User manual for ASTgsm V.1.0 controller

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1. Introduction

REMOTE CONTROL OF LIGHTING

The Street Lighting Controller in a conventional housing with a width of 6 modules for DIN rail mounting. ASTgsm has 6 independently operating outputs, 3 normally open inputs for connecting any signals, a light sensor input, an expander input, a network analyzer input, and a battery input.

ASTgsm, based on GPS position, will calculate the optimal lighting control time based on the current location and sunrise and sunset times, and GSM communication will allow remote parameter changes.

The ASTgsm controller is designed to control street lighting in any lighting cabinet. The controller allows for control of six lighting circuits, with switch-on/off times calculated based on the GPS location of the controller. Switch-on times can be adjusted using correction factors independently for summer and winter.

ASTgsm Controller - Enhanced Capabilities

The controller features 3 normally open inputs allowing for the connection of additional signals, such as the signal from a lighting cabinet door opening sensor.

ASTgsm also includes 4 dedicated inputs:

- Input enabling connection of a light sensor for managing a single controller or a group of controllers,
- Input for connecting an expander, e.g., for Ethernet communication,
- RS485 input for connecting an intelligent network analyzer with MODBUS communication,
- Input for connecting a battery for power backup.

The ASTgsm controller has a built-in GPS receiver, enabling automatic synchronization of the controller's time and geographical position.

Additionally, a network analyzer can be connected to the controller, providing the ability to read parameters such as current, voltage, power, energy consumption, and associated alarm analysis.

2. Technical parameters, features

2.1 Technical parameters

- Power supply 90-265 VAC
- Power consumption below 3W
- 6 relay outputs, load capacity of 5A
- 3 normally open inputs for connecting any signals, e.g., lighting cabinet door opening sensor, voltage analysis on circuits, etc.
- 1 input for connecting a precise light sensor for managing a single controller or a group of controllers
- 1 digital input for connecting an expander, e.g., for Ethernet communication, input/output expander
- 1 RS485 input for connecting an intelligent network analyzer with MODBUS communication
- 1 input for connecting a battery for power backup
- Communication via standard open GPRS TCP/IP communication protocol
- Wifi communication for management via mobile application
- 2 MMCX antenna connectors for connecting GSM and GPS antennas
- DIN rail mounting 6 modules wide (+1 module for battery, +4 modules for network analyzer)
- Operating temperature from -30 to +70 degrees Celsius
- IP20 protection rating

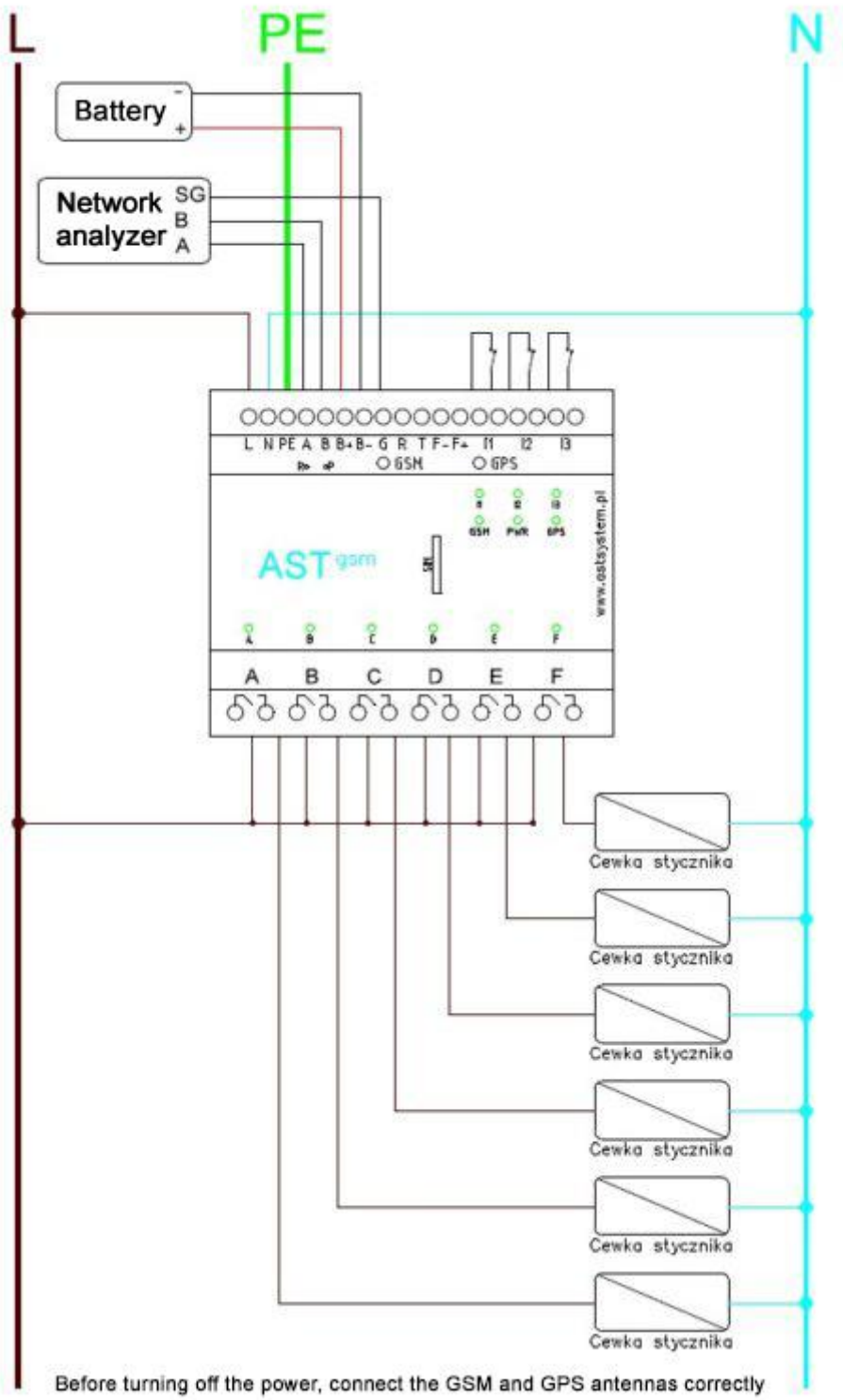
2.2 Features

- Management via a dedicated RWD (Responsive Web Design) portal accessible from both desktop computers and mobile devices
- Access security to the controller via login and password when accessing the portal
- Plug and Play installation (the controller automatically registers itself with the system upon power connection and is ready to operate, simply assign it to a user account)
- Connection establishment with the controller and saving any parameter in less than 3 seconds
- Option to run the web application on a physical server or in the cloud
- Operation in a server-connected model, eliminating the need for SIM cards with public IP addresses
- Time synchronization according to GPS signal
- Adjustment of switch-on/switch-off times +/- 240 minutes
- Automatic localization of the controller on the map within the web application
- LED indicators on the front panel signaling the status of inputs/outputs and controller status information
- Advanced user permission levels such as administrator, observer, and the ability to create sub-accounts within an account (e.g., a city authority can create sub-accounts for specific controllers within its main account) -

Built-in alarm management system for events such as power outage alarms, input circuit state change alarms, and network parameter alarms

- Archiving of alarms and network parameters on the server
- Global control of groups of controllers based on light intensity
- Automatic daylight saving time adjustment (option to disable time change based on configurable settings)
- Independent switch-on time adjustments for summer and winter
- 6 independently programmable outputs allowing for up to 4 switching intervals (3 nighttime breaks)
- Service activations of outputs for (1/10/30 minutes and permanently), remotely or via buttons on the controller
- Recording of output state changes
- API for integration with other open systems

