

Issue: 02

Date: 2023/06/02

Document Title:

Gama RTk5 End User Manual

Summary / Scope:

This document is meant to support Carlson End Users as a single go-to document to guide and answer any questions on how to use Gama in combination with the RTk5 tablet. For guidance on how to use the RTk5 tablet in general or SurvPC please consult dedicated manuals.

Reason for Issue:

- Support End Users getting started with Gama and RTk5 product;
- Single go-to document for all questions on how to use Gama with the RTk5.

Distribution:

Suitable for external distribution.

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1 Gama RTK Technology

The Gama RTK Engine (named after famous explorer Vasco da Gama) is Carlson Software's next generation RTK engine.

Gama deploys a range of new technologies to deliver best-in-class performance.

See our <u>Gama RTK White Paper</u> for details on RTK technology and competitive test results.

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2 Gama RTK Engine Registration

Before using Gama you must register with a valid license key.

Step 1) – Double-click Gama GNSS-UI logo on the Windows Desktop.



Step 2) - Click Settings tab and scroll down to "Registration".



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Step 3) – Ensure the device has internet access, type in the Gama RTk5 serial number and click "Register". If you don't have a serial number please request one from your Carlson Software point of contact.

Step 4) – Type in personal details to complete registration and retrieve Change Key – You will need to copy the Change Key from this page, it is not automatic:

Î	Gama Engine Registration	~~ >
:Map contributor	User Name	5000 km 3000 mi
gs	Company Name	21
	Serial Number	Installatio
	Email Address	Satellites
	Phone Number	Update
-	Account Number	Registrat
-	Reason for Install	Uni
	Initial Installation (including upgrades from previous ve $\ \checkmark$	Modu
	I have read and agree to the terms of the <u>End User</u> <u>License Agreement</u>	Serial
	SUBMIT REGISTRATION	Chang
	CLEAR	Netwo

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	Complete Registration ×
	Gama Engine Registration
5000 km 3000 mi	Map contributo
24	Gama Engine Registration successful
Installatio	Change key сору
Configura	User:
Satellites	Email:
Update	Fax: Account Number:
Registrati	Gama Engine Serial Number:
Uni	Transaction ID. Date: February 6, 2023, 9:07 am
	Print This Page
Modu	
Serial	User Information
Chang	User:
Netwo	Company:
	Phone:
	Copy Change Key before closing OK

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Step 5) – Apply Change Key to complete registration. You should see the Web UI show "Registered" status and blue check boxes on the multiple modules.

Registered		
Modules	 Basic RTK North America 	
Serial Number		
	Turregister	

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3 Updating Gama

Gama can be updated either via the WebUI with an internet connected device, or via a downloaded bin file from the Carlson website.

The preferred method is to allow the WebUI to update itself via the "Check for Updates" button.

Alternatively, *special circumstances* may require usage of the "<u>Upload .bin File</u>" using an update bin.

dol 🕼	Lul Status	≢ Settings
Installation		
Configuration		
Satellites		
Update		
Sensor	Firmware	
Navigation	Gama-v1.0.7 🗹	
GNSS Sensor	1.32	
🚯 Check for Up	odates 🔓	Upload .bin File
	Factory Reset	

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3.1 Updating Gama via Check for Updates

Step 1) – Ensure the RTk5 is connected to the Internet.

Step 2) – Open Gama Web UI using the Desktop icon (alternatively open a browser on the RTk5 tablet and type in 127.0.0.1).



Step 3) - Click Settings tab and scroll down to "Update".

En Status						
nstallation						
Configuration						
Satellites						
Update						
Firmware						
Gama-v1.0.7 🗹						
1.32						
-c F	Lipload hin File					
Factory Reset						
	Firmware Gama-v1.0.7 1.32					

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Step 4) – Click "Check for Updates".

Step 5) – The resulting dialog will either display the current firmware is up-to-date, or if there's a new update.

