>
<td><img src="image6.png" alt="Image 6" /></td>
</tr>
<tr>
<td></td>
<td>Maintain aspect ratio: No</td>
<td><img src="image6.png" alt="Image 6" /></td>
</tr>
<tr>
<td></td>
<td>Maintain video size: No</td>
<td><img src="image6.png" alt="Image 6" /></td>
</tr>
</tbody>
</table>
6 Notes and Tips

Passwords used

The password used or the URL for the output of the image of the network camera is stored unencrypted in the configuration files of the comfort panel and on the configuration PC.

Due to the openness of the password, no default password or no password for high access levels should be used (RT Admin, administrator of Windows domain, admin password the camera etc.).

The password used, should only entitle to watch the live stream.

Overview of performance

Depending on the settings made at the camera control and the settings for the network camera, the comfort panel has to make calculations, for example, regarding scaling. This calculation power differs, depending on the comfort panel used.

The statements are related to the output of the camera image via the camera control.

Figure 6-1

Resolution network camera <-> Size camera control

If the resolution of the network camera is different to the configured size of the camera control, the panel has to carry out the scaling, depending on the settings on the camera control.

If possible, select a setting where the panel does not have to carry out unnecessary scaling.

You will achieve the best performance if the resolution of the network camera is the same as the configured camera control.

Performing changes on the settings of the network camera

If you make any changes on the settings of the network camera, you should disconnect the network connection between the network camera and the comfort panel before. Depending on the network camera used, there might otherwise be undefined states for the output of the camera image.
6 Notes and Tips

**Bad image quality / update**

If the update for of the image is too slow, try to increase the image rate (fps) of the network camera.

If the image tends to have "clusters" (large pixel/bad color gradient) try to increase the "bit rate" (kbit/s).

Try several settings in order to detect the best possible image quality.

**Note:**
A small delay in the reproduction of the camera image via the comfort panel cannot be avoided.

**Interruption of the Ethernet connection**

The picture of the camera will be output black if the connection between the network camera and the comfort panel is interrupted during the operation.

There will be no message output, announcing that the connection was interrupted!

Over a period of approx. 15 minutes, it will be automatically attempted to re-establish the connection. If the connection between the network camera and the comfort panel is re-established within this time, the image of the comfort panel will automatically be updated.

If no connection is established within 15 minutes, the side with the camera control has to update the image by calling it again.

**Interruption of the power supply**

The picture of the camera will be output black via the camera control if the power supply of the network camera is interrupted during the operation.

There will be no message output, announcing that the power supply of the network camera has failed!

The image of the comfort panel is automatically updated if the power supply is re-established after a period of approx. 15 minutes.

The side with the camera control has to update the image by calling it again if the power supply is not re-established within 15 minutes.

**Connection monitoring / Voltage monitoring**

Some network cameras provide outputs that can be configured via which certain signals/modes of the camera can be output. For this purpose, look at the information in the manufacturer’s manuals.
Update time camera <-> Camera OCX (Comfort Panel)

Depending on the settings selected on the side of the network camera and the camera control, there is a certain time delay in the output of the camera image via the comfort panel.

There will always be some time delay in the output of the camera image. This is due to technical reasons of the network camera.
7 Literature

7.1 Bibliographic References

The following list is by no means complete and only provides a selection of appropriate sources.

Table 7-1

<table>
<thead>
<tr>
<th></th>
<th>Topic</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/</td>
<td>Manual</td>
<td>SIMATIC HMI Comfort Panels operator panels</td>
</tr>
<tr>
<td>2/</td>
<td>Manual</td>
<td>WinCC Comfort / WinCC Advanced V11.0</td>
</tr>
<tr>
<td>3/</td>
<td>Manual</td>
<td>SIMATIC HMI operator panels migration guideline Comfort Panel</td>
</tr>
</tbody>
</table>

7.2 Internet Links

The following list is by no means complete and only provides a selection of appropriate sources.

Table 7-2

<table>
<thead>
<tr>
<th></th>
<th>Topic</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/</td>
<td>Siemens Industry</td>
<td><a href="http://support.automation.siemens.com">http://support.automation.siemens.com</a></td>
</tr>
<tr>
<td></td>
<td>Online Support</td>
<td></td>
</tr>
<tr>
<td>4/</td>
<td>Application</td>
<td>Monitoring of machines or plants via live video in the TIA Portal</td>
</tr>
</tbody>
</table>

8 History

Table 8-1

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Revisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1.0</td>
<td>10/2012</td>
<td>First issue</td>
</tr>
</tbody>
</table>