Manual for

TrueView 3D People Counter®

Embedded for Axis IP Cameras

Version 1.x

Copyright © 2017 Cognimatics
Table of Contents

Overview ........................................................................................................................................... 3
Mounting the camera .......................................................................................................................... 5
  Height and width .............................................................................................................................. 6
  Positioning the camera ................................................................................................................... 8
  General guidelines .......................................................................................................................... 8
Installing the software ......................................................................................................................... 9
  Registration and calibration ............................................................................................................ 13
Setup and configuration ....................................................................................................................... 16

Device settings .................................................................................................................................. 16
Schedule ............................................................................................................................................. 18

Reporting ............................................................................................................................................ 19
  Live view .......................................................................................................................................... 21
  Statistics and exports ....................................................................................................................... 22
Statistics .............................................................................................................................................. 22

Exports ............................................................................................................................................... 23

HTTP API ......................................................................................................................................... 24
  1. Real-time data ........................................................................................................................... 25
  2. List or download statistics for counting data ............................................................................ 26
  3. List frame rate .......................................................................................................................... 27
  4. I/O interface .............................................................................................................................. 27
  5. List parameters .......................................................................................................................... 28

Maintenance ....................................................................................................................................... 29
Supported cameras ............................................................................................................................. 30
Overview

TrueView 3D People Counter application is a fully embedded software module for the AXIS P8804 Stereo Sensor Kit, it is intended for shops and other environments where you need to count people. TrueView 3D People Counter offers a solution for people counting with features such as:

1. **Embedded 3D people counter** – Fully embedded into Axis IP camera. TrueView 3D People Counter is a powerful stand-alone people counter directly in your Axis camera. Requiring no dedicated computer, all counting is done in the camera, effectively converting the camera into a sensor.

2. **IP technology** – Using IP technology it offers a cost efficient, infinitely scalable, easy-to-install and flexible system for automatic people counting.

3. **Maintenance** – Maintain your people counter remotely over IP, set and check parameters. Supported to utilize different account privileges of the camera so that unauthorized personnel can view statistics but not change any settings of the counter.

4. **Reporting** – Automatically export counting data to TrueView DataManager® and TrueView Xense® or integrate to any other reporting systems.

5. **Bi-directional counting** – The module simultaneously differentiates and counts people moving upwards and downwards (in or out) in the camera’s field of view.

6. **Statistics** – Built in graphs in the camera web interface makes it possible to instantly monitor your customer traffic. One month statistics stores within the cameras internal memory, no need for additional SD-card storage. Export statistics direct from the camera via open API.

7. **Anonymization** - Configure your people counter to be in anonymized mode so that passing pedestrians can no longer be identified from the camera.
The AXIS P8804 Stereo Sensor Kit provides synchronized stereo imaging from two AXIS F1004 Sensor Units and an AXIS F34 Main Unit. When used with Cognimatics analytics the AXIS P8804 enables the creation of a 3D depth map that facilitates precision people counting.

The kit is designed to be mounted indoors in ceilings—either recessed in a drop ceiling for a discreet installation, or surface-mounted with the included adapter. It is ideal for use, for example, in stores.
Mounting the camera

The P8804 can be mounted in the under ceiling (recessed mount) or surface mount.

The camera should be mounted straight above the point where people should be counted and should be facing straight down.
Height and width

The TrueView 3D People Counter allows a mounting height range from 240 cm and up to 400 cm. Below graphs and tables show the width that can be covered by a camera at a given installation height.

**Below chart is in centimeters.**

![Graph showing width coverage in centimeters]

**Below chart is in inches.**

![Graph showing width coverage in inches]
The tables below shows the installation height and width that the TrueView 3D People Counter can cover. Both in centimeters and inches.

