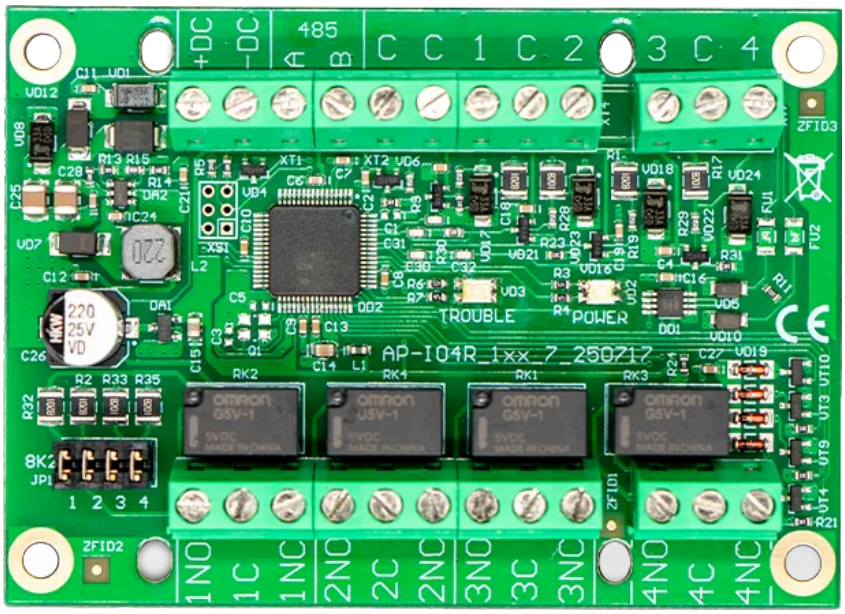
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TRIKDIS Official Distributor

iO4R relay expander for the GATOR gate controller – installation and setup manual

Installation and setup manual for the Trikdis iO4R relay expander: connection to the GATOR gate controller, monitoring and bypassing the safety sensors, gate cycle counting and maintenance, the Protegus 2 app.



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1. Overview

The **iO4R** (also called IO4R, iO-4R) is the Trikdis relay expander for the **GATOR** gate controllers: it adds four inputs and four relay outputs to the gate controller, to which it connects over the RS485 bus. Its main job is **gate monitoring**: the safety sensors of the gate automation (for example the photocells) are connected to the gate automation through the iO4R, so their state is visible in the Protegus 2 app, and a failed sensor can be bypassed remotely by an authorized person, temporarily, until the service technician arrives. Meanwhile Protegus 2 counts the gate's full open–close cycles and signals when maintenance is due.

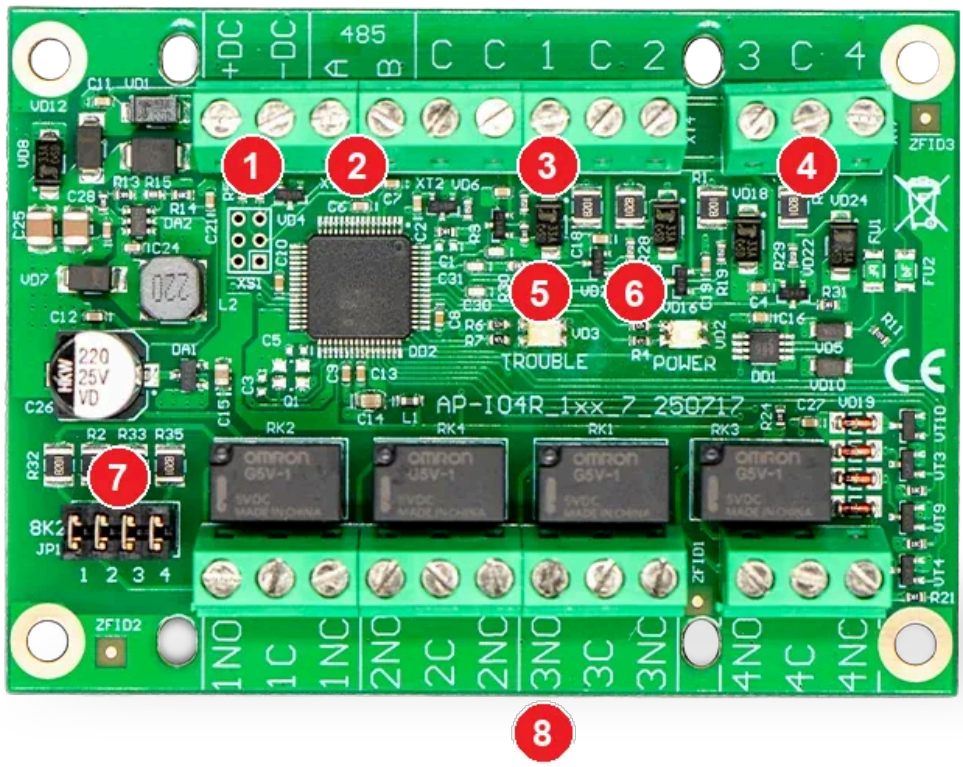


Figure 1. The iO4R expander board.

- 1 **+DC**, **–DC** – power supply, 10–26 V DC
- 2 **A**, **B** (marked "485" on the board) – RS485 bus to the gate controller
- 3 inputs **1** and **2** with the **C** (common) terminals
- 4 inputs **3** and **4** with the **C** (common) terminal
- 5 **TROUBLE** indicator
- 6 **POWER** indicator
- 7 jumper block marked "**8K2**" (**JP1**, 1–4)
- 8 the output terminals of the four relays: **1NO 1C 1NC** … **4NO 4C 4NC**

1.1 What it is for, how it works

It is made for installers: some of the critical faults can be solved remotely with the iO4R, so an unnecessary site visit is avoided. Typical cases:

- **The gate does not close because a safety sensor has failed or is obstructed**: the installer bypasses the input remotely, and the gate works again immediately – there is no need to rush to the site, and the gate does not stand idle either.
- **Monitored inputs**: safety sensors, limit switches or external trigger signals can be connected to the inputs, and their state is visible in real time.

- **Remote relay control**: with the four relay outputs you can start the gate remotely, reset a state, or switch another external device.
- **Maintenance by cycle count**: Protegus 2 counts the full open–close cycles and signals when the set maintenance value has been reached.
- **Expansion**: with four inputs and four outputs it gives the GATOR system more control and automation options; it can be used both in a new installation and to expand an existing system.

