



CONFIGURATION MANUAL

(ENGLISH) (ORIGINAL VERSION)

FIRMWARE UPDATE

CANbus controllers

016-8000-031EN Rev. A





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Preface

This installation manual is intended for persons responsible for updating the SBG CANbus controllers. The manual contains important instructions that should be complied with when commissioning, operating and servicing the SBGuidance system.

This manual has been compiled with the utmost care. SBG Precision Farming assumes no responsibility for any errors or omissions in this document.

Any comments or questions can be sent to service-eu@ravenind.com.

SBG Precision Farming or any of its suppliers will accept no liability for physical or material damage caused whilst using the SBGuidance system.

The installed SBG system produces less than 70dB (A) noise.

This guide uses a number of concepts for extra attention to a few things:



Tip!:

Provides recommendations on how certain activities can be performed much easier.



Please note!:

Indicates certain problems that the user should take note of.



Caution!:

Indicates that the machine can be damaged.



Warning!:

Indicates a risk of injury.

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Disclaimer

-  **Warning!**
Always switch off the tractor before installing or repairing hydraulic and electrical components of the SBGuidance system.
-  **Warning!**
The safety instructions contained in the manuals of the tractor or implements must be complied with at all times.
-  **Warning!**
It is strictly prohibited to use the SBGuidance system on public roads.
-  **Warning!**
It is strictly prohibited to leave a driving vehicle unattended when the SBGuidance system is switched on. The driver is always responsible for the direction and course of the vehicle.
-  **Warning!**
To prevent injury or fire, replace defective fuses only with fuses of the same type and Amperage.
-  **Warning!**
The SBGuidance the operating system is not able to detect and avoid obstacles. If there is an obstacle in your path, you will always need to take action for it to be avoided.
-  **Warning!**
Only allow authorized/qualified persons to operate the system. Authorized/qualified persons are defined as: persons who have read and understood the manual, have been given instructions by a product specialist, and who are both physically and mentally fit and able to operate the system.
-  **Warning!**
In case of system failure or breakdown switch of the tractor and disconnect the electrical power source to avoid further damage. Contact your dealer for further instructions on how to repair your system.
-  **Warning!**
The system contains moving parts! Make sure the immediate environment is clear of people before operating the system.



Warning!

Always wear personal protective equipment when operating/adjusting/repairing the system outside of the tractor cab.



Caution!

In order to prevent power surges from occurring, always start the machine first, before initiating the SBGuidance control system.



Caution!

Only touch the touch-screen with your finger or by using a special touch-screen stylus/pen. Operating the touch-screen with sharp objects may cause permanent damage to the screen.



Caution!

Always consult your supplier as to which products are best suited first before cleaning the touch-screen with chemicals or alcohol.



Please note!

If the terminal is not used for a long period, better remove the terminal from the tractor and store in a heated environment. This will extend the life span of the electronic components.



Please note!







To prevent theft, it is better to not let the terminal and GPS-antenna unattended in the tractor on the field.

1. Overview Controllers












This manual gives an overview of all SBG CANbus controllers (Table 1). A physical controller can be recognized on the CANbus as one or different functions. The installed firmware is defining the function of the controller. The active controllers with corresponding functions can be read out in the tab Flash of the CANTool configuration tool.

Furthermore, the controller update procedure is described.

Table 1 Overview SBG CANbus Controllers






Controller	Function	In tab Flash CANTool shown as
<p>DynamIQ ISO / ISO Raven Steering Controller</p> 	<p><i>Terrain compensation module; measures Roll (lateral hanging), Pitch (forward hanging) en Yaw (heading)</i></p>	<p>When installed on tractor:  Function: VEHICLE_DYNAMIC_STABILITY_CONTROL</p> <p>When installed on implement:  Function: VEHICLE_DYNAMIC_STABILITY_CONTROL</p>
<p>DynamIQ</p> 	<p><i>Terrain compensation module; measures Roll (lateral hanging), Pitch (forward hanging) en Yaw (heading)</i></p>	<p>When installed on tractor:  Function: VEHICLE_DYNAMIC_STABILITY_CONTROL</p> <p>When installed on implement:  Function: VEHICLE_DYNAMIC_STABILITY_CONTROL</p>



<p>STU</p> 	<p><i>Steering controller;</i> responsible for controlling hydraulics and reading in sensors.</p>	<p>When installed on tractor:  Function: STEERING_CONTROL When installed on implement:  Function: STEERING_CONTROL</p>
<p>Actuatorbox</p> 	<p><i>SmartSwitch section control module;</i> responsible for switching power for physical section valves (motor or solenoid)</p>	<p> Function: MACHINE_CONTROL</p>
<p>Switchbox</p> 	<p><i>SmartSwitch section control feedback module;</i> responsible for feedback to Mueller SprayControl S or UniControl S spraying computers</p>	<p> Function: MACHINE_CONTROL</p>
<p>EVC</p> 	<p><i>Electronic Valve Controller;</i> is able to control an existing electronic valve of a tractor. Implement steering can be connected to this valve.</p>	<p> Function: IO_CONTROLLER</p>
<p>STU Slave</p> 	<p><i>Steering controller Slave;</i> responsible for controlling hydraulics of implement steering if the manifold is mounted on the SCV stack of the tractor.</p>	<p> Function: IO_CONTROLLER</p>



