GTO Installation Guide
Version 5.0 - July 2020

- Prerequisites
- On-site Installation
- Troubleshooting

GreenTrapOnline

www.greentraponline.dk

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Introduction

GTO delivers state of the art electronical monitoring of rodent activity.
The GTO system is a wireless solution build on LoRa technology (long range) that alerts you in real time about rodent activity 24/7. All installation of GTO hardware is "**plug & play**" which means that no extraordinary skills are required to install or operate a GTO system.

This document is a guide to help and assist you during the installation of the GTO system.

A standard GTO installation contains the following key components:

GTSensor 3.0 - is a wireless sensor which can easily be integrated in any existing trap/bait station for detecting rodent activity. Any location of a GTSensor 3.0 will be referred to as a *Control Point.*

The GTSensor 3.0 comes with both **motion** and **vibration** (snap trap release) detection.

GTConnect 3.1 - is a specially developed access point that collects data from the GTSensors in a radius of aproximate 150-200 meters and sends them to the mail server for processing.

GTOnline - an online webportal which functioning as the technican's work tool during installation and when making inspections in Control Points.

From the webportal your back-office manager can also monitor and control all the GTO equipped installations.

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1. List of Requirements

Before an on-site installation of the GTO system can be done; the following requirements must be met. Please go through the check list to ensure the best experience when installing the hardware for your customer.

1.1 Prepare the following in GTOnline Webportal

Please refer to the GTOnline User Guide for information on how to configure steps 1-7.

Step 1:

☑ **Create a new plant**

Step 2:

☑ **Update serial number for the GTConnect**

Step 3:

☑ **Planning of the control points location on-site**

Step 4:

☑ **Create control points in GTOnline and key-in sensor ID's**

Step 5:

☑ **Upload floor plan(s)**

Step 6:

☑ **Prepare the GTConnect for the site**
Choose type of server connection
a) Mobile network - modem and PIN code free data sim card needed.
b) LAN - establish port settings with the client's internet provider.

Step 7:

☑ **Grant access to GTOnline Webportal to the necessary users**

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2. Installation of the GTConnect 3.1

The GTConnect 3.1 is a specially developed computer that collects data from the GTSensors and sends them to the server for processing.

The GTConnect is intended for indoor mounting in an "office-like" environment. For other environments (cold/hot/dusty etc.), please contact your GTO supplier for further instructions.

To make sure that the GTConnect has the best conditions for receiving wireless signals from the GTSensors, the device should be placed in a obstacle free environment e.g. mounted on the wall.

The GTConnect comes with a power adapter to connect to a standard power plug.

Antenna -
Must be placed in a right angel when the GTConnect is installed.

Antenna outlet

LED-lamps

Showing status information

Internal ports for USB modem

Port for LAN connection

Power supply

2.1 Prepare the Internet Connection

When ready to install on-site, the GTConnect has already been prepared for the internet connection chosen, as part of the prerequisites check list.

Instuctions for this are found in the GTOnline User Guide.

2.1.1 Internet Connection using Mobile Network Modem (USB stick)

While installing on-site do the following:

- Place the modem in one of the ports inside the GTConnect (remove front cover).

- Power up the GTConnect.

Internal modem ports

2.1.2 Internet Connection using LAN (Ethernet cable)

Make sure that you have a RJ45 cable to use between the GTConnect and the switch/connector etc. where you get access to the network. The ethernet cable should always be shielded (meshes or aluminum foil) for faster transmission speeds and fewer data errors.

- Place the RJ45 cable in the port for LAN (ethernet) connection.

Port for LAN connection

2.2 Power up the GTConnect

When powered up, the GTConnect will imme-
diatly show a solid **GREEN** light in the
LED-lamp at the top.

Within 1 min. after start up, the LED-lamp
in the middel will start flashing **BLUE**, while
seeking for network.

Within 10 min. the LED-lamp will turn solid
BLUE, and the GTConnect is now online and
ready for use.

