

Advanced Topics



This document will serve multiple purposes when covering advanced topics. It will cover the ability to both understand, trace and solve more complex issues when working with the system. It will also cover a list of frequently asked questions and finally you will find chapters covering various topics like communication with external applications and hardware like iTrain and Arduino etc..

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The ability to pinpoint a cause of unexpected behavior in electric systems can be hard at times.

In a system from GamesOnTrack which is using a combination of software and hardware, and where the signals are transferred between multiple devices based on radio and ultrasonic components the pinpointing can be even harder.

The purpose of this document is to provide users of our systems the ability to trace various causes of these issues when your devices doesn't quite behave as you expected.

In the vast majority of these cases, these issues are reported by new users to our system, where some essential parts in our system hasn't been quite clear, or the system lacks a better description on ways to generally troubleshoot. All this is being addressed here.

To form the best possible foundation for troubleshooting, we recommend using the manual delivered with GT-Command as a companion in order to understand how the system works. Many topics are already explained in this manual related to hardware setup, eg. like the recommended min/max distances for transmitters, angles between satellites etc..

Following the guidelines in the manual helps a lot, but it cannot not always prevent you from observing unexpected issues in the system, and this is where this document comes in handy.

We also encourage our customers to keep their software updated with the latest versions released, this counts for software and firmware delivered from GamesOnTrack but also from Microsoft (Windows 10), and third party vendors like suppliers of Digital Controllers etc..

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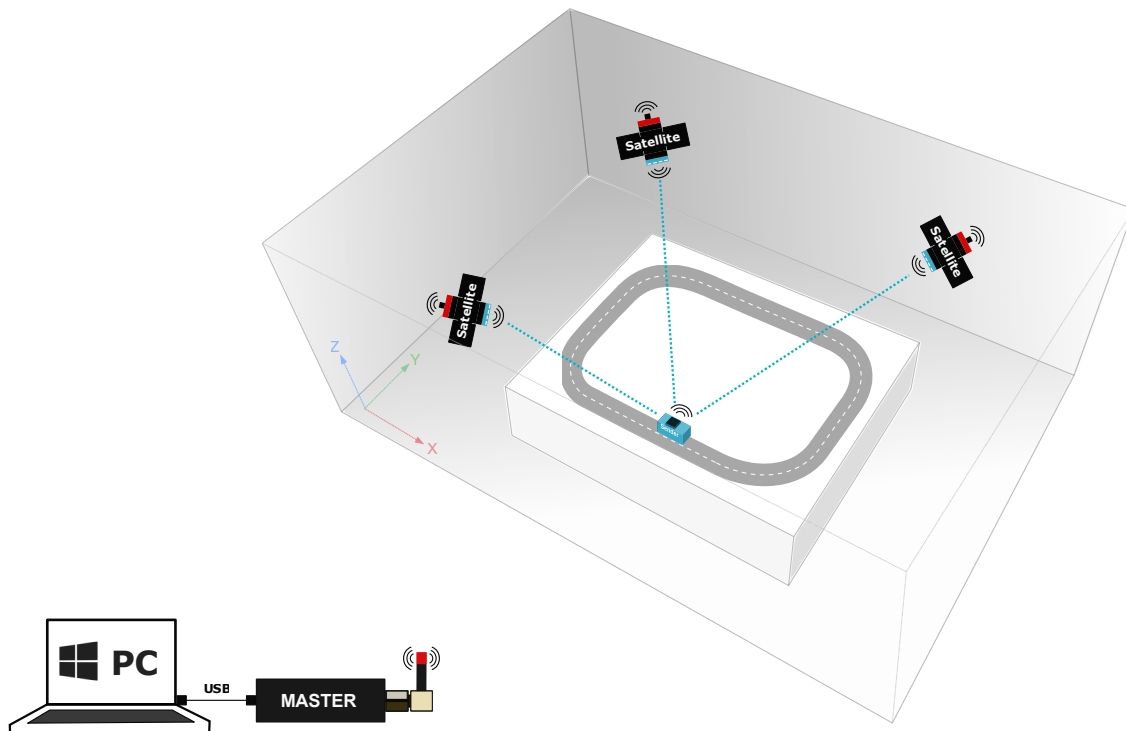
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The Minimum System

Let's start with a focus on a minimum 3D system in GamesOnTrack. A minimum system consists of a PC, a Master, a minimum of three satellites, and a single transmitter. The transmitter is typically mounted on a car, a train or a container.

THE STARTER KIT



When this minimum system is up and running, and you can record positions, you're done. If not, we need to examine these devices in a structured way. If possible, you should keep track of all your devices added to your system, eg. by creating a table like here below.

Hardware Devices		Device Id (Labeled on hardware)
1	MASTER	004029
2	Satellite #1	30025
3	Satellite #2	30026
4	Satellite #2	30027
5	Transmitter	102008

The GamesOnTracks Indoor Positioning System (IPS) relies on a tight timing regiment between each device where the radio connection between each device is crucial. A received signal strength indication (RSSI) of 85% or higher is often needed for good position measurements. The ultrasonic signal produced by the transmitters are also the integral part of the positioning, if the signal is too high or too low this can cause fuzzy positions or an inability to calculate the positions altogether.

Interference on both the radio and ultrasonic signal may cause bad positioning or dropouts. The system will always find the best satellites to use in a system based on a lot of parameters. But if the system is experiencing bad positioning, a lot of or dropout in measurements can arise for satellites or transmitters, this document helps narrowing down the roots of problems.

The Error Sources

The basic causes of errors are listed here.

Radio

- Another radio device is causing a fundamental overload either by using the same frequency or operating within some parts of the same bandwidth.
- Another radio device is producing 2nd and 3rd harmonics.
- Another radio device is producing Spurious emissions.
- The GT-XConnect, GT-Position or GT-XSatellites is placed near material acting as an antenna.
- The GT-XConnect, GT-Position or GT-XSatellites is sandwiched between materials blocking the radio signal.
- The GT-Position device is not getting enough power

Ultrasonic

- The IPS-system is not calibrated optimally. If more than one scenario is used make sure the offset distances and rotations are correct.
- Another ultrasonic source is on or something is producing the same ultrasonic frequency. If that is the case the position should jump or jitter depending on the strength of the noise. The closer to a noise source the transmitter is the more unstable the position is.
- The distance between the transmitter and satellite is too long.
- The GT-Position device is not getting enough power.
- Ultrasonic sound will have a greater velocity in water and metal than air and may attenuate, refract, reflect or scatter in or upon the material. Satellite placement is affected by this.

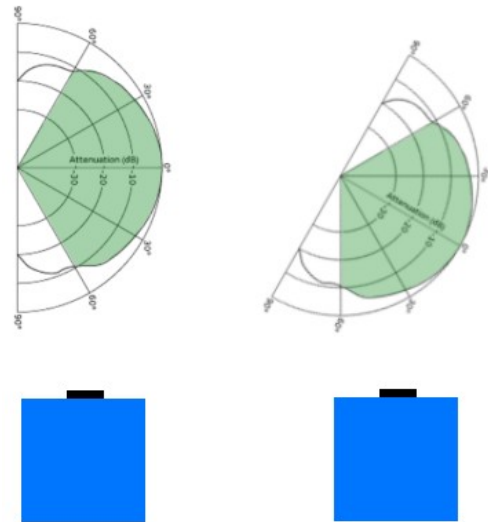
Contacting Support

When contacting support@gamesontrack.com you can help us a lot by providing us with as much information as possible – including the informations listed here below.

Checklist

Here below is a list of some of the most fundamental things you should validate before sending a support ticket.

Please Check	Notes
1 Make sure all your devices a properly powered.	Some movable devices can be powered by batteries. When batteries are reaching a low level, the positions and signals can be missing, random or inaccurate. Change any batteries and/or recharge if necessary. Make sure your tracks are properly connected and powered .
2 Make sure your Master hardware are connected properly	Please check UBS cables and ports, and ensure a reset of the Master or un/re-plugging the device will show up in the log viewer.
3 Do not run both GOTMasterUtils and GT-Command at the same time.	In case both programs are running simultaneously, only the first program started will get access to the Master hardware!
4 Make sure the number of physical devices in your system is less or equal to the number of devices set up in the Master Settings	In case the number of physical devices are greater than the settings, there's a risk of devices never getting online – and even worse, some times the do, and others don't½. The order of devices getting registered in the Master is a kind of random ~ first come, first served principle – leaving out the rest.
5 Ensure that all satellites has line of sight to the transmitters (vehicles)	If there's no line of sight from the satellites placed closest to your vehicles, you can risk of having inaccurate measurements and hence positions. The same apply for both 2D and 3D scenarios.
6 Small satellites symbols could be flashing (red or blue) in the 2D view, or positions are flickering. This could be caused by incorrect settings of radio and/or ultrasonic levels.	In these cases, please lower your radio and ultrasonic settings to a minimum, and raise until the signals are stable. There can be a number of reasons for this behaviour – typically it's caused by satellites and transmitters placed too close to each other, or too far. Devices placed too close will cause disturbance to each other, and devices placed too far can loose measurements.
7 Positions of vehicles can be inaccurate in your system. Please re-calibrate your satellite system – and/or vehicle(s).	<p>Most people forget the importance of the temperature, and keeps using the initial default value of 20 degrees. Please read the chapter on temperature in the manual.</p> <p>A recalibration will often solve this – and if you know the temperature, please enter this in the Master Settings.</p> <p>If vehicles still have inaccurate positions, please re-calibrate a single vehicle, after a calibration of the system.</p>
8 Compare the size and geometry of your layout with the hardware used and the master settings.	When using our round 10 [mm] transducers, we allow the ultrasound to have a maximum travel lenght of 12-15 [m]. Using the squared 5 [mm] transducers the maximum travel lenght is 5-6 [m]. Keep in mind, that in order to calculate a position, the distance from a transmitter (vehicle) to all satellites in the nearest scenario must not exceed these lengths.
9 Poditions in Fiddleyards with 2D scenarios can be inaccurate.	<p>Please ensure the satellites in your fiddleyard are pointing a little downwards the layout, and you have about 10 [cm] distance between the satellite transducer and the vehicle transducer. This is to ensure the ultrasonic signal can travel vertial towards the layout and hence reach the vehicles on the rail closest to this satellite. The transducers have the best possible angle in the middle 120 degrees. See the illustration here below, where the transducer is facing horizontally (left image), and the blue container just below, can have probles with the ultrasonic signals. The image on the right shows the correct way to orientate the transducer</p> <p>– here a 30 degree down towards the layout, where the signals from blue container will now be much better.</p>



10 Keep satellites away from electrical sources

We have in some cases seen the satellites being exposed noise from external sources. So in general you should i keep your satellites at least 50 [cm] away from electrical sources eg. like neon-tubes etc.. In other cases we have seen that the noise originated from power cables of the power supply. In these cases a capacitor from the supply to ground solved these problems.

The Email

The checklist here below is typical example of questions being asked by GamesOnTrack. You can prepare all these answers before writing the email.

