ANPR ACCESS
ANPR ACCESS HD

installation guide

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1 INTRODUCTION

The NEDAP ANPR License Plate Reader offers automatic number plate reading. The NEDAP ANPR is an all in one camera including camera, analyzer and IR illuminator. The ANPR has embedded processing software onboard. The License Plate Reader is default featured with an RS485 and Ethernet communication. Wiegand is possible using the separate available Wiegand Interface Module.

1.1 TYPICAL APPLICATIONS

Typical applications include parking, crime prevention, toll systems, security and access control, logistics and customs. In addition the NEDAP ANPR can be applied in applications where it is difficult to issue RFID tags.

1.2 KEY FEATURES

- Automatic number plate reading.
- All-in-one system including camera, analyzer, IR illuminator.
- ANPR Access optimal performance in range from 3 to 6 meters.
- ANPR Access HD optimal performance in range from 6 to 10 meters.
- Library installed supporting all European countries (libraries for world-wide support available).
- Easy user configuration (web server).
- TCP/IP Ethernet interface.
- RS485 serial interface.
- Optical isolated digital input to trigger image capturing.
- Stand-alone operation supported by digital output and black-, and white-list features.
- 4GB SD-card memory to store log files and/or captured images.
- Wiegand Interface Module available for seamless integration with access control systems.

2 GETTING STARTED

2.1 MOUNTING THE ANPR

Determine how to mount the ANPR. Onto a pole or behind the barrier. Mount behind the barrier to ensure recognition right in front of the barrier.

Important mounting issues are:

- Best focus distance is between 3 and 6 meters [10 ... 20 ft] for ANPR Access and between 6 and 10 meters [20 ... 33 ft] for ANPR Access HD.
- Angle between ANPR and number plate should be smaller than 25 degrees.

Mounting details are described in chapter 3.

2.2 CONNECTING THE ANPR

The ANPR is delivered with 5m cables for power, I/O and network. Power supply, RS485 communication and I/O are combined in one cable. Ethernet network is a second cable. The cables are pre-fitted to the ANPR. For installation the ANPR does not need to be opened. Connecting the power supply and network cables are required to configure the ANPR. Connection details are described in chapter 4.

2.3 ASSIGNING AN IP-ADDRESS

Enter the default IP-address in the address bar of your web browser.

Default IP address is:
IP address: **192.168.0.21**

The login window appears where the user is asked to type the username and password.

Username: **superuser**
Password: **superuser**

Go to the system configuration and setup the network configuration as desired. If required, now also other configuration settings may be changed. Details about network settings are described in chapter 5.3.1.

If the IP-address of the ANPR is unknown, you can use the ANPRTEST software This software features a discovery function that allows to search the LAN network for active and connected ANPR devices. The ANPRTEST software is available for download on our website.

2.4 TESTING THE ANPR

Test the ANPR to check if it is aligned correctly and if it is able to read the license plates. Drive the vehicle into the position where it should be possible to read its license plate.
Connect to the ANPR using your web browser and select the 'Camera OCR' feature. On the left side of the page 'live' video images are shown and also the license plate reading results. It might be necessary to adjust the ANPR alignment.

The installed firmware library supports all European countries. Download the firmware library for other countries from our website. See chapter 5.3.4 for details about how to install a new firmware library file.

3 INSTALLATION

3.1 SAFETY PRECAUTIONS

The following safety precautions must be observed during normal use, service and repair.

- The ANPR shall be connected to safety ground.
- Disconnect the power supply before removing any parts.
- The ANPR shall only be installed and serviced by qualified and trained personnel.
- To be sure of safety, do not modify or add anything other than mentioned in this manual or indicated by NEDAP N.V.
- CAUTION: for continued protection against risk of fire, replace fuses only with the same type and rating.
- The ANPR can be powered from a low power, Class 2 power supply, in compliance with local regulations.
- The ANPR is equipped with an 850nm Infrared illuminator. The human eye will not or slightly see this light coming from the illuminator. Do not look into the ANPR lens directly from close range or for more than 100 seconds. Eyes can be damaged by not taking these precautions. During normal use of the ANPR at a vehicle gate, reading plates, there is no risk to the public.

3.2 MOUNTING

The ANPR is intended for vehicle access control. Vehicles are identified by the number plate when approaching the gate. Because the number plate recognition is very fast, a full stop is normally not necessary. The ANPR covers a reading distance of 3 to 6 meters. The field of view is typically one lane wide. There are 2 recommended positions for the ANPR.

3.2.1 POLE MOUNTING

The ANPR is positioned directly behind or in front of the actual barrier onto a pole. In that case the ANPR can be best positioned on a pole at maximum 2m20 height. In this position the number plate of the vehicle directly in front of the barrier cannot be read anymore. So these vehicles need to be recognized in flow. Mounting the ANPR at 2m20 height is here the best option. When overhead installation is an option, the ANPR can at best be installed in the center of the lane, above the lane. Horizontal angle will be 0° in that case, which is good.

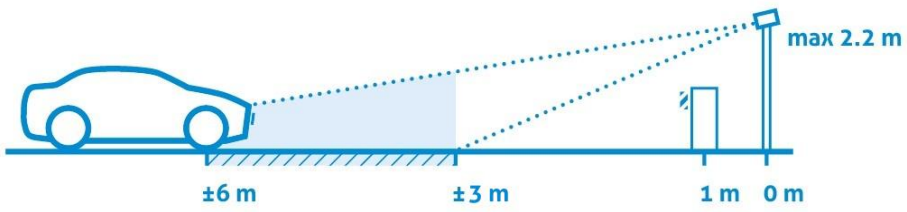

Figure 1: Pole mounting (ANPR Access)

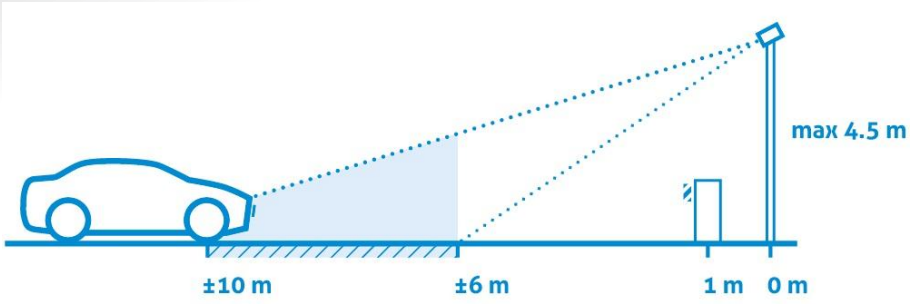

Figure 2: Pole mounting (ANPR Access HD)

3.2.2 BEHIND BARRIER MOUNTING

The ANPR is positioned behind the barrier at bumper height.
If there is space behind the barrier and the sight is not blocked, then the best place for the ANPR is at bumper height (0.5m height) about 2 to 3 meters behind the barrier. A vehicle just in front of the barrier is still recognized in that case.

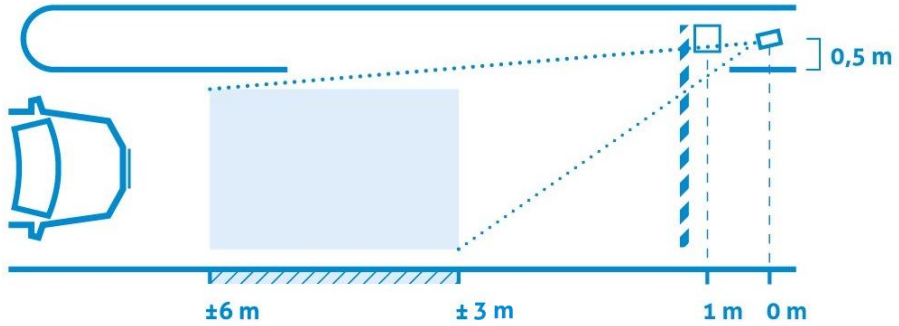

Figure 3: Behind the barrier mounting (ANPR Access)

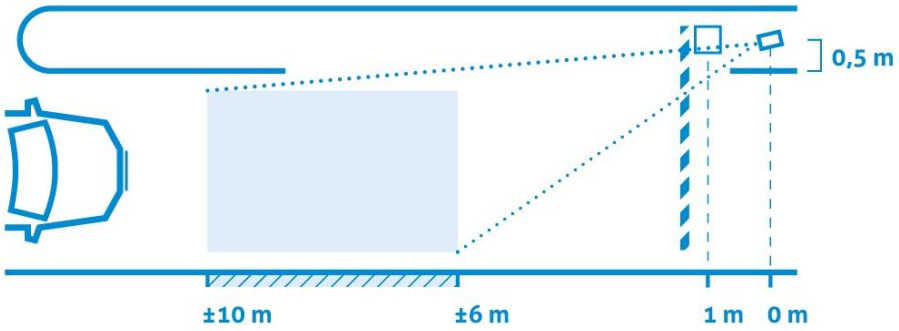

Figure 4: Behind the barrier mounting (ANPR Access HD)