Firmware Update I Rev. A I Controllers

<p>IO Controller DynamIQ (ISO)</p> 	<p><i>Sensor input terrain compensation module; responsible for reading in different additional sensors.</i></p>	<p>When installed on tractor:  Function: IO_CONTROLLER When installed on implement:  Function: IO_CONTROLLER</p>
<p>RCU</p> 	<p><i>Remote Control Unit, is able to control a relay to perform an event.</i></p>	<p> Function: IO_CONTROLLER</p>



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2. Firmware update Controller other than DynamIQ ISO

The controller firmware can be updated by using the CANTool.

Use key combination SHIFT + SBGuidance to open the Configurator from the Loader application. Start SBGuidance Configurator and navigate to CAN > CANTool to open the CANTool (Figure 1).

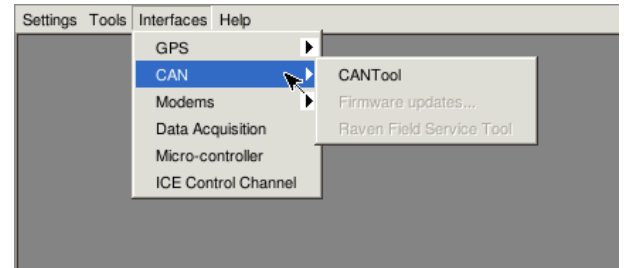


Figure 1 Open CANTool.

Always check the CANTool version as shown in the upper menu bar first. The most recent CANTool version can be downloaded from www.sbg.nl > Dealer > Downloads > Installation & Service. In specific situations, a beta version of the CANTool is needed.

Choose the type of CAN-hardware to setup a connection with the CANbus (Figure 2).

On a Viper 4(+) field computer, choose *VIPER4* at Hardware Manufacturer and choose the correct *Hardware Channel*. If a 'Harness in-cab (Terminal) VPR4' (SBG19711-09) is used choose "1". If a 'Harness, In-cab VPR4 ISO' (11158000064) is used choose "2" and click *Initialize*.

On a GeoSTAR field computer choose *SBG-CAN* at Hardware Manufacturer, Hardware channel *1* and click *Initialize*.

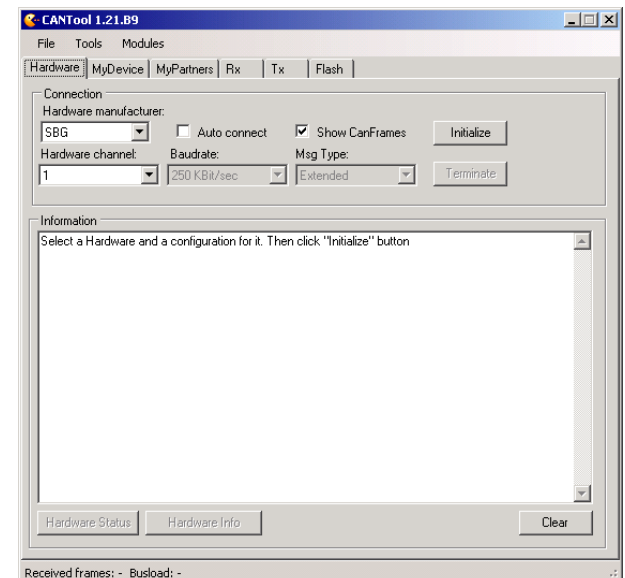


Figure 2 CANTool tab Hardware.



On a GeoSTAR field computer, check the firmware version of the Terminal CAN-module, by clicking the *Hardware Info* button. Check the download page on the website for the most recent firmware and see the *Handleiding – Update terminal CAN-module* for the update procedure.



Please note!

Check the settings of the controller by starting SBGuidance or viewing the settings via the CANTool before updating the controller.

Next, in the tab MyDevice, behind Pre-selection choose *Diagnostic Service Tool* and Type: *Navtronics* (Figure 3) and click *Connect*.

Navigate to the tab Flash (Figure 4). Click *Refresh*. A list with active CANbus controllers is shown (Figure 4). Double click the function you would like to update. In Table 1, an overview of controllers and corresponding functions is shown.

Select the firmware file (*.srec), you wish to install, by clicking the ... button. Click *Flash* to start the update. After the update process is finished, click *Refresh* again and double click the controller to check the firmware version.

