

FREewayCAM3 / SMARTCAM3 / SPEEDCAM3

DIGITAL (IP) LPR CAMERA



INSTALL GUIDE

FREewayCAM3/SMARTCAM3/SPEEDCAM3 Install Guide

For versions from 3.5

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Compliances

CE Certificates:

The ARH FreewayCAM3 ANPR digital camera family complies with the European CE requirements specified in the EMC Directive 2014/30/EU.

The ANPR cameras conform to the following Product Specifications:

Emission and Immunity:

EN 55032:2015, EN 55024:2010+A1:2015

Declaration of RoHS Compliance for Electrical and Electronic Products:

ARH Inc. ("the Company") hereby declares that the FreewayCAM ANPR camera family placed on the European Community market by the Company after 1st July 2006 are compliant with EC Directive 2002/95/EC on the Restrict of Certain Hazardous Substances in Electrical and Electronic Equipment (commonly known as the EU RoHS Directive.)

Compliance with RoHS means that where the product falls under the scope of the EU RoHS Directive, the product does not contain the following substances:

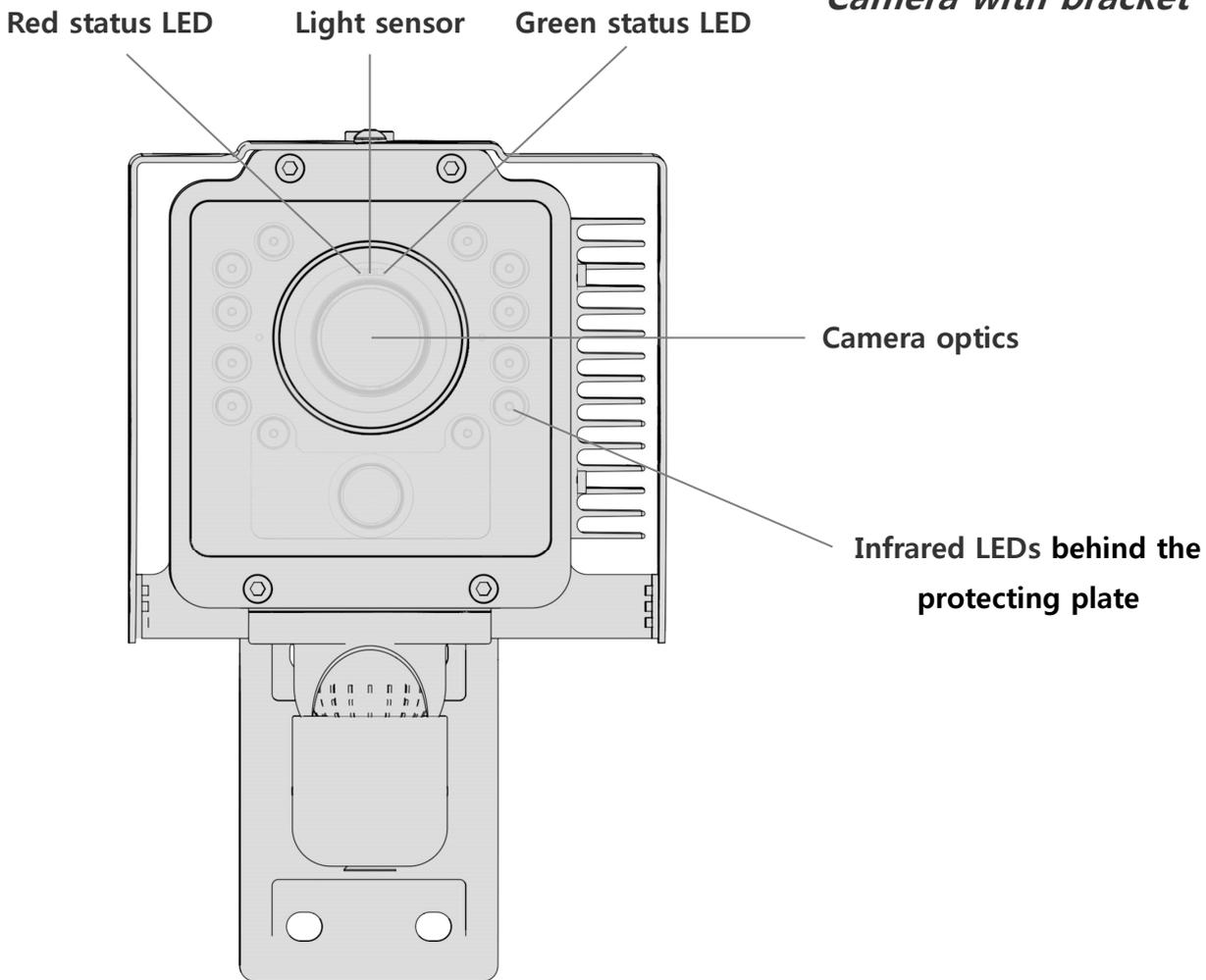
- Mercury (Hg) 0.1%
- Lead (Pb) 0.1%
- Cadmium (Cd) 0.01%
- Hexavalent Chromium (Cr+6) 0.1%
- Polybrominated Biphenyls (PBB) 0.1%
- Polybrominated Diphenyl Ethers (PBDE) 0.1%

above the indicated maximum concentration values by weight in homogeneous materials unless the substance is subject to an exemption specified in the Directive or in subsequent Commission Decisions. This declaration represents the Company's best knowledge, which is partially based on information provided by third party suppliers.

