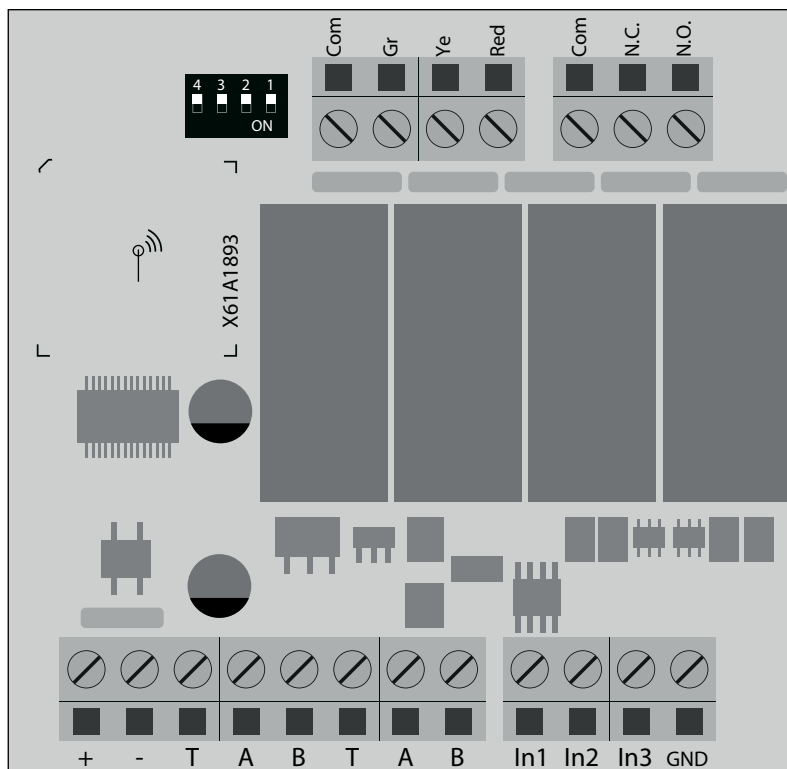


SATURNO

EN

INSTRUCTIONS SATURNO CONTROL UNIT FOR TRAFFIC LIGHT



Moving Ideas.

PORTACON
TOEGANGSTECHNIEK & BEVEILIGING

This booklet is intended for qualified installation technical personnel.

We recommend that you read this instruction manual carefully before installing this product.

Improper use of the product or a connection error could compromise the correct operation of the product and the safety of the end user.

TECHNICAL DATA

MASTER

The Master board is the board on which the programming is carried out, and which takes control of all slaves as per configuration. It is provided with onboard server and an ESP for connection via Wi-Fi, it has two inputs: one for emergency and one to force the stand-by mode.

POWER SUPPLY	IP	OPERATING TEMPERATURE	CONTROLLABLE SLAVES	COMMUNICATION PROTOCOL	MAX DISTANCE COMMUNICATION
230V ~±10% - 50Hz	65	-20°C / +60°C	10	RS-485	1Km

SLAVE

The Slave board is the board dedicated to communicating to the master board the status of the traffic light and its sensors, it also performs any commands received. Each slave is provided with 4 outputs, one for each colour, and a programmable auxiliary output, it also has 3 inputs operating in different ways according to the defined operation mode.

POWER SUPPLY	IP	OPERATING TEMPERATURE	COMMUNICATION PROTOCOL
230V ~±10% - 50Hz	65	-20°C / +60°C	RS-485

USE AND RESTRICTIONS OF USE

The SATURNO system is intended for the management of logistic traffic, in alternate one-way directions, ramps, industrial areas and parking lots. Once installed, Saturno can be considered as an industrial network communicating between the various boards via industrial serial port 485. Each master card can manage a maximum of 10 slaves, each slave can manage 1 traffic light, 1 auxiliary output, 3 programmable inputs, one of which for emergency use.

Any use other than that described above and any installation other than that described in the following technical manual are to be considered prohibited and will be sufficient for the warranty to be invalidated.

