PLUS+1 GUIDE Service Tool 8.1.2 User Guide

Important User Information

Danfoss is not responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included for illustration purposes. Due to the many variables and requirements associated with any particular installation, Danfoss cannot assume responsibility or liability for the actual used bases on the examples and diagrams.

Reproduction of whole or part of the contents of this PLUS+1 Guide Service Tool User guide is prohibited.

The following notes are used to raise awareness of safety considerations.

Warning	Identifies information about practices or circumstances that can cause a hazardous situation, which may lead to personal injury or death, damage or economic loss.
Attention	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.
Important	Identifies information that is critical for successful application and understanding of the product.
Recommendation	Identifies a typical use of a functionality or parameter value. Use recommendations as a starting point for the final configuration process of the system.

Revisions and references

Revision history

Date	Change	Revision
23 January 2014	Document created	1.0
30 March 2015	Updated for service tool 7.1	1.1
30 March 2015	Updated section for How to download bootloader/application in CLS	1.2
23 October 2015	Updated for service tool 7.2 Updated section for How to download bootloader/application in CLS	1.3
3 February 2016	Updated section for How to download bootloader/application .mlhx files in CLS	1.4
24 June 2016	Updated section How to download, How to Install and How to download bootloader/application to download service tool 7.2.10 from archives. Renamed document to User Guide.	1.5
20 September 2016	Updated for service tool 8.1.2	1.6
21 September 2016	Added sections How to use Parameter File Interface OEM page, How to use Parameter File Interface VPS page and How to use Clone PVED-CLS page.	1.7
04 October 2016	Updated Guidelines for using Parameter File Interface Service pages.	1.7.1
29 March 2017	Updated for 1.98 Rev A and updated screenshots for downloading v8.1.2 from product archives.	1.8

References

Literature
http://powersolutions.danfoss.com
Document: USER MANUAL: License Manager Help PLUS+1 (L1019779 • Rev CA • Dec 2013)

Definitions and Abbreviations

AD	**Analog to digital converter**
AUX	**Auxiliary**
CAN	**Controller Area Network**
CRC	**cyclic redundancy check**
COV	**Cut-off valve**
DTC	**Diagnostic trouble code**
FDA	**Fault Detection Algorithm**
FMI	**Failure mode Identifier**
GMC	**Guidance machine command**
GMS	**Guidance machine status**
MAIN UC	**main micro-controller, the one controlling the proportional valve**
MMI	**Man machine interface**
L2L	**Lock to lock ratio (Number of steering wheel revolution for steering the wheels from max right to max left and vice versa)**
LVDT	**Linear variable differential transformer**
PAE	**Product application engineer**
PGN	**Page group number**
PSM	**Program sequence monitoring**
PVED	**Proportional Valve Electronic Digital**
PVED-CLS	**a special type of PVED being developed for new steering applications**
SAFETY UC	**the micro-controller in the safety related channel, the one controlling the cut-off valve**
SASA	**Steering angle sensor absolute**
SEHS	**Safe EH Steering**
SPN	**Suspect Parameter Number**
STW	**steering wheel**
TBD	**to be defined**
UC	**micro-controller**
VSP	**vehicle speed**
WA	**wheel angle**
WAS	**Wheel angle sensor**

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1. Introduction

1.1 Purpose of the Document

The purpose of the document is to give the guidelines to Download, Install and activate license for PLUS1+GUIDE Service Tool.
By reading this document, anyone will be able to Download, install and activate license the Service Tool.

1.2 System Requirements

Please refer release note.

System requirements

	Service Tool Minimum	GUIDE Minimum	GUIDE/Service Tool Recommended
CPU*	1.5 GHz, 32-bit (x86), 1 core, 2008 or later		3.0 GHz, 64-bit (x64), 4 cores, 2012 or later
OS	32-bit Windows 7		64-bit Windows 7/8/8.1/10
UAC	Local Administrator Access		
RAM	1 GB		3 GB
HD	>1 GB Free, HDD		>2 GB Free, SSD
Resolution	1024 x 768		1920 x 1080
Email	For license registration		
PDF	Any recent standards compliant pdf reader		
XML	MSXML 4.0 Service Pack 2 (Microsoft XML Core Services)		
.Net	N/A	Version 4 (Full) is needed for PLC code support in GUIDE	

* The CPU should be intended for at least laptop use. Processors designed for netbooks, tablets or similar are not recommended.

2. Errata information

The latest errata information is always available on the Danfoss homepage via following link:
HTTP://POWERSOLUTIONS.DANFOSS.COM/PRODUCTS/STEERING/PVED-CLS-INTELLIGENT-STEERING-SUB-SYSTEM/
It contains errata information for:

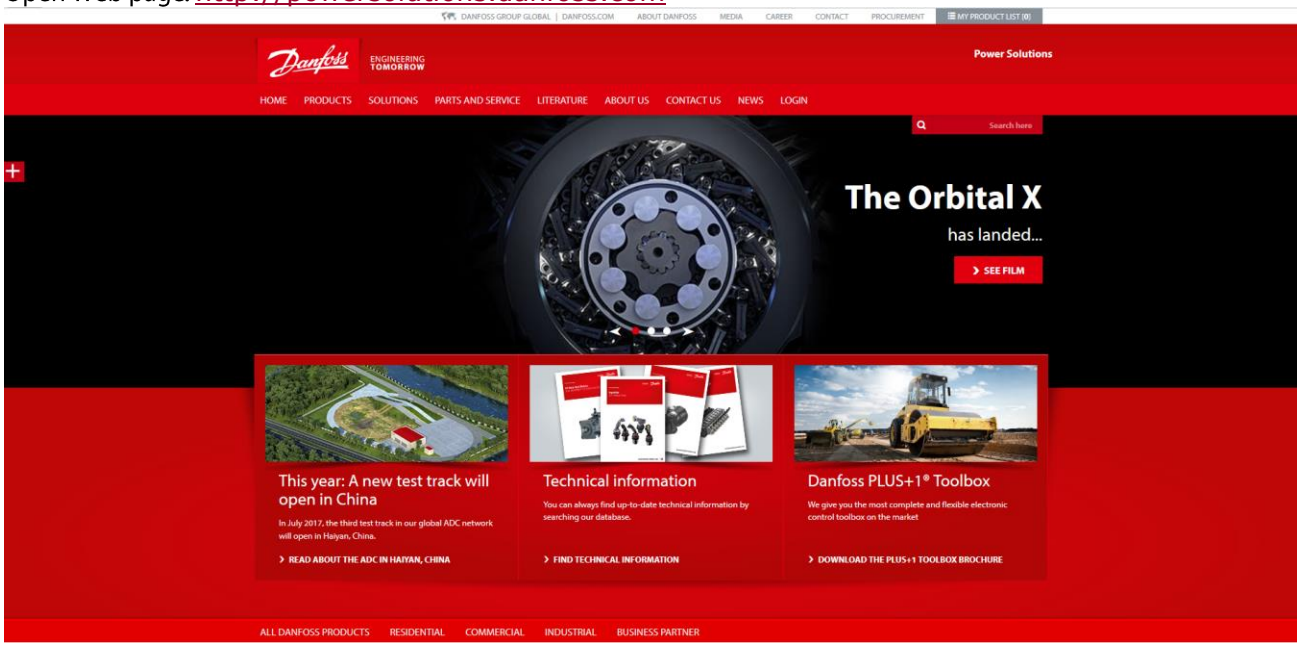
- PVED-CLS boot loader
- PVED-CLS application
- Documentation
- PLUS+1 Service tool
- Other topics related to the steering system

If further information to any errata is required, contact your nearest Danfoss Product Application Engineer

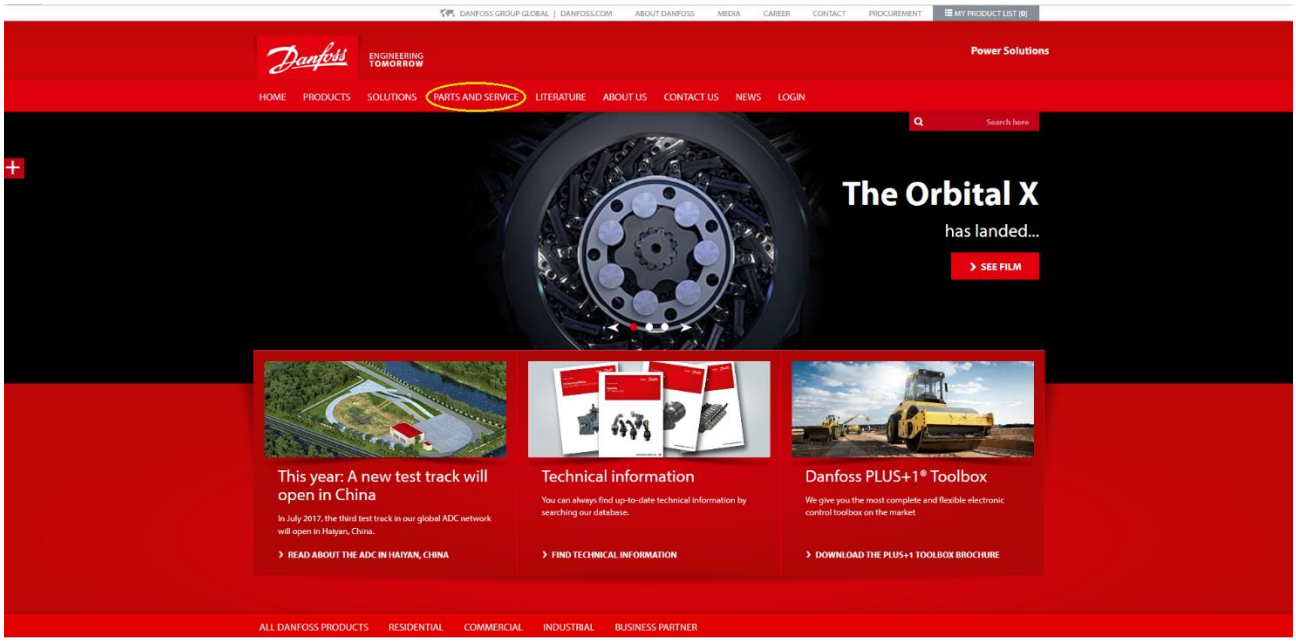
Attention	The system integrator and/or responsible for the target system is advised to periodically observe the errata information as new information will be added as needed.

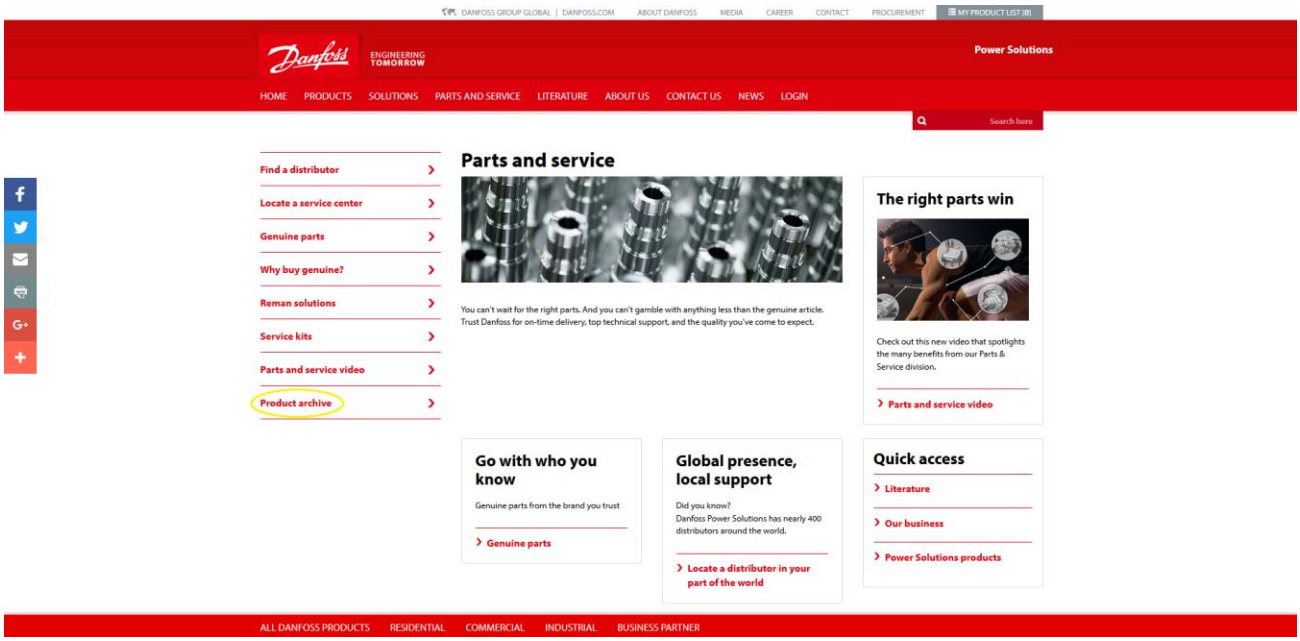
3. How to Download

Open Web page: http://powersolutions.danfoss.com

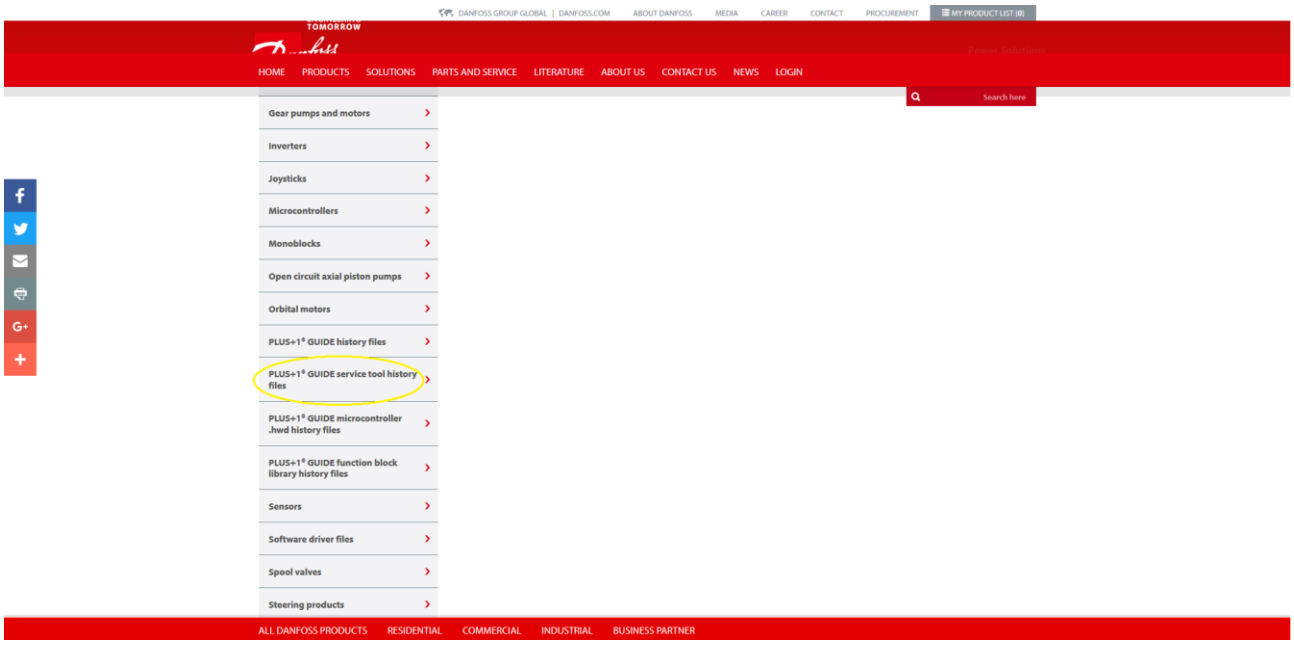


- Click on Parts and Services.

