

GAT SR 950



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For all inquiries concerning this product, please contact your local sales partner or one of the Gantner branch offices directly. The contact details are available via the following link: www.gantner.com/EN/locations.

Contact address of manufacturer

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Dear Customer,

Our aim is to ensure that our product operates with safety and to your complete satisfaction. To achieve this aim, please take this opportunity to familiarize yourself with the following guidelines.

- > Pay attention to the safety messages in this manual. The messages are indicated by the signal words "DANGER", "WARNING", or "CAUTION", and inform you about hazardous situations and how to avoid them.
- > Pay attention to messages indicated by the "NOTICE" signal word. These messages include important information for avoiding property damage.
- > Pay attention to the symbols and safety messages on the product.
- > Read all instructions in this manual carefully before installing or operating the product.
- > Where not otherwise specifically documented, the appropriate installation, commissioning, operation, and maintenance of the product is the customer's responsibility.
- > Keep this manual in a safe place for quick reference.

Notation of safety information and safety symbols

This manual includes important safety messages and symbols intended to inform the user about potentially hazardous situations or important information for the safe and proper use of the described product(s). The safety messages also include directives on how to avoid hazardous situations. These safety messages and directives must be read and observed.

The structure of the safety messages and the meaning of the symbols used in this manual are described in this section.

1. Safety messages for personal injury

Personal safety messages contain a signal word, describe the nature of the hazard, and indicate how to avoid the hazard.



The safety alert symbol used without a signal word always precedes important safety information that must be read carefully, and the instructions carefully observed. Not doing so may cause personal injury.

Format of safety messages that apply to an entire section:

These safety messages may be used with or without a symbol.

CAUTION



Electrical shock

Touching current-conducting parts may result in injury due to electrical shock.

- Do not remove safety protection and covers.
- Do not touch the electrical connections while power is being supplied.

Format of safety messages that are embedded in text and apply to a specific point:



CAUTION! Electrical shock. Never remove safety protection and covers. Do not touch the electrical connections while power is being supplied.

2. Property damage messages

Property damage messages are used to describe potentially hazardous situations that may lead to property damage. These messages have the same layout as safety messages but use the signal word "NOTICE" instead of "CAUTION".

Format of property damage messages that apply to an entire section:

NOTICE

Risk of damage to the device and connected devices
Risk of malfunction

- Read the following instructions carefully before installing the device.
- Always adhere to the instructions.

Format of property damage messages that are embedded in text and apply to a specific point:

NOTE! Risk of damage to the device and connected devices. Read the following instructions carefully before installing the device.

3. Definition of the signal words

	Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.
	Indicates information considered important, but not hazard-related (e.g., messages relating to property damage).

4. Definition of the safety symbols

	Caution: General Information This symbol indicates general warnings or cautions that are not related to a particular type of hazard.
	Caution: Electrical Shock This symbol indicates warnings related to electrical hazards (danger due to high voltage).
	Prohibited: Do Not Disassemble This symbol indicates warnings about not disassembling certain components or equipment. Disassembling may lead to damage or malfunction of the device.
	Mandatory Action: General Information This symbol indicates general information that must be read and followed before proceeding with the accompanying instructions.
	Mandatory Action: Read Instructions This symbol indicates information referring to an important description in the manual, or other documentation, which must be read and followed.

⚠ Important Safety Information ⚠



- The installation, commissioning, and servicing of our products must be performed only by suitably trained personnel. Electrical connections may only be made by correspondingly qualified specialists. Always observe the relevant installation regulations in accordance with the national Electrical Engineers Association.
- ➔ Unqualified personnel may potentially perform actions that result in injury due to electrical shock.



- Where not otherwise stated, installation and maintenance work on our products must be carried out when disconnected from the power supply. This especially applies to appliances that are normally supplied by low-voltage current.
- ➔ If the appliance is not disconnected from power, touching terminals or other internal parts of the appliance may lead to injury due to electrical shock.



- It is prohibited to alter the products (devices, cabling, etc.).
- ➔ Alterations to the products may subsequently result in personal injury, property damage, or damage to the products.
- Do not remove protective shields and covers.
- ➔ Removing protective shields and covers may result in personal injury or property damage.
- Do not attempt to repair a product after a defect, failure, or damage is detected. In addition, do not put the product back into operation. In such cases, it is essential to contact your Gantner representative or the Gantner support hotline.



- The installation, commissioning, operation, and maintenance of the product must be carried out in accordance with the technical conditions of operation as described in the corresponding documentation. Therefore, it is essential to read the corresponding chapter of this manual and observe the instructions and information therein.
- If there are still some points that are not entirely clear, please do not take a chance. All queries can be clarified by your Gantner representative or by ringing the Gantner support hotline.
- Directly on receipt of the goods, inspect both the packaging and the product itself for any signs of damage. Also check that the delivery is complete and includes all accessories, documentation, auxiliary devices, etc.



- If the packaging or product has been damaged in transport, or should you suspect that it may have a fault, the product must not be put into service. Contact your Gantner representative who will endeavor to resolve the problem as quickly as possible.
- Gantner Electronic GmbH accepts no responsibility for any injuries or damage caused due to improper use.

Although great care is taken and we are continuously aiming for improvement, we cannot completely exclude the possibility of errors appearing in our documentation. Gantner Electronic GmbH therefore accepts no responsibility for the completeness or the accuracy of this manual. The right is reserved to make alterations at any time without prior notice.

Should you discover any fault with the product or in its accompanying documentation, or you have any suggestions for improvement, you may confidently inform your Gantner representative or Gantner Electronic GmbH directly.

We especially look forward to hearing from you if you want to let us know that everything is functioning perfectly.

The GAT SR 950 was developed and manufactured under the quality management standard ISO 9001 and Gantner Electronic GmbH is also certified according to standard ISO 14001.



This product is in conformity with the following EC directives, including all applicable amendments:

- 2014/53/EU (Radio Equipment Directive)

The complete text of the CE Declaration of Conformity is available via the following link:

https://www.gantner.com/downloads-gc7.3000_fZ1b98B3p1



Gantner is committed to meeting or exceeding the requirements of the RoHS directive (2011/65/EU).

The RoHS directive requires that manufacturers eliminate or minimize the use of lead, mercury, hexavalent chromium, cadmium, polybrominated biphenyls and polybrominated diphenyl ethers in electrical and electronic equipment sold in the EU after July 1, 2006.



The WEEE symbol on Gantner products and their packaging indicates that the corresponding material must not be disposed of with normal household waste. Instead such marked waste equipment must be disposed of by handing it over to a designated electronic waste recycling facility. Separating and recycling this waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. Please contact your local authority for further details of your nearest electronic waste recycling facility.

WARNING!

The GAT SR 950 is equipped with an 850nm Infrared illuminator. The human eye cannot see or can only slightly see the light coming from this illuminator. Do not look into the GAT SR 950 lens directly from close range or for more than 100 seconds. The eyes can be damaged by not following these precautions. However, there is no risk to the public during normal use of the GAT SR 950 while reading license plates at a vehicle access gate.

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1 INTRODUCTION

1.1 About this manual

These instructions contain information on installing, configuring and commissioning the GAT SR 950 reader with integrated license plate recognition camera to incorporate this functionality into your Gantner access control system.



For more information on the supplementary devices and applications included in this manual, please refer to the documentation of the respective product.

1.2 Target groups

Information on the installation, electrical connection, and configuration of the GAT SR 950 can be found in the relevant chapters. If a chapter is aimed at a specific target group, this is indicated at the beginning of the chapter.

Information for the following target groups is available in this manual:

- > Installation technicians (installation, configuration).
- > Service technicians (configuration).
- > Administrators of the access system (configuration).

Where not explicitly stated, the information in this manual is intended for all target groups in general.

⚠ CAUTION! Injury and property/equipment damage. The tasks described in each chapter must only be performed by the specified target group. Unqualified personnel who perform the described tasks risk personal injury or damaging property/equipment.

1.3 Contact & inquiries

For all inquiries concerning the GAT SR 950, please contact your local sales partner or one of the Gantner branch offices directly. The contact details are available via the following link: www.gantner.com/EN/locations

1.4 Formatting

1.4.1 Safety-critical information

The following formatting (with example text) is used in this manual to display important, safety-critical information that must be read and followed.

NOTE! Following on from this signal word in the manual is a reference text that must be read and followed. The reference text contains important information. Non-observance can lead to damage of the device or associated equipment.

1.4.1 General information

The following formatting (with example text) is used in this manual to display important, but not safety-critical information.



The text accompanying this symbol contains interesting information relevant to the current chapter. It will help you better understand the information in this section or provide tips for the described device or the operation of the software.

1.4.2 Instructions and results

Instructions, which must be completed by the reader, and the results of these instructions are formatted as follows.

- ▶ This symbol represents an action or instruction that that must be followed.
 - This symbol represents the result after completing the previous instruction.

1.5 Terminology

Several key terms that are used often in this manual are defined below.

Data carrier

Data carriers are used to identify users in the system and thus enable movement and the use of services in the facility. Data carriers with contactless RFID (Radio Frequency Identification) chips are available in various forms, e.g., cards, key tags and wristbands, and for different identification systems (LEGIC, MIFARE® or ISO 15693).

GAT DC 7200

Gantner access control device used for door control.

GAT SR 7000 Wiegand

The GAT SR 7000 Wiegand serves as an interface for communication between the access controller and external Wiegand devices such as the GAT SR 950.

GAT Matrix / GAT ACE 7000

Software solution developed by Gantner for access management. Authorizations are managed in the GAT Matrix software and the data is transferred to the GAT ACE 7000 software. If updated data is available for the connected hardware components, e.g., the GAT SR 950, it is transmitted to the hardware in question.

User

This term refers to the person that is using the access system. Multiple users with different hierarchy levels can be defined.

Web interface

To configure the GAT SR 950 and GAT DC 7200, the devices can be accessed directly via a web browser. The configuration interface is displayed in the browser after a valid login. The term “web interface” is used in this manual to refer to this configuration connection and display.

2 GENERAL INFORMATION

2.1 Intended use

The GAT SR 950 is designed for reading vehicle license plates and for processing access control. A typical application in the Gantner access system is access control in combination with master data management. The GAT SR 950 is the ideal solution if vehicles are to be conveniently managed via the access system.

