



OMNIA LPR SERVER 2.0

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# OMNIA LPR SERVER 2.0

The server-based solution for License Plate reading

## USER MANUAL



## OMNIA LPR SERVER 2.0

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**IT IS RECOMMENDED TO READ THIS MANUAL BEFORE USE**

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## INTRODUCTION AND REQUIREMENTS

The Arteco LPR Server 2.0 application is software that can be installed in a Windows environment, capable of reading license plates and transforming images into data.

Arteco LPR Server 2.0 is able to acquire video via RTSP protocol with H.264 or MJPEG encoding, from IP cameras, encoders or video servers.

Performance may vary depending on the hardware and software characteristics of the system on which Arteco LPR Server 2.0 is installed, as well as the camera chosen, the lens installed and the lighting.

The best performances are usually obtained with "box" cameras, because they allow the mounting of a suitable lens and can be installed in a special case with a **suitable IR illuminator**.

Below are the minimum system requirements:

<b>Operative system</b>	Windows 7 or higher
<b>Processor</b>	Intel i5 or higher
<b>RAM</b>	8GB or higher

Below, however, the requirements in terms of **supported video streams**.

<b>Input stream</b>	RTSP
<b>Encoder</b>	H.264, MJPEG
<b>Compression quality</b>	Higher than 85%
<b>Plate contrast</b>	High, possibly by means of IR
<b>Characters contrast</b>	High, IR must come from a led array surrounding lens
<b>Plate sharpness</b>	High, the light must be enough in order to allow high shutter frequencies

Lastly, the requirements in terms of the **size of the license plate**.

<b>Minimum character height</b>	20 pixels
<b>Maximum plate angle</b>	+/- 20°
<b>Max rotation</b>	+/- 3°

## CAMERA POSITION



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Generally, to read a license plate from a known country, you need an image with good contrast and preferably the camera must be set in b/w. In any case, the most important requirement is the PIXEL height of the plate character which, in the image received from Arteco LPR Server, **must be at least 20 pixels**.

### LIGHTING

In order to get the best images from reflective plates, the light source should be mounted as close as possible to the camera lens. The light allows the camera to read at night and improve reading during the day.

An infrared light is preferable to visible light to illuminate a license plate, to avoid visual disturbances or glare of the driver.

An infrared bandpass filter helps improve reading accuracy.

### SHUTTER

In order to obtain clear images even for moving vehicles, it will be necessary to adjust the limits to the camera shutter excursion. Typically, if a vehicle is in motion, the maximum exposure is 1/2000 seconds. Consequently, it will be necessary to adjust the aperture of the diaphragm to obtain a satisfactory brightness of the characters on the plate.

## INSTALLATION

**BE SURE TO HAVE SET CORRECTLY THE DATE AND THE TIME OF THE SYSTEM**

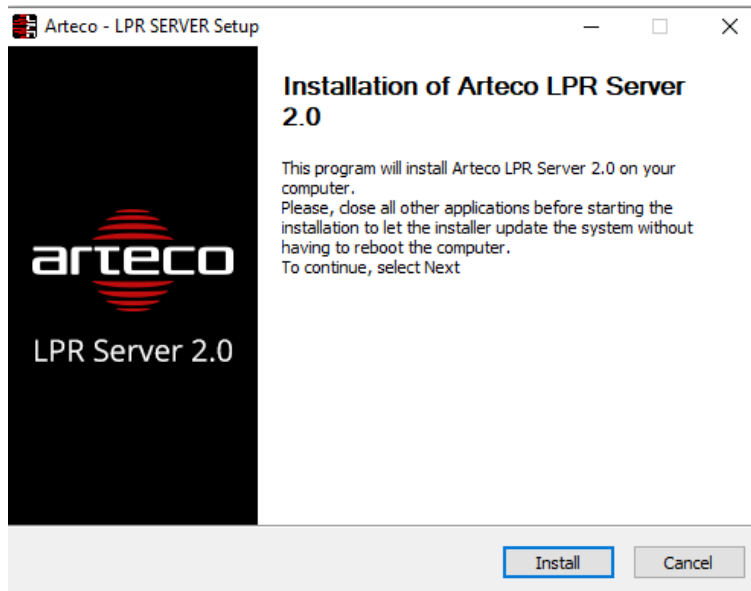
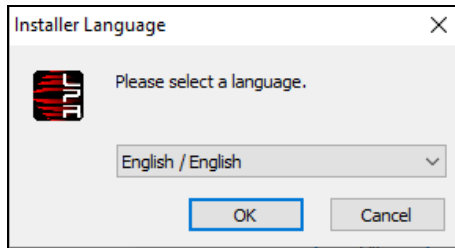


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Open the installation file received from Arteco.

