

# ParkIT

## ANPR Camera

# User's Manual



# ParkIT User's Manual

For versions from 1.12.0.8

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## About this Manual

The aim of this guide is to help users to operate the camera and to make the most of it. With the provided information below, users can easily manage the ParkIT camera through its web interface.

### Key Features of ParkIT

- Auto brightness control designed for license plate recognition
- Automatic day-night mode switch, autofocus
- Camera image rotation (180°), horizontal and vertical mirroring
- Illuminant color compensation, automatic white balance
- Frame filtering
- Hardware motion detection
- Low bandwidth usage, built-in adjustable image compression
- Automatic time synchronization (NTP)
- Trigger IN/OUT

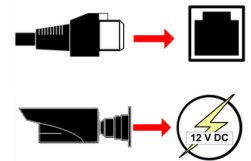
## Accessing the Camera

In order to access the camera, it has to be connected appropriately. For more information see ParkIT Install Guide. For communication with the camera, camera commands have to be used. The easiest way of handling these commands is through the web interface of the camera. For more information on other communication methods see ParkIT Programmer's Manual.

### Access from Browsers

#### 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 powered 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.**

User configured

IP address:

Subnet mask:

- 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.

**For more information on accessing the camera, see ParkIT Install Guide.**

## Live View

The live image of the camera can be viewed on this page.



The screenshot shows the ARH web interface. On the left is a vertical navigation menu with the following items: Login, Live View (highlighted), Configuration Wizard, Setup, Profiles, Users, Date and Time, Network Setup, Easy Setup, Advanced Setup, Motion Detection, Event Manager, Diagnostics, Update, Restart, and Help. The main area displays a live camera feed of a dark-colored car, likely a BMW, with its headlights on. The license plate is visible and reads 'L-403'. At the bottom of the camera feed, a status bar displays the text: 'Fri, 04 May 2012 12:24:40 GMT, 192.0.2.183 @ 30 fps'.

Under the camera image, a status bar is located providing the following information:

- date & time (GMT)

**NOTE:** To alter date and time, see [Date and Time](#) configuration.

- IP address of the camera
- current FPS of the camera

### Saving still images and video streams

With the help of the <http://IP/scapture> command it is possible to get a camera image (in JPEG format) in order to examine the size of it or to check the height of the characters on the license plate in pixels, etc.

The MJPEG stream is displayed by the camera on port 9901. Entering the command <http://IP:9901> will provide the live video stream.

## Configuration Wizard

The ParkIT camera must be configured before using. Use the Configuration Wizard for setting up camera features (e.g. zoom, focus etc.) quickly and easily. The wizard guides users through the main calibration steps configuring various properties of the camera including the Event Manager. Of course, the use of the wizard is optional – camera properties can be set manually as well.

### Steps of the Configuration Wizard:

**Step 1:** Set network settings to communicate with the camera. See [Network Setup](#) for more information.

**Step 2:** Time and date settings. For more information see [Date and time](#).

**Step 3:** The Wizard can optimize the camera for ANPR (Automatic Number Plate Recognition) or Overview purposes. Select the one that is appropriate for your purposes.

**Step 4:** With the help of the Automatic Zoom (ZFG - Zoom From Geometry) feature, optimal character size on the camera image for ANPR can be reached quickly and easily. To use autozoom, enter the required data (e.g. distance of the number plate) into the textboxes then click next. Click 'Skip' to set zoom manually.

**Step 5:** Based on the values provided in the previous step, the camera creates a red rectangle that should include the license plate completely. If not, then adjust the position of the camera in order to do so.

**Step 6:** Use the Autofocus feature to achieve sharp camera image. The focusing process can operate on the entire camera image or on a specified section of it. Use the rectangle to select the area for the Autofocus.

**Step 7:** Configure the basic camera parameters. For more information see [Easy Setup](#) description.

**Step 8:** Configure triggering and trigger events. For more information see [Event Manager](#) description.

**Step 9:** Set or create camera profile. For more information see [Profiles](#).

## Setup

**NOTE:** all set parameters are saved only in case of software restart! In case of hardware reset all unsaved changes will be lost!

## Profiles

Under the profile menu, the list of profiles can be viewed. Camera profiles are pre-set camera configurations containing a complete set of settings that are loaded at startup and cannot be changed at runtime. One of the profiles has to be always active and the active profile cannot be deleted.

The camera has a pre-defined default profile that cannot be erased but altered only or **Set as current** by users.

**NOTE:** To activate new profiles the camera must be restarted.

### Creating new profiles

New profiles can be created according to the followings:

1. Click **Create new** on the 'Profiles' page.
2. Customize the new profile by setting the parameters of the 'HTTP server', 'Hardware layer' and 'Live view setup' menus.
3. Enter a name for the new profile and click **Save**.

**NOTE:** Maximum 32 different profiles can be created.

### Export profiles

Settings of camera profiles can be saved into a .tar.gz file, ready to be uploaded to other ParkIT cameras. The name of the file will contain the exact date and time of exporting as follows: `yyyymmdd_hhmmss.tar.gz`

E.g. `20120620_101422.tar.gz`

The saved settings can be uploaded to other ParkIT cameras by browsing the .tar.gz file in the Setup/Update page.

### Export profiles, users and groups

Besides saving all profile settings into a .tar.gz file –just as in case of '**Export all profiles**'–, this option also saves user and group configurations. The result will be a compressed .tar.gz archive as detailed in the previous option and can be uploaded to other ParkIT cameras in the same way.

## Editing Profiles

### HTTP Server Setup

**NOTE:** HTTP Server options (except '**Name of the server**') are read only and cannot be altered by users.

**HTML rootpath:** Path of the static files (HTML pages, images etc.).

**Listen port:** Port used by the web server, the default is 80.

**Max. connected clients:** Maximal number of connected clients (to the web server) at the same time. Maximal value is 64.

**Max. sessions:** Maximal number of sessions at the same time.

**Max. opened modules per session:** Maximal number of opened modules per session at the same time.

**Session timeout (seconds):** Maximal length of a session, max 3600 seconds (60 minutes).

**Filter module:** If defined, then queries are only transferred to the module specified here.

**Default module:** If no module with the specified name/type has been found, then the module specified here is called.

**Name of the server** (title of the website): Text appearing in the address bar of the browser.

Click **Save** to save the settings.

## Hardware Layer Setup

### Capturing

#### Image capturing frequency of the sensor:

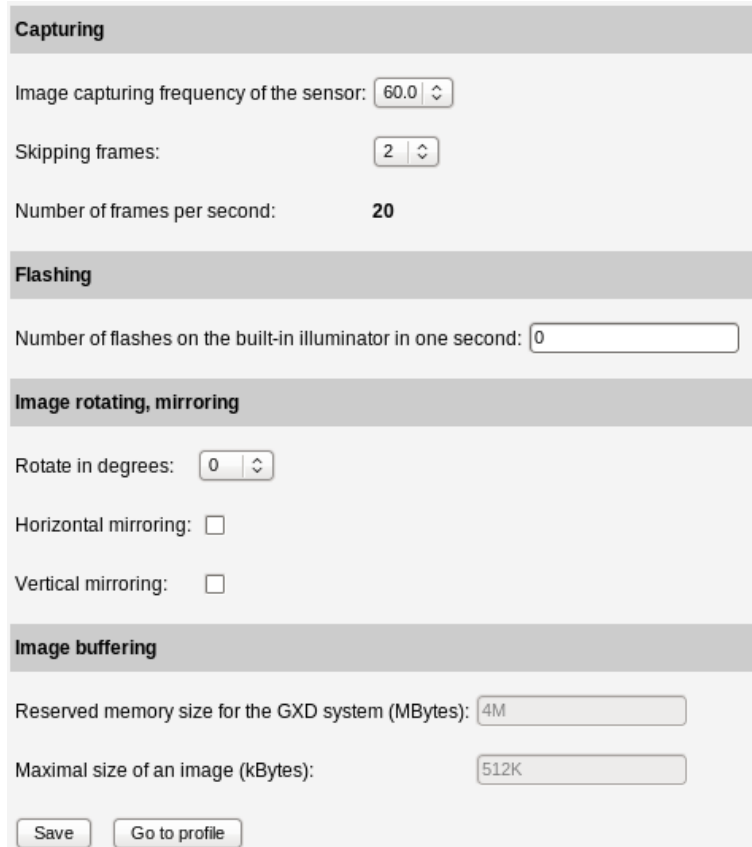
The image capturing frequency of the sensor determines the number of frames the sensor captures in one second. Note that the actual number of frames processed by the camera can be further reduced with the help of the **Skipping frames** and **Number of skipped frames** (see next chapter) options.

This option can be used for reducing mains flickering –caused by artificial light sources– on the camera image. By this value, the camera can be synchronized to the mains frequency of its environment (230V@50Hz or 110V@60Hz).

**Skipping frames:** Frames captured by the sensor can be skipped and omitted from processing.

- 0 = no skipping, the system processes all images
- 1 = every second frame is processed
- 7 = every eighth frame is processed (it drops 7 frames than keeps one)

**Number of frames per second:** This option calculates the actual FPS value from the **Image capturing frequency of the sensor** and the **Skipping frames** values.



The screenshot shows a configuration interface with the following sections and controls:

- Capturing:**
  - Image capturing frequency of the sensor: 60.0 (dropdown)
  - Skipping frames: 2 (dropdown)
  - Number of frames per second: 20 (text)
- Flashing:**
  - Number of flashes on the built-in illuminator in one second: 0 (text)
- Image rotating, mirroring:**
  - Rotate in degrees: 0 (dropdown)
  - Horizontal mirroring:
  - Vertical mirroring:
- Image buffering:**
  - Reserved memory size for the GXD system (MBytes): 4M (text)
  - Maximal size of an image (kBytes): 512K (text)
  - Buttons: Save, Go to profile

### Flashing

**Number of flashes on the built-in illuminator in one second:** Flashing frequency of the illuminator.

### Image rotating, mirroring

The system is capable of rotating and mirroring images.

- **Rotate in degrees** (0 or 180). Camera image rotation in degrees.
- **Horizontal mirroring:** If ticked then horizontal mirroring is enabled.
- **Vertical mirroring:** If ticked then vertical mirroring is enabled.

### Image buffering

**NOTE:** Image buffering parameters are read only.

**Reserved memory size for the GXD system (Mbytes):** Maximal size of memory for the system. The rest of the memory is used as image buffer. This memory is dynamic, if the system needs more memory it allocates for itself automatically.

**Maximal size of an image:** Max. size of images in the camera memory.



## Live View Setup

The camera is capable of streaming live image with four parallel configurations. Number of configurations to be used can be set at **Number of servers** (default: 1). Settings for each configuration can be specified in the corresponding **Server** sections.

### Server options:

**Port of the server:** Default: 9901.

**Number of skipped frames:** The number of frames reduced at the **Skipped frames** option on the *Hardware layer setup* page can be further divided here by omitting frames from the image stream.