WI-FI NETWORK CONNECTION

WI-FI NETWORK NAME	WI-FI PASSWORD	WEBSITE ADDRESS
Saturno - xxxxxXXX	12345678	http://192.168.4.1

FIG 1

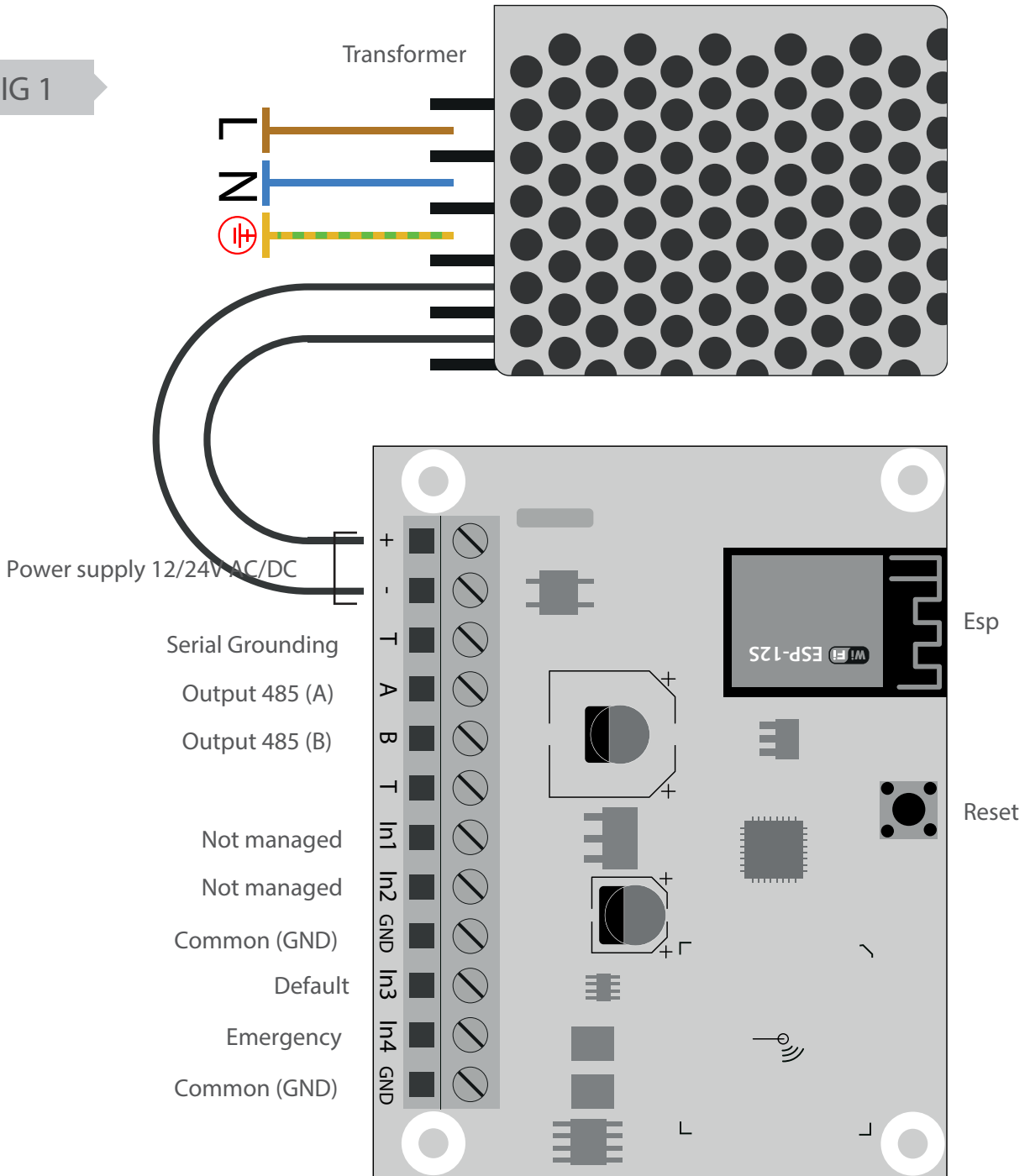
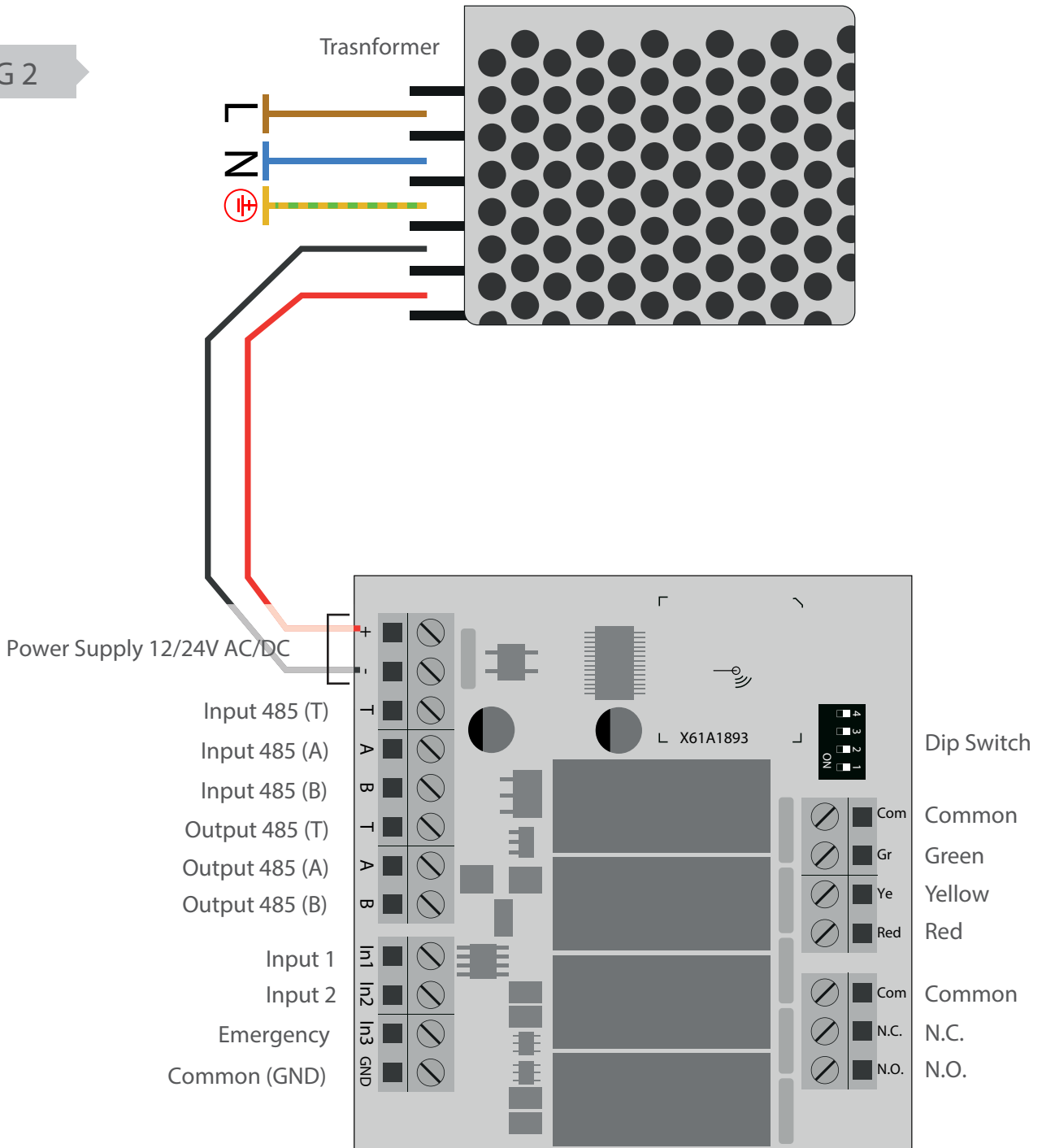