1. Hardware Overview

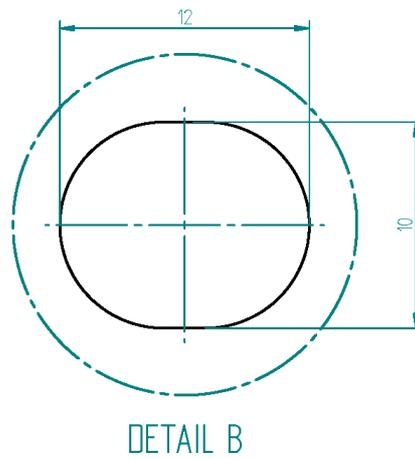
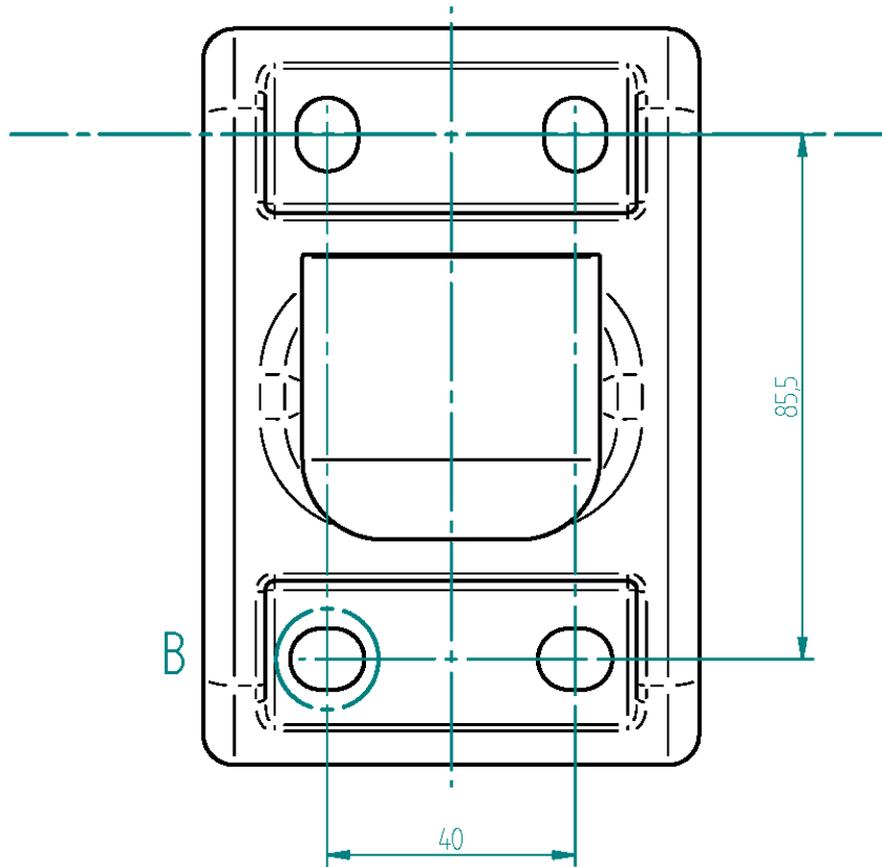