3.3 DIMENSIONS

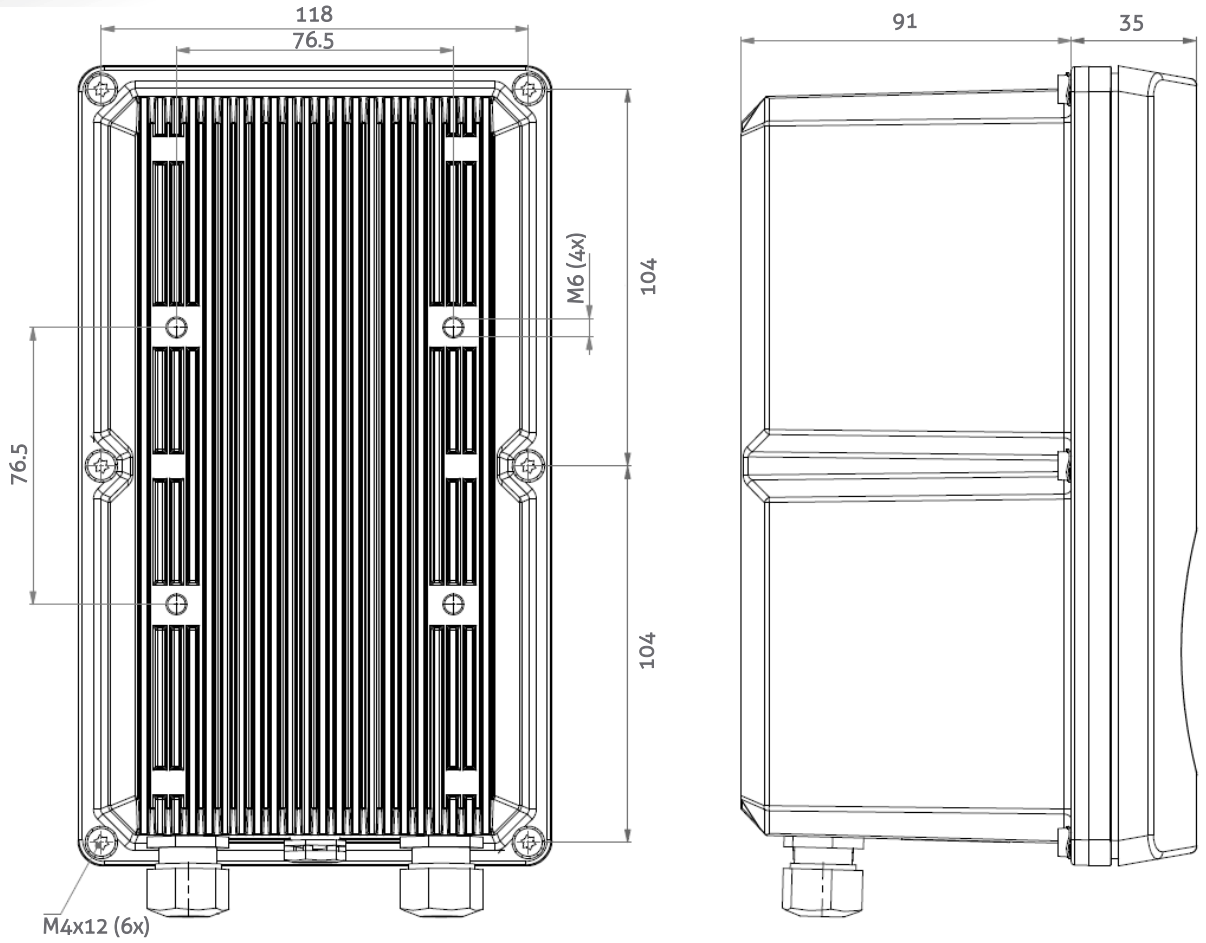

Figure 5: ANPR housing dimensions

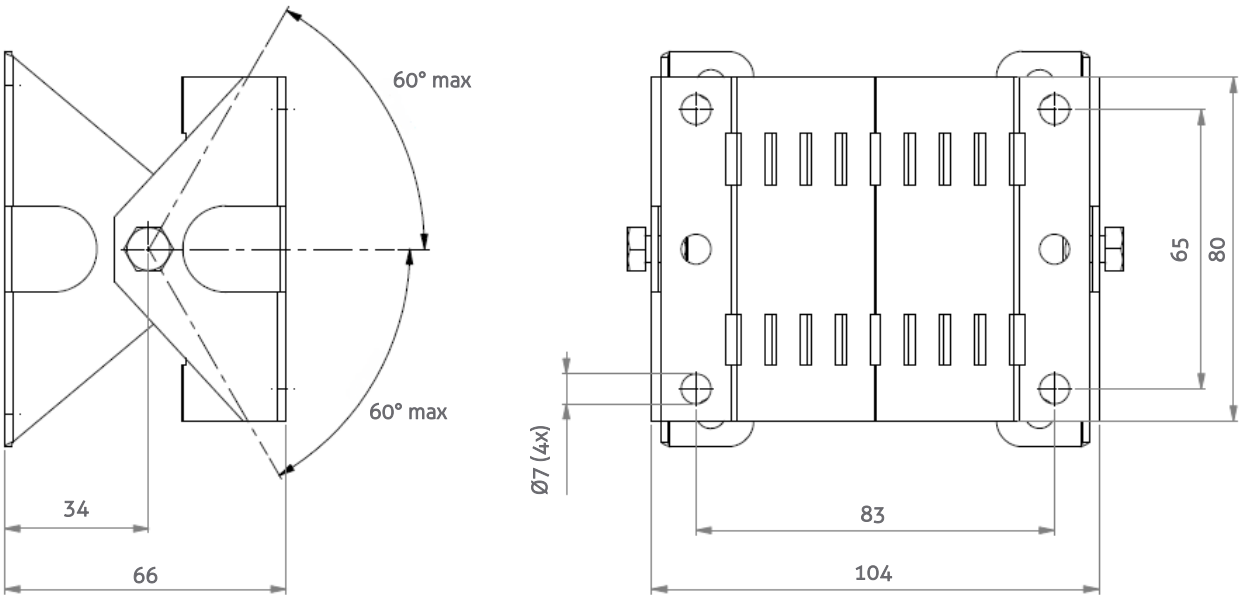

Figure 6: Mounting bracket dimensions

4 CONNECTIONS

The ANPR is delivered with two 5m long cables. Power supply, RS485 communication and I/O are combined in one cable. Ethernet network is a second cable. The cables are pre-fitted to the ANPR. For installation the ANPR does not need to be opened.

4.1 ETHERNET CONNECTION

The Ethernet cable is already fitted to the ANPR provided an RJ-45 connector. This Cat5e cable will be adequate for connection of the unit to a local area network.

4.2 POWER SUPPLY

RED	Power supply +24VDC.
BLUE	Ground 0V.

4.3 RS485 CONNECTION

YELLOW	RS-485 A
GREEN	RS-485 B
PURPLE	RS-485 GND / SC (voltage reference)

4.4 DIGITAL I/O

GRAY	Digital input IN+ (optocoupler positive contact, U_{max} = 24VDC).
PINK	Digital input IN– (optocoupler negative contact).
BROWN	Relay output 0 (normally open contact, U_{max} = 24VDC, I_{max} = 2A).
WHITE	Relay output 0 (common contact).
GRAY/PINK	Relay output 1 (normally open contact, U_{max} = 24VDC, I_{max} = 2A).
RED/BLUE	Relay output 1 (common contact).

5 CONFIGURATION

5.1 USING THE WEB SERVER

Prior to accessing the ANPR using a Browser, make sure the PC network configuration is coherent with the IP-address of the device to access. E.g.: if the ANPR IP-address is 192.168.0.21, the PC in use should have assigned an IP-address belonging to the same class (e.g. 192.168.0.22). See also chapter 2.3 for details about how to assign an IP-address to the ANPR.