2.2 Functional description

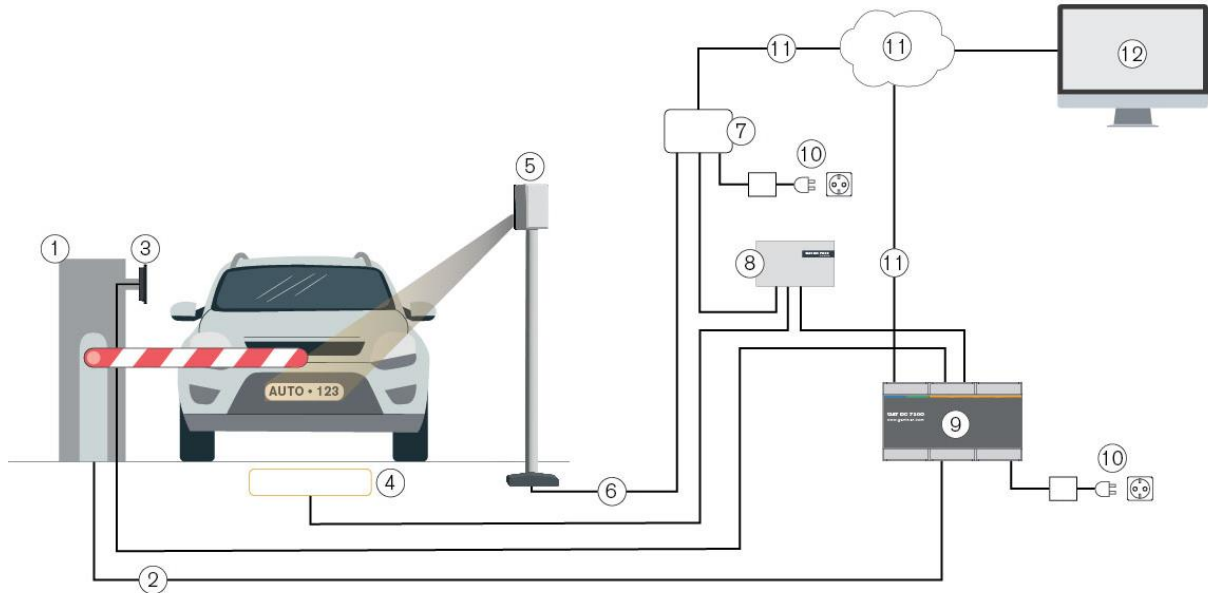
The GAT SR 950 is a reader with an all-in-one camera. With a large reading range of 2 to 10 m, this state-of-the-art camera enables the fast recognition of vehicle license plates to maintain traffic flow. Deep learning algorithms give the camera high accuracy in regions with common license plate formats, such as in Europe.

As of GAT ACE 7000 Version 2.2 and GAT Matrix Version 5.2, vehicle license plates are supported for license plate recognition. The license plate numbers defined in GAT Matrix are transmitted to all cameras in combination with the data carrier information. The GAT SR 950 validates the read license plates and, if validation is confirmed, transmits the data carrier information to the access controller (GAT DC 7200) via the Wiegand interface. The access controller then decides on further processes based on the defined authorizations and settings. You can define for each person whether the decision should be made locally by the controller or online. For decisions carried out online, the access request is processed by external software, e.g., pool management or anti-pass-back.

As of GAT Matrix V5.3, it is also possible to use other camera systems for vehicle license plate that communicate via Wiegand and support the SHA-1 26-bit standard. The SHA-1 hash algorithm is used to calculate check values from the vehicle license plates, which can be used to confirm unambiguously that the license plates match the personal data without being able to identify the license plate in plain text. For more information, refer to the documentation of the GAT DC 7200 controller, in which the cameras and the SHA-1 algorithms are configured.

2.3 System overview

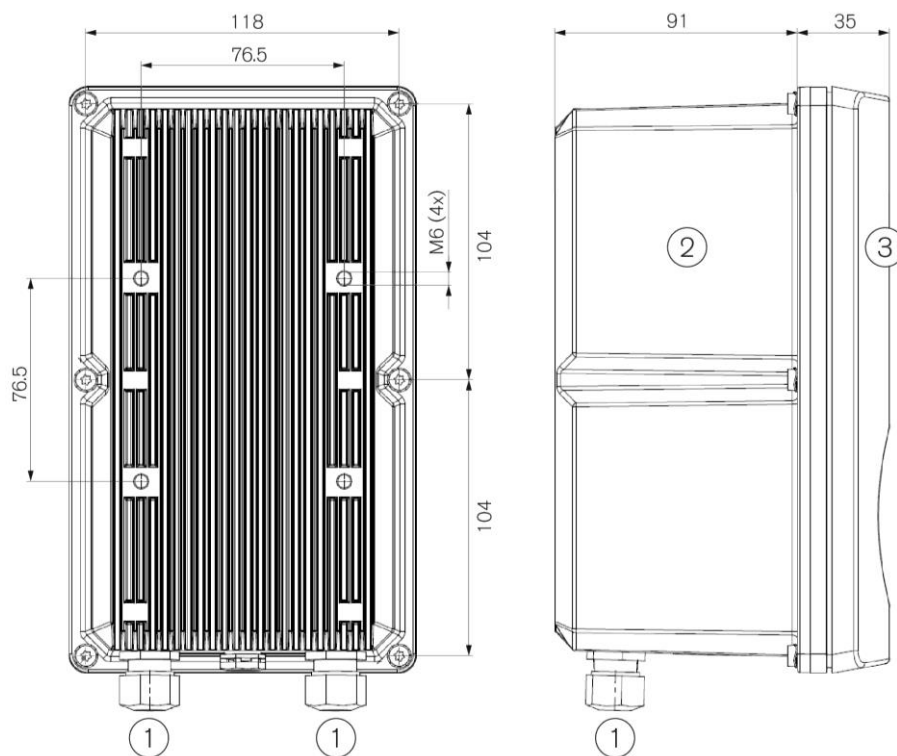
The following diagram shows schematically how the GAT SR 950 operates with the other components of the system.



- | | |
|-----------------------------------|---|
| 1 Access gate | 7 Connection box |
| 2 Gate control | 8 GAT SR 7000 Wiegand |
| 3 RFID reader (optional) | 9 Door controller (e.g. GAT DC 7200) |
| 4 Relay contact induction loop | 10 Power supply unit and mains power |
| 5 GAT SR 950 license plate reader | 11 Network |
| 6 GAT SR 950 cabling | 12 Access management software (e.g. GAT Matrix) |

Fig. 2.1 – System overview

2.4 Device dimensions and components



Measurements in mm

- 1 Cable entry
- 2 Housing
- 3 Cover

Fig. 2.2 – Features and dimensions of the GAT SR 950

3 INSTALLATION

⚠ CAUTION



Electric Shock

- ➔ Touching live parts can lead to injuries from electric shock.
 - Before working on the device or installation/deinstallation, the device must be disconnected from the power supply.
 - The applicable safety and accident prevention regulations must be observed.
 - Protective devices must not be removed.

NOTICE



Damage to or malfunction of the GAT SR 950

- ➔ Improper work can damage the device.
 - Read the information in this chapter carefully before installation.
 - Installation and maintenance of this device may only be carried out by trained, competent personnel.
 - Observe the specified technical data and measurement diagrams of the device.
 - Use the correct tools for installation.

3.1 Target group

This chapter contains information for the technicians responsible for installing the GAT SR 950. Experience in mechanical work and basic electrotechnical knowledge is assumed. Previous knowledge of the GAT SR 950 or the Gantner access system is required.

3.2 Installation instructions

The GAT SR 950 is intended for vehicle access control. Vehicles are identified via the license plate when approaching the access gate. As the license plate recognition process is very fast, a complete stop is normally not necessary. The camera of the GAT SR 950 covers a reading distance of 2 to 8 m, and the field of view is typically one lane wide. There are two options for installing the GAT SR 950: pole installation or installation behind the access gate.

3.2.1 Pole installation

The GAT SR 950 can be mounted on a pole (mast) behind or in front of the access gate. In this case, the GAT SR 950 is mounted on the pole at a recommended maximum height of 2.2 m. The license plate of a vehicle stopped directly in front of the gate can then no longer be read, which means that the reading must occur while the vehicle is approaching the gate.

NOTE! To ensure a smooth process, it is recommended that a feedback signal, e.g., via an induction loop, is incorporated into the access system for authorization release. In this case, the release command is sent to the access gate after positive validation by the access system. For seamless operation, the access system requires a feedback signal to confirm a successful entry, e.g., via a light barrier or induction loop.

If overhead installation is an option, the GAT SR 950 is best installed directly above the lane and in the center. In this case, the horizontal angle is ideally 0°.

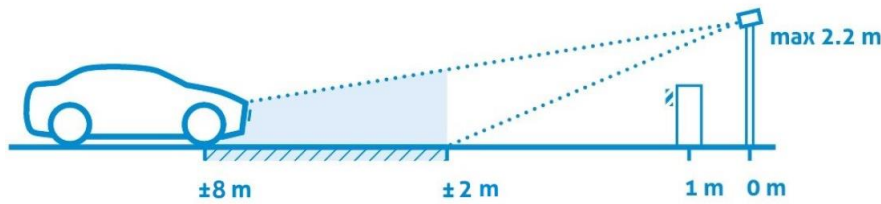


Fig. 3.1 – Pole installation

3.2.2 Installation behind the access gate

For this option, the GAT SR 950 is installed behind the access gate at bumper height. If there is enough space behind the gate and the sight is not blocked, the recommended position for installing the GAT SR 950 is at bumper height (0.5 m) and approximately 2 to 3 m behind the gate. A vehicle just in front of the access gate will still be recognized in this case.

NOTE! To ensure a smooth process, it is recommended that a feedback signal, e.g., via an induction loop, is incorporated into the access system for authorization release. In this case, the release command is sent to the access gate after positive validation by the access system. For seamless operation, the access system requires a feedback signal to confirm a successful entry, e.g., via a light barrier or induction loop.

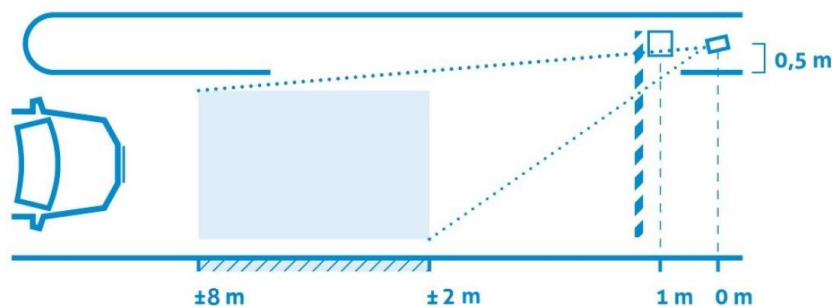


Fig. 3.2 – Behind gate installation

3.2.3 Mounting bracket dimensions

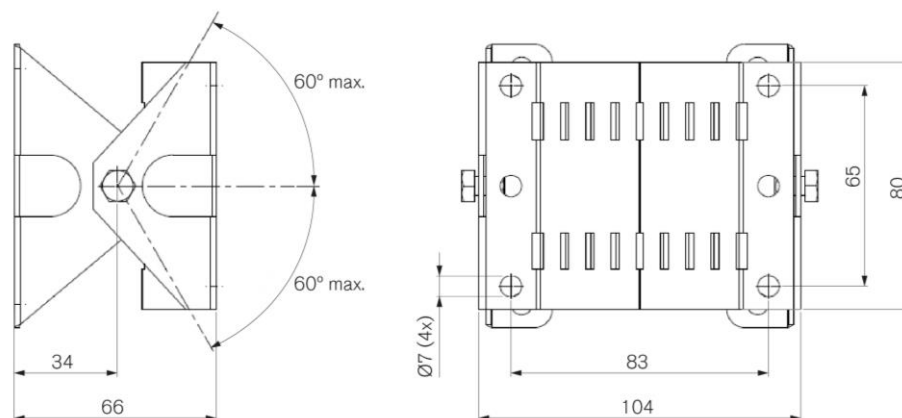


Fig. 3.3 - Measurements of the mounting bracket (measurements in mm)

4 ELECTRICAL CONNECTIONS

⚠ CAUTION



Electric Shock

- Touching live parts can lead to injuries from electric shock.
- Disconnect the power supply before completing the electrical connections.
 - Connect the GAT SR 950 to safety ground.
 - Observe the applicable safety and accident prevention regulations.
 - Observe the specified technical data and technical drawings of the device.
 - Do not remove any protective devices.

