GPS issues

No GPS signal is being received from iGrade.

Symptoms:

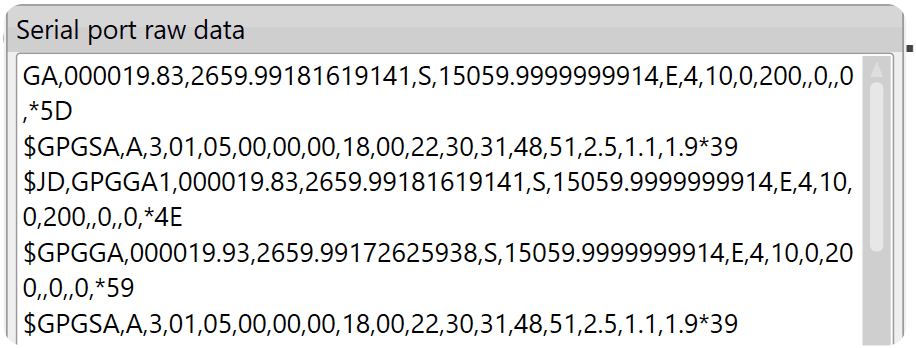
Tractor position icon not appearing on map-screens.

‘GPS info’ button in the bottom right of map-screens is red.

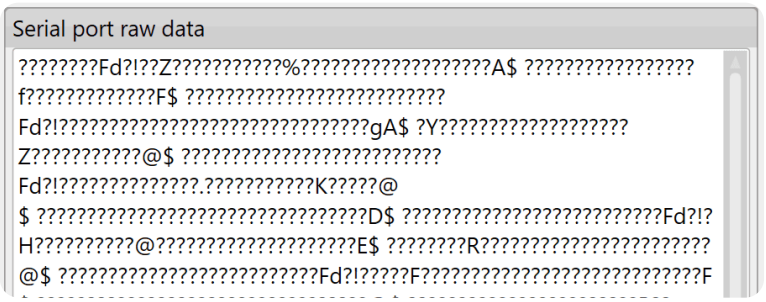
In the ‘Settings’ window there are no characters streaming into the ‘Serial port raw data’ window in the ‘GPS Port Settings’ tab.

Symptoms of incorrect baud:

Incorrect baud rate settings are identifiable by viewing the incoming data in the window provided in the GPS setting tab.



Incorrect baud looks like:



Causes:

The port for the GPS to T3RRA software may be closed.

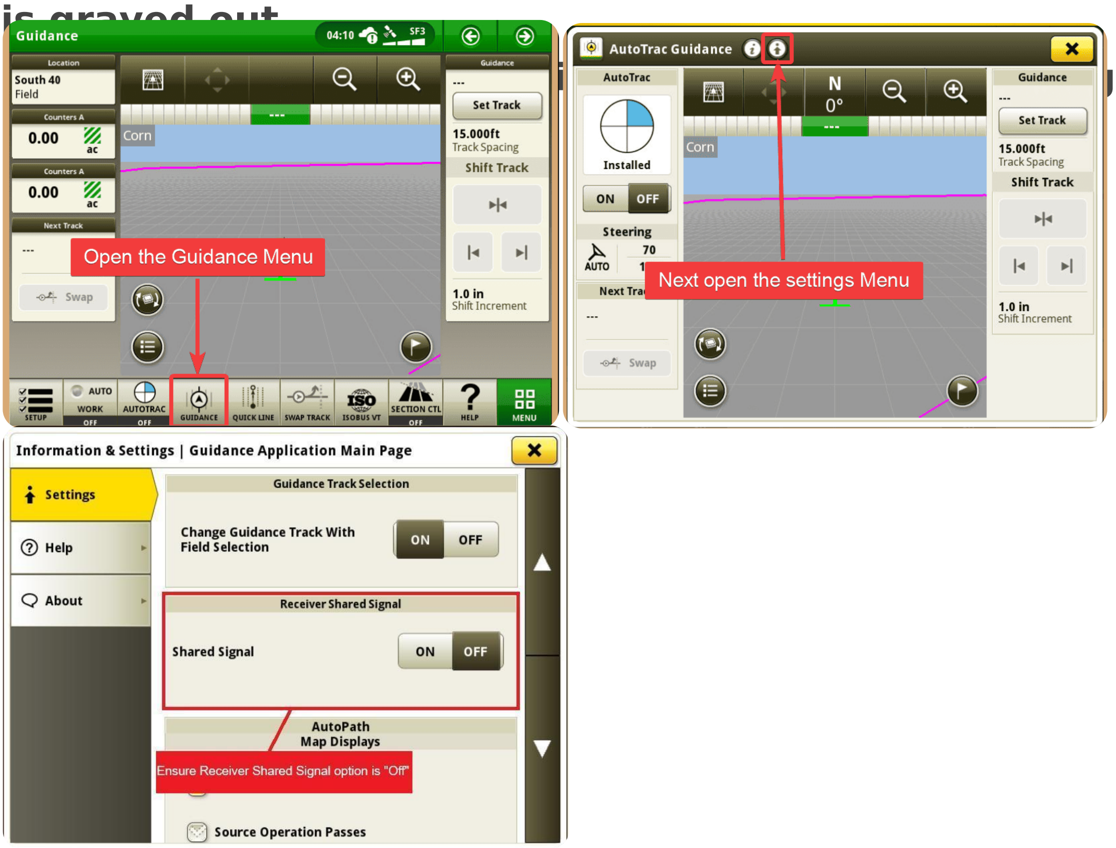
Signal sharing is causing iGrade to lose Gps