How does it work? The iO4R works on the RS485 bus of the gate controller, as the GATOR system's own expansion: input changes and remote commands pass between the two devices without delay. The output of the gate automation's safety sensor goes to one of the iO4R inputs, and the output of the relay belonging to it goes to the safety input of the gate automation. Each input has the relay output with the same number:

Input	Relay output
Input 1	Output 1 (**1NO** / **1C** / **1NC**)
Input 2	Output 2 (**2NO** / **2C** / **2NC**)
Input 3	Output 3 (**3NO** / **3C** / **3NC**)
Input 4	Output 4 (**4NO** / **4C** / **4NC**)

You set up the system in the **Protegus 2** app, in the **Advanced Gator Monitoring** mode that can be selected when the gate controller is added (chapter 4). The other settings of the gate controller are described in the GV17 GATOR manual and the WP17 GATOR WiFi manual – this manual is to be used alongside them.

Trikdis IO4R (IO-4R) – GATOR I/O Expander Module (4 Inputs / 4 Relays)

1.2 Compatible gate controllers

The iO4R is made specifically for the GATOR gate controllers and connects to them over the RS485 bus. It works with two gate controllers:

Gate controller	Also called	Manual
GV17 GATOR – cellular (4G) gate controller	GATOR LTE	GV17 manual
WP17 GATOR WiFi – Wi-Fi gate controller	GATOR WiFi	WP17 manual

One iO4R can be connected to one gate controller.

Trikdis GV17 - GATOR smart 4G GSM / IP gate controller

Trikdis WP17 Smart WiFi controller

1.3 Technical data

Parameter	Value
Supply voltage	10–26 V DC
Current consumption	max. 100 mA (at 12 V DC)
Connection to the gate controller	RS485 bus

Parameter	Value
Inputs	4
Input type	EOL (supervised with an end-of-line resistor), nominal resistance 8.2 kΩ
Input voltage	from 0 V up to the supply voltage
Outputs	4 relays with NC/NO contacts
Output resistance	an 8.2 kΩ resistor can be switched onto the NO terminal – for systems that require a supervised output
Output voltage	0–125 V
Output current	max. 1 A (at 30 V DC)
Operating environment	−10 … +55 °C, max. 80% relative humidity (at +20 °C)

No dimensions are given; the module is compact and can also be fitted inside the gate automation housing.

1.4 Terminals and indicators

Terminal	Function
+DC, **−DC**	power supply, 10–26 V DC
A, **B** (“485” on the board, **RS485A**, **RS485B** on the drawing)	RS485 bus: to the **A RS485** and **B RS485** terminals of the gate controller
1, **2**, **3**, **4**	the four inputs; the sensor contact goes between the input and the **C** terminal next to it
C	common terminal of the inputs
1NO 1C 1NC … **4NO 4C 4NC**	the contacts of the four relays: **NO** – normally open, **C** – common, **NC** – normally closed

Two indicators on the board help with troubleshooting:

- **POWER** – the state of the supply voltage: normal or low supply voltage;
- **TROUBLE** – the RS485 communication with the gate controller has been lost.

Indicators also show the state changes of the inputs and outputs, so the installer can quickly see what is happening in the system. This manual does not detail the blink patterns.

Next to the relays, the board has a four-position jumper block labelled “**8K2**” (**JP1**, 1–4). An 8.2 kΩ resistor can be switched onto the **NO** terminal of the relay outputs: with the jumper fitted the resistor is connected, with the jumper removed it is not. Which one is needed depends on the gate automation.

2. Preparation

Before you start, you will need the following:

1. The **GV17 GATOR or WP17 GATOR WiFi gate controller** that you are setting up now. It must be powered off while you are wiring.
2. The **iO4R serial number** – Protegus 2 asks for it during setup.
3. A **Protegus 2 company or installer account**, and the gate controller's **IMEI number / unique ID** (Unique ID) – it can also be found as a QR code on the gate controller's sticker.

4. A **gate status sensor** (for example the gate's limit switch or the status output of the gate automation) connected to the gate status input of the gate controller: in iO4R monitoring this is the **3 I/O** input (section 3.4).
5. The gate's **safety sensors** (for example photocells) wired through the iO4R – if you want to monitor them in Protegus 2 or bypass them when needed.



3. Wiring

Figyelem!

Tilos a vezetékezést feszültség alatt álló eszközön elvégezni. A munka előtt a megfelelő áramtalanításról és érintésvédelemről (beleértve a szünetmentes működést biztosító akkumulátorokat) gondoskodni kell.

The iO4R connects to the RS485 bus and the power supply of the gate controller, and the safety sensors are connected to the gate automation through it. The complete wiring is shown in the drawing below.