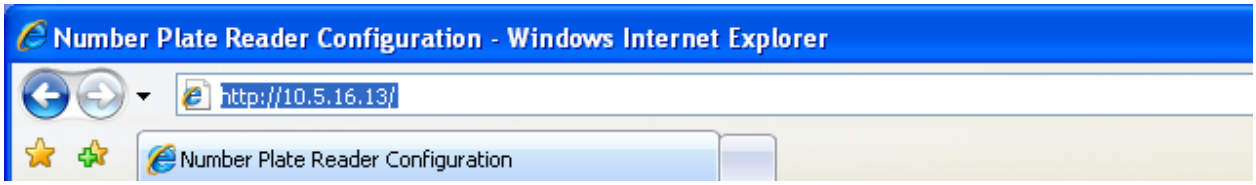

Figure 7: Using the web server

Enter the IP-address (or NetBiosName) in the address bar of your web browser. The login window appears where the user is asked to type the username and password.

Factory default username and password are:

Username:	superuser
Password:	superuser

Note
It is recommended, to change the factory default username and password after installation. See chapter 5.3.2.

If the login was successful, the user is now able to access the main menu screen. The main page shows two sections: Plate Reader and System. Refer to chapters 5.2 and 5.3 for further details.

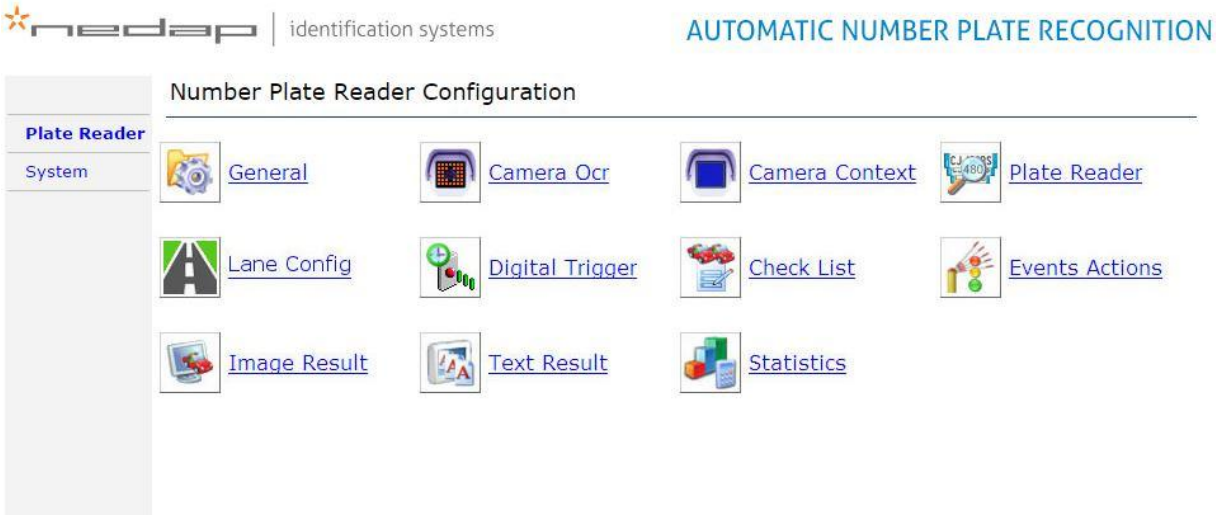

Figure 8: Web server main menu

5.2 NUMBER PLATE READER CONFIGURATION

5.2.1 GENERAL

The ANPR system can operate in three different modes:

- FREE RUN mode
- TRIGGER by digital input mode (see chapter 0 about how to setup the digital input to trigger the ANPR).
- TRIGGER by ethernet mode (see the ANPR ethernet programmers guide about how to trigger the ANPR by ethernet).

In FREE RUN mode the ANPR freely grabs and processes images. The software automatically detects the presence of a number plate in the image and thus generates events.

In TRIGGER-START-STOP mode the ANPR grabs and processes the images in the time period between the start trigger and the stop trigger. In case the stop trigger is not being activated within the GateTimeMax interval, the system automatically generates the stop trigger after the interval expires. Any stop trigger received prior to a start trigger will be ignored. Any start trigger received after a start trigger immediately generates an event and restarts the image processing.

In TRIGGER-START-TIME mode the unit starts image grabbing when the start trigger is activated and stops image grabbing after a time interval that was previously defined in the GateTimeMax setting (see chapter 0). Once GateTimeMax has expired, an event is generated. If the system receives a start trigger during GateTime period, it immediately generates an event and restarts the image processing.

In TRIGGER-START-FREE-RUN-STOP mode the unit starts image grabbing when the start trigger is activated and then starts grabbing and reading number plates in FREE RUN mode. The system may generate multiple events during the interval between start trigger and stop trigger.

In TRIGGER-ETHERNET mode the image grabbing and processing is started upon receiving the start TRIGGER message from the Ethernet network. The start trigger message contains a precise time in milliseconds that expresses the GateTime during which the ANPR will grab images. When GateTime expires or upon receiving a stop trigger message, the machine stops image grabbing. The trigger message also contains a generic string the system uses to generate trigger messages where info may be inserted. Such string will later made available on the web interface using the %NET_TRIG_ID tag. This makes it possible to associate to any event data, images and other info about the specific trigger message from which they were originated.

The system may generate the following events upon a processed image:

- OCR READ
- OCR NOT READ
- OCR NO PLATE (not in FREE RUN mode)

The General Settings page contains the following configuration fields:

Enable Engine: It allows enabling/disabling the processing of the images grabbed by ANPR. The parameter takes two possible values: YES or NO. If set to NO, the device is switched to stand-by mode and its infrared illuminator is disabled. It will ignore any external trigger. The infrared illuminator is only momentarily enabled if the Camera OCR page is being accessed.

Acquisition mode: It allows selecting the system operating mode. Select FREE-RUN, TRIGGER-START-STOP, TRIGGER-START-TIME, TRIGGER-START-FREE-RUN-STOP or TRIGGER-ETHERNET.

Site Address: This field can contain an alphanumeric string, such as the address of a system location. This string is available as %SITE_ADDRESS TAG and can be sued in the text value field of the Save Image action.

TCP message after ftp actions: With this parameter you can enable sending a TCP message after ftp actions (ftp save image and ftp save DB).

Maximum fps: Sets the maximum grabbing frame rate. Use "0" for no limitation.

Filter static plates: Allows to avoid sending plates if the same plate is detected multiple times, e.g. when a vehicle stops in the camera field of view. Use with care.

5.2.2 CAMERA OCR

This page configures the Frame Grabber Settings.
On the left side of the page 'live' video images are shown. The red rectangle on the image border represents the search plate window. It is possible to set size and position of this window in Plate Reader page.

General

Grab Mode: Here it is possible to set the image grabbing mode and camera related settings. Three image grabbing modes are available: AUTOIRIS, SINGLE-POINT, and MULTI-POINT.

Info position: In this section, it is possible to specify, inside the live image, the position of the OCR reading results and the unit's work parameters. The allowed values are: TOP-LEFT, TOP-RIGHT, BOTTOM-LEFT, BOTTOM-RIGHT and DISABLED.

Image mode: In this section it possible to see an enlargement of the central area of the image. The allowed values are: NORMAL and CENTRED ZOOM.

Note
Image processing engine is stopped during live video displaying!

Autoiris

The Autoiris mode allow the camera to automatically calculate and set the best acquisition parameters (shutter time, strobo time, gain). Autoiris mode allows the automatic adaptive grabbing parameters to be set during the whole day. This is the preferred working mode that should give the best performances. The following configurable parameters are available. Please be careful when changing these parameters:

Iris Level: Desired brightness level (values 0-100). Advised 25.

Min Shutter us: Minimum electronic exposure time. The minimum value permitted is 3 us.

Max Shutter us:	Maximum electronic exposure time (maximum is 10000 uS). If this value is high, the grabbing frame rate of the device decreases. Advised 1000 uS.
Min Gain:	Minimum gain. The minimum value is 3.
Max Gain:	Maximum gain (max 512). High gain values lead to high noise images.

Single-point

Gain:	Indicates the gain of the vehicle signal.
Shutter us:	Indicates the exposure time in microseconds.
Strobe us:	Activation time of the infrared illuminator in microseconds.

Multi-point

In this section it is possible to set the parameters for the multi-point grabbing mode. This mode cyclically uses the work points Gain0/Shutter0, Gain1/Shutter1, Gain2/Shutter2 and Gain3/Shutter3. Too light or too dark images are automatically excluded from processing by the ANPR software.
Set values must be steady crescent. This means that Gain3 ≥ Gain2 ≥ Gain1 ≥ Gain0 and Shutter3 ≥ Shutter2 ≥ Shutter1 ≥ Shutter0. The web page does not allow setting values that do not comply with these requirements.