3. Connection diagram



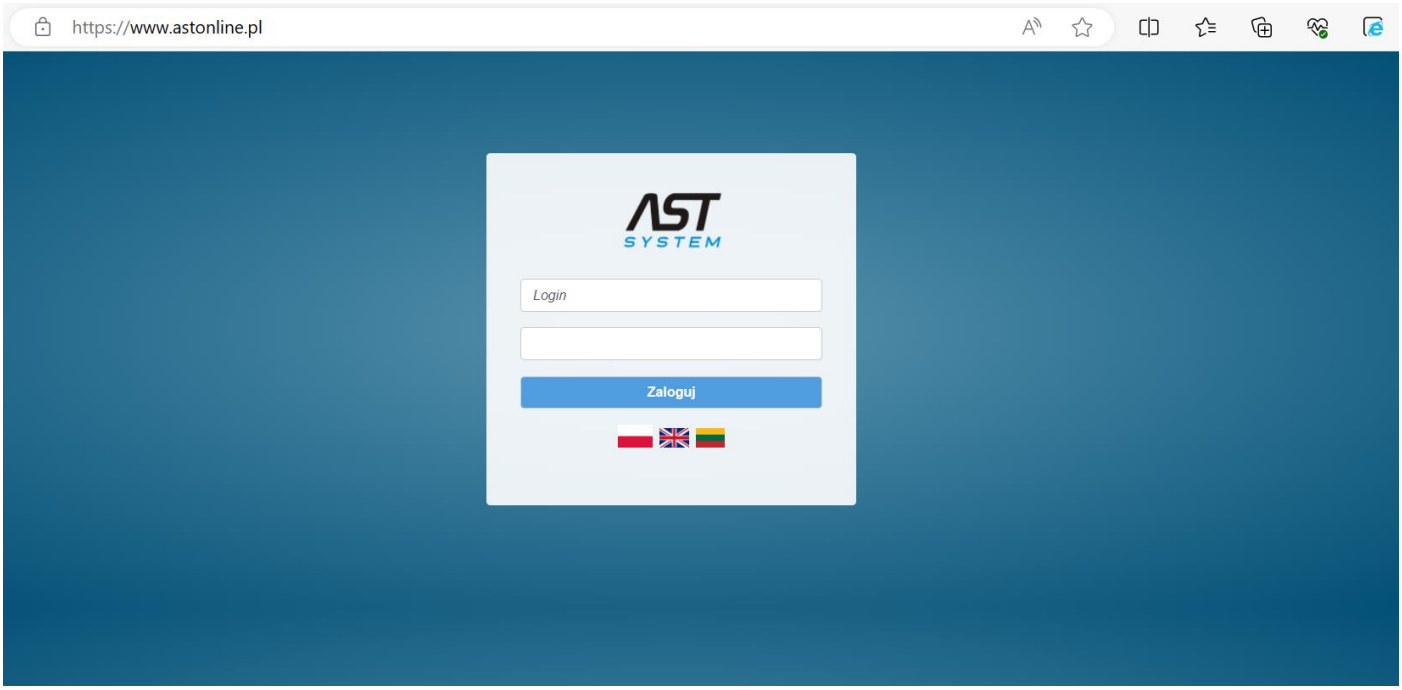
4. Operating with the controller

The ASTgsm controller is ready for operation with factory settings. Upon power connection, the controller's outputs will be activated 15 minutes after sunset and deactivated 15 minutes before sunrise. The sunrise and sunset times for factory settings are configured for the city of Warsaw.

All controller parameters are configurable. To modify them, use the web portal. at www.astonline.pl The following points will describe the process of configuring the controller.

4.1 Logging into the account

To log into your account, please visit the website www.astonline.pl and enter the username and password provided by the administrator.



After logging in, you will see a list of controllers assigned to your account. Here, you can check which controllers are active, powered, and view information about sunrise and sunset times.