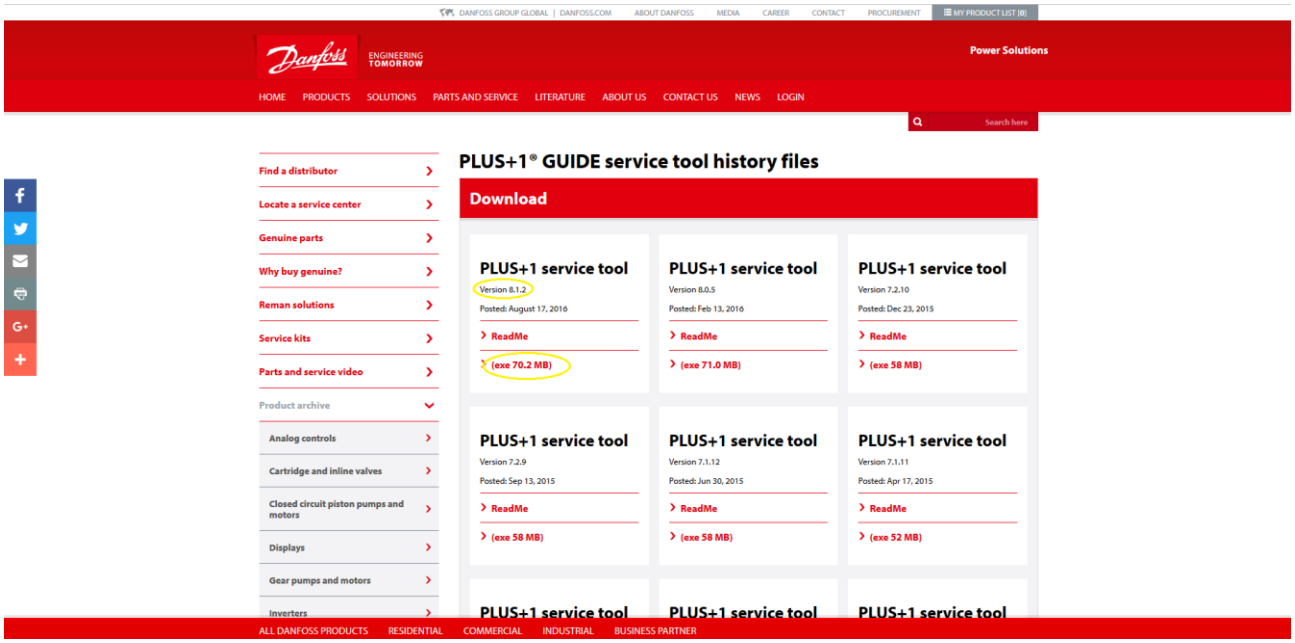




- Click on Product archive.



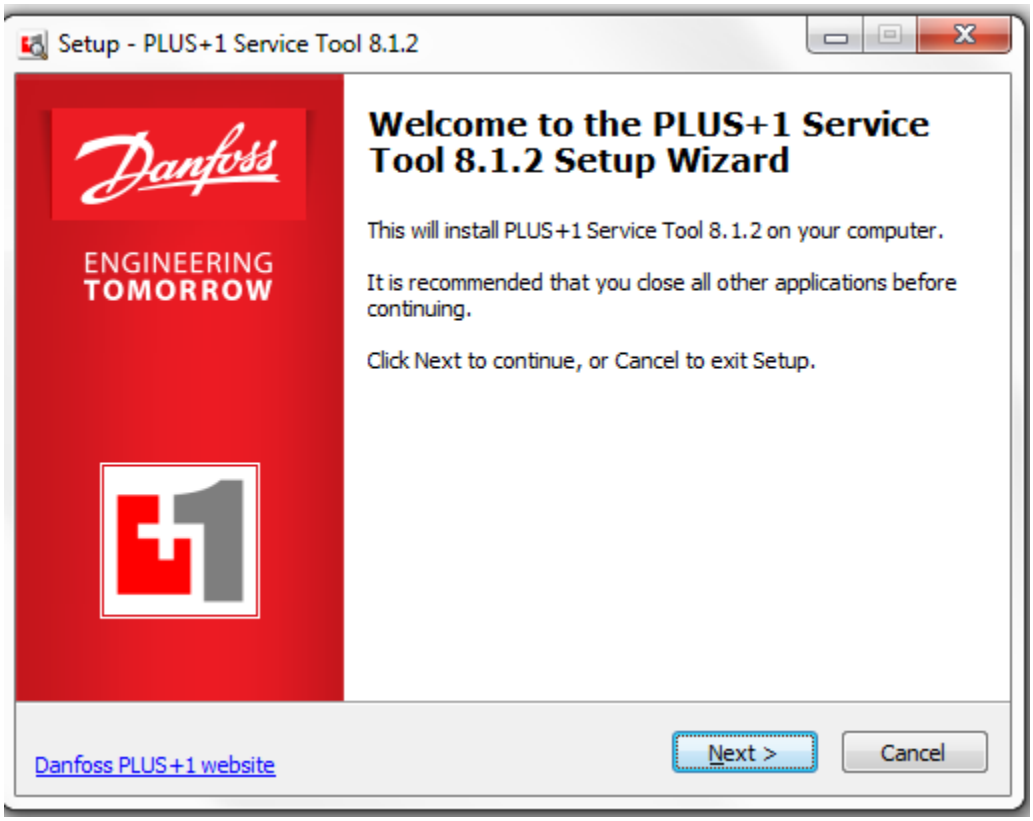
- Click on PLUS+1 GUIDE service tool history files.



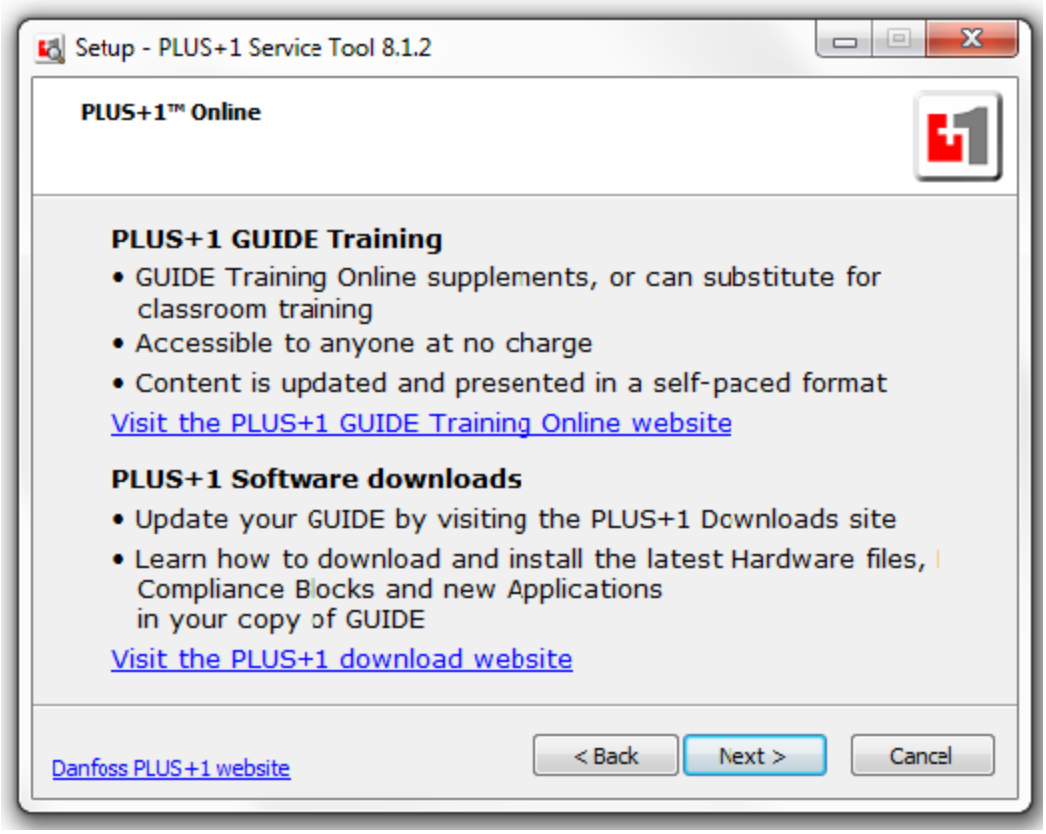
- Click on (exe 70.2 MB under PLUS+1 service tool Version: 8.1.2).

4. How to Install

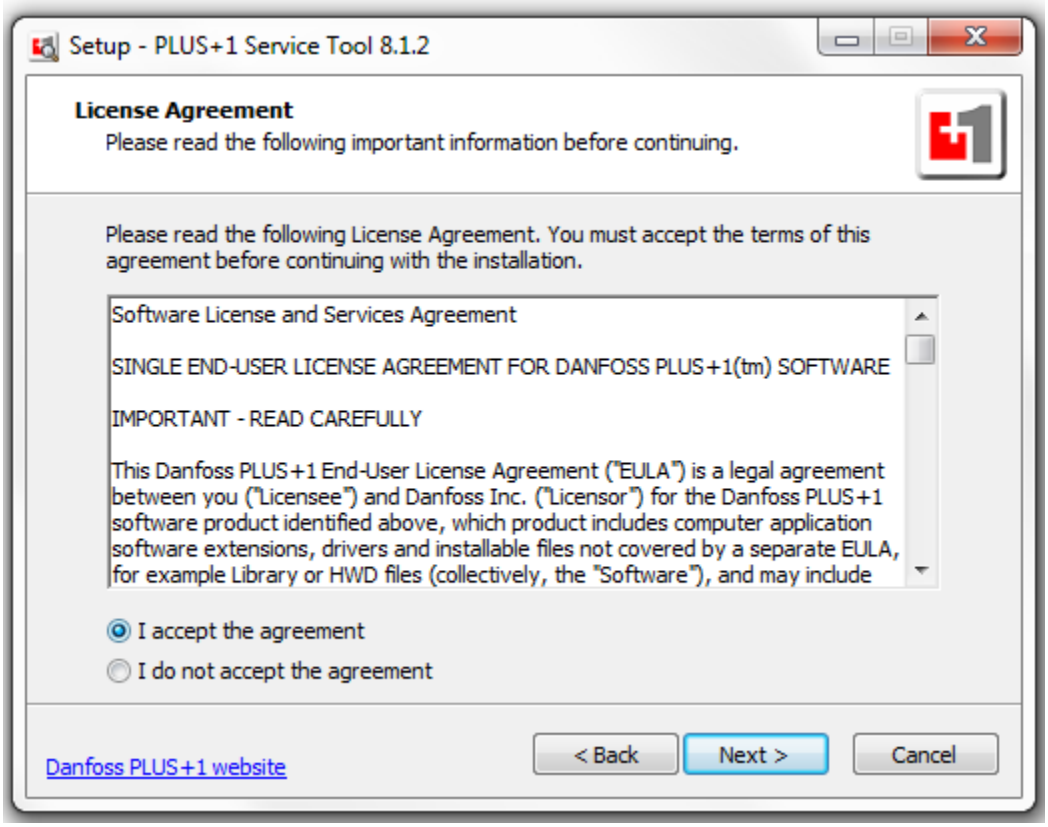
- Double click on setup file: PLUS+1 Service Tool 8.1.2 setup.exe and Click on Run.



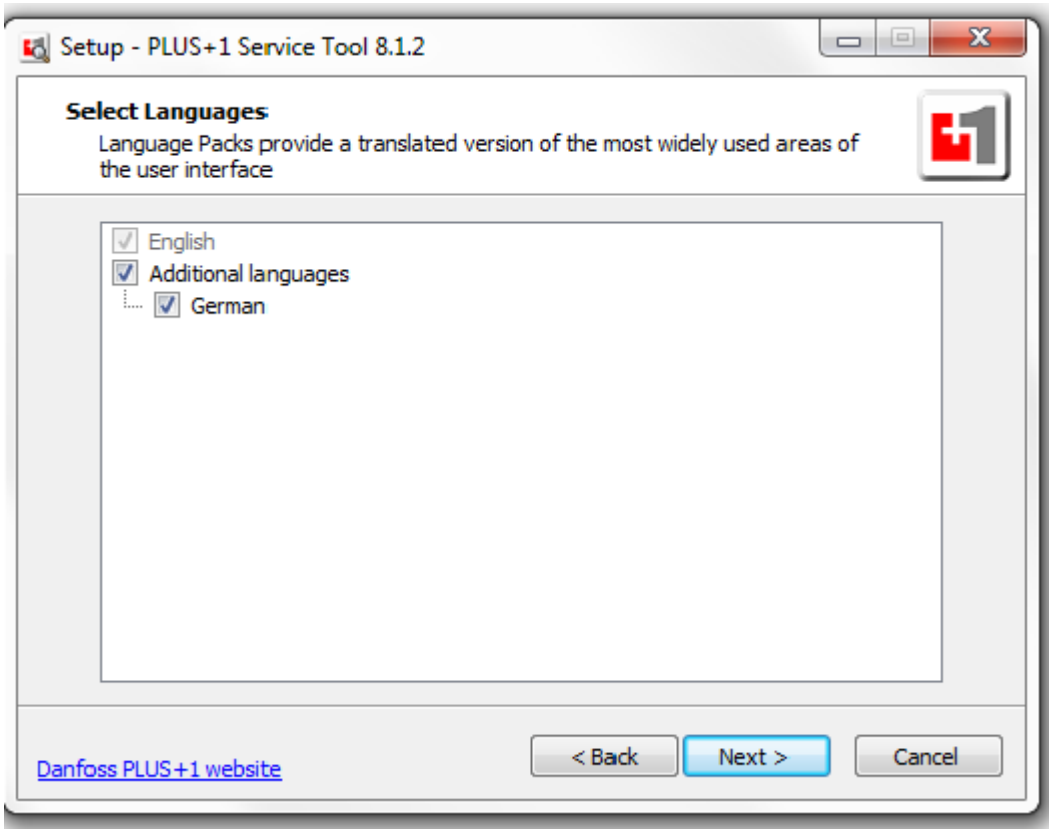
- Click on Next.