Gain0:	Indicates the gain of the vehicle signal for work point 0.
Shutter0 us:	Indicates the exposure time in microseconds for work point 0.
Gain1:	Indicates the gain of the vehicle signal for work point 1.
Shutter1 us:	Indicates the exposure time in microseconds for work point 1.
Gain2:	Indicates the gain of the vehicle signal for work point 2.
Shutter2 us:	Indicates the exposure time in microseconds for work point 2.
Gain3:	Indicates the gain of the vehicle signal for work point 3.
Shutter3 us:	Indicates the exposure time in microseconds for work point 3.

Focus

Set Focus to YES to enable focus tool. You can use the focus tool to adjust the camera focus. Default set to NO (focus tool disabled).
If enabled adjust the focus area by setting the left, top, right and bottom parameters. These parameters are configured in percentages of the image size.

Function buttons

Start Live:	Start live video displaying.
Stop Live:	Stop live video displaying.
Apply:	Confirm entered configuration values.
Reset:	Cancel entered configuration values that not have already been confirmed with the Apply-button.

5.2.3 CAMERA CONTEXT

This page displays the color image grabbing camera settings used for shooting context images.

Enable:	Select YES to enable a context camera.
IP Address:	The context camera IP address.
Protocol:	Select context camera protocol: STANDARD: Vega network context camera protocol. HTTP: Generic HTTP camera acquisition.
Packet timeout:	Default 20 seconds.
HTTP String:	The string that you use to get the image by the browser.
HTTP Authorization:	Enable if you need to use a HTTP authorization.
HTTP Username:	HTTP authorization username (Only if HTTP Authorization is enabled).
HTTP Password:	HTTP authorization password (Only if HTTP Authorization is enabled).
HTTP LINK:	Click on the HTTP-LINK to directly access the context camera. The hyperlink uses the parameters entered above. This is useful to check whether the context camera is operating properly and to verify if the settings are correct.

Example

URL to get image from context camera (e.g. http://192.168.0.1/jpg/image.jpg)

Protocol:	*HTTP*
IP Address	*192.168.0.1*
HTTP String	*/jpg/image.jpg*

If HTTP Authorization is required (e.g. my_username / my_password):

HTTP Authorization	*YES*
HTTP Username	*my_username*
HTTP Password	*my_password*

Go to Events and Actions (chapter 0) to configure when the context camera will be triggered.

5.2.4 PLATE READER

The ANPR system is capable of real time OCR processing grabbed images. Up to 32 countries number plates can be simultaneously read. It is necessary to update the ANPR firmware library if the user wants to change the countries the system should read.
To view the countries the ANPR system is capable of reading, please access the web server and click the DeviceInfo icon: go to the line that shows the firmware library version, as in the example below:

Example
Firmware version = VEGA ACCESS 7.85 NLD-EU

The Plate Reader page contains the following fields:

Plate Locator

Sensitivity: Sets the sensitivity of the car plate search algorithm. Allowed values are NORMAL, AUTO or HIGH. Default value is NORMAL. Please leave this setting unchanged unless instructed by Nedap. Incorrect values may cause longer calculations and lower overall performance.

Char Size Pixel

These parameters represent the size of the plate characters the OCR video camera is to recognize. The maximum and minimum character sizes should be empirically set upon installation, in order to check whether the OCR recognizes the number plates.

Min Width: The minimum character width in pixels.
Max Width: The maximum character width in pixels.
Min Height: The minimum character height in pixels.
Max Height: The maximum character height in pixels.

Note
Character size adjustment is important and can significantly improve the overall system performance.

Procedure for adjusting the character size settings:

1. In the Camera OCR page, take a shot of the number plate under the actual conditions later used in the ANPR system.
2. Use the Result Position setting in order to activate the OCR results image overlay feature.
3. Now, when the plate reading occurs, on the image is displayed not only the number plate but also the character size in pixels.
4. Enter these size values in the Plate Reader page, using the exact minimum and maximum values displayed on the screen during the live capture from the most distant vehicle position (min. size) and the nearest vehicle position (max. size).
5. If number plate reading is not reached, try and set a higher character maximum size, until a valid reading is reached.
6. In the Result web page, it is possible to read the character size of last detected vehicle. This is useful when checking the validity of the character size setup during system operation.

Plate Format

Max Jolly Chars: This feature allows setting the maximum number of plate characters the ANPR reader is allowed not to recognize within the number plate. If set to 0 (zero), the reading is

valid only if the ANPR recognizes every character of the number plate. If set 1 or 2 (maximum value), the ANPR will consider the reading valid while the unrecognized characters are replaced by a Jolly character – represented by the # symbol. Number plate readings with jolly characters generate an OCR_READ event.

Plate With Separator: If enabled (YES) then an underscore character ('_') is inserted between the number plate character groups. Only for German plates (DEU).

Enable UTF8 Encode: it allows to decode the string of characters using UTF8 coding. Without this function enabled the string is coded as ASCII (8 bit). Example: UTF8 allows to shows Arabic characters and umlaut characters (ä, ö, ü).

Temporal Integration

The ANPR system processes multiple images for each vehicle, which allows for higher OCR reading effectiveness and reliability. Section Temporal Integration contains the parameters for managing the whole packet of processed images for each single event.

Max Time Transit: This parameter is relevant only in FREE-RUN mode. This is the maximum time period allowed for any number plate transition. If, for example, this parameter is set to 1000ms, then the ANPR system reads the number plate once, but will wait 1000ms before generating the event.
During this time, the system keeps grabbing and processing images of the same vehicle whose number plate was read. This allows for a highly reliable number plate reading process.
During this same interval, the system may detect a vehicle with a different number plate number. In that case a new event is immediately generated (no waiting for the 1000ms interval to expire). The images subsequently acquired and processed must be related to the new event.
The MaxTimeTransit value should be set to the highest possible value while of course complying with the specific installation requirements. Setting a too low MaxTimeTransit value means less images are processed for the same vehicle, which leads to lower reliability in OCR reading.

Min Time Same Plate (Enable Multi Out Same Plate = 0):
It represents the minimum time in milliseconds during which the camera will not generate an event even if the number plate has already been recognized. In other words, during this time a previously recognized number plate does not need be in the ANPR field of action in order to generate another event. If the vehicle remains in the ANPR field of action, the same plate recognition event is generated only once.

Min Time Same Plate (Enable Multi Out Same Plate = 1):
It represents the length of time in milliseconds that must elapse before generating a new recognition event associated with a plate that was already recognized. In

this case, if vehicle remains within the camera field, then the ANPR system will repeat generating a recognition event every Min Time Same Plate.

Image Selection Mode: Indicates the selection mode of the image containing the recognized plate. Possible values are: FIRST-PLATE, LAST-PLATE, BIGGEST-PLATE or BEST-LUMINANCE.

Min Numb Plate Read: Minimum number of read images to validate a transit. The allowed values are 1 to 3 and is used only in FREE RUN mode. This filter is useful to avoid false readings caused b patterns that may confuse the camera.

Advanced features

Enable Kemler Codes (ADR) Recognition:

Select to enable or disable the recognition of ADR license plates (if supported by the firmware library). ADR license plates are special license plates used for transport vehicles with hazardous goods.

Join Special Plates in a Single Result:

Select YES to join special plates reading in a single result.

Enable Vehicle Classification:

If enabled, the vehicle classification is made considering the reflective panels. This processing could slow down the system.

5.2.5 LANE CONFIG

The configuration of the lanes is used to assign the correct identification at each transit lane. This assignment is useful in the case in which there are external detectors speed which assign speed and / or class of the vehicle in transit and also to know which lane has generated transit in the case of the acquisition mode has been set to TRIGGER_INTERNAL.

The following position Fields are expressed in percentage of the width / height of the image, and you can set positive and negative values in order to align the lane lines to the current configuration of the road

This section specifies the coordinates of the search area of the plate within the image. The search area is displayed with a red rectangle on the image of the live video page Ocr Camera.
The possibility to set the search area allows to exclude from some parts of the image. This can be useful to exclude areas of the image where there can never be a license plate or to exclude areas in which the reading of the plate should not be performed and in this way speed up the image processing.

Win MinX pixel:	Represents the X coordinate of the upper-left corner of the search area of the plate within the image.
Win MinY pixel:	Represents the Y coordinate of the upper-left corner of the search area of the plate within the image.
Win MaxX pixel:	Represents the X coordinate of the lower-right corner of the search area of the plate within the image.
Win MaxY pixel:	Represents the Y coordinate of the lower-right corner of the search area of the plate within the image.