4.2 Icon legend


Active


Powered on


Inactive

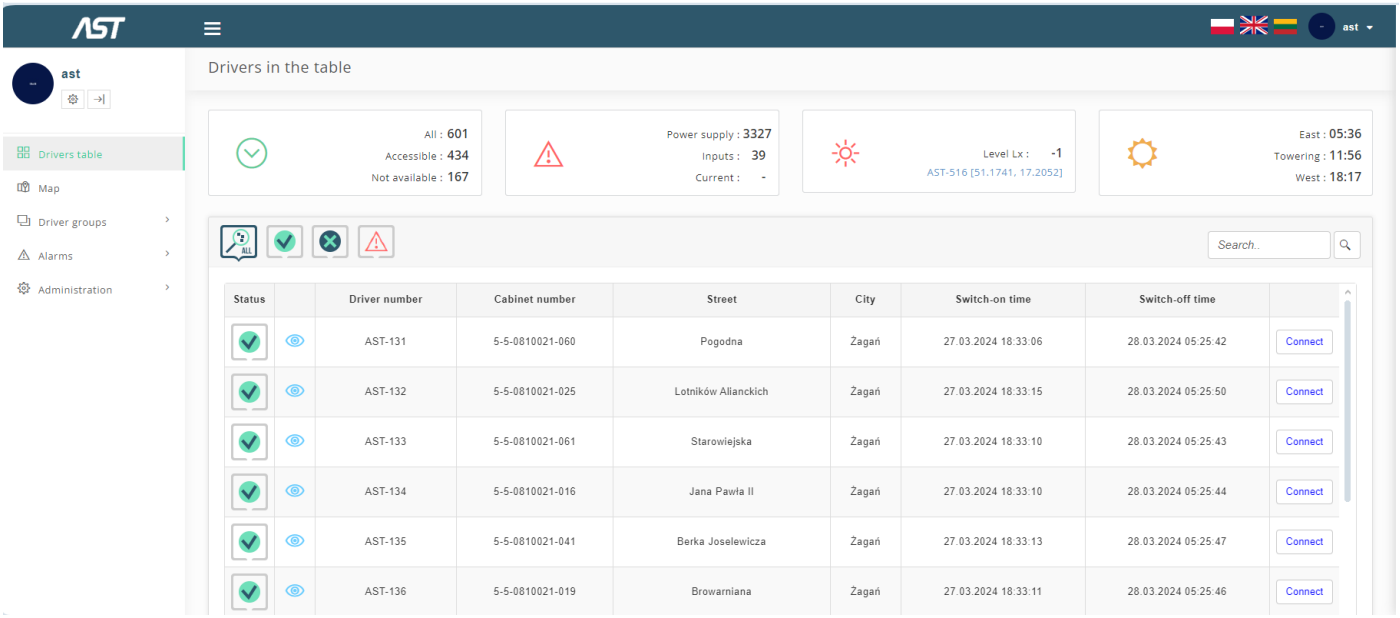

Power alarm


Input alarm

4.3 The application menu

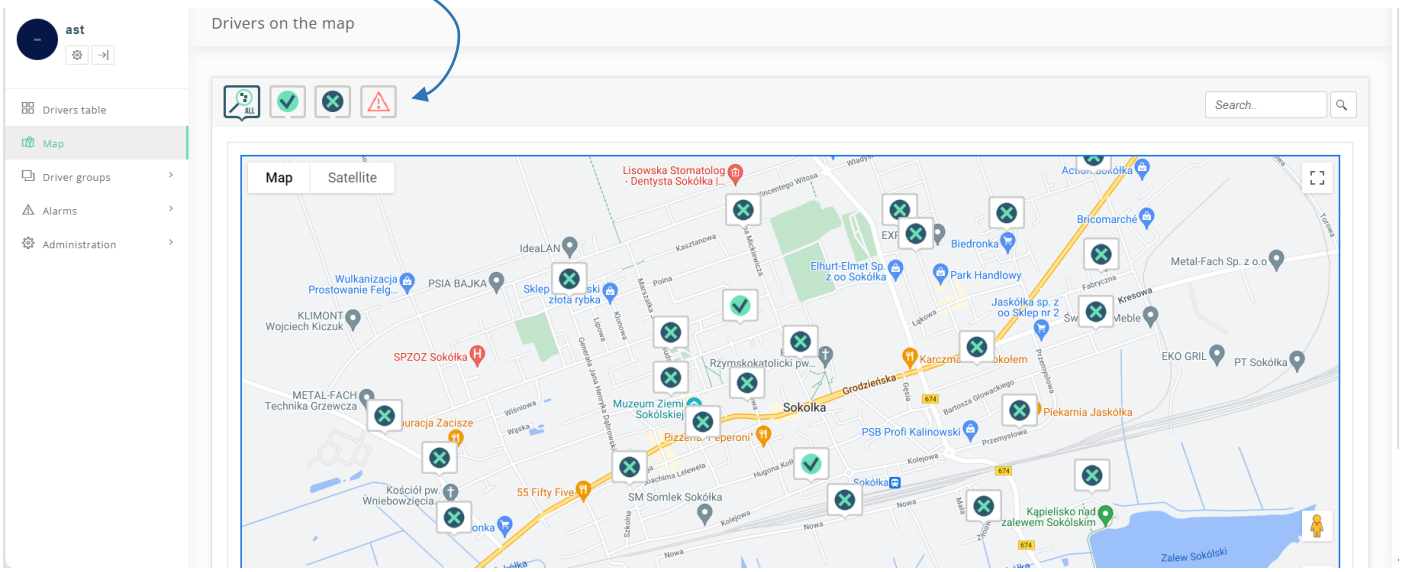
4.3.1 Drivers Table

In the "Controllers Table" tab, you will find access to all controllers as well as the ability to connect to them or view their parameters, which will be discussed in the following points.

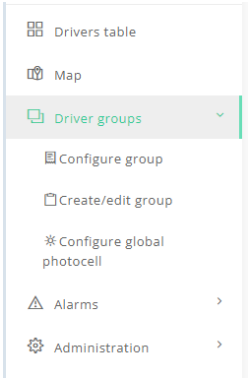


4.3.2 Map

In the next tab, "Map," you can check the precise location of controllers, including active devices, inactive ones, or those with potential issues.

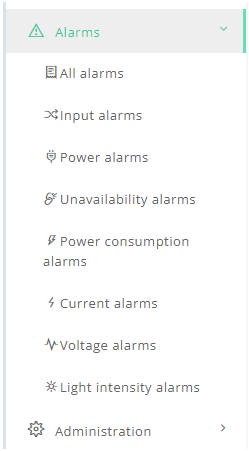


4.3.3 Driver groups



The "Controller Groups" tab allows us to create common settings for multiple controllers, enabling easy integration of multiple devices, for example, on a long street. It is also possible to verify any alarms that occurred in the "Alarms" tab below.

4.3.4 Alarms



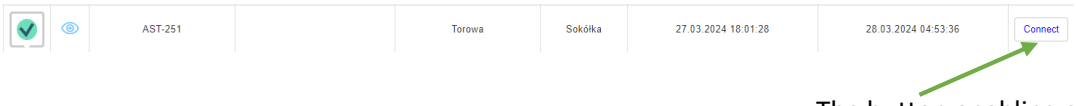
The "Alarms" tab allows for the identification of specific issues with individual controllers, categorizing them into Input alarms, Power alarms, Unavailability alarms, Power consumption alarms, Current alarms, Voltage alarms, Light intensity alarms

along with the date and description of the alarm.

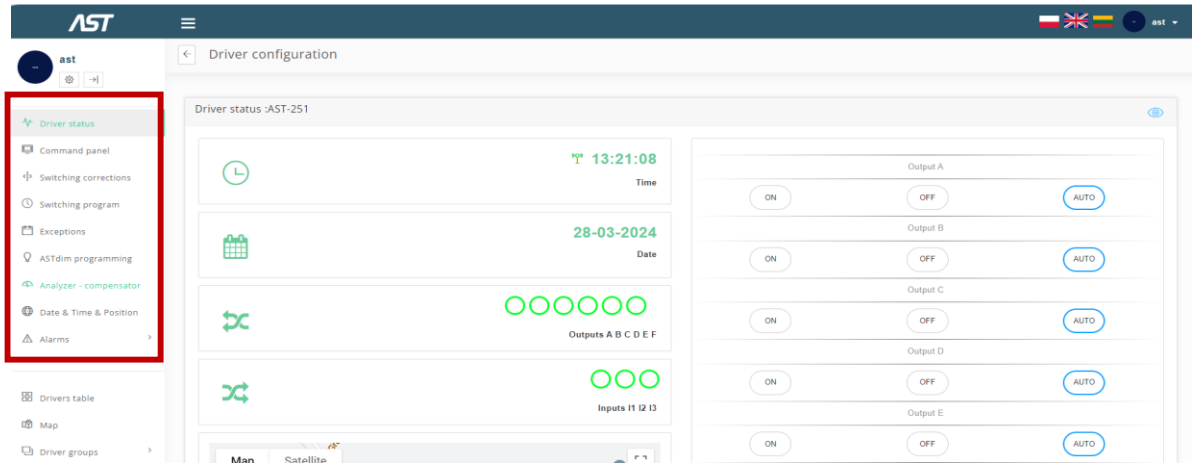
The "Uncheck" button is used to mark an alarm as read.

4.4 Controller Menu

After connecting to the controller, the menu will appear on the left side of the screen. Upon selecting the desired item, we can change the controller's parameters. The menu includes tabs such as:

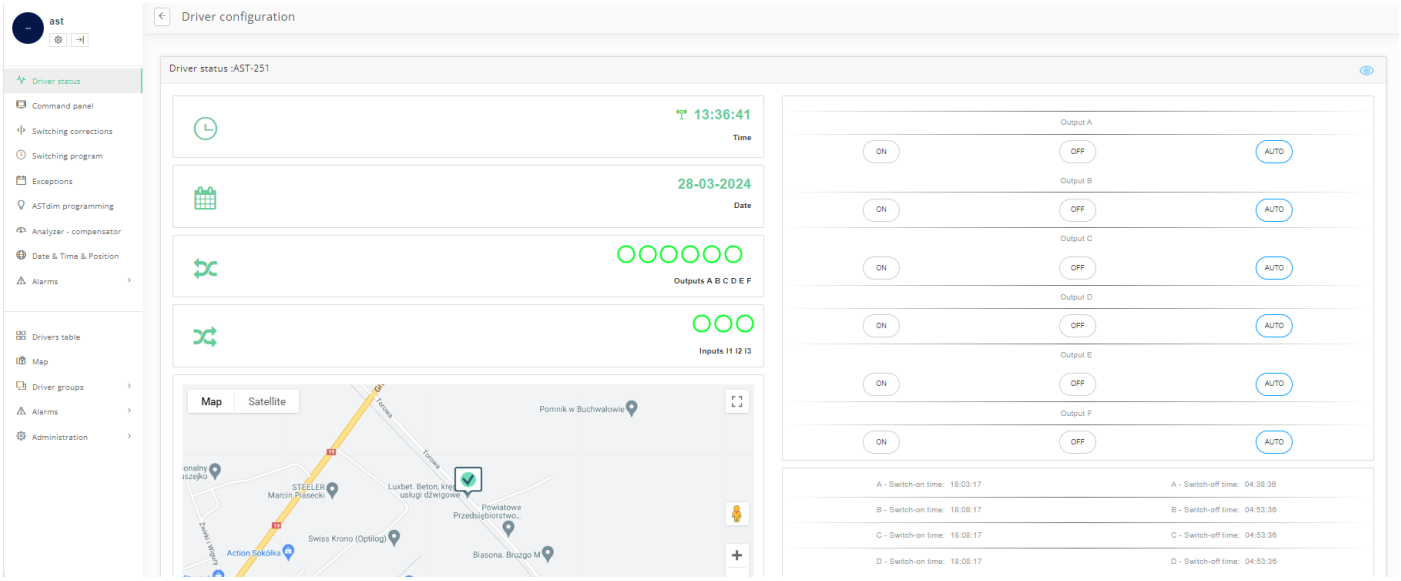


The button enabling connection to the controller



» Driver status
» Command panel
» Switching corrections
» Switching program
» Exceptions
» ASTdim programming
» Analyzer - compensator
» Date & Time & Position
» Alarms

4.4.1 Driver status

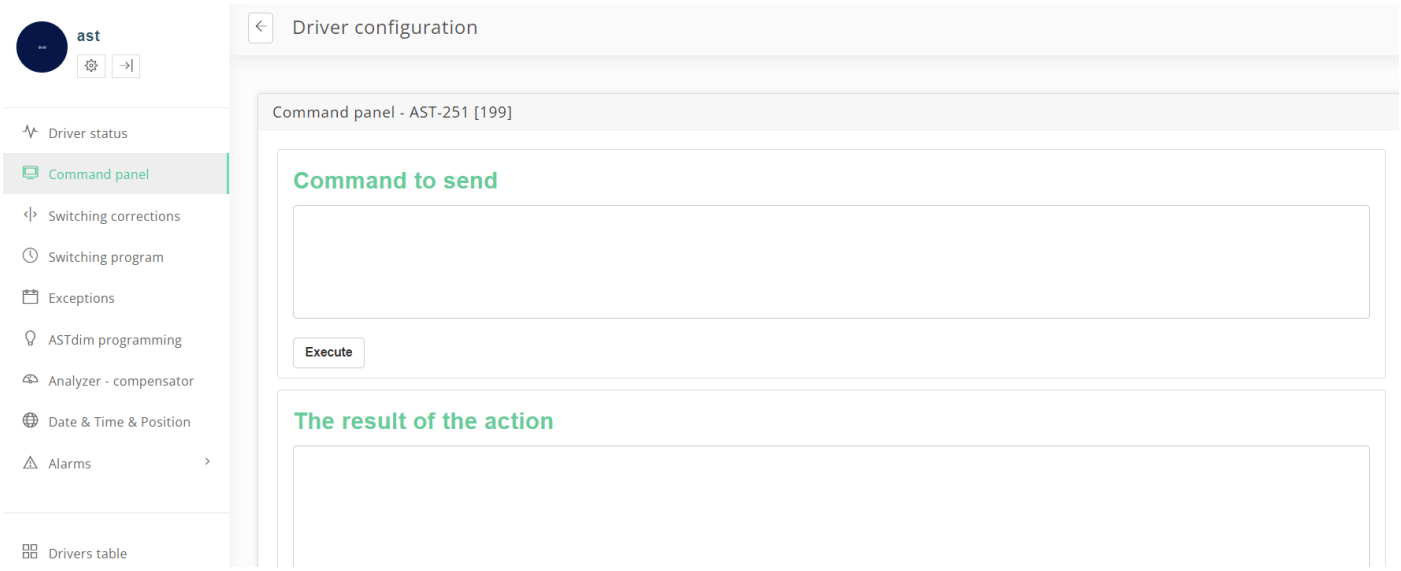


This tab contains information about the controller such as:

- Whether the controller has a GPS signal
- Current time
- Current date
- Status of outputs
- Status of inputs
- Geographic position of the controller
- Service activations

It is also possible to set the operation mode of outputs according to our individual needs. Setting ON and OFF ensures the absolute operation of the controller. After a specified time of 1/10/30 minutes, the setting will return to AUTO mode. This mode makes the controller operate according to the settings we have defined in relation to sunrise and sunset.

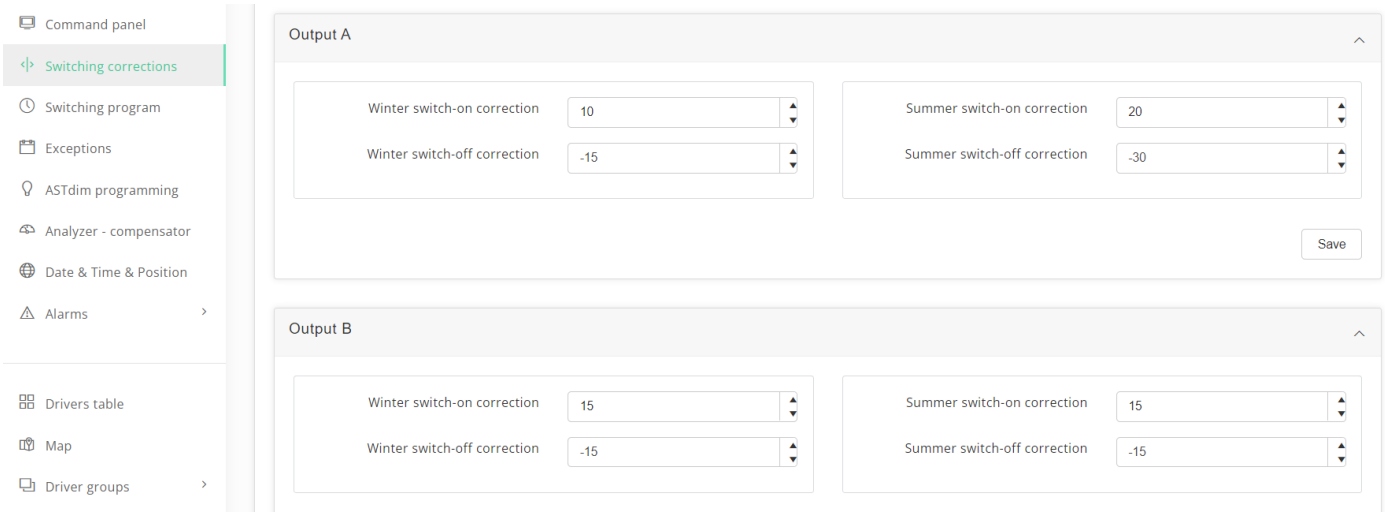
4.4.2 Command panel



In the case where the ASTgsm controller is used for lighting purposes and astronomical switch-on andswitch-off times are utilized, these times can be adjusted using corrections.