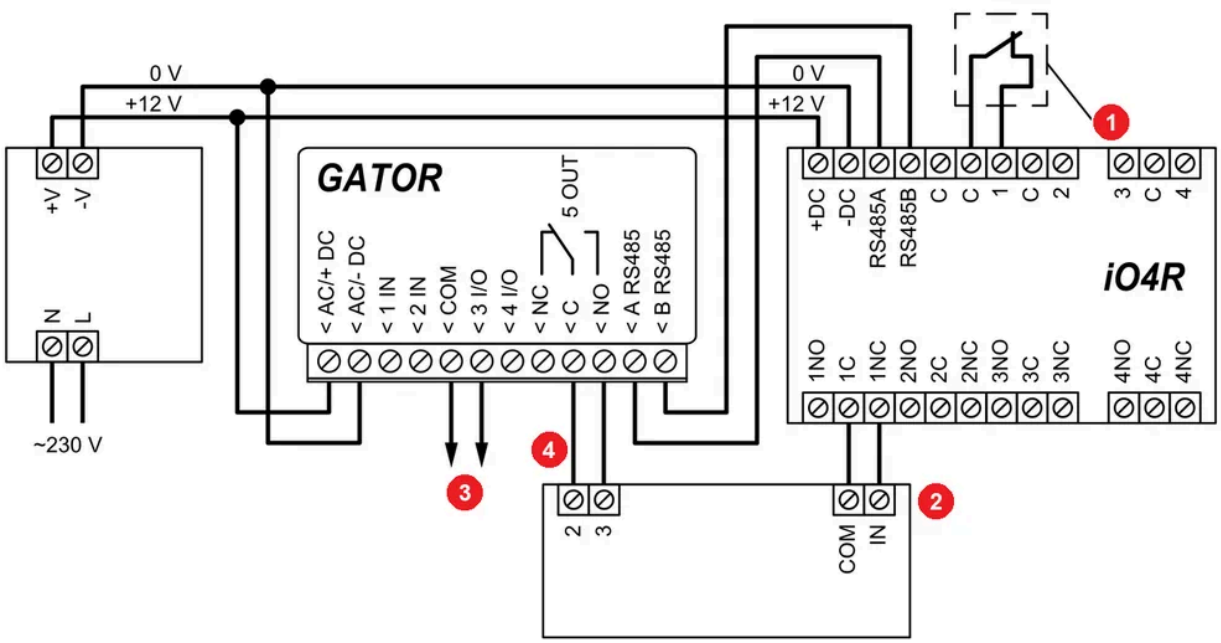


Figure 2. Wiring the iO4R to the GATOR gate controller and the control unit of the gate automation (“Gate automatic”). The input of the power supply (“Power supply”) is ~230 V; its +12 V and 0 V outputs go to the **AC/+DC** and **AC/−DC** terminals of the GATOR and to the **+DC** and **−DC** terminals of the iO4R. RS485 bus: the **A RS485** and **B RS485** terminals of the GATOR go to the **RS485A** and **RS485B** terminals of the iO4R.

- 1 the output of the gate automation's safety sensor is wired to the input of the iO4R module: to terminals **1** and **C** (“The output of the gate automation safety sensor are wired to the input of the iO4R module”)
- 2 the output of the iO4R module is wired to the safety input of the gate automation: **1C** to **COM**, **1NC** to **IN** (“The output of the iO4R module are wired to the safety input of the gate automation”)
- 3 the gate status signal (“Gate status”) to the **COM** and **3 I/O** terminals of the GATOR; NC – closed state (“NC - status close”)
- 4 gate control (“Gate control”): the **C** and **NO** terminals of the GATOR's **5 OUT** relay to terminals **2** and **3** of the gate automation

WP17 GATOR WiFi

The drawing shows the terminal labels of the GV17 GATOR (also called GATOR LTE). On the WP17 GATOR WiFi the corresponding terminals are: **+DC**, **−DC**, **A RS485** and **B RS485** – see the terminal table in the WP17 manual.

3.1 Placement

The compact module can also be fitted inside the gate automation housing, with no separate space or complicated wiring needed. Place it so that the terminal blocks stay accessible and the indicators (**POWER**, **TROUBLE**) are visible during servicing.

3.2 Power supply and RS485 bus

1. **Power**: the **+DC** and **−DC** terminals of the iO4R take 10–26 V DC; in the drawing it is fed from the same 12 V power supply that also powers the GATOR.
2. **RS485 bus**: connect the **A RS485** terminal of the gate controller to the **A** (**RS485A**) terminal of the iO4R, and the **B RS485** terminal to the **B** (**RS485B**) terminal.

Supply voltage

The iO4R only works on DC voltage (10–26 V DC). The GV17 GATOR can also run on 9–32 V DC or 12–24 V AC: if the gate controller is fed with AC voltage or with a DC voltage outside 10–26 V, the iO4R needs a separate 10–26 V DC power supply.

3.3 Safety sensors and relay outputs

You connect the safety sensors of the gate automation (for example the photocells) to the gate automation through the iO4R:

1. Connect the output contact of the sensor to one of the iO4R inputs: between the input terminal and the **C** terminal next to it (in the drawing **1** and **C**).
2. Connect the **C** and **NC** terminals of the relay with the same number (in the drawing **1C** and **1NC**) to the safety input of the gate automation, where the sensor output was connected before (in the drawing **COM** and **IN**).
3. The same for more sensors: input 2 goes with output 2 (**2NO** / **2C** / **2NC**), input 3 with output 3 (**3NO** / **3C** / **3NC**), input 4 with output 4 (**4NO** / **4C** / **4NC**).

The inputs also accept EOL wiring (supervised with an end-of-line resistor) with a nominal resistance of 8.2 kΩ; the input voltage can be between 0 V and the supply voltage. Whether the sensor goes to the input with or without an 8.2 kΩ resistor depends on the gate automation. The relays can switch max. 125 V and max. 1 A (at 30 V DC). An 8.2 kΩ resistor can be switched onto the NO terminal of the relay outputs with the "8K2" jumper (1.4) – where the receiving side expects a supervised output.

The iO4R is used to bypass faulty safety sensors. If you bypass a faulty sensor and operate the gate, always make sure that there is no obstacle in the gate's range of movement.

3.4 Gate status sensor and gate control

- **Gate status (3 I/O)**: connect the contact that signals the gate status (limit switch or the status output of the gate automation) between the **COM** and **3 I/O** terminals of the GATOR. This input provides the gate position and the cycle counting: a cycle only counts if the gate has **fully opened and fully closed as well**.
- **Gate control (5 OUT)**: the **C** and **NO** terminals of the GATOR's **5 OUT** relay go to the control input (open/start) of the gate automation – as described in the gate controller's manual.

Important

In the Protegus 2 monitoring setup, **3 I/O** provides the gate position and the cycle counting. If there is a Wiegand reader, the exit button would also go to **3 I/O**, but **3 I/O** can only do one of the jobs at a time, so you have to choose. If you select **3 I/O** as the exit button in the settings, the exit button works, but the gate status is not shown in the app. If you want to see the gate status in the app via **3 I/O**, the exit button does not work. If you use the iO4R as a simple expander, you can connect the exit button to **3 I/O**. The **IN1** and **IN2** inputs are reserved for the Wiegand reader.

4. Setup in the Protegus 2 app

You add the gate controller and the iO4R in the Protegus 2 app in one go. Log in with your **company or installer account**, and keep the gate controller's IMEI number (unique ID) and the iO4R serial number at hand.

4.1 Adding the gate controller

1. In the list of systems, tap the **+** button (add a new system).
2. Enter the gate controller's **Unique ID/IMEI**, or tap **Scan QR Code** and scan the QR code on the gate controller's sticker. Tap **Next**.