Questions	Example of Answers
1 Can you describe the problem in details?	Describe here...
2 What has been change in the system lately?	Nothing.
3 When was this problem observed first time?	A couple of weeks ago
4 Is this problem seen only once, or is it recurring? - static or periodically? - do you see a pattern?	The problems is recurring statically, with no obvious pattern observed.
5 What version of GT-Command is being used?	4.5.0.85
6 What version of Master firmware is being used?	3.1.53
7 Can you provide a list of all labelled unit Id's for all GamesOnTrack hardware in your system?	Master Id: 004029 Satellite 1: 30025 Satellite 2: 30026 Satellite 3: 30027 Transmitter: 102008
8 Can you attach a copy of your system file (.got)?	Yes: CustomerLayout.got

Finding Version and Unit Information

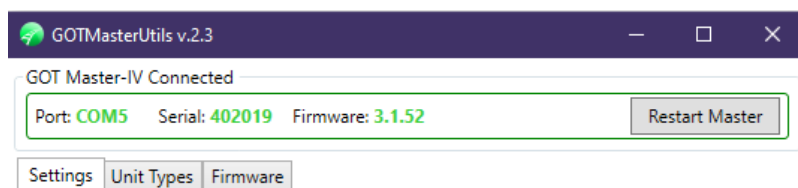
Info	Example	Notes
1 Master Id	Example: 402019	This Id is found on the label attached to the hardware
2 Master version	Example: 3.1.52	This version is found in the menu [Debug → Show Log] – see the example here below:

```

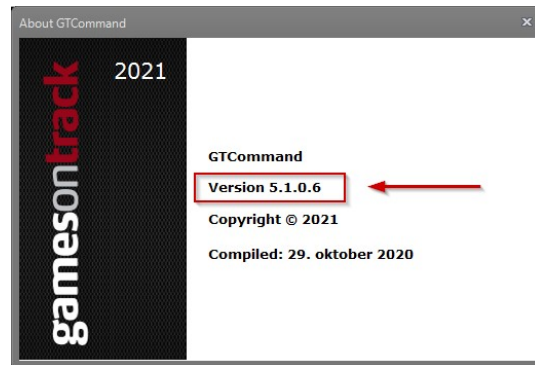
10:02:05.371: =====
10:02:05.372: MASTER RESTART REQUESTED: RestartSoftware=True RestartRadio=True
10:02:05.373: =====
10:02:05.373: RESTART_MASTER_REQ: MASTER: Software=1, RadioSystem=1
10:02:08.688: SETUP_REQ: MASTER: Data=[0C-00-00]
10:02:08.689: VERSION_REQ: MASTER: Data=[04-00-00]
10:02:08.689: TEST_MODE_SET: MASTER: Data=[F0-00-00-01-00-00]
10:02:08.731: SETUP_ANS: MASTER: FirmwareSelection=15, RadioChannel=EU_SINGLE, RadioLevel=MID, UltrasonicLevel=Medium, MaxDataCount=60, I
10:02:08.767: VERSION_ANS: MASTER: FIRMWARE VERSION=3.1.52, channel=EU_SINGLE, RadioAddress=402019, HardwareVersion=20 ProtocolVersion=0
10:02:08.768: SETUP_SET: MASTER: FirmwareSelection=15, RadioChannel=EU_SINGLE, RadioLevel=MID, UltrasonicLevel=Medium, MaxDataCount=60, I
10:02:08.769: RESTART_MASTER_REQ: MASTER: Software=0, RadioSystem=1
10:02:08.769: DEBUG_TEXT_INF: MASTER: Text=TestMode= 1 Value1=0 UHFA Master: Sep 11 2020, 12:23:23, Crystal=0, Addr=402019, Chan=3, Level=2
10:02:08.770: DEBUG_TEXT_INF: MASTER: Text=Master=1 DCCout=0
10:02:08.771: SETUP_ACK: MASTER: FirmwareSelection=15, RadioChannel=EU_SINGLE, RadioLevel=MID, UltrasonicLevel=Medium, MaxDataCount=60, I

```

GOTMasterUtils.exe can also display the same information:



3 GT-Command version	Example: 4.5.0.85	The version is found in GT-Command menu [Help → About]
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4 Control Station

Example **Märklin CSIII**

The model number is important.

Sometimes we also need to know the firmware of this station. Please consult the manual delivered for your specific control station.

In general we encourage you to keep your firmware updated – especially if the latest firmware contain bugfixes.

Notice: GamesOnTrack is supporting some of the most popular control stations – please see a complete list in the GT-Command manual. We try to keep up with all the changes made to these controllers out there. But as you can imagine, this task can be hard at times when changes in protocols and firmware must be adapted, new models arrive, and our customers are asking for support of older and sometimes special brands and models. You can always send us a request, but in general we encourage you to focus on the popular brands and models to get the best possible experience.

5

Hardware Id(s) Example: 30716

This Id is from a label on a single satellite, but a list of all the units you expect to be online in your system is preferred.

A Real World Example

A user is observing the positions of all movable devices on his physical layout. He compares the observations with the positions displayed in the 2D layout in GT-Command and after a period of time these positions starts getting incorrect and this continues getting worse and is resulting in very large discrepancies over a long period. Monitored over short periods after a start up, he does not see this behavior when observing the layout. He can't figure out why this suddenly happens, and decides to write an email to GamesOnTrack describing the situation.

The Shots

At the support desk a lot of questions starts to pile up. Often we need more details in general – but here is an example of questions being raised:

- 1) Did this customer changed anything in the system lately?
- 2) When did the customer observe this problem first time?
- 3) Is this problem seen only once, or is it recurring, static or periodically?
- 4) What version of GT-Command is being used?
- 5) What version of Master firmware is being used?
- 6) Did the customer attach a copy of his current system file (.got)?
- 7) Does this problem also exist when only a single vehicle is online on this layout?

If we look at the reason for each question:

- If the user has changed anything lately, this will indicate where to look – especially if the system has worked flawlessly until this point in time.
- If you look at the menu [Help→ Changelog] you'll find a list of frequent releases. If we know the first time, a user has observed any odd behavior, we can go back and see if this behavior is related to any previous releases containing changes in our sourcecode.
- If a problem is observed only once, and it can't be reproduced, we will investigate, but it can be often be hard to find the cause in these cases without a recurring pattern.
- If the problem static we have a better change for finding the cause of the problem compared to a problem that is periodically, and especially if there is no pattern.
- If you always send us the version number of the software, we have a much better chance of helping you, and often quite faster. Let's say you report an issue, and the version number of your software is 4.5.0.43. Our latest released version is 5.1.1.0. If the problem described is already is resolved with a bug-fix in a newer version like 4.5.0.67, we will encourage to update the software to the latest version. In general this is highly recommended. All changes in our software are accumulated, meaning the latest version 5.1.1.0 also will contain the bug fix applied in version 4.5.0.67 – and all other bug fixes and new features.
- The same is the case for the master Firmware. Se bullet (4).
- If we always receive the customers system file, we can start investigating the problem almost right away, so this is a great help for us.

- In this case the customer has reported that all vehicles have the same behavior. Applying the rule of simplicity, we want the customer to remove as much hardware as possible, and see if this problem still exist.

Analysis of the problem:

Our first internal thoughts and discussions, in order to narrow down this problem:

- We do not believe this is a hardware problem caused by vehicles – all vehicles will not just suddenly begin to malfunction at almost the same time and in the exact same way.
- The problem does not seem to exist on the short term, but is getting worse over long time, which is another indication of this could be a software issue – again: all vehicles will not start to malfunction concurrently and in the exact same way.
- Positions of each vehicle are calculated inside GT-command, so if a bug is introduced in the calculation lately it could actually affect all vehicles – but this is not the case – no changes are applied to this part of our code.
- All distances from the vehicles are delivered from the master hardware, but there has not been any relevant changes to the firmware lately, which could cause this behaviour.
- The positions displayed in the UI are not always based on the real time measurements from the satellites, but instead predicted. This happens when the vehicles are driving inside tunnels where no satellites are mounted. In these cases we are forced to predict the vehicles position, and we can do this prediction quite good. The prediction depends of how good the system and the vehicles are calibrated of course - and we know, that when the vehicles often will reside in the tunnels for relative short periods (seconds) before leaving the tunnel again and start using the real positions from the satellites again - and hence the vehicle image on the 2D-layout will be synced with the physical position again. In this case both the system and all vehicles should then suddenly have very bad calibrations, which we do not believe is this case. It must be something else..
- Now we take a look at the customers system file. We were not informed with all important details in the written email from this customer, but he has a layout with several tunnels.
- When creating tunnels, one way to do this, is to place a pair of sections on the layout each marking a tunnel entrance and tunnel exit respectively. Using this type of tunnel sections, we can determine exactly when to leave the 'prediction mode' and allow the real time positions to be applied again.

The Cause and Solution

The cause of this problem was a missing tunnel Exit section. When this section is missing in a pair, the system will continue to predict the position of all vehicles passing the tunnel Entrance section, and never switch back to use real time positions, due to the missing tunnel Exit section. Over a very long period, the predicted positions will accumulate a too large discrepancy from the physical positions, even if the calibration was performed perfectly. After adding this tunnel exit section on the layout, all problems suddenly vanished!

TIP

Please ensure every Tunnel Entrance has a matching Tunnel Exit!

The Mindset



Starting with the minimum system illustrated above is just the beginning of an adventure. Most customers will often expand their layout with a large number of hardware units over time. When running model trains many customers still like to use their control stations from eg. Märklin, ESU, Uhlenbrock etc.. which sometimes can make troubleshooting even more difficult.

When you expand the system or do updates of the software and firmware, and discover the system suddenly behaves unexpected – *just seek back to a safe ground!*

Simplicity Is The Key

In general you should keep the system simple when troubleshooting. Lets say, you have a large layout, with lots of devices, containers, vehicles, and perhaps a control station connected when running both trains and cars. If your're observing a problem with one of these devices, lets say a container doesn't behave as expected, then you should turn off as much hardware as possible, if a replacement of fresh batteries in the container, and a restart if the master doesn't solve your problem. This will also reduce the amount of messages in the Logviewer, and hence make the investigation from our side much easier and faster.

The Workflow

"Real men don't take backups, but they cry a lot!"

Please remember that all programs including the operating system on your PC, can be restored if a system fails – but not your own work, unless you use a backup plan!

When registering the GT-Command software, you are asked if you would like GamesOnTrack to take regularly backups of your system file. We highly recommend you to enable this feature. This way you can restore your system to a known working state. Otherwise just do a local copy of your current system file yourself before editing. If you have enabled the backup feature and

your system file somehow gets corrupted or deleted, you should just contact GamesOnTrack using the email support@gamesontrack.com in order to receive your latest working backups.

One thing at a time

When applying new hardware and or software to your system, you should only apply one thing at a time, and ensure everything still works as expected before you apply the next part from your list. Patience is important here, especially when applying software and firmware updates, please monitor your system for a while before adding anything to the system. This will make it far more easy to find the cause of issues. Adding new hardware components, combined with a new controller station for your trains and updating both firmware and software in a single shot, will be extremely hard to support when raised as a support task in gamesontrack.

We expand systems in small steps when engineering both software and hardware. In case we discover an unforeseen behavior or an error introduced to the system we always step back to the last known stable working state. From there we can re-apply the changes one by one until you either confirm or reject the presence of this behaviour. This way we can narrow in the scope of both code or components causing this unexpected behaviour. In these situations we all need the most simple system possible, meaning the absolute minimum number of devices. This is to avoid any 'disturbing' elements not relevant to the particular parts being examined.

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Starting up the system

In order to start troubleshooting you should always try start up your system in a controlled way, where you can follow what happens, when the hardware is connected.

And please remember: You can always re-install GT-Command including drivers, if you suspect the installation to be broken somehow.

- Start from scratch by turning off ALL your hardware.
- Now start your PC and run the GT-Command.
- Insert the Master (XConnect) and verify you see a change in bottom of the screen.

The PC

Please read section 6.2 [Check System Requirements] in the manual.

If your PC is fulfilling these requirements, you should be good to go and install the software.

Normally you'll receive the GT-Command software on a USB stick. In case this stick is malfunctioning, it can be caused by the following:

Examples:

- The hardware USB port(s) in the PC.
- The hardware USB stick itself.
- The software on the USB stick is somehow corrupted.