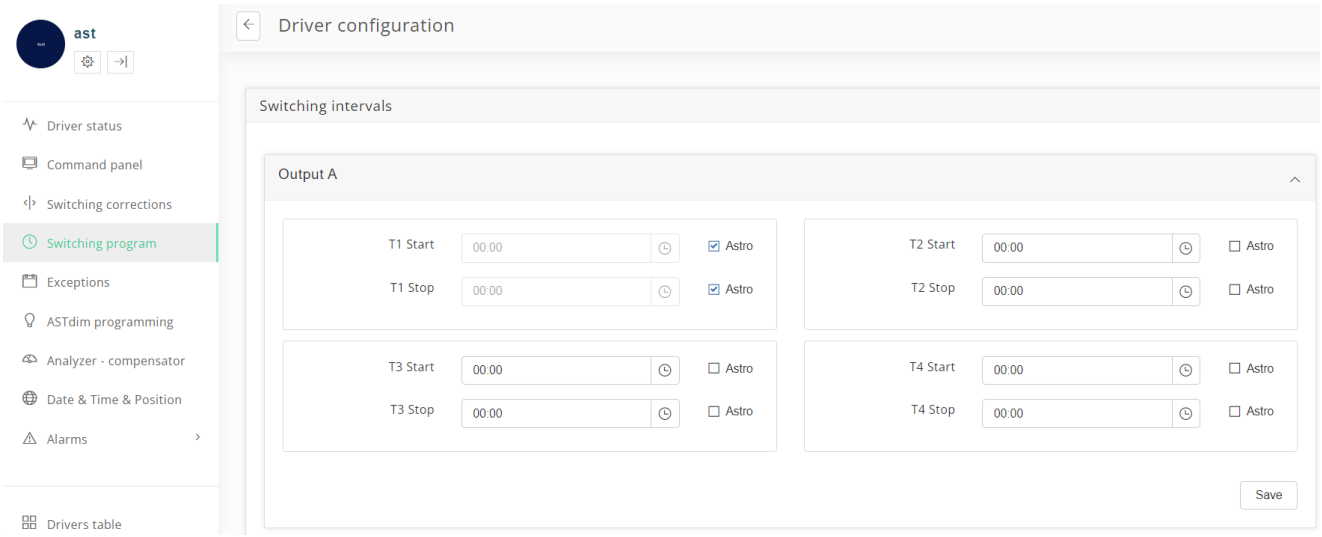
To save the correction, it is necessary to press the "**Execute**" button.

4.4.3 Switching corrections



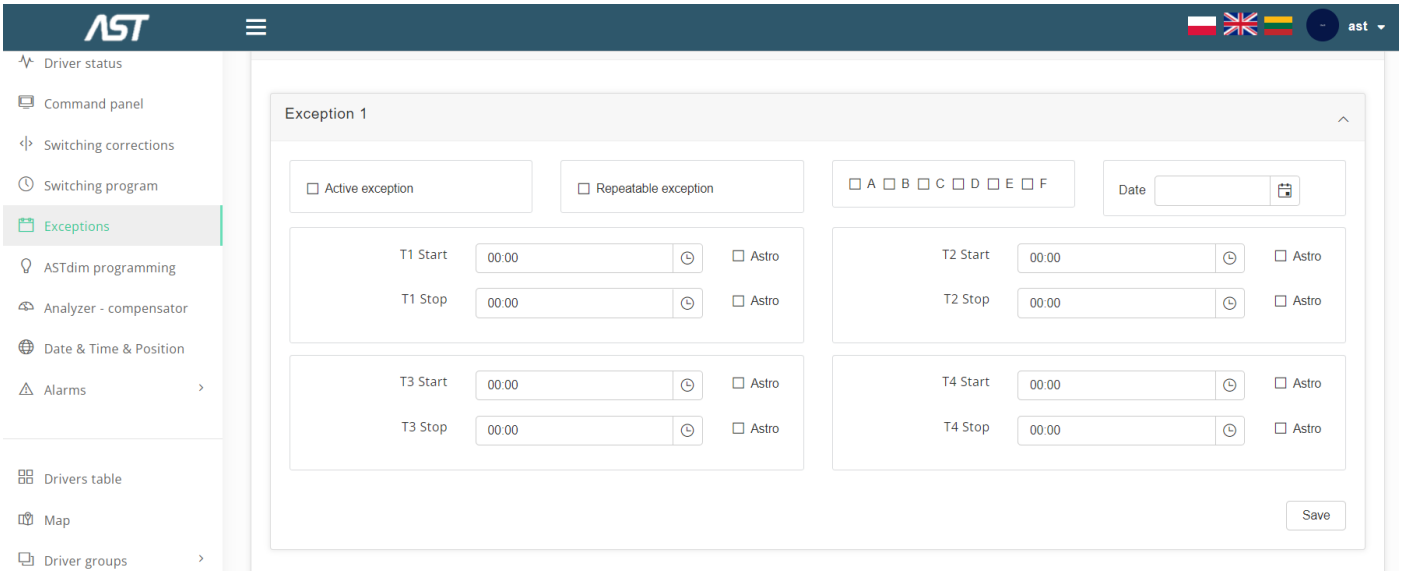
It is possible to introduce switch-on corrections for specific outputs of the controller, for example, 15 minutes before sunrise.

4.4.4 Switching program



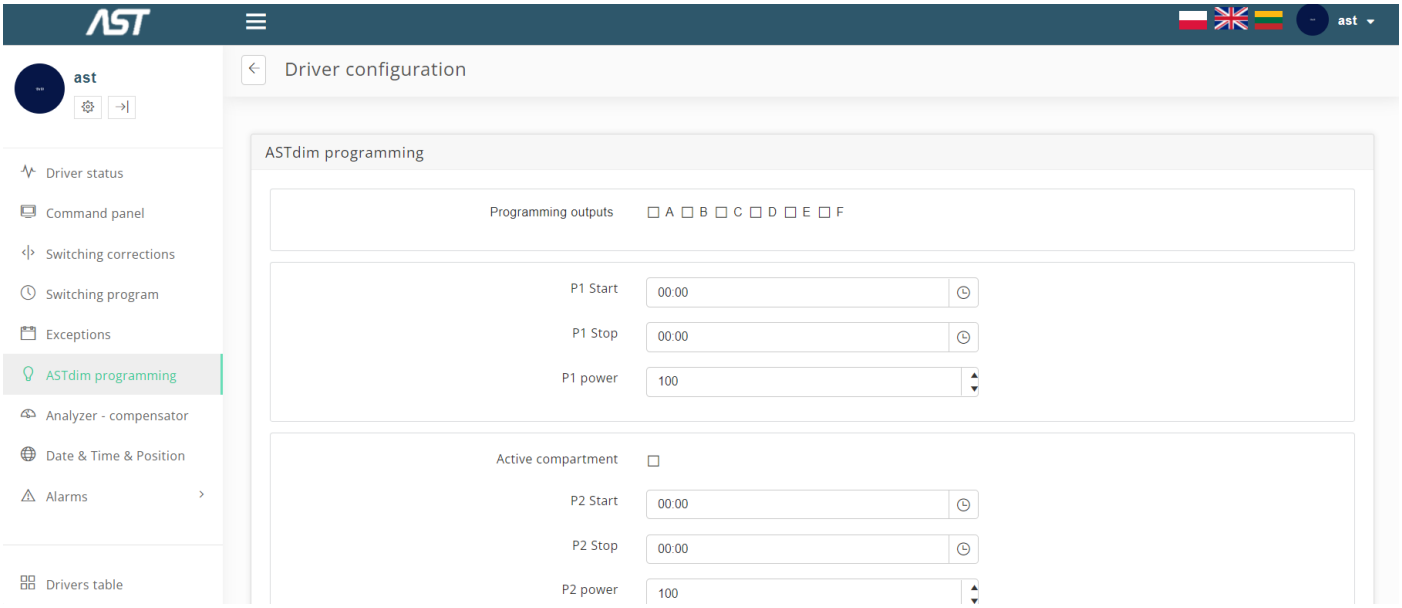
The ASTgsm controller allows for up to four switching intervals to be independently programmed for each output.