4.1 Target group

This chapter contains information for the electricians responsible for completing the electrical connection of the GAT SR 950. This work may only be carried out by qualified personnel. Previous knowledge of the GAT SR 950 or other Gantner devices is required.

4.2 GAT SR 950 connection cables

The GAT SR 950 is supplied with two 5 m cables that are pre-connected to the reader.

- > Cable 1: Power supply, RS-485 communication, and input/output (I/O) combined in one cable.
- > Cable 2: Ethernet LAN for communication and PoE (optional).

To connect the two cables, the appropriate local power and communication connections must be available at the installation site. The housing of the GAT SR 950 does not need to be opened to complete the electrical connections.

4.3 Power supply connection

The GAT SR 950 requires a power supply of +24 V DC ~ 1A (see technical data) and can be powered by a separate power supply (low power, Class 2) in compliance with local regulations or via Power over Ethernet (PoE).

- For supply via a separate power supply, connect the following wires of cable 1 to the corresponding wires of the power supply:

Wire color	Signal
Red	Power +24 V DC ~ 1A
Blue	Ground 0 V
Black	Ground 0 V

Fig. 4.1 - Wiring for a power supply

4.4 Network connection

Cable 2 is for the LAN Ethernet connection and is supplied pre-connected to the GAT SR 950 with an RJ-45 connector on the other end. Cable 2 is a Cat5e cable that is connected to the network. The TCP/IP connection is used to transfer the changed access software data and to configure the camera settings via the web interface.

NOTE! As of GAT Matrix V5.3, a network connection to the GAT SR 950 is only required to complete the initial configuration. No network connection is required for operation.

Recommended cables / cable lengths for LAN Ethernet:

- > Shielded and twisted data cable (recommendation min. CAT 5e for 100 MBit).
- > Cable length max. 100 m.

Cable 2 can also be used to power the GAT SR 950 via Power Over Ethernet (POE).

NOTE! Also consult with your IT administrator for instructions.

- Connect the Ethernet cable to a separate port on the network switch. Depending on the standard used, the wire colors for the Ethernet cable are as follows:

PIN	Signal	Wire color TIA-568A	Wire color TIA-568B
1	Receive signal RX +	White/green	White/orange
2	Receive signal RX –	Green	Orange
3	Transmit signal TX +	White/orange	White/green
4	DC +	Blue	Blue
5	DC +	White/blue	White/blue
6	Transmit signal TX –	Orange	Green
7	DC –	White/brown	White/brown
8	DC –	Brown	Brown

Fig. 4.2 – Ethernet wiring

4.5 GAT SR 950 to GAT SR 7000 Wiegand / GAT DC 7200 connection

- Connect the GAT SR 950 to the GAT SR 7000 Wiegand and GAT DC 7200 as follows.

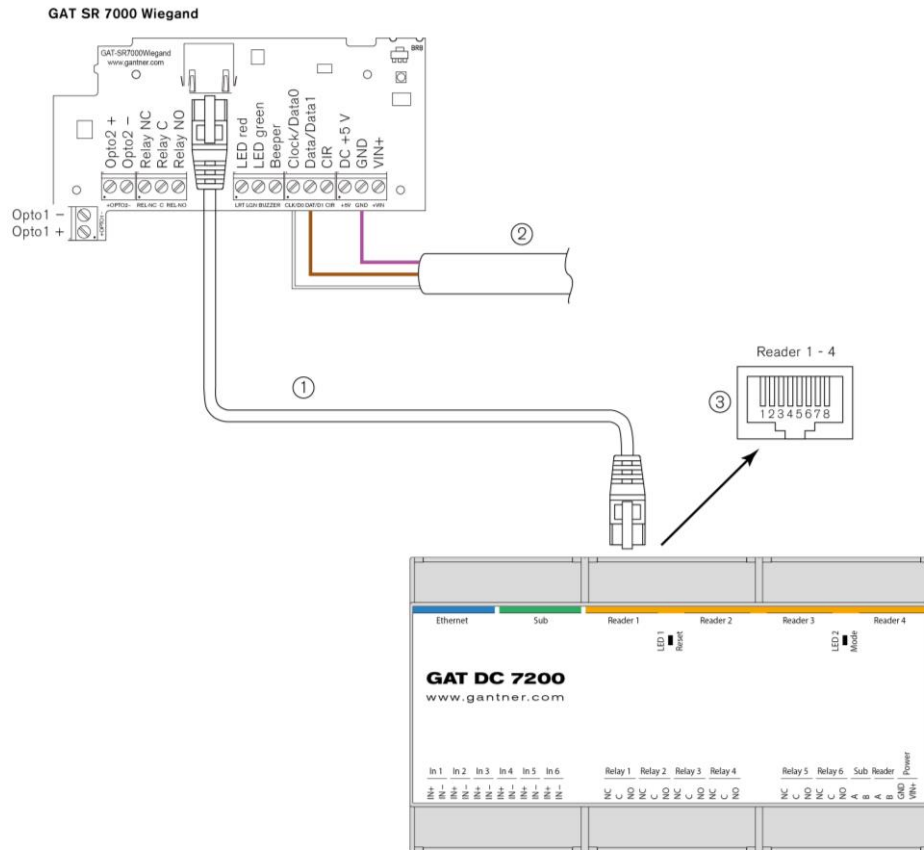


Fig. 4.3 – Wiegand connections

- 1 Shielded, twisted pair data cable (min. CAT 5e, wire colors as per TIA/EIA-568-B.1-2001 - T568B)

PIN	Wire color	Signal
1	White/orange	IDENT
2	Orange	-
3	White/green	GND
4	Blue	A (RS-485)
5	White/blue	B (RS-485)
6	Green	GND
7	White/brown	VOut+ (12-24 V DC)
8	Brown	VOut+ (DC 12-24 V)

- 2 GAT SR 950 cable 1

Wire color	Signal
White	Wiegand Data-0
Brown	Wiegand Data-1
Purple	Wiegand GND

- 3 GAT DC 7200 RJ45 port for reader/Wiegand connection

4.6 RS-485 connection

The following RS-485 connections are available for cable 1:

Wire color	Signal
Yellow	RS-485 A
Green	RS-485 B
Purple	RS-485 GND

Fig. 4.4 – RS-485 connections

4.7 Digital I/O

The following digital input/output connections are available for cable 1:

Wire color	Signal
Pink	Digital input IN 1 + (optocoupler positive contact, U = 5 - 24 V DC)
Gray	Digital input IN 1 -
Gray/pink	Digital input IN 2 + (optocoupler positive contact, U = 5 - 24 V DC)
Red/blue	Digital input IN 2 -
White/green	Relay output 1 (normally open contact, U _{max} = 24 V DC, I _{max} = 2 A)
Brown/green	Relay output 1 (common contact)
White/yellow	Relay output 2 (normally open contact, U _{max} = 24 V DC, I _{max} = 2 A)
Brown/yellow	Relay output 2 (common contact)

Fig. 4.5 – Input/output connections

5 CONFIGURATION

5.1 Target group

This chapter contains information for the technicians responsible for commissioning and configuring the GAT SR 950. A basic understanding of electrical engineering is assumed. Gantner recommends that only suitably trained personnel carry out the system configuration. Gantner offers regular training courses for its partners.

5.2 GAT DC 7200 configuration settings

The configuration of the GAT DC 7200 is completed via an internet browser and a web interface. Any common browser can be used on a computer as well as the mobile variant on a smartphone or tablet. Gantner recommends using the latest version of the Chrome or Edge web browser for configuration.



Refer to the GAT DC 7200 manual for detailed information on the configuration process.

- ▶ To access the GAT DC 7200 web interface, enter one of the following addresses into the web browser:
 - > `https://DC7x_nnnnnnnnnn` (where nnnnnnnnnn is the device serial number) or
 - > `https://<IP-Address>` (where <IP-Address> is the IPv4 address of the GAT DC 7200 in the network)

- ▶ Enter the username and password into the login window.

NOTE! The default username and password are **admin** and **GAT** respectively. The default values must be changed to secure details after the initial login.

- ▶ Click on **OK**.
 - The main window of the web interface is displayed. The various settings pages are accessed via the sidebar on the left.

- ▶ To configure the Wiegand interface of the GAT SR 7000, open the settings page **Configuration > Readers > ISO2/Wiegand** tab and configure the following settings.

Fig. 5.1 – GAT DC 7200 settings for the Wiegand interface

- Protocol Select **Wiegand 26 bit** from the menu.
- Data carrier type: Enter the data carrier type (card type) as configured in GAT Matrix for identification with the GAT SR 950 (see "5.4.3 GAT Matrix").
- Ignore unknown data carriers: Enabling this option is recommended for vehicle license plate identification. Only the valid or known license plates are then recorded in the log and unnecessary entries, e.g., the license plates of visitors or guests, are not saved.

► Click on **Save**.

NOTE! The Wiegand settings are global settings per controller. Other Wiegand products, such as the GAT Reader 550, cannot be connected to the same GAT DC 7200.

5.3 GAT SR 950 configuration settings

Similar to the GAT DC 7200, the settings of the GAT SR 950 are configured via a web interface. The latest version of any common web browser can be used. Prior to accessing the web interface, make sure that the network configuration of your PC is consistent with the IP address of the camera being configured, i.e., that the IP addresses of all devices belong to the same network.



*The network settings of the GAT SR 950 are displayed on the **SYSTEM SETTINGS > NETWORK** tab of the web interface.*

The web interface is divided into separate configuration pages. After configuring the settings on a page, it is important to press **APPLY** to save the settings in the GAT SR 950. The following chapters describe the recommended settings for a GAT SR 950 in a Gantner access system. Depending on the requirements, the settings required for your system may differ from the specified settings.

5.3.1 Establishing a connection to the web interface

- Enter the IP address of the GAT SR 950 into the address bar of the web browser.

NOTE! The default IP address of the GAT SR 950 is **192.168.3.15**.

- The login window of the web interface opens.

- Enter the username and password into the login window.

NOTE! The default username and password are **admin** and **secret** respectively. It is recommended to change the default login details after the initial login and to store the new login details in a secure place.

- If the login was successful, the **Home** screen of the web interface is displayed.

5.3.2 Camera settings

The main function of the GAT SR 950 is capturing images. The quality of the images depends on the camera and illumination preferences.

- Click on **Configuration** in the top menu of the web interface.