Solutions:

- To verify the current USB port on the PC, just remove the USB stick and insert your USB mouse to this port. If you can move the mouse around, the port seems to be functioning. If not, then try move the mouse to another USB port until you find a functioning port – then insert the USB stick there. If no ports are working it can be caused by a malfunctioning Operating System or a defect PC, that should be repaired. Before you start installing or updating your operating system or drivers, try install on another PC (and newer) if possible. If it works there, the PC must be the problem. These steps are very easy to do, and you don't
- If the hardware USB stick is defect or the software in the stick is corrupted, you can contact us at support@gamesontrack.com and we will provide you with a download link to the software and manuals.

If you look at the basic system drawing above, the only hardware connected to the PC is the Master (XConnect). No matter if the master is version two, three or four, it must be connected to one of the USB ports on the PC.

So in case the master doesn't show up in the software, it can be related to this connection.

If we just look at the hardware for a moment, the reason for not showing up can - in severe cases - be caused by defect hardware parts:

- The USB cable.

- The USB port(s) in the PC.
- The USB port in the Master.
- The hardware on PC or Master.

If we look at the software, the following parts can be defect:

- The USB driver on the PC.
- The USB driver on the Master.
- The GT-Command Software
- The Master Firmware
- The PC operating system

But this is very rare, and you can perform some simple tests to validate this.

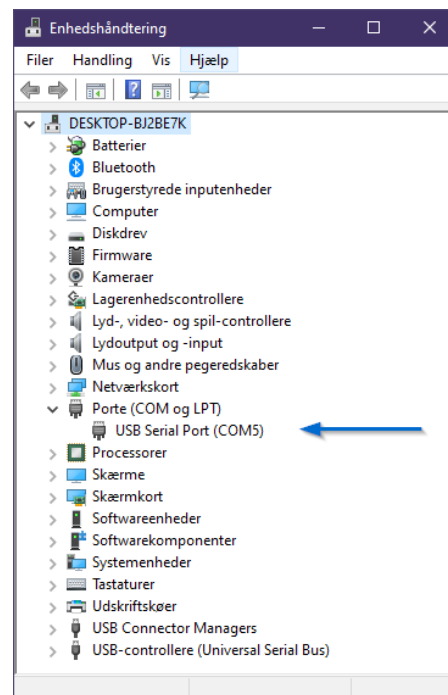
The Master

If possible the Master should be placed at the center of the layout, with a minimum of 5 [m] to all units, and with the radio signal sending power set to maximum. But this is not always possible, so the sending power should be decreased – start at lowest level, and increase until

No connection to Master

1 Check COM port

Open DeviceManager and verify a COM port is used when inserting/removing the Master USB connector into the PC a couple of times.



2 Check cable

If Master 2 or 3 is used, please check the cable isn't broken or has defects – if possible then try using another cable eg.

the USB cable from your printer.

3 Re-Install GT-Command.

If the software or any driver somehow is broken, then re-install GTCommand, and ensure both drivers are checked during the installation.
Please restart the PC when completed.

GT-Command

In GT-Command there are two important aspects when dealing with trouble shooting. The Master Settings and the Log Viewer.

Master Settings

One of the first thing to verify is the Master Settings. When expanding a layout, users often forget to increase the number of devices being used in the system. This often includes both vehicles and satellites.

In GT-Command click the menu [Master→ Settings].

Radio Channel	Full Channel
Radio Strength	Medium
Number of Vehicles	10
Number of Satellites	8
Number of Arduinos	1
Number of Radio handhelds	1
Vehicle Sending Power	Medium
Room Temperature (°C)	21
Enable whitelist	<input type="checkbox"/> Manage whitelist
LocoNet Master	<input checked="" type="checkbox"/>
Use fixed interval	<input type="checkbox"/> (Master restart required!)
Measure Interval [ms]	85

Save Cancel

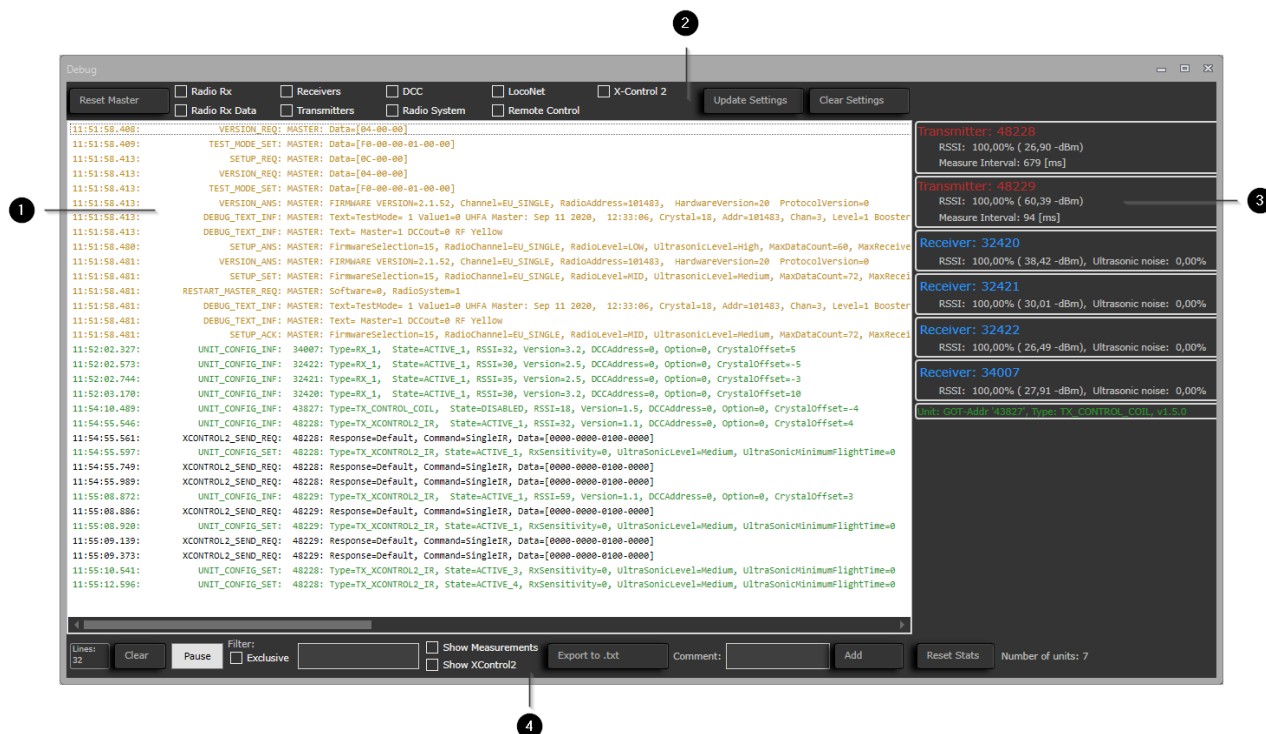
TIP

Ensure the number of devices are set properly in the Mastere Settings. Set the value a little higher than the number of physical decvices. Having a layout with 8 satellites and 10 vehicles you could set the values to the minimum as listed here below, but it's fine to increase those values a bit to eg 12 each.

Show Log

In GT-Command click menu [Debug→ Show Log].

Show Log is one of the most important part of the system when troubleshooting.



To the right it lists all active radio units, trains, cars containers, satellites, and a short statistic about their performance. In the middle the last 5000 commands through the Master will show up. You can clear it all and you can put a filter on only to see some relevant commands.

Item	Description
1	Log Messages This is the most important part for inspection of messages. All messages set up to be logged will be displayed here. All messages will be inserted at the bottom of this window. For each message you will see a timestamp to the left followed by some spaces and a right-justified MessageType, then the device Id, and finally the message.
2	Log Settings In the top bar the Master can be restarted, and various types of log messages can be enabled. When these check boxes are enabled, please press the button [Update Settings]. Press the button [Clear Settings] in order to reset the log settings, when complete.
3	Online Devices In this pane you will see all online devices found by the Master. Satellites will be colored in blue, senders/transmitters in red, and all other devices colored in green. For satellites and transmitters you will see a value for the radio signal quality RSSI (Radio Signal Strength Indicator). In general the RSSI should be larger than 95 [%]. For transmitters you get the measure interval, and for satellites the ultrasonic noise and the level. The Level should be > 90 [%]
4	The control bar In the bottom you will see the following parts available from left to right: <ul style="list-style-type: none"> ■ The number of lines currently in the log. ■ Clear button to remove all log messages from the view. ■ Pause button to make the view stop scrolling ■ Filter checkbox. When enabled, only lines containing the text typed in the text box will be displayed in the view. ■ Show measurements messages received from all satellites. ■ Show XControl2 messages ■ The button [Export to .txt] will export all log messages in the

current view to a text file of your choice.

- Comment: Use this textbox combined with the Add button to inject an arbitrary text into the logmessages. This text will be surrounded by a pair double stippled lines.
- The button [Reset Stats] will reset the calculated statistics seen in the right pane for the online devices.
- The number of online devices are counted.

Log Messages

When the Master is reset from the application, the logview will look like this:

The first two important things to pay attention to is the FIRMWARE VERSION and the RadioAddress, framed in red boxes here below:

```
10:02:05.371: =====
10:02:05.372: MASTER RESTART REQUESTED: RestartSoftware=True RestartRadio=True
10:02:05.373: =====
10:02:05.373: RESTART_MASTER_REQ: MASTER: Software=1, RadioSystem=1
10:02:08.688: SETUP_REQ: MASTER: Data=[0C-00-00]
10:02:08.689: VERSION_REQ: MASTER: Data=[04-00-00]
10:02:08.689: TEST_MODE_SET: MASTER: Data=[F0-00-00-01-00-00]
10:02:08.731: SETUP_ANS: MASTER: FirmwareSelection=15, RadioChannel=EU_SINGLE, RadioLevel=MID, UltrasonicLevel=Medium, MaxDataCount=60, I
10:02:08.767: VERSION_ANS: MASTER: FIRMWARE VERSION=3.1.52, Channel=EU_SINGLE, RadioAddress=402019, HardwareVersion=20 ProtocolVersion=0
10:02:08.768: SETUP_SET: MASTER: FirmwareSelection=15, RadioChannel=EU_SINGLE, RadioLevel=MID, UltrasonicLevel=Medium, MaxDataCount=60, I
10:02:08.769: RESTART_MASTER_REQ: MASTER: Software=0, RadioSystem=1
10:02:08.769: DEBUG_TEXT_INF: MASTER: Text=TestMode= 1 Value1=0 UHFA Master: Sep 11 2020, 12:23:23, Crystal=0, Addr=402019, Chan=3, Level=2 I
10:02:08.770: DEBUG_TEXT_INF: MASTER: Text=Master=1 DCCout=0
10:02:08.771: SETUP_ACK: MASTER: FirmwareSelection=15, RadioChannel=EU_SINGLE, RadioLevel=MID, UltrasonicLevel=Medium, MaxDataCount=60, I
```

The firmware version can tell us if you're running on the latest version. This is important, because we accumulate all new features and bugfixes over time, so please update your firmware whenever you're notified by the software that a new version is ready for you.

The RadioAddress is the MasterId. This value must match the Id found on the label mounted on the master hardware.

Log Settings

In the top bar a set of flags can be enabled, when advanced logging or troubleshooting is needed. This is never used by end users of our products, so no details are described on the output from these flags here.