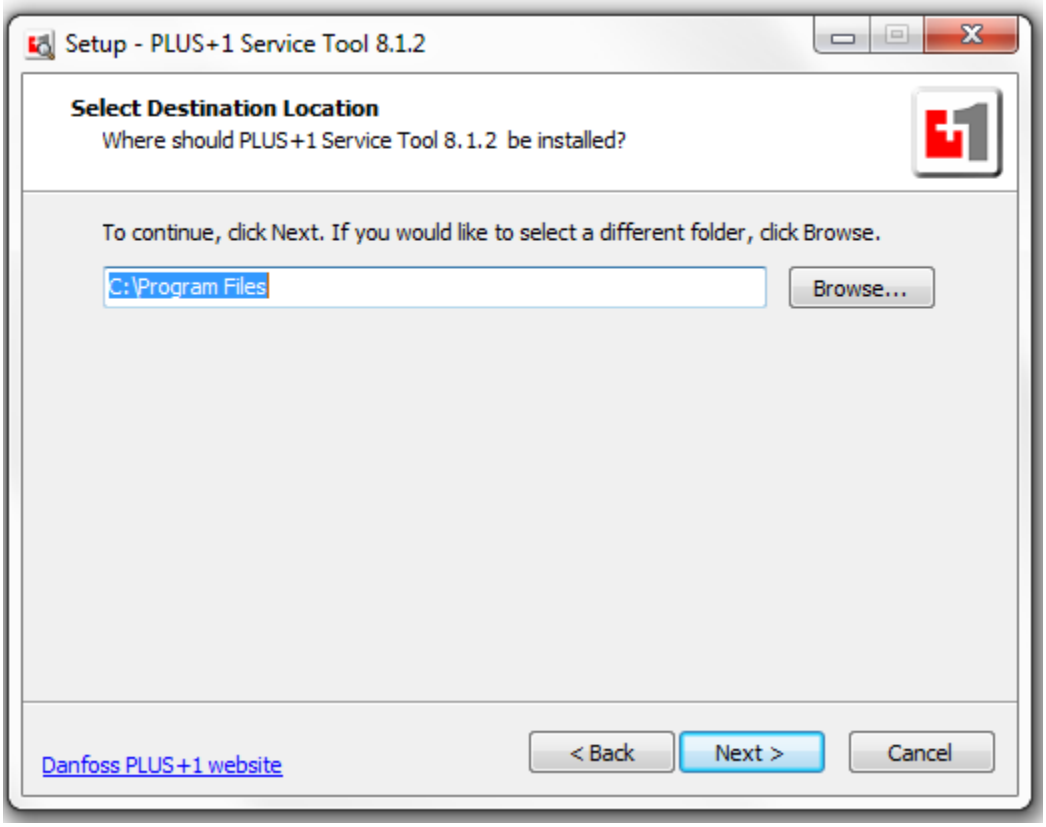


- Click on Next

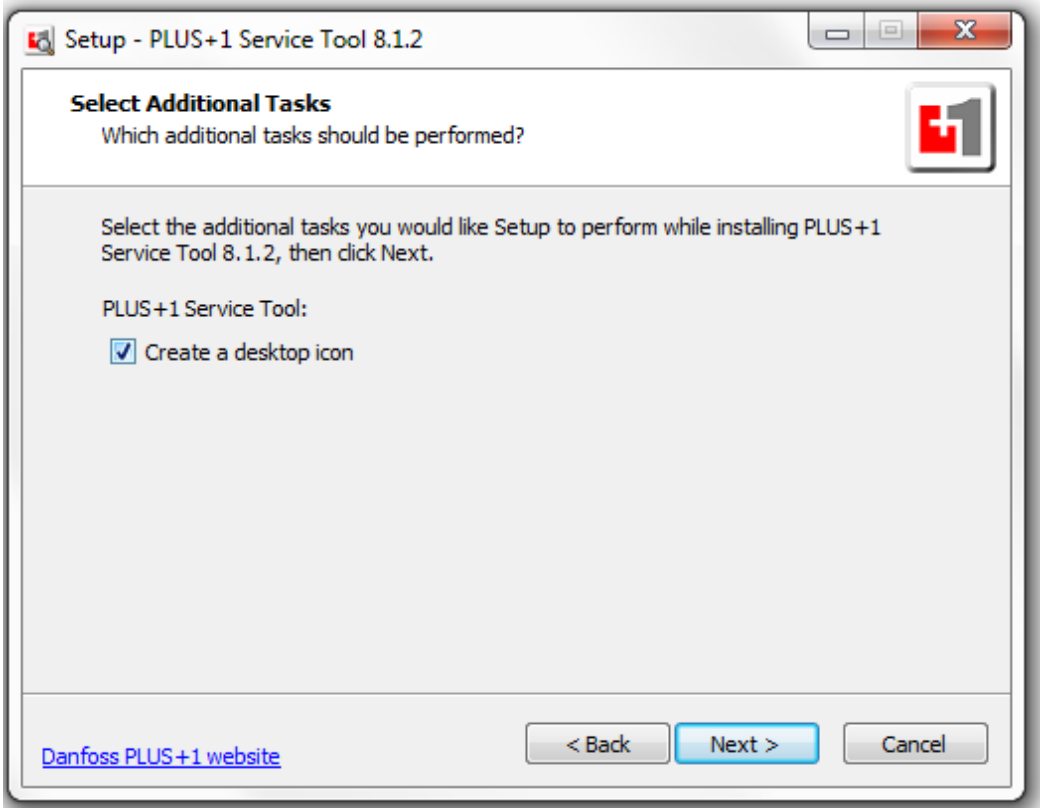


- Accept agreement.
- Click on Next.

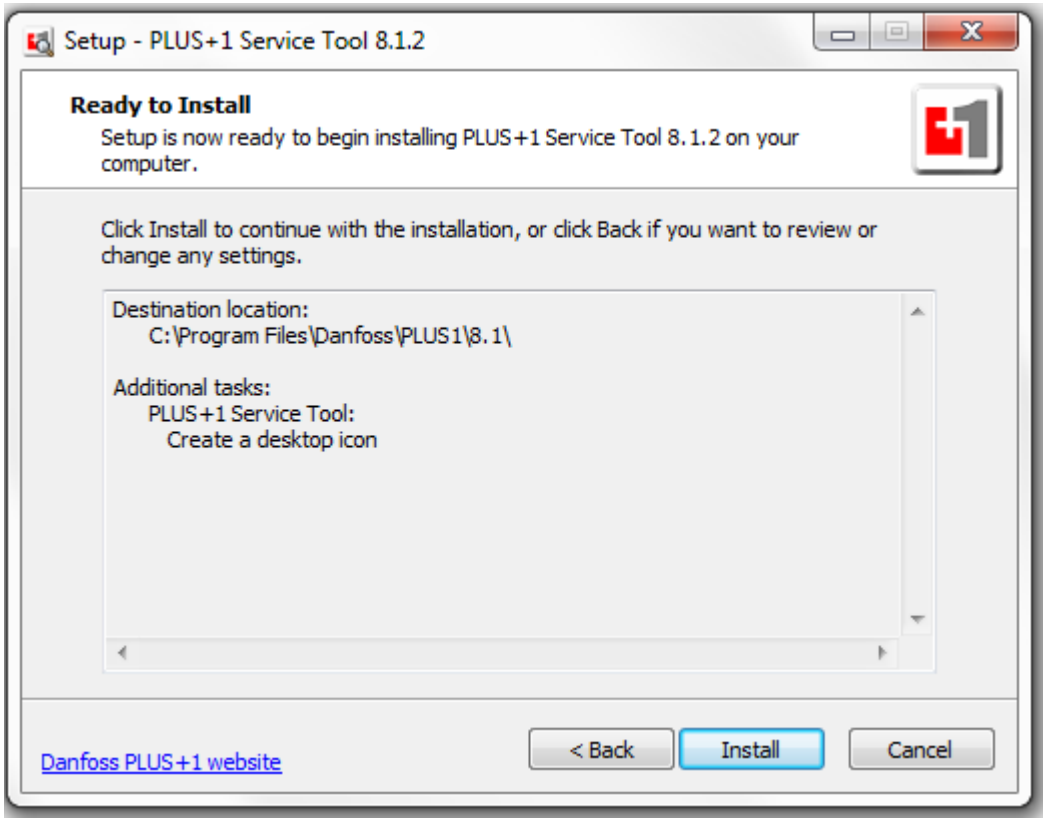




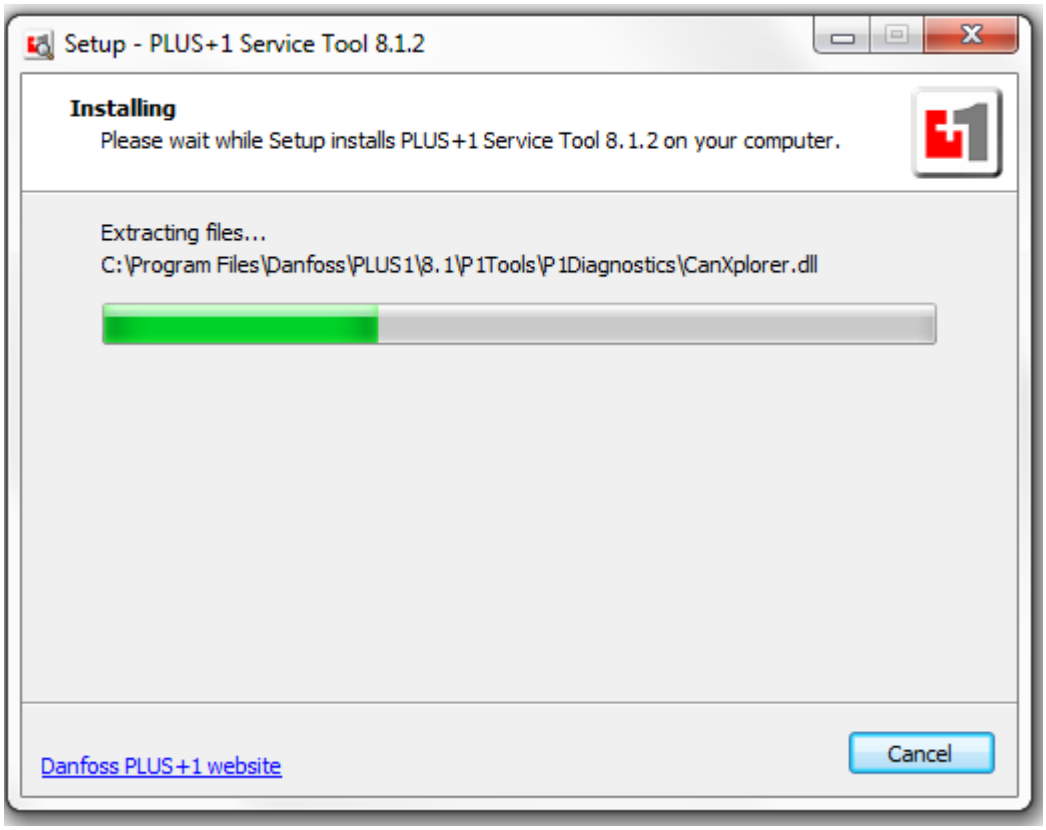
- Select Location where to install setup.
- Click on Next.



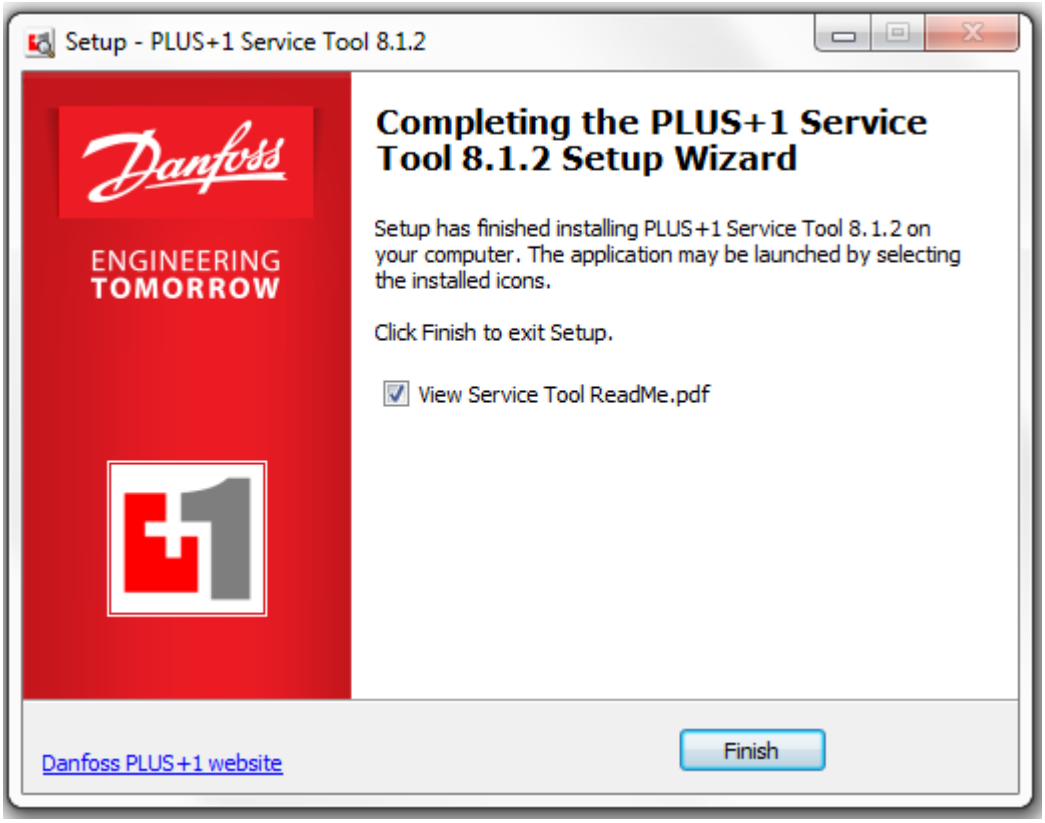
- Click on Next.