Drivers for tablets serial port or USB-to-serial port may not be up-to-date.

Cables may not be seated correctly.

Solutions:

1. **Ensure all Windows updates are performed.**
2. **Open the GPS info screen by pressing on the GPS button in the bottom right of the Collect or Apply step. Confirm that you have an RTK GPS signal and that the Open Port button is grayed out**
3. **gs**



4. Confirm USB-to-serial cable's driver is up-to-date if applicable (refer to 'Access to the port 'COM X' is denied'. for instructions on how to update driver)
5. Confirm harnessing is correctly installed using AE3166 to connect T3RRA to iGrade app controller or AE3070 to T into receiver for surveying without iGrade.
6. Perform a continuity check on the iGrade harness to make sure the pin configuration is correct and the cable is not damaged.
7. **Check settings in both iGrade and T3RRA (iGrade and T3C need identical Baud Rate):**

IMPORTANT: **When using T3RRA Products with iGrade you must configure the serial settings in "**iGrade Settings**". You only need to configure the serial port in "**Receiver Settings**" if you are connecting directly to the StarFire (as you might do when you are surveying in a Gator for instance).**

In iGrade UCC1:

- **Select Main Menu**
- **Select Control Selection**
- **Select Serial Port Setup**
- **Baud Rate – 38400**
- **NMEA – GGA, GSA**
- **NMEA Rate – 5 Hz**
- **Set Last Altitude - Off**

Power cycle the UCC1 controller (note that the controller may have been connected to constant power, and so a key off/on may not be sufficient to power cycle the controller).

In T3RRA (using iGrade UCC1):

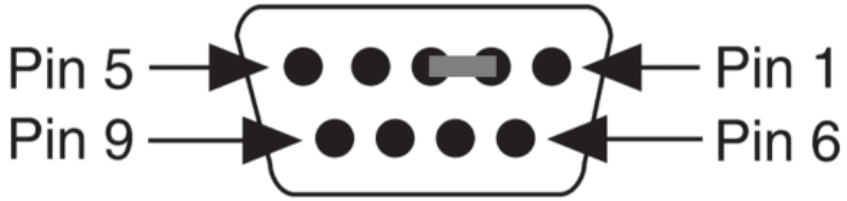
- **Open T3RRA program and go to Settings > GPS Port Settings**
- **Set 'COM Port' to the correct port**
- **Set Baud rate to 38400**
- **Select Ok button**

Testing Serial harnessing.

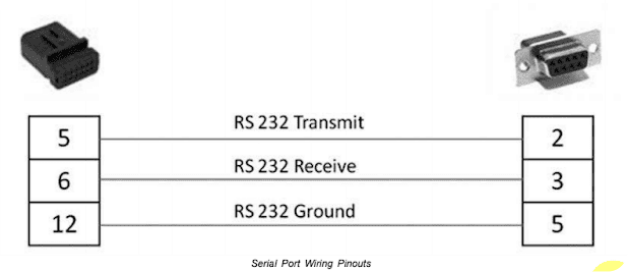
The most reliable way to confirm correct serial port harnesses operation when using T3RRA Products is to utilise the Port data window and use a testing method called Serial Loopback.

A loopback test can verify the operation of serial communication by sending and receiving data from the same serial port. It can show problems in the serial port, the cable, or the software generating the messages without having to connect to third party hardware.