2.3 External antenna for GTConnect 3.1

In larger installations, it can sometimes be necessary to improve the wireless signal
strenght between the GTConnect and the sensors.
The wireless range depends solely on the environment where the GTO system is placed.
Concrete walls, steel, long distance ect. can weaken the signal strength between the
GTConnect and the sensors.

To improve the signal an **Aurel plane antenna** can be mounted to the GTConnect and
placed next to it. This will increase the wireless signal significantly.

The Aurel plane antenna comes with a mounting bracket.

In larger installations it can sometimes also be necessary to set
2 or more GTConnect's to cover the whole area.

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3.0 Installation of GTSensor 3.0

The GTSensor ID is always 6 digits long. When installing a GTSensor, it is important to make sure, that the ID of the sensor is the correct entered ID for the given control point in GTOnline (please refer to GTOnline User Guide).

The sensors are made to fit into many different boxes/traps/bait stations. In some cases, extra brackets are needed in order to mount the GTSensor. Please contact your GTO supplier if you need assistance with this.
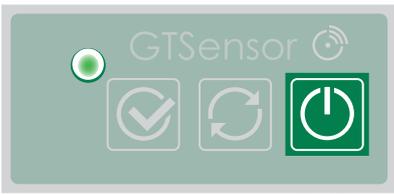For instructions on how to mount GTSensor in a TinCat, please refer to Appendix 1.

3.1 Power up the GTSensor

When the GTSensor has been installed at the control point, it has to be powered up.
Switch ON the GTSensor by pressing the **ON/OFF** key.
The key to the right; shown as a "circle with a line at top".

LED-lamp

Switch ON and OFF
Push key > 1 sec until LED flashes:

2 x green ● (1 long and 1 short) = ON

1 x red ● = OFF (1 long)

On/Off

When switched on, the GTSensor will immediately try to get in contact with the GTConnect, that has already been installed and is online (connected to the Internet).
If successful, the GTSensor will short after (within 5 sec.) indicate, that it has received a reply from the GTConnect, by flashing the **RED** LED **1 time**.
Connection to the GTConnect is now **OK**.

NB: The motion and vibration sensor are disable for 18 second, when a key on the sensor is activated/pushed!

3.2 Reset the GTSensor

If the GTSensor did NOT flash the **RED** LED within 5 sec (or you missed the RED flash) after switch ON, retry connecting to the GTConnect by pressing the RESET key in the middle.

Reset

Reset GTSensor
Push key > 1 sec until LED flashes:

2 x green ● (1 long and 1 short) = ON

1 x red ● = within 5 sec. if connection to the GTConnect is OK.

GTSensor is reset when the LED lights flash **GREEN** 2 times -1 long flash and 1 short flash.

When reset, the GTSensor will immediately again try to connect to the GTConnect.
If successful, the GTSensor will short after (within 5 sec.) indicate, that it has returned a reply, by flashing the **RED** LED **1 time**. Connection to the GTConnect is now **OK**.
If the GTSensor did **NOT** flash the **RED** LED within 5 sec. repeat reset of the GTSensor (up to 5 times).
Hereafter you must consider, placing or moving a GTConnect closer to the GTSensor.

3.3 Check the signal strength of the GTSensor

The GTSenor has a built in test function to check the GTO network connection.

By pressing the left button marked with a "check" sign, the GTSensor will automatically test the connection to the GTConnect. This test will measure the signal strength of the connection to determine a good or bad wireless connection.

GTSensor will start testing when the LED lights **GREEN** for 1 sec.
This test will be repeated for 1 min. and the result is displayed with the LED flashing.

Every test is initiated with a short **GREEN** flash followed by a number of long **GREEN** flashes.

Test

Check signal strength
Push Test key - shortly. This will initiate a test cyclus for 1 min.

Every test is initiated with a short green flash followed by a number of long green flashes.