Installatio	'n		Configu	figuration	
Configura Satellites	Firmware Up-to-da	ate ×	Update	New Firmware Available	
Update	Currently installed Gama-v1.0.7 is up-to-date!		Se Na GN	Sense New version available: Gama-v1.0.7 Navig Do you want to update? GNSS This operation can not be undone.	
Navig	gation	Gama-v1.0.7 🔼		No Yes	
GNSS	5 Sensor	1.32			
	Check for Updates	🔓 Upload .bin File		Tactory Reset	

Step 6) - To proceed with the update, select "Yes."

Step 7) – Wait until update procedure finishes.

	Sensor	Firmware	
Jpdate	Navigation	Gama-v1.0.4	
Sensor	Processing		
Navigation		Gama-v1.0.4	
	ng		
Processi			
Processi			

Step 8) – Once update finishes it will automatically restart and the Web UI will show up again with the new firmware version. You can then use Gama normally via the Web UI or with SurvPC.

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3.2 Updating Gama via Manually Downloaded Bin File

Step 1) – Request Gama update .bin file from your Carlson Software point of contact.

Step 2) – Open Gama Web UI using the Desktop icon (alternatively open a browser on the RTk5 tablet and type in 127.0.0.1).



Step 3) - Click Settings tab and scroll down to "Update".

	dol 🕼	🔟 Status	幸 Settings			
Inst	Installation					
Con	Configuration					
Sate	Satellites					
Upd	ate					
	Sensor	Firmware				
	Navigation	Gama-v1.0.7 🗹				
	GNSS Sensor	1.32				
	Check for Updates	L	Upload .bin File			
	1	Factory Reset				

Step 4) – Click "Upload" button on the Web UI and select the update file.

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Step 5) – Wait until update procedure finishes.

	Sensor	Firmware		
Jpdate	Navigation	Gama-v1.0.4	_	
	Processing			
Sensor				
Navigation		Gama-v1.0.4		
Processi	ng			

Step 6) – Once update finishes it will automatically restart and the Web UI will show up again with the new firmware version. You can then use Gama normally with SurvPC or via the Web UI.

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4 Using Gama with SurvPC

Always make sure you have the latest version of SurvPC 7. To connect SurvPC to Gama follow these steps:

Step 1) - Ensure you have the GNSS antenna correctly connected to the RTk5.

The GNSS antenna connector is the left SMA connector on top of the device:



RTk5 ships with Tallysman 3972XF and Harxon CHX-602A.



Tallysman TWI3972XF



Harxon HXC_CHX602A

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Step 2) – Open SurvPC 7.

Step 3) – Click "Equipment" on the top menu and then click "3 GPS Rover".

🔍 🛐 ЈОВ:NEWJOB			
Eile Equip Survey	COGO Road BIM		
1 Total Station	6 Localization		
2 GPS Base	Z Monitor/Skyplot		
3 GPS Rover	8 Tolerances		
4 GPS Raw Only	9 Peripherals		
<u>5</u> Configure	0 GPS Utilities		

Step 4) – Under manufacturer select "Carlson" and pick "RTk5" under model.

GPS Rover			
Current		Receiver	RTK
Manufacturer:	Carlson		- • •
Model:	RTk5		•
	BRx7		
	BRx6+		
	BRx6		
	BRx5		
	NR3		
	Rx5		
Load	Flex G2		
	RTk5		

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Step 5) – Check the model of your antenna. RTk5 ships with Tallysman 3972XF and Harxon CHX-602A.

Step 6) – Click "Receiver" on the top menu and make sure you have the right antenna type selected. By default the RTk5 tablet will be shipping with the Tallysman TWI3972XF.

GPS Rover	Ĩ	
Current	Receiver	RTK
Antenna Type:		● <u>V</u> ert ○ <u>S</u> lant
Antenna Height:	0 ft Abs. 10.0n	nm
Elevation Mask:	10	•
Position Rate:	5 Hz	▼
	Advanced	

Step 7) – To enable raw logging for post-processing in SurveyGnss: Click "Advanced" and ensure "Log Raw Data to Receiver" is checked.