Camera with bracket

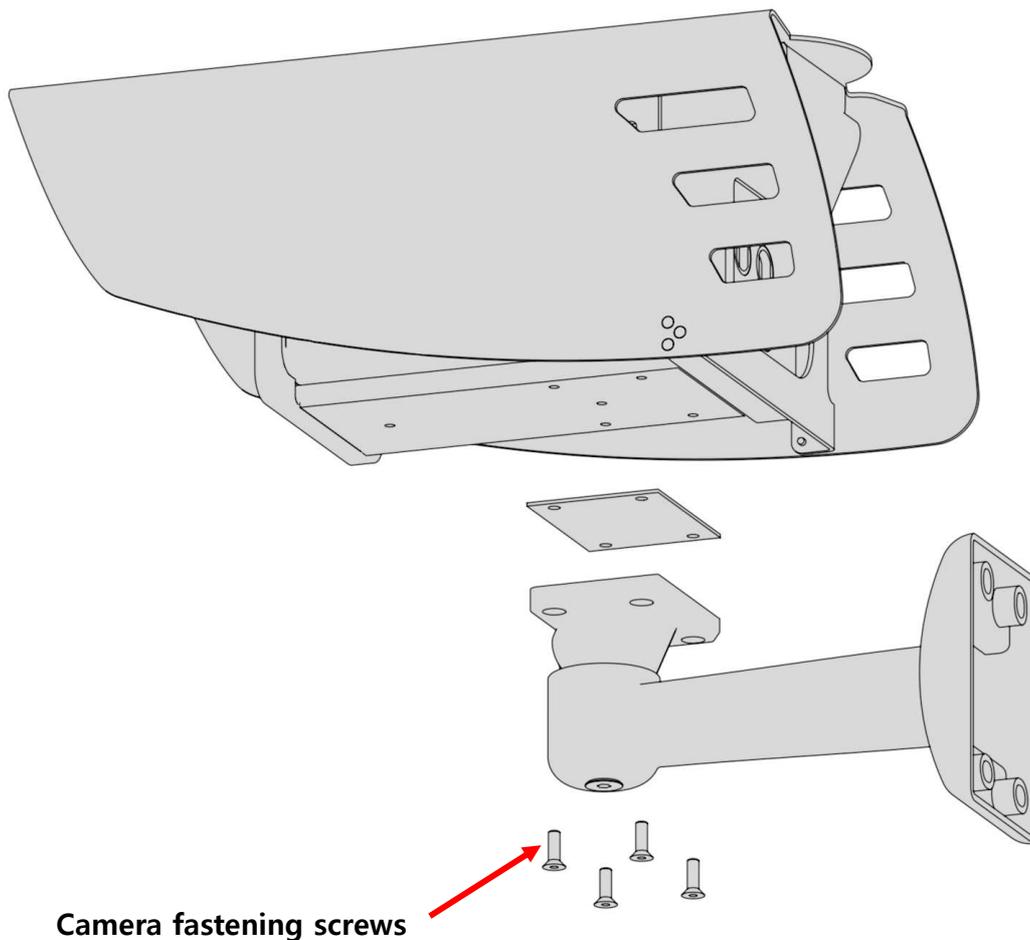


Camera front

1.1 Bracket Details and Sizes



2. Install the Hardware



NOTE: Remove protective film from the protecting plate (on the camera front) before using the camera.

Adjust the bracket

1. Loosen the camera fastening screw on the bottom of the bracket. (Use size 5 Allen key).
2. Adjust the bracket into the desired position.
3. Tighten the screw back.

NOTE: Do not overtighten the screws.

2.1 Mounting

The bracket can be mounted into different surfaces. Use appropriate screws for installation according to the mountable surface.

NOTE: Failures due to inappropriate installation void the warranty.

3. Connect the Cables

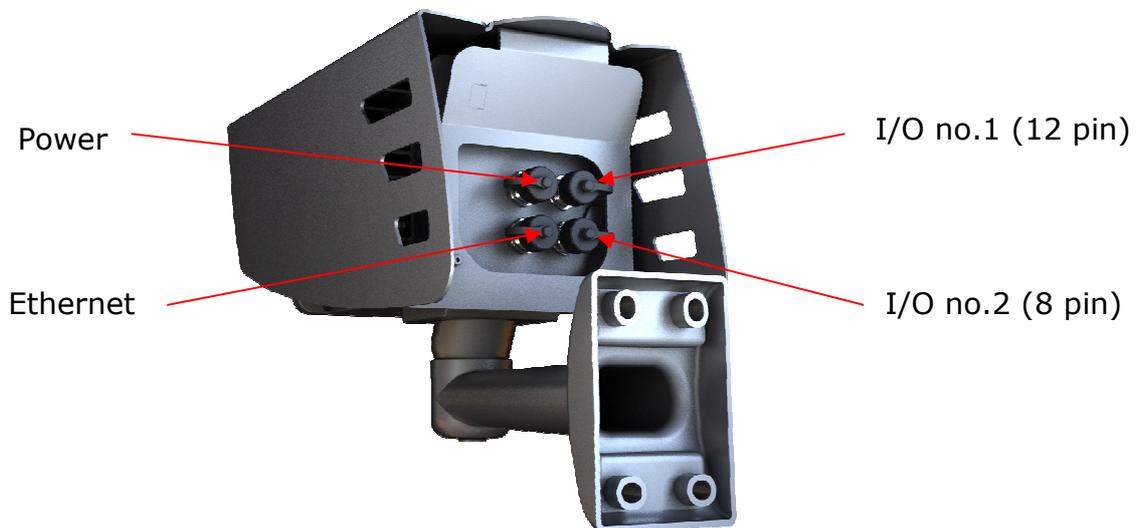
NOTE: Technical specifications are subject to change without prior notice.

IMPORTANT NOTICE! For cabling use quality, outdoor-certified cables! Improper cabling causes warranty to void! Water may enter into the camera inside through loose cable ends. Use smooth circular cables only.

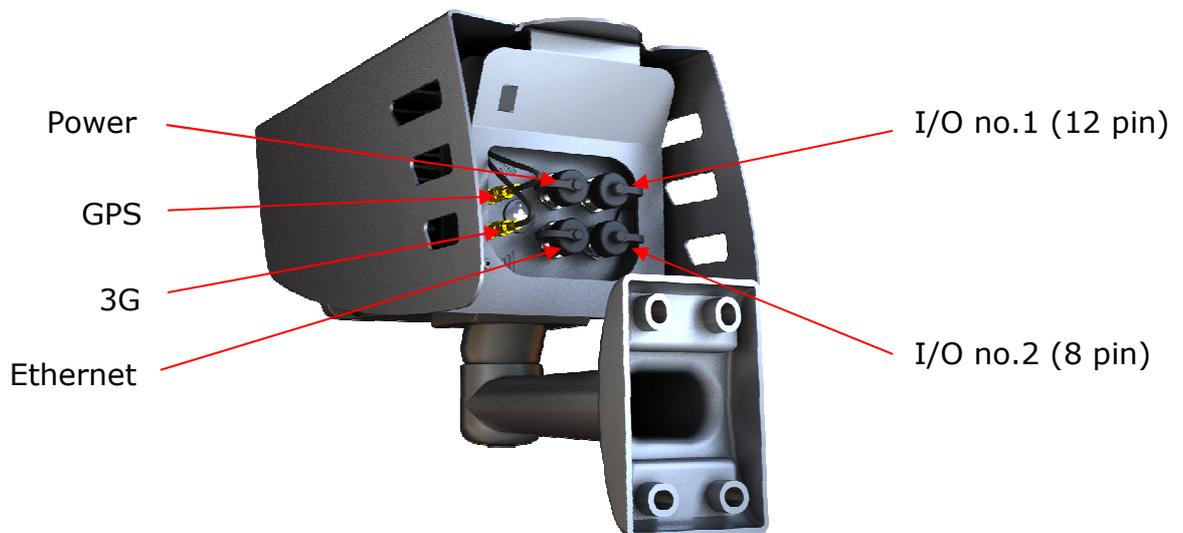
SEAL THE UNUSED CABLE ENDINGS (END SLEEVES) BEFORE CONNECTING TO POWER IN ORDER TO AVOID DAMAGES DUE TO SHORT CIRCUIT!