VERY CAREFULLY! **connect the transmit (TXD) signal to the receive (RXD) signal pins 2&3 on the serial port connector. Or pins 10&3 on the JD SF Receiver connector. Or Pins 5&6 on the iGrade connector.**



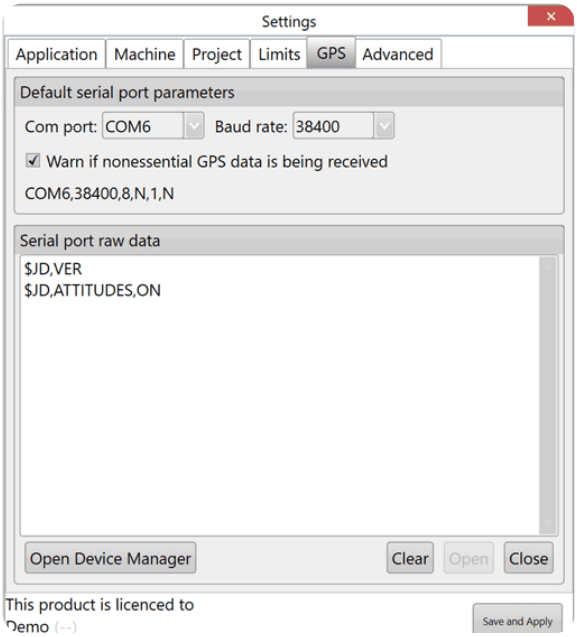
Pin Number	Circuit Code	Function
3	933	TX1 (SF to Aux)
7	070A	Power Ground
10	936	RX1 (SF from Aux)



Serial Port Wiring Pinouts

While these pins are connected, press the Open Port button.

The serial port raw data should populate the messages as indicated below, this would indicate both the send and receive pins are working correctly and the harnessing is connected correctly.



No GPS signal is being received when connected directly to a GPS receiver.

Symptom:

The Tablet PC running T3RRA Software is connected directly to GPS but it is not receiving a GPS data stream.

Cause:

There are two potential causes of this problem.

1. **The GPS receiver is not properly configured to output data via serial.**
2. **The cable between GPS and tablet is not connected or defective.**

Solutions:

1. **Check your receiver settings to ensure the correct data strings are being sent to the appropriate port.**
   a. **NMEA GPGGA @ 5 Hz**
   b. **NMEA GPGSA @ 5Hz**
2. **Check your receiver settings to ensure that the baud rate in use matches that expected by your T3RRA software. The rates configured in each must match.**
3. **Check your cabling.**
4. **Perform Windows updates.**

If connecting to a StarFire receiver directly with a T harness (AE3070 from AgExpress), confirm harnessing is correctly installed for surveying without iGrade.

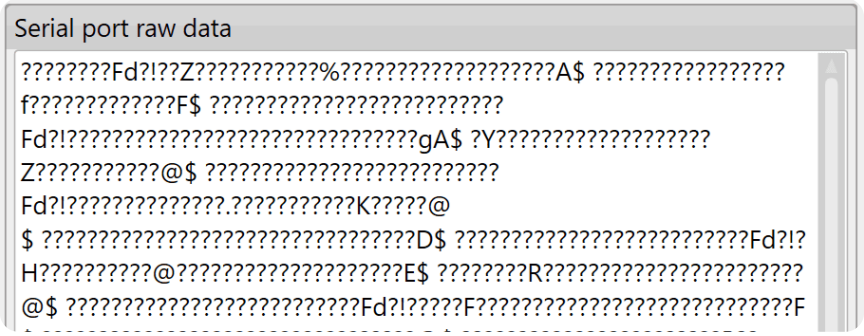
To test if T3RRA software is at fault when no serial data is being received from iGrade it can be helpful to close the T3RRA software and use another independent program to read and display the serial data. One such program is‘RealTerm’

https://realterm.sourceforge.io/ . If you can successfully display incoming iGrade data in a serial terminal program it rules out a bad serial cable or incorrect settings on iGrade. If you are receiving valid text strings in such a program take special note of the port settings (Baud rate, and COM port number). These will be the same ones needed in T3RRA software.

Baud rate is set correctly but messages from iGrade are still garbled.

Symptoms:

Baud rates are set correctly on both T3RRA software and in iGrade. The T3RRA software is not receiving GPS and the GPS lligible data stream.