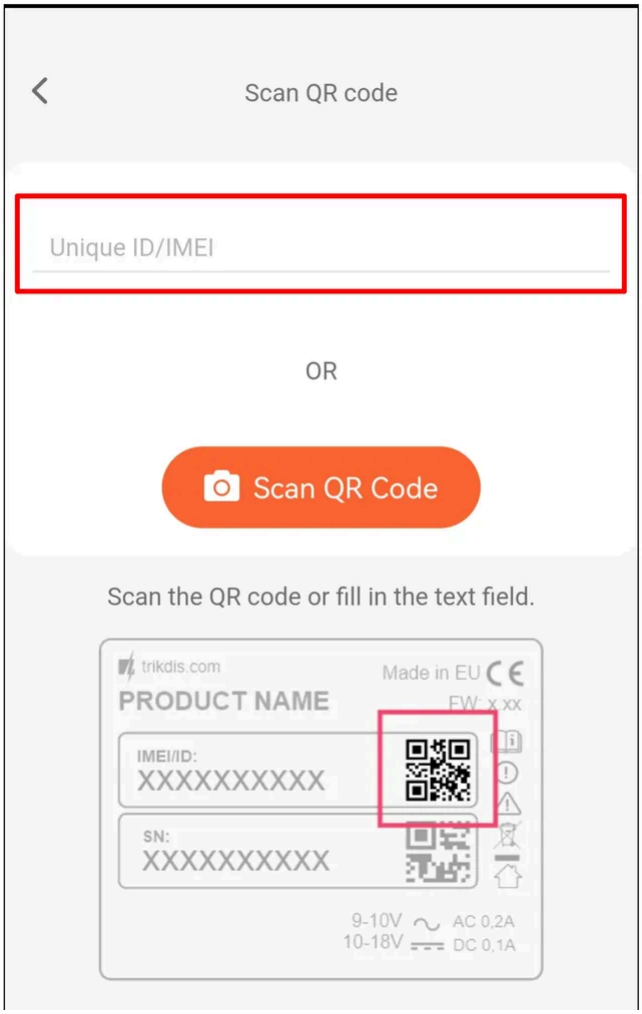


Figure 3. Protegus 2 – entering the ID: the **Unique ID/IMEI** field with the **Scan QR Code** button below it; on the sticker drawing, the location of the QR code and the ID.

3. On the **Select the setup mode** screen, choose the **Advanced Gator Monitoring** mode – this is the setup of the iO4R expander with gate monitoring and cycle counting. (**Default** is the usual system adding, without further settings.)

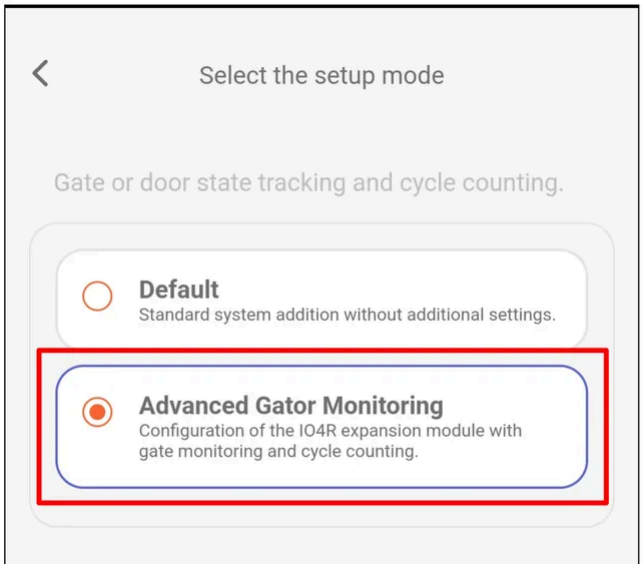


Figure 4. Protegus 2 – **Select the setup mode**: the **Default** (usual adding) and the **Advanced Gator Monitoring** (setup of the iO4R expander with gate monitoring and cycle counting) mode.

4.2 Gate control and maintenance

On the **Gate control and maintenance** screen you enter the output that switches the gate, the gate status input and the maintenance cycle count:

- **Output 5 Name** – the name of the **5 OUT** output that switches the gate ("Gate control" in the example). The users see this name and icon.
- **Gate/Door position input** – the gate position is provided by the **3 I/O** input, which also counts the cycles. **I/O 3 Name**: the name of the input (the users see this name and icon); **Type**: the type of the connected contact (NO in the factory example).
- **Cycles** – maintenance is due after this many cycles (3000 in the example). A cycle counts when the gate opens fully and closes fully.

The information box at the bottom (**How monitoring works**) sums up the same: the 5 OUT output follows the gate status based on the 3 I/O input and counts the full open–close cycles. 3 I/O is for cycle counting and cannot be changed; IN1 and IN2 are reserved for the Wiegand reader. Tap **Next**.