1-5 green flashes ● ● ● ● ●
indicates the strength of the signal

3 red flashes ● ● ● = no signal

If the LED lamp flash 3 times **RED** after the test is initiated with a short **GREEN** flash, this means that the sensor did not get reply from the GTConnect. Either because the GTConnect is located too far away from the sensor, because the GTConnect is not online at the moment or because several sensors are being tested at the same time.

Check if the GTConnect is online and try to perform the signal strength test closer to the GTConnect to find out when the GTSensor can connect. Consider moving the GTConnect or setting up a new one.

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3.4 Installations period (6 hours)

During installation (first 6 hours after power ON), the GTSensor act a bit different.

Each time the GTSensor senses a <u>motion</u> or a <u>vibration</u>, the **RED** LED will flash. This will indicate to the user, that the sensors are working correctly.

After installation (after 6 hours after power ON), the GTSensor will enter low power mode.

- **No LED will flash**

- **The GTSensor will connect to the GTConnect every decided time interval** (by default 24 hours)

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4.0 Troubleshooting - GTConnect 3.1

GTConnect will not start-up

- Check if the GTConnect is powered up correctly.
- If you are not able to start up the GTConnect when it is correctly powered up, please contact your GTO supplier.

GTConnect starts up but LED-lamp don't turn solid blue

When the LED-lamp don't turn solid **BLUE** after 5 min. but continues to flash, the Internet connection is failing and data from the sensors can not be transmitted to GTOnline.

The GTConnect can be connected in two ways:

1. *LAN connection to a network*
2. *Modem Connection*

No network connection to the GTConnect by LAN

If the GTConnect is using a LAN connection and the LED-lamp don't turn solid blue it could be due to:

- Local LAN network settings have been changed or not set up properly
- LAN cable is defect - try another cable

The GTConnect uses DHCP (get the IP address from server) and the following ports to establish the connection: **port 80** and **port 443**

These are accessible in most networks but some network setups can block the communication.

To check if the LAN connection provided for the GTConnect is working properly, a laptop can be used:

- Connect the laptop to the cable (make sure that the PC is set-up for DHCP, normally standard).
- Open a browser and connect to a website (e.g. www.greentraponline.dk)
- If the web site is shown properly and the LAN connection is OK then the GTConnect might be defect. Please contact your GTO supplier.

If the website is not shown, the connection is not working. Contact the provider of the LAN connection and ask for assistance.

No network connection to the GTConnect by modem

When installing the modem for the GTConnect, the SIM card has to be placed in the modem before use. The SIM card has to be mounted correctly otherwise the modem will not work.

Depending on the type of modem, there might be some small differences to the installation:

1. Remove the cap from the end of the modem
2. Take off the top cover to see the SIM card slot
3. Insert your SIM card into the card slot
4. Reattach the cap on the modem again.
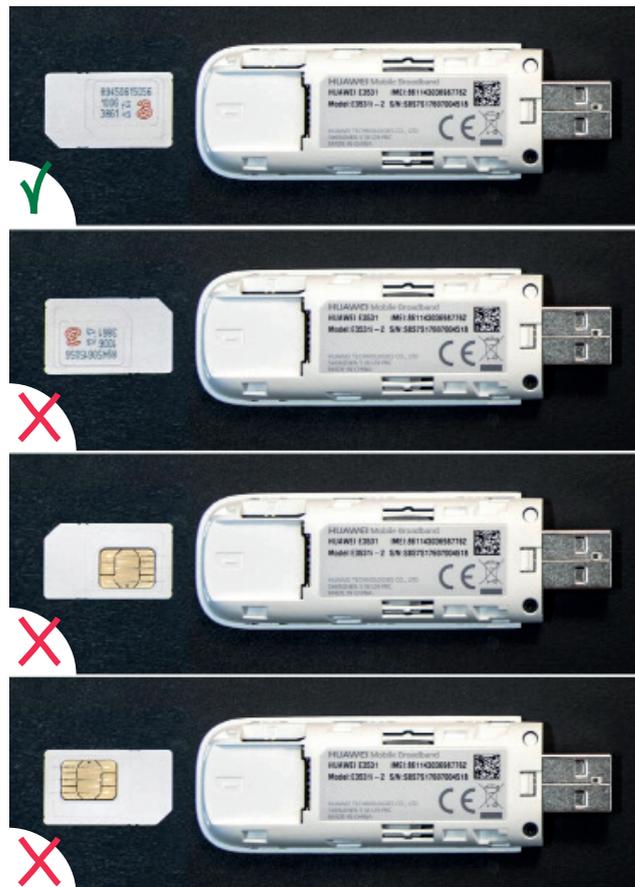
LED-lamp continues to flash