3.1 Cable Layouts

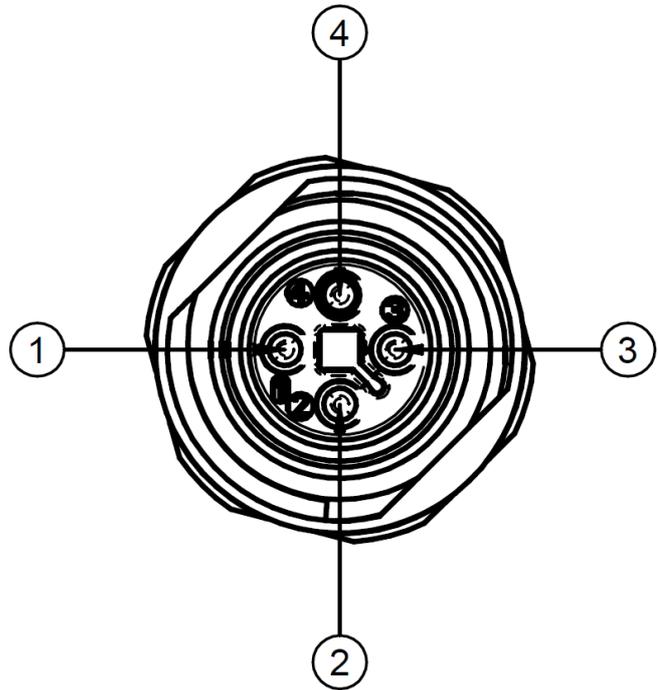
In case of cameras with four connectors:



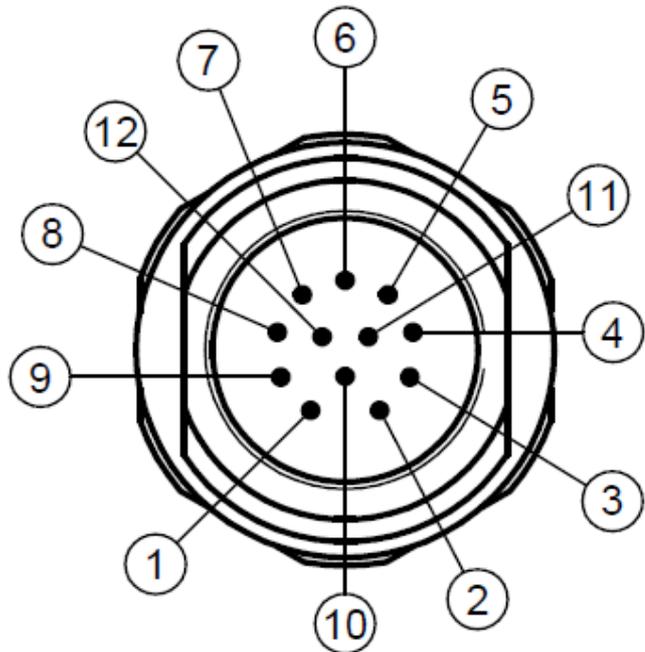
In case of cameras with six connectors:



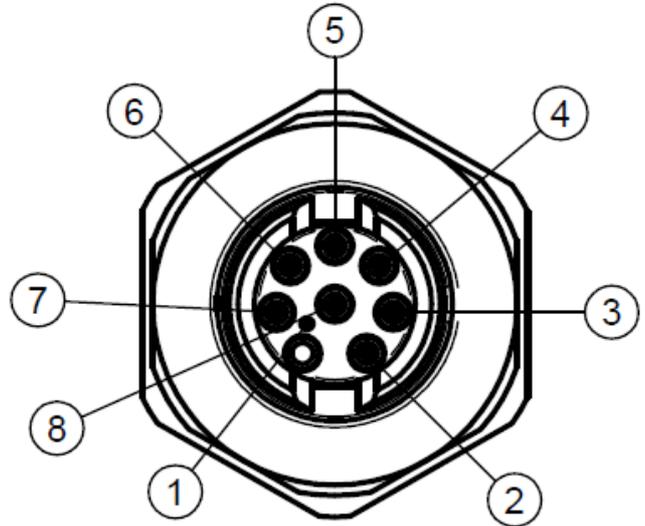
4 Pole Power Connector	
Pin	Function
1	AC_1
2	
3	AC_2
4	