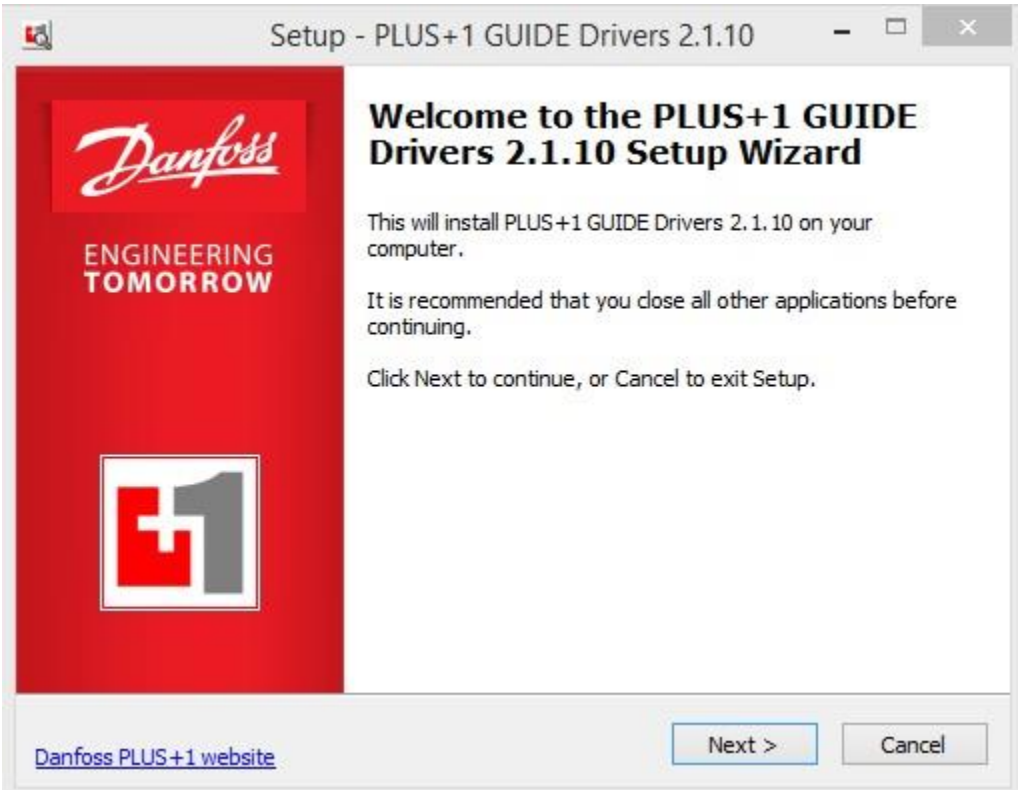
- Click on Install



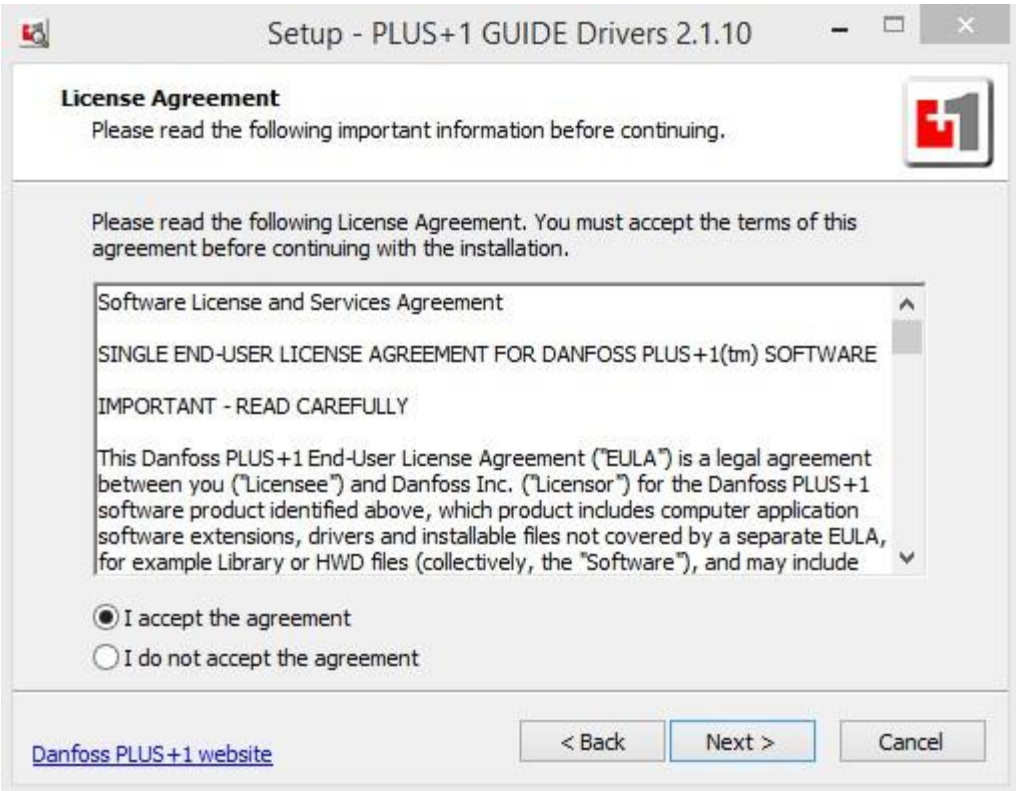
- Wait to install PLUS+1 GUIDE service tool.



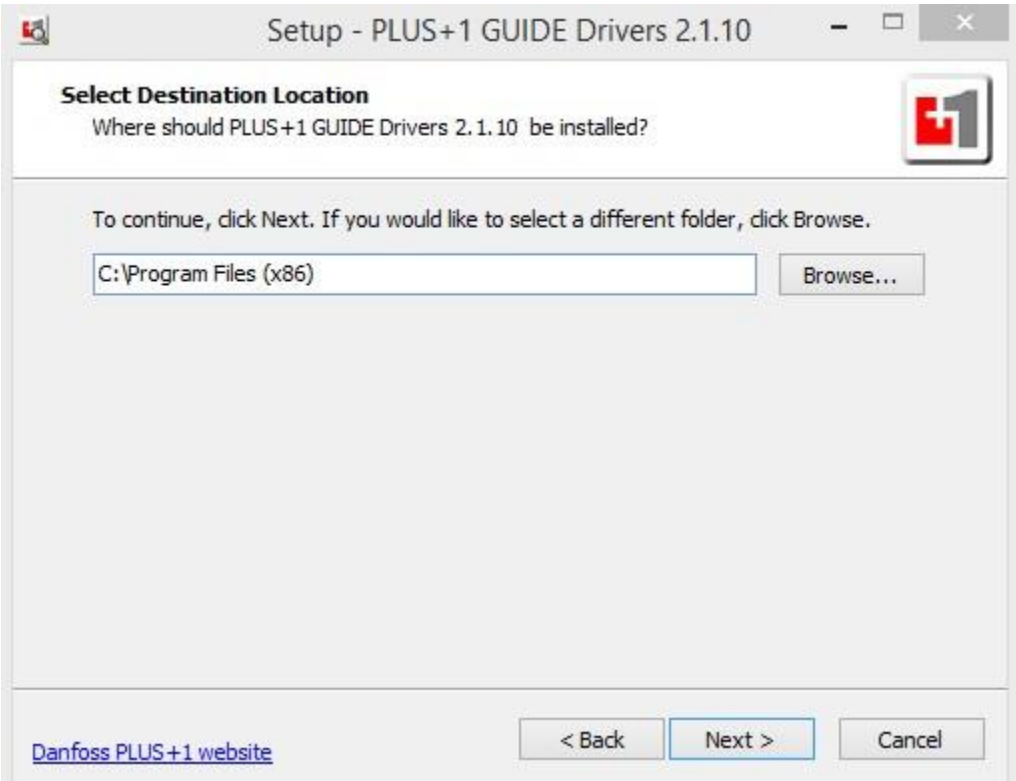
- Click On Finish.



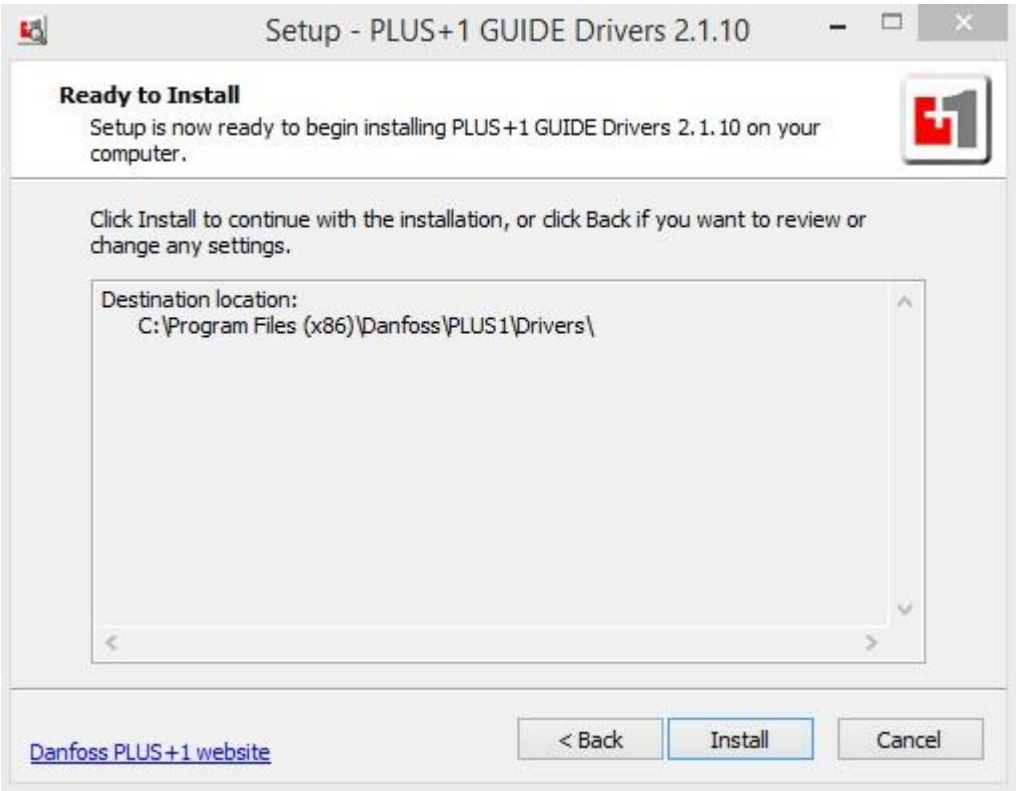
- Click On Next.



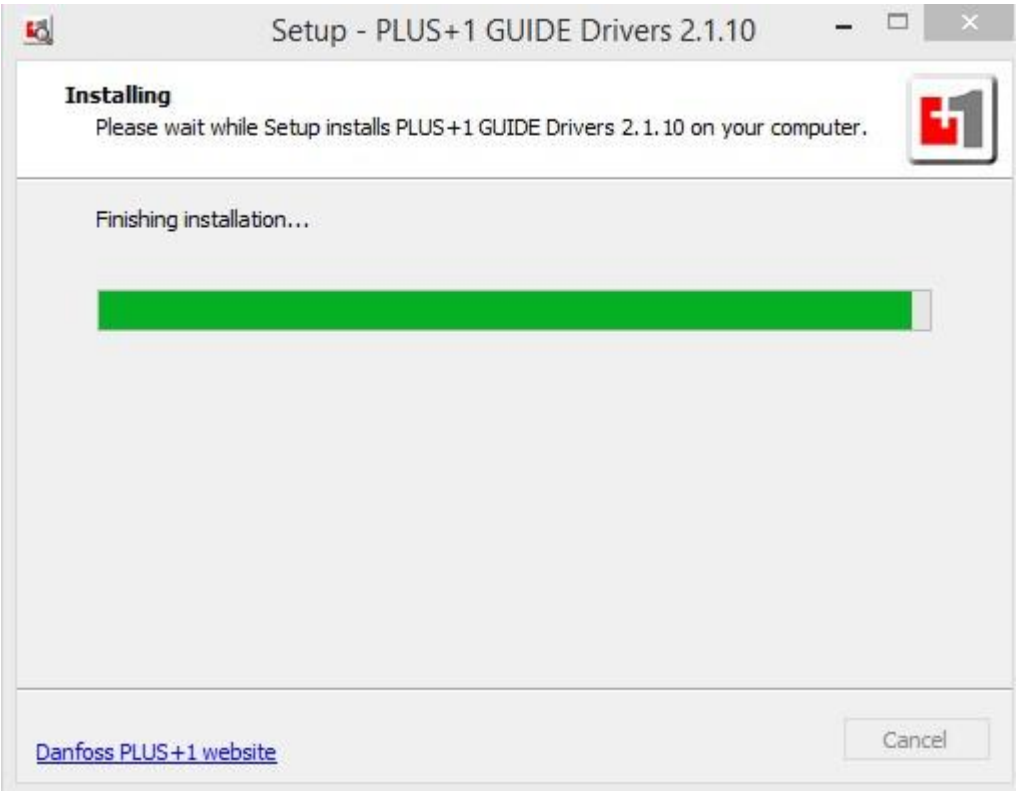
- Accept agreement.
- Click on Next.



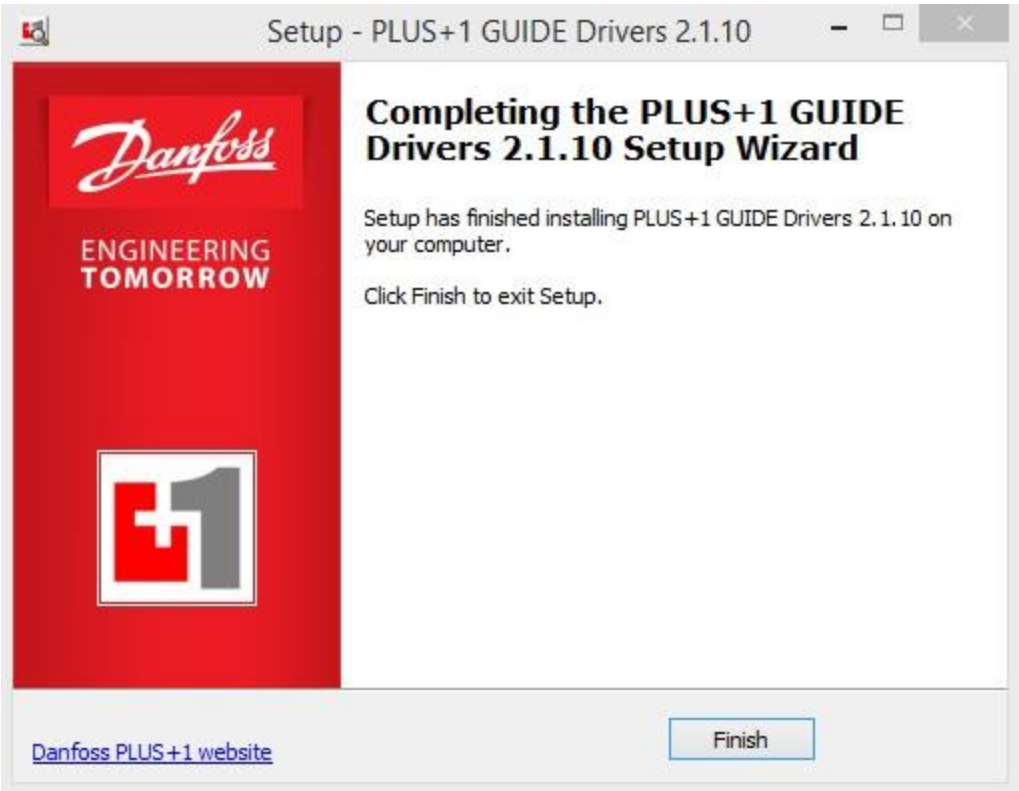
- Select Location where to install setup.
- Click on Next.



- Click on Install.

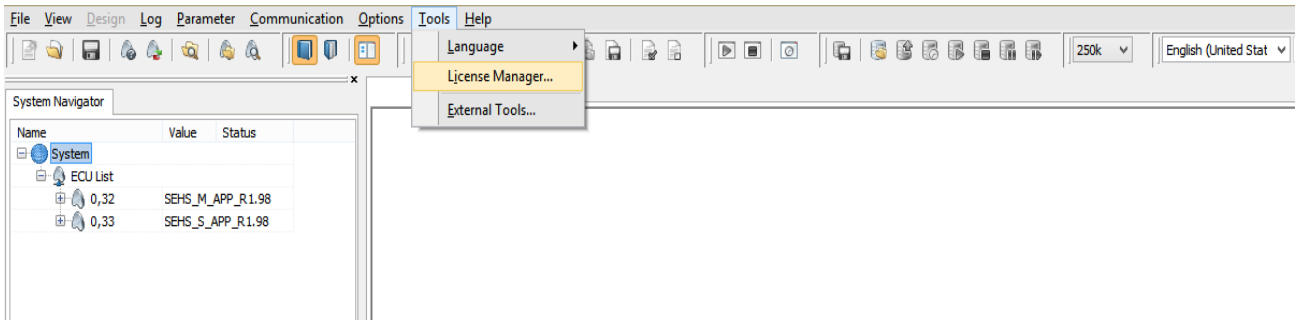


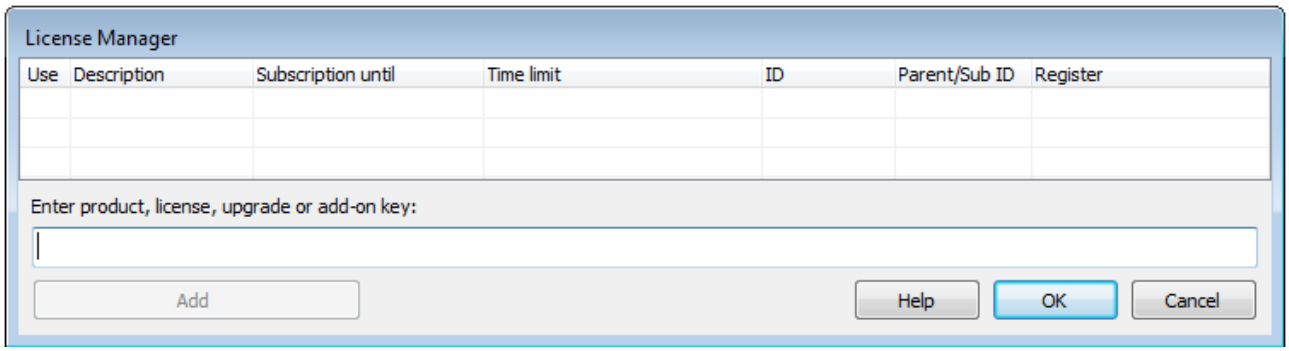
- Wait to install PLUS+1 GUIDE Drivers.


