CARMEN® ANPR

EU ARH 001

- NUMBER PLATE: ARH 001
- VEHICLE TYPE: MERCEDES BENZ
- NATIONALITY: EU-HUNGARY
- SPEED: 158 MPH / 254 KMH
- BLACKLIST: --- NO ---
- COLOR: BLUE METAL
- OWNER: ZSOLT VANYI
- RECOGNITION TIME: 2015-01-12T15:19:21+00:00

INSTALL GUIDE

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Document version: 2016-12-14

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INTRODUCTION

This documentation contains a step by step guide on how to install both the hardware and software components of the CARMEN® ANPR engine. It also gives a brief description on recommended camera positioning and image requirements.

This guide only details the installation procedure for Windows based systems, Linux users please follow this link: CARMEN® for Linux install guide

If you would like to read more about the demo software that is provided with the engine, please follow the links below:

- ANPR Demo for Videos User's Manual
- ANPR Demo for Images User's Manual

HANDLING PRECAUTIONS

There are some standard precautions that should be followed when handling the Neural Network Controller (NNC) card or any other computer component:

1. Keep the card in its anti-static bag until it is ready to be installed.
2. Protect the card from static electricity by grounding your body and the equipment during installation. Wear a grounded wrist strap, or touch the metal case or chassis of the PC before touching the card.
3. Always grasp the card by its edges.
4. Do not touch the components on the card or the "gold finger" connectors plugged into the expansion slot. Instead, grasp the card by its mounting bracket.
5. Ensure the system power is completely turned-off before doing any installation work. In case of PCs with ATX power supplies, it is recommended to unplug the power cord before installation.

> !Important
>
> During hardware installation, exercise caution when handling hardware components as these might have sharp edges or protruding parts that can cause hand injuries.

PACKAGE CONTENTS

A CARMEN® license has both hardware and software components. Hardware components are shipped physically via a courier service, software components are downloaded via the ARH Technical Support System (ATTS) following registration.

Software Components:

- Software development libraries
- Sample codes for all supported languages:
    - C/C++, C#, VB.NET and Java programming languages for Windows
    - C/C++ and Java for Linux
- Manual for the API in electronic format
- Drivers for the PCIe(x1)/USB port Neural Network Controller (NNC)
- ANPR Demo software
- General LPR engine for reading common license plates with Latin characters
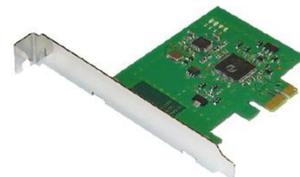
Hardware components:

- One of the following Neural Network Controllers (NNC)

| FXMC USB | FXMC Internal USB | FXMC PCIe |

INSTALLING CARMEN® ANPR

1.   SYSTEM REQUIREMENTS

Minimum system requirements:

- Intel Pentium Ⅲ 1GHz CPU or higher (or any other fast x86 or x64 compatible CPU)
- 512 Mbytes of RAM or more
- Free PCIe slot with bus mastering option or USB 2.0 port
- Windows 7, 8, 8.1, 10 32/64 bit or Linux (current releases of Ubuntu, Fedora, Debian or Red Hat) operating system
- For CARMEN® ANPR: image files (.jpg, .bmp, .png, .jpeg2000) loaded from a mass storage drive or directly from memory as input

In order to run CARMEN® ANPR, you should either have a USB 2.0 port NNC or PCIe NNC. This is a form of HW protection for the software, the dongle includes the license.

> 🗋 Note
>
> The system requirements detailed above are the minimum specifications that CARMEN® can run on. Using a computer with the specifications above will result in lower processing speeds. Therefore, a higher performance PC is recommended if faster processing times are required. The speed of image processing greatly depends on the clock speed of the processor. Due to the high amount of calculation, hyper-threading and other emulation technologies do not yield advantages in terms of performance. A CARMEN® engine will run optimally on a CPU that is 3 GHz or faster.

2. HARDWARE INSTALLATION

2.1. INSTALLATION OF THE PCIE (X1) NNC

1. Turn the computer off and unplug the power cord.
2. Remove the cover from the computer (refer to the user's manual of the PC for specific instructions).
3. Locate an available empty PCIe expansion slot.
4. Remove the slot cover screw and slot cover if possible.
5. Open the antistatic protective sleeve of the CARMEN® NNC card, grasp the circuit board by the edge of its mounting bracket and take it out from the sleeve.
6. Insert the card into the empty PCIe expansion slot by its gold finger connectors and gently press down on the top edges of the board to ensure that all connecting points are seated securely. Fasten the mounting bracket of the board using the screw removed earlier.
7. Reinstall the cover of the PC and reconnect the power cord.
8. Turn the computer on.
9. During system boot, enter the BIOS setup program of the computer and check whether the **Bus mastering** option is enabled. If not, enable it. Save and exit setup. (This option is not available in every BIOS setup program; check the user's manual of the PC for specific information).
10. When the New Hardware Found wizard starts, click on **[Cancel]**.