A screen will appear, on which you will need to choose the language to be used during the installation. Once selected between Italian and English, click on "OK".

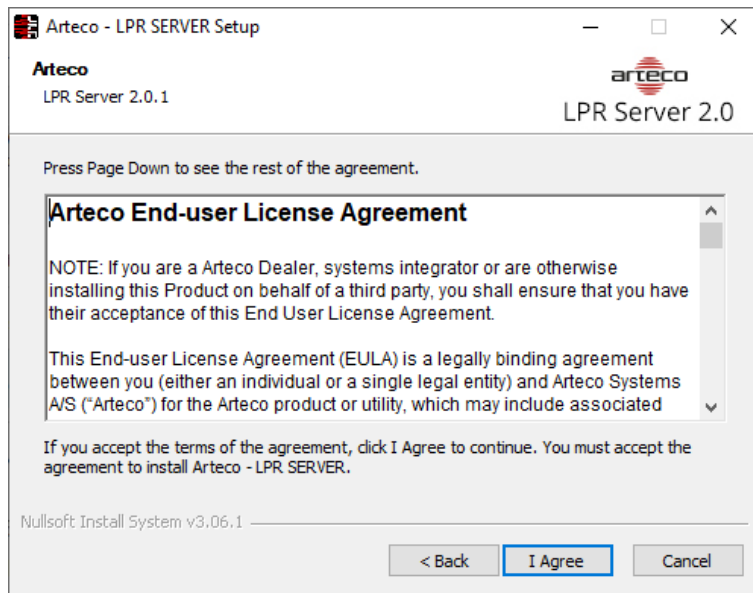


In case of an update the installer will use the previous license, configuration and installation path.

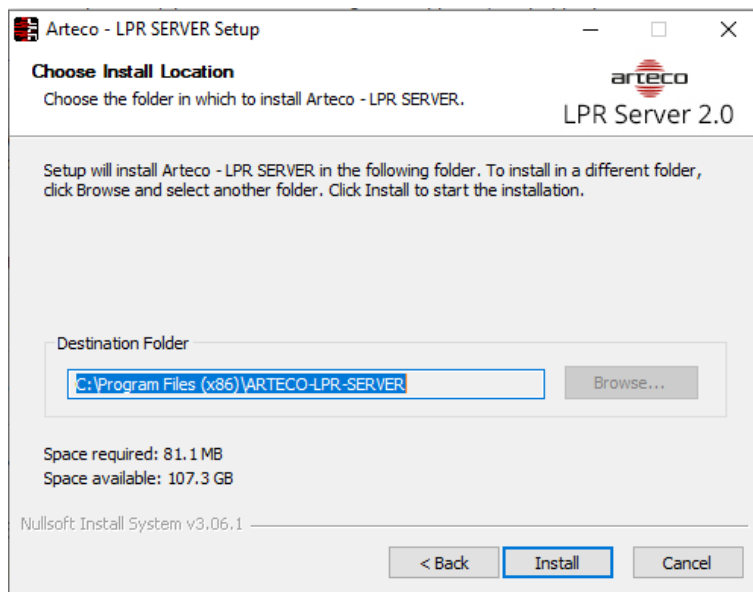
Then the screen containing the EULA terms will appear. To continue, you must accept.



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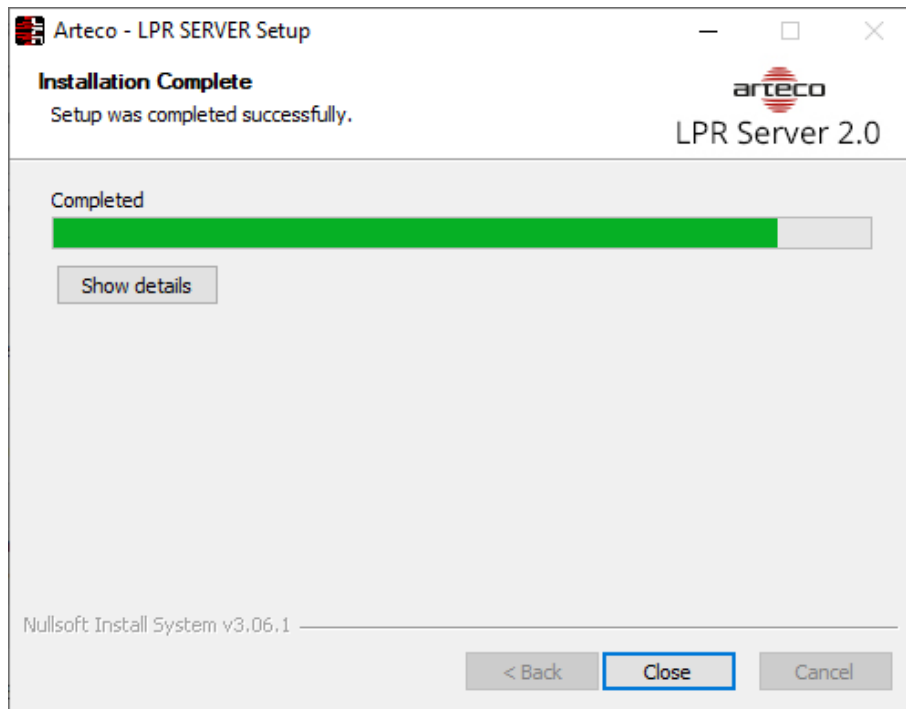