<table>
<thead>
<tr>
<th>Ceiling height (cm)</th>
<th>Counting zone width (cm)</th>
<th>Ceiling height (inch)</th>
<th>Counting zone width (inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>240</td>
<td>172</td>
<td>94,5</td>
<td>67,7</td>
</tr>
<tr>
<td>260</td>
<td>203</td>
<td>102,4</td>
<td>79,9</td>
</tr>
<tr>
<td>280</td>
<td>234</td>
<td>110,2</td>
<td>92,1</td>
</tr>
<tr>
<td>300</td>
<td>266</td>
<td>118,1</td>
<td>104,7</td>
</tr>
<tr>
<td>320</td>
<td>297</td>
<td>126,0</td>
<td>116,9</td>
</tr>
<tr>
<td>340</td>
<td>310</td>
<td>133,9</td>
<td>122,0</td>
</tr>
<tr>
<td>360</td>
<td>291</td>
<td>141,7</td>
<td>114,6</td>
</tr>
<tr>
<td>380</td>
<td>272</td>
<td>149,6</td>
<td>107,1</td>
</tr>
<tr>
<td>400</td>
<td>254</td>
<td>157,5</td>
<td>100,0</td>
</tr>
</tbody>
</table>
Positioning the camera

Adjust the position of the camera so that it is natural for people to pass through the camera’s view vertically.

*Remember that you need to mount the camera prior to the calibration of the TrueView 3D People Counter setup.*

General guidelines

Place the camera straight over the area where people are walking. Make sure that the camera is looking straight down and is not tilted.

In order for the camera and, in effect, TrueView 3D People Counter to function properly, make sure that the lighting is sufficient.
Installing the software

If TrueView 3D People Counter software module is not already installed from your vendor it must be installed manually in your Axis camera.

1. Make sure you have one of the supported Axis IP cameras (e.g. AXIS P8804 Stereo Sensor Kit) for the TrueView 3D People Counter and that you have the correct corresponding software module of TrueView 3D People Counter. The supported cameras and the corresponding software modules are listed in the section Supported cameras on page 29.

2. Install the camera on your network, start it up, and point your web browser to it. Supported web browsers are the most recent versions of Google Chrome, Mozilla Firefox, Internet Explorer, and Safari.

3. Upload the TrueView 3D People Counter StartApp file by clicking Setup -> Applications.

   The download to the installation file is found on the Cognimatics website or in your PDF delivery.

   Under the section Select package file to upload, specify the path to the Cognimatics StartApp file or use the Browse button. Click on the Upload Package button.
4. Once the StartApp has been installed onto the camera, the download and installation of the TrueView 3D People Counter can start. The StartApp application is designed to connect to the Internet and download the latest version of the TrueView 3D People Counter.

Click on the **Cognimatics StartApp** link under the **Application menu** to configure proxy server settings if applicable in the network.

The download and installation of the TrueView 3D People Counter will start when you click on the **Main page** located under the settings tab in the **Cognimatics StartApp** menu.
5. The application framework will download when you click on the Download app framework, once downloaded click on the Install app framework to install the TrueView 3D People Counter onto the camera.
6. When the installation is done, a pop-up window with the registration page will be opened. *Notice that your browser might block the pop-up, allow pop-ups for this address or click on the link.*
Registration and calibration

The first time you use the product, you will be asked to enter your license code. Enter the license code that you received in the PDF delivery document and follow the instructions.

By default, the TrueView 3D People Counter will attempt to activate the license automatically by connecting to the Cognimatics registration server over the Internet.

See picture below.

If you do not have an Internet connection when you do the registration, you can use another device such as a smartphone to do an offline registration.
If no Internet connection is detected during the registration procedure, you will automatically receive an Installation ID.

Enter the Registration code and the Installation ID on the website http://face.cognimatics.com/activation, which will generate an Activation code as a response that you should enter on the TrueView 3D People Counter’s registration page in order to complete the activation.
Calibration procedure

It is important that the camera is installed correctly at its intended placement, e.g. 90 degree down at the desired place to count people. The calibration is done in two steps.

During the first step data is gathered and there must be people moving under the camera.