LED-lamp ➡

The LED-lamp has 3 different states:

1. Immediately after power on, the LED will be repeating flash 2 x **GREEN**, meaning the modem is searching for cell tower connection.
2. Within normally 30 sec. after power on, the LED will start flashing 1 x **BLUE**, meaning the modem has connected to the cell tower.
3. Finally, within 2-3 minutes after power on, the LED will turn solid **BLUE**, meaning internet connection is up and running.
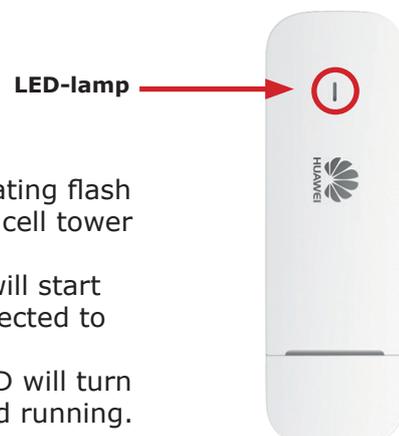
If the modem never reach point 2 above:

- The signal might be weak or no signal at all. Check the mobile signal strength on the site by using a laptop.
- Network access not granted. Check if the SIM card is PIN-code free.
- Data has not been enabled for the network.
- SIM card is locked.
- Contact SIM card provider.

If the modem never reach point 3 above:

- Contact SIM card provider and ask for the correct APN.
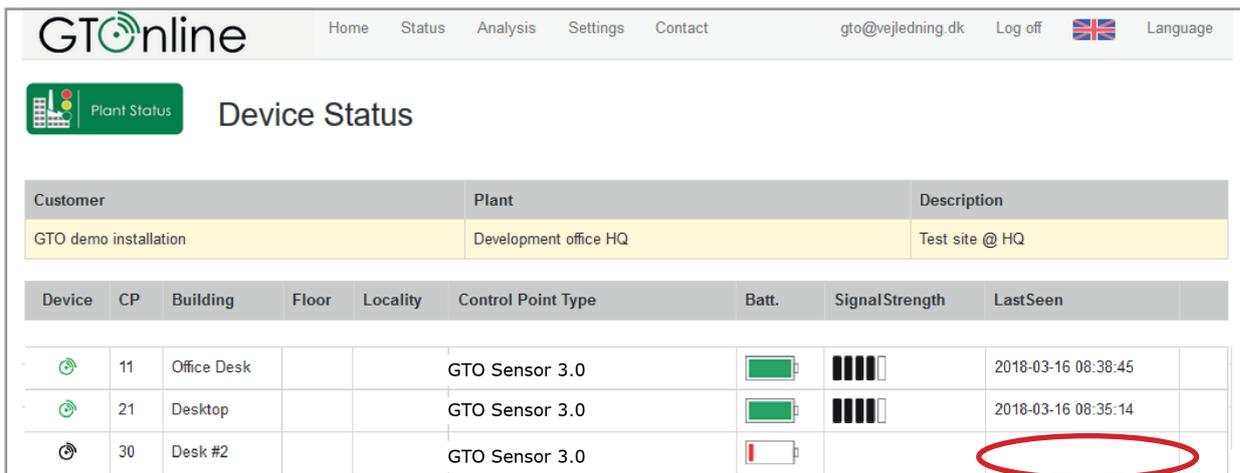- Contact your GTO supplier.