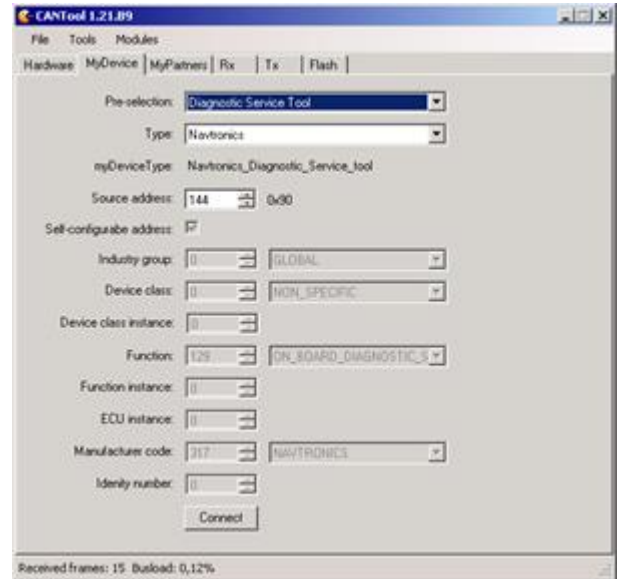


Figure 3 CANTool tab MyDevice.

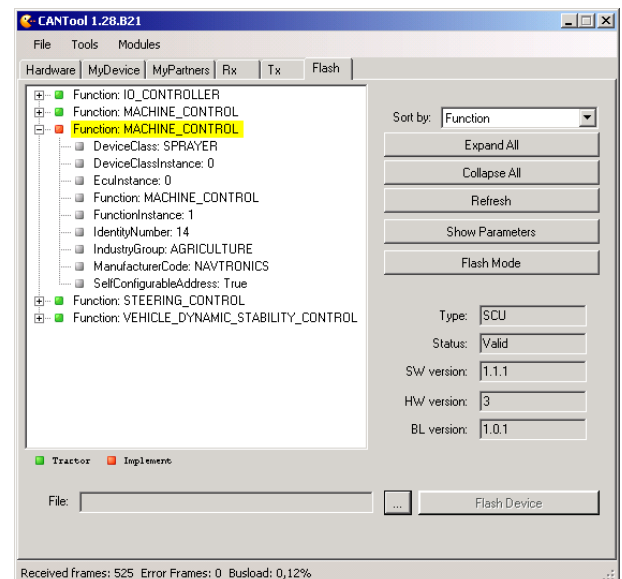


Figure 4 CANTool tab Flash.



Please note!

Check the settings of the controller by starting SBGuidance or viewing the settings via the CANTool.

STU

Check the settings via the CANTool and use the manual control (scrollbar) to test the steering.

DynamIQ

Check the Roll value in SBGuidance. The Roll value may fluctuate some hundredths of degrees while standing still.

Check the settings with the CANTool and choose *Restore defaults* if the DynamIQ firmware version was older than 1.0.0 before the update process was done. See the *Handleiding – Firmware update DynamIQ* as well.

SmartSwitch

Check in SBGuidance if the sprayboom is shown with the correct number of sections. Check the machine settings as well.



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3. Firmware update DynamIQ ISO

Due to the different operating systems installed on a Viper 4+ and a Viper 4/GeoStar, the update procedure of a DynamIQ ISO will be different.

3.1. Update DynamIQ ISO on Viper 4+

On the Viper 4+, the CANTool can be used to update a DynamIQ ISO. Take the following steps to perform the update:

1. Open the SBGuidance Configurator from the SBGuidance Loader (Shift + SBGuidance).
2. Go to *Interfaces > CAN > CANTool* (Figure 1).
3. Choose the correct *Hardware Channel*. If a 'Harness in-cab (Terminal) VPR4' (SBG19711-09) is used choose "1". If a 'Harness, In-cab VPR4 ISO' (11158000064) is used choose "2" (Figure 5).
4. Click *Initialize* (Figure 5).
5. Go to tab *MyDevice*.
6. Select *Raven Field Computer* behind *Pre-selection* (Figure 6).
7. Click *Connect*.

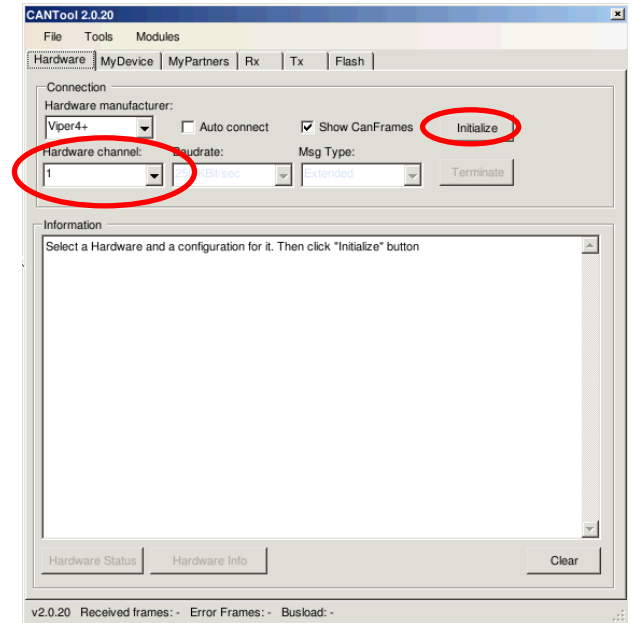


Figure 5 CANTool – Hardware.