FIG 2



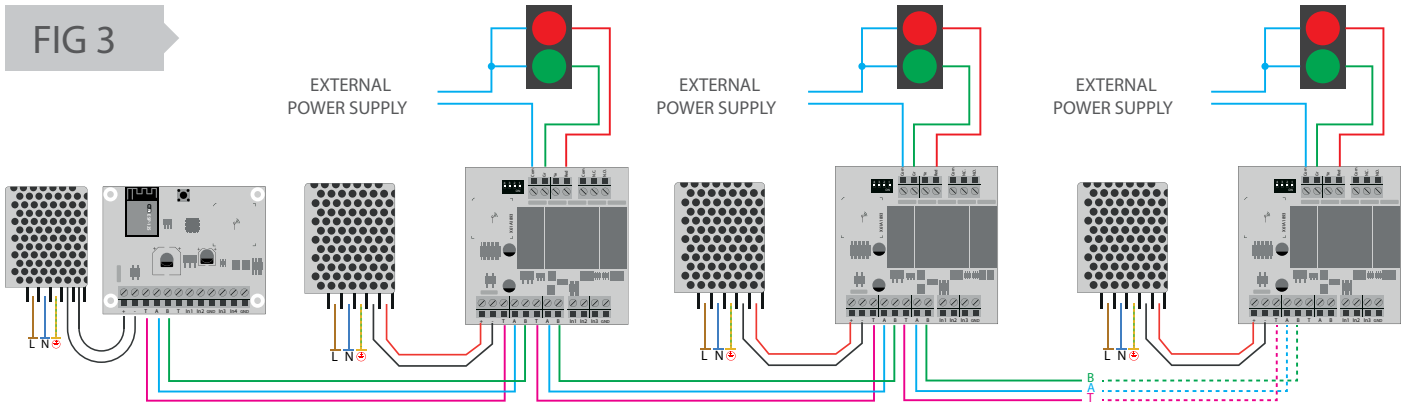
ELECTRICAL CONNECTIONS



Warning!
All electrical connections must be executed with no power supply. In addition, the consistency of the markings must be respected for serial.v wiring