The second step processes the data, this usually takes 5 to 15 minutes depending on device performance. Once the calibration process is completed, click on Go to application to proceed with the setup process. You can also perform a new calibration if needed by clicking on Start Calibration.
Setup and configuration

To ensure accurate counting of persons passing under the camera, the TrueView 3D People Counter must be calibrated and configured before use. The calibration of the scene is done during the initial calibration procedure while modifications to the height and counting zone are performed in the settings page of the application.

Device settings

Begin by measuring the height of the camera’s installation (from the floor to the bottom of the lenses) and enter the measurement in the Device section.

The minimum height is 2,4 meters (94 inches)
The maximum height is 4,0 meters (157 inches)
For detailed information, see Height and width on pages 6-7.

Notice! It is common practice to set a fitting name at the Device settings tab, use for instance the name of the location plus what kind of passage it is. Example: “Axis_MainEntrance_T_building”
General settings

The counting zone defines the floor area a person must pass to be counted. The counting zone can be seen as red shaded area in the image.

To visually guide the setup, a perspective box is drawn on top of the counting zone with the approximate height of a person. This means that a correctly defined counting zone would have people’s bodies within the clear or red area and feet only within the red area.

To change the counting zone’s position and size use the sliders:
Counting zone offset: Move the counting zone along the image Y-axis.
Counting zone width: Limit counting zone to parts of the image width.

Set the direction for what’s IN to the location that should be counted (down or up in the picture).

Notice! Several constraints are in place limiting the sliders possible values. These constraints are heavily related to camera installation height and in place to ensure proper performance of the application.
Schedule

In order to avoid the camera detecting movements when the lightning is turned off during the night, it is recommended to always setup a schedule for the application.

The simple schedule type can be used when you want to set the openings ours for same for the whole week or for individual days.

Use the advanced mode to set the schedule the open or closed times more in detail.
Reporting

Apart from showing statistics in the camera interface and serving CSV/JSON data, TrueView 3D People Counter can also push count data to the TrueView DataManager and then further to TrueView Xense reporting if desired.

Below system overview shows the different parts that can be connected to the analytical application installed on the Axis camera. More information about how to get access to the reporting TrueView Xense or the data storage server TrueView DataManager can be found on the cognimatics.com webpage.
1. Check the *Enable* check-box to enable pushing data to TrueView DataManager server.

![Reporting settings]

2. Enter the server address and the *folder connection* credentials. Information on how to setup the folder connection identifier and password on the server side TrueView DataManager can be found in the TrueView DataManager manual section “*Transfer data from sensors*” on page 21. See link below.


3. Choose in what time interval you would like to push the data to the DataManager server. Minimum time interval is 1 minutes and maximum time interval is 3600 minutes.
Live view

The Live view page of TrueView 3D People Counter allows you to see the counts that are being recorded by the application. This page can also be a great help when fine tuning the settings. The latest counts are shown in a table to the right of the camera’s image.
Statistics and exports

Statistics

The Statistics page of TrueView 3D People Counter allows you to view the counts that have been recorded by the application over the last seven days and the current day. The data in these visuals is updated in real time.

![Statistics for 3DPC](image)

<table>
<thead>
<tr>
<th></th>
<th>2/1</th>
<th>3/1</th>
<th>4/1</th>
<th>5/1</th>
<th>6/1</th>
<th>7/1</th>
<th>8/1</th>
<th>9/1</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>In</td>
<td>111</td>
<td>77</td>
<td>80</td>
<td>109</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>47</td>
</tr>
<tr>
<td>Out</td>
<td>46</td>
<td>39</td>
<td>42</td>
<td>48</td>
<td>2</td>
<td>0</td>
<td>8</td>
<td>5</td>
<td>23</td>
</tr>
</tbody>
</table>

Day Chart

Week Chart

![Day Chart](image)  ![Week Chart](image)
Exports
Data files can be downloaded in csv or json format by selecting the format and clicking the day you want the data for in the date picker. Different time resolutions can be chosen. If you want to download all available data in a certain format just select the *All available data* option.

Export data

Select format, time resolution and time period:
- Format: csv, json
- Time resolution: Minutes, 15 Minutes, Hours, Days
- Time period: Single day, Multiple days, All available data

Pick a start and...