Setup - PLUS+1 GUIDE Drivers 2.1.10
Danfoss
ENGINEERING
TOMORROW
Completing the PLUS+1 GUIDE Drivers 2.1.10 Setup Wizard
Setup has finished installing PLUS+1 GUIDE Drivers 2.1.10 on your computer.
Click Finish to exit Setup.
Danfoss PLUS+1 website
Finish

5. Adding a product Key

1. If you do not have a PLUS+1 License, please order your PLUS+1 license through your local Danfoss sales person. You will be sent an email with a Product Key that will allow you to activate a License Key.
2. Start PLUS+1 Guide Service Tool, a message box appears with the option to launch the License Manager. The License Manager can also be launched from the PLUS+1 GUIDE Tools menu.



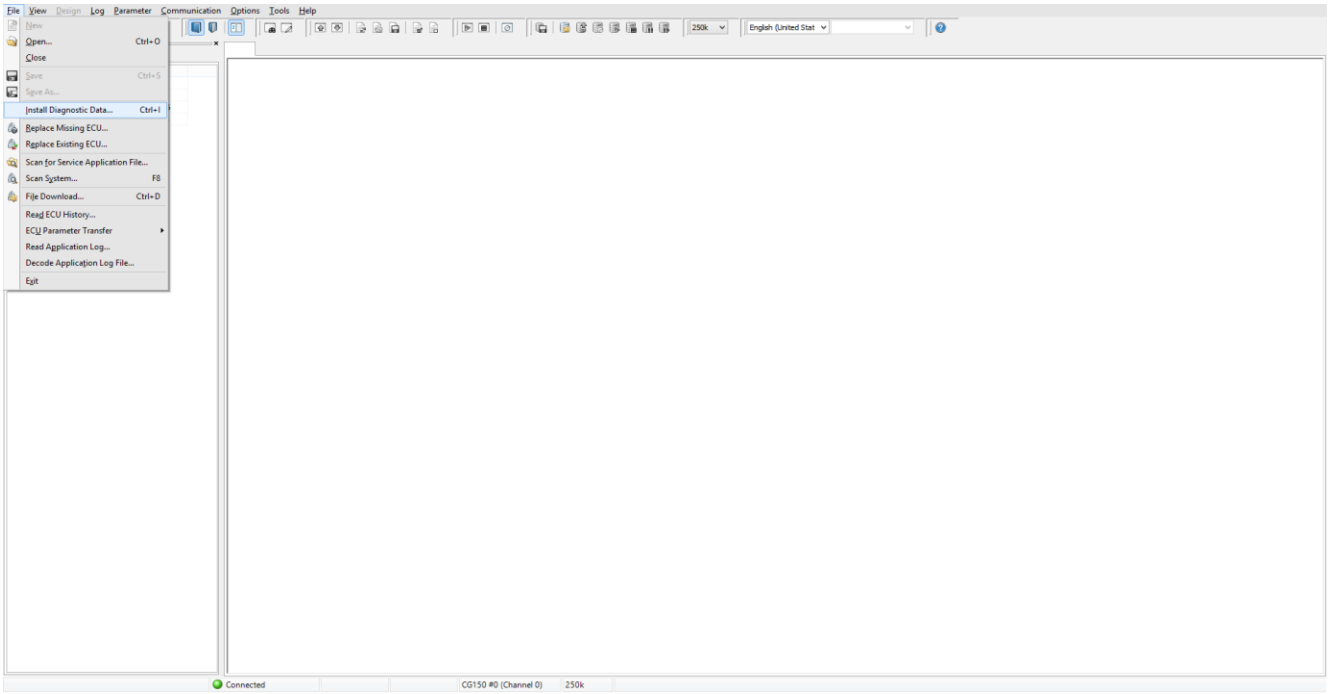


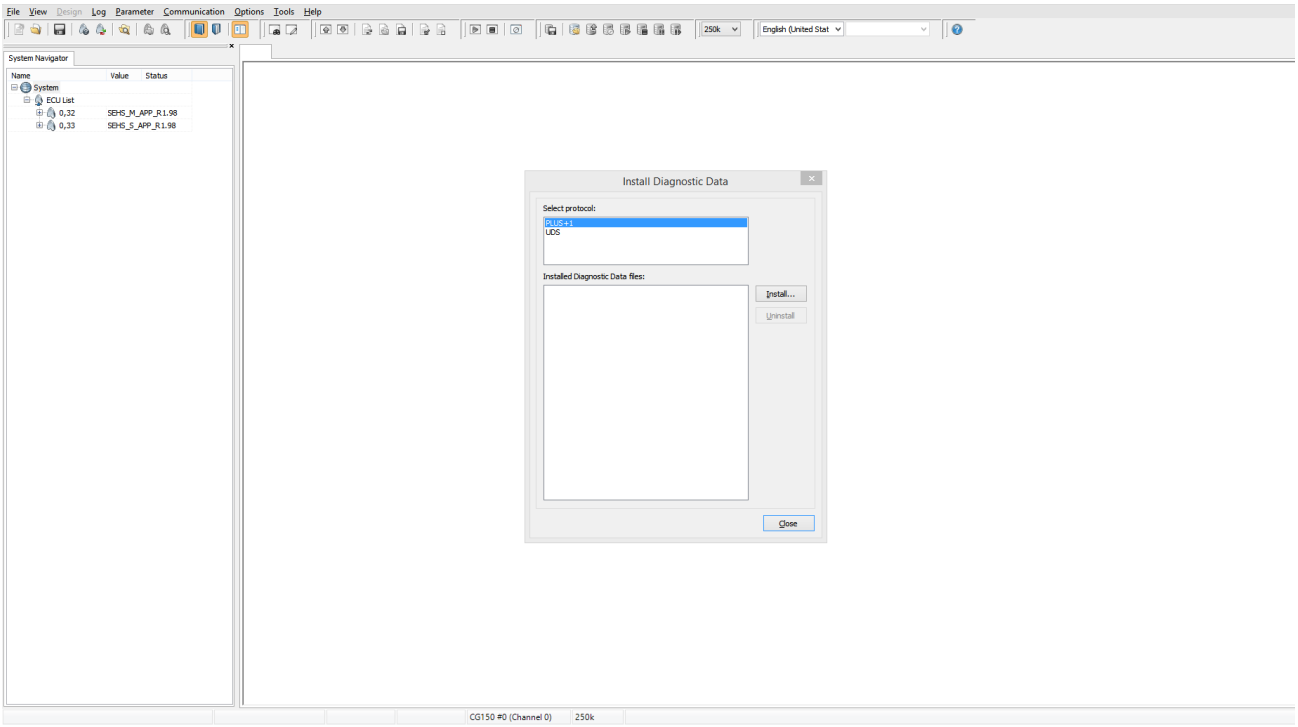
3. Enter product key, or copy and paste from the PLUS1license-AutoActivation@danfoss.com email into Enter product, license, upgrade, or add-on key, then click Add Product Key. Tool can immediately be used for a 7 day time limit without activating license.
4. Click Activate in the column Register of the License Manager window.
5. Activate License window opens, select product key under Product or license key then click E-mail registration.
6. Dialog window will appear, read and then click OK.
7. The Activation pre-written email to PLUS1license-AutoActivation@danfoss.com will appear in the active user's default email-client. Send the email.
8. The automatic activation server will reply with an e-mail containing the activated license key.
9. Enter license key, or copy & paste from an e-mail under Enter product, license, upgrade, or add-on key, then click Add License Key.
10. PLUS+1 license is activated.

6. How to download bootloader/application in CLS

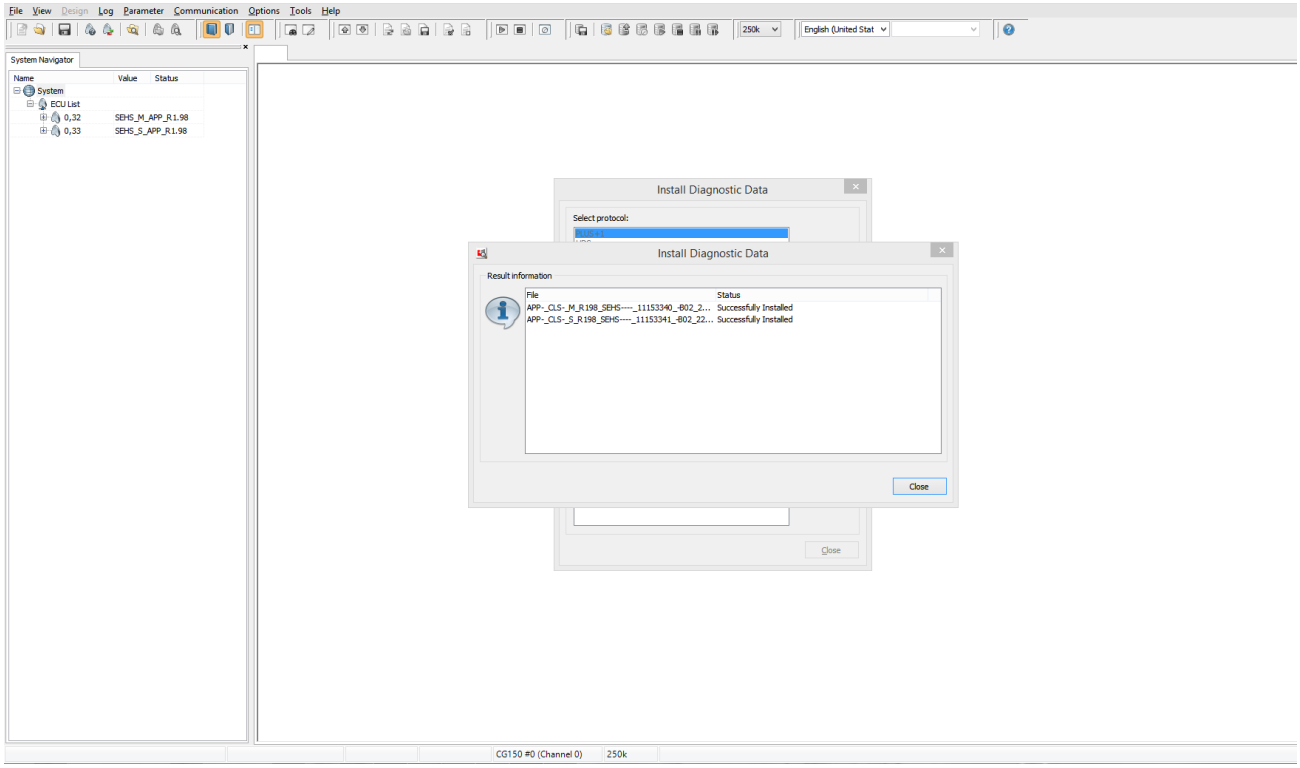
6.1 Install Diagnostic data files

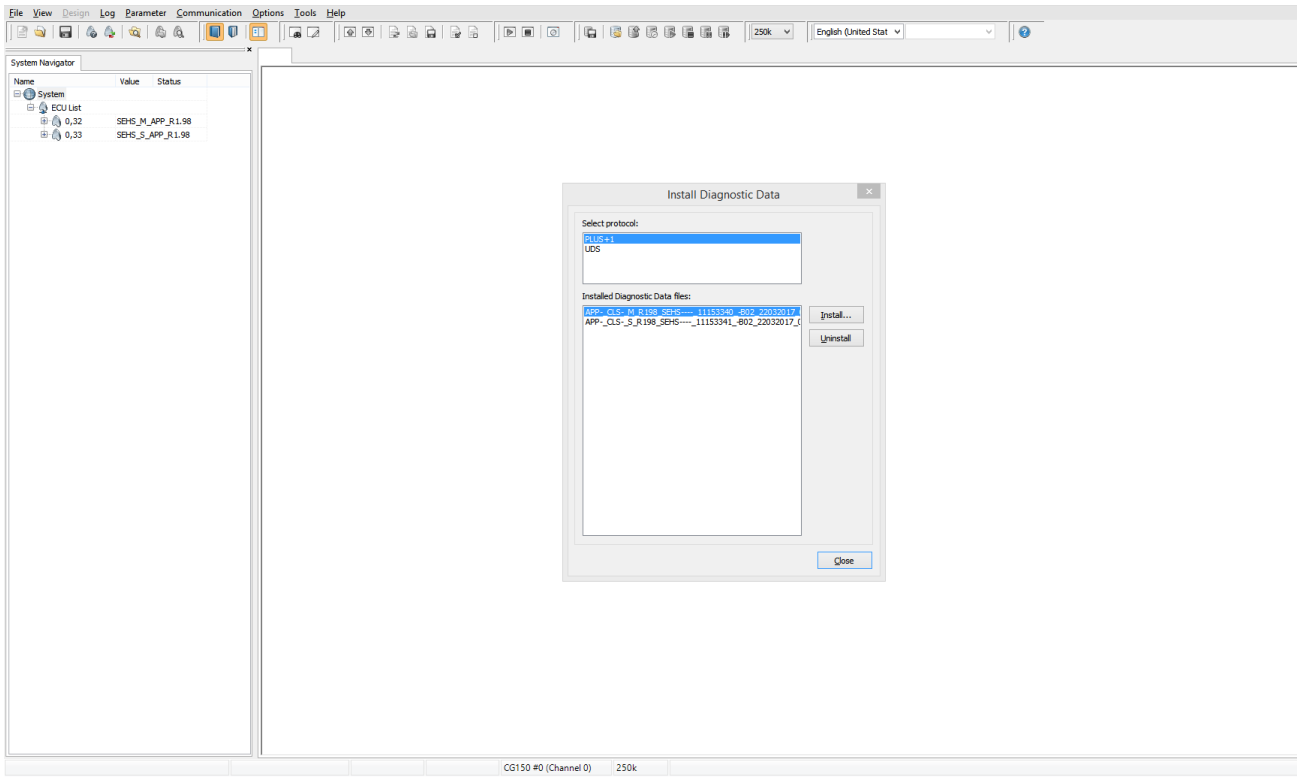
- Select File Menu -> Install Diagnostic Data





- Click on Install button and select .plg files (install plg files for bootloader as well as application).