### Type of the container:

- MJPEG (only if the image channel is set to live image)
- JPEG sequence (only if the image channel is set to live image)

**NOTE:** JPEG sequence stream cannot be viewed in browsers.

Server 1	
Port of the server:	<input type="text" value="9901"/>
Number of skipped frames:	<input type="text" value="0"/>
Image channel:	<input type="text" value="Camera image"/>
Type of the container:	<input type="text" value="MJPEG"/>
Maximum number of simultaneous connections:	<input type="text" value="2"/>
Idle connection limit (in milliseconds):	<input type="text" value="10"/>
Frame limit (zero is infinity):	<input type="text" value="0"/>
Connection time limit (zero is infinity):	<input type="text" value="0"/>
Frame buffer (number of frames):	<input type="text" value="5"/>

**Image Channel:** The source of images the camera transmits can be of two types: Camera image and Motion detection image.

**Maximum number of simultaneous connections:** Default: 2.

**Idle connection limit (in milliseconds):** Default: 10.

**Frame limit:** Connection is closed as the number of frames the camera has sent reaches this value. Default: 0 (0 = no limit).

**Connection time limit:** Connection is closed after this time is up. It represents the maximal length of connection time in seconds. Default: 0 (0 = no limit).

Values are applied after clicking **Save**.

## Users

**NOTE:** At the first occasion, the camera automatically starts with administrator rights. In order to create new users and groups, a user with 'admin' privileges must be created first.

Settings related to users can be managed on this page. The camera handles users on five different access levels (detailed below). Users can be deleted and edited with the corresponding buttons. Note, that edited user settings will be applied only after restarting the camera.

### Adding new users

New user profiles can be created after clicking on **Add new user**. In the appearing form, data of the new user must be provided into the corresponding fields.

**Access level of the logged out users:** The camera can be enabled to be accessed by users who are not logged in. The access level of such users can be set up by this option.

**NOTE:** Users with 'Guest' access level cannot be created; this access level can be set up as 'Access level of the logged out users'.

**Change password of the 'root' user:** Password of the Administrator level user can be changed here.

**NOTE:** Only numbers and the letters of the English alphabet can be used in passwords and user names. Settings are applied after clicking **Save**.

### Access levels of the ParkIT camera

Access level	Privileges
Guest	no privileges, only login page
Viewer	live view help log in/out
Normal user	live view help login/log out easy setup advanced setup motion detection event manager diagnostics/camera log certain steps of the Configuration Wizard (see page 5)
Power user	live view help login/log out easy setup advanced setup event manager diagnostics/camera log profiles restart Configuration Wizard
Administrator	access to every camera feature

## Date and Time

Manage date and time settings of the camera easily on this page according to the followings:

### Setting camera time

#### I. Manually

Type the **Date** and **Time** values into the corresponding checkboxes then click **Set these values**.

#### II. Automatically

##### a) Adopt the time of the PC

Click **Get the time of the PC** to adopt time and date settings of the PC connected to the camera then click **Set these values**.

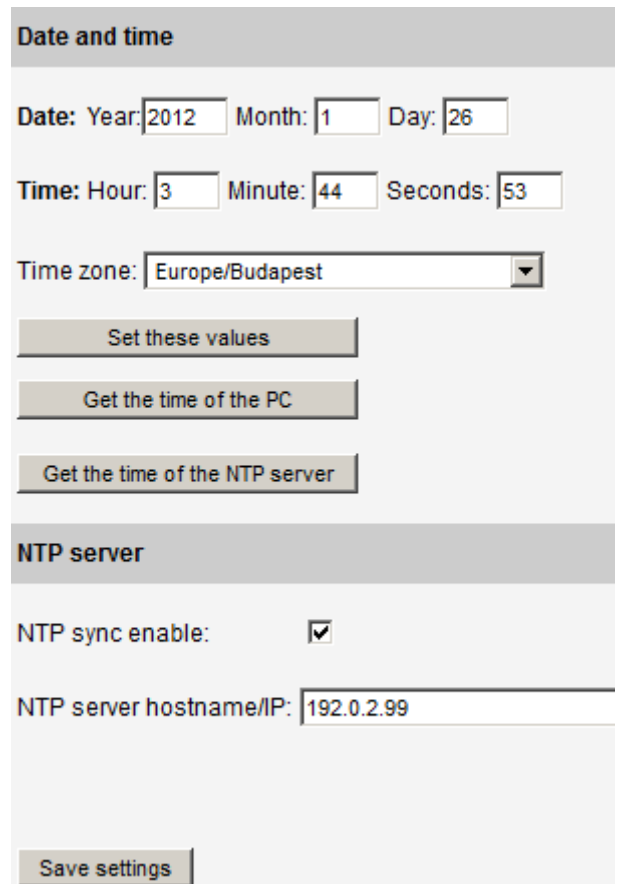
##### b) NTP synchronization

NTP synchronization is supported to ensure accurate time consistently on the camera.

1. Enable NTP synchronization (tick **NTP sync enable**).
2. Enter the hostname or IP address of an NTP server into the **NTP server hostname/IP** field.
3. Click **Save settings** to apply changes (a short camera restart is necessary).
4. Click **Get the time of the NTP server**.
5. Click **Set these values**.

Use **Time Zone** option to set the time zone according to your region. Click **Set these values** to apply new time zone.

**NOTICE:** The camera has an internal battery feeding its Real Time Clock (RTC) while the camera is powered off. If this battery is low or down then the camera clock is reseted every time it is disconnected from power. In case of such a problem, contact ARH Support Team.



## Network Setup

**Hostname:** The host name of the camera has to be entered into this field.

The camera can operate in **DHCP** mode in which the camera queries the **IP address, Netmask, Gateway, Primary DNS IP** and **Secondary DNS IP** from the server. Otherwise, these values have to be set by the user.

### IP version 4 and 6

The camera supports IPv4 and IPv6. Both versions can be enabled simultaneously, but at least one version must be set. When using IPv4, the IP address for the camera can be set automatically via DHCP, or a static IP address can be set manually. Note that only IPv6 fixed IPv6 addresses are supported.

**NOTE:** In case of IPv6 addresses **/16** stands for the length of the subnet mask (16 refers to an 8 character long mask).

Settings are applied after clicking on **Save**.

Hostname:

DHCP:

**IPv4 settings**

IP address:

Netmask:

Gateway:

Primary DNS IP:

Secondary DNS IP:

**IPv6 settings**

IP address:

Primary DNS IP:

Secondary DNS IP:

## Easy Setup

### Image

**Focus** - Manual focus adjustment. Set focus to make the camera image sharp.

**Start Autofocus** - By autofocus, the camera adjusts focus automatically until it detects that the camera image is sharp. Autofocusing may also include automatic brightness adjustment if the brightness of the camera image is not satisfactory for the autofocus process.

**Zoom** - Manual zoom adjustment. Set zoom to reach the intended camera view.

**BrightNow!** - The BrightNow! function automatically adjusts gain, shutter and iris to achieve the selected target value (Brightness target). With the help of BrightNow!, the optimal brightness of the camera image can be reached quickly but less accurately. When the target level is reached, the camera switches back to the previously set autobrightness mode.

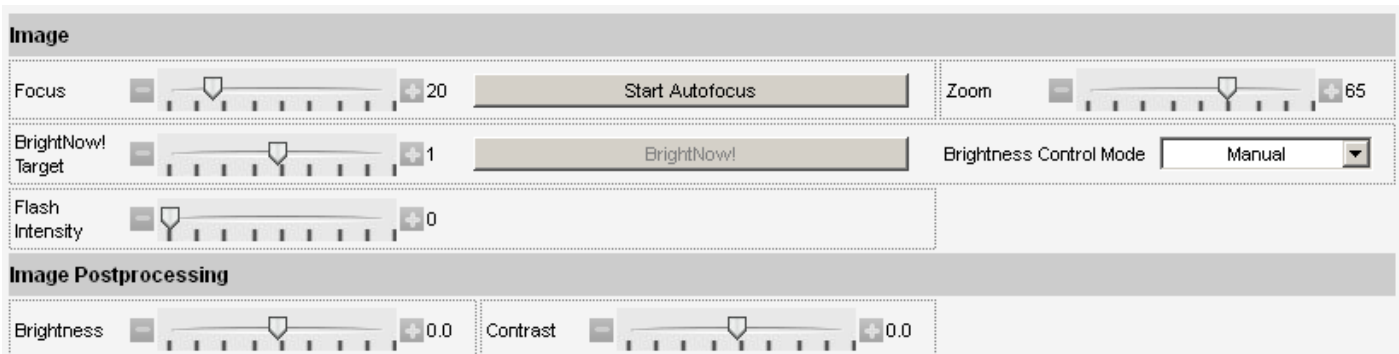
**Brightness target** - The following automatic brightness strategies set and maintain the value set here.

**Brightness Control Mode** - Strategy of the brightness controller

- **Manual** - In manual mode, the values of gain, shutter and iris can be adjusted manually.
- **ANPR** - Strategy appropriate for ANPR camera purposes The ANPR strategy does not let any pixels to burn out.
- **Overview** - Strategy appropriate for overview camera purposes. This mode allows some pixels to burn out.
- **Quick** - The Quick controller method adapts to the brightness changes of the camera environment quickly. This strategy is suitable for special overview purposes.

**NOTE:** Flash intensity cannot be adjusted in case of 1.3MP camera models.

**Flash Intensity:** - The light intensity of the camera's built-in infrared illuminator can be set by this option. Note that prolonged direct exposure to infrared light can cause permanent damage to the eye!



### Image Post Processing

**NOTE:** For more information on the parameters, see Advanced Setup description below.

**Brightness** - Brightness of the camera image can be adjusted manually.

**Contrast** - Contrast of the camera image can be adjusted manually.

## Advanced Setup

### Image Setup

**Gamma** - Gamma correction used on the camera image.

**Brightness** - Brightness of the camera image can be adjusted manually.

**Contrast** - Adjust this control to change the contrast of the camera image.

**Whitelevel** - Defines the highest pixel value that will be mapped to white. This will be the ending point of the gamma curve. Values between 0 and 1.0 are valid.

**Black level** - Defines the lowest pixel value that will be mapped to black. This will be the starting point of the gamma curve. Values between 0 and 1.0 are valid.

**NOTE:** Incorrect whitelevel and blacklevel values may cause entirely black or entirely white camera image. In such cases, reset the whitelevel and blacklevel values to default (whitelevel=1 and blacklevel=0) to restore the camera's live view. See [Appendices](#) to inspect the effect of adjusting the main image properties.

**Compress Rate** - The quality of the captured images can be set. The lower this value is, the better the quality of the images will be. Note, that images of better quality are greater in size therefore, they increase network load. For that reason it is not recommended to set this value below 20. The network transmission must not go over 40 MBit (~4MByte/sec), so the image quality should be chosen according to this.

E.g. if the size of an image is 35 kBytes and the images are transmitted with 30 FPS, it means:  $35 \times 30 \text{ kBytes/s} = 1050 \text{ kBytes/s} \sim 1 \text{ MByte/s}$ .