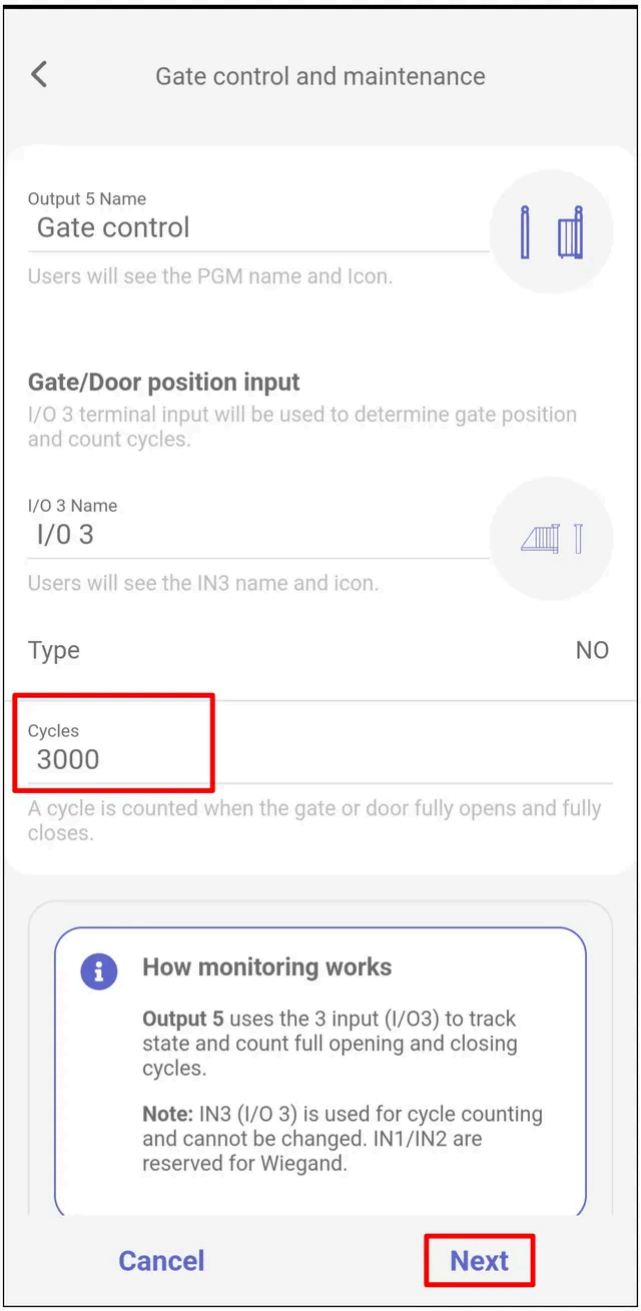


Figure 5. Protegus 2 – **Gate control and maintenance**: **Output 5 Name** (the name of the output that switches the gate), the **Gate/Door position input** group (**I/O 3 Name**, **Type**), the **Cycles** field (maintenance cycle count, 3000 in the example) and the **How monitoring works** information.

4.3 Setting up the iO4R

1. On the **iO4R Settings** screen, tap the **Serial number** row, enter the iO4R serial number and tap **OK**.
2. Switch on the outputs (**Output 1** … **Output 4**) to which you have connected a safety sensor.

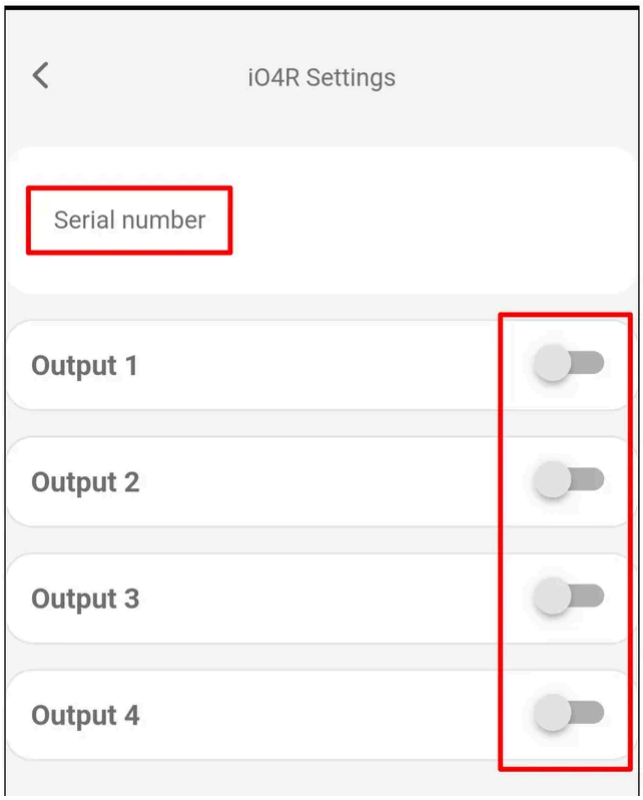


Figure 6. Protegus 2 – **iO4R Settings**: the **Serial number** row and the **Output 1** … **Output 4** switches.

3. For each output you switched on, enter: - the **name** of the output (“Output 1 iOx1” in the example) – the users see this name and icon; - the **type** of the output – **Guard** in the factory example; - in the **Assigned input** field, the assigned input (“Input 1 iOx1” in the example) – the input to which the sensor is connected; - in the input's **Type** field, the contact type (NO in the factory example).
4. Tap **Next**.



Figure 7. Protegus 2 – setting up an output: the serial number (000023 in the example), the name ("Output 1 iOx1") and type (**Guard**) of **Output 1**, in the **Input** group the **Assigned input** ("Input 1 iOx1") and the input type (**NO**); below it the next output (**Output 2**).

4.4 Finishing the setup

1. The app writes the settings to the gate controller and restarts it (**Restarting device**: connecting, preparing, writing successful, restarting). Wait until it finishes.
2. On the **Configuration almost done** screen, tap **Next**. (Further settings are available with the **Advanced settings** button.)
3. Enter the **name** of the system ("Gator" in the example), choose a **background** and set the **time zone**, then tap **Next** (or **Skip** if you do not want to enter them).
4. After the **System added successfully!** message, you can change the default names with the **Personalize** button, or skip this with the **Skip** button.

5. Wait: the system becomes fully operational within **1 minute** at most. After that it is shown in **Online** state, with the gate control button (**Gate control** in the example).

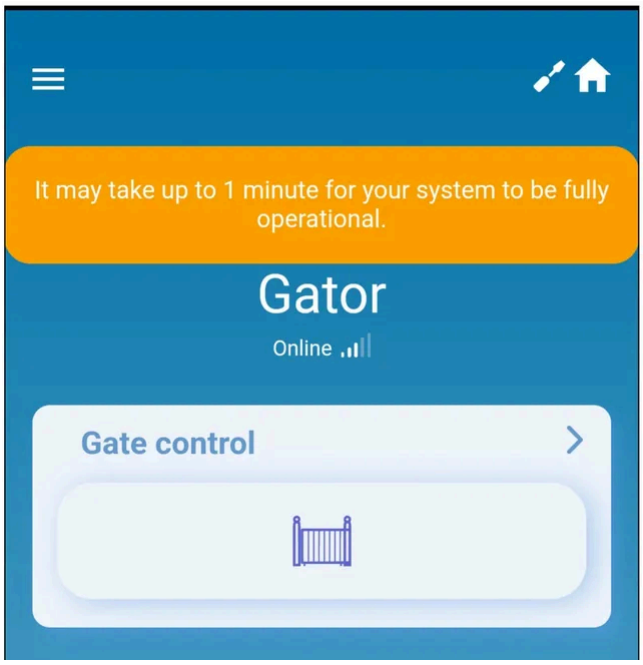


Figure 8. Protegus 2 – the added system: at the top the notice ("It may take up to 1 minute for your system to be fully operational."), below it the name of the system, its **Online** state and the **Gate control** button.