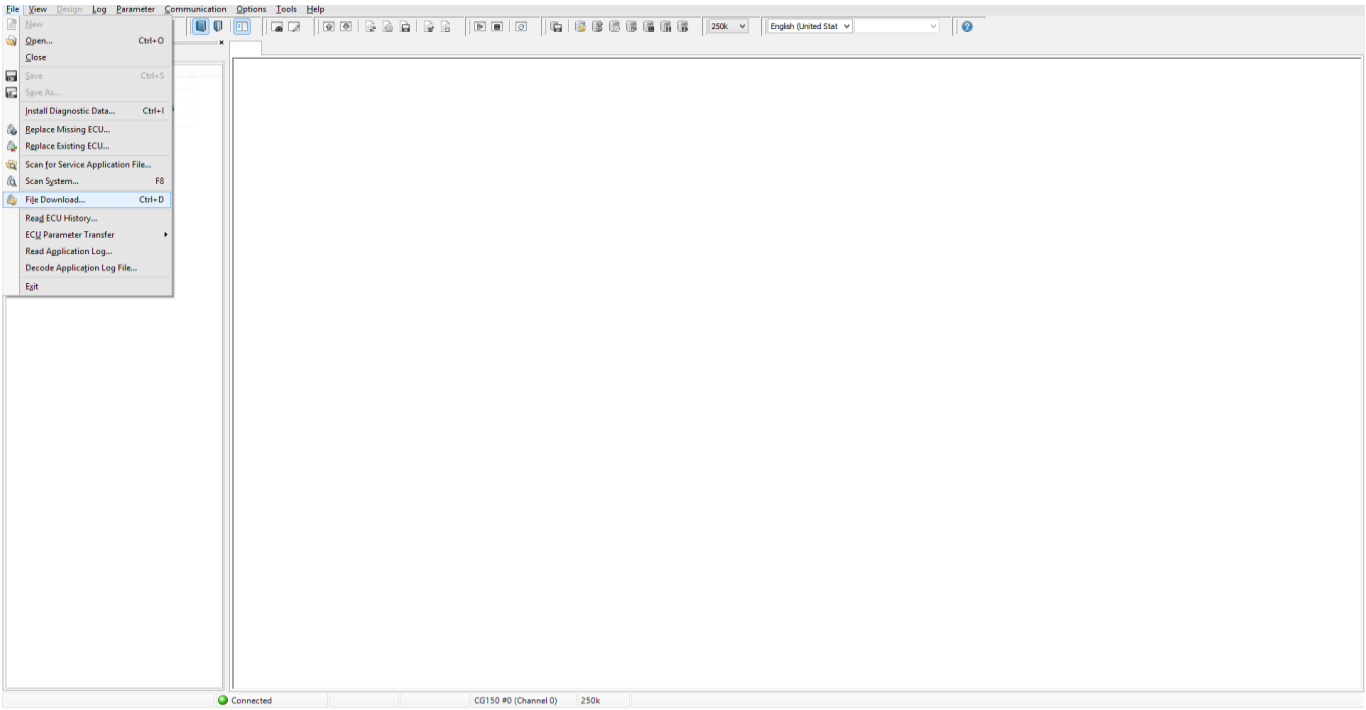




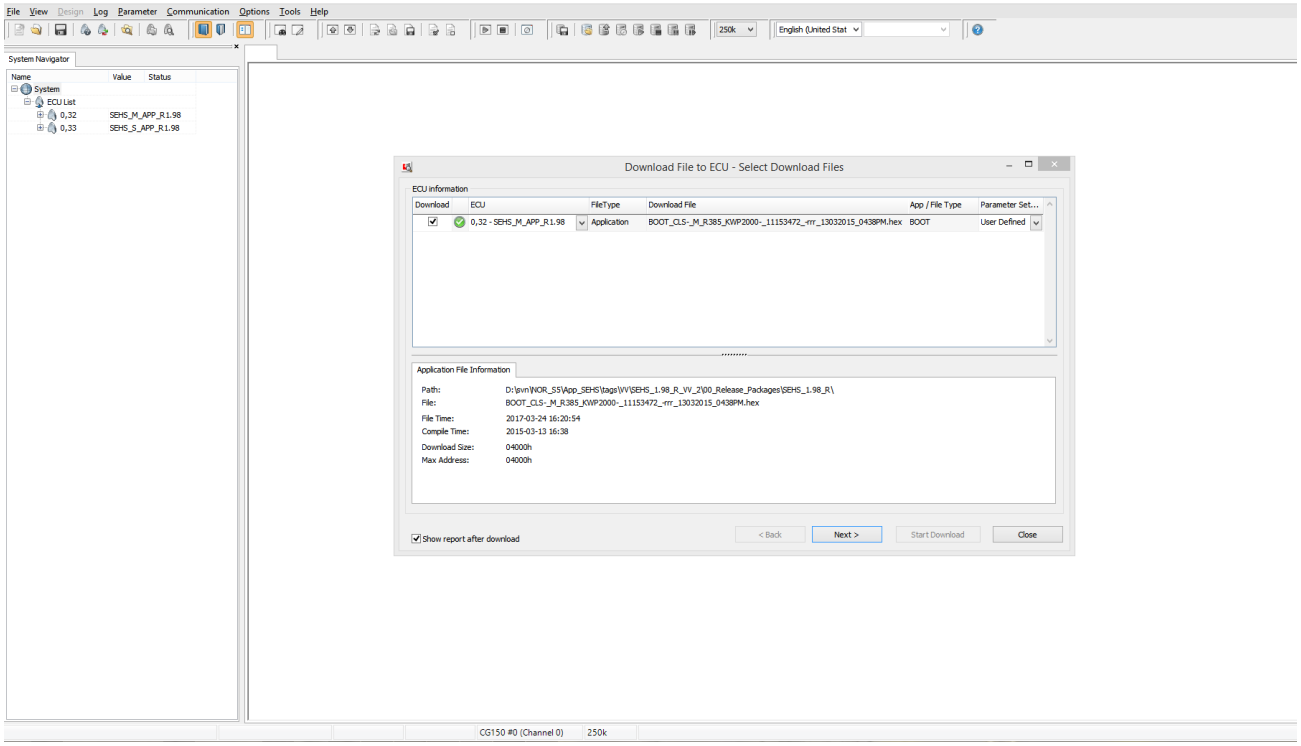
- The installed files can be seen under “Installed Diagnostic Data Files” section.
- Click on Close button.

6.2 Download Bootloader

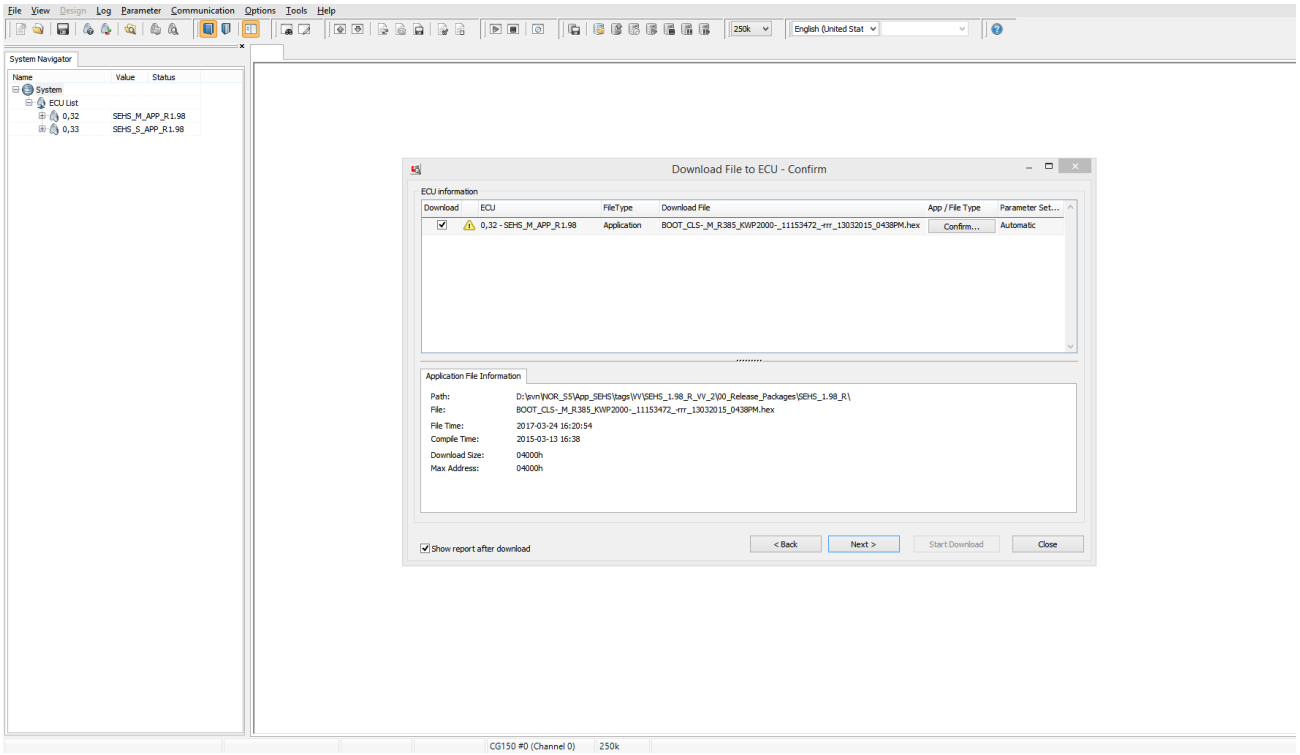
- Select File Menu -> File Download.



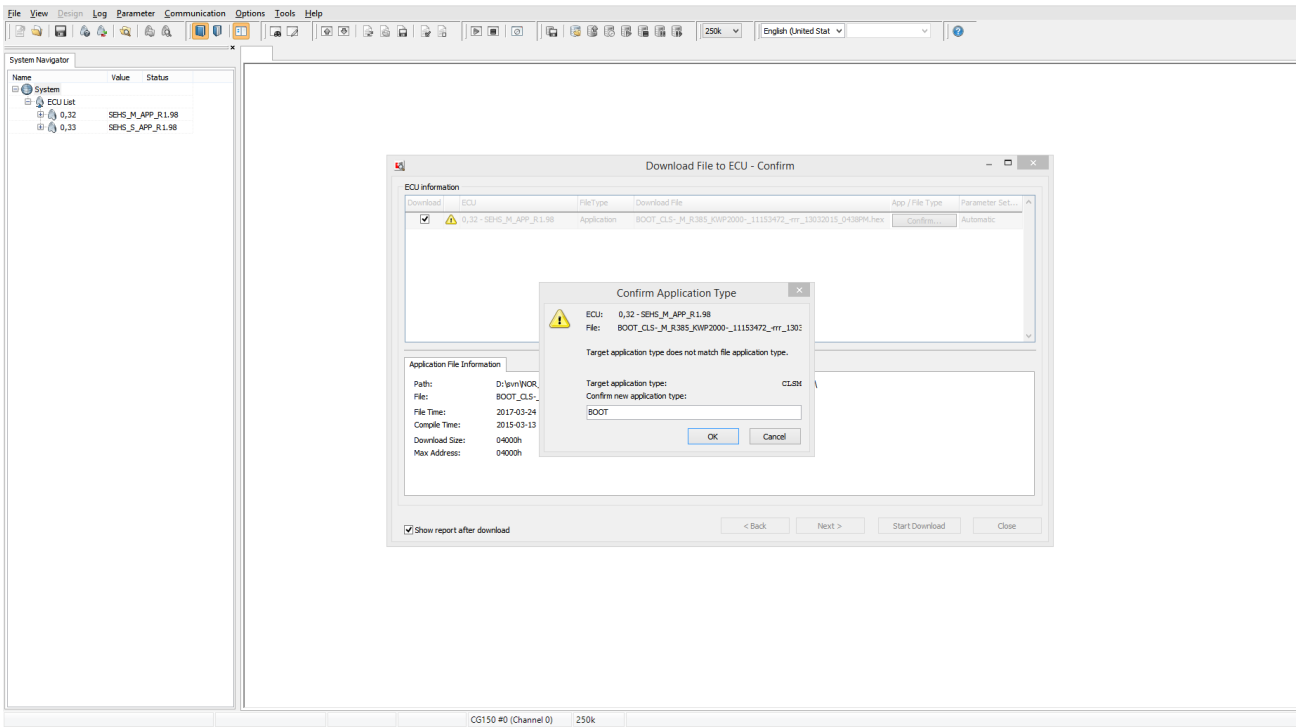
- Select .hex file to download bootloader.



- Change ECU if needed.
- Click on Next button.



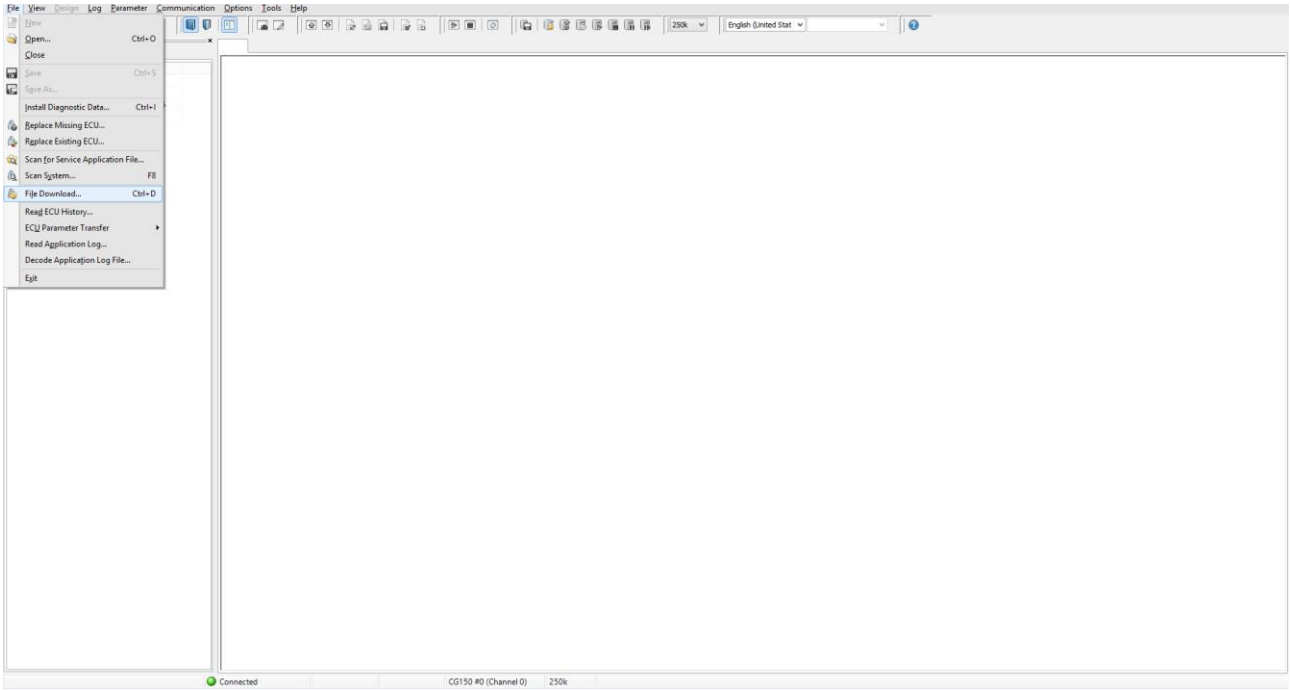
- Change App/File Type. Click on Confirm Button.