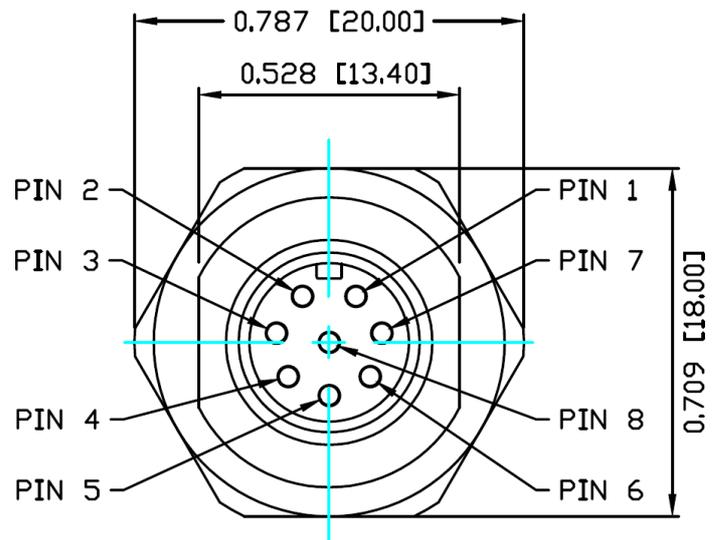
IO1: 12 Pole I/O Connector		
Pin	Function	Wire colour
1	OPTO_1_OUT_S	brown
2	OPTO_1_OUT_G	blue
3	OPTO_1_IN_G	white
4	OPTO_1_IN_S	green
5	ILL_STROBE	pink
6	OPTO_2_OUT_S	yellow
7	TX-ILLUM	black
8	RB_USER	grey
9	RX_ILLUM	red
10	TA_USER	purple
11	GND_ILLUM	grey/pink
12	GND_USER	red/blue



IO2: 8 Pole I/O Connector		
Pin	Function	Wire colour
1	RB_USER	white
2	OPTO_2_OUT_G	brown
3	TA_USER	green
4	OPTO_2_OUT_S	yellow
5	OPTO_2_IN_G	grey
6	OPTO_2_IN_S	pink
7	GND_RADAR	blue
8	12V_RADAR	red



Circular ethernet	
Pin	Function
1	D3-
2	D4+
3	D4-
4	D1-
5	D2+
6	D1+
7	D3+
8	D2-



POWER SPECIFICATIONS:

The required input voltage is model dependent, please use the proper input according to your model! Please consider voltage drop if you use cables!

	Camera with HD sensor	Camera with FullHD sensor
AC Input	isolated 24 - 28V AC (sinusoidal)	
Power (typical)*	10 – 19 W	11 – 26 W
Power (max. / max. with heating)	25 / 28 W	26 / 29 W
Over-current Protection	by fuse	

* - Depending on usage and configuration

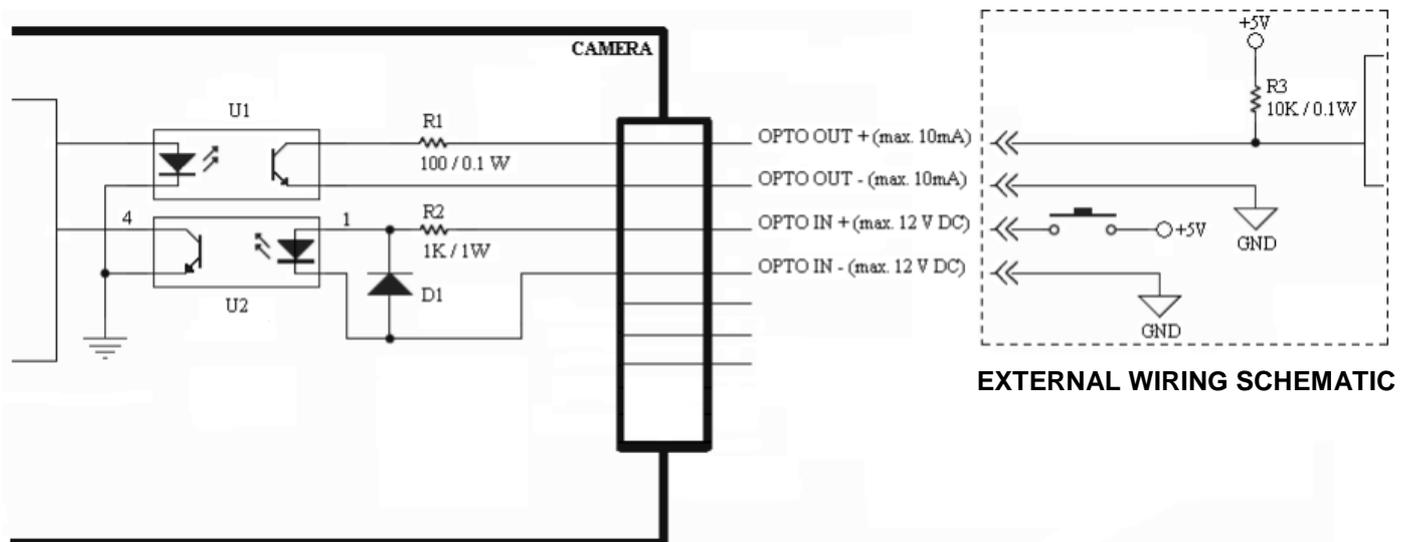
TRIGGER SPECIFICATIONS:

- **Input:** min. 5V, max. 12V
- **Pulse width:** min. 1 ms

Logic Output: min. 5V, max. 12V, max. 10mA

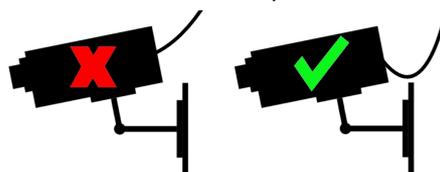
NOTE: Be aware of the polarity.