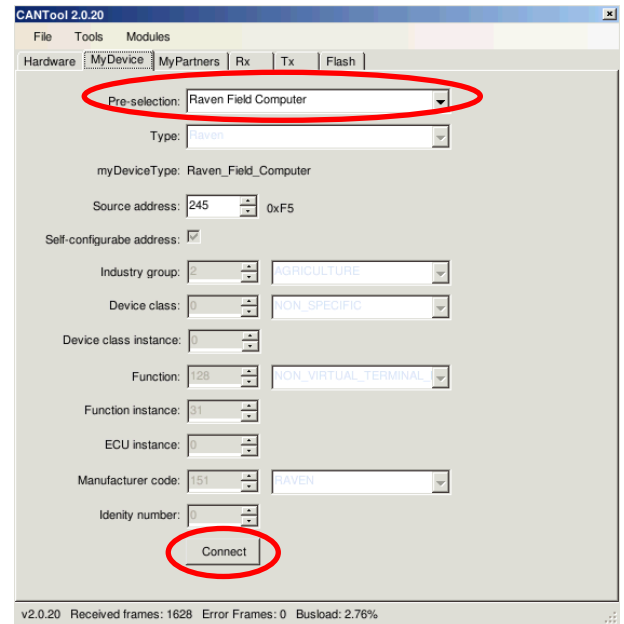


Figure 6 CANTool – MyDevice.



8. Go to *Flash*.
9. Click *Refresh*.
10. Double click
Function: VEHICLE_NAVIGATION. Information about the DynamIQ ISO appears.
11. Click "...". (see red circle Figure 7).
12. Choose *HDD (vfat, sda1)* (Figure 9) An USB drive, depending on the type, can be visualized as *sda*, *sda0*, *sda1* or *sda2*.
13. Go to the correct folder on the USB drive and choose the correct *SGC.hex* file (Figure 8).
14. Click *Open*.
15. Click *Flash Device*. A window (Figure 10) appears.

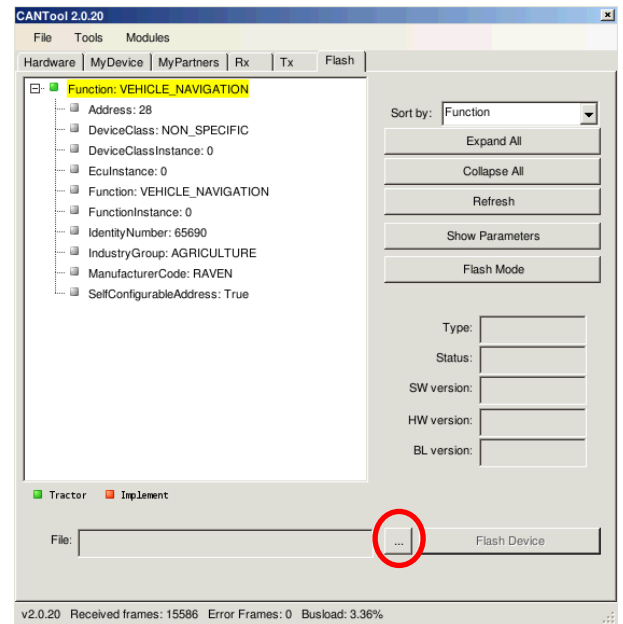


Figure 7 CANTool – Flash.

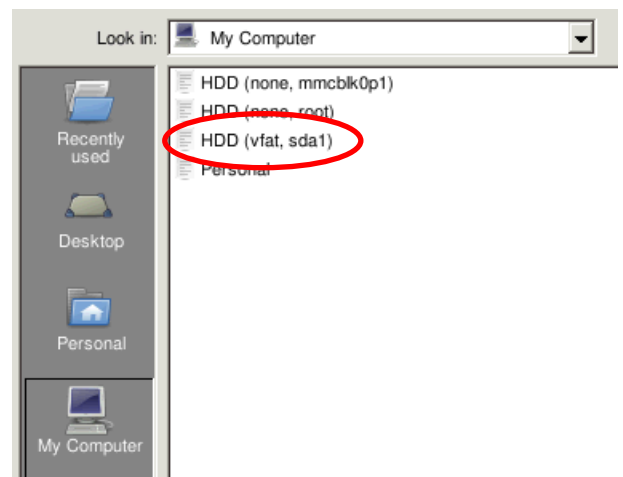


Figure 9 CANTool - USB Drive.