You will be asked in which folder to install the application. We recommend not change the suggested folder.



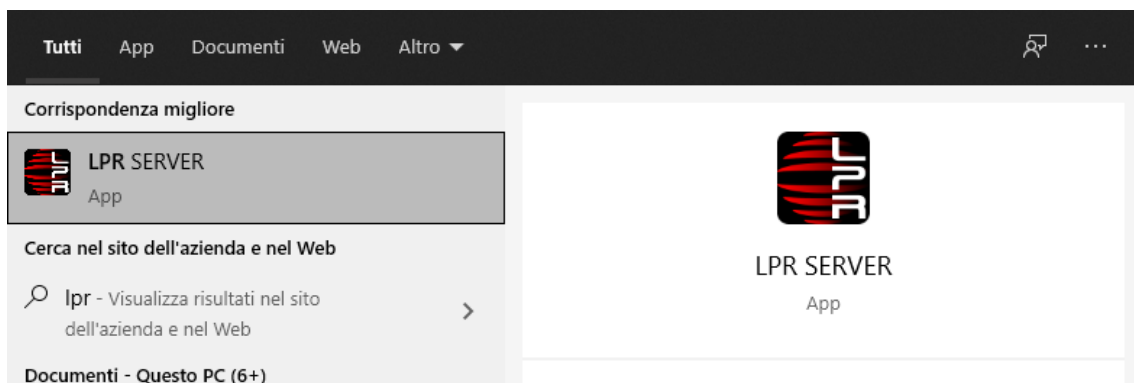


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Arteco LPR Server 2.0 will be installed on the system. To start using the solution and display the GUI, click on the relative icon in the App menu.

By default LPR Server 2.0 will run as a service.

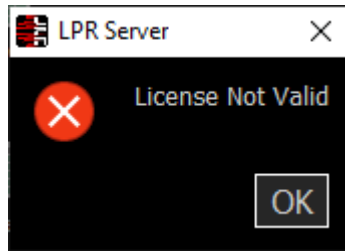




## FIRST LAUNCH - LICENSING

After installing the application and launching the application as described on the previous page, the Arteco LPR Server GUI will open.

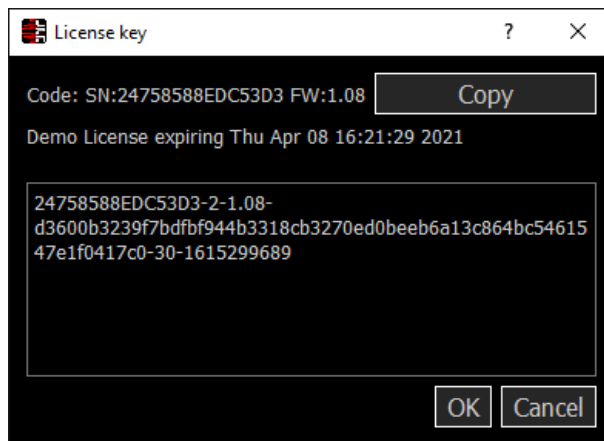
If the system has not yet been activated, a notification message will appear.



A window will open, allowing you to license Arteco LPR Server.

Copy the alphanumeric code next to the "Code" field, using the "Copy" button, then send it to Arteco via email/ Reserved Area on the website.

Arteco will respond with a "license key" to be placed in the box below. After doing this, click on "OK".



The screen will automatically open allowing you to configure the system.