SCHEMATIC FOR TRIGGERING:



SERIAL CONNECTION SPECIFICATION:

The serial port of the camera complies with the RS 232/485 standard.



Route the cable according to the image to avoid collecting rainwater at the socket.

4. Software Requirements

The cameras are developed to operate without any kind of special software.

Software requirements:

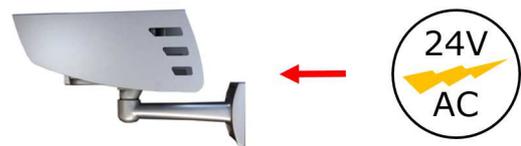
- For network setup, administrator (root) privileges are necessary.
- Web browser: Mozilla Firefox 52, Internet Explorer 11, Google Chrome 51.X.X.X or later editions.
If it is possible, update your browser (Firefox or Chrome) to the newest available version.

NOTE: To enable all camera functions, enable JavaScript control in your browser.

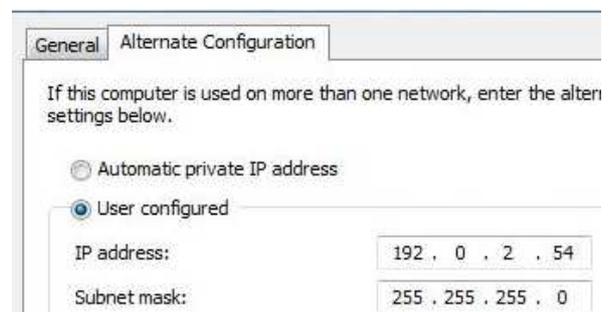
5. Accessing the Camera

Steps of accessing the web interface of the camera from a browser:

1. Connect the camera to a computer or network switch, then power on the camera. After it is turned on, both status LEDs (red and green on the camera front) are turned on while the camera is booting. After finished, the green status LED flashes two times while the red one turns off signaling that the camera is ready for operation.



2. Enter an alternate IP address (or set your computer's IP) in the 192.0.2.x subnet – where x is an integer number between 1 and 254 **except 3** – with the subnet mask of 255.255.255.0. For more information, see [Appendix](#).



3. Use the ping command to test the communication with the camera:

Windows: `C:\>ping -t 192.0.2.3`

Linux: `username@mylinux:~$ ping 192.0.2.3`

4. Soon, the ping package returns: **Reply from 192.0.2.3**. If not:
 - first check the Ethernet LEDs at the PC or the switch side
 - check whether the IP address is set correctly; the own IP address of the PC can be pinged.
 - proxy is set in the browser or the browser is not set to offline.

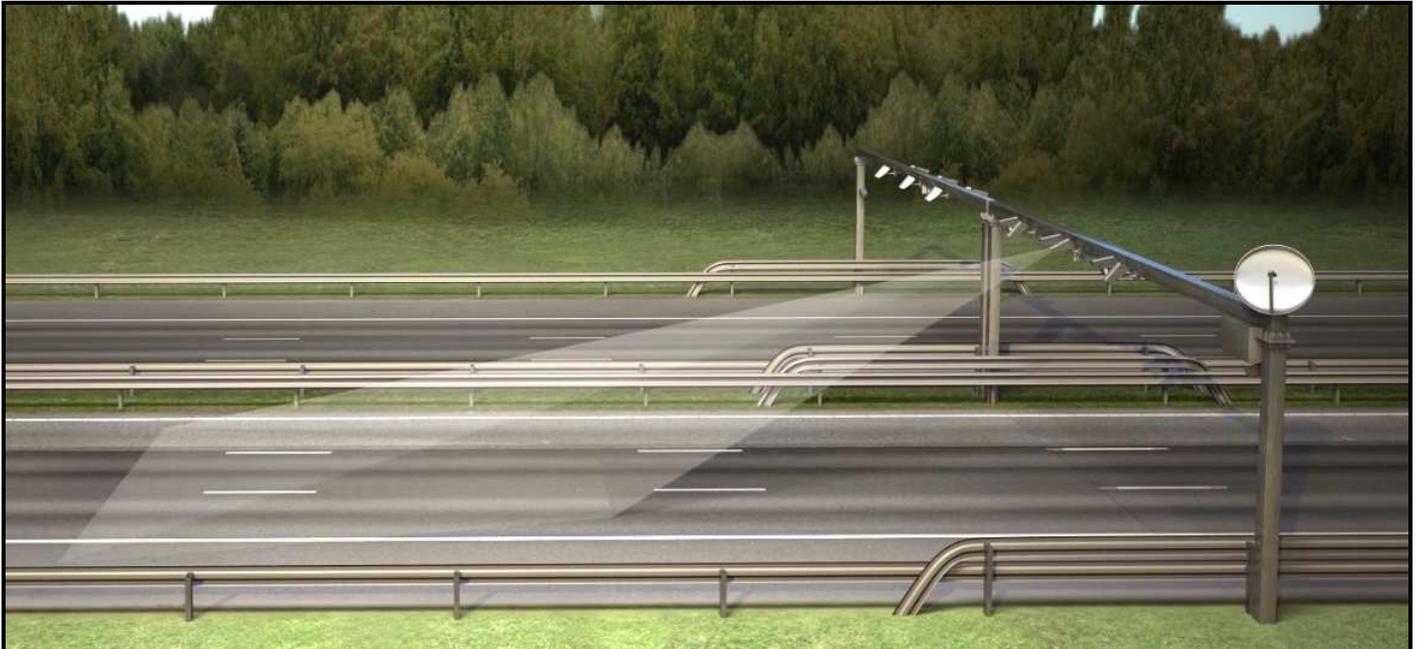
If these obstacles are checked and there is still no reply, power off then on and enter the previous ping command again.