Online Devices

The various online devices are described in the subsections below, but first a general tip:

TIP

If you should get any issues with a device, please first check the Log messages in GT-Command, to see if any clues can be found there. If not try the following:

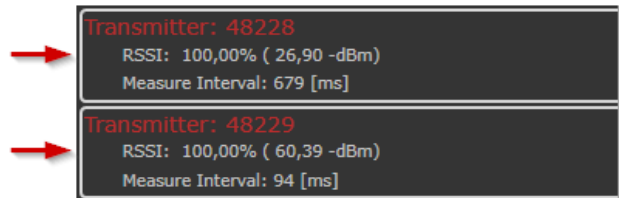
- *Verify the hardware unit is powered, by checking power cables, power supplies, and/or replace any flat batteries if needed.*
- *Clear the log and restart Master. Now monitor the log and check if the unit gets online.*
- *Finally close the application, turn off all hardware, restart the PC, restart GT-Command, open the menu [Debug→ Show Log]. Now restart all hardware in a controlled way, while you monitor the log: Turn on the Master (GT-XConnect), turn on satellites, the transmitters, then the control units, and finally the Train Controls Station.*
- *Notice: If a control unit not is using positioning, it can be monitored with the Master only - the satellites and transmitters does not have to be turned on.*

The Transmitters (Position Senders)

Solution

1 RSSI

The RSSI (Radio Signal Strenght Indicator) is normally very high ~ 100 [%]
If the RSSI value drops to 0, it indicates that a response is missing from this device.

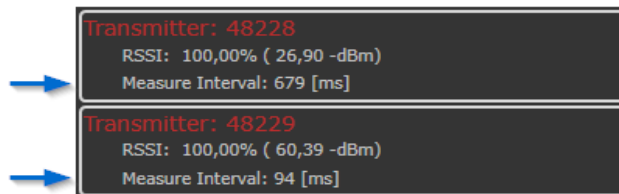


Transmitter: 48228 RSSI: 100,00% (26,90 -dBm) Measure Interval: 679 [ms]
Transmitter: 48229 RSSI: 100,00% (60,39 -dBm) Measure Interval: 94 [ms]

2 Measure Interval

The measure interval indicates how often the transmitter is sending it's position to GT-Command.

In case you wonder why transmitter 48228 has an interval of 679 [ms], where transmitter 48229 has 94 [ms], here is the reason: If both transmitters were moving physically on the layout, theses values would most likely be 94 [ms] each. But in this case one of these transmitters has stopped moving on the layout. When this happens, the system will lower the priority on this particular vehicle, slowly towards the lowest possible interval. When a vehicle reaches the lowest priority, the system will only ask for it's position at every 8th roundtrip, until it starts moving again. The value displayed is an average over the lastest set of measurements.



Transmitter: 48228 RSSI: 100,00% (26,90 -dBm) Measure Interval: 679 [ms]
Transmitter: 48229 RSSI: 100,00% (60,39 -dBm) Measure Interval: 94 [ms]

3 Text here

The Satellites

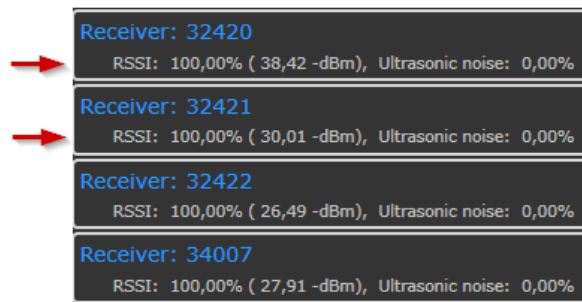
Please read chapter 5 in the manual [Construction and Commissioning].

When the satellites are mounted, you should open the [Show Log]

Solution

1 RSSI

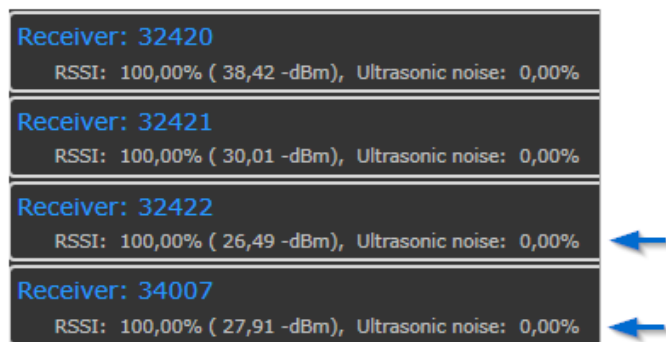
The RSSI (Radio Signal Strength Indicator) is normally very high ~ 100 [%]
If the RSSI value drops to 0, it indicates that a response is missing from this device.



Receiver: 32420
RSSI: 100,00% (38,42 -dBm), Ultrasonic noise: 0,00%
Receiver: 32421
RSSI: 100,00% (30,01 -dBm), Ultrasonic noise: 0,00%
Receiver: 32422
RSSI: 100,00% (26,49 -dBm), Ultrasonic noise: 0,00%
Receiver: 34007
RSSI: 100,00% (27,91 -dBm), Ultrasonic noise: 0,00%

2 Ultrasonic Noise

The ultrasonic noise is, is the level of noise detected in the receiver. When we ask a transmitter to send it's position, we open the transducers. If we immediately detects ultrasonic sound, this can be caused by ultrasound in the room, that not originates from the system delivered from GamesOnTrack. This kind of noise will most likely disturb the system – also seen by incorrect positions.



Receiver: 32420
RSSI: 100,00% (38,42 -dBm), Ultrasonic noise: 0,00%
Receiver: 32421
RSSI: 100,00% (30,01 -dBm), Ultrasonic noise: 0,00%
Receiver: 32422
RSSI: 100,00% (26,49 -dBm), Ultrasonic noise: 0,00%
Receiver: 34007
RSSI: 100,00% (27,91 -dBm), Ultrasonic noise: 0,00%

3 Text here

The Control Units

Control units are hardware devices of various functions, typically not related to positioning. This can be special modules like DCC boosters, modules for controlling Arduino devices, modules for turnouts like the GT-Xcontrol-Coil etc.

Control units are also listed in the right panel, when getting online, and displayed with a green color – like here.



Info		Description
1	Device Id	The Id of the device – often labelled on the hardware.
2	Device Type	The type of hardware – here the GT-Xcontrol Coil (item number 1302702/1303702 (US)).
3	Version	The firmware version installed in the device.

Show Measurements

If the checkbox [Show Measurements] is enabled, all measurements for each transmitter are recorded in the logview. In case you eg. have a single transmitter, you'll receive a line in the logview at ~ 70-100 [ms] from this transmitter. Here is an example of one of these lines:

```
15:39:30.833:Measure: Tx(43028), R= 22, Q=100%, C= 0, V=226| Rx(32421), D=3070,76253316177,
Lvl= 1, R= 28| Rx(34007), D=2205,48626676471, Lvl=255, R= 43| Rx(32420), D=2180,00698919118,
Lvl=255, R= 24| Rx(32422), D=3200,19726323529, Lvl= 1, R= 29
```

Each measurement will be received in one string. Let's split it up and look at the details:

- 15:39:30.833: Measure: Tx(43028), R= 22, Q=100%, C= 0, V=226
- | Rx(34007), D=2205,48626676471, Lvl=255, R= 43
- | Rx(32420), D=2180,00698919118, Lvl=255, R= 24
- | Rx(32422), D=3200,19726323529, Lvl= 1, R= 29

The transmitter is listed at first (Tx), then all satellites (Rx) - each part is separated by the "|" symbol. The tables below describes these properties and values.

	(Tx) Transmitter	Description	Notes
1	15:39:30.833	The exact time we received the measurement	
2	Measure: Tx(43028)	The measurement for this Transmitter	
3	R = 17	R is the RSSI measurend in [-dBm]. <i>RSSI = 0 ~ a missing response from the device</i>	RSSI should be between 5 and 255
4	Q = 100	Q is the radio quality measurend in [%] <i>This value is incremented (+1) every time a message is received from a satellite, and decremented (-2) at every missing response, with a max of 100 ~ percent.</i>	Q should be above 1.
5	C = 0	C is the Radio Lost Count. <i>This value is counting the consecutive missing responses from a device. The value will be incremented at every missing message (max 15) and reset when a message is received.</i>	Should be low < 3.
6	V = 226	V is the transmitter battery voltage	Value is normally in 100 [mV] units

This measurement line includes three receivers – here we just display the first receiver.

	(Rx) Receiver(s)	Description	
1	Rx(34007)	The Id of the first receiver/satellite in the list.	
2	D= 2205	D is the measured distance in [mm] from the transmitter to this satellite. See tips below!	Expect the value of D to be less than 15000, since the maximum distance allowed in the system is 12-15 [m]
3	Lvl=255	Lvl is the ultrasonic Level arriving from from transmitter 43028. <i>The Level can be between 0..255 when measured at the edge of the maximum distance under optimal conditions.</i> See tips below!	Level should be between 1 and 255. If the user is experiencing errors at values below 5-10, this is often caused by a too large distance (and in worst case defect devices)
4	R = 43	R is the RSSI measurend in [-dBm]	RSSI should be between 5 and 255

TIP

Level = 0, Distance = 1: The level indicates the ultrasonic power, if the level is 0 and the distance is 1, that means the receiver is oscillating due to high sending power or transmitting ultrasound directly under a satellite.

Level = 0, Distance > 1: If the level is 0 but the distance is greater than 1 means that a measurement was taken but its level is too low to make it reliable.

- 0 -

Distance D=0: it means ultrasonic timeout where the receiver did not receive an ultrasonic signal at all. This can be caused by a number of things:

- a too low setting for the ultrasonic power of the transmitters in relation to the wanted distance or angle,
- or in worst case a defect device.
See the Vehicle Sending Power in master settings.

Distance D=1: it means the receiver detected an ultrasonic signal exactly when the measurement was started, which then can't originate from this sender! This can be caused by a number of things:

- Ultrasound from other sources.
- Hard surfaces in rooms like walls and furnitures will increase reflections of ultrasound, can cause this problem too.
- Location of receivers very close (less than 50cm) from other electrical noise sources e.g. neon tubes.

The problem can often be solved by reducing the ultrasonic sending power for vehicles or by increasing the measure interval in the Master Settings.

Placing the Satellites

The placement of satellites is normally quite easy on smaller layouts – especially if a stand with mounted satellites can be used, but quite often users have large layouts, which require the ceiling to be used for the mounting. In these cases the shape of the roof will have an impact on how the satellites should be mounted.

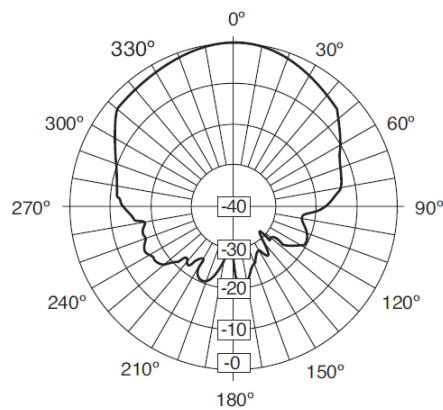
Satellites Directivity

The transducer on a satellite will follow a certain form where the angle and distance determine how the ultrasound is emitting. Examples of this directivity is displayed in the datasheets below.



