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

SIMATIC WinCC Comfort

Application Description • January 2014
Caution:
The functions and solutions described in this entry are mainly limited to the realization of the automation task. In addition, please note that suitable security measures in compliance with the applicable Industrial Security standards must be taken, if your system is interconnected with other parts of the plant, the company’s network or the Internet. More information can be found under entry ID 50203404.

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

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Warranty and Liability

Note

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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
- 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.

The picture shows exemplarily the construction. About buttons, the "pictures" of the different network cameras shall be called. In this example, the "plant 1" is monitored over the "camera 1" and output via HMI operator panel.
2 Solution

2.1 Overview of the general solution

Solution

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

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”.
2 Solution

2.1 Overview of the general solution

Hardware requirements of the network cameras

The network camera has to support the protocol (streaming protocol)

- RTP/RTSP

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.

NOTE

The use of camera control is not suitable for positioning. Depending on the camera configuration, there can be a delay in picture transmission.

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>
<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 Link can be used.</td>
</tr>
</tbody>
</table>

Standard software components

<table>
<thead>
<tr>
<th>Component</th>
<th>Qty.</th>
<th>MLFB/order number</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIMATIC WinCC Comfort</td>
<td>1</td>
<td>6AV2101-0AA02-0AA5</td>
<td>Alternative: mentioned component or higher. WinCC Professional V12 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>
Example files and projects

The following list includes all files and projects used in this example.

<table>
<thead>
<tr>
<th>Component</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>62383298_WinCC_TIA_Camera_OCX_CODE_V30.zip</td>
<td>This zip file contains the HMI project.</td>
</tr>
<tr>
<td>62383298_WinCC_TIA_Camera_OCX_DOKU_v30_e.pdf</td>
<td>This document.</td>
</tr>
</tbody>
</table>

### 2.4 Supported operator panels

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

<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” 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 3-1

<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="camera_control_addon.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>• Unzip the “SIMATIC_TIAP_V12_COMFORT_PANEL_CamControl_V1_0.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></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></td>
</tr>
<tr>
<td></td>
<td>Read the note in the dialog and then click the “Next” button.</td>
<td><img src="license_agreement.png" alt="Image" /></td>
</tr>
</tbody>
</table>
3.1 "Camera Control Addon for TIA Portal" software

4. Confirming installation
   The installation program is ready for installation.
   Start the installation via the "Next" button.

5. Progress display
   The dialog shows the progress of the installation.

6. Completing the installation
   Complete the installation with the "Close" button.

3.1.2 Uninstallation

Use the Windows control panel to uninstall the “Camera Control Addon for TIA Portal" software. Close the SIMATIC WinCC 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>
<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>
<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</td>
<td>User: device1</td>
</tr>
<tr>
<td></td>
<td>Password: admin</td>
<td>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><strong>Calling web interface</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Call the web interface of the network camera via an internet browser.</td>
<td><img src="image1.png" alt="Web Interface" /></td>
</tr>
<tr>
<td></td>
<td>Enter the IP address of the camera into the command line.</td>
<td><img src="image2.png" alt="Web Interface" /></td>
</tr>
<tr>
<td></td>
<td>The default IP address is:</td>
<td><img src="image3.png" alt="Web Interface" /></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 password.</td>
<td><img src="image4.png" alt="Web Interface" /></td>
</tr>
<tr>
<td></td>
<td>The default name/password is</td>
<td><img src="image5.png" alt="Web Interface" /></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 Configuration and Settings
4.2 Configuration of the “SIEMENS CCMS2025” camera

2. Compression

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.
### 4.2 Configuration of the “SIEMENS CCMS2025” camera

#### No. | Action | Images
--- | --- | ---
3. | **Network settings**

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

![Network Settings Screenshot](image)

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

4. Network – RTSP settings

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

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” 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 Configuring the “CamControlES” camera control

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 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

MaintainAspectRatio:

Figure 4-3

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

Note

The option can only be selected when the “MaintainOriginalSize” 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.
4 Configuration and Settings

4.3 Configuring the “CamControlES” camera control

Example 1:
Network camera setting: 4:3
Camera control: 16:9

Table 4-4

<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>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 4-5

<table>
<thead>
<tr>
<th>Network camera (16:9)</th>
<th>Camera control (4:3) view</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image2" alt="Original image" /></td>
<td>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>
Maintaining video size:

With the "MaintainOriginalSize" option, the size of the recording medium (image size of the network camera) is maintained.