TrikdisConfig

On the **Modules** page of the GATOR's TrikdisConfig program, the iO4R is also among the selectable modules (as **AP-IO4R**). You set up the iO4R in Protegus 2, in the Advanced Gator Monitoring mode – and this manual follows that too.

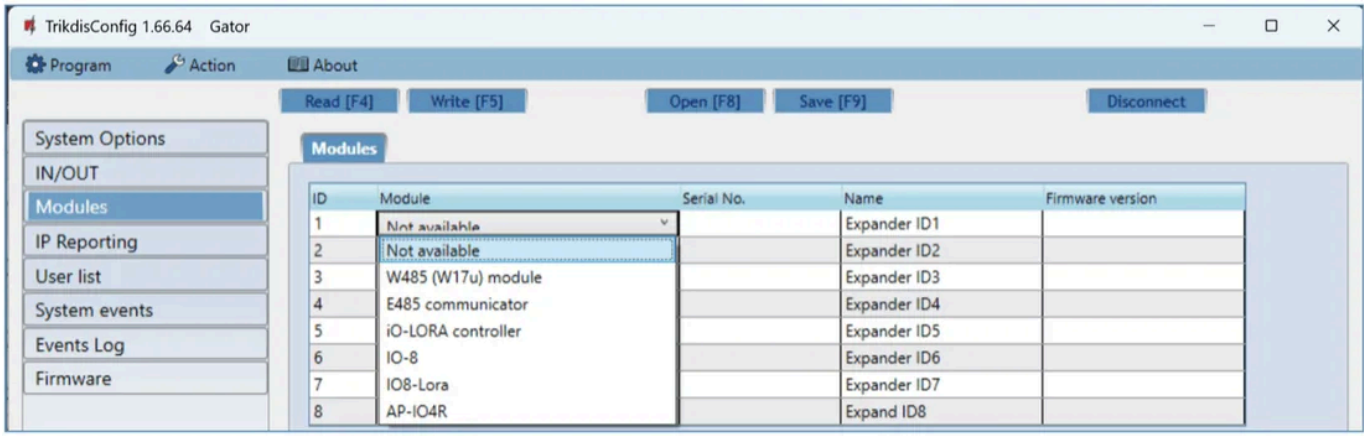


Figure 9. TrikdisConfig – the GATOR's **Modules** page: in the **Module** drop-down list, **AP-IO4R** next to the W485, E485, iO-LORA, IO-8 and IO8-Lora modules; beside it the **Serial No.**, **Name** and **Firmware version** columns.

5. Handover to the user

At the end of the setup you transfer the system to the user's own Protegus 2 account:

1. On the system screen, open the menu (☰).
2. Select **Settings**.

3. In the **Configure Gator** list, tap **Transfer system**.

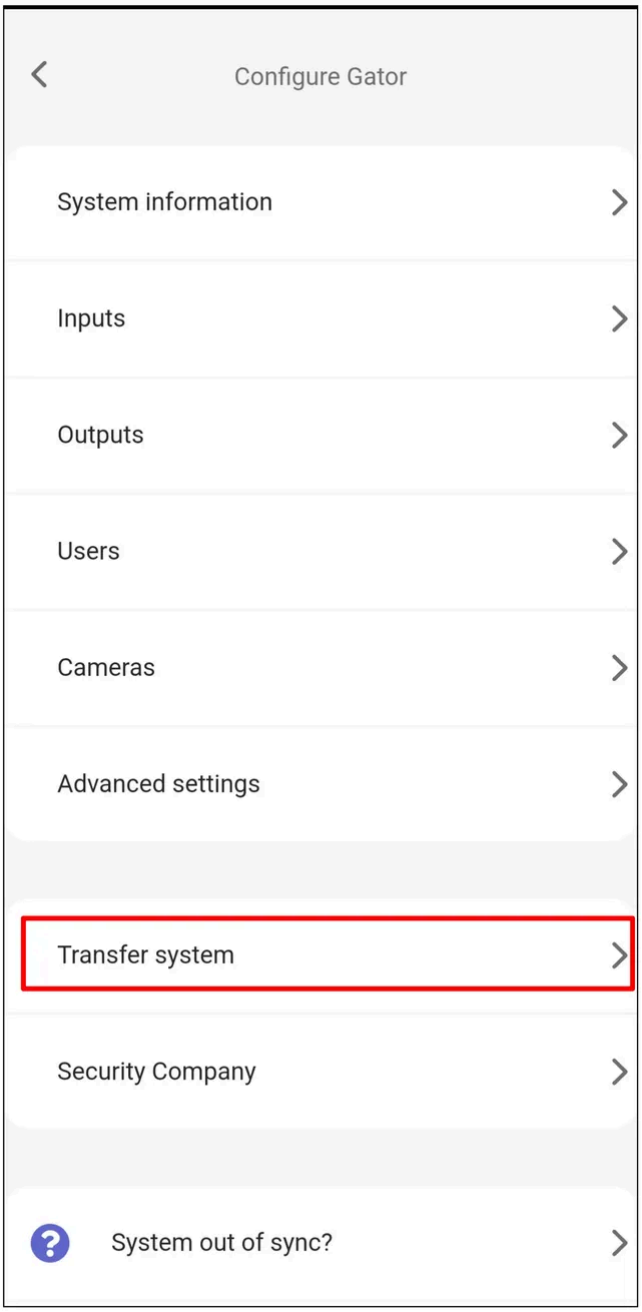


Figure 10. Protegus 2 – **Configure Gator**: the list of system settings (**System information**, **Inputs**, **Outputs**, **Users**, **Cameras**, **Advanced settings**), with **Transfer system** highlighted.

4. Enter the user's **email address** (**Email**), or select it from the list (**Choose from list**), then tap **Transfer**. The address must be registered in Protegus 2.