Choose retrieval method:
- Retrieval method: Open in new tab, Download as file


Export
HTTP API

1. Real-time data
2. List or download statistics for counting data
3. List frame rate
4. I/O interface
5. List parameters
1. Real-time data

URL
http://<servername>/stereo/people-counter/counts.json

Format
JSON

Method
GET

Return

```
{
    "in":<in>,
    "out":<out>
}
```

<in>
    number of people passing in until now for the current day

<out>
    number of people passing out until now for the current day
2. List or download statistics for counting data

**URL (CSV) Example:**
http://<servername>/stereo/people-counter/export.csv?resolution=60&date=all&method=open

**URL (JSON) Example:**
http://<servername>/stereo/people-counter/export.json?resolution=60&date=all&method=open

**Format**
- CSV or JSON

**Method**
- GET

**Parameters:**
- Different time resolutions can be set via the parameter “?resolution=seconds”. Example: 3600 seconds, this time interval can also be written as the name “minute”, “hour” or “day”.

  - Example:
  http://<servername>/stereo/people-counter/export.csv?export-method=on&date=20170110&resolution=day&method=open

- All data stored on the camera is collected via the parameter “&date=all”

- Single days or multiple days can also be collected by writing the specific date: “&date=YYYYMMDD” or “&date=YYYYMMDD-YYYYMMDD”

- Select what retrieval method to use. E.g., download to computer or open in browser: “&method=open” or “&method=download”

**Returns**
The API returns all statistics stored in the camera in JSON or plain text comma separated format (CSV).

**CSV:** The first line contains a description of each element, and the following lines contain the corresponding data for the chosen time interval and resolution.

| Interval Start, Interval Start (Unixtime), In, Out |  |  |
3. List frame rate

URL:
http://<servername>/stereo/fps.json

Format
JSON

Method
GET

Returns
Return the current internal frame rate.

Format

```
{"fps": real time fps,
"fps_100": average FPS for the last 100 frames,
"fps_1000": average FPS for the last 1000 frames,
"fps_5": average FPS for the last 5 frames,
"fps_50": average FPS for the last 50 frames,
"frames": frame counter.
}
```

4. I/O interface

URL:
http://<servername>/stereo/io.json

Format
JSON

Method
GET

Returns
Get latest IO signals as “false” or “true”
5. List parameters

**URL:**
http://<servername>/stereo/params.json

**Format**
JSON

**Method**
GET

**Return**
Get all parameters currently set.
Maintenance

On the Maintenance page (found under Help->Maintenance) there are options for simplifying maintenance of TrueView 3D People Counter.

**Reset** If you find the counting inaccurate or the web interface unusually slow, you may try restarting the running services or restart the camera. You can also clear all statistics in the cameras memory.

**Installation** Automatically downloads and installs the latest TrueView 3D People Counter version.

**Record Debug Data** You can use this feature to download debug data from the camera which can be sent to Cognimatics for troubleshooting.

**Logs** If the application is not working as intended you can use the logs to get a better view of what the cause might be. You can also contact support@cognimatics.com and include the logs.

**Calibration** If you find the application inaccurate or for any other reason want to re-calibrate the device click the button below to go to the calibration page.

**Registration** In this section you can renew or clear the current license that is registered as well as access the registration page.
Supported cameras

Table A.1. Supported cameras

AXIS P8804 Stereo Sensor Kit consist of two AXIS F1004 Sensor Units and an AXIS F34 Main Unit. The Axis F44 main unit can also be used to run the TrueView 3D People Counter application.

<table>
<thead>
<tr>
<th>Camera model</th>
<th>Software module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis F34</td>
<td>Cognimatics_StartApp_x_y-z_mipsisa32r2el.eap</td>
</tr>
<tr>
<td>Axis F44</td>
<td>Cognimatics_StartApp_x_y-z_mipsisa32r2el.eap</td>
</tr>
</tbody>
</table>

x.y.z is the version number of the software module.