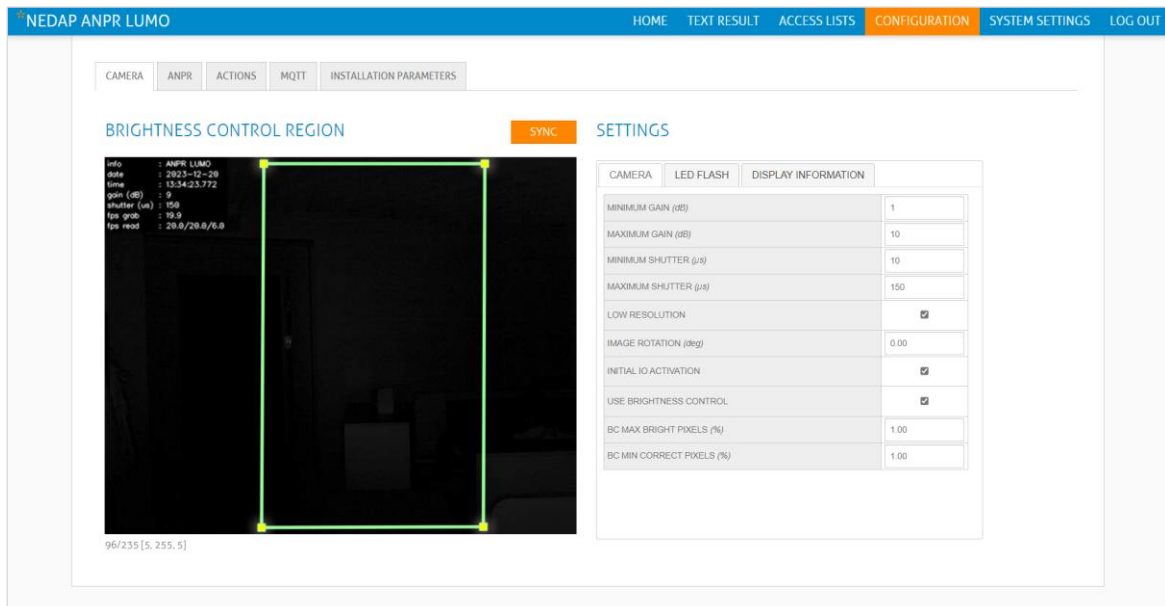


Fig. 5.2 – GAT SR 950 web interface - Camera settings

The area within the green square is the so-called region of interest (hereinafter referred to as ROI). It defines the image area within which the camera measures and corrects the image brightness. It is important to limit this area to the area where vehicle license plates are expected to appear. This maximizes the impact of brightness control parameters during image acquisition for the selected area.

- The following settings and their recommended values can be found on the **CAMERA** tab.

NOTE! The settings may vary depending on the camera's firmware version or individual requirements.

MINIMUM GAIN (DB)	Recommendation = 1 (default). This setting controls the amplification of the signal from the camera sensor, which can make the captured images appear brighter.
MAXIMUM GAIN (DB)	Recommendation = 10 (default).
MINIMUM SHUTTER (μs)	Recommendation = 10 (for parking situations), i.e., for slow vehicles (default = 1). This setting is the minimum exposure time in microseconds for which the shutter remains open and should be set according to the vehicle speed.
MAXIMUM SHUTTER (μs)	Recommendation = 150 (default).
LOW RESOLUTION	Enable this setting. The camera sensor can operate in two resolutions: low resolution 640 x 480 pixels (setting enabled) and high resolution 1280 x 960 pixels (disabled).
IMAGE ROTATION (deg)	Recommendation = 0.00 (default).

INITIAL IO ACTIVATION	Enable this setting.
USE BRIGHTNESS CONTROL	Enable this setting. Allows brightness control over the defined ROI.
BC MAX BRIGHT PIXELS (%)	Recommendation = 1.00 (default). Exposure control of the camera counts all good pixels (those that are not too dark or overexposed) within the brightness control ROI.
BC MIN BRIGHT PIXELS (%)	Recommendation = 1.00 (default).

► Open the **LED FLASH** tab and configure the following settings:

ENABLE FLASH	Enable this setting. When enabled, the embedded IR LEDS are turned on.
FLASH BRIGHTNESS	Recommendation = 2 . Defines the brightness of the IR flash.

► Open the **DISPLAY INFORMATION** tab and configure the following settings:

OSD SIZE	Select Medium from the menu. This determines the font size of the On-Screen-Display (OSD) in the image.
OSD POSITION	Select Upper Left from the menu. Position of the OSD in the image.
TEXT INFO	Here you can enter an optional display name for the camera.
HUD DISPLAY OPTIONS	Enable all settings in this menu. The activated values are then displayed in the OSD.
DRAW PLATE	Enable this setting. Generates an image of the read plate and displays it on the processed images.
PLATE VISUALISATION OPTIONS	Enable all settings in this menu. The respective value is then displayed in the OSD.
LIVE VIEW JPEG COMPRESSION	Recommendation = 65 (default). JPEG compression reduces the size of images, which results in faster FTP uploads and reduces bandwidth consumption.
DRAW CAMERA FOCUS	This setting can be disabled.

5.3.3 ANPR settings

These settings affect the operating software of the camera, which is responsible for reading the license plates and processing requests from the received images.

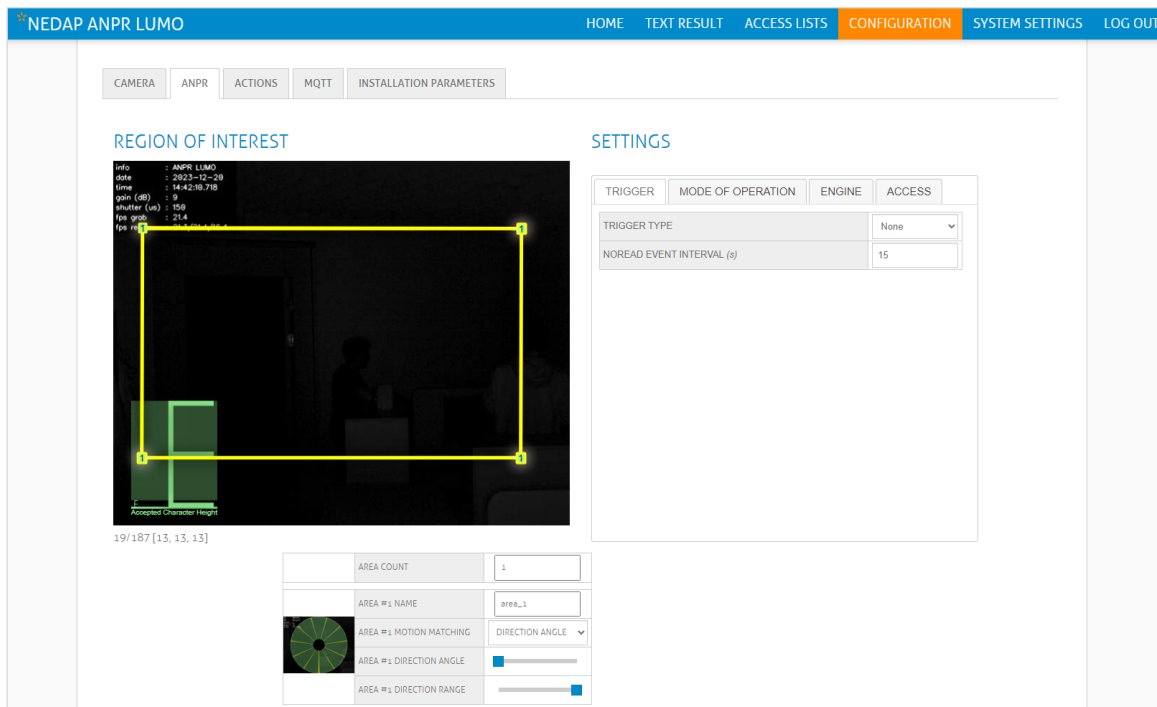


Fig. 5.3 – GAT SR 950 web interface - ANPR settings

The Region of Interest (ROI) is the area within the yellow rectangle. The ROI defines the image region used by the camera to process the images. The camera module only searches for indicators within the ROI range. A ROI area must contain at least three points, and the shape can be modified using the following actions:

- > **Reshape** the ROI by selecting one of the points and dragging it to the desired location.
- > **Add** more points by double clicking on an existing point. You can then drag the point to a new location.
- > **Remove** a point by right clicking on it.

- Open the **TRIGGER** tab and configure the following settings:

TRIGGER TYPE	Recommendation = None .
NOREAD EVENT INTERVAL	This setting is only used in Free Run mode.

- Open the **MODE OF OPERATION** tab and configure the following settings:

STREAM MODE	Select Freeflow from the menu. This mode is designed to capture the plates of all passing vehicles in free-flowing real-time systems. A delay of up to 15 frames is possible before the result becomes available.
MINIMUM DETECTIONS	Recommendation = 2 . This setting controls how many times the same license plate is read until a definite result is produced.

MAXIMUM CHARACTERS MISMATCH	Recommendation = 1 . Maximum plate mismatch refers to the maximum number of characters allowed to be different between two plate strings for them to be merged.
SEND UTF-8	Enable this setting. When enabled, the output message is sent in UTF format.
DROP AFTER (ms)	The maximum permissible interval in milliseconds to keep indicator strings in the processing history.
RESET AFTER (s)	Recommendation = 2 .

► Open the **ENGINE** tab and configure the following settings:

READING MODE	Select Standard from the menu. This setting is a good compromise between speed and reading performance and recommended for most situations.
MIN LETTER HEIGHT (px)	Recommendation = 10 . Sets the minimal height of characters in pixels. The value should not be less than 8 pixels.
MAX LETTER HEIGHT (px)	Recommendation = 50 .
MAX PLATE ANGLE (deg)	Recommendation = 20 . You can instruct the GAT SR 950 to search for plates in a wider angle relative to x-Axis. Best results are achieved between 5° and 30°.
MIN PLATE CONFIDENCE (%)	Recommendation = 80 . The minimum confidence level at which the GAT SR 950 will recognize a license plate as valid.
LIMIT OF LOW CONF (%)	Recommendation = 80 .
MAXIMUM PLATES	Recommendation = 3 . Sets the limit for which the reading confidence will be considered low, but still valid.
MINIMUM CONTRAST	Recommendation = 50 . Minimum contrast to differentiate characters from the license plate. Reducing this value can increase reading performance but also increase processing time.
SCALE WIDTH	Recommendation = 100 (default). If the SCALE WIDTH and SCALE HEIGHT settings are changed, the input image is adjusted by the specified ratios before processing begins.
SCALE HEIGHT	Recommendation = 100 (default). See SCALE WIDTH.
SEARCH INVERTED	Select Disabled from the menu. When disabled, the GAT SR 950 recognizes plates with dark colored characters on a light-colored background.
ENHANCED DETECTION	If this setting is enabled, additional algorithms are activated to find a license plate if no license plates are initially detected.
ADVANCED STATE DETECTION	If this setting is enabled, the areas around the license plate are additionally analyzed during the detection process.

► Open the **ACCESS** tab and configure the following settings:

WHITESPACE MATCHING	Enable this setting. This setting defines whether whitespaces (' ') should be considered during list matching.
ACTION JPEG COMPRESSION	Recommendation = 65 .
CHECK ENTRY EXPIRATION	Activates a process that checks for expired entries at intervals of 1 hour.

5.3.4 Action settings

In the **ACTIONS** menu, you can define the actions that the GAT SR 950 will carry out when certain events occur.