Advanced	
✓ Log Raw Data to Receiver	
Readings Per Point:	1
Send file after config	No File Selected!
Configure NMEA Output	Configure Constellations

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Step 8) – Click "RTK" on the top menu to configure your base station correction stream.

Step 9) – Click the green check button to setup connection between SurvPC and Gama.

Receiver	RTK
lector GSM or Wifi	
sten	▼
▼	
RTCM V3.2	
ntions	
en	
	Receiver

Step 10) – If raw data logging was enabled, give the raw log file an appropriate name. **Ensure that the name is unique, as a raw recording cannot be appended to, it will always overwrite!** SurvPC opens this file as a Stop+Go file, meaning points recorded in the survey routines will be given event markers which indicate the start and stop of an occupation. These event markers are critical for post-processing. SurvPC will command the recorded data to update the antenna height whenever it's modified.

🔍 Log Raw Data File		
Free Memory: 557.2557Gbyt	es	
🖌 New File:	rtk5testing	
Existing:	testjobr.njs	
Antenna Height:	0	m

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Step 11) – Use SurvPC as normal. If recording data intended to be used for post-processing, ensure best-practices are followed.

Average GNSS						
SATS:15/34 Status:FIXED)		Hsdv:(0.015m V	sdv:0.01	8m
Average Requirements						
🖌 Min. Measurement count				10		
Time in minutes				30.	.000	
Standard Deviation			H:	0.020	V:	0.030
Redundancy Sessions:		1				
	Time Delay:	20.00	Ν	Vinutes		Linearanaia Visionaiaa Visionaiaaa Visionaiaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
Configure	Tolerar	nces		М	onitor/S	Sergi & Sanchi Kanoli Kan

Step 12) - To download raw NJS log, navigate to: Equip -> GPS Utilities -> GPS Raw Utilities.

Click "Close File" to ensure the NJS is properly flushed to the disk.

🔍 GPS I	Raw Utilities		
File:	(logging)		
		Close File	
		File Manager	
Free M	em on Receiver: 557	7.4999Gbytes	

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Step 13) - Click File Manager, select the raw file, and click "Download".

lame	Size(kB)	Modified		Created				
tk5testing.njs	5017	02/23/23	19:56:33	02232023 :	.9:49:11			
Storage Locat	ion:		Interna	al Memory		•	1 files	
Storage Locat Free Memory	ion: : 557.4	873 Gbytes	Interna	al Memory		•	1 files	

Step 14) – Please wait while the NJS file is downloaded to your job folder.

🔍 Files on	Receiver	
Name	Size(kB) Modified	Created
SurvPC		
	Downle	oading Log File
		15%
		Cancel
Free Memor	y: 557.2490 Gbytes	
		Download Delete

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Step 15) – Perform a Data Transfer of the job to removeable media e.g. USB Flash Drive.

File → Export → Data Transfer
[Set Folder]
[Copy Current Job to Folder]

🔍 Data Transfer		X
	Man	ual Transfer
D:\TEST_DATA_TRASNFER\		
Copy Current Job to Folder		Set Folder
Copy Job to Folder	Include Im	nages

Step 16) – Exit SurvPC.

→ This PC → Data (D:) → TEST_DATA_TRASNF	ER > rtk5testing		
Name	Date modified	Туре	Size
	2/23/2023 12:05 PM	File folder	
📄 rtk5testing.crd	2/23/2023 11:53 AM	CRD File	1 KB
🖻 rtk5testing.dxf	2/23/2023 12:05 PM	AutoCAD File	2 KB
👼 rtk5testing.inf	2/23/2023 12:04 PM	Setup Information	5 KB
📄 rtk5testing.jat	2/23/2023 11:43 AM	JAT File	0 KB
📄 rtk5testing.jdb	2/23/2023 12:05 PM	JDB File	300 KB
📄 rtk5testing.jdb-shm	2/23/2023 11:43 AM	JDB-SHM File	32 KB
📄 rtk5testing.jdb-wal	2/23/2023 11:53 AM	JDB-WAL File	395 KB
🗃 rtk5testing.njs	2/23/2023 12:04 PM	NJS File	4,902 KB
rtk5testing.not	2/23/2023 11:53 AM	NOT File	1 KB
tk5testing.rw5	2/23/2023 12:03 PM	RW5 File	2 KB
🚳 rtk5testing.sys	2/23/2023 12:04 PM	System file	1 KB

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5 RTk5 GNSS Antennas

RTk5 ships with Tallysman TWI3972XF and Harxon CHX-602A.