## CONFIGURATION

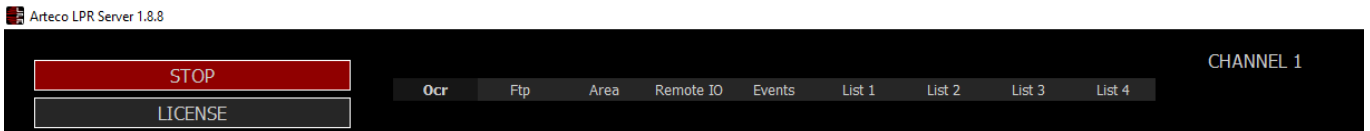




## OMNIA LPR SERVER 2.0

In the image below there is a preview of the Arteco LPR Server screen.

On the left there are buttons that allow you to launch / stop the application, manage the license to use and configure the various channels, whose configuration consists of four main items in the tab menu: OCR, RTSP, FTP, AREA, REMOTE IO, EVENTS, LIST 1, LIST 2, LIST 3 AND LIST 4.



## CHANNEL (#)

According to the license, on the left side of the screen you will find the relative CHANNELS to be configured, where it will be possible to basically define the RTSP strings of the cameras on which to enable license plate reading.

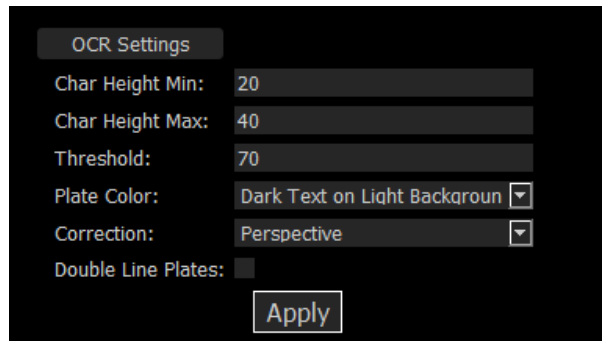
First of all, click on the channel you want to configure, selecting it from the left column, and then enter the data relating to it.



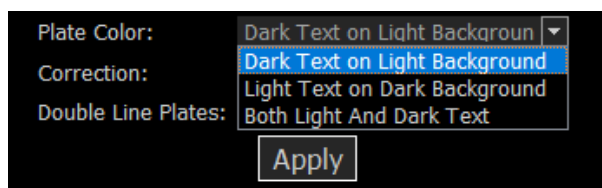
- In "Location" you can type-in a specific channel name, which usually "reflects" the location where the camera is installed.
- In "URL", enter the RTSP MJPEG string as specified. This is usually provided by the camera manufacturer, **so you need to know the data in advance.**
- The "Use KeepAlive" field is to be selected to allow Arteco Server LPR to maintain connection with the streaming device, such as Wisenet Samsung cameras, Arteco Mobile, etc.
- In "Protocol" you can indicate which communication protocol, between TCP and UDP, to transmit the video stream between Arteco LPR Server and the device.

## OCR

Before changing the following settings, set lens focus properly, minimize camera rotation and skew, and point the camera to plate perpendicularly (+/-20°).



- The parameter “MinCharH” means minimum character height [pixel] expected by software, while “MaxCharH” is the maximum character height [pixel] expected by software. You can change these parameters if your lens cannot reach the plate width as ¼ of image width. Minimum acceptable height for a plate character is 20 pixels.
- By opening the “Correction” drop-down menu you will be allowed to select one of two distortion corrections: Perspective or Rotation. Choose for the dominant image distortion, if any, otherwise select “none” to preserve CPU resources.
- “Threshold” will allow to cut-out readings which trustiness is weak in order to avoid fake readings. A bright, clear and well sized plate image generate a score = 100. A misreading will fall below 50. A good tradeoff for this threshold is = 70.
- “Plate color” will speed up read time when set properly according to plates you may need to read. Three options are available:
  - 1) Dark text on Light Background
  - 2) Light text on Dark Background
  - 3) Both Light and Dark Text



- The “Double line plate” option, if enabled, will allow OCR to read plates split over 2 lines like the following example



FTP



## OMNIA LPR SERVER 2.0

This menu defines communication parameters between the Arteco LPR Server 2.0 and the FTP Server, capable of receiving images of decoded license plates from the system, including metadata.

First, you need to click on the channel you want to configure, select it from the left column, and then enter the data in the right part.

For each channel, it is necessary to set:

- URL FTP Server: The IP address of the system on which the FTP server is installed.
- Port: the communication port used between the two systems
- User: Authorized User Name
- Password: Authorized user password
- Passive Mode: active

Such data must be known in advance.