5.2.6 DIGITAL TRIGGER

This page configures the digital input to trigger image processing on the ANPR system. When the ANPR is configured to FREE RUN mode, the settings below are ignored. The Digital Input Trigger page contains the following fields:

Input Num:	Set the number of the digital input associated with the start/stop trigger.
Input Edge:	Set the start/stop trigger edge (rising edge or falling edge).
Inactivity time ms:	Specifies the minimum time between two consecutive triggers. If a trigger is received before this time is expired it will be discarded.
Median filter size:	Allows to set the window size over which the median filter is calculated. Can be set from 3 to 91. Default value is 13.
Enable median filter:	Enable the median filter for the digital inputs when it is slow and/or noisy. Disable the filter to catch a short and fast trigger.
GateTimeMax:	It allows setting the value, in milliseconds, of the maximum period between start and stop of the trigger. The values may range from 40 to 30000 (=30 seconds).
Trigger Shift Time:	It allows setting a delay to be applied to the start and stop triggers. This may be useful in order to insert a delay between trigger detection and processing initialization. Specify value in milliseconds. Default 0 is no delay.

Note
The maximum check file size is 200kbytes. This approximately holds up to 10000 number plates, depending upon number plate and comment lengths.

5.2.7 CHECK LIST

The ANPR features 2 check lists called A and B. The configuration of check list A and B are identical. These check lists can also be referred to as a white-list or black-list.

These check lists can be stored either on the internal flash memory of the ANPR or on a remote ftp-server. The check list is loaded into RAM memory upon ANPR start-up.

It is possible to modify and update in real time the number plate lists located in the ftp-server or in the internal flash memory of the ANPR unit. To load the updated list into the RAM memory, press the 'Reload List'-button.

Syntax Check List file contents

The check list file A and B containing number plate lists, must comply with the following syntax:

Vehicle Number plate; Country; Comment string

The semicolon (' ; ') is used to separate the fields. Irrelevant spaces are ignored.

The Country field should contain the 3 character capital code. See for a complete list of country codes: www.nedapidentification.com/anpr-countries.
The comment string maximum length is 64 characters. Longer comment strings will be truncated. Every line (including the last line) must be terminated with a carriage-return.

Example
46HVR9;NLD;Ferrari 599 GTO
ZLSZ17;NLD;Fiat Cinquecento
AB123HK;ITA;

General

Enable:	Enables the use of the check list.
List Location:	Select the check list location. FFS is the ANPR internal Flash File System. FTP refers to a list residing on an external server.

FTP Server

File Name:	It allows setting the check list file name. The file name and its extension must correspond to the file name residing on the server.
FTP IP:	The ftp-server IP address.
FTP Username:	Username of the ftp-server user.
FTP Password:	Password of the ftp-server user.
FTP Port:	Port number of the ftp- server. Usually port number 21.

FFS (Flash File System)

Upload procedure -upload check file from PC to ANPR:
Click the Browse-button and select the check file (located on the PC or on the local network). After the file has been selected, click the 'Upload List'-button to send the file to the ANPR.

Download procedure - download check file from ANPR to PC:
Click the 'Download List'-button to download the check list from the ANPR (as .TXT file). This list is read from the ANPR's RAM memory.

5.2.8 EVENTS / ACTIONS

The ANPR generates a number of different of events. It is possible to associate one or more actions to each event. The Events and Actions matrix is used to configure and assign actions to the events.

On the left side of the matrix the events are shown.

OCR Read:	Event number plate recognized.
OCR Not Read:	Event number plate read partially. Partially means that groups of character were read that do not comply with any syntax supported by OCR libraries of the version in use. Typically, an OCR Not Read event is generated when the detected number plate can't be properly read due to dirt or damage. This event is also generated if the number plate's Country of Origin is not supported by the firmware library version.
OCR No Plate:	Event image processed containing no number plate – this event is generated in trigger mode only. See chapter 5.2.1 for a more detailed description of the various available operating modes.
Match on list A:	Event number plate number recognized and a match found in check list A.
No match on list A:	Event number plate number recognized but no match found in check list A.
Match on list B:	Event number plate number recognized and a match found in check list B.
No match on list B:	Event number plate number recognized but no match found in check list B.
Start trigger:	Start trigger event (either digital or Ethernet).
Stop trigger:	Stop trigger event (either digital or Ethernet).
System alarm:	System diagnostic alarm events as configured in system diagnostics configuration.

The matrix contains the following icons (no icon is shown in case the event/action pair is not possible):

Icon indicating that the corresponding action is assigned to the event.

Icon indicating that the action is disabled.

In order to enable, disable or configure an event action, it is sufficient to click the icon as shown above. This will access the user to the Configuration page that contains all action parameters and allows enabling/disabling the action itself.

The Configuration page allows setting each action parameters using configuration TAGS i.e. strings starting with a % symbol. Click the context HELP buttons in each web page to view the available TAGS. The ANPR translates these TAGS into their corresponding value. Click on the Help button next to the configuration field to get detailed information about the supported tags.

For example: Let's think of how to form the name of the file to which the image will be saved. If the file name was set to %PLATE and the number plate is HG542ER then the file name is HG542ER.JPG (if image is saved to JPG format).

%PLATE → HG542ER.jpg

When using TAGS not provided by the software, then they are not translated. For example, the %TEST and %_ tags are not supported, so that:

%TEST%_%PLATE → TEST_HG542ER.jpg

Action: Send Image FTP

This function allows saving the images of vehicle detected by the ANPR to a remote ftp-server. See chapter 4.1 for details about connecting the Ethernet interface.

Enable:	Select YES to enable save image to an ftp-server.
Jpeg Quality:	Jpeg image quality. The value may range from 1 to 100 where 1 is the maximum compression level (lowest quality) and 100 is the minimum compression level (highest image quality). Suggested values from 50 to 90.

Example jpeg image quality 90.

Example jpeg image quality 5.

Crop Image:	This setting allows sending to an ftp-server a crop of the full image. The crop is cut around the number plate. Available sizes are: 320x240, 640x480, 800x600 and 1024x768. Sending an image crop instead of the full image saves space on the storage server and cuts down on transmission time on the network (this is useful when working with low bandwidth networks).
Path Name:	Specify the folder name where the image is saved. It is necessary to use appropriate tags to indicate this folder name. For example, use the %DATE tag in order to use the date of grabbing as folder name. If the specified directory does not exist, it is automatically created.
File Name:	Specify the image file name. It is necessary to use appropriate tags to indicate this file name. For example, use the %PLATE tag in order to insert the read number plate in the name.
Ctx Enable:	Select YES to enable sending a context camera image to the ftp-server. See also chapter 0 to configure the context camera settings.
Ctx File Name:	Specify the context camera image file name.
Text Position:	Specify the position of a text window inside the saved image. This window contains the information entered in Text Value. The allowed values are: TOP-LEFT, TOP-RIGHT, BOTTOM-LEFT, BOTTOM-RIGHT and DISABLED.
Text Options:	It allows enabling the option NOT-OVER-PLATE. This option moves automatically the text window when positioned over the plate, in order to not cover the plate.
Text Value:	Specify the information to be included in the image. It is necessary to use appropriate tags to provide this

	information. Click the Help-button to check the supported tags.
FTP IP:	The ftp-server IP address.
FTP Username:	Username of the ftp-server user.
FTP Password:	Password of the ftp-server user.
FTP Port:	Port number of the ftp- server. Usually port number 21.
FTP Passive Mode:	It allows enabling (YES) the passive modality (PASV) for data transferring.
Buffering on SD:	In case of network failure and Buffering on SD is enabled, the camera will save all data regarding the actions. When the network connection is restored, the ANPR will manage automatically all data stored, freeing the memory. The saving is based over a circular buffer. In case of full memory the ANPR will overwrite oldest data.
FTP LINK:	Click on the FTP-LINK to directly access the ftp-server. This hyperlink uses the FTP parameters entered above. This is useful to check whether the ftp-server is operating properly.

Action: Save DB FTP (Send Data To FTP Database)

If enabled, this feature allows creating and automatically updating on a remote ftp-server a text file in CSV format (CSV = Comma Separated Values) containing information about every detected vehicle by the ANPR. See chapter 4.1 for details about connecting the Ethernet interface.

Enable:	Select YES to enable updating the database with the generated events.
Path Name:	Specify the folder name where the database is saved. It is necessary to use appropriate tags to indicate this folder name. For example, when using %DATE, a new folder is created each day.
File Name:	Specify the name of the database to be updated with the event info. For example when using %DATE a new file is generated each day. The file name is the date on that day (e.g.: 2011-07-28.CSV).
Fields:	Specify the database fields. For example: %DATE;%TIME;%PLATE CSV file contents: 2011-07-28;09-14-44-222;ZLSZ17-NLD 2011-07-28;09-14-44-222;46HVR9-NLD
FTP IP:	The ftp-server IP address.
FTP Username:	Username of the ftp-server user.
FTP Password:	Password of the ftp-server user.
FTP Port:	Port number of the ftp- server. Usually port number 21.
FTP Passive Mode:	It allows enabling (YES) the passive modality (PASV) for data transferring.
Buffering on SD:	In case of network failure and Buffering on SD is enabled, the camera will save all data regarding the actions. When the network connection is restored, the ANPR will manage automatically all data stored, freeing the memory. The saving is based over a circular buffer. In case of full memory the ANPR will overwrite oldest data.