The Tallysman antenna is meant for highest accuracy on-the-pole surveys while the Harxon can be directly attached to the RTk5 for extra flexibility and convenience (no survey pole required). Both antennas are graded for high precision RTK accuracy but the Harxon is more susceptible to suffer from multipath effects.



Harxon HXC_CHX602A

5.1. Tallysman TWI3972XF

The Tallysman antenna assembly consists of 2 elements: 1) the antenna and 2) the ground plane.

To install the antenna follow these steps:

- 1) Insert ground plane through 5/8" thread
- 2) Insert antenna cable through the custom survey pole
- 3) Rotate antenna until tightly attached to the survey pole

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5.2. Harxon HXC CHX602A

In order to achieve high accuracy surveys with the Harxon antenna, it is important to understand how to use the device to avoid unwanted offsets:

- It is fundamental that the antenna is always vertical with respect to the ground
- The position is reported at the antenna reference point (ARP)

Below are 3 acceptable configurations for surveying. The position reported by the system is tagged with an X in the following images.

1) RTk5 is vertical and antenna is vertical



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2) RTk5 is tilted and antenna is vertical



3) RTk5 is flat on a surface and antenna is vertical

Note that in this case the RTk5 measures the height at the surface.



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6 Gama Web UI

5.3. Web UI Introduction

The main purpose of Gama UI on the RTk5 is to allow:

- 1. Registration of the Gama engine
- 2. Update Gama and Factory Reset
- 3. Support and issue tracking
- 4. Stand-alone tool for using Gama without SurvPC

The Gama Web UI is always accessible on the RTk5 by two options:

- 1. Double click GNSS UI icon on the Windows Desktop
- 2. Open a browser and type in 127.0.0.1

The Web UI has 3 main tabs:

- Job
- Status
- Settings



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5.4. Job

Job - Position

Monitor detailed information about the GNSS solution, namely status, value, accuracy, differential correction age.

dol 🕼	Lad Status	æ Settings
Position		Fixed+ RTK ± 0.015 m
Time		14:39:51.40 PM Off by 2.653 s
Position		38° 42' 19.0666" N 9° 10' 42.7183" W ± 0.015 m
Elevation		92.490 m ± 0.016 m
Quality		1.06 PDOP 1 s Latency

Job - Satellites

Monitor satellite sky plot, SNR values and satellite usage status.



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Job - Data Logging

Menu for administrating raw data logging independently from SurvPC.

Under this section you can:

- Open and close log files:
 - o Static
 - Stop+Go
 - Kinematic
- Log NMEA;
- Delete existing log files;
- Download existing log files (in order to download you must first close the file by unchecking the "active box");
- Add "static" and "moving" events to active Stop+Go log files.

You can log multiples files simultaneously. The WebUI is intelligent enough to only add Stop+Go event markers to an open Stop+Go log file.

				Interna	I				
Active	Name	Туре	Status	Size	Events	Created		Modified	Action
~	230206-145214-NMEA	NMEA	-	89.12 KB	0	2023-02-06	5 14:52:35	2023-02-06 14:53:42	<u>*</u>
2	230206-145222-Stop-Go	Stop-Go	Kinematic	601.64 KB	1	2023-02-06	5 14:52:43	2023-02-06 14:53:42	<u>±</u>
	230206-145232-Static	Static	Static	89.84 KB	0	2023-02-06	5 14:52:53	2023-02-06 14:53:01	* *
New Lo	g File								
File Nar	me								
23020	06-145323-Static		Static			~	Internal		~
Rod he	ight Changed								
0				Mete	ers				د ~
Event									
Name	2				Descriptio	n			
				Open					

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5.5. Status

Monitor overall status of the Gama GNSS system and issue track potential problems.