4.1 Troubleshooting - GTSensor 3.0

The GTSensor does not show any indicator lights or respond to pressing of ON/OFF or Reset

- The battery is dead and must be replaced

GTSensor "LastSeen" not updated in the GTOnline portal

When a sensor is powered on during installation on a plant, it will start by sending a "keep alive" signal to the GTO servers (thereafter the sensor will only send a "Keep alive" every 24 hours). Within 2-3 minutes, this will be shown as "**Last seen**" in the Device Status. If the GTSensor is shown without a last seen or last seen is older than installation time, check the following:

- Double check that the sensor ID on the label match the sensor ID entered in GTOnline (see section 3).
- Check that the nearest GTConnect is up and running and connected to the internet, indicated by a solid **BLUE** lamp (see section 2).
- Check that the sensor can reach the GTConnect by pressing the reset button (see section 3.2). It is very important that the physical sensor is directly placed at the control point on the ground, because lifting the sensor up by hand to e.g. 1 meter above ground, can indicate erroneous better coverage than the true coverage on ground level.
- If nothing of the above solves the problem, please contact your GTO supplier.
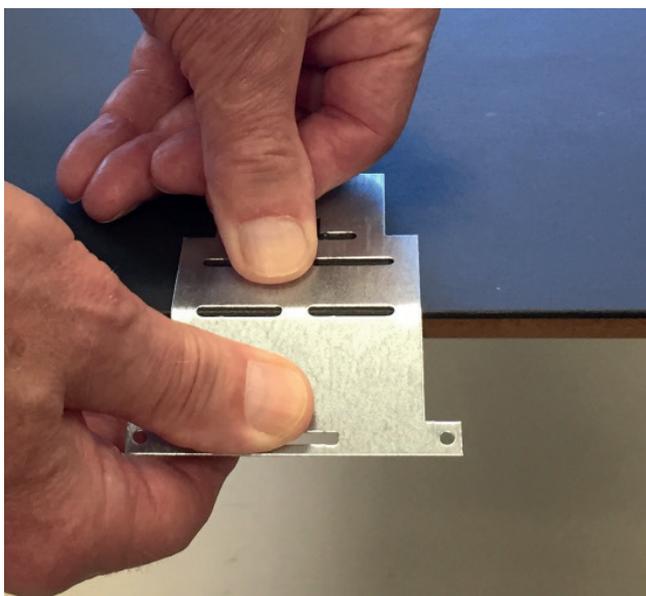
Appendix 1: Mounting GTSensor in a TinCat
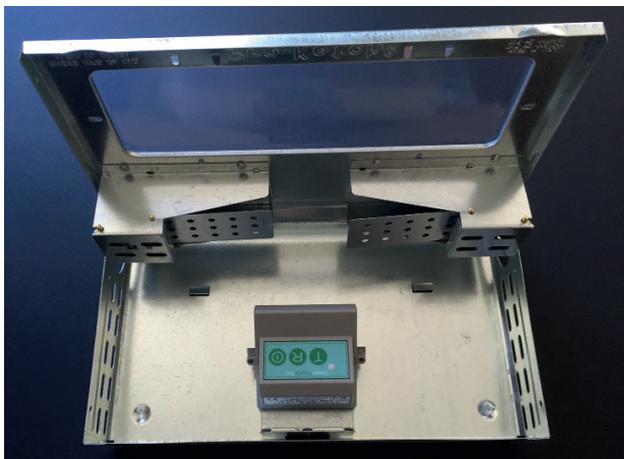
GTSensor in a TinCat