FTP LINK:	Click on this FTP-LINK to directly access the ftp-server. This hyperlink uses the FTP parameters entered above. This is useful to check whether the ftp-server is operating properly.

Action: Pulse Out

If enabled, activates a digital output for a specified time period. See chapter 4.4 for details about the digital outputs.

Enable:	Select YES to enable activation the digital output.
Output Number:	Number of the digital output to be activated.
Delay Time:	Delay (in milliseconds) to be applied prior to the actual activation of the output.
Pulse Time:	The time period (in milliseconds) for which the digital output will be activated.

Action: Com485 Message (Send Message To RS485 Serial Port)

It is possible to send messages to the RS485 serial port. Tags are used to define the content of the message sent. Before using the serial ports, it is necessary to configure them in a web page found in the system section. See chapter 5.3.3. See chapter 4.3 for details about connecting the RS485 serial interface.

Enable:	Select YES to enable sending messages to the RS485 serial port.
Message:	Specify the message content syntax. This is done using tags. Click the Help-button to check the supported tags. It is possible to inserts bytes using hexadecimal coding. This makes data packet building more flexible than when using alphanumeric characters only. For example: in order to send the number plate number string followed by the two character sequence CR (carrier return) and LF (line feed) as terminators, the message field is to be set as follows: %PLATE%0x0D%0x0A where 0x0D and 0x0A are the hexadecimal codes of CR and LF, respectively.

Action: TCP Message (Send Message To TCP/IP Socket)

If enabled, this action will send a message to a TCP/IP socket connection. Tags are used to define the content of the message sent. See chapter 4.1 for details about connecting the TCP/IP Ethernet interface.
See the ANPR Ethernet programmer's guide which describes the TCP/IP message data format.

Enable:	Select YES to enable sending messages to a TCP/IP socket.
Message format:	Select the message format. STANDARD: messages composed by tcp TAGs. See further below. STRING: plain ascii text string message format. XML: XML formatted messages. Other formats are proprietary message protocol formats.
Message:	Specify the message contents. This is done using tags. Click the Help-button to check the supported tags. It is possible to insert in the packet either data (such as

	number plate number, date and time) or the JPEG image of the vehicle: %IMAGE_BW. The data is sent on the network using a message header that includes the overall number of data contained in the message.
Jpeg Quality:	Jpeg image quality. The value may range from 1 to 100 where 1 is the maximum compression level (lowest quality) and 100 is the minimum compression level (highest image quality). Suggested values from 50 to 90.
Server IP:	IP address of the server.
Server Port:	Server listening port.
Reuse Connection:	NO: the socket connection is opened and closed upon every message. YES: the socket connection is opened upon sending the first message and is kept active. The connection is shut down if unused for 15 minutes. Regardless of mode configuration, the TCP connection will close and open a new TCP connection when problems occurred while sending data. This means the receiver should be steadily ready to accept new TCP connections.
Buffering on SD:	In case of network failure and Buffering on SD is enabled, the camera will save all data regarding the actions. When the network connection is restored, the ANPR will manage automatically all data stored, freeing the memory. The saving is based over a circular buffer. In case of full memory the ANPR will overwrite oldest data.

The packet data contains the tags defined in the Message field. Every tag is defined by a tag-identifier and a tag-size indicator. The packet may contain any number of tag-fields. Tag-fields are arranged depending on the ANPR firmware. This may as well change when using a different firmware version. For this reason, when searching for tag-fields in a received packet, the server should scan all tag-fields regardless of their position inside the received message. This programming method allows for software compatibility with future firmware versions.

In the web interface it is possible to select the tags to attach to the message sent to the TCP server. To define the data to be attached, tags are used. For example, use %PLATE in order to attach the string with the number plate number. Refer to the table in appendix A for an overview of the available tags on the web interface, their description and tag-identifier code included in the message.

Standard message format - Network data packet format

Value	Length (in bytes)	Description
24	4	Header size in bytes. Always set to 24 (=0x00000018).
<CMD>	4	Command code. Always set to 40000 (=0x00009C40).
0	4	Not used
0	4	Not used
<ERR>	4	Error code (0=no error).
<LEN>	4	Data size in bytes. 32-bit aligned. Header not

		included.
<DATA>	<LEN>	Packet data. Containing the tag defined in the Message field above.

Standard message format - Network packet tag-field format

Value	Length (in bytes)	Description
<TAG-ID>	4	Tag-identifier
<TAG-LEN>	4	Tag-size in bytes
<TAG-DATA>	<TAG-LEN>	Tag field contents

String format

Output is generated using a syntax where each transit is represented by a string composed by all fields specified in the "Message" field. The "Message" field can contain TAGs and generic text. Each unknown TAG will be considered as string.

For example, these message tags:

```
%PLATE%_%DATE% %TIME%_TEST_SITE
```

Generate the following string output:

```
369AXJ-CANSK_2014-06-24 18-18-17-125_TEST_SITE
```

XML format

Output is generated using a XML syntax where each transit is represented by a root node and every TAG specified by the user in the "Message" field is represented by a child node.

For example, these message tags:

```
%PLATE%DATE%TIME%GAIN%SHUTTER%STROBO%IMAGE_BW
```

Generate the following XML output:

```
<?xml version='1.0' encoding='UTF-8' standalone='no'?>
<root>
<PLATE>AA555AA-ITA</PLATE>
<DATE>2013-10-30</DATE>
<TIME>17-08-55-808</TIME>
<GAIN>256</GAIN>
<SHUTTER>20000</SHUTTER>
<STROBO>1000</STROBO>
<IMAGE_BW> (BASE64-encoded image) </IMAGE_BW>
</root>
```

Action: Send Image FTP 2

This function allows saving the images of vehicle detected by the ANPR to a remote ftp-server. This action is identical to the SEND IMAGE FTP action described in chapter 0, but can be used to send images to a second ftp-server.

Action: Save DB FTP 2

If enabled, this feature allows creating and automatically updating on a remote ftp-

server a text file in CSV format (CSV = Comma Separated Values). This action is identical to the SAVE DB FTP action described in chapter 0, but can be used to update a second ftp database server.

Action: TCP Message 2

If enabled, this action will send a message to a TCP/IP socket connection.
This action is identical to the TCP MESSAGE action described in chapter 0, but can be used to messages to a second host.

Action: SD Saving (Save Image To SD Memory)

If enabled, save data on a partition of the SD memory regardless of network status. In this case the saving is NOT managed with circular buffer.

Enable:	Select YES to enable saving images on SD memory.
Jpeg Quality:	Jpeg image quality. The value may range from 1 to 100 where 1 is the maximum compression level (lowest quality) and 100 is the minimum compression level (highest image quality). Suggested values from 50 to 90.
Crop Image:	This setting enables a crop of the full image. The crop is cut around the number plate. Available sizes are: 320x240, 640x480, 800x600 and 1024x768.
Path Name:	Specify the folder name where the image is saved. The first part of the path is mandatory %DATE%HOUR.
File Name:	Specify the image file name.
Text Position:	Specify the position of a text window inside the saved image. This window contains the information entered in Text Value. The allowed values are: TOP-LEFT, TOP-RIGHT, BOTTOM-LEFT, BOTTOM-RIGHT and DISABLED.
Text Options:	It allows enabling the option NOT-OVER-PLATE. This option moves automatically the text window when positioned over the plate, in order to not cover the plate.
Text Value:	Specify the information to be included in the image. It is necessary to use appropriate tags to provide this information. Click the Help-button to check the supported tags.

Action: Save DB SD

If enabled, this feature allows creating and automatically updating a text file on Secure Digital in CSV format (Comma Separated Values) containing information about every vehicle transit detected by the Vega plate reader.

Enable:	this parameter takes two possible values: YES or NO. If enabled (YES), this feature allows saving the image of the event.
Path name:	It allows specifying the folder name where the database is saved. It is necessary to use appropriate TAGs to indicate this folder name. For example, when using "%DATE", a new folder is created each day.
File name:	It allows specifying the name of the database to be updated with the data about vehicle transit. For example when using %DATE a new file is generated each day. The file name is the date on that day – e.g.: 2008-10-28.
File extension:	Specifies the extension of the generated file. For example,

	if File Name field contains %DATE and File Extension contains CSV, the resulting file name will be similar to "2008-10-28.CSV". The File Extension field can be left empty.