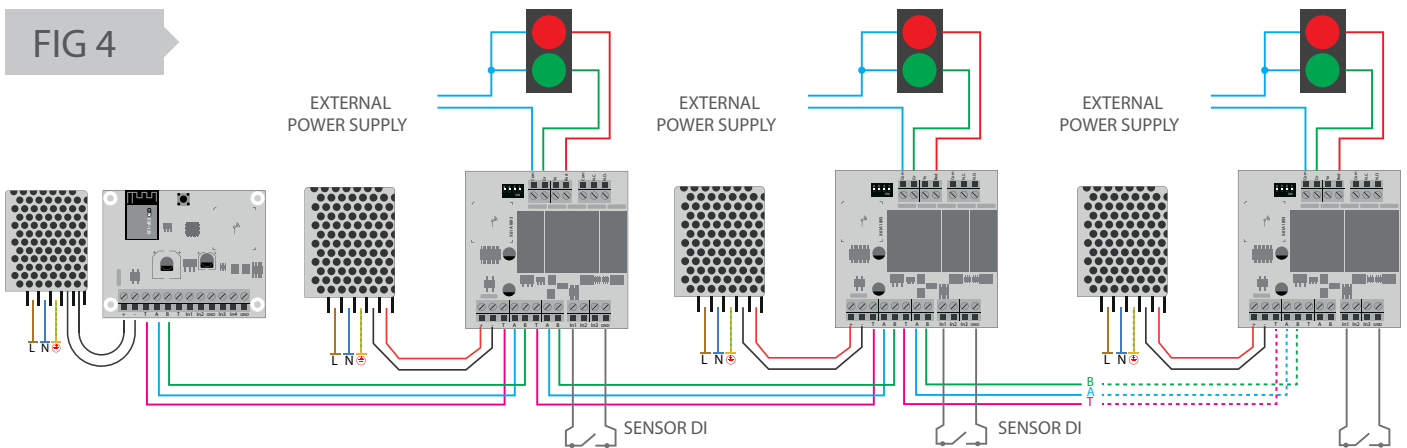
OPERATING MODE CYCLING

FIG 3



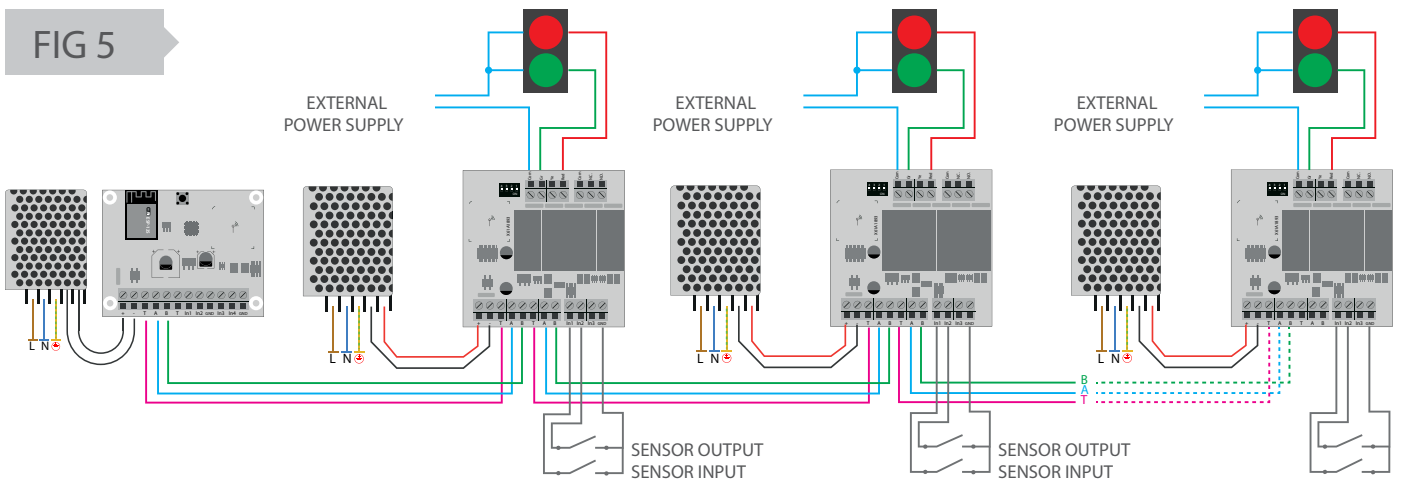
OPERATING MODE PRIORITY AND COMBINED

FIG 4



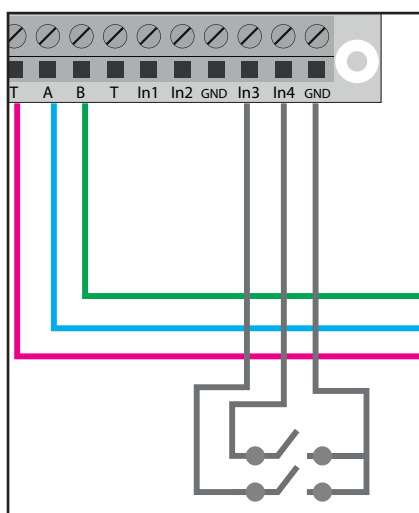
OPERATING MODE PARKING

FIG 5



INPUT AND OUTPUT AUXILIARY

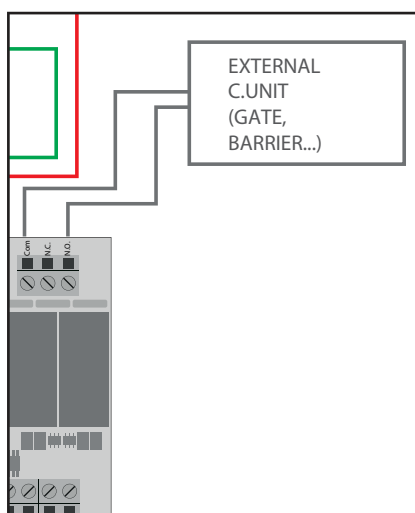
FIG 6



EMERGENCY INPUT (N.C.)
DEFAULT INPUT (N.C.)

MASTER

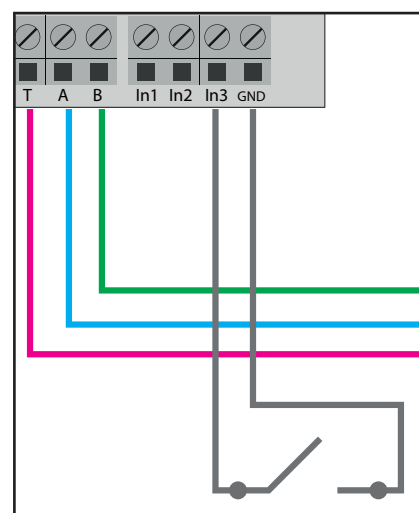
FIG 7



OUTPUT CONTROL
EXTERNAL C. UNIT

SLAVE

FIG 8



EMERGENCY INPUT (N.O.)

SLAVE ADDRESSES TABLE

Set the Dip Switches when the system is off, it is essential that each slave has a different ID from the others.

Here is a table showing how to set up IDs, use a screwdriver and be careful of short circuits.

	1	2	3	4	ADDRESS
	ON	OFF	OFF	OFF	1
	OFF	ON	OFF	OFF	2
	ON	ON	OFF	OFF	3
	OFF	OFF	ON	OFF	4
	ON	OFF	ON	OFF	5
	OFF	ON	ON	OFF	6
	ON	ON	ON	OFF	7
	OFF	OFF	OFF	ON	8
	ON	OFF	OFF	ON	9
	OFF	ON	OFF	ON	10

CONNECTION TO THE MASTER BOARD

1

Look for the Wi-Fi network indicated on the first page of this manual. In case the network is not displayed immediately please wait for a few seconds.