4.4.5 Exceptions



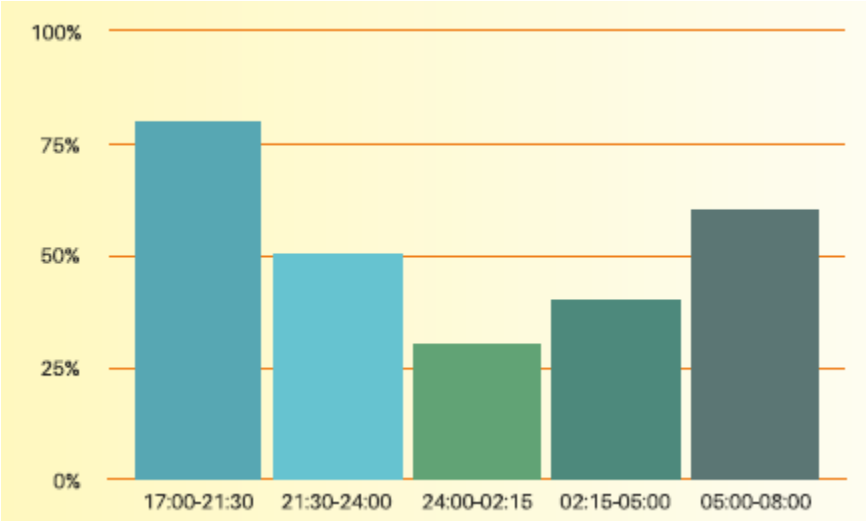
In the ASTgsm controller, up to 10 switch-on exceptions can be programmed. Switch-on exception for the ASTgsm controller should be understood as a set of switch-on intervals that will be used only once for a specific date. After completing the task, the controller will return to its original operation.

4.4.6 ASTdim programming



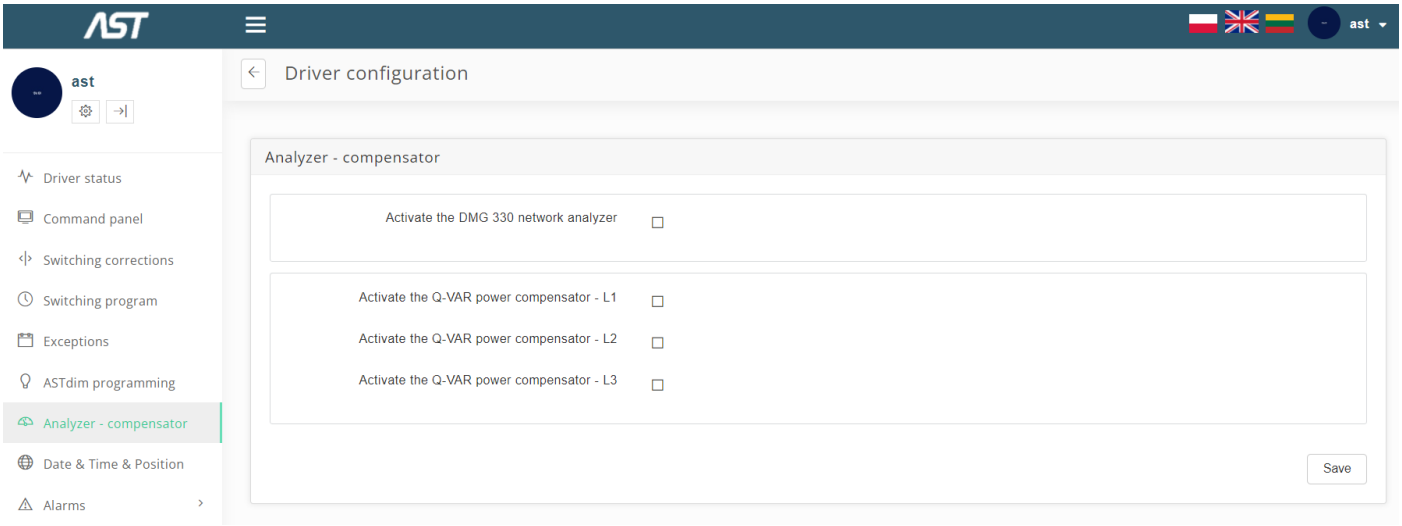
When the circuit is equipped with luminaires with intelligent power reducers, ASTgsm allows us to change the lighting reduction schedule through this tab.

An example of changing luminaire power in time intervals



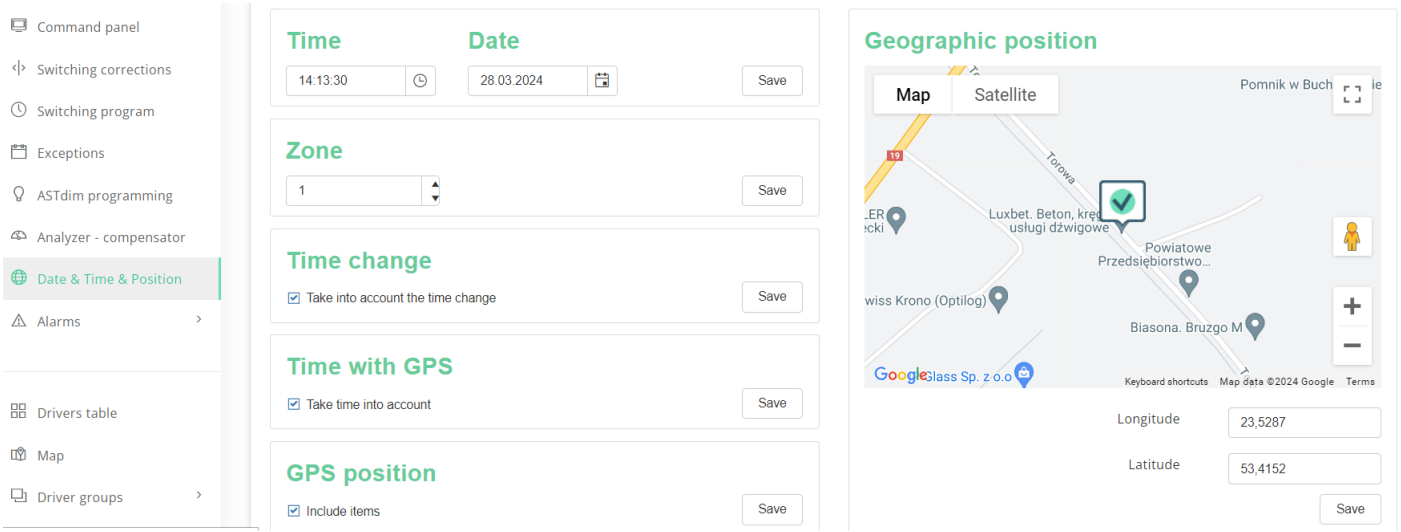
To do this, you need to select the output to which the circuit is connected and choose the time and power level of the luminaires. To save the changes, click the "Save" button. ASTgsm allows for setting up to five power reduction thresholds.