Image Setup	Brightness Control	Optics Control	Flash Control
Gamma <input type="range" value="1.0"/>	Brightness <input type="range" value="0.0"/>	Contrast <input type="range" value="0.0"/>	
Whitelevel <input type="range" value="1.0"/>	Blacklevel <input type="range" value="0.0"/>	Compress Rate <input type="range" value="20"/>	
Wb Red <input type="range" value="0.0"/>	Wb Green <input type="range" value="0.0"/>	Wb Blue <input type="range" value="0.0"/>	
Saturation <input type="range" value="0.0"/>	Color Compensation <input type="text" value="Off"/>		
Default Settings		Previous Settings	

#### Parameters for Color Cameras Only

**Wb. Red, Wb. Green, Wb. Blue** - Red, green and blue channel gains.

**Saturation** - The intensity of colors can be adjusted by saturation. See appendices to inspect the changes of saturation value.

**Color compensation** - Color correction can be used to achieve the best color fidelity in captured images by compensating the color of the dominant light source illuminating the scene. The following options can be set for different light sources:

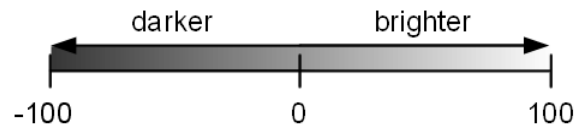
- Incandescent tungsten, (CCT=2865 K)
- Cool White Fluorescent, (CCT=4300 K)
- Mid-morning Daylight, (CCT=5500 K)
- Overcast Sky, (CCT=6000 K)
- Average Summer Sunlight, (CCT=6500)
- North daylight, (CCT=7500 K)
- Auto - Auto compensation
- Off - No light source compensation

Settings can be reseted to the defaults by clicking on **Default Settings**.

## Brightness Control

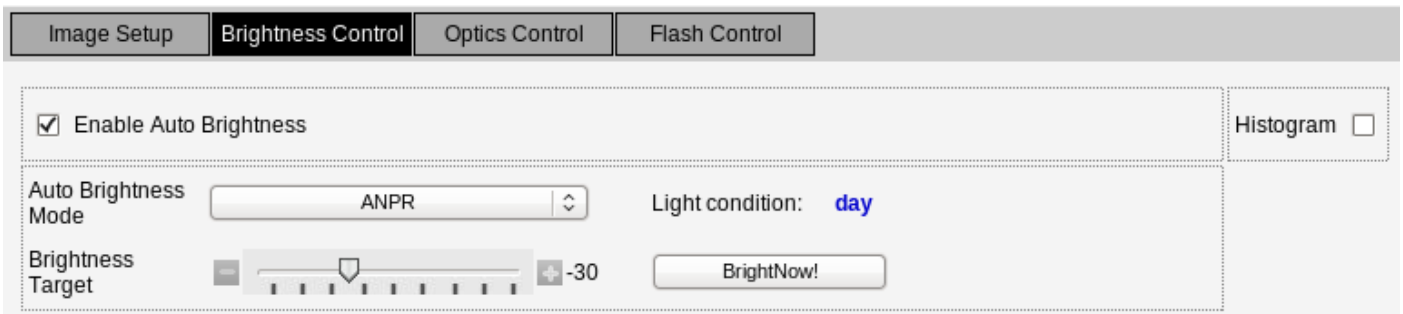
**Enable Auto Brightness** - If auto brightness is enabled, automatic strategies are used to adjust the brightness of the camera image.

**Brightness Target** - The following automatic brightness strategies set and maintain the value set here.

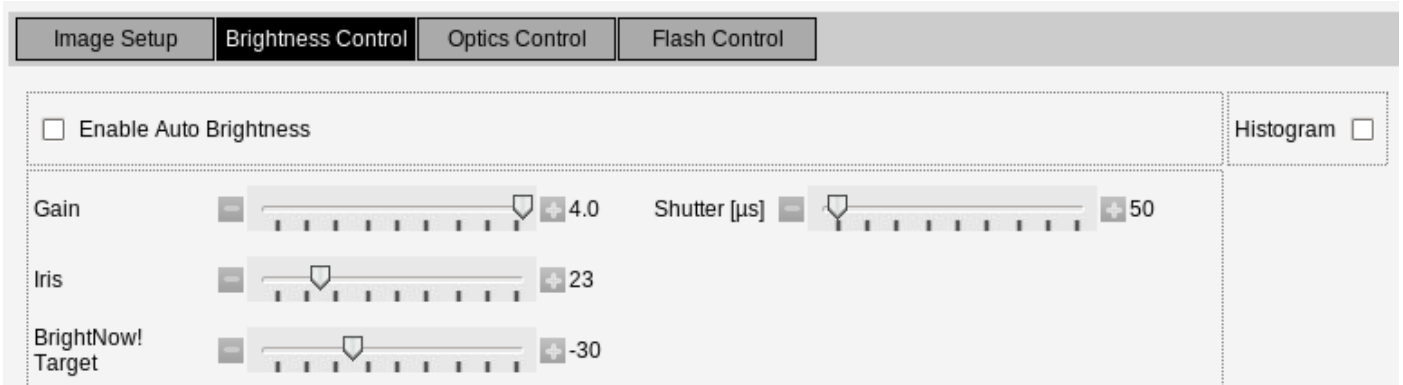


- **Manual** - In manual mode, the values of gain, shutter and iris can be adjusted manually.
- **ANPR** - Strategy appropriate for ANPR camera purposes The ANPR strategy does not let any pixels to burn out.
- **Overview** - Strategy appropriate for overview camera purposes. This mode allows some pixels to burn out.
- **Quick** - The Quick controller method adapts to the brightness changes of the camera environment quickly. This strategy is suitable for special overview purposes.
- **Parking** – this strategy is appropriate in case of slow motion vehicles (from firmware version 1.12.0.22). The iris can not be altered in this strategy.

**Auto Brightness Mode** - The current strategy is displayed and can be selected here.



**Light condition** - Brightness settings can be set for day and night light conditions respectively. The light condition returns the value **day** or **night** based on the camera light sensor.



**Gain** - Gain is the extent to which the strength of a video signal is boosted. Note that high gain values result in noisy images.

**Iris** - Iris is a mechanical device that controls the amount of light reaching the sensor. If 0 then no light can pass through to the camera sensor.

**Shutter** - Controls the length of exposure time. Too high shutter values may result in blurred images.

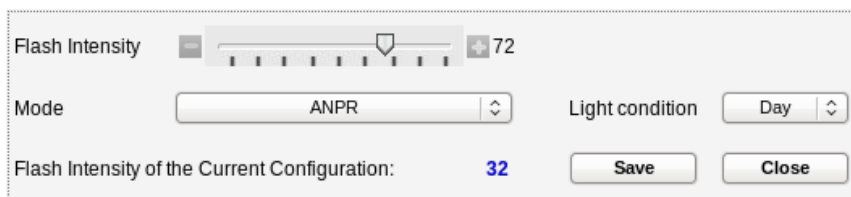
**Histogram** - Enable it to draw image histogram on the camera view.

**BrightNow! Target** - The BrightNow! function automatically adjusts gain, shutter and iris to achieve the selected target value. With the help of BrightNow!, the optimal brightness of the camera image can be reached quickly but less accurately. When the target level is reached, the camera switches to the previously set mode.

**NOTE:** Flash Intensity cannot be adjusted in case of 1.3MP camera models.

**Flash Intensity** - The light intensity of the camera’s built-in infrared illuminator can be set by this option. Note that infrared light can severely damage the human eye. Do not look into the light source directly.

**Set** - Click **Set** to assign different Flash Intensity values for each Auto brightness mode respectively, according to the followings:



1. Select the Auto brightness mode and Light condition to which you want to assign a Flash intensity value (at **Mode** and at **Light condition**).
2. Set the desired Flash Intensity value (at **Flash Intensity**).
3. Click **Save**.

As a result of this procedure, the set Flash Intensity values will be applied for the assigned Mode and Light condition automatically when changing Auto brightness mode.



## Configure Parking Brightness Control

The following HTTP requests are available from firmware version 1.12.0.22.

With the *camera IPaddress/plainconfig/parkingbc.htm* HTTP request all parameters related to the brightness control of the parking mode can be displayed.

The name of the parameter, its measure, minimal and maximal value (parameter value limits), the default value, step and the attribute (whether it is writeable or read only) can be seen here.

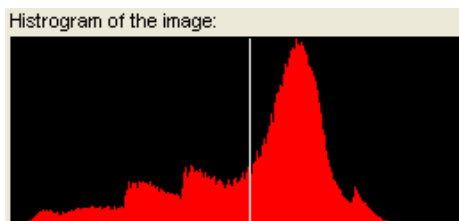
### Parameters of the Parking mode:

**Target** – target of the control. Thresholds: dark image (-100) or bright image (+100). See **BrightNow! Target**.

**Hysteresis [%]** – determines the boundaries of the tolerance interval. If the median falls out of this interval the control starts.

**Mode** – 0: the control is turned off  
1: night mode  
2: day mode

**Median** – Read only parameter. An index number that is intended to provide information on how dark or bright is an image. The median separates the amount of dark pixels from the bright pixels equally on the histogram. On the image below the median is indicated with a white line in the middle of a histogram. To provide an excellent image quality, in an ideal case the value of the median should be between 85 and 100.



**Burn** – Read only parameter. Number of burned out pixels.

**Nsteps** – Read only parameter. Number of interventions from the camera start.

**Iris\_min** – minimal iris value

**Iris\_max** – maximal iris value

**Iris\_step** – extent of the steps

**Gain** – gain value for image capturing

**Shutter** – value of shutter in  $\mu\text{s}$

**Gamma** – gamma correction on the camera image

**Daynightcut** – under this rate the control does not take effect (the environment is too dark, to reach the target)

**Daynighthist** – it determines the range around the *daynightcut*, which influences the day/night transition.

For example: if the *daynightcut* is set to 70 and the *daynighthist* is set to 5, if the value reaches 65 the day mode will turn into night mode and in case of 75 the night mode will turn into day mode. In this way the status will not alter between the boundaries.

**Auto\_filter** – responsible for the filter switch

1: IR/Cut is turned on in day mode

2: All pass filter is turned on in night mode

**Auto\_modesw** – switching of the modes

1: the switching is automatic

0: stays in a previously set mode

**Ledpc\_day** – Flash Intensity at daytime

**Leddiff\_day** – odd/even flashes at daytime. See Frame Parity Flashing

**Ledpc\_night** – Flash Intensity at night

**Leddiff\_night** – odd/even flashes at night. See Frame Parity Flashing

**Main\_loop\_sleep** – determines the frequency of the control algorithm in milliseconds. How often should the control algorithm run.

**Snap\_iris** – if it is turned on and the user sets an iris value that falls outside the previously set iris\_min and iris\_max threshold, the control restore it into these boundaries.

The set parameters can be accepted by the **[Set]** button.