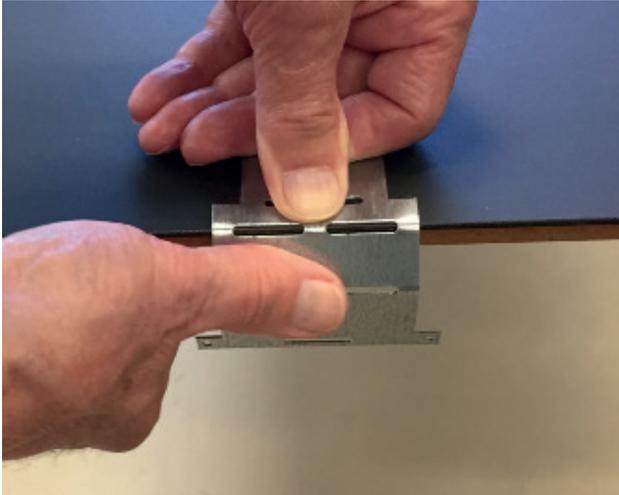Correct installation of a GTSensor in a TinCat.
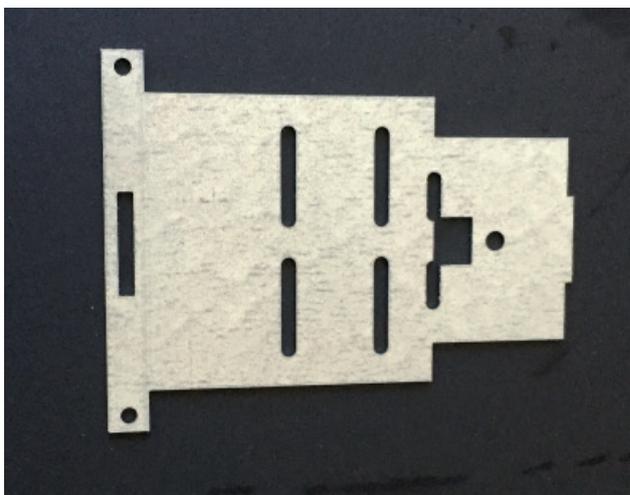
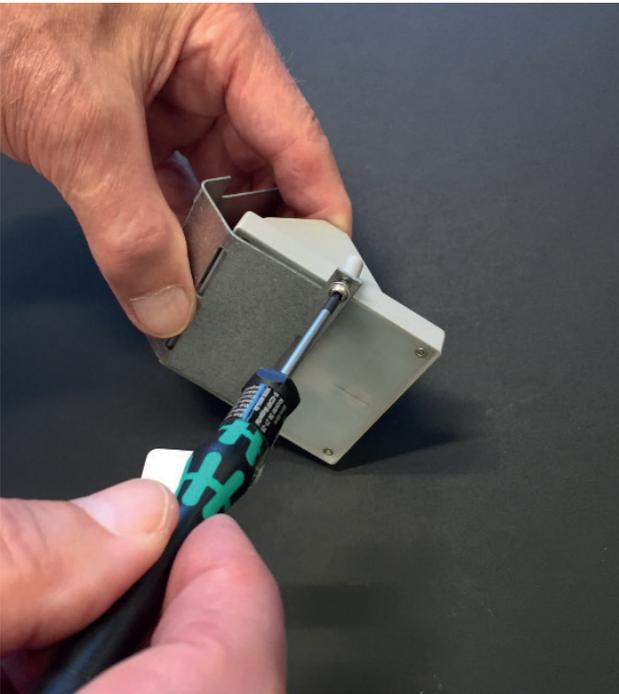### Bracket for mounting GTSensor

0,9 mm alu-zink steel plate

Bending bracket - 1st bending

Bend the bracket 45°

Bending bracket - 2nd bending

Bend the bracket 90°

Fasten GTSensor on bracket

Fasten GTSensor with A2 stainless steel screw for thermoplastic (3x8 mm TX10 - A2)

Fasten bracket with GTSensor in a Tin-Cat with "DuoTech" tape