Status – GNSS

Monitor detailed information about the GNSS status and data flow.

Here you can also issue a Reset of the Gama engine.

In this section you can inspect detailed diagnostics about the GNSS system, namely if the receiver is powered on and connected, if it is tracking and receiving observations, if Gama is running correctly, etc.

dol 🔐	Lul Status	幸 Settings
GNSS		
Gama Gama-v1.0.7		Computing 오
Position		Fixed+ RTK ± 0.014 m C ⁴ Engine Reset
Satellites 23 / 34		GPS 7 / 11 Image: Constraint of the second se
Antenna Master		Observations 🤗
		antex modeled connected communication keepalive observations solution
Corrections RTCM3		Receiving 🤡
		communication 🥥 observations 🤡 < 5km
System		

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Status – System

Monitor detailed information about RTk5 CPU, RAM memory and internal storage.



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5.6. Settings

Configure Gama via the Web UI.



Settings – Installation

• Configure antenna type and antenna serial number.

Settings – Configuration

- Configure mode (Rover/Base);
- Set GNSS data rate;
- Set rod height.

Settings – Satellites

• Configure satellite elevation mask;

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- Enable/disable GNSS constellations;
- Exclude satellites.

Settings – Update

- Update Gama engine see section 3 Updating Gama;
- Perform Factory Reset.

Settings – Registration

- Manage Gama engine license and registration
- The Gama-RTk5 license modules are:
 - Basic Allows recording of Raw Data (NJS) and Communication with SurvPC
 - RTK Allows usage of corrections streams to go RTK-Fixed
 - o North America Allows usage of RTK within North America

Settings – Display

• Configure display settings and units (metric/imperial).

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7 Importing to SurveyGNSS

To post-process Gama raw data in SurveyGNSS ensure raw data logging is enabled in SurvPC or via the Web UI.

SurveyGNSS can directly import raw NJS files (SurveyGNSS version 2.3.5 and above), no special procedure is required.

~	Carlson NavJSON [RINEX 3 via nj-ops] (*.njs)
	RINEX Observation(s) (*.??o;*o.rnx) Carlson SurvCE raw data (*.rw5) Carlson BRx Receiver [RINEX 3.04] (*.bin)
	Carlson NavJSON [RINEX 3 via nj-ops] (*.njs)
	Carlson Surveyor+ GNSS Receiver [RINEX 3.04 via NovAtelConvert] (*.log) FOIF A3/A30/F70 Receiver [RINEX 3.02 via TransCMD] (*.f??) Hemisphere Receiver [RINEX 3.04] (*.bin)
	Javad JPS Receiver [RINEX 2 via teqc] (*,jps) Javad Receiver [RINEX 3.04 via jps2rin] (*,jps) Leica MDB/LB2 Receiver [RINEX 2 via teqc] (*.m00;*.lb2)

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8 Troubleshooting

If Gama becomes unresponsive or is not operating as expected follow these steps:

- 1) Open Gama Web UI using the Desktop icon (alternatively open a browser on the RTk5 tablet and type in 127.0.0.1).
- 2) Inspect Status tab on the Web UI and check if all status are OK.

Normally, all status be in blue colour as shown below. You see any item in red continue reading below for troubleshooting.

do L∎	Lill Status	₽ Settings
GNSS		
Gama Gama-v1.0.7		Computing 🥑
Position		Fixed+ RTK ± 0.014 m C ^d Engine Reset
Satellites 23 / 34		GPS 7 / 11 ♥ GLO 7 / 9 ♥ GAL 5 / 7 ♥ BDS 4 / 7 ♥
Antenna Master		Observations 🥏
		antex modeled connected communication keepalive observations solution
Corrections RTCM3		Receiving 🥑
		communication observations 🥑 < 5km 🛛 🗸
System		

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8.1 Antenna or cable connection problem

If antenna shows "No observation data" status (in yellow) but Gama shows "Idle" (in yellow) then double check your antenna connection and cable.

dol 🥵	Lul Status	幸 Settings
5NSS		
Gama Gama-v1.0.5		Idle
Position		Inval C ^e Engine Reset
atellites 0 / 0		GPS 0 / 0 GLO 0 / 0 GAL 0 / 0 BDS 0 / 0
Antenna Naster		No observation data
		antex modeled connected communication keepalive observations solution
Corrections		Receiving
		communication (

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Ensure you have the GNSS antenna correctly connected to the RTk5.