If the set parameter is incorrect (falls out of the MIN – MAX range), a standard error code will appear next to the **[Set]** button of the parameter:

		MIN	MAX	DEFAULT	STEP	ATTRIBUTE	
mode	<input type="text" value="3"/> [mode]	0	2	1	1	rw	<input type="button" value="Set"/> <b>ecode: -22</b>

### Configure Brightness Control Limits

The *IP address/plainconfig/bclimits.htm* HTTP request provides settings belonging to the current mode (Anpr, Overview, Quick [Indoor]).

The below parameters specify when the camera has to switch between the day and night modes.

**Mode:** the mode – of which the brightness control limits has to be configured – can be selected

Configure Brightness Control Limits

Mode  Section

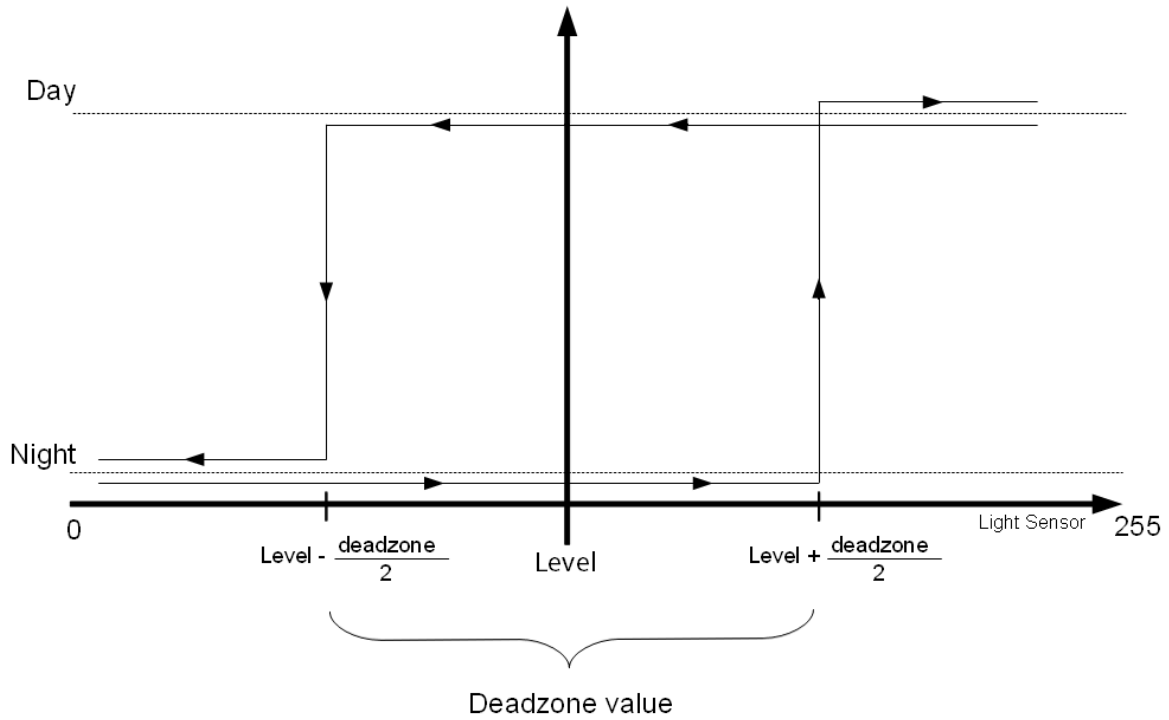
		MIN	MAX	DEFAULT	STEP	ATTRIBUTE	
level	<input type="text" value="40"/> [DAC]	0	255	40	1	rw	<input type="button" value="Set"/>
deadzone	<input type="text" value="10"/> [DAC]	0	128	10	1	rw	<input type="button" value="Set"/>
seconds	<input type="text" value="60"/> [s]	0	3600	60	1	rw	<input type="button" value="Set"/>

**Section:**

*daynight*

Level – value of the light sensor

Deadzone – the **Figure1** intended to illustrate this parameter



**Figure1**

Seconds – minimum waiting time between switches.

In the *day\_limits* and *night\_limits* sections the user can define the limits between which the control should operate.

## Optics Control

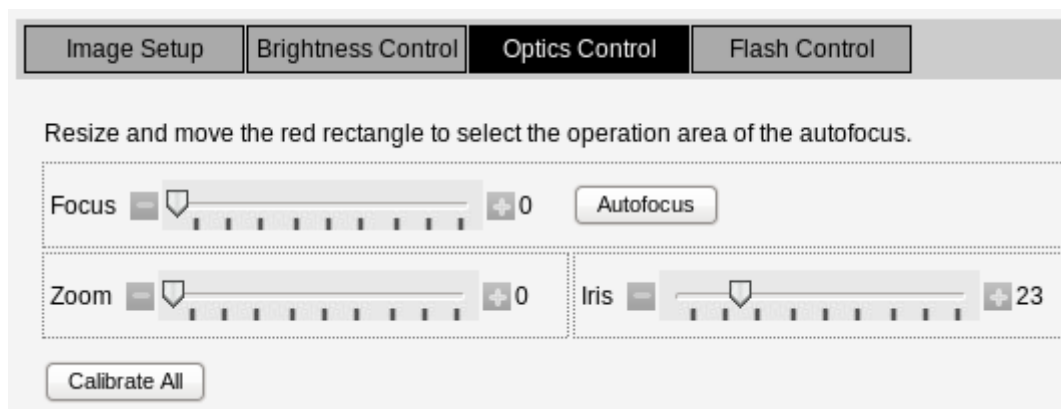
**Focus** - Manual focus adjustment. Set focus to make the camera image sharp.

**Autofocus** - By autofocus, the camera adjust focus automatically until it detects that the camera image is sharp. Auto-focusing may also include automatic brightness adjustment if the brightness of the camera image is not satisfactory for the auto-focusing process.

**NOTE:** The camera is capable of focusing to a specified area within its view (e.g. on a license plate). Move and resize the red rectangle on the camera image to set this area for the autofocus.

**Zoom** - Manual zoom adjustment. Set zoom to reach the intended camera view.

**Iris** - Iris is a mechanical device that controls the amount of light reaching the sensor. If 0 then no light can pass through to the camera sensor.



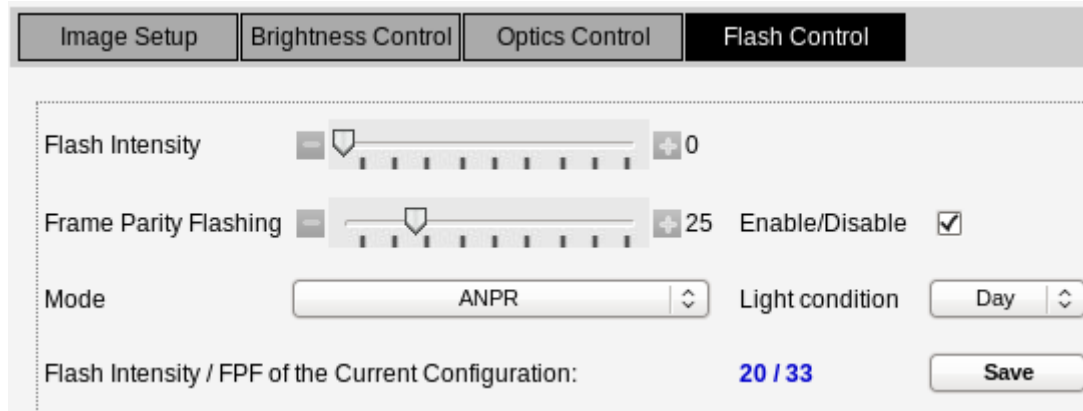
**Calibrate All** - Use this button for focus, zoom and iris calibrations. The motorized optics can be operated in finite many steps. Calibration means rescanning the entire range of the optics to measure the exact position and length of control to compensate deviations (if there are any). If the auto brightness is enabled the iris cannot be altered. If this button does not appear, it means that your device has not to be calibrated.

**Filter** - This parameter is available only for cameras equipped with filter switchers. The state of a filter switcher can be of two types:

- **All pass** - The filter passes both visible and infrared light, use this setting when infrared illumination is present and necessary (typically at nighttime capturing).
- **IR cut** - The filter cuts out infrared light to maintain color fidelity on color images.

## Flash Control

In the Flash Control section, various parameters of the camera illumination can be set.



If one of the automatic brightness control modes is active, its flashing parameters can be adjusted and saved here.

**Flash Intensity:** By this parameter, the light output of the camera illuminator can be adjusted.

**NOTE:** In case of 1.3MP camera models, adjusting **Flash Intensity** and **Frame Parity Flashing** are not supported – they can only be turned on/off.

If **'Enable/Disable'** is **not selected**, this value stands for the illuminating light output for all frames. Otherwise, this value is valid on even frames only.

### Frame Parity Flashing

**NOTE:** The use of this function is required only under such special circumstances when the recognition of both reflective and non-reflective number plates is necessary.

This option can be used to setup the camera for reading both reflective and non-reflective license plates. This task is realized by switching to lower and higher light output between odd and even frames. With this illuminating technique, the camera captures images with more and less intensive illumination. The former images will be suitable for the recognition of non-reflective license plates, while the latter ones are for reflective plates.

If 'Enable/Disable' is selected, this value stands for the illuminating light output for odd frames and is represented as a percentage of the Flash Intensity value.

E.g. if Flash Intensity is set to 50 and Frame Parity Flashing is set to 20 then the camera will flash with 50% power on even frames and 10% (20% of the 50%) on odd frames.

**NOTE:** To assign Flash Intensity and Frame Parity Flashing values for brightness modes/light conditions, check 'Enable Auto Brightness' on the Brightness Control Tab.

**Flash Intensity / FPF of the Current Configuration:** This option represents the saved Flash Intensity and Frame Parity Flashing values saved for brightness mode and light condition set at **Mode** and **Light condition**.

By clicking on **Save**, the set Flash Intensity and Frame Parity Flashing values are saved to the set **Mode** and **Light condition**.

## Motion Detection

**NOTE:** This feature has to be ignored in case of using LetUgo automated entry and exit control software product. With the help of the hardware motion detector, the camera is capable of detecting motions in image streams based on the pixel differences between consequent frames. This motion detector can be customized for different purposes through its settings detailed below and can be used to launch trigger events on motions.

**Actual View** - In **Motion detection view**, the live camera image can be seen to help to setup motion detection. Note that this view is intended to help the setup process, the quality of the image stream is not appropriate for other purposes.