Figur 1: Top view of satellite

Directivity
(255-400ST12M-ROX)



3.1.2 Directivity

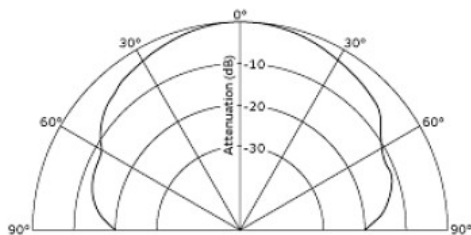


Fig.3 S.P.L.(MA40S4S)

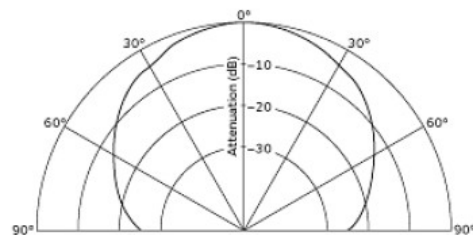
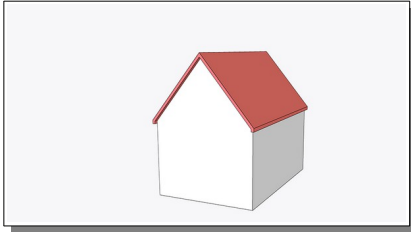


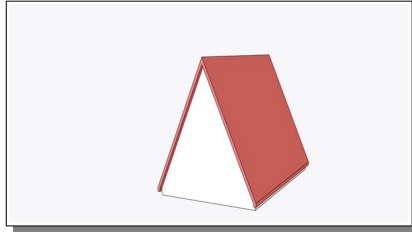
Fig.4 Sensitivity(MA40S4R)

Roof types

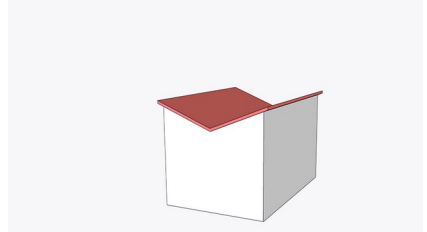
Here is a set of various roof types where the most common are # **1**, **2**, **7** and **8**.



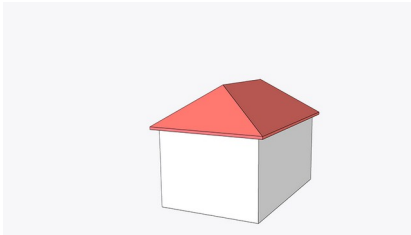
1



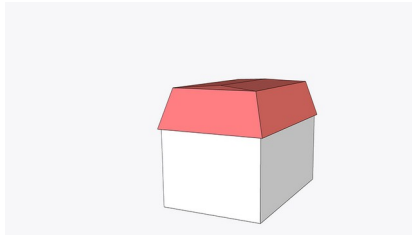
2



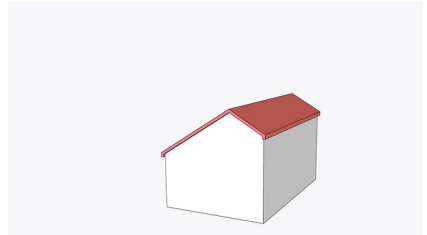
3



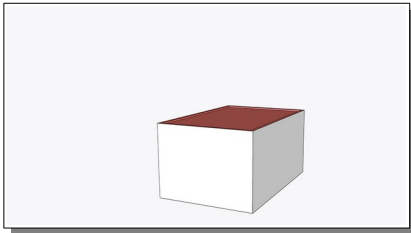
4



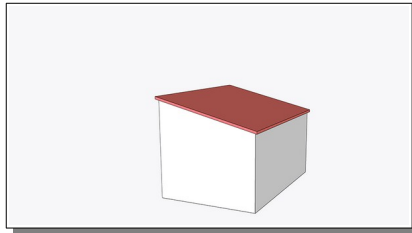
5



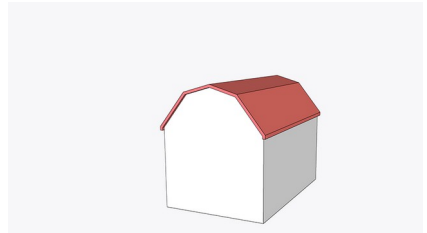
6



7



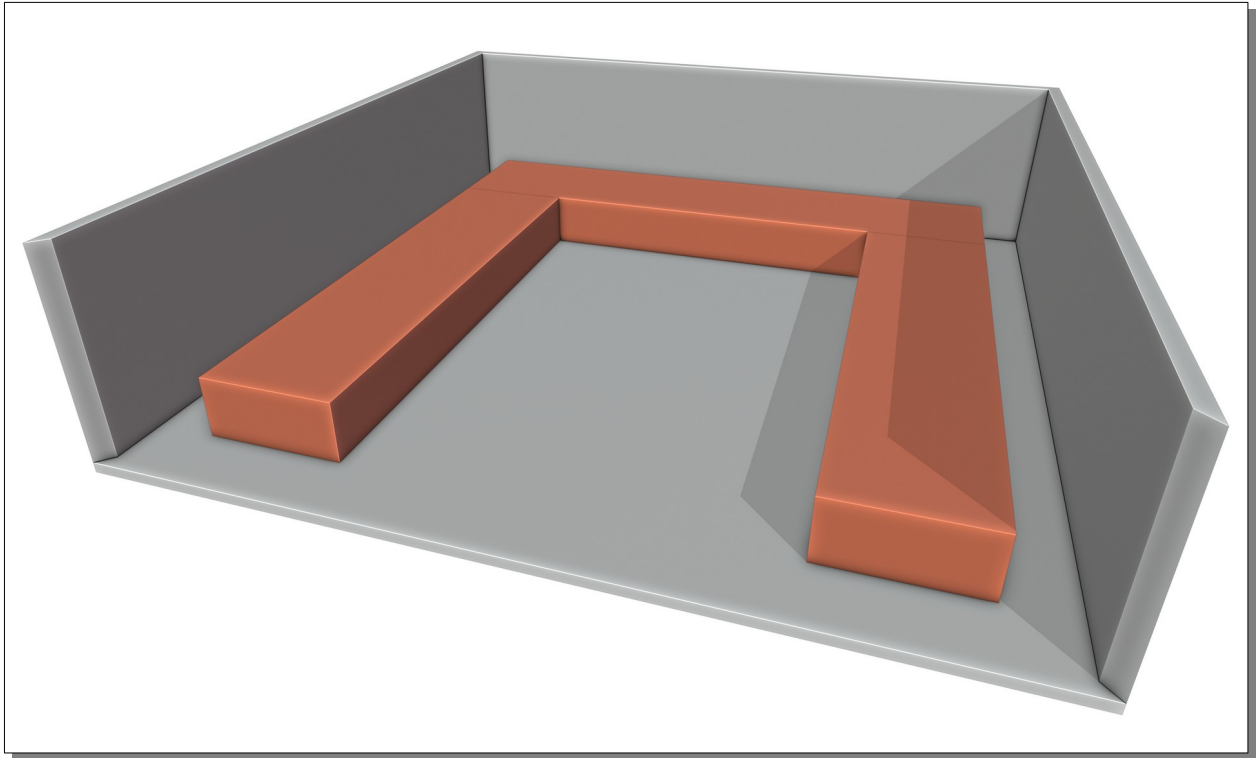
8



9

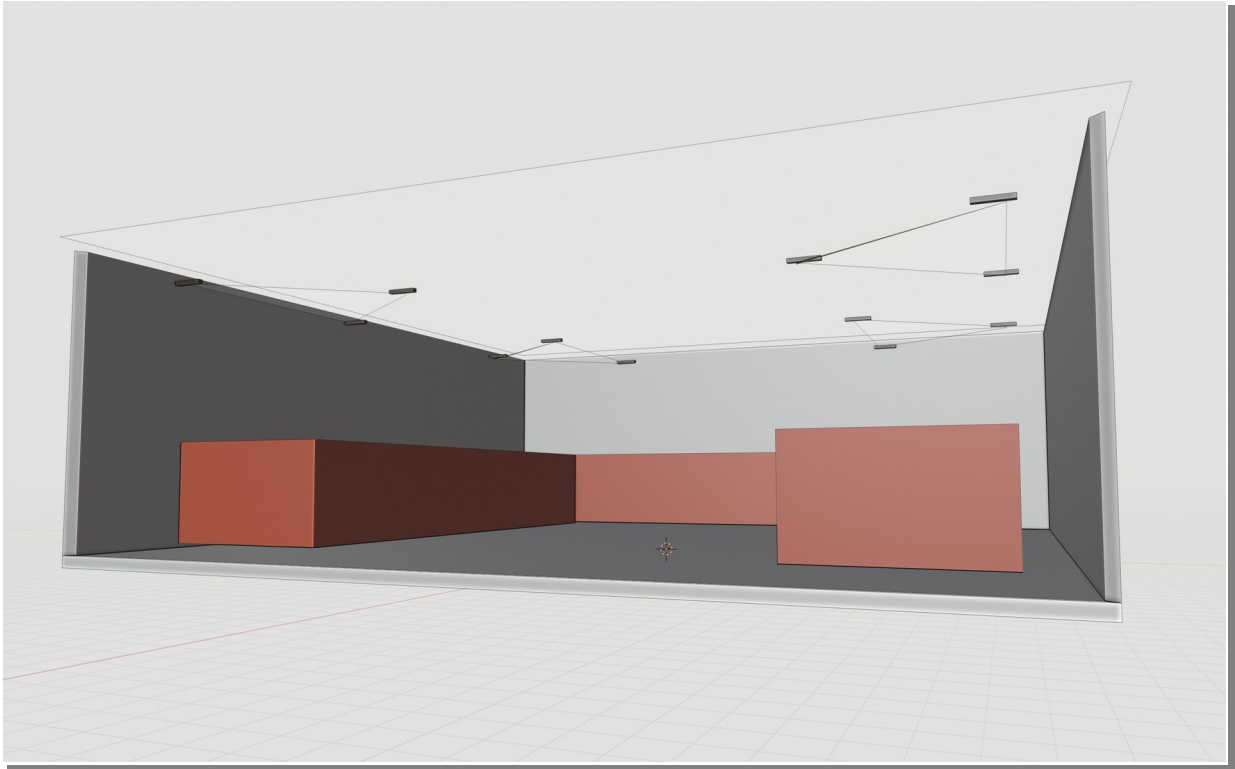
The layout table

Below is an example of a table to be used for a layout – here a U-shaped form is used.