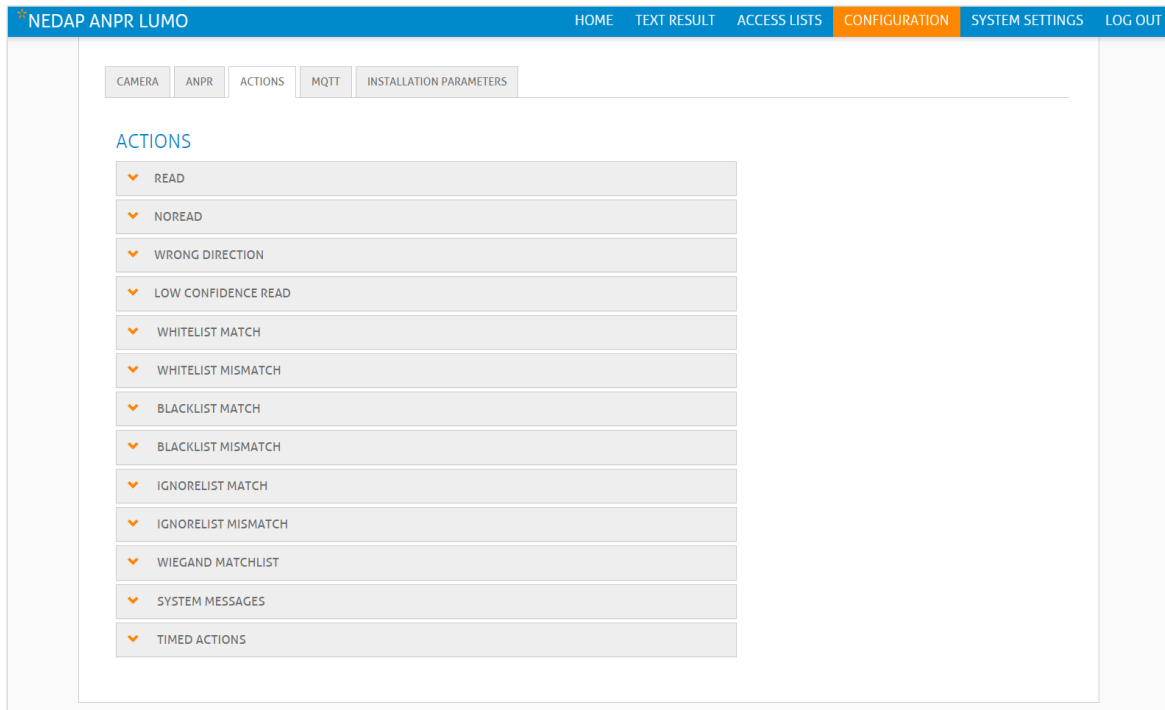


Fig. 5.4 – GAT SR 950 web interface - Actions menu

The following types of events based on the OCR system are available:

- **READ** When the GAT SR 950 recognizes a license plate.
- **NOREAD** When there are no plates recognized within the limitations set for the configuration trigger (i.e., Start and Stop trigger, or Start trigger and Trigger timeout).
- **WRONG DIRECTION** A wrong direction event occurs when a new license plate is detected, but it is moving in a direction that is not within the allowed direction range defined for the area.
- **LOW CONFIDENCE READ** A low confidence read event occurs when a license plate is read but the confidence level is lower than the level defined in the **MAXIMUM PLATES** setting.

For each access list (**WHITELIST**, **BLACKLIST**, **IGNORELIST**), you can define which actions the camera should perform if a read license plate matches (**MATCH**) or does not match (**MISMATCH**) a license plate in the access list.

The following actions can be added to any of the events, and you can also make a combination of actions:

FTPUPL (FTP upload), **FTPDATA** (FTP database), **STORE**, **DIGITALOUT**, **SERIAL**, **TCP**, **HTTP**, **HMACTTP**, **MQTT**, **WIEGAND26**, **WIEGAND64**.

For each action you can define for which area of interest the action should be carried out, e.g., ALL AREAS or just one selected AREA.

5.3.5 Installation parameters

The GAT SR 950 has sensors that measure tilt, roll and voltage. These sensors can be used to trigger an alarm. First, the operating parameters must be configured, which define the limitations in which the camera may work.

WORKING LIMITS	
TILT RANGE	+/-7.50
ROLL RANGE	+/-8.90
VOLTAGE RANGE	+/-3.90
WAITING PERIOD	1 (mins)

EDIT

SENSOR INFO	
CURRENT TILT	-82.78
CURRENT ROLL	1.10
CURRENT VOLTAGE	20.14

SET AS REFERENCE

REFERENCE VALUES	
REFERENCE TILT	85.19
REFERENCE ROLL	0.10
REFERENCE VOLTAGE	0.00

Fig. 5.5 – GAT SR 950 web interface - Installation parameters

- Configure the installation parameters as shown above.
- Press the **SET AS REFERENCE** button.
 - The parameters are transferred to the GAT SR 950. As soon as the limit of any parameter is exceeded, an alarm is triggered. This alarm can be used to set an action, e.g., in the **ACTIONS > SYSTEM MESSAGES** area.

5.4 Settings for the SHA-1 Wiegand function

The SHA-1 Wiegand function is the recommended option for transmitting license plate data. In this case, no whitelist is required in the GAT SR 950 settings. Instead, the GAT SR 950 calculates a SHA1 hash value of the license plates and sends this hash directly to the GAT DC 7200 for processing. The controller also recognizes these hashes and uses them to grant access.

The SHA-1 Wiegand function requires the following prerequisites:

- > GAT SR 950: min. firmware V1.02
- > GAT DC 7200: min. firmware V3.6
- > GAT Matrix: min. V5.3

5.4.1 GAT SR 950 settings

- On the **CONFIGURATION** page select the **ACTIONS** tab.
- Open the **READ** section and click on **ADD**.

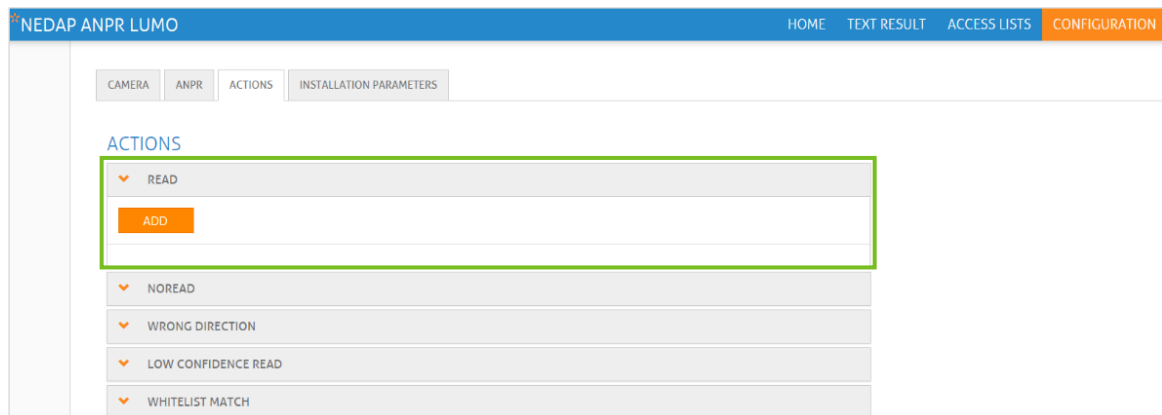


Fig. 5.6 – GAT SR 950 web interface – “Read” action

- The following window opens.

The 'ADD/EDIT ACTION' window is displayed. It has a title bar 'ADD/EDIT ACTION'. Below the title bar, there is a dropdown menu showing 'WIEGAND26' and an orange 'TEST' button. Underneath, there is a section titled 'WIEGAND 26 ACTION' with a blue 'ON' button and a grey 'ENABLE' button. Below this, there is a 'DEFINED FOR' label and a dropdown menu showing 'ALL AREAS'. At the bottom of the window, there are two buttons: a grey 'CANCEL' button and an orange 'SAVE' button.

Fig. 5.7 – GAT SR 950 web interface – “Add/edit” action

- Select **WIEGAND 26** from the drop-down menu and configure the following settings:

WIEGAND 26 ACTION Set to **ON**
DEFINED FOR Select **ALL AREAS**

- Click on **SAVE**.
- Another action must now be configured. Open the **WHITELIST MATCH** action and click **ADD**.

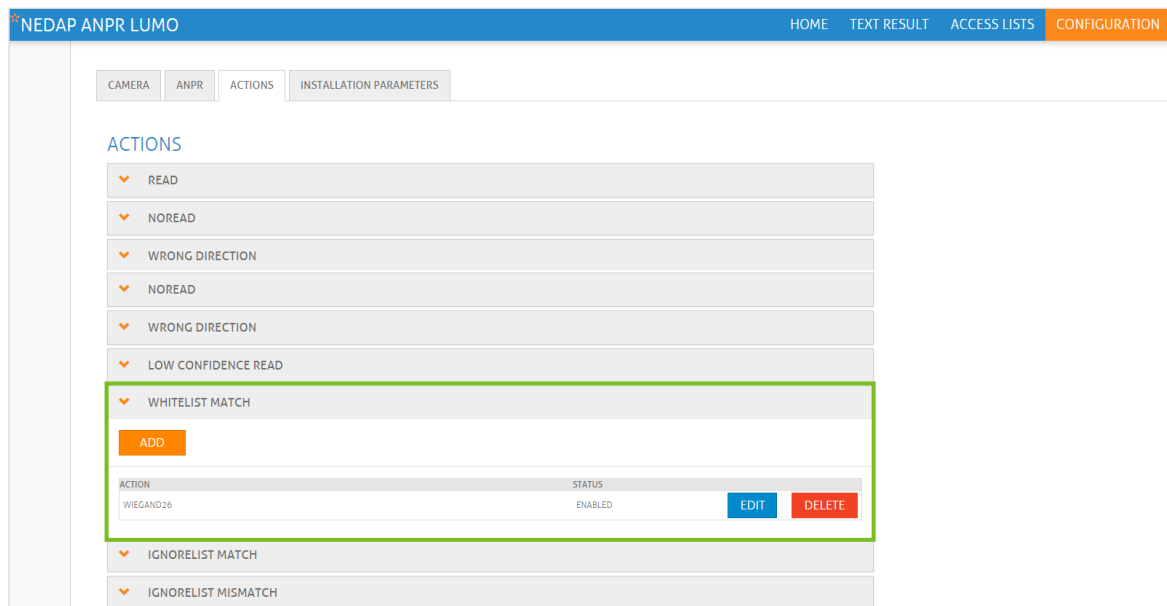


Fig. 5.8 – GAT SR 950 web interface – “Whitelist Match” action

- o The following window opens.

The 'ADD/EDIT ACTION' window is displayed. It features a dropdown menu with 'WIEGAND26' selected and a 'TEST' button. Below this, the 'WIEGAND 26 ACTION' section has 'ON' and 'ENABLE' buttons. The 'DEFINED FOR' dropdown is set to 'ALL AREAS'. At the bottom, there are 'CANCEL' and 'SAVE' buttons.