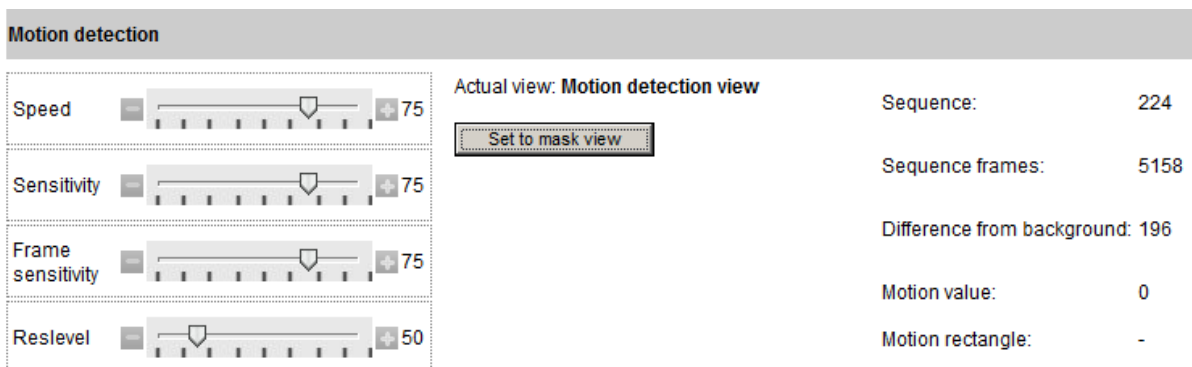
When clicking **Set to mask view**, the mask toolbar (detailed below) appears.

**Speed** - By setting the speed of the motion detector, it can be specified that how fast pixel changes should be considered as motions. If this value is set too low then slow ambient brightness changes (e.g. cloudy/sunny weather) may be considered as motion. If set too high, even a lightning can trigger signaling motion.

**Sensitivity** - By sensitivity, it can be set that what extent of pixel changes of the camera image should be considered as motion. If low, then minimal pixel changes are sufficient to cause motion, if high, only great pixel changes initiate motion.

**Frame sensitivity** - Sensitivity of the motion detection frame.

**Reslevel** - Motion limit. The extent of pixel changes below which the detected motion is ignored (the 'motion' text does not appear).



Parameter	Value
Speed	75
Sensitivity	75
Frame sensitivity	75
Reslevel	50
Actual view	Motion detection view
Sequence	224
Sequence frames	5158
Difference from background	196
Motion value	0
Motion rectangle	-

**Sequence** - Images containing motion are arranged into sequences. These sequences have unique IDs.

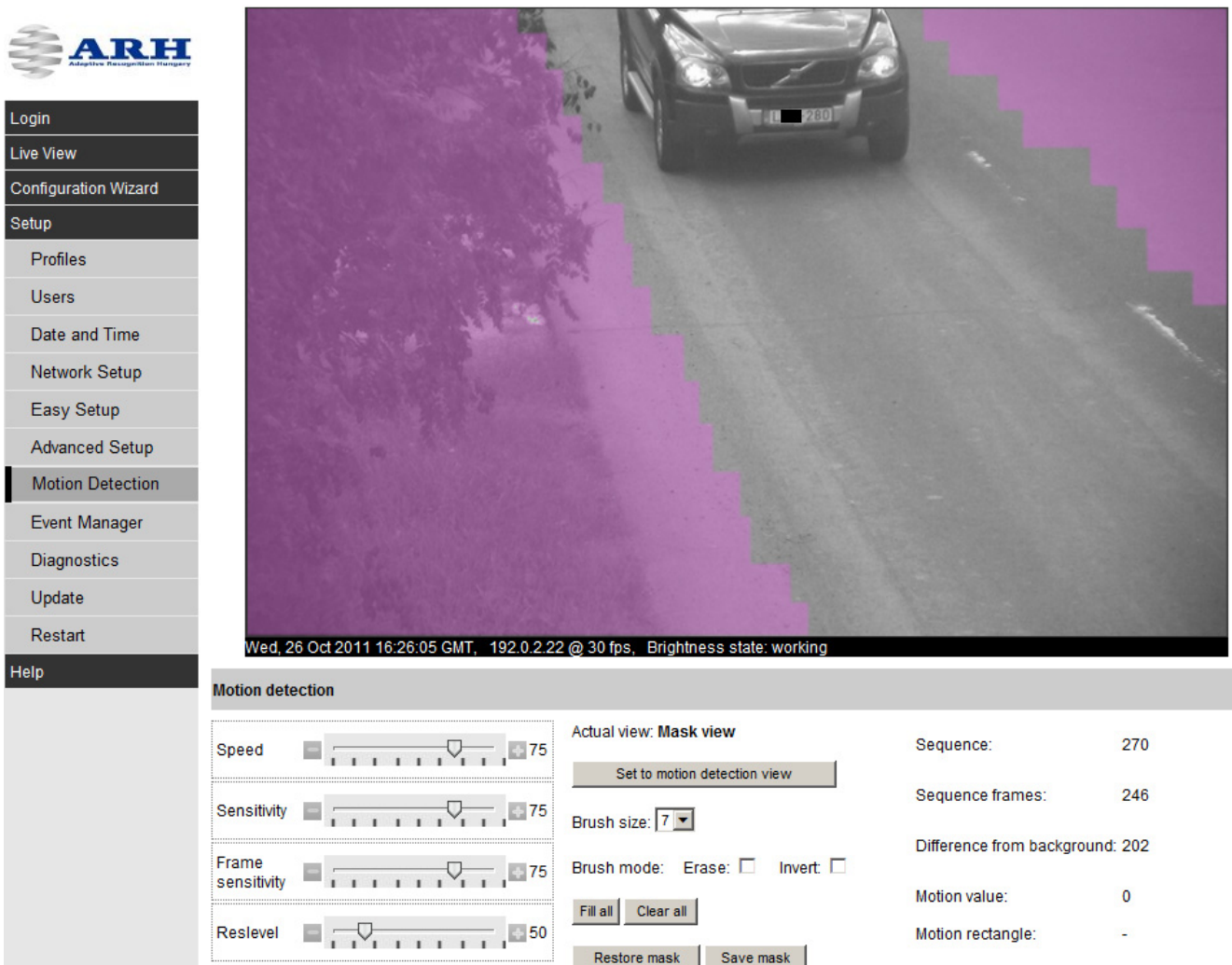
**Sequence frames** - The index of frames within the sequences.

**Difference from background** - This value represents the extent of difference between the previous and the current image. The higher this value is the more motion has occurred.

**Motion value** - This value shows the extent of motion on the current image. This value is based on the sensitivity, speed and difference from background.

**Motion rectangle** - The area in which motion has occurred is framed by a motion rectangle defining the place of motion in the image. This option returns the coordinates of the motion rectangle.

**Masking** - With the help of image masking, certain parts of the camera view can be ignored by the motion detector. This feature is designed for situations when not the entire camera image is interesting for triggering (e.g. if the camera covers two lanes but only one of them is observed by the user).



The screenshot shows the ARH web interface. On the left is a navigation menu with options: Login, Live View, Configuration Wizard, Setup (highlighted), Profiles, Users, Date and Time, Network Setup, Easy Setup, Advanced Setup, Motion Detection (highlighted), Event Manager, Diagnostics, Update, Restart, and Help. The main area displays a camera view of a car on a road, with a purple mask covering the left side. Below the camera view is a 'Motion detection' control panel with sliders for Speed (75), Sensitivity (75), Frame sensitivity (75), and Reslevel (50). It also includes buttons for 'Set to motion detection view', 'Brush size' (7), 'Brush mode' (Erase and Invert checkboxes), 'Fill all', 'Clear all', 'Restore mask', and 'Save mask'. On the right side of the control panel, there are status indicators: Actual view: Mask view, Sequence: 270, Sequence frames: 246, Difference from background: 202, Motion value: 0, and Motion rectangle: -.

### Creating mask

1. Click **Mask View**.
2. Select the **Brush size** (the amount of pixels to be masked on one click).
3. Move the mouse cursor on the camera image and click on the area to be masked. Repeat this step as many times as necessary to mask the desired area(s).
4. Click **Save Mask**.

### Modifying mask

#### A. Erase

- ▶ Click **Clear All** to delete the entire mask.
- ▶ Check **Erase** and click on the masked area(s) to be deleted.

#### B. Fill

Mask the entire camera image by clicking on **Fill All**.

#### C. Invert

When selecting invert, masked areas can be erased and unmasked areas can be masked by simple mouse clicks. The size of the brush can be adjusted in case of inverting as well.

#### D. Restore

Return to the previously saved mask by clicking on **Restore Mask**.

## Event Manager

The camera can be set up to execute tasks on various occasions (e.g. to upload images when it detects motion). These occasions are called **triggers** (in the above example: the detection of motion) while executed tasks are called **trigger tasks** (in the example: uploading images). Currently, one trigger task (uploading images) is provided with the camera, but adding further tasks is possible.

The Event Manager is responsible for deciding at each time instant if the prescribed trigger task should be executed. This decision is based on the state of the trigger sources at the given time instance.

### Trigger sources

A trigger source has two states: asserted and not asserted. Being asserted means being active. A trigger source may have multiple outputs: this is like having multiple instances of the same trigger source (each may be configured differently), but handling them together.

Basically, trigger sources can be of two types:

- external trigger: signals arriving from the trigger input or the user UART of the camera, triggers sent from the client software programmatically or manually (by clicking on the button on *Software Trigger* page)
- internal trigger: the motion detector of the camera, or scheduled (see **Configure Scheduler**) by the user

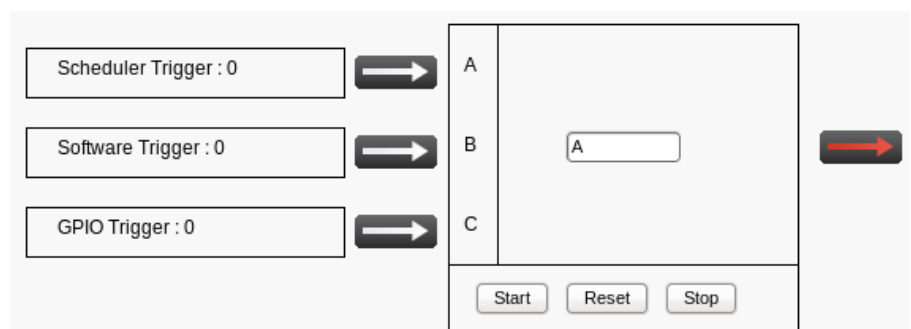
By default, there are five trigger sources:

- Hardware Motion Detection
- Software trigger
- UART trigger
- GPIO trigger
- Scheduler trigger

Every trigger source can be assigned with a letter (capital letters of the English alphabet from A to V, see figure below). When configuring through the web interface, it is done automatically. The Event Manager will identify the trigger source using this letter. The trigger sources to be used can be selected by registering them with the Event Manager.

### Simple events

In the simplest case, the execution of the trigger task depends only on one trigger source. In this case, by simply writing the letter of a trigger source into the formula box, trigger event (upload set on the upload page) occurs when trigger signal arrives on the source associated with letter. E.g. if the UART trigger is assigned with the letter C and C is written to the formula box (see figure) upload will occur on trigger signals arriving through UART. It is not even necessary to register any other trigger source in this case.





The formula is applied (marked with green arrow after the formula box) right after clicking **Start** and can be invalidated (marked with red arrow after the formula box) by the **Stop** button. When clicking **Reset**, all the registered sources are deleted.