If the system is integrated with Arteco NEXT [see the appropriate chapter.](#)

## AREA

The Area menu allows to define active or exclusion zones for plate readings. You will be able to set an area in which the software will read plates (green), or define a "masking" area where ARTECO LPR will not read the plates (red).

1. To enable this function, check the "Enabled" combo-box.
2. Define if you want to draw a "Detection" detection, or a "Non detection" zone and click on "New".
3. Click and move the mouse in relation to the image of the camera, with each right click the system will "fix" a point in order to define the outline of the area, when finished right click with the mouse.

If you want to remove an area, click on the area on the screen and then press the "Delete" button.



This feature might be useful when the camera is pointing to a double-lane, and you do not want readings from either of the two directions (incoming or outgoing vehicles) or if there are any disturbance elements.

**Click on Apply to confirm changes.**

## REMOTE IO

The REMOTE IO menu allows you to trigger an Output of a device by configuring the URL command, username and password.



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The output trigger configuration is linked to each camera.

This device / output must be activated via http/cgi commands (eg. Arteco Everywhere, cameras, audio signaling devices ...).

Notes:

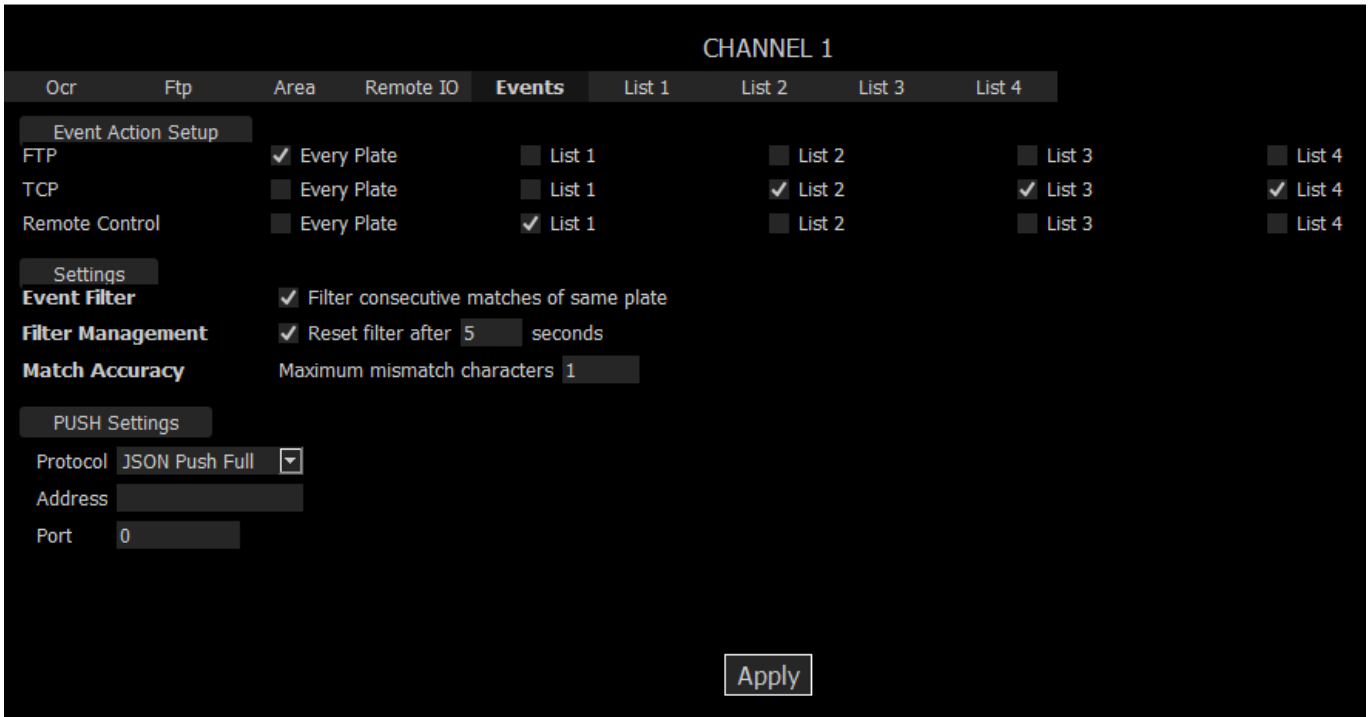
- The command to be entered is provided by the device manufacturer.
- Enter the User and Password if requested by the device.