The GNSS antenna connector is the left SMA connector on top of the device:



RTk5 ships with Tallysman 3972XF and Harxon CHX-602A.



Tallysman TWI3972XF



Harxon HXC_CHX602A

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8.2 Internal GNSS receiver connection problem

In the event a Windows update takes control of the built-in GNSS, it will block Gama from establishing a connection to the internal GNSS Receiver.

In this case, the "Antenna" field will show the "Disconnected" status. Please follow these steps to identify and resolve this problem.

Job	Luu Status	幸 Settings
GNSS		
Gama Gama-v1.0.7		Idle 🗢 Unregistered 😮
Position		Invalid
		C Engine Reset
Satellites		GPS 0/0 🙁
0/0		GLO 0/0 😣
		GAL 0/0 😣
		BDS 0/0 😢
Antenna Master		Disconnected 😫
		antex 😣
		modeled 🕴
		connected 🕴
		communication 8
		solution 8
Corrections None		No license module 😫
		communication 8
		observations 😫
		8
System		

Open Windows "Device Manager" (click Start and type "Device Manager").

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If you see "u-blox Universal GNSS" under "Sensors" than your RTk5 has the wrong driver installed. Follow the next steps to resolve the issue.

File Action View Help File Action View Katapters File Action	🛃 Device Manager	—	×
 Image: Security devices Solicon Labs Quad CP2108 USB to UART Bridge: Interface 1 (COM9) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 2 (COM8) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) So D host adapters So D host adapters So D host adapters So So D host adapters So D host adapters So D host adapters So D host adapters So D host adapters Sol D host ad	File Action View Help		
 Human Interface Devices IDE ATA/ATAPI controllers Keyboards Modems Motors Monitors Portable Devices Ports (COM & LPT) Quectel USB NT Port (COM14) Quectel USB DM Port (COM13) Quectel USB NAP Port (COM13) Silicon Labs Dual CP2105 USB to UART Bridge: Enhanced COM Port (COM11) Silicon Labs Dual CP2105 USB to UART Bridge: Interface 0 (COM10) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 1 (COM9) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) So Dhost adapters So Dhost adapters Security devices Sensors 			
 Keyboards Mice and other pointing devices Monitors Monitors Portable Devices Portable Devices Quectel USB AT Port (COM14) Quectel USB AT Port (COM15) Quectel USB NMEA Port (COM15) Quectel USB NMEA Port (COM13) Silicon Labs Dual CP2105 USB to UART Bridge: Enhanced COM Port (COM11) Silicon Labs Dual CP2105 USB to UART Bridge: Interface 0 (COM10) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 1 (COM9) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 1 (COM9) Silicon Labs Quad CP2108 USB to UART Bridge: Interface 3 (COM7) Print queues So D host adapters So D host adapters Sonsors Struktorelectionics 5-Axis Dig tal Accelerometer u-blox Universal GNSS 	Final Human Interface Devices The ATA/ATAPI controllers		^
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	> 📕 SD host adapters		- 11
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STivileroelectronics 5-Axis Digital Accelerometer Universal GNSS	Sensors		
Universal GNSS View Control Co	El STIVicioelectronics 3-Axis Dig tal Accelerometer		
	🔚 u-blox Universal GNSS		
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1) Right click on "u-blox Universal GNSS" and click "Unistall device".