### Complex events

In case of complex events, upload depends on more than one trigger sources. To express relationships between the sources, logical operators can be used. Available logical operators: AND(&), OR(|), NOT(!).

You can use two shorthands 'any' and 'each', which mean 'launch trigger task if *any* of the registered sources is asserted' and 'launch trigger task if *each* of the registered sources is asserted' respectively.

#### Example A:

Let '**A&B**' be set where:

- A is the Hardware Motion Detector
- B is the Scheduler

This setup may correspond to a situation where traffic monitoring is only necessary at some times of the day: e.g. we want to upload images containing motion e.g. from 6 to 11.

With this setup, the trigger task (uploading of images) will be executed only when both the Scheduler and the Hardware Motion Detector are asserted, so, **both** trigger signals at the same time are necessary to start uploading.

#### Example B:

Let '**A | B**' be set where

- A is the Hardware Motion Detector
- B is the GPIO trigger

This setup may correspond to a scenario where an inductive loop is used to send triggers (through GPIO) when it detects motion and the camera Hardware Motion Detector is also used to support the loop (in case of pedestrians or vehicles that can be barely detected by the loop (e.g. bicycles). If '**A | B**' is set then upload occurs when a trigger signal arrives on the GPIO or from the Hardware Motion Detector or both, so, **either** trigger signal is sufficient to start uploading.

Brackets can also be used in the formulas to express complex relationships:

Let '**(A | B) & !C**' be set where

- A is the Hardware Motion Detector
- B is the Scheduler
- C is the UART trigger

In this case, trigger event occurs only if

1. motion is detected
2. the Scheduler trigger is asserted
3. trigger signal does not arrive on the UART

} at the same time.

**NOTE:** Spaces are not allowed in formulas.

## Software Trigger

By using the software trigger source, triggers can be sent to the camera either from user applications or using the **Send Trigger** button on the web interface. The time of trigger start and trigger end can be brought forward or delayed by **Start offset [ms]** and **End offset [ms]**. Settings are applied after clicking **Submit**.

## UART Trigger

The camera can be triggered through its UART. Besides the common UART properties (baudrate, byte size, parity, number of stop bits) the communication protocol can also be specified here.

An UART trigger event starts with a **Trigger Start Token (TST)** byte, then max. 254 bytes of trigger data may follow, and then it ends with a **Trigger End Token (TET)** byte. The trigger start timestamp will be the system time at the instant the TST arrives, plus the **Start Offset**, while the trigger end timestamp will be the system time at the instant the TET arrives, plus the **End Offset**. Trigger data (including the TST and TET) will be forwarded to the Event Manager along with the image.

It is possible to specify the byte value of the TST (e.g. entering 0x0A means the trigger will begin with a '\n' byte) or check 'Start on first byte', which means, whatever byte comes first or follows the last end token will be the trigger start token.

Trigger task (upload) can be set to be launched at various stages of a trigger signal:

### 1. Level Mode

In case of level mode, trigger task is executed continuously until the end of the trigger signal:



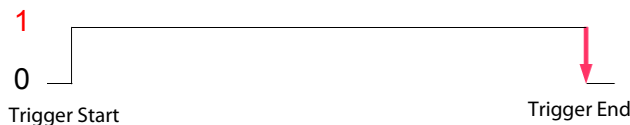
### 2. Rising Edge Mode

In case of rising edge mode, trigger task is executed once, at the moment when the trigger signal arrives:



### 3. Falling Edge Mode

In case of falling edge mode, trigger task is executed once, at the moment when the trigger signal ceases:



## GPIO Trigger

On this page, the general purpose input and output (GPIO) ports can be set.

GP input can be used for triggering. To do this, the sample rate with which the port is sampled must be specified. Note that if a high sample rate is set then erratic behavior may occur due to bouncing. Always use the lowest possible sample rate. The voltage level can also be set that corresponds to the logic '1' level. A constant offset can be added to the assertion (making active) and the de-assertion (making inactive) of the GP input with start and end offset.

**Output:** If ticked, the trigger output of the camera is active. If empty, it is inactive. This is e.g. for opening the barrier.

**Input:** This is e.g. for detecting the arrival of a car. If the trigger input of the camera is active, the bulb is green. It is red when the input is in an invalid state (debouncing failed).

**Sample Rate:** This is for debouncing. The General Purpose Input is sampled with this frequency (e.g. 100 Hz means the voltage on the input pin is measured 100 times in a second.)

**Required samples:** Minimal number of equal valued samples to accept the input as active. E.g. we measure the voltage on the GP input pin a 100 times a second (Sample Rate=100). A 'required samples' value of 10 means that we must measure 'high' voltage consecutively 10 times in order to accept the pin as active, without measuring any 'low' values in between. This parameter is for debouncing as well.


**Logic '1' voltage level:** Defines which voltage value (low or high) represents the logic value of '1', that is when is the trigger input considered to be 'Active' by the camera. E.g. if it is set to 'low', then the input is in a 'high' state by default, and if voltage drops to 'low', a trigger event is generated.

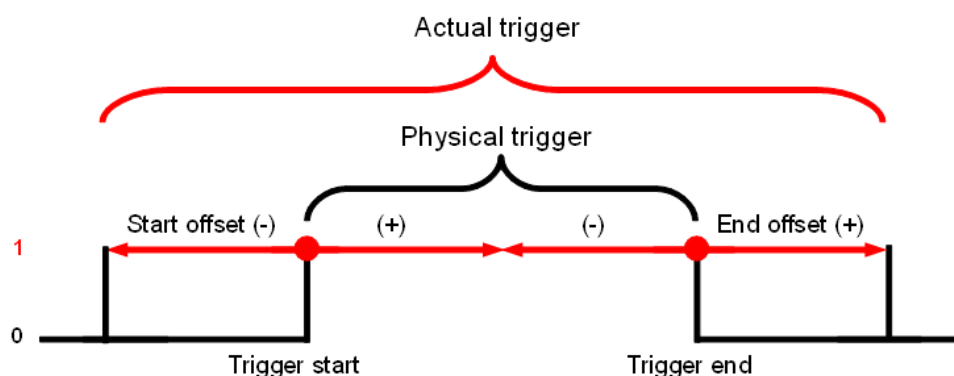
### Start offset [ms]

This amount of delay will be added to the start timestamp of the trigger event. Possible values in milliseconds: -10000 <-> +10000

### End offset [ms]

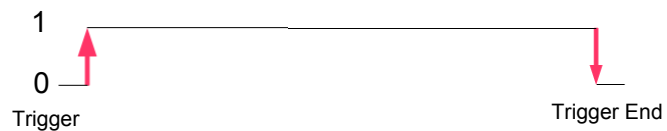
This amount of delay will be added to the end timestamp of the trigger event. Possible values in milliseconds: -10000 <-> +10000

Output	<input type="checkbox"/>
Input	
Sample rate	100 Hz
Required samples	10
Logic '1' voltage level	Low
<b>Output</b>	0
Start offset [ms]	0
End offset [ms]	0
Trigger mode	Rising edge
<input type="button" value="Submit"/> <input type="button" value="Back to Event Manager"/>	



With the help of two outputs, trigger task cannot be launched only on the preconfigured modes (level, rising edge, falling edge -see UART description above) but on 'custom' modes combined from the mentioned ones. E.g. Setting **Output 0** to **Rising edge** and **Output 1** to **Falling edge**, upload can be set to occur on trigger start and trigger end:

Output	1
Start offset [ms]	0
End offset [ms]	0
Trigger mode	Falling edge
<input type="button" value="Submit"/> <input type="button" value="Back to Event Manager"/>	



### Trigger mode

Trigger task (upload) can be set to be launched at various stages of a trigger signal:

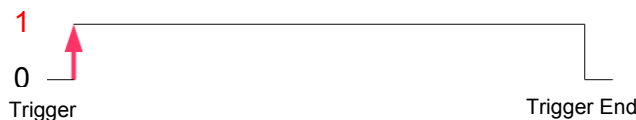
#### 1. Level Mode

In case of level mode, trigger task is executed continuously until the end of the trigger signal:



#### 2. Rising Edge Mode

In case of rising edge mode, trigger task is executed once, at the moment when the trigger signal arrives:



#### 3. Falling Edge Mode

In case of falling edge mode, trigger task is executed once, at the moment when the trigger signal ceases:



## Scheduler

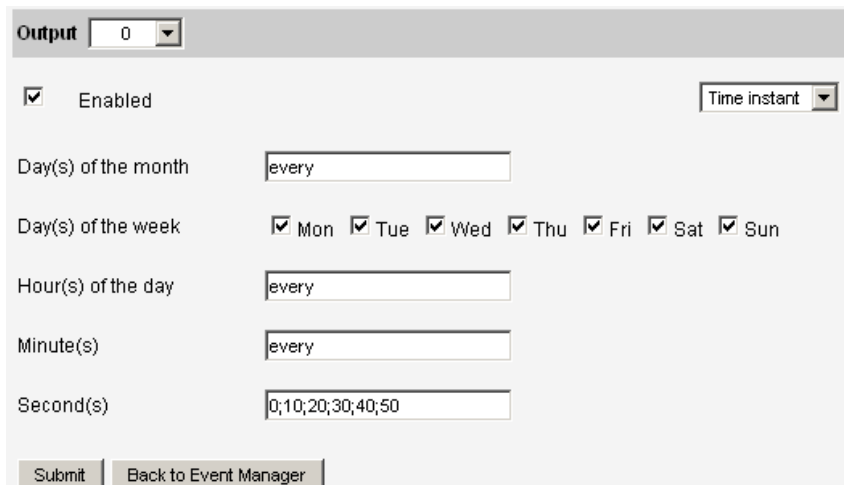
With the help of the scheduler, timed trigger events can be launched by users (events must be set on the 'Event Manager' page). For timing these events, as many outputs (timers) are available as set in the **Output** field (maximum 2).

In the fields of the outputs the following expressions can be used:

- numerals separated by semicolons (e.g. 6;9)
- the word 'every'
- hyphens to express intervals (e.g. 7-9)

+ combinations e.g. 6;7;9-11;15

**NOTE:** Use semicolons at the end of the lines the mark end of data.



Within the outputs, two kinds of triggering can be specified: **time instance** and **time interval**.

### Time instance(s)

When selecting time instances, trigger signals are emitted according to the set frequency. This frequency can be set from once a month to every second.

### Time interval(s)

When selecting time intervals, a trigger signal is emitted until the specified second/minute/hour has elapsed.

E.g.