Fig. 5.9 – GAT SR 950 web interface – “Add/edit” action

- Select **WIEGAND 26** from the drop-down menu and configure the following settings:

WIEGAND 26 ACTION Set to **ON**
DEFINED FOR Select **ALL AREAS**

- Click on **SAVE**.

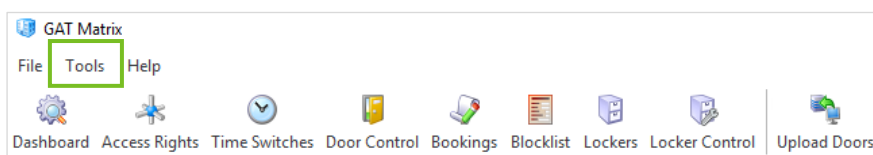
5.4.2 Access management software configuration

The following configuration is required to define which users are allowed to drive the vehicle they are driving through the access gate monitored by the GAT SR 950. For more information on this process, also refer to the GAT ACE 7000 and GAT Matrix manuals.

NOTE! License plate recognition requires a separate "License Plate Recognition" license for GAT Matrix (see GAT Matrix manual). If this is not available, the personnel data are sent to GAT ACE 7000 when the doors are loaded, but the license plate data are not sent. An error message and notification are displayed in the error log.

5.4.3 GAT Matrix

- Select **Data carrier types** from the **Tools** menu.



- The **Data Carrier Types** window opens. A data carrier type that is to be used exclusively for vehicle recognition must be created here.

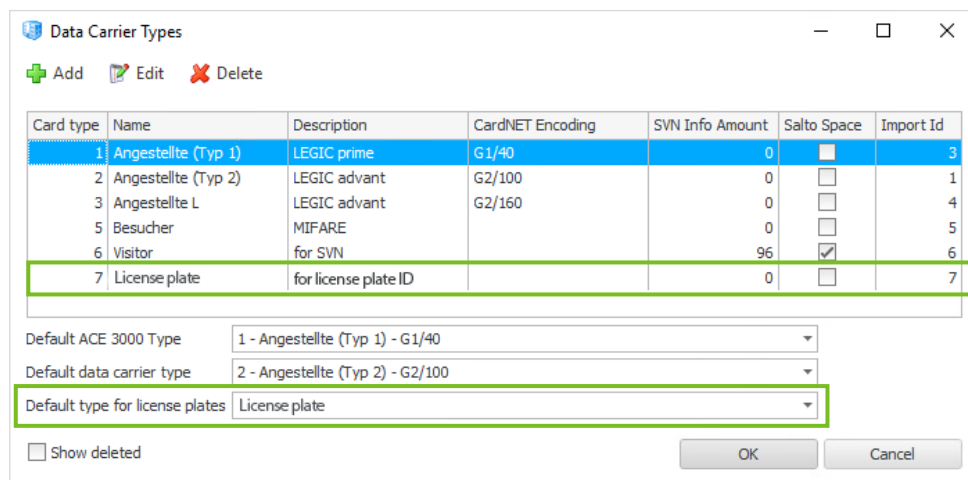


Fig. 5.10 – Defining data carrier types

- Click on **Add** and configure the desired settings (see GAT Matrix manual).
- After configuration, select the defined data carrier type in the **Default type for license plates** field.

NOTE! A separate data carrier type must therefore be used for vehicle license plates independently of existing data carrier types.

- In **GAT Matrix**, click on **Access Rights** and then on the user in the list on the left to whom you want to assign a license plate number.

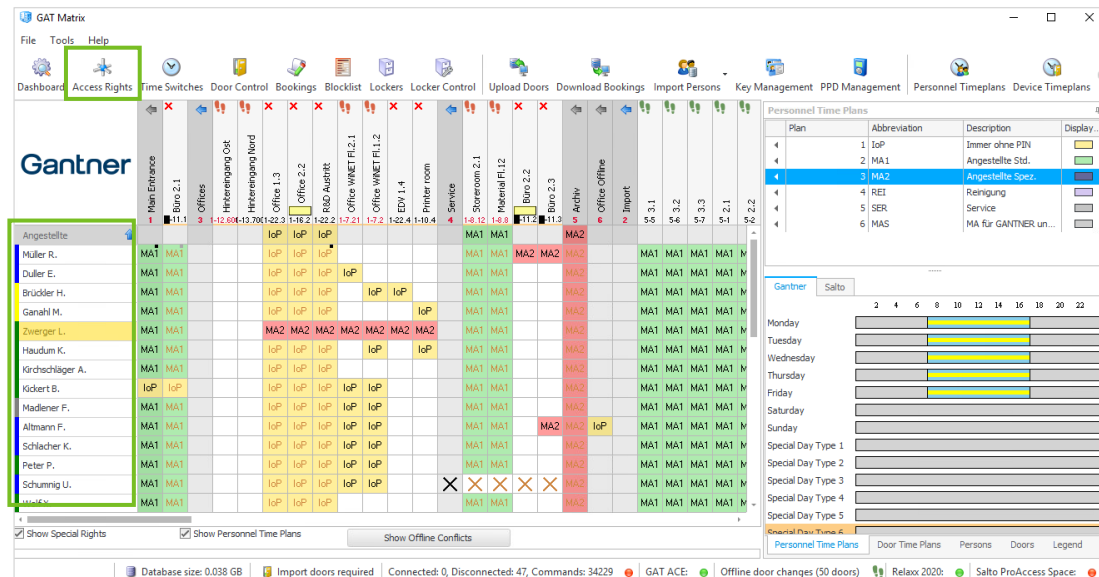


Figure 5.11 – GAT Matrix – Access Rights

- The **Edit Person** window opens.
- Click on the **Optional fields** tab and enter the license plate into the respective field. You can enter the license plate with or without spaces. GAT ACE 7000 checks the entries for plausibility and corrects the entries accordingly if they contain special characters or spaces.

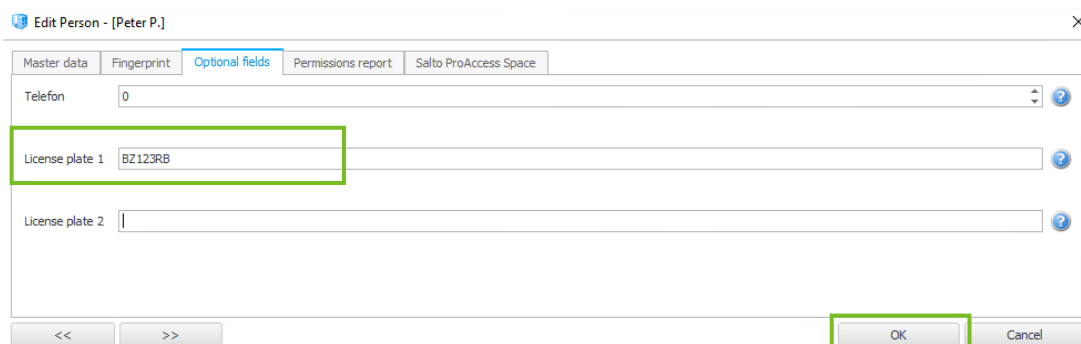


Figure 5.12 – GAT Matrix – Optional fields



*This function requires at least one optional field of the type **License Plate** to be defined in GAT Matrix via **Tools > Options > Optional Fields** (see the GAT Matrix manual). Several license plate fields can be added, and GAT Matrix checks every license plate entry for uniqueness.*

- If multiple optional fields of the type "License plate" have been defined, you can also enter additional license plates for the person (e.g., for second cars).
- Click on **OK**.

NOTE! If a license plate is entered that is already being used by another person, a red X symbol is displayed, and saving is not permitted. Enter another license plate in this case.

NOTE! The following step is only required if you are using GAT Matrix V5.2 or a previous version. As of GAT Matrix V5.3, it is possible to identify users via their license plate number only without a data carrier.

- Open the **Master data** tab and check the **Data Carriers** area. There must be at least one data carrier number of the same data carrier type that was previously defined in the GAT ACE 7000 camera settings (see **Error! Reference source not found.**). This data carrier type must be enabled (i.e., no tick in the **Is Inactive** box).

Edit Person - [Peter P.]

Person active ☒ Person status Normal permission

Person ID: 8
Personnel number: 8
Import reference:

Title:
First name: P.
Last name: Peter
Display name: Peter P.
International Phone Number:
Salto mobile app: None

PIN Code: ☐ Use PIN code instead of FIU (only GAT ACE 3000)

Data Carriers

New Data Carrier: 2 - Angestellte (Typ 2) - G2/100 Add

Drag a column header here to group by that column.

Position	Is Inactive	Data Carrier Number	Data Carrier Type	Badge number	Use for Salto	
2	☐	16147155104438362429	2 - Angestellte (Typ 2) - G2/100		☐	✕
3	☐	2133456457	1 - Angestellte (Typ 1) - G1/40		☐	✕

Pool Group: [No Pool Group]

Valid From: Valid Until:

<< >> OK Cancel

Fig. 5.13 – GAT Matrix – Data carrier for vehicle recognition

- To transfer the license plates to the cameras, the data must be sent to GAT ACE 7000. To do this, click on **Upload Doors**.

GAT Matrix

File Tools Help

Dashboard Access Rights Time Switches Door Control Bookings Blocklist Lockers Locker Control **Upload Doors** Download Bookings Import Persons Key Management PPD Management Personnel Timeplans Device Timeplans

	Main Entrance	Buro 2.1	Offices	Hinteringang Ost	Hinteringang Nord	Office 1.3	Office 2.2	R&D Ausstr.	Office WINEY Fl. 2.1	Office WINEY Fl. 1.2	EDW 1.4	Printer room	Service	Store room 2.1	Material Fl. 1.2	Buro 2.2	Buro 2.3	Archiv	Office Offline	Import	3.1	3.2	3.3	2.1	2.2
Angestellte																									
Müller R.	MA1	MA1												MA1	MA1	MA2	MA2	MA2			MA1	MA1	MA1	MA1	M
Duller E.	MA1	MA1												MA1	MA1			MA2			MA1	MA1	MA1	MA1	M
Brückler H.	MA1	MA1												MA1	MA1			MA2			MA1	MA1	MA1	MA1	M
Ganahl M.	MA1	MA1												MA1	MA1			MA2			MA1	MA1	MA1	MA1	M
Zwinger L.	MA1	MA1												MA2	MA2	MA2	MA2	MA2			MA1	MA1	MA1	MA1	M
Haudum K.	MA1	MA1												MA1	MA1			MA2			MA1	MA1	MA1	MA1	M
Kirschschläger A.	MA1	MA1												MA1	MA1			MA2			MA1	MA1	MA1	MA1	M

Personnel Time Plans

Plan	Abbreviation	Description	Display...
1	IoP	Immer ohne PIN	
2	MA1	Angestellte Std.	
3	MA2	Angestellte Spez.	
4	REI	Reinigung	
5	SER	Service	
6	MAS	MA für GANTNER un...	

Gantner Salto

Monday: 2 4 6 8 10 12 14 16 18 20 22
Tuesday:
Wednesday:
Thursday:

Fig. 5.14 – GAT Matrix – Upload doors

- The license plate data are now transferred to the GAT SR 950.

NOTE! GAT ACE 7000 always transfers all license plates for all persons to all defined cameras.