Fields:	It allows specifying the database fields.
	Example string on web interface:
	`%DATE%;%TIME%;%PLATE%`
	CSV file on FTP server:
	`DATE;TIME;PLATE`
	`2015-10-03;09-14-50-222;SA249BH-ITA`
	`2015-10-03;09-15-00-569;CH123BV-ITA`
	`2015-10-03;09-18-07-234;AF234SV-ITA`

Save headers:	When this field is set to YES, the system inserts a row containing the list of fields at the beginning of the file.

5.2.9 IMAGE RESULT

This Image Result page displays image and grabbing data of the last detected vehicle. The page is automatically and periodically reloaded so it is possible to keep open and view in real time the system results. Since the page is periodically being reloaded, it might happen that not all system-detected vehicles are displayed. It may happen, with heavy traffic, that the refresh period is not capable of showing all vehicles that actually have passed.

Next to the image, the following data is displayed:

Plate:	The number plate associated with the recognition.
Country:	Three-character string indicating the plate's country of origin. See www.nedapidentification.com/anpr-countries.
N. Read:	The number of images containing the read plate.
Char Width/Height:	The character width and height, in pixels. Helpful when adjusting the minimum and maximum character size in the Plate Reader settings page (see chapter 0).
Shutter:	The exposure time, in microseconds, used for image grabbing.
Strobe:	The infrared illuminator activity time, in microseconds, used for image grabbing.
Gain:	The gain used for image grabbing.
Date/Time:	Date and time at which the image was grabbed.

5.2.10 TEXT RESULT

The Text Results page displays the returned values of the OCR algorithm for each grabbed image.

14/07/2011 14:46:38:643 ZLSZ17-NLD(7) Acq(Sh=1226ms, St=1000ms, G=284, GP=2, IL=50)
14/07/2011 14:46:38:643 YT57HB-NLD(5) Acq(Sh=1158ms, St=1000ms, G=284, GP=2, IL=50)
14/07/2011 14:46:38:643 NOTREAD Acq(Sh=1717ms, St=1000ms, G=284, GP=3, IL=50)

The text lines will contain the recognized number plate (if any), the corresponding date and time and the shutter, strobe and gain parameters that were used during the image processing.

5.2.11 STATISTICS

This page contains the OCR statistics for the last 24 hours of operation.

The upper part of the OCR Statistics page contains the percentages recognized as READ, NOT READ or NO PLATE. The lower part contains the percentage of readings for the 3 different points of image grabbing. This allows viewing, at any time of the day, how many vehicles have been detected as well as what grabbing points were used. Using this information, the user can evaluate whether the grabbing settings are correct and consistent and calculate the recognition rate.

5.3 SYSTEM CONFIGURATION

5.3.1 NETWORK

The Network Settings page contains the following configuration fields:

Network

NetBiosName	It allows setting the name of the ANPR device. It is possible to enter alphanumeric values in this field. Spaces must be represented by "_" (underscore).
IpAddress	It allows setting the IP address of the ANPR device.
NetMask	It allows setting the network net mask.
Gateway	It allows setting the gateway IP address.
DhcpEnable	It allows enabling/disabling automatic acquisition of IP addresses.

Time Server

Syncro	This feature enables/disables the synchronization to an external timeserver.
IpAddress	Indicates the IP address of the time server which is used as reference to synchronize the ANPR's internal clock.
GMT Offset	Indicates the number of minutes to add to the time received from the time server, in order to offset between "Greenwich Mean Time" and local time. This value is expressed in minutes and can be negative. See http://wwp.greenwichmeantime.com for further details on time zones for different countries around the world.
Auto DST	Automatically adjust clock for daylight saving changes. If set to YES, it automatically handles switching between daylight-saving time and standard time.

5.3.2 HTTP USERS

Three user access levels are available:

Superuser	The superuser is allowed to access all system-enabled features, modify operational parameters (setup) and assign access rights to other users.
Administrator	The administrator has the rights to modify any all operational parameters but is not allowed to access the HTTP Users page.
Guest	Guest users are only allowed to view the system parameters.

Access to HTTP Users page is granted to the superuser only, who is allowed to enable, disable or delete users or to assign new passwords. Up to ten administrator and/or guest users can be assigned to the system and only one superuser account.

The HTTP Users page contains the configuration settings of the users who access the ANPR via a browser.

Server Port:	The port number where the http server is open. Default value is 80.
Name:	User's username.
Password:	User's password.
Status:	User's access level. Can be ADMIN, GUEST or DISABLED.

5.3.3 RS485 SERIAL PORT

It is possible to send messages to the RS485 serial port. The messages must be enabled in the Events / Actions settings table. Tags are used to define the content of the message sent. See chapter 0.

Below the RS485 serial port configuration is shown:

Enable:	It allows enabling or disabling communication through the serial port.
Baud rate:	Serial port communication speed. Default 9600.
Parity:	Serial port parity checking. Default NONE.
Data Bit:	Serial port number of data bits. Default 8.
Stop Bit:	Serial port number of stop bits. Default 1.
Message:	Message protocol format. Default RAW format. This format syntax can fully be specified using the web interface. See chapter 0. Using the PROTOCOLLED format involves a message header, footer and acknowledge packets. See packet formats below.
Wait ACK:	It allows enabling/disabling the confirmation signal sent by the external unit upon data receiving. Only when in protocolled mode.
Timeout ms:	It allows specifying the time (in milliseconds) of waiting for an answer from the external unit (only when in protocolled mode).
Retry Number:	It allows specifying the number of times to resend unacknowledged messages to the external receiving unit (only when in protocolled mode).

Protocolled data packet format

Value	Length (in bytes)	Description
0x89ABCDEF	4	Open message code.
<ID>	4	Message ID number. Start at 1, incremented upon every message.
<LEN>	4	Data size in bytes.
<DATA>	<LEN>	Packet data. As specified in chapter 0.
<XOR>	1	Checksum. Xor of all previous bytes.
0x12345678	4	Close message code.

Protocolled acknowledge packet format

Value	Length (in bytes)	Description
0xA5	1	Open message code.
<ID>	4	Message ID number. Must be the same as the ID of the received message.
0x5E	1	Close message code.

5.3.4 FIRMWARE / LIBRARY

It is possible to update the ANPR firmware library. The firmware library is one file, containing the ANPR operating system, recognition library and configuration. The installed recognition library supports all European countries. The firmware package file is distributed as a .bin-file.

Two possible update options are available:

- Upgrade firmware library keeping current settings.
- Upgrade firmware library with default settings (network settings will remain unchanged).

Upgrade procedure (from PC to ANPR):
Click the Browse-button below the preferred update method and select the firmware library file (.bin-file). After the file has been selected, click the Upload-button and confirm the operation. When the update completes, the user is asked to reboot the device.

Backup download procedure (from ANPR to PC):
Press the Download-button to save a compressed bin-file containing the ANPR firmware and all its user defined parameters. This feature is very useful when duplicating the same configuration onto another device or keeping the file for backup purposes. The bin-file can be directly loaded to an ANPR system, using either of the available upgrade options.

Note
It is recommended, to use the internet explorer to update the firmware. Other browsers may not work or cause problems with the ANPR firmware.
During the update it is very important to make sure the ANPR is not powered off. Please do not close the HTTP connection until the download is completed

5.3.5 DEVICE INFO

This page displays information about the ANPR firmware library, device hardware status and diagnostic information:

Version

Firmware version	= VEGA ACCESS 10.6.3 NLD-EU Mar 14 2013 12:02:53
OCR lib version	= Tattile Plate Reader Ver.3.69.01
TOS version	= 4.33.12
FPGA Version	= 0

Device Status

Image Sensor OCR	= CCD_1300x1000_BW (74)
board Serial Number	= 583447
Board code	= 573
Board revision	= 2
MAC Address	= 0x0050C2BE1442
Temperature	= Not Available
Flash file system size	= 40312 KByte
Buffering SD size	= 3.8 GB (READY)
Storage SD size	= 3.8 GB (READY)

Diagnostic Status

Status	= OK
Internal parameters	= M:0x05e5 C:0x05e5 A:0x0000 W:0x0000 R:0x0000
Last check time	= 17/09/2013 09:01:00,298
Boot time	= 29/08/2013 07:16:52,680
Status Secure Digital	= OK

Status Memory	= OK
Status Process	= OK
Status Time Synchro	= OK
Status OCR Camera	= OK
Status Plate Reader	= OK

5.3.6 DIGITAL I/O

The ANPR has a number of embedded digital inputs and outputs. Outputs are used for external monitoring devices or for example control an electronic door lock. Inputs are used as trigger sources. It is possible to check and modify the status of digital outputs. This function is useful when checking the cabling after installation. See also chapter 4.4 for details about the digital i/o connections.