Day(s) of the month: 12 ; 15 – on the 12<sup>th</sup> and 15<sup>th</sup> of the every month

Days of the week:  Mon  Tue  Wed  Thu  Fri  Sat  Sun – on every weekday

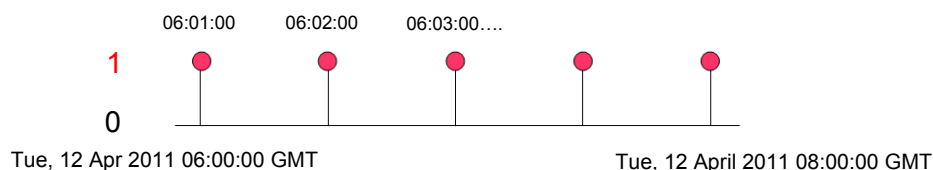
Hour(s) of the day: 6-8; – from 6am until 8am

Minute(s): every – in every minute of the selected hour(s)

Second(s): 0

### As time instances:

Trigger signals are emitted on the 12<sup>th</sup> and 15<sup>th</sup> in every month, independently from weekdays (since all weekdays are ticked it does not matter that on which weekday 12<sup>th</sup> and 15<sup>th</sup> will be), from 6am until 8am once in every minute at 0 seconds.



**As time intervals:**

Trigger signals are emitted on the 12<sup>th</sup> and 15<sup>th</sup> of the every month, independently from weekdays (since all weekdays are ticked it does not matter that on which weekday 12<sup>th</sup> and 15<sup>th</sup> will be) and asserted from 6am until 8:59:59.99 am.



Settings are saved after clicking **Submit**.

The target for uploading on scheduler trigger can be set by clicking the **Configure Upload Target** button, right after submitting changes.

## Upload

The camera is capable of forwarding **Images** (image files e.g. jpegs), **Event data** (image and capture information in a .par file) and **Trigger information** (in a .trg file) via one of the three supported protocols: **FTP**, **SMTP** and **HTTP POST**.

For more information on event data and trigger information, see ParkIT Programmer's Manual.

### FTP

Set the following fields to upload camera images, event data and trigger information to an FTP server:

**Include:** The uploaded data may consist of image, event data and trigger information. Use the checkboxes to select the one(s) to upload.

**Host:** the hostname of the FTP server

**Username:** for authorization to the FTP server

**Password:** for authorization to the FTP server

**Filename template:** The filename format of the images (data) can be customized with the help of the following arguments:

\$y: year (4 characters)

\$r: year (2 characters)

\$o: month

\$d: day

\$h: hour

\$m: minute

\$s: second

\$l: millisecond

\$t: frametimems

\$i: motion sequence ID (hexadecimal number)

\$x: frame index within a sequence (hexadecimal number)

text: string

e.g. \$d/\$h-\$m-\$s-\$l.JPEG argument set results in file names like:  
06/11-08-37-957.JPEG

Settings are applied after clicking **Submit**.

FTP	
Include	Image <input checked="" type="checkbox"/> Event data <input checked="" type="checkbox"/> Trigger info <input checked="" type="checkbox"/>
Host	<input type="text" value="testserver"/>
Username	<input type="text" value="testuser"/>
Password	<input type="password" value="....."/>
Filename template	<input type="text" value="/\$i/\$d-\$h-\$m-\$s-\$l_\$x.JPEG"/>
<input type="button" value="Submit"/> <input type="button" value="Show log"/> <input type="button" value="Back to Event Manager"/>	

### SMTP

Camera data can be forwarded in simple e-mails as well. To use SMTP protocol, provide the following information:

**Include:** see above at FTP

**Send:** type of data to be sent in e-mail

**Host:** hostname or IP address of the mail server

**Username:** for authentication

**Password:** for authentication

**From:** sender of the e-mail

**To:** recipient of the e-mail

**Filename template:** see above at FTP

Settings are applied after clicking on **Submit**.

Include	Image <input checked="" type="checkbox"/> Event data <input checked="" type="checkbox"/> Trigger info <input checked="" type="checkbox"/>
Host	<input type="text" value="testserver"/>
Username	<input type="text" value="user"/>
Password	<input type="password" value="....."/>
From	<input type="text" value="testsender@testuser"/>
To	<input type="text" value="testuser@testserver"/>
Filename template	<input type="text" value="\$d-\$h-\$m-\$s-\$l.JPEG"/>
<input type="button" value="Submit"/> <input type="button" value="Show log"/> <input type="button" value="Back to Event Manager"/>	

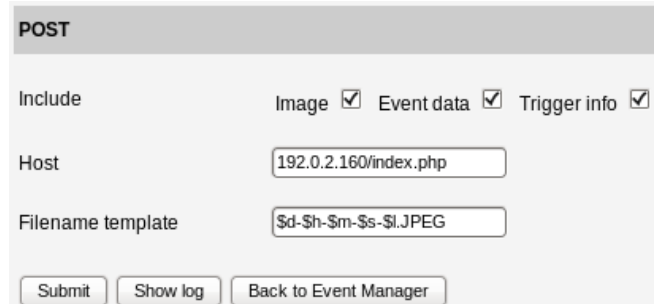
## HTTP POST

When using the HTTP POST protocol, camera data can be forwarded to a web server (for further processing).

**Include:** The uploaded data may consist of image, event data and trigger information. Use the checkboxes to select the one(s) to upload.

**Host:** Address of the web server (e.g. 192.168.0.12/index.php).

**Filename Template:** See [FTP](#) above.



Settings are applied after clicking on **Submit**.

## Logging

Uploaded data and/or images are logged by the camera. The log can be viewed by clicking on the **Show Log** button on the Upload page.

Log				
Protocol	Filename	Included	Status	Error
FTP	__FTP__ /27/09-40-20-288.JPEG.trg	image + data	OK	
FTP	__FTP__ /27/09-40-20-096.JPEG.jpg	image + data	OK	

Structure of the log:

**Protocol:** the protocol used for uploading. Currently, it can be FTP, SMTP and HTTP POST.

**Filename:** name of the uploaded trigger information (.trg) and/or image file according to the set Filename template (see above).

**NOTE:** If trigger info uploading is selected (on the Upload tab), a .trg file is uploaded independently of the criteria set in the Event Manager, while image file is uploaded only if the set criteria (in the Event Manager) are fulfilled.

**Included:** the type of the uploaded data (image, data or both); uploading of trigger info is indicated in extension of the uploaded trigger file: .trg.

**Status:** status of the upload; OK signals successful uploading

**Error:** this field signals if there was any error during the upload.



## Diagnostics

### Diagnostics

**Light sensor value [0 – 255]:** Value of the light sensor. The brighter the camera environment is, the higher this value will be. (0 refers to complete darkness). This value saturates at 100% in normal daytime light conditions.

**Temperature [°C]:** Inside temperature of the camera.

**Built-in Flash Overdrive:** The LED control circuit of the camera turns off the LEDs for a short period preventing impairment when exceeding safe voltage/FPS values.

Possible values: **No** - no overdrive  
**Yes** - the LED control circuit is intervening to protect the LEDs

### Memory usage

**Total Buffer Memory:** size of the image buffer

**Free Buffer Memory:** size of free memory in the image buffer

**Total Device Memory:** size of full system memory

**Free Device Memory:** size of free system memory

### Loaded Modules

The name, path and short description of modules is enlisted in this group. For more information, see ParkIT Programmer's Manual.

## Camera Log

Camera events are logged into the central log file for administrative and error management purposes. The lines (records) of the log can be filtered for specific events according to the typed in characters. Filtered events are listed after clicking **Submit**. Note, that the log file content is erased after restarting the camera. To save log file, enter the following command into your browser's address bar:

```
http://{IP address}/logging/logstream?getlog&ajaxcall=1
```

The appeared data can be inserted into any text editor by simple copy/paste procedure.

## Update

The firmware of the camera can be updated by this option according to the followings: **Browse** the tar.gz firmware file then click **Update**.

Click **Export all** to save profile, user, group, network and time zone settings as described in the [Profile page description](#).

## Restart

Under certain circumstances (e.g. when changing camera profile) the camera must be restarted. The restart takes several seconds after which the camera is ready for operation with saved or default settings.

## Help

Open the ParkIT manuals for more information on camera setups and management.

## Recovery Mode

The camera has a Recovery Mode primarily designed to maintain the communication with the camera when it is unreachable for various reasons e.g. due to misconfiguration. The following section is intended to provide you a complete understanding on the *Recovery mode v3.x*. The 3.x version can be used in case of cameras with previous firmware versions as well (from 1.12.0.26 firmware version)! In case of previous versions, please update the camera at least to version 1.12.0.26.

### Entering Recovery mode

Starting of the Recovery mode can be implemented in the following way:

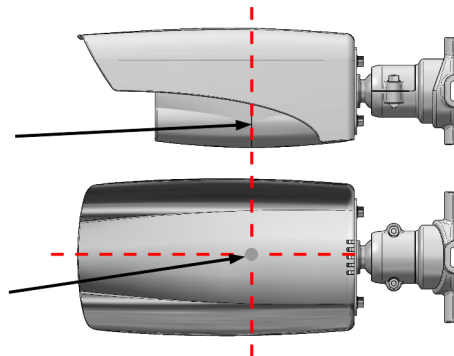
By magnetization:

1. Power off the camera.
2. Touch a magnet (not included) to the sunshield of the camera, right in the middle and hold it in position. See figure below.
3. Power on the camera and wait 5 seconds.
4. Remove the magnet.
5. Reach the camera via its default (192.0.2.3) IP address.

Use the centerline of the camera to help to locate the position of the magnet.

The recommended strength of the magnet is 1210 mT (millitesla).

Magnet



### Update, Factory and other compressed files

Difference between the files:

- **Factory-xxx.bin**

These files are prepared by the manufacturer and they mean a complete system backup. In case of normally functioning cameras these should not be used in the cameras firmware update, because it may damage the well functioning system (it writes files, which may be currently used by the system). These files can be uploaded by the *Recovery mode*.

- **Update-xxx.bin**

These are the so-called firmware update files. They serve for the update of a functioning system. It could be for example in case of update from the version 16 to 17. However, these cannot be used in the recovery mode only in normal mode of the camera.

- **Xxx.cfz**

These files contain only configuration settings. For example, if the 'user' or 'image' settings will be saved and then reloaded later. Such files should be uploaded to or created on the normal mode of the camera (although it can be done in the recovery mode as well).

In some cases the extension is not .bin or .cfz, but .tar.gz. In these cases the beginning of the file has to be *Factory* or *Update*.

## Web interface of the recovery mode

### Information screen

**RECOVERY MODE**

Information	<b>System</b>
Settings	Serial number: 000068
Firmware	Panel type: 1 - Version 4.0 (400/533MHz DSP with DDR3 memory)
Restart	Sensor type: 15 - CMOS 1.2MPix 1280x960/GS / RGB
	IPU type: 25 - X25 with DDR3 memory
	Firmware version : 1.12.0.26
	<b>Recovery mode</b>
	MAC: 00-1D-4D-00-00-FE
	IP: 192.0.2.3 / 255.255.255.0
	<b>Normal mode</b>
	MAC: 00-1D-4D-00-00-68
	DHCP: OFF
	IPv4: 192.0.2.189 / 255.255.255.0
	IPv4 2: /
	IPv6: /
	<input type="button" value="Change"/>

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The MAC and the IP address is the same for all cameras at the *Recovery mode*. But the IP address of the camera can be altered at the *Normal mode* part by clicking the [**Change**] button or at the *Network settings* part of the Settings menu item.