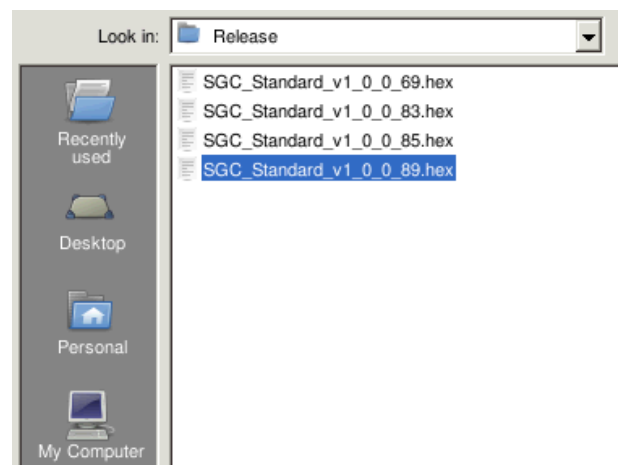


Figure 8 CANTool - .Hex file.

16. Click on *Flash Device* in the Raven ISO Programmer (Figure 10). The *Status* will change to *BL_ERASING* and to *BL_PROGRAMMING*. Wait for the *Status* to indicate *BL_COMPLETE_ACK*, the update is finished now.
17. Shut down the Raven ISO Programmer tool.
18. Take the following steps to check the firmware version of the DynamIQ ISO:
 - a. Go to *MyDevice*.
 - b. Click *Disconnect*.
 - c. Choose behind *Pre-selection* for *Navigation Controller (Tractor)* or *Navigation Controller (Implement)* depending on the use of a DynamIQ ISO tractor or implement.
 - d. Click *Connect*.
 - e. Go to *MyPartners*.
 - f. Click *Add* behind *IMU DynamIQ* on.
 - g. Check software version (Figure 11).
19. Shut down the complete system. After shut down, start it again. The system should be ready to use.

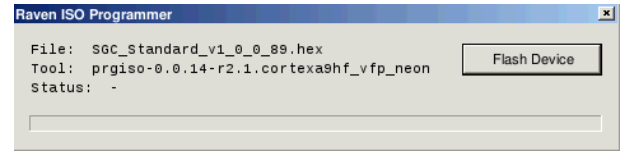


Figure 10 Raven ISO Programmer.

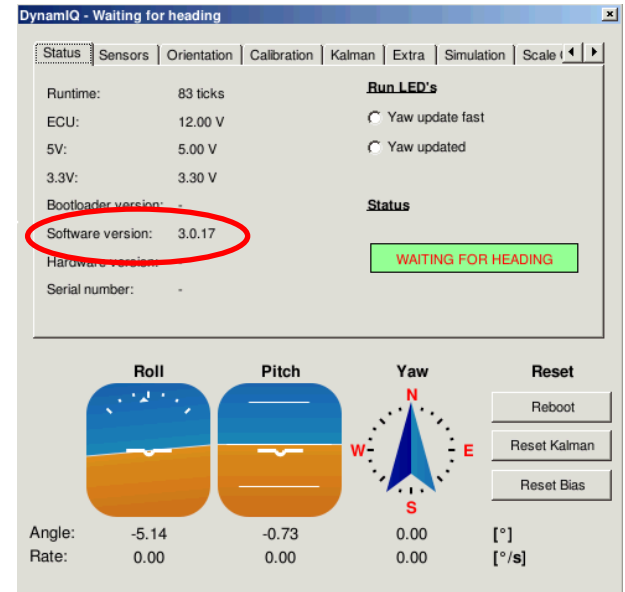


Figure 11 DynamIQ Status.



3.2. Update DynamIQ ISO Viper 4 or GeoStar

To update a DynamIQ ISO module on a Viper 4 or GeoStar, installing a special version of the Raven Service tool, called Raven Field Service Tool is required. This tool is available on the SBG website. Furthermore, SBGuidance version 4.1.57 or higher and CANTool 2.0.24 or higher are required to use this tool.

1. Check the SBGuidance software. This version should be 4.1.57 or higher, if required, update the software with the Update Manager (see user manual Update Manager to do this).
2. Click "Shift + SBGuidance" to open the SBGuidance Configurator.
3. Go to *Interfaces* > *CAN* > *CANTool*.
4. Select the correct Hardware manufacturer and Hardware channel (see Chapter 2).
5. Click *Initialize*.
6. Go to *MyDevice*.
7. Select *Raven Field Computer* behind *Pre-selection* (Figure 12).
8. Click *Connect* (Figure 12).
9. Wait for 6 seconds. The DynamIQ ISO update mode is activated now.
10. Click *Disconnect*.
11. Shut down the CANTool.