5. Start a browser then enter the default IP address of the camera into the address bar (**http://192.0.2.3**). After this, the camera starts with administrator privileges, ready to be set up and configured.

NOTE: To enable all camera functions, enable JavaScript and ActiveX controls in your browser.

6. Recommended Camera Position

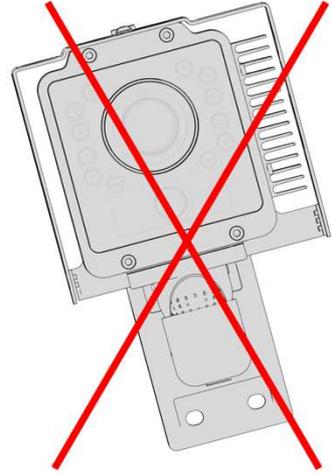
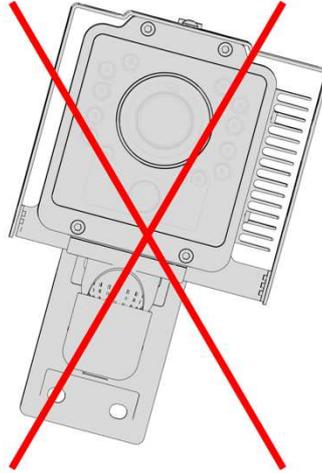
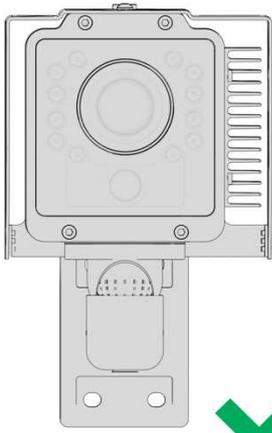
A good ANPR engine can read the plates from images taken in various conditions. However, if you want to achieve over 95% recognition rate with short recognition times, you have to calculate the position of the camera accurately. The best position is if the camera is installed on a gentry above the traffic lane (see below).



If there is no possibility to install a gentry above the concerned road section the installation of the camera can be done near the road. In this case the angle between the camera axis and the direction of the vehicle movement should be minimal and the camera should be installed 1 – 1,5 meters above the headlights of the vehicles.

The distance between the camera and plate is also important. If the camera is too far from the plate, the characters may not be large enough for recognizing them. In this case, zoom-in until you reach the proper size. If the distance is too short it may happen that a part of the plate is over the camera's field of view (when the vehicle is near to the side of the lane or the plate is not at the middle of the vehicle).

From the point of ANPR/LPR the most important is the size of the characters on the image. For English characters it is recommended to have at least 16 pixel average character height, for Arabic or other special characters it is recommended to have 20 pixel height (due to they are more calligraphic than the English characters). The too large characters are also not suitable for ANPR, therefore try to avoid settings where the character size is greater than 50 pixels in height. A line width of a character on the image should be at least 2 pixels.

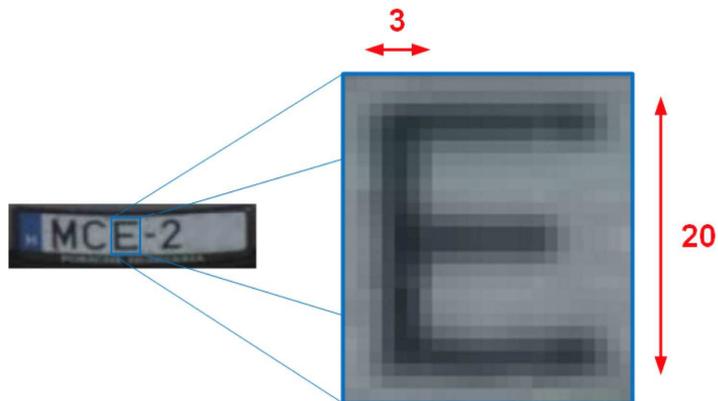


Correct camera position **Do not rotate the camera any direction from the horizontal position**

A properly set camera should provide a similar image:



A proper sample image



Proper character sizes (in pixels) on the sample image

7. Maintenance / Storage

The cameras are designed for 24/7/365 work for every weather condition and they do not need special maintenance. Please keep clean the camera front. During the cleaning process, avoid scratching the front cover.

Do not use the camera without its sun-shield in hot environment, because it was specially designed to provide proper air-cooling.

The cameras should be stored in low humidity environment in temperature range of -40 °C to + 55 °C. Always use the sealing caps on the connectors to keep the camera unit waterproof! If you miss to use it, the warranty will be void!

The maintenance of the devices is recommended on a quarterly basis. In case of extreme weather conditions more often.