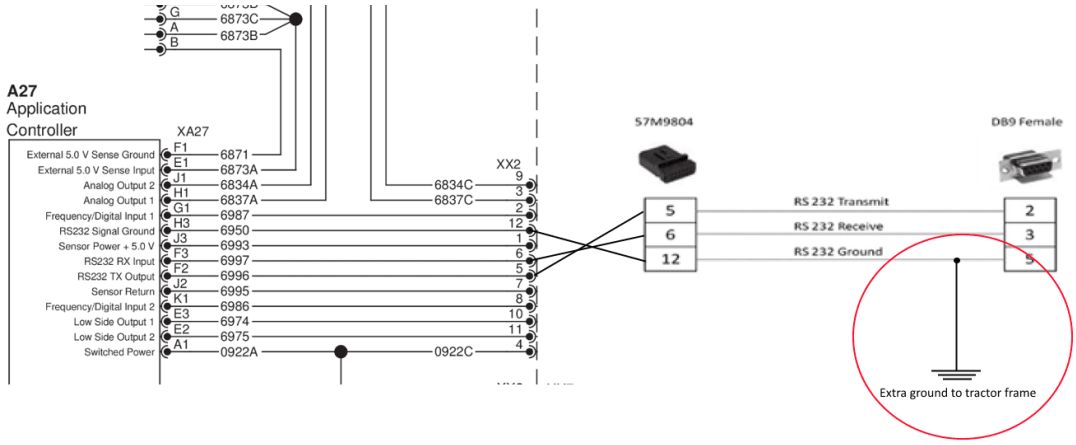


Causes:

The serial connection is not properly grounded. Pin 5 is disconnected or connected to the wrong pin at the other end of the cable.

Solutions:

Carefully check the remote control cable and the iGrade harness. Ensure that the ground wire is properly grounded. In at least one case we have had a user report that an additional grounding wire was required as shown below.


A27
Application
Controller
XA27
External 5.0 V Sense Ground
External 5.0 V Sense Input
Analog Output 2
Analog Output 1
Frequency/Digital Input 1
RS232 Signal Ground
Sensor Power + 5.0 V
RS232 RX Input
RS232 TX Output
Sensor Return
Frequency/Digital Input 2
Low Side Output 1
Low Side Output 2
Switched Power
F1 6871
E1 6873A
J1 6834A
H1 6837A
G1 6987
H3 6950
J3 6993
F3 6997
F2 6996
J2 6995
K1 6986
E3 6974
E2 6975
A1 0922A
G 6873C
A 6873B
B
XX2
6834C 9
6837C 3
2
12
1
6
5
7
8
10
11
4
0922C
57M9804
5
6
12
RS 232 Transmit
RS 232 Receive
RS 232 Ground
DB9 Female
2
3
5
Extra ground to tractor frame

Vertical Performance Issues (GPS drift).

Symptoms:

Blade seems to drift throughout the day. When grading over an area of the field that is thought to be ‘finished’ the blade consistently begins to either cut or fill. For larger sudden jumps in elevation, see Sudden Vertical Shifts.

Possible Cause:

- **Using SF6000 and SF3000 receivers together as a base and rover, or as tractor and implement.**
- **Base is configured as a Quick Survey base when using iGrade.**
- **Poor GPS availability throughout the day.**
- **Base station in a non-ideal location.**
- **Base station being interfered with by passing vehicles.**
- **High VDOP values are shown by T3RRA Software.**

Solutions:

- **ALWAYS look for correlations with something that is happening in your vicinity when the issue is occurring. If the issue always happens at a certain time, or in proximity to buildings, trees, powerlines or other features then**

troubleshooting options can be narrowed.

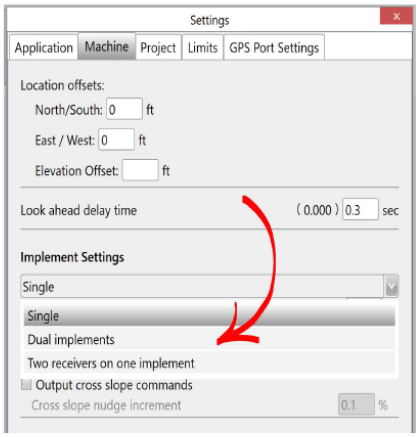
- **If using a 3000 receiver on the implement, John Deere recommends using an external antenna.**
- **John Deere recommends not mixing Receiver generations, as Base-Rover or as Machine-Implement configurations.**
- **Ensure the base is always configured as an absolute base when using iGrade.**
- **You must ensure Signal sharing is turned off in AutoTrac settings when using iGrade.**
- **Check GPS conditions at http://satpredictor2.deere.com/address. GPS conditions may be non-ideal, shift activities to bulking work until the GPS constellation improves.**
- **Use a mobile base and place it as close to the working area as practically possible.**
- **Move the base away from obstructions (building, vehicles, trees) and higher off the ground.**
- **Tune iGrade hydraulic thresholds.**
- **If you notice that degraded accuracy consistently occurs at certain times of the day there may be unavoidable satellite/atmosphere conditions. Try and schedule bulking work for this period, leaving high accuracy finishing grading for other periods in the day.**