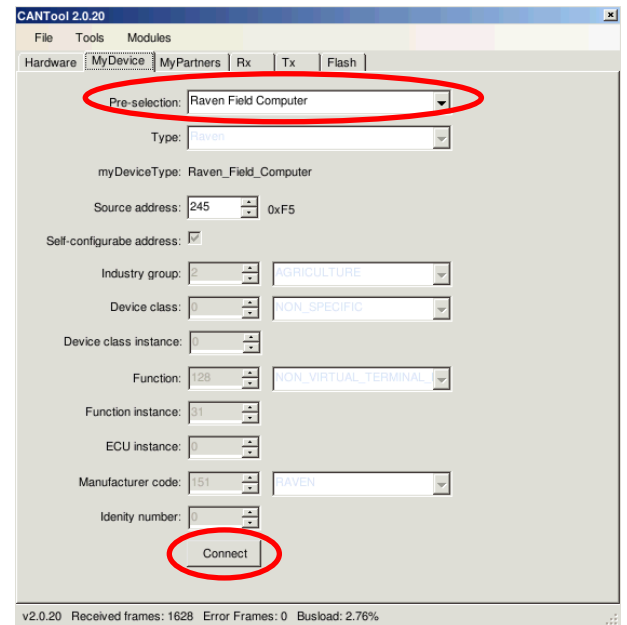


Figure 12 CANTool – MyDevice.

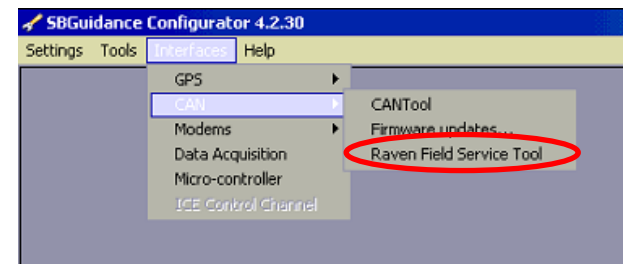


Figure 13 SBGuidance Configurator - Open Raven Field Service Tool.

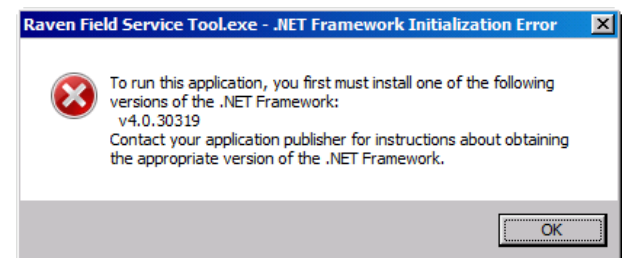


Figure 14 Raven Field Service Tool - Error message.

12. Go to *Interfaces > CAN > Raven Field Service Tool* (Figure 13).
 - a. If you cannot click *Raven Field Service Tool*, go to section 3.3 to install the Raven Field Service Tool.
 - b. If you get a "Raven Field Service Tool .NET Framework" error message (Figure 14), go to section 3.4 to update the .NET Framework.
13. Go to *Interfaces > CAN > Raven Field Service Tool* (Figure 13).
14. Select the correct Hardware Manufacturer and the correct Hardware Channel.
15. Click *Connect* (Figure 15).
16. Click on "... " (see the red circle in Figure 15).
17. Select the latest correct (*SGC.hex*) firmware version on the USB Drive, and Click *open*.
18. Right click on the device with the correct SN number. This SN number is shown on the ISO Steering Controller
19. Click *Program* (Figure 16). The update will start. Wait until the update is finished.
20. Click *Disconnect*.
21. Shut down the Raven Field Service Tool.
22. Open the CANTool.
23. Click *Initialize*.
24. Go to *MyDevice* and Choose behind *Pre-selection* for *Navigation Controller (Tractor)* or *Navigation Controller (Implement)* depending on the use of a DynamIQ ISO tractor or implement.
25. Click *Connect*. Now the DynamIQ ISO is set to the correct SBG settings.
26. Click *Add* behind *IMU DynamIQ*.
27. Check software version (Figure 17).
28. Shut down the complete system, after shut down, start it again. The system should be ready to use.