Device Manager		×
> 🙀 Human Interface Devices		
> 📹 IDE ATA/ATAPI controllers		
> 🔤 Keyboards		
Mice and other pointing devices		
> 📲 Modems		
> 🛄 Monitors		- 1
> 🚍 Network adapters		
Portable Devices		
Ports (COM & LPT)		
Quectel USB AT Port (COM14)		
Quectel USB DM Port (COM15)		
Quectel USB NMEA Port (COM13)		
Silicon Labs Dual CP2105 USB to UART Bridge: Enhanced COM Port (COM11)		
Silicon Labs Dual CP2105 USB to UART Bridge: Standard COM Port (COM12)		
Silicon Labs Quad CP2108 USB to UART Bridge: Interface 0 (COM10)		
Silicon Labs Quad CP2108 USB to UART Bridge: Interface 1 (COM9)		
Silicon Labs Quad CP2108 USB to UART Bridge: Interface 2 (COM8)		
Silicon Labs Q(Last of the driver		
SD hort adapter		
Security devices		
Sensors Scan for hardware changes		
STMicroelectrc		
Properties		

2) Click "Uninstall" to confirm.

Device Manager		\times
le Action View Help		
• 🔿 📧 🖼 🖬 🖳 💺 🗙 💿		
Human Interface Devices		^
> The AIA/AIAPI controllers		
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Quectel USB NMEA Port (COM		
Silicon Labs Dual CP2105 USB		
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Silicon Labs Quad CP2108 USE		
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> 🖻 Print queues		
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> 🧱 SD host adapters		
> 🔐 Security devices		
Sensors		
STMicroelectronics 3-Axis Digital Accelerometer		
🔚 u-blox Universal GNSS		

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- 3) Shutdown Windows (do not restart, make sure to shutdown).
- 4) Power on RTk5 and open "Device Manager". You should now see the following:



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8.3 Gama is unregistered

If Gama is not fixing, if you cannot connect SurvPC to Gama, or some features appear disabled (not able to log NJS raw data) make sure Gama is correctly Registered. To Register Gama see chapter 2 - Gama RTK Engine Registration.

Note that Gama may become unregistered due to data corruption or by executing the Fresh Installation procedure on an existing install of Gama, which will delete the active registration from the device.

dol 🕅	Lill Status	≢ Settings
GNSS		
Gama Gama-v1.0.4		Idle 🗢 Unregistered 8
Position		Invalid C Engine Reset
Satellites 0 / 0		GPS 0 / 0 2 GLO 0 / 0 2 GAL 0 / 0 2 BDS 0 / 0 2
Antenna Master		Disconnected 😣
Corrections		No license module 😫
System		

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8.4 Wrong antenna type

If you forgot to set the antenna type or selected a wrong antenna then Gama will not be able to apply antex calibration (causing vertical offsets) and will not be able to correctly model the antenna SNR response (leading to sub-optimal RTK performance).

GNSS Gama Gama-v1.0.3 Computin Gama-v1.0.3 Computin Position Float RTK ± 0.4 C Engine Res Satellites 16 / 28 Satellites Computin GAL 0 / 4 BDS 0 / 7 Antenna Master Corrections Corrections Corrections Communication observations Communication Communica	Job	Lul Status	幸 Settings
Gama Gama-v1.0.3 Computing Float RTK ± 0.40 Position Float RTK ± 0.40 C Engine Rest GPS \$ / 8 Satellites GPS \$ / 8 16 / 28 GLO \$ / 9 Antenna Master Observations Computing antex modeled connected connected connected Corrections Receiving	NSS		
Position Float RTK ± 0.4 C ² Engine Res Satellites GPS 8 / 8 16 / 28 GL0 8 / 9 GAL 0 / 4 BDS 0 / 7 Antenna Observations Master antex modeled connected communication keepalive observations solution Corrections Receiving	ama ama-v1.0.3		Computing 🤇
C Engine Resc Satellites 16 / 28 Antenna Master Observations antex modeled communication keepalive observations Corrections Receiving communication observations	osition		Float RTK ± 0.409
Satellites GPS 8 / 8 16 / 28 GLO 8 / 9 GAL 0 / 4 BDS 0 / 7 Antenna Observations Master antex modeled connected connunication keepalive observations solution Corrections Receiving			C Engine Reset
16 / 28 GLO 8 / 9 GAL 0 / 4 BDS 0 / 7 Antenna Master Observations antex modeled connected communication keepalive observations solution Corrections Receiving communication observations	atellites		GPS 8/8
GAL 0 / 4 BDS 0 / 7 Antenna Master	5 / 28		GLO 8/9
Antenna Observations Master antex Master antex modeled connected communication keepalive observations solution Corrections Receiving communication observations			GAL 0/4
Antenna Observations Master antex modeled connected connected communication keepalive observations corrections Receiving communication communication corrections Receiving			BDS 0 / 7
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Corrections Receiving communication observations			observations 🗸
Corrections Receiving communication observations			solution 6
communication observations	orrections		Receiving
observations			communication <
			observations 🧟