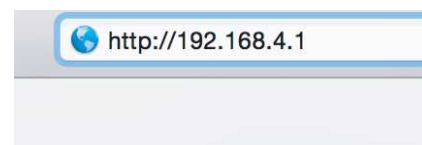
2

Access it using the default Password shown on the first page of this manual.



3

Once logged in, open the browser of your smart device and type in the following address: <http://192.168.4.1>



Warning!

The network can handle up to 3 devices simultaneously.
In case of slowdowns during the connection, make sure that only one device is connected to the network.
Alternatively, please restart the Wi-Fi connection of the smart device you are using.

INTERFACE

The Saturno board has 6 main pages:

1. Machine information, where the version of the firmware in use is reported.
2. **Traffic lights status**, where it is possible to see in real time the status of the system.
3. **Configuration**, where you can set up the entire system.
4. **WiFi configuration**, where you can customize the name of the WIFI, change its Password or the radio channel in use. Please note that if one of these parameters is modified, it will be necessary to restart the master and reconnect to the newly modified network.
5. Saving and resetting, this screen allows you to download a backup file of all settings, useful for systems with more than one master and of course to keep a record of the settings in case of failures. It is also possible to upload a backup file into this screen if you already have it.
6. Help , online help explaining every single field in the user interface, from logic to configuration fields. In the whole interface there is also another type of help, lingering on a field or on a label, it will appear a short text with the description of the object itself.

LOGICS

TIME

The system cycles normally according to the pre-set programming, operating without any sensor. However, both the emergency and default inputs are taken into consideration and the auxiliary outputs of the slaves can also be programmed.

BOOKING

The system will switch on according to the set stand-by state. At the first priority request, the set area clearing time will be executed and only after it has been completed the green light will be given to the traffic light requesting it. Only if "Overlay of greens" is active, priority will be given to all the traffic lights requesting it, leaving green also the traffic lights with the "Green in stand-by" setting

COMBINED

Combined-operation logic is used to manage more complex systems because it allows green waves to be executed, according to the times required. The main difference between the booking logic and the combined logic is that the booking logic only executes the cycle of the traffic light from which it received the priority, while the combined logic takes as its starting point the traffic light from which it received the priority and then executes one by one the cycles of the following traffic lights, applying the area clearance time only at the beginning and at the end of a cycle.

PARKING

• For each traffic light

By setting the capacity and free places (at that precise moment) for each traffic light, the slaves will work exclusively on the reference traffic light, therefore useful to cover a multi-storey car park.

• Global

By setting the global capacity and the free places (at that precise moment) the various slaves will increase a single counter, so once the maximum is reached all the traffic lights will turn red. Useful to manage parking lots or areas with multiple entrances and exits.

MACHINE INFORMATION SECTION

In this section you will find information about the firmware version. When accessing the interface, allow the firmware version to be displayed and the “Stagnoli” logo to be visible before changing sections so that there are no slowdowns or malfunctions associated with displaying the data.

TRAFFIC LIGHTS STATUS SECTION

The **first box** displayed shows the **status of the traffic lights** in real time and allows the entire system to be kept under control.

The first column of the box corresponds to the modbus address.

The second column corresponds to the name of the traffic light.

The third and fourth columns correspond to the status of inputs 1 and 2.

The fifth is dedicated to emergency reporting.

The sixth is dedicated to the real-time status of the traffic light.

The seventh column, which only appears if the “Booking” or “Combined” operating mode is active, indicates whether a booking is in progress and the order that bookings follow.

Only if a parking logic has been set another column called “Free places” will be displayed, which will indicate the number of free places left within the area managed by that particular traffic light. From there you can also enter the number of free spots present at the time of installation.

The second box displays the total cycle time of the system, which is the sum of the seconds of green and the seconds of red, and its progressive increase in real time. Next to this box, the emergency status (white = no emergency; red = emergency) and the stand-by status (green = no stand-by; red = system in stand-by) are indicated.

If a parking logic has been set on the control unit and a general counter has been assigned for all the traffic lights, the item “Global free places” will be

SETUP SECTION

In the “Setup” section, first of all a box appears in which you are asked to add all the traffic lights used in the system, which correspond to all the slaves installed, using the appropriate “add” button. After adding all the traffic lights (called “Light X” by default) it will be possible to customize and configure each individual traffic light by using the three buttons located in the last column to the right of each row.