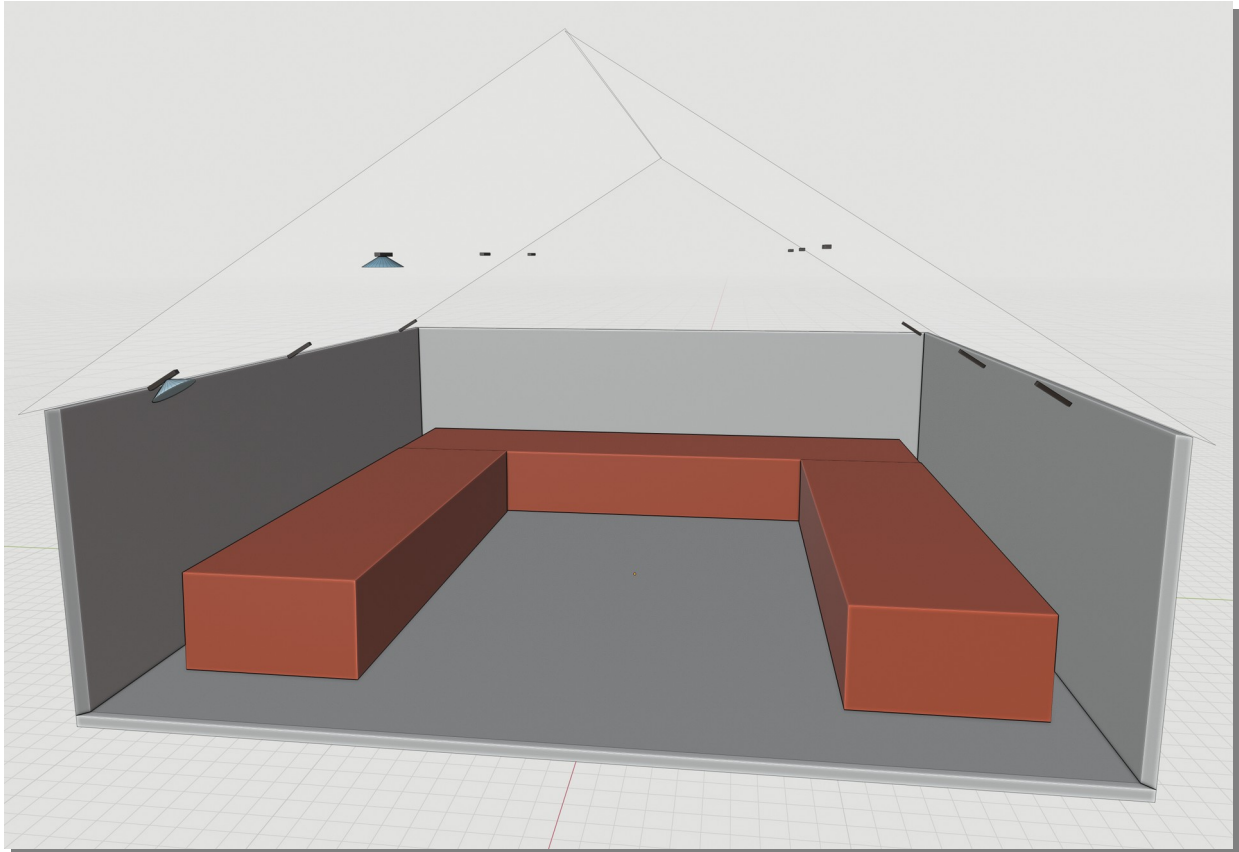
Flat Roof

Imagine a room with a size of 10 [m] x 10 [m]. Here the satellites should be placed so they can form triangles. Here the satellites can be placed with the transducers facing vertically downwards towards the layout. This setup will cover roof types 7 and 8.



Pitched Roof

For pitched roofs, the upper satellites on the ceiling can also form triangles, and have the transducers facing vertically downwards towards the layout. The lower placed satellites near the edges between the walls and the ceiling must have the transducers facing towards the layout, meaning at an angle as shown in the illustration here below on the left side. The transducers receiving 'area' is shaped as a cone. This setup will cover roof types 1 and 2.



Frequently Asked Questions (FAQ)

Here below is a lists of frequently asked questions with answers.

User Questions	Answers
<p>■ One of my three satellites died - it is not blinking anymore when powered – do I need a new one?</p>	<p>It might be the power cable where one lead is out. You can open the satellite with a sharp small screwdriver, lift up the small red dot with the ladder in white, and unscrew the cable, and finally insert the cable again from bottom.</p> <p>If this doesn't help, you need a to replace with a new the satellite.</p>
<p>■ I am very interested in buying your decoders with their respective transmitters to expand my Faller Car System Digital 3.0 with numerous small cars. But I wonder if your decoders support the Faller Car System Digital 3.0 software. Can these decoders be read by the software that I am using? I don't want to make wrong purchases.</p>	<p>GamesOnTrack has developed the Faller digital 3.0 platform for Faller and thus everything we do is compatible with that.</p> <p>You will need to upgrade the software license, so you can run both hardware from both Faller and GamesOnTrack like cars, trains, decoder, turnouts etc..</p>
<p>■ I have recorded my complete layout, and created all turnouts with success. When I drive a vehicle on the layout, it always stops at a certain point on the layout every time. All my vehicles behave that way. What is wrong here?</p>	<p>When recording layouts, the positions are placed on a coherent line in the forward direction of the vehicle. In rare cases, perhaps due to reflections in metal or walls, you can get a few positions being placed very close to each and also at random directions. These offsets (or spikes) are not always visible in the 2D view if the displacement is in the Z- direction (upwards).</p> <p>Please open your 3D view, and zoom in on the area where the vehicles stop, and see if any points are forming spikes on the track. Press the button [Restoration], also if no spikes seems visible. This button will try to smooth out any 'invalid' points or zig-zag patterns forming too sharp angles.</p> <p>If this does not solve your problem, then select and delete a few points on the track in this area and apply the positions manually to form a complete track again.</p>
<p>■ I have a big problem with the Ecos controller. If any turnout is switched then all blocks and signals are automatically set to green ion GT-Command. This makes any control impossible. What am I doing wrong or is there a bug in the software?</p>	<p>All GOT signals must also be defined in Ecos. Then all signals are switched correctly. This is an important note. Apparently Ecos sends a command to monitor its signals when switching a turnout. However, if the signals are available in Ecos, only correct setting commands are sent by Ecos.</p>
<p>■ What kind of current does the GT-XControl Sound need? (Digital or DC)</p>	<p>From 4.5 to 10 [V] DC.</p> <p>Please consult the Hardware menu in GT-Command, it contains a pdf with a complete list of datasheets for the GamesOnTrack products.</p>
<p>■ I have added more vehicles to my system and now the vehicles are sometimes set offline in random.</p> <p>What am I doing wrong here?</p>	<p>When adding more vehicles to you system, you must update your Master Settings. Increase the number of vehicles to match the number of physical vehicles as minimum.</p>
<p>■ What is the difference between the various types of tunnel blocks, and how do I use the blocks if I want to drive in both directions?</p>	<p>When using a simple tunnel section the system detects itself when the vehicle is in or out and when to stop measuring and when to resume. The Tunnel Entrance and Tunnel Exit sections are used when you want to control this manually.</p> <p>In a bidirectional tunnel you should use a pair of these sections set up this way: [Exit] [Entrance]...inside tunnel...[Entrance] [Exit]</p> <p>For further details see chapter 10.2.3 Driving in Tunnels</p>

THE HELP GUIDE

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- **The DAISY2 handcontroller is not working properly, can you please help?**

In the master settings you must disable the [Loconet Master] checkbox.

- **I'm using the GT-Command. I configured several times the MASTER by means of the GOT Utilities program. Even if I unchecked the Loconet master checkbox in Got Utilities, the next time I tried to reconfigure, the checkbox was ON. I do not understand why?**

When the MASTER is connected to the PC it will get the settings from the application started. Every time GTCommand is started it will write its own settings to the MASTER. This is the reason for the checkbox is ON when you start GT-Command.

- **Where do I find the current systemfile?**

Systemfiles are placed here, and have the extension .got:

C:\Users\<USER>\Documents\GTCommand\System Files

- **I 've tried to start a demo from the installation directroy and I've got this error message:**

License Restrictions
You have reached the limitations for your current license. Maximum number of running automations: 8
Please upgrade your license on the website.

This message indicates you're running on a test-license. In the menu Help→License in GT-Command you should just enter the LicenseKey received for your Master.

The same dialog can appear with other limitations like:
Maximum number of vehicles
Maximum number of mobile clients

- **Where can I find installation instructions for the GT-Xcontrol 1302700? 10 colored wires is a bit much to guess.**

You can find the datasheets for all our products in the menu **Help→Hardware**

- **Is it possible to send the raw position data provided by GTcommand as a TCP/IP stream?**

Yes. Just Add the **tcpsendpos** in the command line option to the GTcommand.exe shortcut or cmd file like this:

"C:\Program Files\GamesOnTrack\GTcommand\GTcommand.exe" tcpsendpos
Default port is 15010, but a port can be specified.

"C:\Program Files\GamesOnTrack\GTcommand\GTcommand.exe" tcpsendpos:15010

Position data

Data is delivered in a comma-separated string. For every receiver there is an ID, distance and level:

<Time>, <Sender ID>, <valid measurement>, <x>, <y>, <z>, <Receiver ID>, <Distance>, <Level>

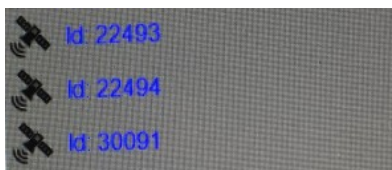
<Time>	Milliseconds after start
<Sender ID>	The specific transmitter ID, can be seen on the label
<valid measurement>	1 for valid measurement, 0 for invalid
<x>	The x-coordinate in mm
<y>	The y-coordinate in mm
<z>	The z-coordinate in mm (is normally negative in a right handed coordinate system)
<Receiver ID>	The specific receiver ID, can be seen on the label
<Distance>	The measured distance in mm
<Level>	The level of the measured ultrasound signal at the receiver. From 0-1000, with 0 being the lowest.

Example records

Time	SID	v	X	Y	Z	RID1	RID2	RID3
55924,11000,1,1190,871,-1435,20104,2059,918,20103,1727,966,20105,1498,999;								
56074,11015,1,1055,712,-1430,20104,1937,912,20103,1756,922,20105,1312,865;								
56224,11000,1,1189,873,-1434,20104,2056,917,20103,1726,960,20105,1503,987;								
56374,11015,1,1052,716,-1430,20104,1930,910,20103,1756,925,20105,1320,860;								

See further details in chapter NNN in the GT-Command manual.

- **What does blue blinking satellites indicate?**

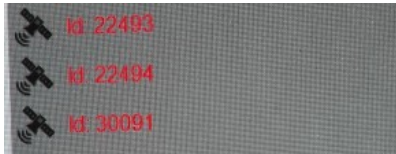


And red blinking satellites?

Blue blinking satellites indicate that the ultrasound is causing problems, e.g. like satellites and senders are too close, too far or external disturbance to the system.

Red blinking satellites indicates issues with the radio.

In these cases, please lower your radio and ultrasonic settings to a minimum, and raise until the signals are stable. There can be a number of reasons for this behaviour – typically it's caused by satellites and transmitters placed too close to each other, or too far. Devices placed too close will cause disturbance to each other, and devices placed too far can loose measurements.

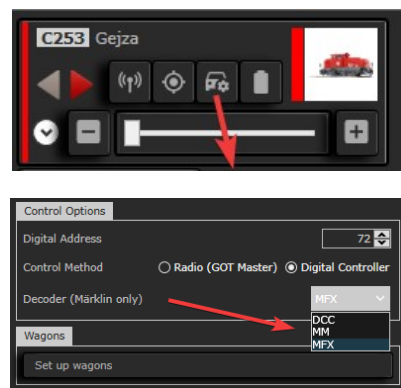


- **I'm using the Märklin CS2 controller, but some of my trains does not drive, when setting gthe speed. I ride with 5 trains:**
Train 1 MFX.
Train 2 MFX, container
Train 3 MM2
Train 4 MFX
Train 5 MM2 container

Trains 3 and 5 that have MM2 decoder run fine, whereas trains 1, 2 and 4 that have MFX decoder do not run.

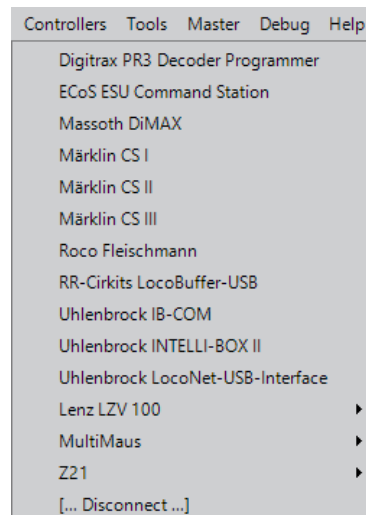
I do not know if this matters, but the IP address on GT is 192.168.025, on Märklin CS2 the IP address is 192.168.08?