**Note**

By selecting the option, the "MaintainAspectRatio" 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>
Deselecting the “MaintainAspectRatio” and “MaintainOriginalSize” options:

Figure 4-5

If neither of the options “MaintainAspectRatio” or “MaintainOriginalSize” 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.
4.3 Configuring the “CamControlES” camera control

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>
<thead>
<tr>
<th>Network camera (16:9)</th>
<th>Camera control (16:9) view</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Original image" /></td>
<td><img src="image2.png" alt="Image output via camera control" /></td>
</tr>
<tr>
<td>The smaller dimension of the camera control &quot;distorts&quot; the image output via the camera control.</td>
<td></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>
<thead>
<tr>
<th>Network camera (16:9)</th>
<th>Camera control (16:9) view</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3.png" alt="Original image" /></td>
<td><img src="image4.png" alt="Image output via camera control" /></td>
</tr>
<tr>
<td>The larger dimension of the camera control &quot;distorts&quot; the image output via the camera control.</td>
<td></td>
</tr>
</tbody>
</table>
UseUDP:

Enter the protocol type via the “UseUDP” 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>
<thead>
<tr>
<th>Image of the network camera</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>MaintainAspectRatio</td>
<td>MaintainOriginalSize</td>
</tr>
<tr>
<td>Not selectable</td>
<td>Not selected</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4 Configuration and Settings

4.3 Configuring the “CamControlES” camera control

4.3.3 Parameters of the “CamControlES” - layout

Open the properties of the “CamControlES”.

Layout

Figure 4-7

![Properties of the “CamControlES”](image)

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

![Properties of the “CamControlES”](image)

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 "MaintainAspectRatio" 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

Figure 4-9

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.
4.3 Configuring the “CamControlES” camera control

Calculating of the aspect ratio

Example 1:

<table>
<thead>
<tr>
<th>Camera control</th>
<th>Size 1280 x 720 (16:9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network camera</td>
<td>Resolution 640 x 480 (4:3)</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Camera control</th>
<th>Size 640 x 480 (4:3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network camera</td>
<td>Resolution 1280 x 720 (16:9)</td>
</tr>
</tbody>
</table>

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.

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.

The basic hardware requirements of the network cameras are described in chapter 2.1 (Link).