If you confirm you did select the right antenna type but still observe a red indicator for "antex" or "model" then you may be using a new type of antenna that is not yet fully supported by Gama. In this case please reach out to your Carlson Software Support point of contact.

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8.5 Baseline degrading performance

If the selected base has a baseline too long, Gama will perform have sub-optimal RTK performance.

VRS is unique in that the base observations are synthetically generated. Ensure you are within the VRS network.

Corrections RTCM3	Receiving 🤡	Corrections RTCM3	Receiving 오
	communication observations 오 < 5km 📀		communication observations 🕑 < 15km 😔
Corrections RTCM3	Receiving 😑	Corrections RTCM3	Baseline 😣
	communication ♀ observations ♀ > 25km ━		communication < observations < > 45km 😢
Corrections RTCM3	Receiving 🕑		
	communication observations VRS		

Review the selected Base and ensure the distance is an appropriate length.

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8.6 Hard crash

If a hard crash occurred but the Web UI is still responsive, you see should see a status like this:

dol 🙀	Ltd Status	幸 Settings
GNSS		
Gama 20230204.1		No Response 😣
Position		Invalid C Engine Reset
Satellites 0 / 0		GPS @ / @ 🔇 GLO @ / @ 🔇 GAL @ / @ 🔇 BDS @ / @ 🔇
Antenna Master		Disconnected 🙁
Corrections		None 🗢
System		

Follow these steps:

1) Open Windows File Explorer and type in the following path "C:\ProgramData\Gama\logs";

2) Copy all logs and forward them to your Carlson Software Support point of contact;

3) Reboot RTk5 tablet.

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8.7 Web UI unresponsive

If the Gama Web UI is unresponsive, you may observe the following:

dol 🕼	Lill Status	幸 Settings
	.)	
	\cup	

This is expected behaviour after updating Gama. Please wait and refresh (press F5). If the Web UI continues unresponsive, follow these steps:

- 1) Open Windows File Explorer and type in the following path "C:\ProgramData\Gama\logs";
- 2) Copy all logs and forward them to your Carlson Software Support point of contact;
- 3) Reboot RTk5 tablet.

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8.8 Installing Tallysman antenna

The Tallysman TWI3972XF antenna is screwed directly to the pole. There is no need for bolts, neither rubber, only the ground plate is in between the antenna and the pole. Then, you just pick the right antenna from the SurvPC library (TWI3972XF).



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8.9 GNSS Sensor Firmware Out-of-Date

To ensure Gama performs optimally, it is required that the GNSS Sensor be operating within a specified range of firmware (FW) versions.

The current FW version of the internal GNSS Sensor is located on the Gama Web UI update section.

	년 Status	≢ Settings
Installation		
Configuration		
Satellites		
Update		
Sensor	Firmware	
Sensor Navigation	Firmware Gama-v1.0.8 ☑	
Sensor Navigation GNSS Sensor	Firmware Gama-v1.0.8 ☑ 1.32	
Sensor Navigation GNSS Sensor	Firmware Gama-v1.0.8 1.32	

At the time of this document, the latest GNSS Sensor firmware is:

GNSS Sensor: 1.32

If your displayed version is less than the above, the GNSS Sensor FW can be updated by following the <u>Updating Gama procedure</u>.

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