Digital input
Green input icon indicates that the input is high (gray is low).
Click on the Refresh-button to update the states of the icons.

Digital output
Red output icon indicates that the output is high (gray is low).
Click on the digital output icon to change its state.

Note
Only digital output 0 is wired on the ANPR.

5.3.7 SYS STATISTICS

This page contains the statistics about data sending from ANPR to external devices. The info in this page is very useful upon installation as they help check the available bandwidths from ANPR to the data receiving servers.

In addition to this info, the page displays the statistics about synchronization with the SNTP server. These statistics are updated when synchronization with time server is enabled (see chapter 5.3.1).

	Time[sec]		Bandwidth[KB/sec]		Counters	
	Mean	Max	Mean	Min	Success	Fail
FTP Save Image	0.00	0.00	0	0	0	0
FTP Save DB	0.00	0.00	0	0	0	0
TCP Send Message	0.01	0.03	5	1	6354	0
PNS Alarm	0.00	0.00	0	0	0	0

TIME SERVER SYNCRO
Synchronization disabled

5.3.8 SECURE DIGITAL

SD memory management is entirely automatic and transparent by the ANPR firmware. SD memory is used to store data of ANPR generated events. The storage occurs only if the action planned for the event can't be executed.

Let's consider for example the 'save image to ftp-server' action taken upon number plate reading event. In case the ftp-server is not available (service not available or whatever network connection problem) then the image is being stored to SD memory. As soon as the ftp-server is back to service, the image is automatically read from the SD memory and sent to the server.
Before sending the image, the event/action matrix is checked. If the action is enabled, the image will be sent while if disabled, the image will be deleted. In general, whenever action-related data are retrieved from the SD memory, the relevant action parameters that were set via web page are always checked first so that the action is executed according to these setting.

Let's assume for example that when saving the image to SD, the ftp-server IP is 192.168.0.100. If upon reading the image from SD the server IP is 192.168.0.200, then the image will be sent to this IP address.

5.3.9 SYSTEM DIAGNOSTICS

The diagnostic configuration page allows to set working limits on Vega Access, Vega III, Vega HD / 2HD. State variables you can configure are the following:

- Camera tilt and roll
- Temperature and humidity range
- Max current consumption

The values stored in this page are used for generating diagnostic alarms.

Installation parameters

Current angles	Currently measured Tilt and Roll angles.
Installation angles	Specify here installation Tilt and Roll angles. A significant deviation may cause a diagnostic system alarm message.

Working limits

Temp range	Min and max temperature (default from -10 to +75 °C).
Humidity range	Min and max relative humidity (default from 0 to 70 %RH).
Current range	Min and max current consumption (default from 200 to 700 mA).
Tilt range	Accepted Tilt angle deviation.
Roll range	Accepted Roll angle deviation.

Alarm message handling

Alarm repeat time	Set to 0 for no alarm repetition.
Send warnings	YES or NO.
Send end of alarm	YES or NO.

A TCP TAG IDENTIFIER OVERVIEW

Tag web	Description	Tag-id	Tag-len	Data type
%DATE	Date string YYYY-MM-DD. E.g. '2011-07-28'	14000	12	STRING
%TIME	Time string HH-MM-SS. E.g. '12-34-56'	14001	16	STRING
%NETBIOSNAME	NetBiosName. E.g. 'NEDAP_ANPR1'	14002	32	STRING
%PLATE	Number plate, including country. E.g. '46HVR9-NLD'	14003	24	STRING
%PLATE_STRING	Number plate, without country. E.g. '46HVR9'	14004	20	STRING
%PLATE_COUNTRY	Number plate country. E.g. 'NLD'. See: www.nedapidentification.com/anpr-countries	14005	4	STRING
%NREAD	Number of times the number plate was read	14006	4	INT32
%IMAGENAME	Image file name	14007	128	STRING
%IMAGEPATH	image file path	14008	128	STRING
%TRANSIT_ID	Transit counter.	14009	4	INT32
%PLATE_MIN_X	Upper left X-coordinate of the car plate rectangle	14010	4	INT32
%PLATE_MIN_Y	Upper left Y-coordinate of the car plate rectangle	14011	4	INT32
%PLATE_MAX_X	Lower right X-coordinate of the car plate rectangle	14012	4	INT32
%PLATE_MAX_Y	Lower right Y-coordinate of the car plate rectangle	14013	4	INT32
%SPEED	Vehicle speed (km/h)	14014	4	INT32
%CLASS	Vehicle class id	14015	4	INT32
%CLASS_STRING	Vehicle class description: CAR, CAR WITH TRAILER, LORRY, LORRY WITH TRAILER, BUS, MOTORCYCLE, UNKNOWN, ...	14016	32	STRING
%SN	ANPR serial number	14017	4	INT32
%DIRECTION	Vehicle direction	14018	12	STRING
%NET_TRIG_ID	String received using ethernet trigger	14019	32	STRING
%IMAGE_BW	Camera image in jpeg format	14020	IMG-DIM	BUFFER
%IMAGE_COL	Context camera image	14021	IMG-DIM	BUFFER
%OCRSCORE	Score of the OCR regarding the number plate reading	14022	4	INT32
%OCRSCORE_CHAR	Score of the OCR regarding each character within the license plate.	14097		
%PLATE_DESC_A	Plate description (only for match on list A)	14023	128	STRING
%PLATE_DESC_B	Plate description (only for match on list B)	14024	128	STRING
%ACQUISITION_MODE	Acquisition mode (FREE_RUN, TRIGGER, ...)	14025	32	STRING
%PLATE_STD	Standard plate (only when joined)	14026	40	STRING
%PLATE_TRL	Trailer plate (only when joined)	14027	40	STRING
%PLATE_ADR	ADR plate (only when joined)	14028	40	STRING

%SHUTTER	Image acquisation shutter time in microseconds	14029	4	INT32
%GAIN	Image acquisation gain	14030	4	INT32
%STROBO	Image acquisation strobo time in microseconds	14031	4	INT32
%VEHICLE_TYPE	Vehicle type description based on plate format: UNKNOWN, PASS, PRIV_TR , TAXI, MOTO, PUBL_TR, EXPORT, DIPLOMATIC, TRAILER, DEALER, IMPORT, ...	14032	32	STRING
%DIAG_STATUS	Diagnostic status: DIAG_NONE=no alarms DIAG_WARNING=warning status DIAG_ALARM=alarm status	14037	257	STRING
%DIAG_STRING	Detailed diagnostic status string. The status type is identied by 3 characters: DAT=date and time. THE=temperature and humidity. SDD=secure digital status CVM=current and voltage TLR=camera inclination MEM=memory status PRO=running processes TSY=time synchronization COA=BW camera CCA=color camera PRA=plate reader The actual status is indicated with 1 character: 0=invalid, unavailable or disabled 1=ok 2=warning 3=error Each status entry is separated with an underscore ('_').	14038	257	STRING
%SITE_ADDRESS	Site address name as specified in general settings.	14039	128	STRING
%PLATE_NOT_READ	Plate number for plate not read. Example not read: '46HVR9-NRD' Example read: '46HVR0-READ' Example no plate: '46HVR9-NOPLATE'	14040	40	STRING
%CAM_SIGN	Camera signature.	12518	256	STRING

All strings are null-terminated. Unused bytes are set to zero.

The STRING and BUFFER values are not necessarily multiples of 4 bytes, yet the occupied buffer space is always a multiple of 4 bytes, this in order to keep structure alignment.

Example 1: %CAM_SIGN contains the string 'AEF23AC012' which is 10 bytes long.

Including the null-terminator, there are 11 bytes required. Aligned to 4 bytes the total field length must be equal to 12 bytes. So the payload will contain 12 bytes of which the last 2 are 0. The tag-len field will contain the number 11 meaning that the useful bytes in the payload are only the first 11 bytes.

Example 2: %IMAGE_BW contains a image data buffer of IMG-DIM 34231 bytes. The data buffer is aligned to 4 bytes and the will therefore have exactly 34232 bytes.

B DISCLAIMER

C DOCUMENT REVISION

Version	Date	Comment
4.3	2016-05-31	Updated with new features
4.2	2016-03-22	Added document number
4.1	2014-10-24	Added ANPR Access HD
4.0	2014-02-13	Layout adjusted to new corporate style.
1.0	2013-09-17	Updated tcp tag id list in appendix A and added system diagnostics.
0.5	2013-02-12	Firmware library update better explained
0.4	2011-12-06	RS485 A/B naming corrected
0.3	2011-11-10	Text corrections
0.2	2011-10-25	Update introduction and getting started chapters
0.1	2011-07-12	Initial document version