2.2. INSTALLATION OF THE USB 2.0 PORT NNC

1. Connect the NNC to one of the USB 2.0 ports of the computer.
2. The key will only be detected and recognized once the software package has been installed.

3. SOFTWARE INSTALLATION

Download links for the CARMEN® Installation Package are distributed via the ARH Technical Support System (ATSS). The links are sent out automatically once your order is processed. If you did not receive a download link, please open a ticket in ATSS.

3.1. INSTALLATION ON WINDOWS PLATFORMS

1. Before installing a new CARMEN® ANPR version, uninstall any previous versions of CARMEN® ANPR from your system (if applicable) and reboot the computer.
2. Extract the received zip file to a folder on the hard disk of your computer.
3. CARMEN® setup does not start automatically; locate the setup.exe within the Installation Package to start the installation.
4. Follow the installation steps and accept the END-USER LICENSE AGREEMENT by clicking on **[I Agree]**.
5. Once this is done, select the method of installation in the pop-up window.

Three options are available:

    a) Minimal: only the drivers and the function libraries will be installed.

> **Note**
>
> If this option is selected, the License Manager application will not be installed. The License Manager is only necessary if you intend to update licenses on the computer.

   b) Typical: besides the drivers and the function libraries, the demo applications will be installed as well.

> **Note**
>
> Typical installation is the default installation method recommended for users. Development libraries will not be installed if this option is selected.

c) Full: recommended for developers. Selecting this option will install the entire package on the PC.
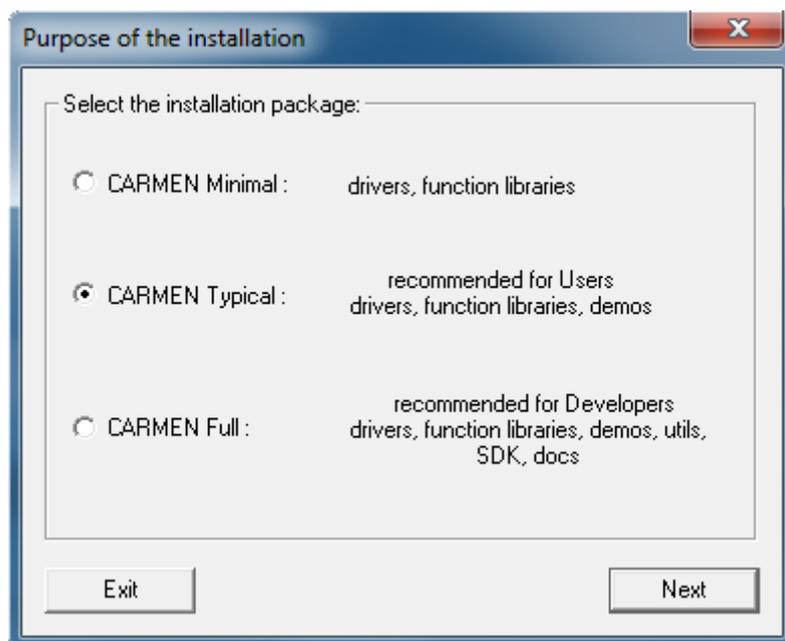
6. Click on **[Next]** to start copying files to your computer.
7. Restart the computer to complete the installation process.
8. Connect the USB or Express Card Hardware Key into the computer. When the New Hardware Wizard starts, select **Install the software automatically**.
9. Go to **Start Menu/ (All) Programs/ CARMEN GX** and run the **ANPR Demo for Images** to start using CARMEN®.