<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  
  **KP400 Comfort and KTP400 Comfort:**  
  • Camera resolution: 320 x 240  
  • Camera format OCX: 320 x 240  
  • Image rate: 10 fps  
  • Bit rate: 512 Kbits  
  **xP700 Comfort to xP1200 Comfort:**  
  • Camera resolution: 640 x 480  
  • Camera format OCX: 640 x 480  
  • Image rate: 10 fps  
  • Bit rate: 2000 Kbits  
  **xP1500 Comfort to TP2200 Comfort:**  
  • Camera resolution: 1920 x 1080  
  • Camera format OCX: 1280 x 720  
  • 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>
| 2.  | Manufacturer: AXIS  
     Type: “207MW” | **In general:**  
     - URL address: rtsp://<IP address>/mpeg4/media.amp  
     - Image mode: MPEG4  
     - Audio: Off  
   **KP400 Comfort and KTP400 Comfort:**  
     - Camera resolution: 160 x 90  
     - Camera format OCX: 320 x 240  
     - Image rate: 10 fps  
     - Bit rate: 512 Kbits  
   **xP700 Comfort to xP1200 Comfort:**  
     - Camera resolution: 640 x 480  
     - Camera format OCX: 640 x 480  
     - Image rate: 10 fps  
     - Bit rate: 2000 Kbits  
   **xP1500 Comfort to TP2200 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  
   **KP400 Comfort and KTP400 Comfort:**  
     - Camera resolution: 160 x 120  
     - Camera format OCX: 320 x 240  
     - Image rate: 10 fps  
     - Bit rate: 512 Kbits  
   **xP700 Comfort to xP1200 Comfort:**  
     - Camera resolution: 640 x 480  
     - Camera format OCX: 640 x 480  
     - Image rate: 10 fps  
     - Bit rate: 512 Kbits  
   **xP1500 Comfort to TP2200 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  
  **KP400 Comfort and KTP400 Comfort:**  
  - Camera resolution: 320 x 240  
  - Camera format OCX: 320 x 240  
  - Image rate: 10 fps  
  - Bit rate: 512 Kbits  
  **xP700 Comfort to xP1200 Comfort:**  
  - Camera resolution: 640 x 480  
  - Camera format OCX: 640 x 480  
  - Image rate: 10 fps  
  - Bit rate: 2000 Kbits  
  **xP1500 Comfort to TP2200 Comfort:**  
  - Camera resolution: 640 x 480  
  - Camera format OCX: 640 x 480  
  - Image rate: 10 fps  
  - Bit rate: 2000 Kbits |
| 5.  | Manufacturer TP-link Type “TL-SC3171G” | **In general:**  
  - URL address:  rtsp://<IP address>/video.mp4  
  - Image mode: MPEG4  
  - Audio: Off  
  **xP1500 Comfort to TP2200 Comfort:**  
  - Camera resolution: 640 x 480  
  - Camera format OCX: 640 x 480  
  - Image rate: 10 fps  
  - Bit rate: 2048 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><img src="example_image1.png" alt="Image of calling example application" /></td>
</tr>
<tr>
<td></td>
<td>After starting Runtime the image on the 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>
<tr>
<td>2.</td>
<td>“Overview” image</td>
<td><img src="example_image2.png" alt="Image of overview image" /></td>
</tr>
<tr>
<td></td>
<td>You can now navigate to the example application via the “Overview” image.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>For this purpose click the “Configuration example (1)” or “Configuration example (2)”.</td>
<td></td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
<th>Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Camera without user / password</td>
<td><img src="Image1" alt="Camera without user / password" /></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><img src="Image2" alt="Camera without user / password" /></td>
</tr>
<tr>
<td></td>
<td>When addressing the “URL address”, no user and password is stored.</td>
<td><img src="Image3" alt="Camera without user / password" /></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><img src="Image4" alt="Camera without user / password" /></td>
</tr>
<tr>
<td></td>
<td>At the “control unit” with different buttons, no functions are stored.</td>
<td><img src="Image5" alt="Camera without user / password" /></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><img src="Image6" alt="Camera without user / password" /></td>
</tr>
<tr>
<td>2.</td>
<td>Camera with user / password</td>
<td><img src="Image7" alt="Camera with user / password" /></td>
</tr>
<tr>
<td></td>
<td>When addressing the “URL address”, a user and a password is stored.</td>
<td><img src="Image8" alt="Camera with user / password" /></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="Image9" alt="Camera with user / password" /></td>
</tr>
<tr>
<td></td>
<td>At the “control unit” with different buttons, no functions are stored.</td>
<td><img src="Image10" alt="Camera with user / password" /></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="Image11" alt="Camera with user / password" /></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><strong>Configuration example (2), image 1:</strong></td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>Resolution of the network camera: <strong>640 x 480</strong></td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>Size of the camera control: <strong>640 x 360</strong></td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td><strong>Settings made at the camera control:</strong></td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>MaintainAspectRatio: Yes</td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>MaintainOriginalSize: No</td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td>2.</td>
<td><strong>Configuration example (2), image 2:</strong></td>
<td><img src="image7.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>Resolution of the network camera: <strong>640 x 360</strong></td>
<td><img src="image8.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>Size of the camera control: <strong>512 x 600</strong></td>
<td><img src="image9.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td><strong>Settings made at the camera control:</strong></td>
<td><img src="image10.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>MaintainAspectRatio: Yes</td>
<td><img src="image11.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>MaintainOriginalSize: No</td>
<td><img src="image12.png" alt="Image" /></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>
</table>
| 3.  | Configuration example (2), image 3:  
Resolution of the network camera: 640 x 480  
Size camera control < resolution network camera.  
Settings made at the camera control:  
MaintainAspectRatio: No  
MaintainOriginalSize: Yes |
| 4.  | Configuration example (2), image 4:  
Resolution of the network camera: 640 x 480  
Size camera control > resolution network camera.  
Settings made at the camera control:  
MaintainAspectRatio: No  
MaintainOriginalSize: Yes |
| 5.  | Configuration example (2), image 5:  
Resolution of the network camera: 640 x 480  
Size camera control < resolution network camera.  
Settings made at the camera control:  
MaintainAspectRatio: No  
MaintainOriginalSize: No |
| 6.  | Configuration example (2), image 6:  
Resolution of the network camera: 640 x 480  
Size camera control > resolution network camera.  
Settings made at the camera control:  
MaintainAspectRatio: No  
MaintainOriginalSize: No |
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

<table>
<thead>
<tr>
<th>Performance comparison of the Camera Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comfort Panel 4&quot;</td>
</tr>
<tr>
<td>low</td>
</tr>
</tbody>
</table>

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.
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.
6 Notes and Tips

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.
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>Topic</th>
<th>Title</th>
</tr>
</thead>
</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>Topic</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>/3/</td>
<td>Siemens Industry Online Support <a href="http://support.automation.siemens.com">http://support.automation.siemens.com</a></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>
<tr>
<td>V2.0</td>
<td>02/2012</td>
<td>Terms and descriptions matched in the document.</td>
</tr>
<tr>
<td>V3.0</td>
<td>08/2013</td>
<td>Adaptation to WinCC Comfort V12</td>
</tr>
<tr>
<td>V3.0</td>
<td>01/2014</td>
<td>Add camera TP-link TL-SC3171G</td>
</tr>
</tbody>
</table>