The Märklin CS2 controller should have its own IP adress, that is different from GT-Command, so this is okay. You should pay attention to the settings for you vehicles. in Edit Vehicle you must also specify the decoder type – like this:



- **I have a Marklin H0 system with a Central Station 1 (60212). Can Central Station 1 be used with your positioning system?**

Yes, we have support for this controller too. Here is the list of supported controllers:



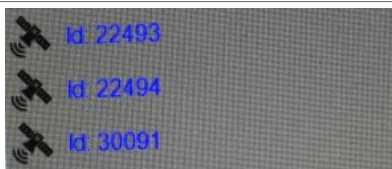
- **What does the blinking satellites indicate – here blue?**

Small satellites symbols could be flashing (red or blue) in the 2D view. This is often caused by incorrect settings of radio and/or ultrasonic levels.

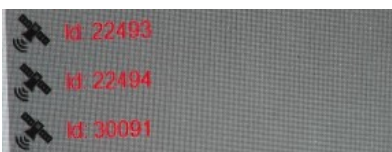
Blue blinking satellites indicate issues with ultrasound is causing problems, e.g. like satellites and senders are too close or too far or there is and external disturbance to the system.

Red blinking satellites indicates issues with the radio.

In these cases, please lower your radio and ultrasonic settings



And red:



to a minimum, and raise until the signals are stable. There can be a number of reasons for this behaviour – typically it's caused by satellites and transmitters placed too close to each other, or too far.

Devices placed too close will cause disturbance to each other, and devices placed too far can loose measurements.

■ **Does your system support iTrain?**

Yes. Just Add the **itrain** in the command line option to the GTcommand.exe shortcut or cmd file like this:

"C:\Program Files\GamesOnTrack\GTcommand\GTcommand.exe" itrain

See further details in chapter NNN in the GT-Command manual.

■ **Is it possible to copy an automation?**

Yes. Open the automation, mark all text and press CTRL+C. Now create a new automation and press CTRL+V

■ **Can I use the software on multiple computers?**

Yes. But you must connect the Master to the working computer.

■ **I have a fiddle yard about 500mm under my main table and have four satellites which I want to mount above it. I can't find access to 2.5D scenario setup. I have the latest version of GOT. Page 62 of the manual says to select the 2.5D method but I am unable to find it.**

GT-Command do not support 2.5D scenarios anymore, but both 2D and 3D are supported.

If the fiddle yard is a flat surface, you can use a 2D scenario. The minimum satellites for a 2D scenario is two, and depending on the length of your layout you can add more satellites – placed in a straight line - if needed.

■ **Could you please help me how much it would cost to upgrade our license to support the Faller Car System Digital?**

Sure, there are 2 steps in his procedure.

1. We upgrade you to the GT-Command PRO license if you not already have this.
2. From the PRO license we upgrade you to operate the Faller cars as well.

Upgrade GT-Command to PRO: \$137 (excl. VAT in 2021)
Upgrade from PRO to Faller cars: \$250 (excl. VAT in 2021)

It will all be included in one new license key.

■ **Hello, I bought a copy of your software from my train dealer years ago and was able to install it, but I cannot find where to update the software, can you help me?**

If your software is named GT-Position which is an old label, we do not support this anymore. The application will work, but you have to register the software manually here:

We recommend you request an update to GT-Command instead by contacting support@gamesontrack.com.

■ **I bought a copy of GT-command and the install went fine it, but I cannot activate the LicenseKey nor register the software, is this a bug?**

First: You should check if your firewall or antivirus software is preventing a connection to our servers. This applications are getting more protective over time, so this most likely the case Secondly: Depending on the version 3.x and 4.x in the early versions you can experience that the registration must be done manually. You can do this here:

http://www.gamesontrack.co.uk/forum/bruger/opret_bruger.asp

or better: download a later version where this issue is solved.
http://gamesontrack.eu/gtcommand_download/GTCommandSetup_5.1.2.1.exe

■ **You are supporting LEGO – do you also support the Lego Bluetooth system?**

No, unfortunately we do not support the Bluetooth system. Perhaps in the future, if we enough users are requesting this.

■ **Sometimes the "GPS" button on vehicle disappear. What is the reason?**

This button is only visible when the vehicle is online

■ **Is it possible to set a kind of "direction" on the road? I mean is it possible to tell the software that a vehicle on a particular road must go in a specific direction? Sometimes a vehicle is**

No, all tracks are two way.

<p>detected on the wrong road and drive against the direction, so this will prevent this kind of issue.</p>	
<p>■ I've tested sign. But sometimes it doesn't work e.g the vehicles don't slow down on a speed limit sign. Even if the sign is attached to the road. Is it a bug, or is there a setting that I forgot?</p>	<p>The attachment of signs to the road is important, there must be a white line from the road to the sign. But in your case this is verified, so go into Edit mode in the 2D view and rotate the sign(s), so the sign is seen from the vehicle forward direction (with the rod pointing downwards). This counts for all signs.</p>
<p>■ What is the effect of these signs when attached to a road? 1. Pedestrian 2. Lane direction left/right 3. Light in Tunnel</p>	<p>1. Pedestrian: Speed of the vehicle will be slowed for a time. 2. Lane Direction: The lane direction sign will force the car to blink to the given direction (from the sign) 3. Light in tunnel: Vehicles without lights entering a tunnel, will have their lights turned on while driving in the tunnel.</p>
<p>■ Sometimes a vehicle is detected on the wrong road and drive against the direction – how can this happen?</p>	<p>If the calibration of both the layout and all vehicles are done properly, and all your hardware are working correct, you should not see this 'jumping' of vehicles between tracks on the layout. Please re-calibrate the system first. Then remove all all vehicles except one, and do a speed calibration on this single vehicle. Now let this vehicle drive and monitor if jumps are happening. The jumping can happen if the system has static or dynamic obstacles between the vehicles and the satellites like. There can be a load-bearing wood/metal rod mounted from the ceiling to the floor, or people can walk or stand and prevent the line-of-sight and causing the system to measure 'incorrect' distances. In rare cases malfunctioning satellites and vehicles can also be the cause.</p> <p>Please notice if the jumping is happening on the layout at specific locations each time or it is randomly all over, or it is happening to all vehicles or specific vehicles every time – this can be very helpful to us.</p>
<p>■ When I add a module in GT-Command, I cannot set it's address – what am I doing wrong?</p>	<p>Most modules have to be powered and online. These will present their address in a drop down.</p>
<p>■ Hi, I am a registered purchaser of GOT products and would like to update my registered products to the latest versions you have emailed me about today. How do I access my free updates?</p>	<p>You will get the latest update of GT-Command directly inside the application. You should also be informed about the new update when the application is started. In case you have an older version of GT-Command just write an email to support@gamesontrack.com and we will provide you with a link to the latest version.</p>
<p>■ Is is possible to try out your software for free?</p>	<p>You can order a 30 days test license of the program GT-Command on this page: http://en.shop.gamesontrack.dk/gt-command-sw-uk.aspx</p>
<p>■ We are going to use the GT Automation Server to communicate with GTCommand in our research project. Is there some documentation available for the GT Automation Server (API)?</p>	<p>Yes, you can grab the documentmtation here: http://gamesontrack.eu/gtcommand_download/Manuals/AutomationServer.pdf</p>
<p>■ I have a question; it is possible to control only one car without satellites in GT-Command via Märklin mobilstation part no 60653 without computer?</p>	<p>No, this is not possible. The communication to your vehicles is only ensured via radio on the Master which is connected to a computer. And if positioning of this vehicle also was a requirement, you had to buy the satellites as well.</p>
<p>■ I have entered the Licensekey and Reg-key – both are colored green, so they seems to be accepted, but the Master will not connect. What can I do?</p>	<p>1. First ensure, that only one application that uses the Master is running at a time: GT-Command or GOTMasterUtils.</p> <p>2. Then you should ensure that the two USB Serial drivers are installed. Normally these are checked in the Installation dialog. You can re-install the application if you are uncertain on this.</p> <p>3. Some Antivirus/Protection software programs are scanning your USB-ports. This can be done silently but in most cases you will get a dialog where you must allow the connection. If not, then try to locate the setting for ports in your antivirus-application and allow the Master connection or disable the port scanning if you allow all external USB-connections to your PC.</p>

All satellites are suddenly no longer 'there'

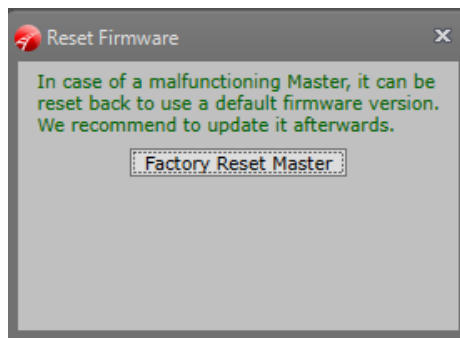
I have the problem with satellites, they are suddenly «no longer there». No more LEDs flash on the master. I have 6 satellites and the system has been in use without any problems.

I tried switching off/on, but no success. Could the behavior be caused by a firmware upgrade? Do you have any idea what could be the cause?

Answer:

This can be caused by clicking on the Factor Reset Master, and never do the online update afterwards.

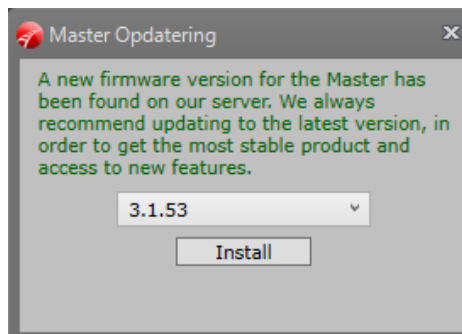
Step 1. When clicking the menu entry that reset the firmware to factory settings, you should wait until the update is succeeded, which means the master will be restarted and the previous running red LED pattern is now replaced by a heartbeat pattern.



Press the menu View Log and verify the master is restarted with version 0.8.7 in the log text:

```
12:24:20.318: TEST_MODE_SET: MASTER: Data=[F0-00-00-01-00-00]
12:24:20.318: VERSION_ANS: MASTER: FIRMWARE VERSION=0.8.7 Channel=EU_SINGLE, RadioAddress=101483,
12:24:20.319: DEBUG_TEXT_INF: MASTER: Text=TestMode= 1 Value1=0 UHFA Master: Aug 13 2013, 18:35:23,
```

Step 2. **Important:** Now you must click the menu [Update Firmware Online], and you will see a dialog with the latest firmware – here 3.1.53 (Faller customers will see version 2.1.53)



Again press the menu View Log (if it not already is open) and verify the master is updated to version 3.1.53 (Faller customers will see version 2.1.53)

```
12:27:18.674: TEST_MODE_SET: MASTER: Data=[F0-00-00-01-00-00]
12:27:18.675: VERSION_ANS: MASTER: FIRMWARE VERSION=3.1.53, Channel=EU_SINGLE, RadioAddress=101483,
12:27:18.675: DEBUG_TEXT_INF: MASTER: Text=TestMode= 1 Value1=0 UHFA Master: Nov 2 2020, 14:01:24, C
```

ATTENTION

The factory firmware reset will only ensure our customers are able to do a real update of the firmware in order to make the system work properly again. Version 0.8.7 is a bootstrap version. The importance is always to ensure the online Firmware Update after the factory reset in order to get the latest and proper running version installed including all the new features, modifications and bug-fixes applied 'on top' of the bootstrap version 0.8.7.

Why does my GT-Xcontrol not 'log in' to the software?

Answer: A connected GT-Xcontrol will not automatically be notified in the foremost part of the userinterface. The connect notification will be visible in the menu Debug --> Show Log.