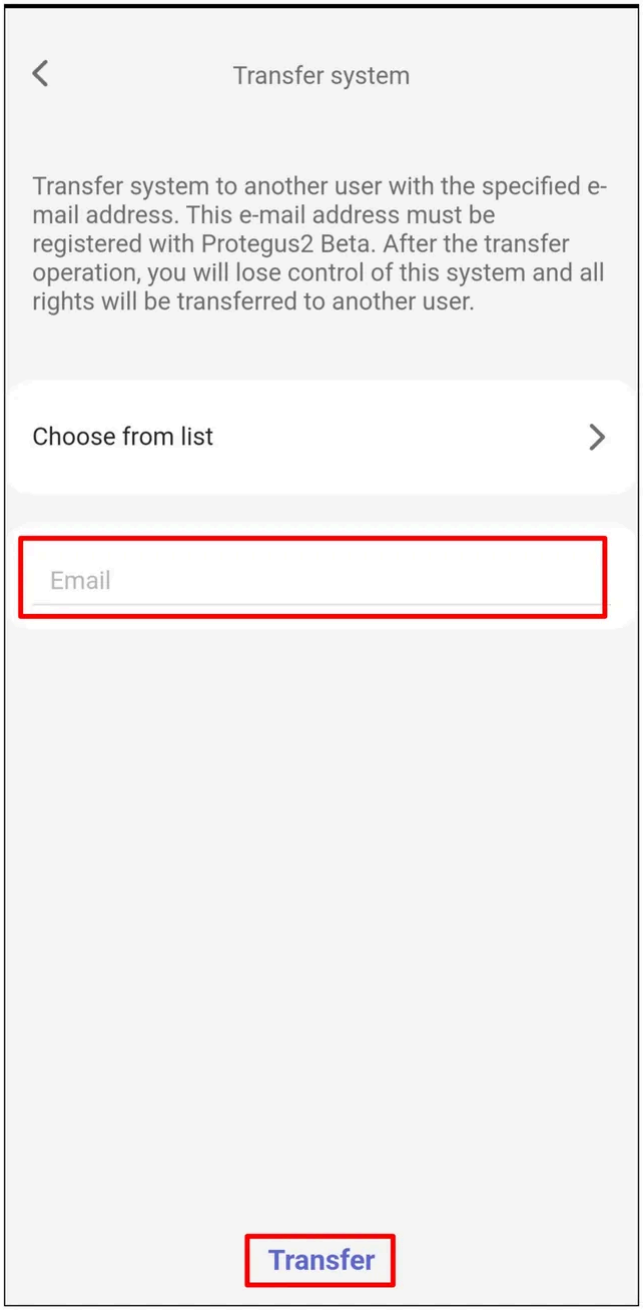


Figure 11. Protegus 2 – **Transfer system**: transferring the system to the user belonging to the given email address. According to the text, the address must be registered in Protegus 2 (the factory screenshot is from the Protegus2 Beta version); after the transfer you lose control over the system, and all permissions pass to the other user. Below it **Choose from list**, the **Email** field and the **Transfer** button.

After the transfer you **lose control** over the system, and all permissions pass to the user.

6. Checking gate monitoring and control

After the handover, the user has to log in to Protegus 2 with **their own account**.

Bypassing a safety sensor can disable the gate's safety protection. Use the bypass only as a temporary, authorized service intervention, and restore the normal operation of the sensors before you hand the system over for regular use.

6.1 Cycles, inputs, control

1. On the system screen, tap the gate control button (**Gate control** in the example).
2. In the **Cycles** group, **Total cycles** is the number of cycles counted so far, and **Cycles to maintenance** is the number of cycles remaining until maintenance (the value entered during setup, 3000 in the example). Below them **Input status** (state of the inputs), **Events** and **More** (further options).

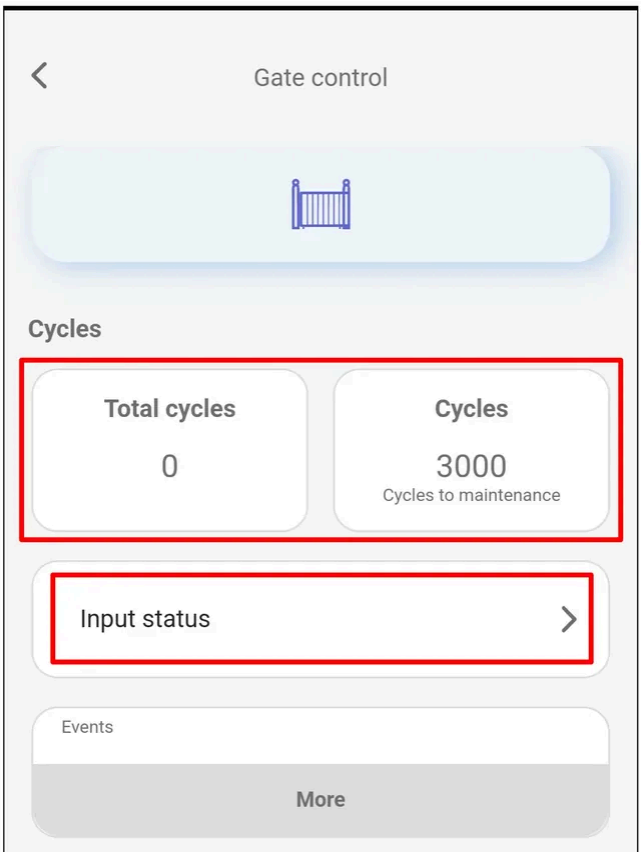


Figure 12. Protegus 2 – the gate control screen: at the top the gate button, in the **Cycles** group **Total cycles** (cycles so far, 0 in the example) and the cycles remaining until maintenance (**Cycles to maintenance**, 3000 in the example), below them the **Input status** row.

3. Tapping the **Input status** row opens the **Input status / bypass** screen: at the top the gate status input (**I/O 3**), below it the four inputs of the iO4R (**Input 1 iOx1** … **Input 4 iOx4**), each with a switch next to it – the bypass of the input is handled from here.