## Settings screen

RECOVERY MODE

Information	<b>Network settings</b>
Settings	The network settings of the camera can be modified (e.g. IP address, netmask). These settings will be applied at camera restart, when the camera operates in normal mode.
Firmware	<input type="button" value="Modify"/>
Restart	<b>User/Password reset</b>
	The default, factory User and the Password can be restored.
	<input type="button" value="Reset"/>
	<b>Restore factory settings</b>
	All the default factory settings can be restored.
	<input type="button" value="Restore"/>
	<b>Import settings</b>
	Settings can be uploaded from PC to the camera.
	Upload the file: <input type="text"/> <input type="button" value="Browse..."/> <input type="button" value="Upload"/>
	<b>Export settings</b>
	Settings of the camera can be saved to the PC.
	<input type="button" value="Download"/>

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Setting-related backups and restoring can be performed on this screen. Only certain parts of the system can be managed here, operations concerning the whole system can be performed at the **Firmware** menu item of the *Recovery mode*.

### Network settings

At the '*Network settings*' part the network settings can be altered by clicking the [Modify] button. In this case not the recovery mode that is modified, but the network settings of the camera operating in normal mode.

### User/Password reset

The '*User/Password reset*' restores the default, factory User and Password.

### Restore factory settings

The '*Restore factory settings*' restores all the default factory settings.

### Import settings / Export settings

The '*Export settings*' creates a .cfz file and saves the settings of the camera into a directory on the PC. The '*Import settings*' is able to restore these settings by uploading these .cfz files.

## Firmware screen

RECOVERY MODE

Information	<b>Firmware update</b>
Settings	A full firmware file (e.g. Factory-xxx.bin) can be uploaded in this part. After the firmware update all settings will be lost and will be restored to the factory defaults.
Firmware	In some cases the support team can send a special update file, which only modifies some modules and settings of the camera. <b>The usage of the Update-xxx.cfz and Update-xxx.bin files in this updater is not allowed.</b> Use update files only if the camera operates in the normal operating (not recovery) mode.
Restart	<p>Upload the file: <input type="text"/> <input type="button" value="Browse..."/> <input type="button" value="Upload"/></p> <hr/> <p><b>Full factory restore</b></p> <p>Reset of the firmware and all settings to the factory defaults. All settings will be lost, as if the factory status of the camera would be restored.</p> <p><input type="button" value="Start"/></p> <hr/> <p><b>Full sytem backup</b></p> <p>Full system backup request. This module will create a firmware file which contains programs, data and settings.</p> <p><input type="button" value="Download"/></p>

Full system backup-related processes can be implemented on this screen. While at the settings menu only certain parts of the system can be managed, here operations concerning the whole system (settings, programs, complete operating system etc) can be performed.

### Firmware update

At the 'Firmware update' part a complete (factory) system can be uploaded to the camera. All settings will be deleted, except the hardware related environment set by the manufacture (MAC address, panel type, sensor type, serial number, license file).

### Full factory restore

The 'Full factory restore' basically behaves as the *Firmware update* with the difference that this feature uploads a default factory package. By contrast, *Firmware update* is waiting for such file from the PC.

### Full system backup

The 'Full system backup' saves the entire camera settings (the file system operating in normal mode). It can be used later at the *Firmware update* part. It cannot be used at the firmware update of an active system in a normal mode of the camera!

## Updates between versions

### Minor changes between versions (e.g. from v1.12.0.10 to v1.12.0.26)

Minor changes means, that the first number of the version is the same (v1.x, v2.x or v3.x). In this case only the file with higher version starting with *Update-* has to be uploaded at the 'Update' part of the Setup menu item of the camera web interface (in normal mode). The update packages are prepared to handle the smaller updates (e.g. from v1.1 to v1.2) of the higher versions (v1, v2, v3).

### Upgrade of the Recovery mode

Like in case of normal update, a file starting with *Update-Recovery-* has to be uploaded during the normal operation of the camera. It can be done at the 'Update' part of the Setup menu item of the camera web interface. After the upgrade of the recovery mode the firmware version of the camera is not altered, only the firmware version of the recovery mode!

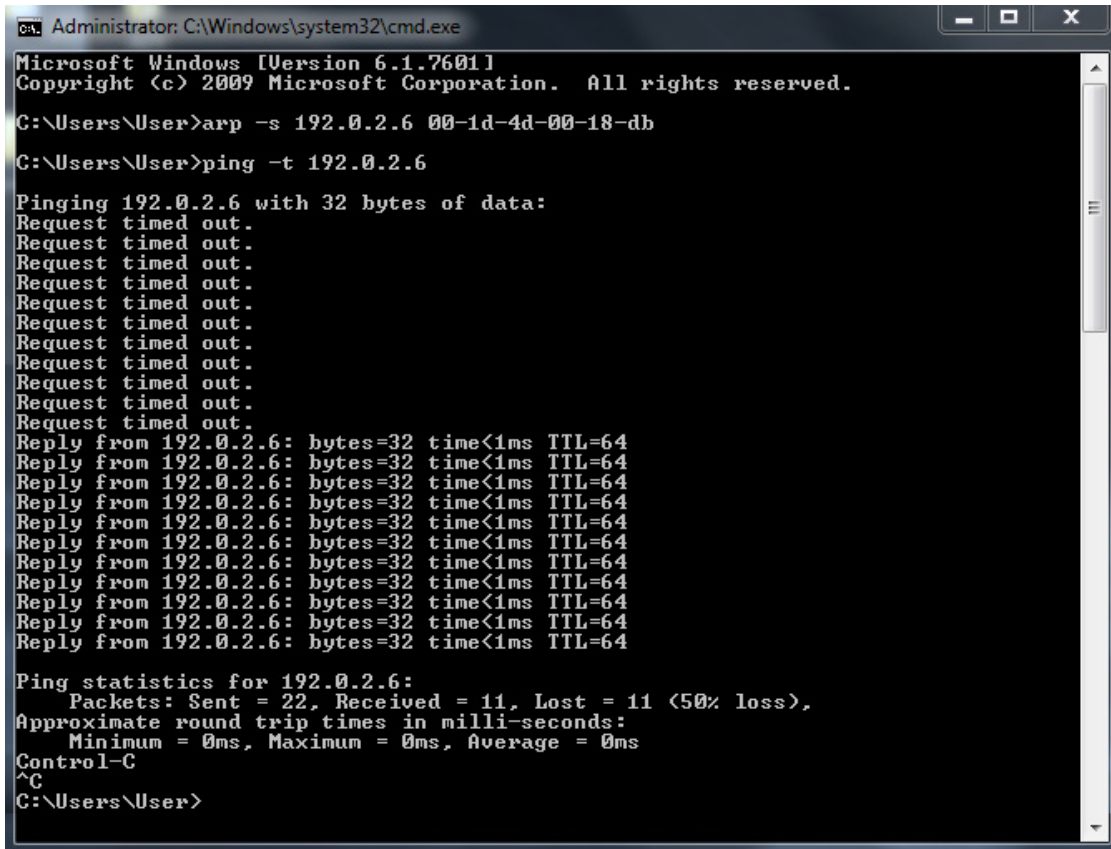
## Recovering a Lost IP Address

If the IP address of a ParkIT camera is unknown (forgotten) it can be reached through the camera MAC address located on the back of the device. Note that this method can be used for only temporary camera access.

### Windows

1. Click **Start** and select **Run**.
2. Enter the cmd command.
3. In the appeared window add the MAC address of the camera to the ARP cache table:  
`arp -s {desired IPv4 address} {camera MAC address separated by hyphens e.g. 00-1d-4d-00-09-B7}`
4. Ping the camera with the IP address set above within 1 minute from camera startup.  
 - e.g.: `ping -t 192.0.2.6`.  
 - restart the camera  
 - wait until the ping package returns

After the ping package has arrived, the camera picks up the IP address and becomes ready to be set up.



```

Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\User>arp -s 192.0.2.6 00-1d-4d-00-18-db
C:\Users\User>ping -t 192.0.2.6

Pinging 192.0.2.6 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Reply from 192.0.2.6: bytes=32 time<1ms TTL=64
Reply from 192.0.2.6: bytes=32 time<1ms TTL=64
Reply from 192.0.2.6: bytes=32 time<1ms TTL=64
Reply from 192.0.2.6: bytes=32 time<1ms TTL=64
Reply from 192.0.2.6: bytes=32 time<1ms TTL=64
Reply from 192.0.2.6: bytes=32 time<1ms TTL=64
Reply from 192.0.2.6: bytes=32 time<1ms TTL=64
Reply from 192.0.2.6: bytes=32 time<1ms TTL=64
Reply from 192.0.2.6: bytes=32 time<1ms TTL=64
Reply from 192.0.2.6: bytes=32 time<1ms TTL=64
Reply from 192.0.2.6: bytes=32 time<1ms TTL=64
Ping statistics for 192.0.2.6:
    Packets: Sent = 22, Received = 11, Lost = 11 (50% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
Control-C
^C
C:\Users\User>
  
```

## Linux

1. Open a console.
2. Add the MAC address of the camera to the ARP cache table:

```
arp -s {desired IPv4 address} { camera MAC address separated by colons e.g. 00:1d:4d:00:09:B7}
```


## Windows&Linux

**NOTE:** In order to access the camera successfully, the desired IP address must be in the same subnet with your computer. See the MAC address on the sticker located on the back of the camera.

**NOTE:** The first characters of a MAC address are always 00-1d-4d while the last three hexadecimal numbers are correspond to the last three characters of the camera serial number (also located on the back of the device).

**IMPORTANT:** This IP address can be used for only temporary camera access. It must be changed right after accessing the camera.

# Appendices

	Low	Normal	High
<b>Contrast</b>			
<b>Brightness</b>			
<b>Saturation</b>			
<b>Gamma</b>			

## White balance

	Low	Normal	High
<b>Red</b>			
<b>Green</b>			
<b>Blue</b>			



## Contact Information

Should you have any problem during operating the ParkIT cameras, our support team is at your disposal. Please try to explain the problem as detailed as possible and do not forget to send the following information to make it easier to help you:

- The name of your company (for administration purposes).
- The **exact type** of the **product** you have (serial number is appreciated).
- If you have problems **during recognition, send images** in the original file format.
- If there is any **error code or message** appearing, please send us the code snippet where it occurs (a screenshot may also be helpful).
- If you noticed the problem while running a Demo or a sample application, please let us know the **name of the application** you tested.
- If you have some problem while **developing your own** application, please specify the followings:
  - your programming language
  - your operating system
  - the name and version number of the compiler you use
  - the programming technology (e.g. native C/C++ / ActiveX / .NET)
  - If possible please send a short part of the source code. Please try to determine the place where the error occurs (e.g. "the `capture?getshutter` command returns a negative number...").

### IMPORTANT NOTES:

- **Before sending back a faulty device, always contact ARH Support Team.**
- **Repairs may be executed by the manufacturer only!**

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