4.4.7 Analyzer – compensator



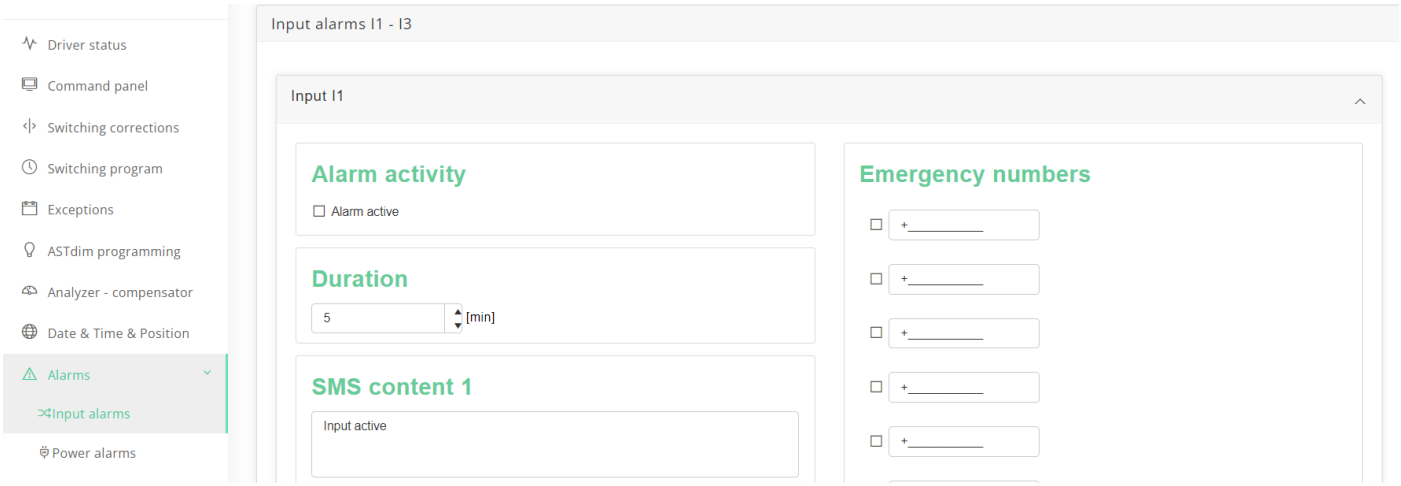
In this tab, you can activate the selected network analyzer or power compensator.

4.4.8 Date & Time & Position



In this tab, you can manually change the date, time, time zone, and position of the controller, as well as set the controller not to change between daylight saving time and standard time.

4.4.9 Alarms

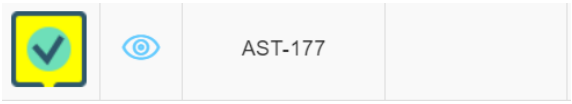


In this tab, you can enable notifications for power alarms and input alarms, and enter the phone number to which SMS notifications will be sent in case of an alarm.

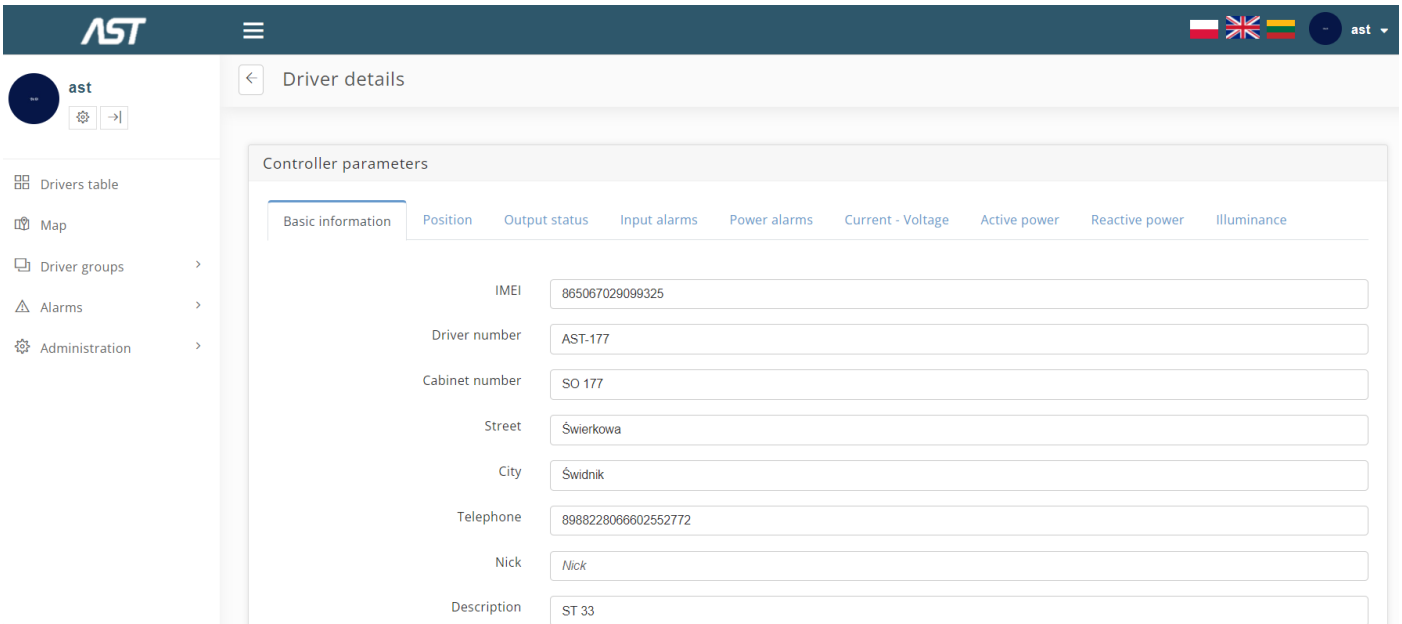
4.5 Controller parameters

You can open the details of the controller using the button.

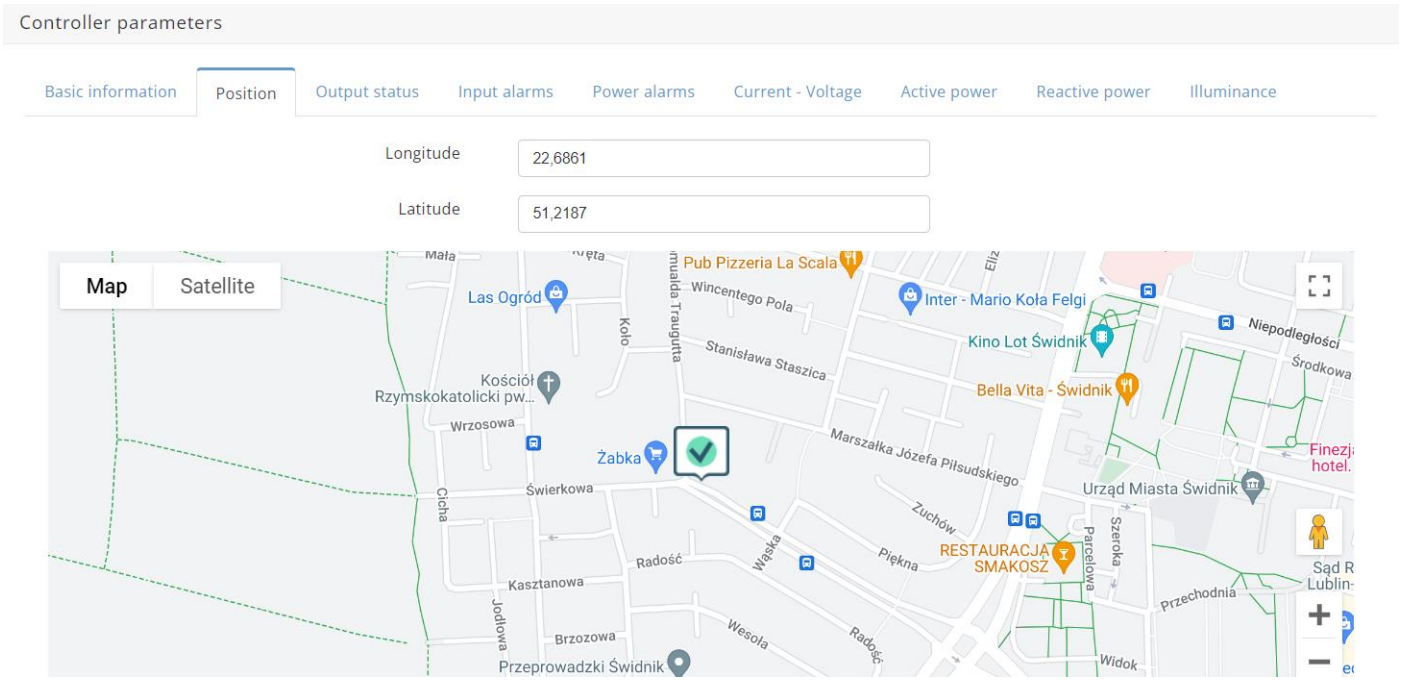
located next to the controller activity icon.