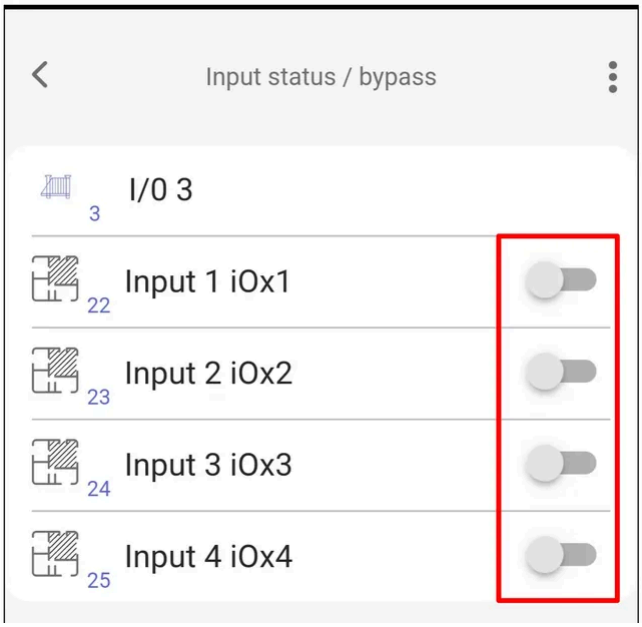


Figure 13. Protegus 2 – **Input status / bypass**: the **I/O 3** gate status input and the four inputs of the iO4R (**Input 1 iOx1** … **Input 4 iOx4**), with the switches next to them.

4. Try the gate control: when you tap the button, the gate operates, and the event log shows who switched it and when (in the example “User Igoris has switched on Gate control” – the user switched on the gate control, with the time).

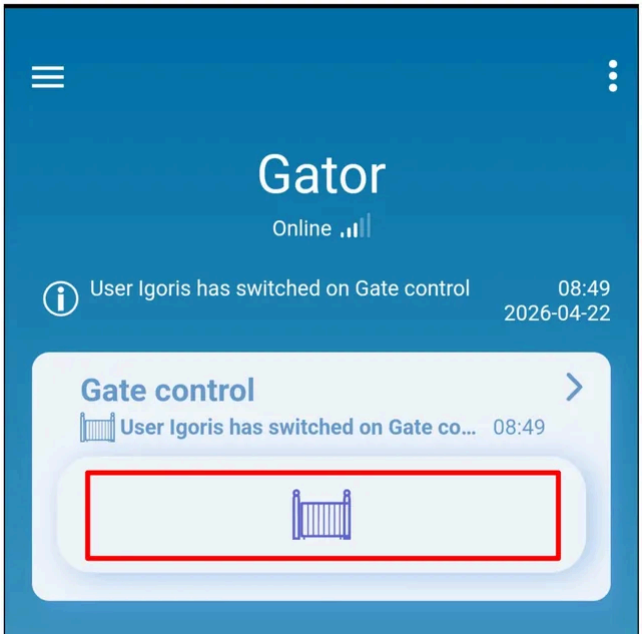


Figure 14. Protegus 2 – opening the gate: on the system screen the latest event (“User … has switched on Gate control”, with the time) and the **Gate control** button.

6.2 System check

Before the handover, check the following:

1. Open and close the gate fully, and see whether the cycle counter changed as expected.
2. Operate each monitored input of the iO4R one by one (for example obstruct the photocell), and check whether the state of the input changes in Protegus 2.

3. Try the gate control icon, and check whether the gate automation responds correctly.

7. Troubleshooting and frequently asked questions

The cycle counter does not change

- A cycle only counts if the gate **opens fully and closes fully as well** – a movement stopped halfway or reversed is not a cycle.
- The gate status sensor must be connected to the **3 I/O** and **COM** terminals of the GATOR (section 3.4), and in Protegus 2 the type of **I/O 3** (NO or NC) must match the connected contact (section 4.2).

Can the gate status input be moved to another input?

No. In the Protegus 2 monitoring setup, the gate position and the cycle counting can only be provided by **3 I/O**; this cannot be moved to another input. **IN1** and **IN2** belong to the Wiegand reader. **3 I/O** can only do one job at a time: if you set it up as the exit button, the gate status is not shown in the app (section 3.4).

The TROUBLE indicator is on

The **TROUBLE** indicator shows that the RS485 communication with the gate controller has been lost. Check the RS485 wires (the **A RS485** terminal of the gate controller to terminal **A** of the iO4R, **B RS485** to terminal **B**), and whether the iO4R is getting power (**POWER**).

What should I watch out for when bypassing a sensor?

The bypass can disable the gate's safety protection: use it only as a temporary, authorized service intervention, and before operating the gate make sure there is no obstacle in its range of movement. Restore the normal operation of the sensors before handing the system over for regular use.

Can the iO4R be set up in TrikdisConfig?

The iO4R is also in the **Modules** list of the GATOR's TrikdisConfig program (as **AP-IO4R**), but the setup is done in the **Advanced Gator Monitoring** mode of Protegus 2 (chapter 4).

8. Safety instructions

Figyelem!

Az elektromosság veszélyes! Személyi sérülést vagy HALÁLT, valamint anyagi kárt okozhat!

A telepítés során elektromos berendezéssel történik munkavégzés, amit az érvényes erős- és gyengeáramú rendelkezések betartásával kell kivitelezni!

A garancia (jótállás) érvényesítésének is feltétele, hogy az eszközt szakképzett személy telepítse az elektromos berendezések telepítésére vonatkozó előírások betartásával és az elektromos berendezések biztonságos üzemeltetésére vonatkozó hatályos előírásokat követve.

- The iO4R may only be installed and maintained by qualified persons.
- Before wiring, **disconnect both the mains and the low-voltage power supply**.
- Follow the safety instructions of the gate automation manufacturer and the local electrical regulations.

- Bypassing a safety sensor can disable the gate's safety protection: use it only as a temporary, authorized service intervention, and restore the normal operation of the sensors before handing the system over for regular use.
- With a bypassed sensor, always make sure that there is no obstacle in the gate's range of movement before operating the gate.
- The relay outputs can switch max. 125 V and max. 1 A (at 30 V DC).

See also

- GV17 GATOR gate controller – installation and programming manual and WP17 GATOR WiFi gate controller – installation and programming manual – wiring, power supply and all further settings of the gate controller.
- iO8 input and output expander – installation manual – the other expander that can be connected to the GATOR.
- Documentation in English: docs.trikdis.com – GATOR LTE and GATOR WiFi with iO4R quick setup and the trikdis.com iO-4R product page (technical data) – the manuals on docs.trikdis.com are in English.

Related products

Trikdis IO4R (IO-4R) – GATOR I/O Expander Module (4 Inputs / 4 Relays)

Trikdis GV17 - GATOR smart 4G GSM / IP gate controller | **Trikdis WP17 Smart WiFi controller**

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