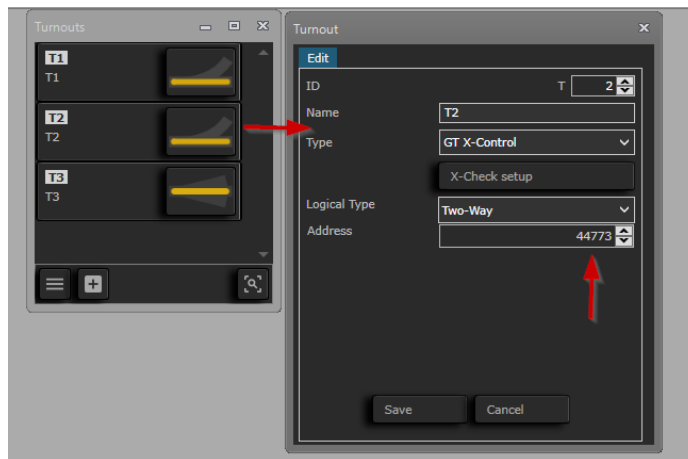
In the right side you'll find all devices connected to the master, here the GT-XControl module:

```
Unit: GOT-Addr '44773', Type: (15) TX_CONTROL
```

In the logview test you will find a corresponding line for this module, as shown here:

```
09:54:48.327: VERSION_REQ: MASTER: Data=[04-00-00]
09:54:48.327: TEST_MODE_SET: MASTER: Data=[F0-00-00-01-00-00]
09:54:48.331: SETUP_REQ: MASTER: Data=[0C-00-00]
09:54:48.331: VERSION_REQ: MASTER: Data=[04-00-00]
09:54:48.331: TEST_MODE_SET: MASTER: Data=[F0-00-00-01-00-00]
09:54:48.331: VERSION_ANS: MASTER: FIRMWARE VERSION=3.1.53, Channel=EU_SINGLE, RadioAddress=101483,
09:54:48.331: DEBUG_TEXT_INF: MASTER: Text=TestMode= 1 Value1=0 UHFA Master: Nov 2 2020, 14:01:24, C
09:54:48.331: DEBUG_TEXT_INF: MASTER: Text= Master=1 I
09:54:48.395: SETUP_ANS: MASTER: FirmwareSelectio
09:54:48.395: VERSION_ANS: MASTER: FIRMWARE VERSION=3.1.53, Channel=EU_SINGLE, RadioAddress=101483,
09:54:48.395: SETUP_SET: MASTER: FirmwareSelectio
09:54:48.395: RESTART_MASTER_REQ: MASTER: Software=0, Rad
09:54:48.395: DEBUG_TEXT_INF: MASTER: Text=TestMode= 1 Value1=0 UHFA Master: Nov 2 2020, 14:01:24, C
09:54:48.395: DEBUG_TEXT_INF: MASTER: Text= Master=1 I
09:54:48.406: SETUP_ACK: MASTER: FirmwareSelectio
09:54:52.596: UNIT_CONFIG_INF: 44773: Type=TX_CONTROL
```

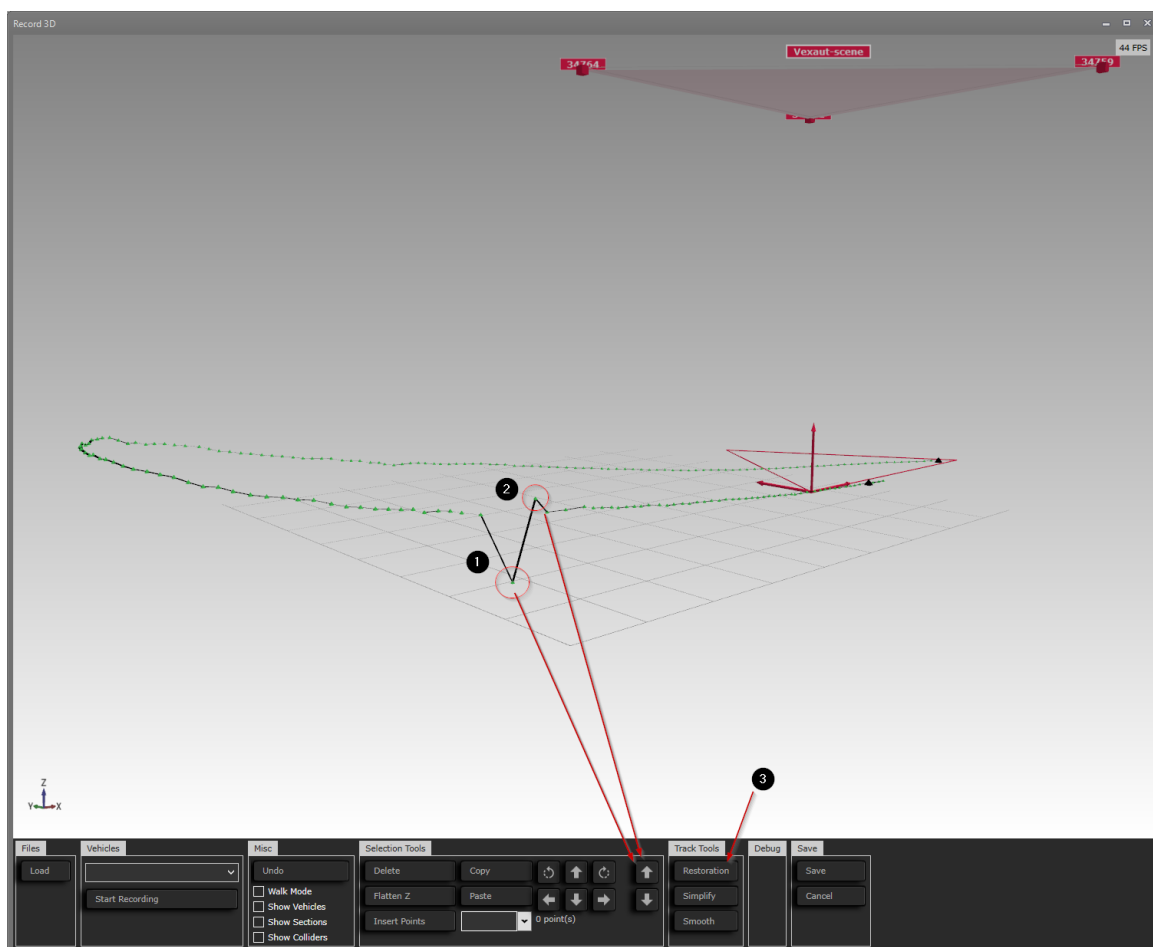
The address of this device (here 44773) must be used when you set up a turnout using this GT-XControl module – like this:



Why does my vehicle suddenly stops driving on the layout?

Answer: When loading the systemfile and examine this in the 3D view a spike is discovered.

This spike can be adjusted to a flat line using the up and down arrows in (1) and (2). Another approach is to click the [Restoration] button to reduce the height of the spike.



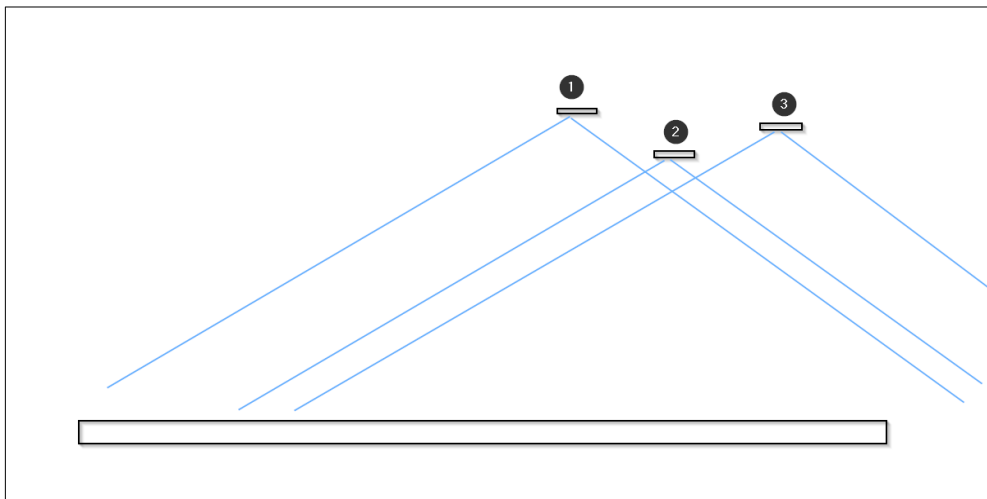
Why do the positions flicker in some areas of the layout?

Answer: First a look at the transducer displayed here:

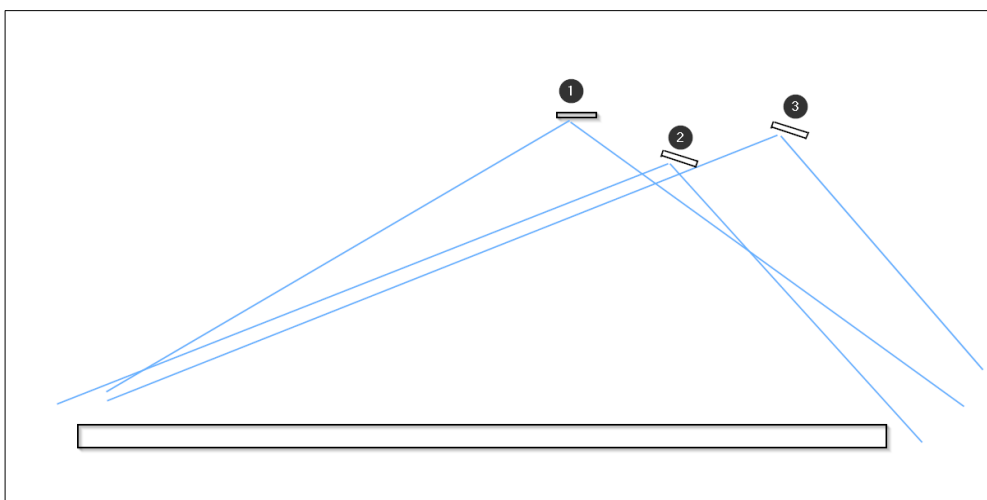


This transducer can receive the ultrasound from inside a certain angle as illustrated here below (blue lines)

Try first with all transducers facing down like shown here.



If this doesn't give you good measurements you can rotate transducer 2 and 3 clockwise a bit, so all the blue cones will cover the layout



Supported Platforms and TCP/IP

PHP: DRAFT – der mangler stadig afklaring om hvor vi skal placere dette!

Arduino

Manual:

http://gamesontrack.eu/gtcommand_download/Manuals/GT-Command%20%26%20Arduino.pdf

Zipped arvhive with both Arduino software and manual:

http://gamesontrack.eu/gtcommand_download/Arduino/GOTArduino.zip

Positions (TCPSENDPOS)

https://wiki.rocrail.net/lib/exe/fetch.php?media=got:gt-position_ip_interface_setup_uk.pdf

AutomationServer

http://gamesontrack.eu/gtcommand_download/Manuals/AutomationServer.pdf

iTrain

<https://www.berros.eu/en/itrain/systems.php>

RocRail

https://wiki.rocrail.net/doku.php?id=got:got-en#gt-position_ip_interface

Appendices

Version history

Version	Description	Date
2021.2.614.0	Initial version	14. jun 2021

Abbreviations

Abbreviation	Description
GOT	GamesOnTrack
IPS	Indoor Positioning System
GPS	Global Positioning System
RSSI	Received Signal Strength Indicator. This is measured in [dBm]
SATELLITE	Receiver
SENDER	Transmitter
MASTER	GT-XConnect / Faller Car System Digital Master

Templates

Reference table

References	
1	Daniel A. Russell, 2019:
2	Wikipedia, 2019:
3	

Info boxes

ATTENTION

Example text...

TIP

Example text...

Code

```
Example text here...
```