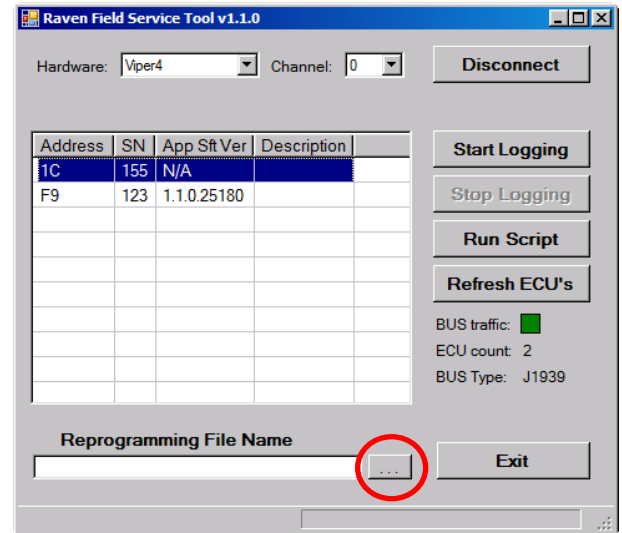


Figure 15 Raven Field Service Tool.

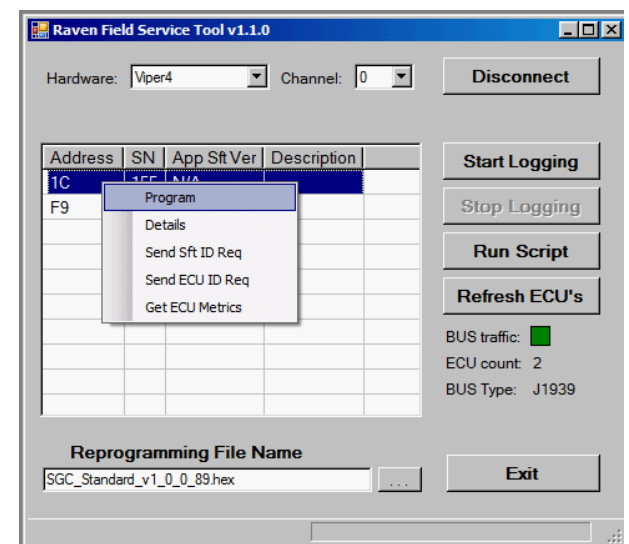


Figure 16 Raven Field Service Tool.

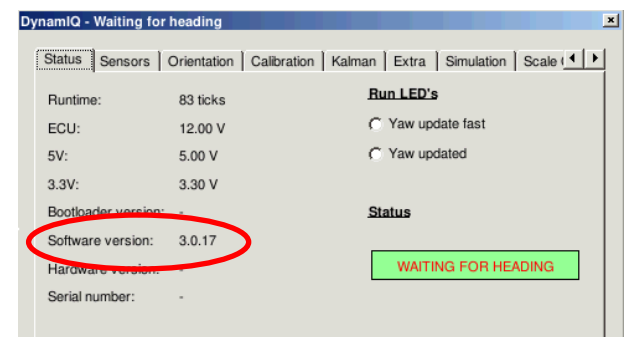


Figure 17 DynamIQ ISO diagnostics.



3.3. Install Raven Field Service Tool

In case the Raven Service Tool is not installed on the Viper 4 or GeoStar field computer. Take the following steps to install the Raven Field Service Tool:

1. On a laptop, paste the *install-rfst-1.2.0.exe* file (available on the SBG website) on your USB Drive.
2. In the SBGuidance Configurator, go to *Tools > Windows Explorer*.
3. Open your USB drive and double click the *install-rfst-1.2.0.exe* executable. An update wizard occurs (Figure 18).
4. Press on *Next*.
5. Press on *Install* (Figure 19).
6. Press on *Finish* (Figure 20). The Raven Field Service Tool will open now.
7. Go back to step 13 of section 3.2.

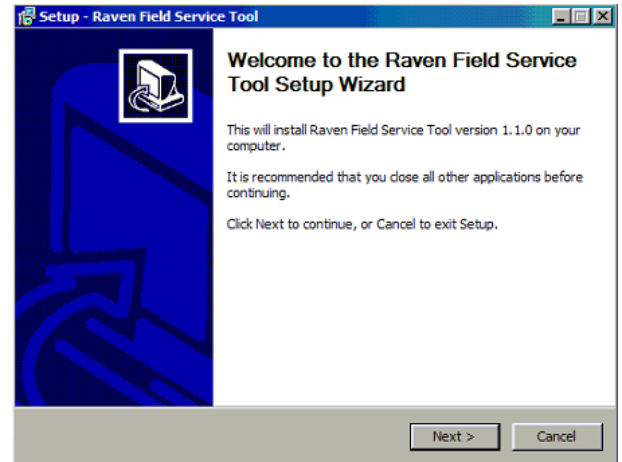


Figure 18 Raven Field Service Tool installation.