A screenshot of a web-based configuration interface. At the top right, it says "CHANNEL 1". Below that is a navigation bar with tabs: "Ocr", "Ftp", "Area", "Remote IO" (which is highlighted), "Events", "List 1", "List 2", "List 3", and "List 4". The main area contains three input fields: "Command URL:", "User:", and "Password:". Below these fields is a "Send Command" button. In the bottom right corner of the interface, there is an "Apply" button.

## EVENTS

Through the EVENTS menu it is possible to choose the post event actions such as the FTP sending (Arteco NEXT or 3rd party sw) , TCP (then selectable through the Push settings menu ) and Remote Control (Output cgi), **for each channel**.

It is however possible to select more than one item, for each type of protocol.

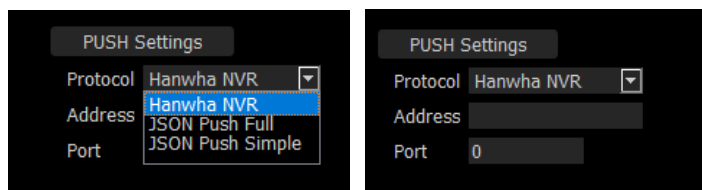


- Every plate: Arteco LPR server 2.0 sends an event after any plate read
- List 1: the Arteco LPR server sends the event if the plate read is present in list 1
- List 2: the Arteco LPR server sends the event if the plate read is present in list 2
- List 3: the Arteco LPR server sends the event if the plate read is present in list 3
- List 4: the Arteco LPR server sends the event if the plate read is present in list 4

In the "Settings" sub-menu the user can define some additional features for the access control:

- **Event Filter:** if selected, it triggers the actions defined only once, ignoring multiple readings of the same plate. This function has the purpose of avoiding repeated notifications (eg the vehicle is stopped in front of a barrier and its license plate is read continuously by the camera).
- **Filter Management:** the activation of this function is to reset the previous filter after the defined number of seconds, in order to re-activate the readings and notifications.
- **Match Accuracy:** this parameter sets a tolerance of N wrong characters in the plate reading, in case there is not a complete match between the plate read and the plate in the list. It can be useful in order to allow entry even in case of small reading errors (eg dirty plate).

In the PUSH Settings sub-menu you can select the TCP transmission protocol for sending data through various modes:





Once the type of protocol has been selected, the IP address and the "socket" port enabled on the third-party system must be indicated.

For more information, consult the [Arteco LPR Server - Event sending protocols chapter](#)

## CONNECT LPR SERVER 2.0 WITH ARTECO NEXT

Arteco NEXT is the VEMS supplied by Arteco that allows you to manage license plate reading cameras and license plate archives.

The first thing to do is to configure appropriately the video channel and assign a LPR License.

Then remember to enable the License plate recognition plug-in.

If the configuration is successful, Arteco NEXT will start receiving the plate events from the Arteco Server LPR system.

GENERIC-RTSP

LPR 4th November blv (Hanwha P)

Enable Camera

Channel License: LPR

IP Address: 82 . 62 . 11 . 6

HTTP Port: 80

User: admin

Password: .....

Protocol: TCP

RTSP Port: 8553

Main Stream

rtsp://<ip>/  
/0/onvif/profile2/media.smp

H264 7.91 MEGAPIXEL

Sub Stream

Enable Substream

rtsp://<ip>/

Audio In

FTP Path: /arteco-lpr3

FTP User: administrator

FTP Password: avs123

Plugin

- Violated Area
  - Basic settings
  - Schedule
- Abandoned/Removed Object
  - Basic settings
  - Schedule
- License Plate Recognition**
  - Basic settings
- Input Output
  - I/O event generation
  - Associated devices
  - I/O Enabling control
  - Chained I/Os

Arteco-IT-Demo-LPR  
LPR 4th November blv (Hanwha P)