GAT Matrix displays the status of the cameras used for license plate recognition on the Dashboard.

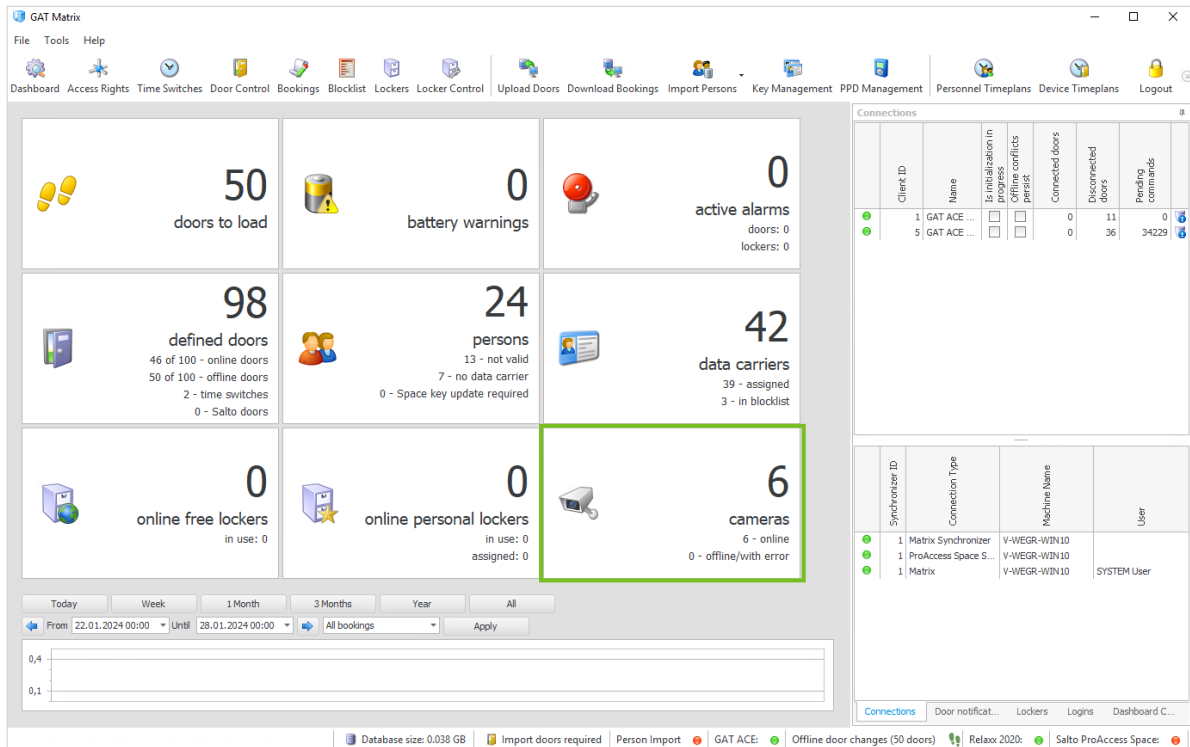


Fig. 5.15 – GAT Matrix Dashboard – Camera information

5.4.4 GAT ACE 7000

For the SHA-1 Wiegand function, it is no longer necessary to configure the GAT SR 950 via the Cameras tab in GAT ACE 7000. Only the configuration of the GAT DC 7200 controllers, which control the readers, is required. Instructions for this can be found in the GAT ACE 7000 manual.

5.5 Settings for the whitelist function

For GAT Matrix V5.2 or previous versions, a whitelist must be defined that contains the license plate data together with an assigned data carrier number and which is loaded onto the GAT SR 950. After reading a license plate, the GAT SR 950 then uses the whitelist to send the data carrier number linked to the license plate to the GAT DC 7200 controller via the Wiegand interface.



Gantner recommends updating all components of the access system and using the SHA-1 Wiegand function as described in chapter "5.4 Settings for the SHA-1 Wiegand function". The instructions outlined in this chapter are then not necessary.

5.5.1 GAT SR 950 settings

- Open the **ACTIONS** tab on the **CONFIGURATION** page.
- Click on **WIEGAND MATCHLIST** and then on **ADD**.

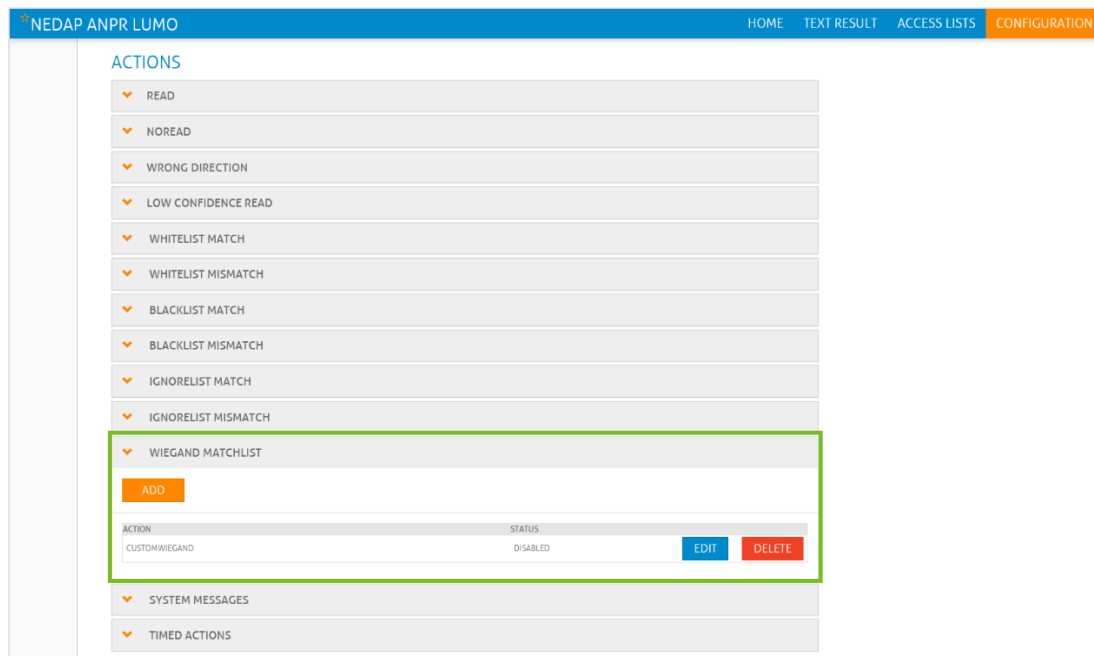


Fig. 5.16 – GAT SR 950 web interface – “Wiegand Matchlist” action

- The following window opens where you can define the Wiegand output. These settings are used to send the Wiegand ID defined in the **WIEGAND MATCHLIST ACCESS LIST**.

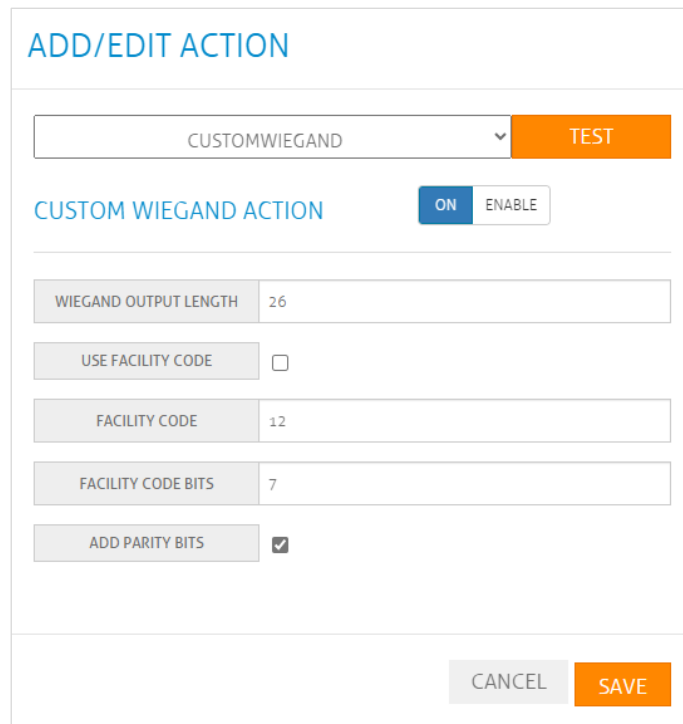


Fig. 5.17 – GAT SR 950 web interface – “Custom Wiegand” action

- Configure the following settings:

CUSTOM WIEGAND ACTION	Set to ON .
WIEGAND OUTPUT LENGTH	Set to 26 . This is the length of the complete Wiegand string in bits.
USE FACILITY CODE	Disable this setting. When disabled, the facility code is not included in the Wiegand string.
FACILITY CODE	Set this value to 12 .
FACILITY CODE BITS	Set this value to 7 . The number of bits used for the facility code.
ADD PARITY BITS	Enable this setting. When enabled, the parity bits are included in the string.

- Click on **SAVE**.

5.5.2 Access management software configuration

The following configuration is required to define which users are allowed to drive the vehicle they are driving through the access gate monitored by the GAT SR 950. For more information on this process, also refer to the GAT ACE 7000 and GAT Matrix manuals.

NOTE! Min. GAT ACE 7000 V2.2 and GAT Matrix V5.2 or later are required for license plate recognition.

NOTE! License plate recognition requires a separate “License Plate Recognition” license for GAT Matrix (see GAT Matrix manual). If this is not available, the personnel data are sent to GAT ACE 7000 when the doors are loaded, but the license plate data are not sent. An error message and notification are displayed in the error log.

5.5.3 GAT Matrix

The configuration in GAT Matrix for the Whitelist function is as described in chapter “5.4.3 GAT Matrix”.

5.5.4 GAT ACE 7000

- In **GAT ACE 7000**, click on the **Cameras** tab.