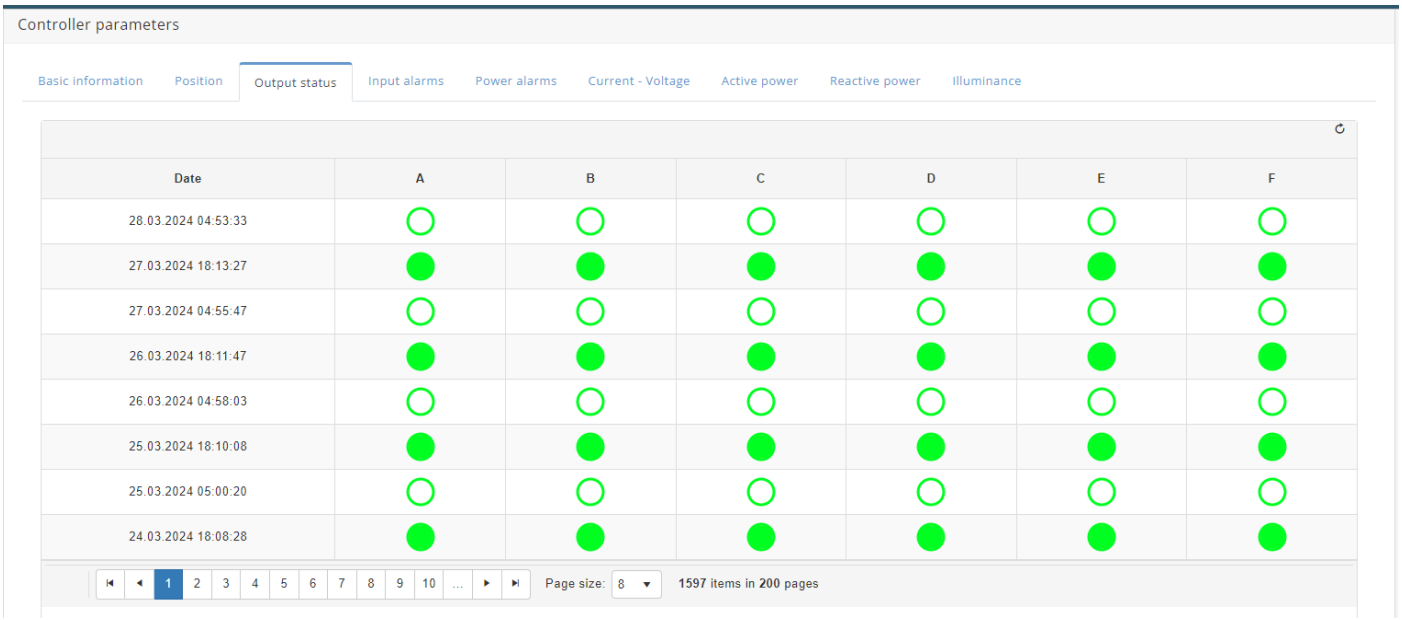
Pressing it will take you to the "Controller Parameters" panel.



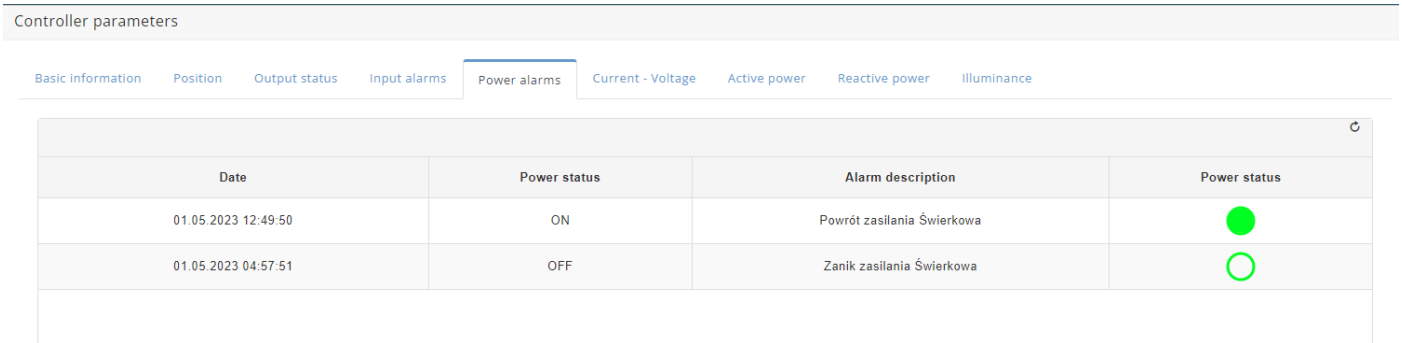
In the opened tab, you will read the basic data of each controller. You can also retrieve its exact position, provided in both longitude and latitude, in the "Position" tab.



Next, you will be able to see the current and past status of outputs with precise switching times in the "Output Status" tab.



If the controller is operating correctly, you will not find any data in the "Input Alarms" and "Power Alarms" tabs.



In the "Current - Voltage" tab, you can read the current consumption and its intensity within the selected time interval.

There is also an option available to export data to Excel, CSV, and Word formats.

Date	Voltage L1 [V]	Voltage L2 [V]	Voltage L3 [V]	Current L1 [A]	Current L2 [A]	Current L3 [A]
28.03.2024 14:12:33	236,61	239,13	236,62	0	0	0
28.03.2024 14:02:31	236,63	239,95	236,7	0	0	0
28.03.2024 13:52:30	235,91	238,81	236,47	0	0	0
28.03.2024 13:42:28	235,21	238,64	235	0	0	0
28.03.2024 13:32:27	236,83	236,66	233,92	0	0	0
28.03.2024 13:22:25	235,82	238,53	235,92	0	0	0
28.03.2024 13:02:23	236,61	237,46	235,12	0	0	0
28.03.2024 12:52:21	236,03	238,08	235,2	0	0	0

Similarly, you can perform the same actions in the " Active power"; „Reactive power" and „Illuminance" tab.