FIRST BUTTON: MODIFY

The first button is the “Modify” button. This allows you to:

- set the precise second in which the cycle of the traffic light considered will be started (Start);
- set the duration in seconds of the green, yellow and red light.

In order to have a correct configuration and depending on the type of operation you want, the seconds set (start, green, yellow and red) must be added together to obtain the total operating time of that given traffic light.



SECOND BUTTON: SETUP

By clicking on the “Setup” button you can:

- change the name of the traffic light;
- provide the control unit with the number of lamps (2 or 3);
- set the output mode (the way in which the auxiliary output should behave by choosing from the settings listed);
- set the TmAux, time expressed in seconds indicating the duration of the impulse function of the auxiliary output;
- indicate the modbus address, assigned by default, but modifiable, which is used to specify on which slave the settings should be made;
- activate “Green stand-by”, which is used to turn on the green light when the installation goes into stand-by mode;
- activate “Green emergency”, which is used to turn on the green light when the system goes into an emergency state;
- activate NC input 1, NC input 2, NC input 3, which are used to ensure that the inputs have a normally closed signal (N.C.) because by default they are set to a normally open signal (N.O.);
- indicate the number of spots in each area (only when you are in “Parking” operating mode and if you manage more than one area; otherwise leave the value set to “0”).




THIRD BUTTON: REMOVE

This button allows you to delete the entire line related to a traffic light.

On the next box, instead, you can:


- choose whether to activate the possibility of overlapping greens (without this active function, it is not possible to have two green lights at the same time for safety reasons);

 STAGNOLI T.G. S.r.l., as a manufacturer, is not responsible for any damage to property or persons, as the programming is the responsibility of the installer who MUST have all the skills and must have thoroughly analyzed the system in order to adopt the safest solutions for users.

- set the operating mode*;
- set the pre-flashing, which consists of flashing the lights before they start the cycle (expressed in seconds);
- set the area clearance time, additional time (expressed in seconds) that can be added to increase the safety factor;
- determine the response of the lights in their stand-by status;
- determine the response of the lights in an emergency status;
- indicate the number of global spots (only when you are in “Parking” operating mode and if you only manage one area; otherwise leave the value set to “0”).

You can choose between the following operating modes:

- 1) `_time_` : in this mode it is important to pay close attention to the seconds set in order to have the result desired considering that the installation will cycle independently ignoring the inputs and following only the times set.
- 2) `_booking_` : In addition to setting the times, it should be considered that the connected accessories will play a decisive role in the correct operation of the system. Therefore, this mode will not cycle if it does not receive an input and remains in stand-by mode.
- 3) `_combination_` : it is a function which will execute the cycle of the traffic light from which the booking arrived, if present, the cycles of the other traffic lights will be executed sequentially. The inputs received from the other traffic lights, during a cycle, will be assigned a priority index and then executed sequentially, in order of request. In case of absence of further inputs, only the requested cycle will be completed and after that the system will go to stand-by.
- 4) `_parking_` : it is a function that changes the interface a bit and some of the settings described so far. In this mode you will be able to decide whether to assign a single counter to the entire system, which is located in the second box under "parking spots" and from there you can set the total number of parking spots (free and occupied) that the parking has. In the " Setup " section, on the other hand, each traffic light can be assigned a total parking spot counter (free and occupied) which, for example, will be dedicated to managing a floor car park or a certain area. It will be necessary to use two sensors, one wired to input 1 (input) and one wired to input 2 (output) of the slave. The sensor wired to input 1 will be used to decrease the number of free spots and, vice versa, the sensor wired to input 2 will be used to increase the number of free spots.

 **Salva** After you have made all the changes you need to save your settings by clicking on the button "Salva".

WI-FI CONFIGURATION SECTION

In this section you can configure everything related to the connection with the terminal (master).

SSID device : name displayed in the list of devices available during the search to establish a connection with the master through a smart device (PC, tablet, smartphone).

Password device: it is the security key that will be used to keep the connection to the device and consequently the system settings safe.

Channel device: it is the frequency on which the Wi-Fi connection will be established. Leave the default setting.

The remaining settings in this section should not be considered and therefore their respective fields should be left blank.

 **Salva** When changing the parameters click on "Salva" to save the changes made..

SAVE AND RESET SECTION

In this section you can download the system configuration and load a configuration you already have.

Stagnoli recommends that you always create a backup copy of the traffic light configuration in case you need to reset it.



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