Enable



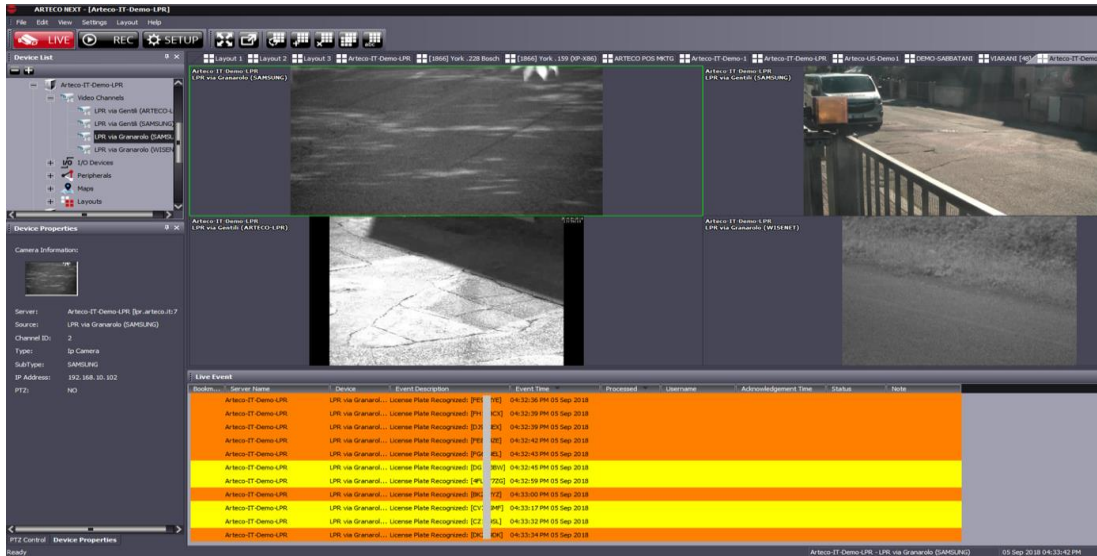
## LIVE

On Arteco NEXT it is possible to watch live videos (if the LPR camera provides it) or watch snapshots. The license plate reading events will be displayed in the Event Log, see the example below.





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For a quick evaluation of the events you can double click on the log line, the Events Panel will open, displaying the event details as shown below. Displayed you will find the details of the event, with the possibility to modify the properties and add notes.



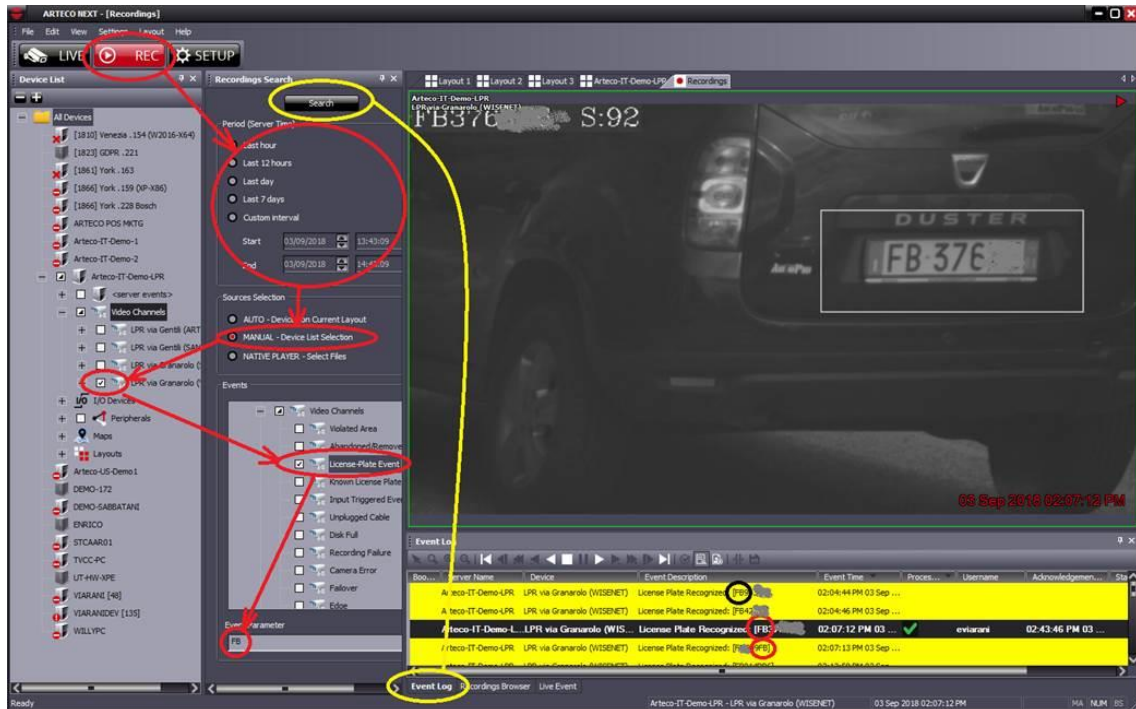
Below, on the video frame on the left you will see the live video, while in the right frame you will see the snapshot, with the immediate possibility of exporting it to an image file or in a standard format video.