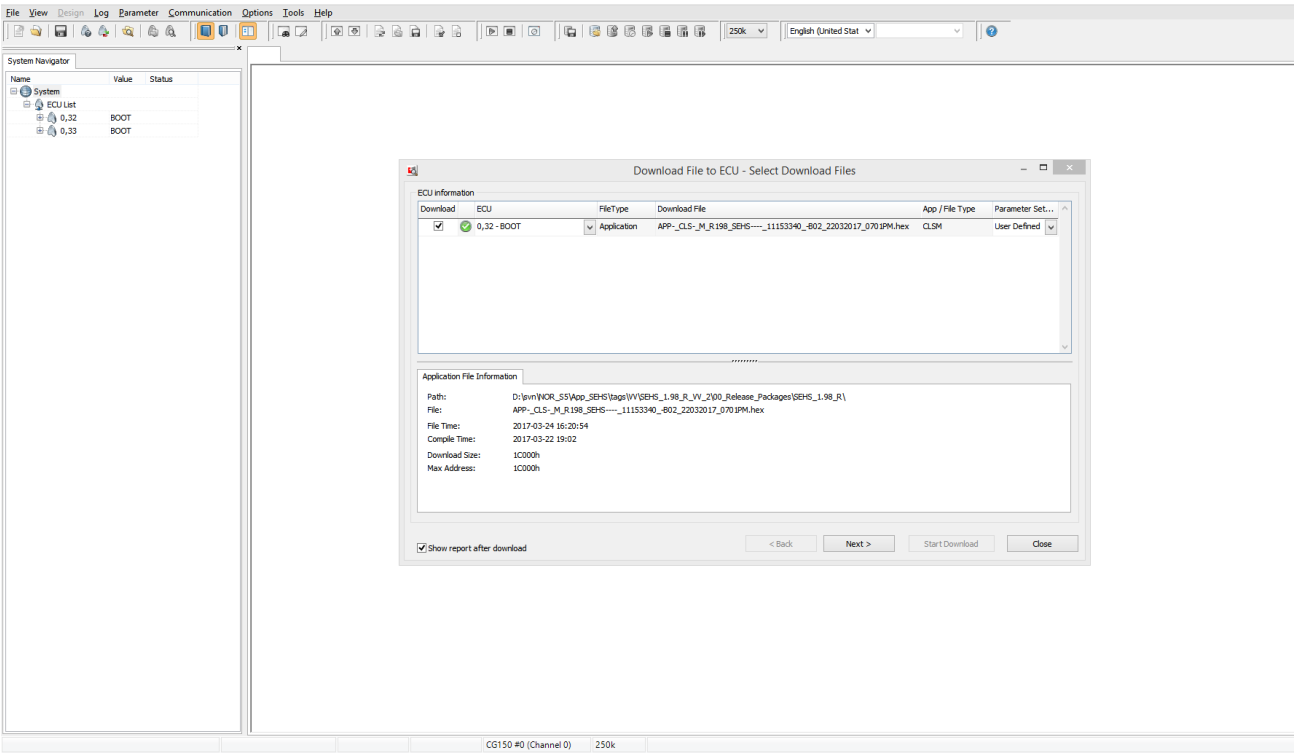
- Enter Application Type as “BOOT”.
- Click on Ok button.
- Click on Start download button.
- Click on Close button.

6.3 Download Application

- Select File Menu -> File Download.

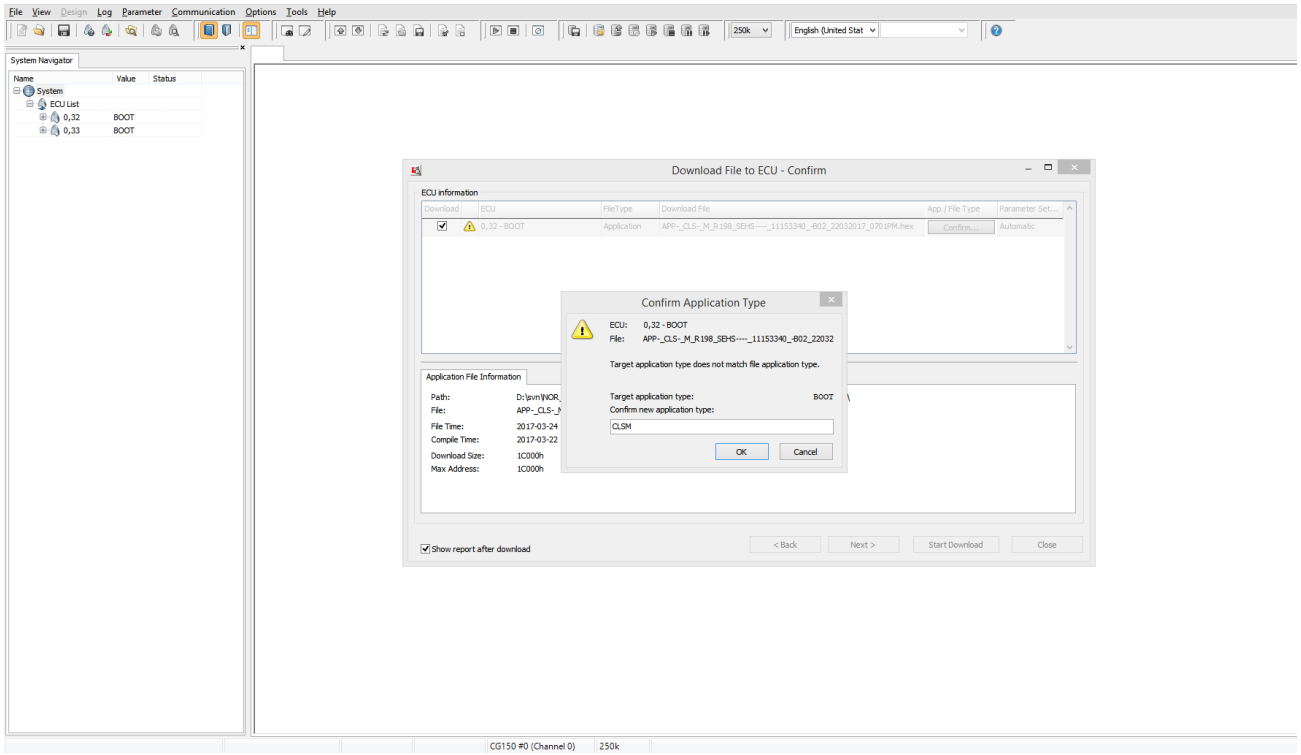


- Select .hex file to download an application.

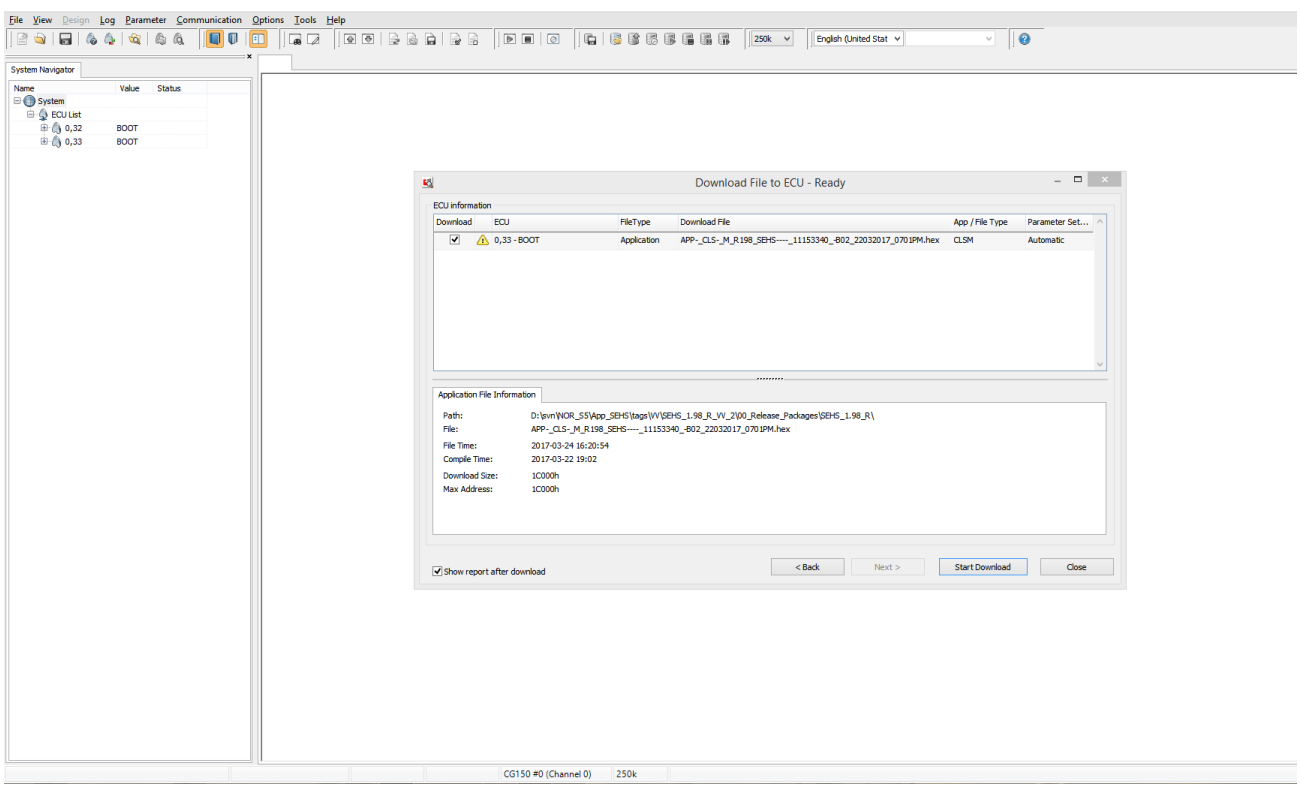


- Click on Next button.

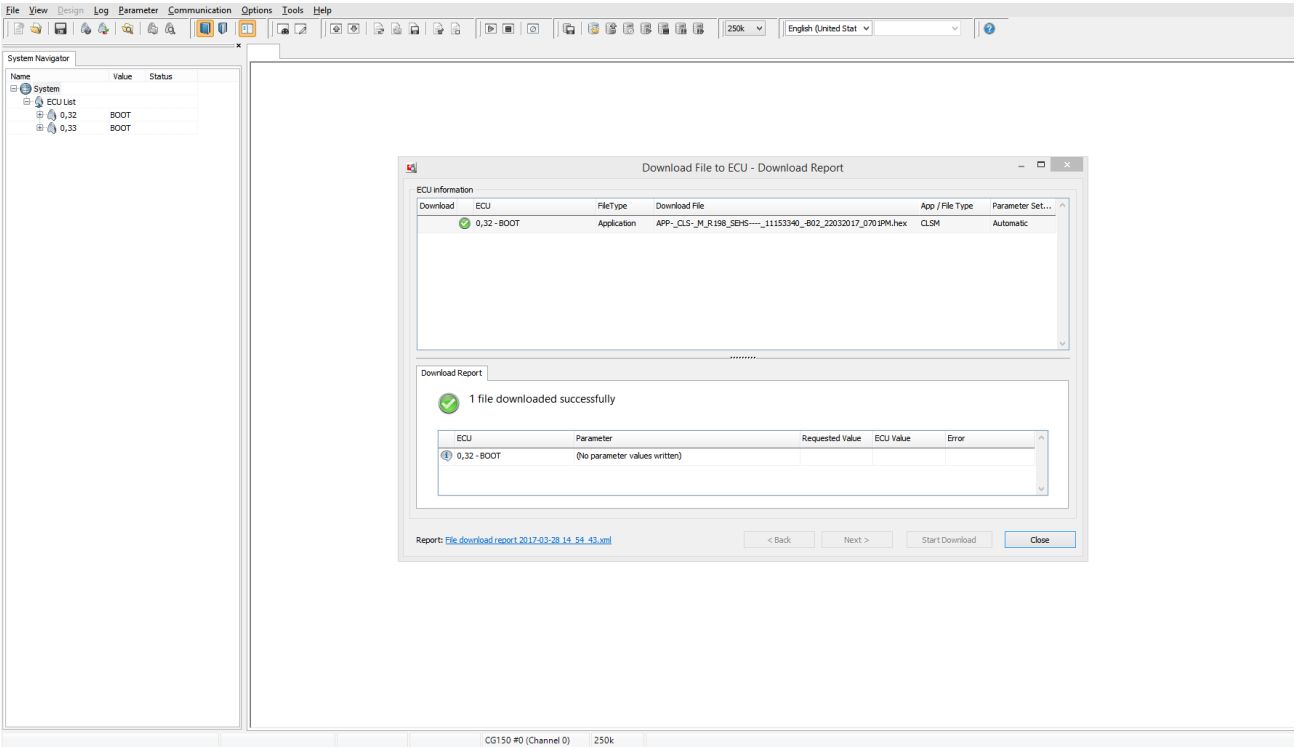
- Enter Application type as “CLSM” for MainUC and “CLSS” for SafetyUC.



- Click on Ok button.



- Click on Start Download button.



- Click on Close button. The Status will show OK during System scan if Application downloaded correctly.