During the maintenance, make sure that:

- the camera operates properly,
- it is facing to the previously set direction,
- the fastening is not slack,
- the front of the camera and the camera itself is clean (no spider webs or any other contaminants inhibit the visibility),
- there are no strange circumstances (vapor, damage).

Appendix

Adding Alternate IP Address

Windows Vista/Windows 7

1. Click **Start** and select **Control Panel**.
2. Make sure you are in Classic View by clicking **Classic View** on the left of the Control Panel.
3. Open **Network and Sharing Center**.
4. Click **Manage Network Connections** on the left side of Network and Sharing Center.
5. Right click on the network connection you want to add an IP address for (to which the camera has been connected) and select **Properties**.
6. Select **Obtain an IP address automatically** and click on the **Alternate Configuration** tab.
7. Select **User configured** and enter e.g. the 192.0.2.54 **IP address** and 255.255.255.0 as **Subnet mask** as shown on *Figure 1*.
8. Click **OK** in the opened windows.

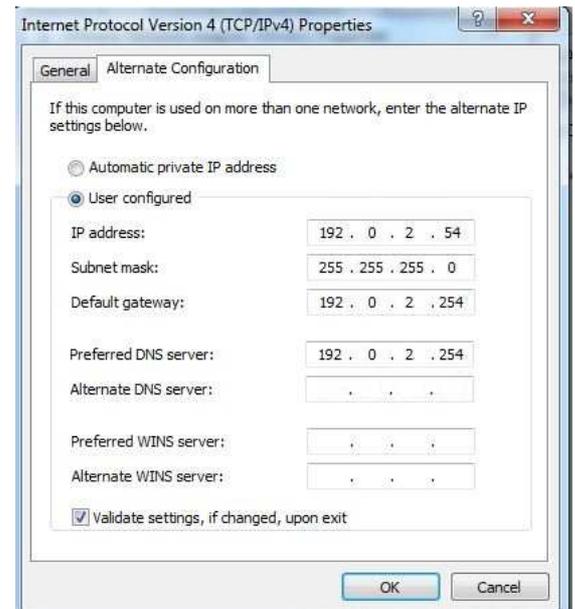
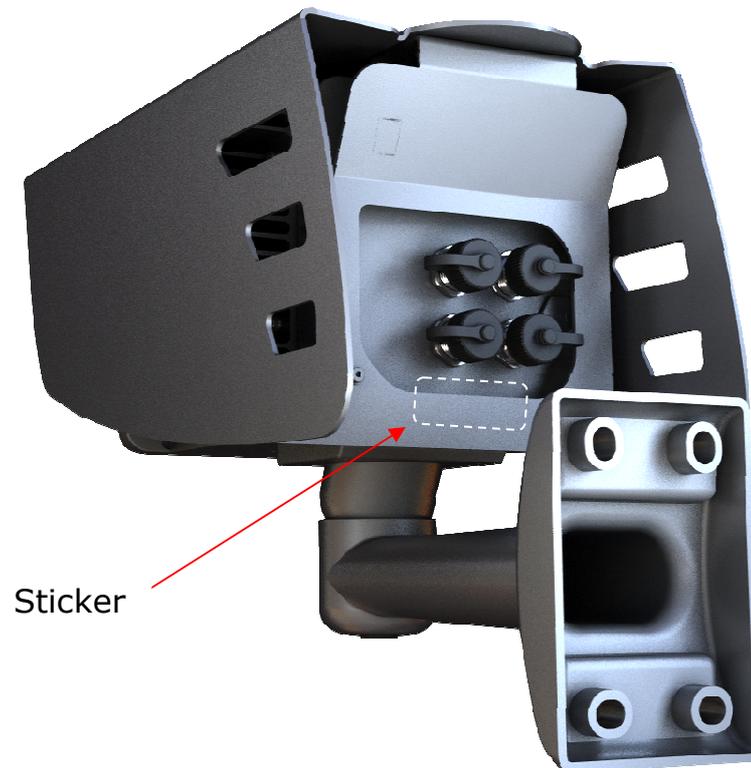


Figure 1.

Linux

1. Open a terminal.
2. Enter the ifconfig command to see the reserved Ethernets (e.g. eth0).
3. Enter the following command: `ifconfig ethY 192.0.2.25`
where **Y** is a free eth (e.g. eth1) and 192.0.2.25 is a sample IP address.

Position of the sticker



The sticker, indicating the Name, IP address, MAC address and the Serial Number of the camera, can be found on the back of the device, under the sunshield.

CAUTION!

The device is equipped with an 850nm InfraRed illumination unit. The human eye will not or slightly see this light coming from the LED's. Do not look into the illumination unit directly from close range or for more than 100 seconds. Eyes can be damaged by not taking these precautions.

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ARH Technical Support System (ATSS) is designed to provide you the fastest and most proficient assistance, so you can quickly get back to business.

Information regarding hardware, software, manuals and FAQ are easily accessible for customers who previously registered to enter the dedicated ATSS site. Besides offering assistance, the site is also designed to provide maximum protection while managing your business information and technical solutions utilized.

New User

If this is your first online support request, please create an account by clicking on this [link](#).

Returning User

All registered ATSS customers receive a personal access link via e-mail. If you previously received a confirmation message from ATSS, it contains the embedded link that allows you to securely enter the support site.

If you need assistance with login or registration, please contact atsshelp@arh.hu for help.