## SEARCH

You can do detailed searches on multiple cameras / servers. To do this, follow the steps below:

1. Go to the REC environment
2. Select query time range
3. Choose the "Manual" source selection and choose the camera from the device tree

4. Check "License Plate Event" among the "Video Channels" event types
5. Enter the license plate string (even incomplete)
6. Press "Search" and select the "Event Log" tab at the bottom
7. Browse through the query results by clicking on the relevant rows to view the license plate images



## NOTIFICATION PROTOCOLS

### FTP image

Arteco LPR Server 2.0 can transmit read plates snapshots through the FTP client system.

The file name format is "20140826113939-DV680JB.jpg" where "20140826" is the date and "113939" is the camera timestamp; "DV680JB" is the decoded plate string.



If no readings occurs the App sends a keep alive image named as "KA.jpg" containing the current image taken at the time of generating the file. The keepalive period if no reading occurs is a file every 10 seconds.

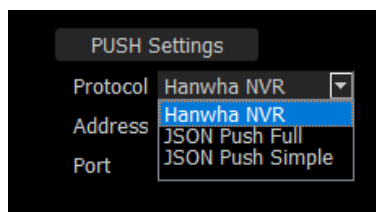
## TCP JSON Push

In order to meet the need for integration with external solutions, two different JSON protocols are available, allowing the application to send network socket notifications through a standard format.

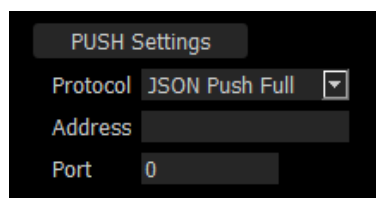
JSON Push Protocol consist of JSON messages sent over a TCP connection to a user-defined TCP socket server.

- The JSON Simple protocol consists of two messages: KeepAliveEvent and PlateDetectedEvent (plate read)
- JSON Full also sends files of the entire image and the cutout of the license plate.
- The messages are unidirectional from the Arteco LPR Server (TCP client) towards the TCP Socket Server.

From Setup -> Event action menu you can select JSON packages:



The socket server coordinates (address / port) must be entered in the relevant fields as shown below :



## KeepAliveEvent

KeepAliveEvent is sent every 10 minutes and is formatted in the following way:

```
{"KeepAliveEvent":"SerialNumber":"ABCDEF","LicenseValid":"0"}\n
```

where

**SerialNumber** is the Serial Number of the camera



**LicenseValid** is "1" if Application License is Valid "0" if is not Valid.

At the end of message is append a newline character to help socket server size parsing.

## PlateDetectedEvent

This event is sent every time a new Plate is detected and it is formatted as follows:

### Full Protocol Version

```
{"PlateDetectedEvent":{"SerialNumber":"ABCDEF","PlateNumber":"AAAAAA","Date":"20161113","Time":"212724","VehicleImage":"XXXXXXXXXXXXXXXXXXXXX","PlatelImage":"YYYYYYYYYY YYYYYY","MatchListResult":"0"}}\n
```

where

**SerialNumber** is the Serial Number of the camera

**PlateNumber** contains the string plate detected in UTF8 encoding

**Date** is formatted like "yyyymmdd"

**Time** is formatted like "hhmmss"

**VehicleImage** is the BASE64 representation of the full image processed by the LPR

**PlatelImage** is the BASE64 representation of the image of the plate

**MatchListResult** can be:

- "0" (Match list not configured)
- "1" (Plate match one entry in the match list)
- "2" (Plate does not match any entry in the match list)

At the end of message is append a newline character to help socket server size parsing.

### Simple Protocol Version:

```
{"PlateDetectedEvent":{"SerialNumber":"ABCDEF",  
"PlateNumber":"AAAAAA","Date":"20161113","Time":"212724","MatchListResult":"0"}}\n
```

where:

**SerialNumber** is the Serial Number of the camera

**PlateNumber** contains the string plate detected in UTF8 encoding



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**Date** is formatted like “yyyymmdd”

**Time** is formatted like “hhmmss”

**MatchListResult** can be:

- “0” (Match list not configured)
- “1” (Plate match one entry in the match list)
- “2” (Plate does not match any entry in the match list)
- At the end of message is append a newline character to help socket server size parsing.

**ARTECO Sede Italia**

Via Gentili, 22 48018 Faenza (RA) Italy  
Ufficio: +39 0546 645777 - Fax: +39 0546 645750

**ARTECO US HQ**

14515 North Outer Forty, Suite 150 Chesterfield, Missouri 63017 - 5798 USA  
PH: +1 (314) 434-5331 - Fax: +1 (866) 462-1323

**Arteco South Africa**

Johannesburgh - PH: +27 81 443 8583