RECOMMENDED CAMERA POSITION

A good ANPR engine can read the plates from images taken in various conditions. However, if recognition rates of over 95% with short recognition times are required, the position of the camera has to be calculated accurately. In an ideal situation the camera is installed on a gantry above the traffic lane (see below).
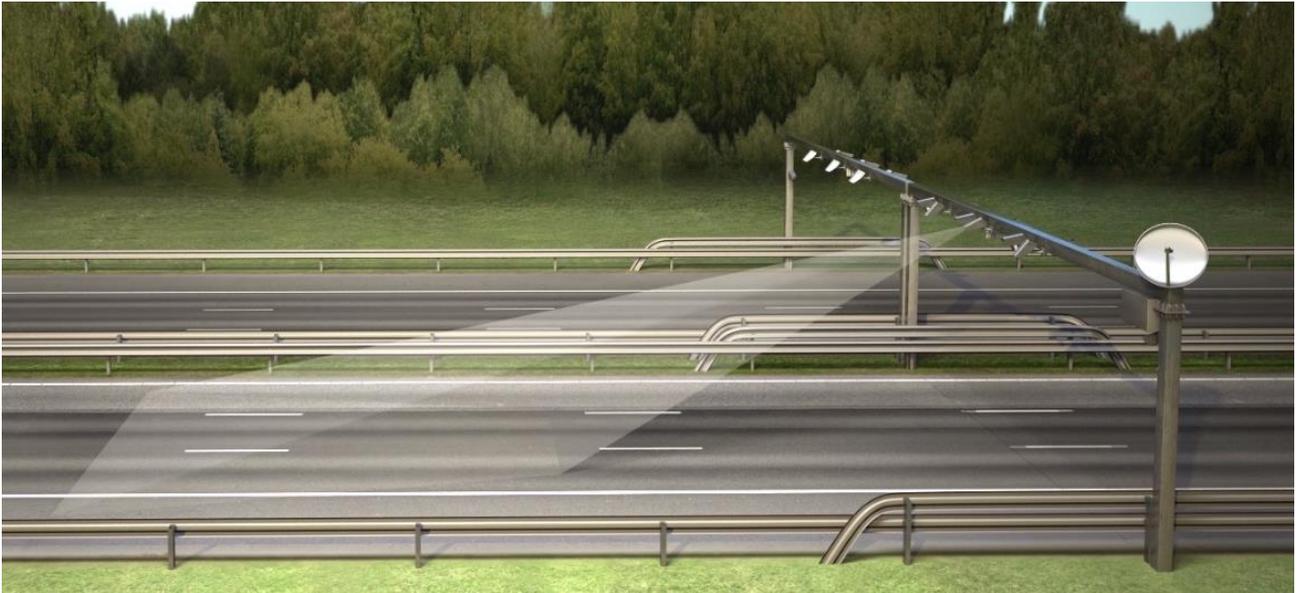
If no gantry exist at the site where ANPR is necessary, then the camera can be installed near the side of the road as well. In this case, the angle between the camera axis and the direction in which the vehicle is moving should be minimal. Furthermore, the camera should be installed 1 – 1.5 meters above the headlights of the vehicles.

The distance between the camera and plate is also important. If the camera is too far from the plate, the characters may not be large enough for recognition. If this is the case, zoom-in until you reach the proper size. If the distance is too short, it may happen that a part of the plate is outside the camera's field of view (when the vehicle is near to the side of the lane or the plate is not in the middle of the vehicle).
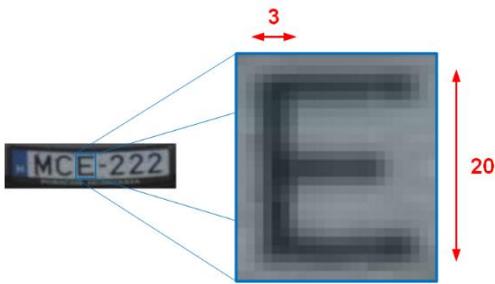
Proper character sizes (in pixels) on the sample image

From the point of ANPR/LPR, the most important factor is the size of the characters on the image. For Latin characters it is recommended to have an average character height of at least 16 pixels. For Arabic or other special characters, it is recommended to have characters that are at least 20 pixels in height. A higher resolution is needed in the latter case as these characters are more intricate in their design.

Very low resolution pictures are unusable for ANPR, but so are very high resolution images as well. Therefore, avoid settings where the character height is greater than 50 pixels. The line width of a character on the image should be at least 2 pixels.

IMAGE REQUIREMENTS

In order to expect the most accurate result from the CARMEN® software, the processed images should contain a plate:

- with reasonably good spatial resolution (on the license plate the minimum character height is 16 pixels for Latin and 20 pixels for Arabic characters, 2 pixels line-width on the image),
- with reasonably good sharpness,
- with reasonably high contrast,
- under reasonably good lighting conditions,
- in a reasonably good position and angle of view.

Although, "reasonably" is not an exact definition, still it can be understood easily if you look at the sample images below. The first six image are **NOT** usable for ANPR. The ones on the next page however, can be properly used for ANPR.

EXAMPLES TO AVOID

LOW SPATIAL RESOLUTION

BLURRED IMAGE

LOW CONTRAST

OVEREXPOSURE

HIGH DISTORTION

BAD LIGHTING CONDITIONS
(SHADOW AND STRONG LIGHT)

IMAGES ADEQUATE FOR ANPR

- GOOD SPATIAL RESOLUTION

- GOOD SHARPNESS

- HIGH CONTRAST

- GOOD LIGHTING CONDITIONS

- GOOD POSITION AND GOOD ANGLE OF VIEW

CONTACT INFORMATION

HEADQUARTERS	ARH AMERICA	INNOVATION CENTER
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The ARH Technical Support System (ATSS) is designed to provide clients with fast and proficient assistance.

Information regarding hardware, software, manuals and FAQs are easily accessible for clients who are already registered in ATSS. In addition to offering assistance, the system is also designed to provide high levels of protection while managing your business information.

NEW USERS

If this is your first online support request, please create an account by clicking on this link.

RETURNING USERS

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

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