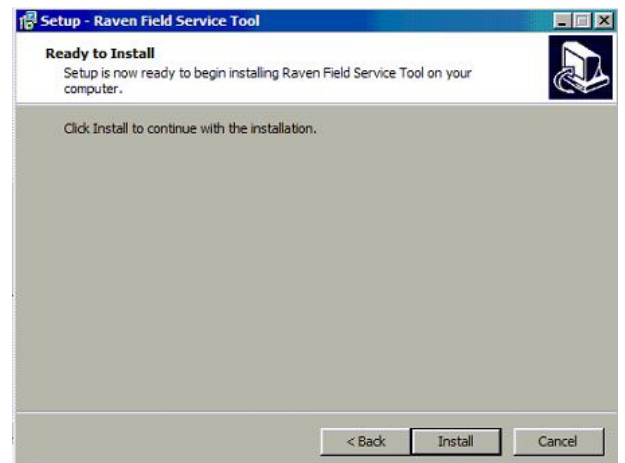


Figure 19 Raven Field Service Tool installation.

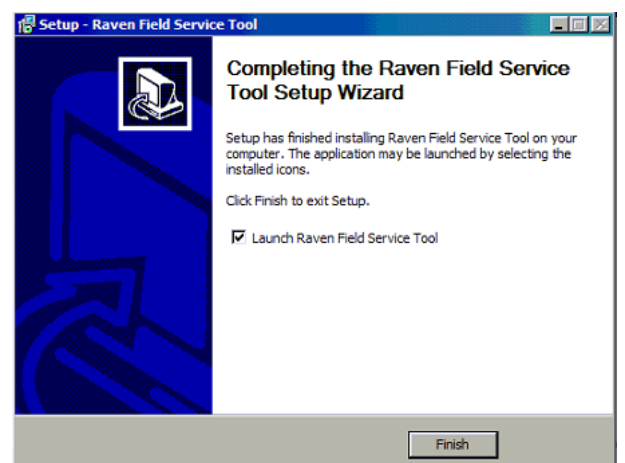


Figure 20 Raven Field Service Tool Installation.

3.4. Update .NET Framework

In case the correct .NET Framework is not installed on the Viper 4 or GeoStar field computer. Take the following steps to update .NET Framework:

1. On a laptop, paste the *dotNetFx40_Full_x86_x64.exe* file (available on the SBG website) on your USB Drive.
2. In the SBGuidance Configurator, go to *Tools > Windows Explorer*.
3. Open your USB drive and double click the *dotNetFx40_Full_x86_x64.exe* executable. The software starts extracting files (Figure 21). This can take a couple of minutes.
4. In the next screen (Figure 22) select *I have read and accept the license terms* and press on *Install*. The installation process starts now and will take about 6 minutes.
5. Press *Finish* (Figure 23).
6. Go back to step 13 of section 3.2.



Figure 21 .NET Framework installation.

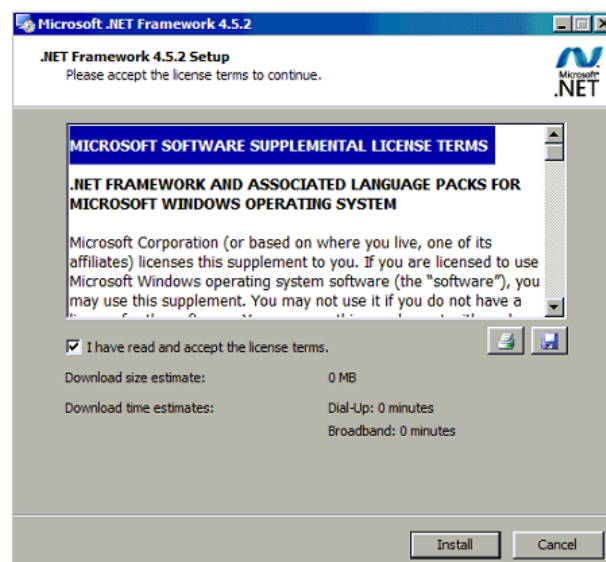


Figure 22 .NET Framework installation.

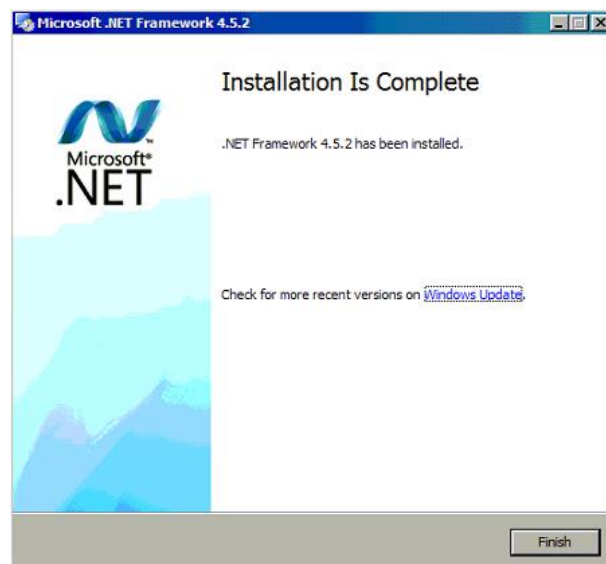


Figure 23 .NET Framework installation.