Dealers are encouraged to file a John Deere DTAC case if vertical accuracy issues are not solved using other recommendations in this guide.

No GPS in T3RRA Cutta v1 when using dual scrapers in iGrade v1.

Symptoms:

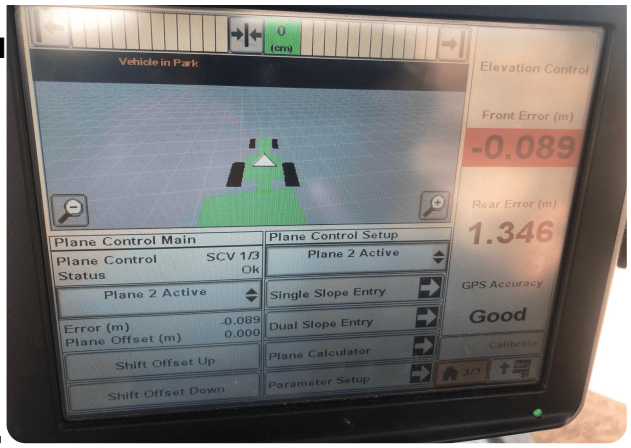
Customer is running dual scrapers on iGrade v1. GPS appears to be present in T3RRA Cutta if only one scraper is configured. Changing to dual scrapers in T3RRA Cutta causes GPS to be lost.



Implement Settings Options:

- Single - one implement (default)
- Dual - two implements connected as front and rear
- Two receivers on one implement - receivers mounted on left and right side of implement with split hydraulics controlling blade heights independently

Cause:

iGrade had been set u 

& SCV3 under the control selection .

Solution:

Change the control selection to “Remote Control” for SCV1 & SCV3 and cycle power.

You are getting GPS data but the quality is not RTK.

Symptoms:

When you open a COM port you clearly see that positional data is being received. However the GPS Info window is displaying a fix other than FixedRealTimeKinematic.

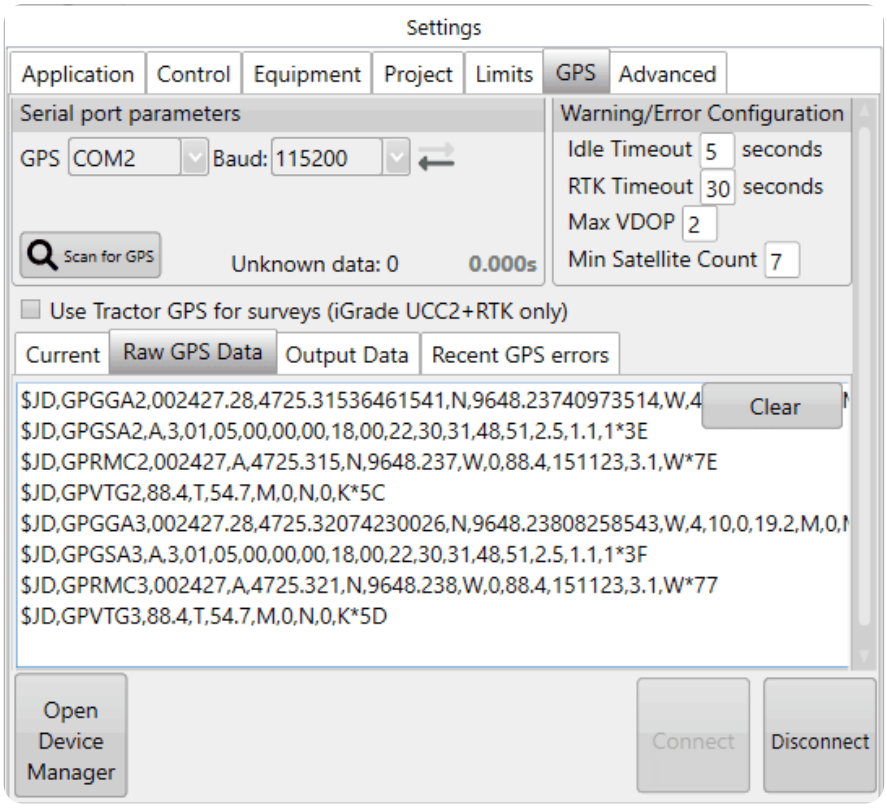
Cause:

1. **You are connected to the wrong COM port. This is possible if your tablet has an internal GPS and you are connecting to its port.**
2. **Your GPS is not receiving RTK correction packets from its base station.**

Solutions:

1. **Check to see that you are connected to the correct serial port.**

2. **There are many reasons a GPS may not be receiving correction packets from its base station. Check your GPS documentation for solutions.**



GPS data stops and COM port number has changed.

Symptoms:

The position stops updating and it is apparent that position data is no longer being received. When you open the ‘GPS Info’ window it is apparent that the COM port has changed to a different port from normal. The regular port may or may not be there. If it is there and you change back to it everything is ok, but the problem may intermittently continue to occur.

Cause:

You are using a USB-to-Serial adapter. It is loose and the connection is randomly lost when the machine vibrates or travels over bumps.

Solutions:

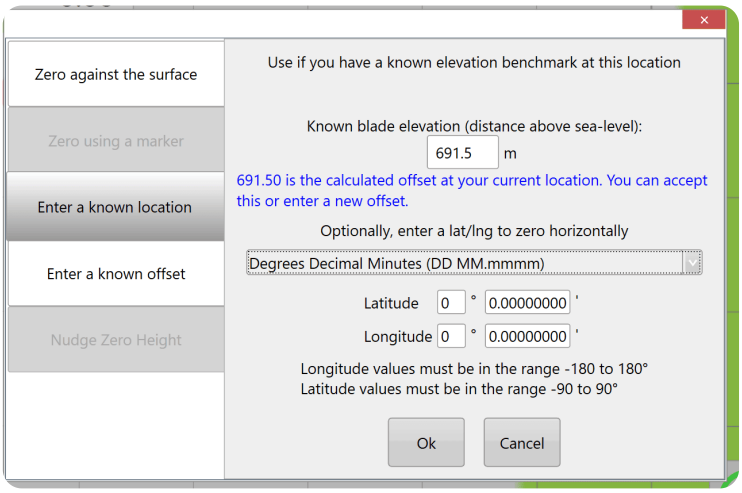
1. **Check connector ends for obvious damage.**
2. **Secure the adapter more securely using cable ties or other restraints.**
3. **Clean the USB metal contacts using contact cleaner and a cotton swab (or similar).**
4. **If the tablet has more than one USB port try the USB-to-Serial adapter in an alternative USB port.**

5. **Replace the USB-to-Serial adapter (please only use an approved FTDI adapter).**

You have bench mark locations but they are not in Latitude and Longitude.

Symptoms:

If you are attempting to calibrate your GPS against a design and you have known bench mark locations you can use the “Enter a known location” option to achieve this. However you may find that your bench mark values do not match any of the formats requested.



Cause:

Your bench mark locations are in an incompatible projection or coordinate system. Commonly they are in UTM easting or northings or similar.

Solutions:

Contact your provider and request the bench mark locations in WGS84 Latitude and Longitude format. If possible, request that they use ‘decimal degrees’.

GPS issues with Windows 11

Issue:

T3RRA having GPS inconsistently operating after updating to Windows 11

Cause:

Out of date COM drivers/ incompatible drivers with Windows 11

Solution:

update USB-RS232 drivers on tablet to restore GPS connection.

Sudden Vertical Shifts/Jumps

Symptoms:

The elevations may suddenly and randomly jump (0.3 to 4m / 1 to 10ft), requiring going back and re-zeroing. This occurs at various times (minute to hours apart), but not predictably. RTK fix is sometimes dropped, but regained in 1-3 seconds, however, the elevations do not return to the original values. For smaller shifts in elevation, see Vertical Performance Issues (GPS drift).

When investigating in detail: In the GPS logs, these jumps only occur at the start of a new second when an RTK correction is applied.

Possible Cause:

- **Base receiver has an intermittent failure.**

Solutions:

- **Update the receiver software of the base and rover.**
- **Swap the base receiver with a working receiver.**