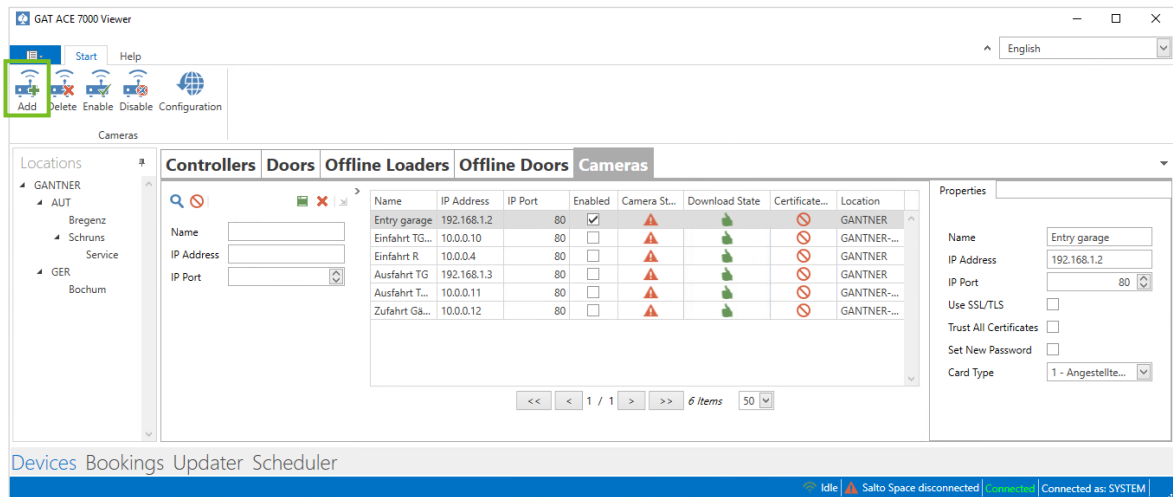


Fig. 5.18 – GAT ACE 7000 – “Cameras” tab

- For a new camera, click on **ADD** and define the following settings as required (Name, IP address, IP Port, etc.):

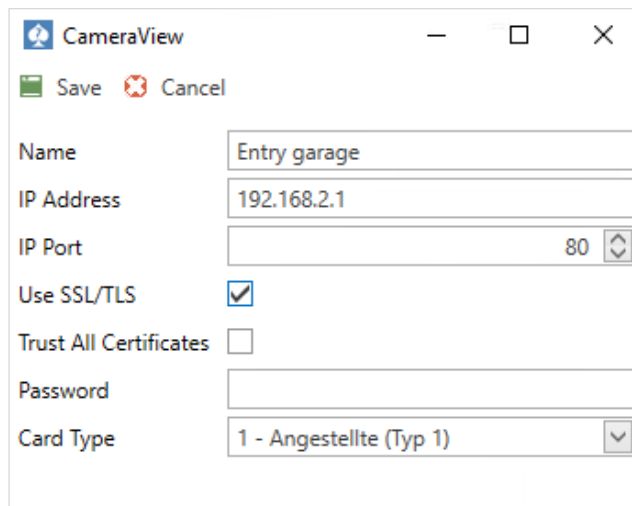


Fig. 5.19 – GAT ACE 7000 – Adding a new camera

NOTE! Card Type For license plate recognition, the license plate functions as the “data carrier” for user identification. In the **Card Type** field, select which data carrier type the license plate should correspond to. The card types are defined in GAT Matrix (**Tools > Data Carrier Types**) and are necessary for the authorization check. Please note that the license plates of the GAT Matrix persons will only be transmitted if an authorized data carrier of the type previously defined for the camera is transmitted.

- ▶ Click **Save** after entering the data.
 - The new camera is inserted in the cameras list.
- ▶ Activate the camera via the **Enable** button in the taskbar.

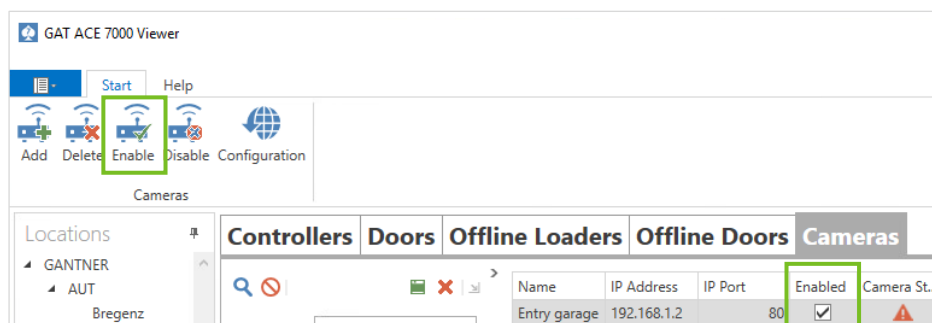


Fig. 5.20 – GAT ACE 7000 – Enabling a camera



You can now also directly access the web interface of the GAT SR 950 by clicking on the **Configuration** button in the taskbar.

5.6 Analysis

- In the GAT SR 950 web interface, open the **ACCESS LISTS** page.
 - The following window is displayed.

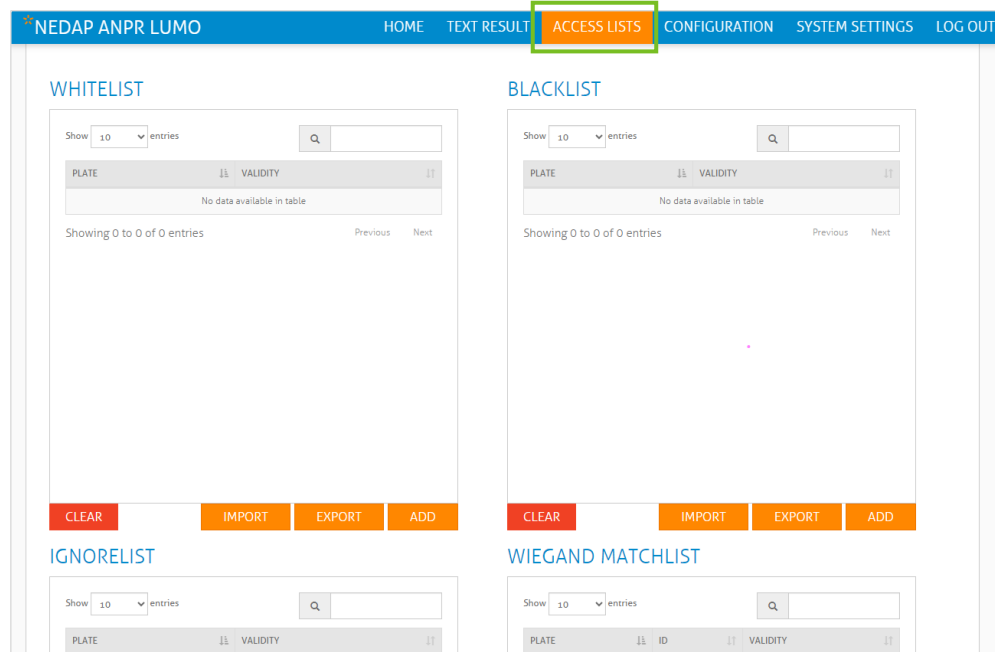


Fig. 5.21 – GAT SR 950 web interface – Access lists

- You can check here in the **WIEGAND MATCHLIST** area via the data carrier number or the plate number whether the data has been transferred to the camera.

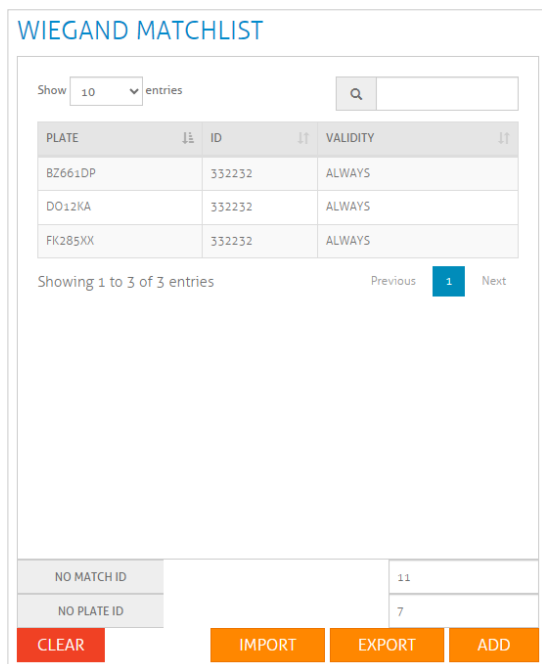


Fig. 5.22 – GAT SR 950 web interface – Wiegand Matchlist

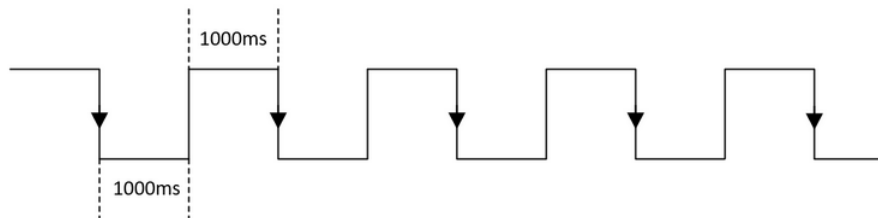
5.7 Resetting the GAT SR 950

If there is an issue with the GAT SR 950, e.g., a connection issue, resetting or rebooting the camera can help to rectify the problem.

If the web interface of the GAT SR 950 is still accessible:

- In the web interface, go to **SYSTEM SETTINGS > SYSTEM > SYSTEM MANAGEMENT** and select one of the following options:
 - **RESTART ANPR** Select this option to restart the GAT SR 950 software (the GAT SR 950 remains powered on).
 - **REBOOT SYSTEM** Select this option to reboot (power off and power on) the GAT SR 950.

If you cannot connect to the web interface, carrying out a hardware reset is an option to reestablish communication. This reset function is activated by feeding a specific I/O pulse sequence to Digital input 1 (IN+, IN-) of the GAT SR 950 directly after rebooting (powering on) the camera. The reset signal consists of 1 second pulses (shown below) and the full signal must be entered within the 30 second time frame.



NOTE! To avoid a second reset after the automatic reboot, apply the reset signal for at least 30 seconds but not longer than 45 seconds.

The GAT SR 950 checks for the reset signal immediately after powering on for a duration of 30 seconds. As soon as the camera has detected the correct reset signal, the reset will occur approx. 2 minutes later. During the reset, the IP address is reset to default and the GAT SR 950 reboots automatically.

NOTE! Do not power the GAT SR 950 down during this time otherwise the reset will not be completed.

6 TECHNICAL DATA

Power supply	24 V DC +10% linear supply recommended or PoE PoE (802.3af) or PoE+ (802.3at)
Power consumption	8 W
Read range	Distance: 2 to 10 m (6.5 to 33 ft) Width: Up to 3.5 m (11.5 ft)
Supported license plates	IR reflective number plates, (non)standardized license plates, ADR HIN
Camera optics	12 mm (½ in)
Image sensing resolution	1/1.8" CMOS sensor, 1280 x 1024 pixel, SXGA
Camera illuminator	IR 850 nm
Communication interfaces	1 line half duplex selectable baud rate, cable distance 1200 m (3937 ft) 10/100 Mbps, TCP, UDP, FTP, HTTP, DHCP Wiegand 26 SHA1, Wiegand 64, Custom Wiegand, OSDP v2, include secure channel
Relay output	2 relay outputs
Input	2 digital inputs (opto-isolated)
Output	Read results from number plates and/or images taken by the camera
Cable specifications	Network (Cat 5E) Power + IO: (LiCY) 8 x 2 x 0.14 mm ²
Cable length	Network: 5 m (16.4 ft) Power + IO: 5 m (16.4 ft)
Data message customization	RESTful interface (API) and String syntax fully configurable for integration with access control systems and third-party software
Storage	10 GB
Weight	2.5 kg (5.5 lbs.)
Dimensions	221 x 131 x 126 mm (8.7 x 5.2 x 5 in)
Material	Housing: Silafont 3 die-casting Cover: HIBS
Color	Housing: RAL 9006 Cover: RAL 5011
Included accessories	Pole/wall mounting kit included
Operating temperature	-20 to +55°C (-4 to +131°F)
Storage temperature	-30 to +55°C (-22 to +131°F)
Relative humidity	10% to 93% relative humidity, non-condensing
Protection class	IP65
Environment class (VdS 2110)	IV (outdoor conditions)
Compliance	CE, UKCA and UL



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SCAN FOR CONTACT

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