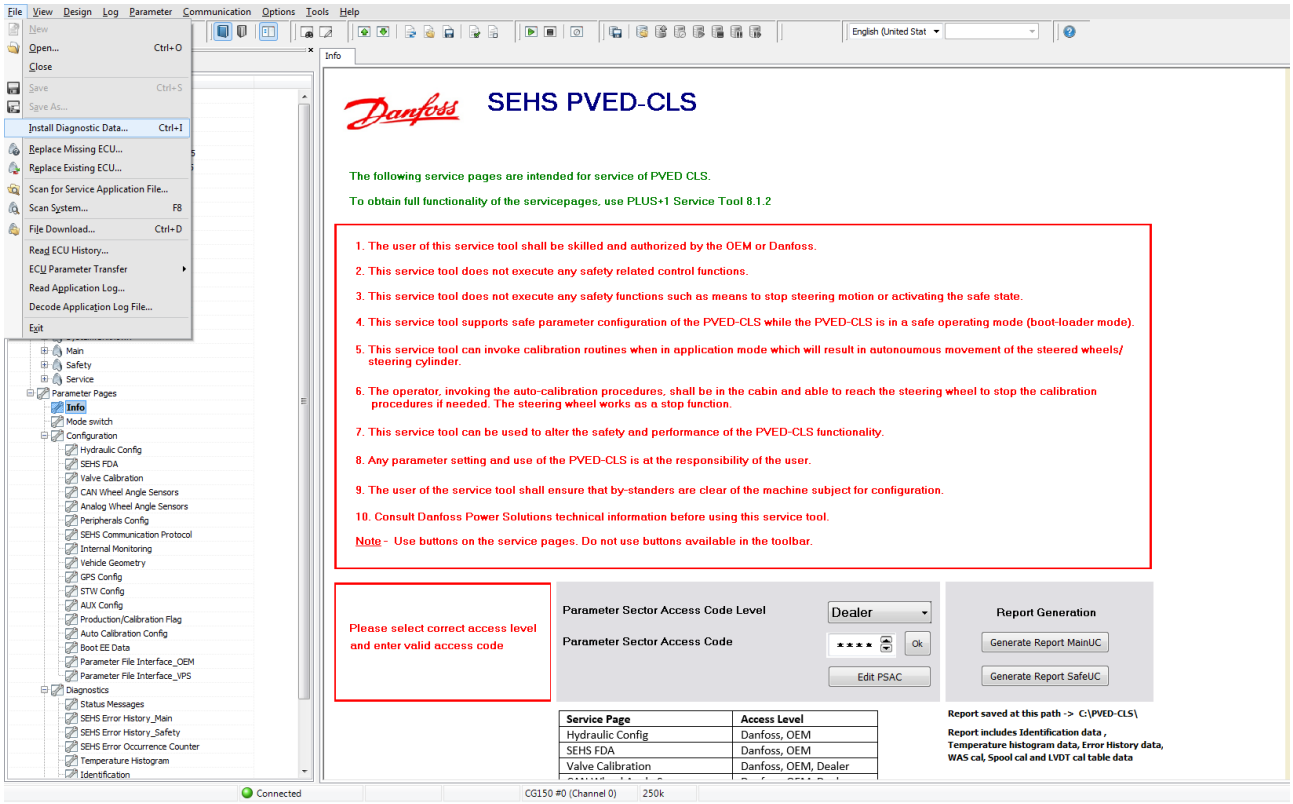
7. How to download .mlhx files

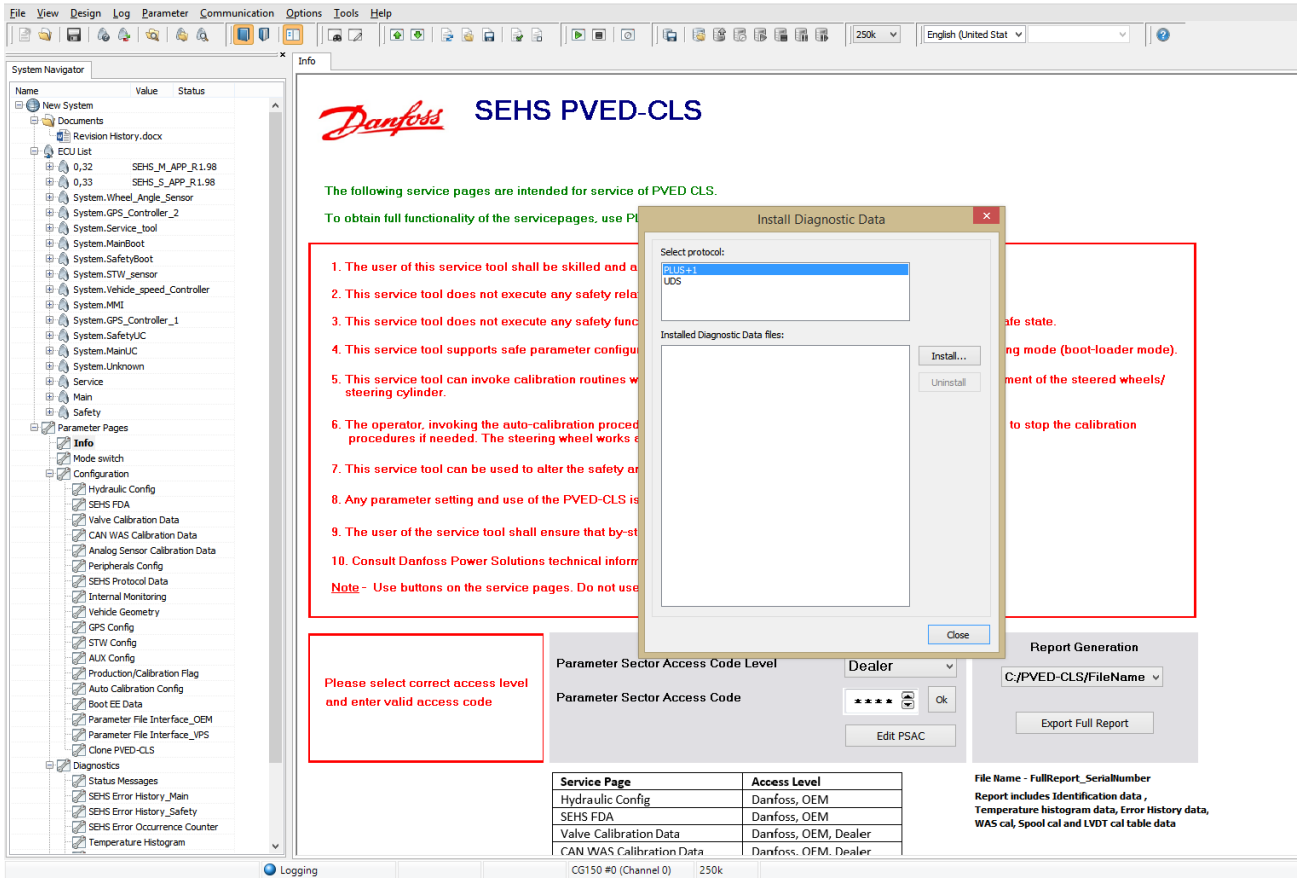
Important

The .mlhx files support boot node ID's 8, 19 and 32 for Main controller and 33 and 90 for Safety controller. If other boot node ID's are used, software download has to be done according to section 5.

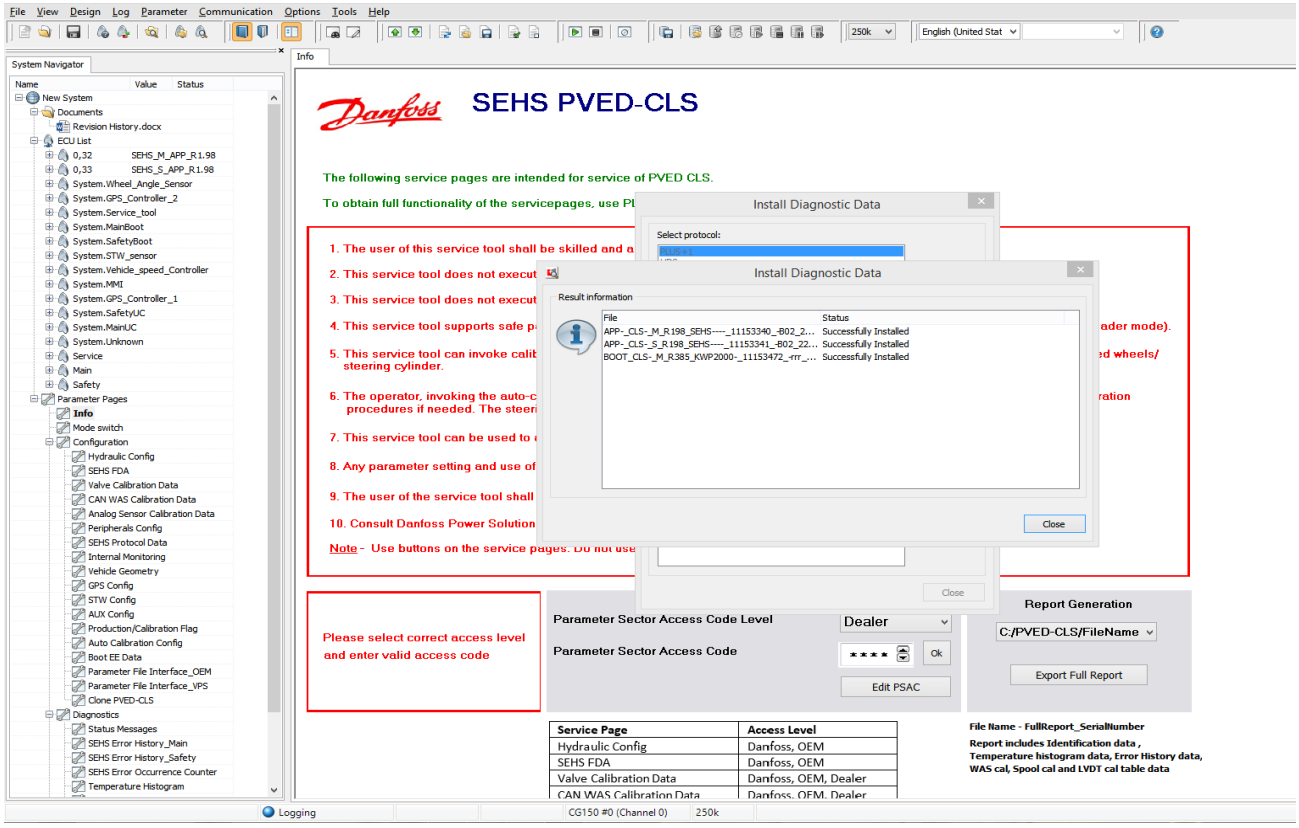
7.1 Install Diagnostic data files

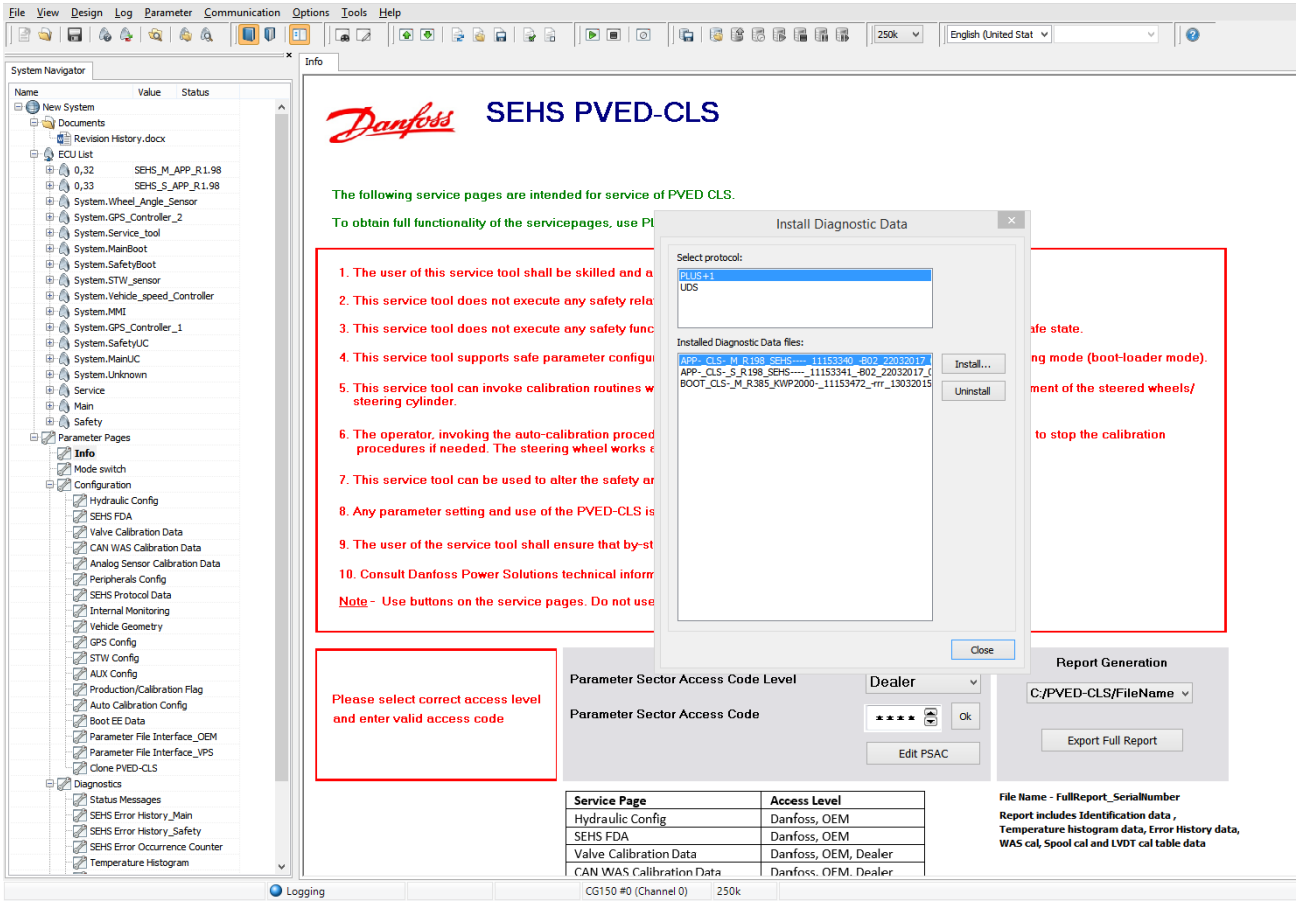
- Select File Menu -> Install Diagnostic Data





- Click on Install button and select .plg files (install plg files for bootloader as well as application).

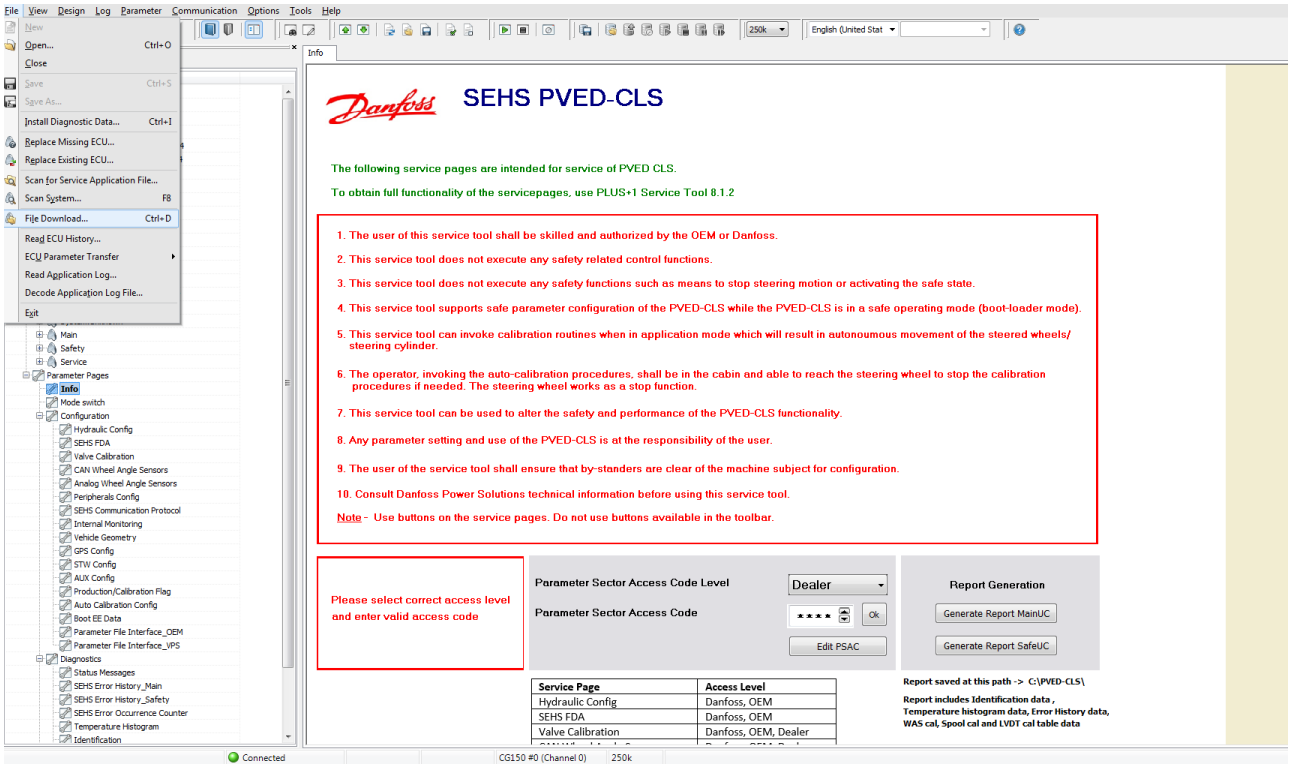




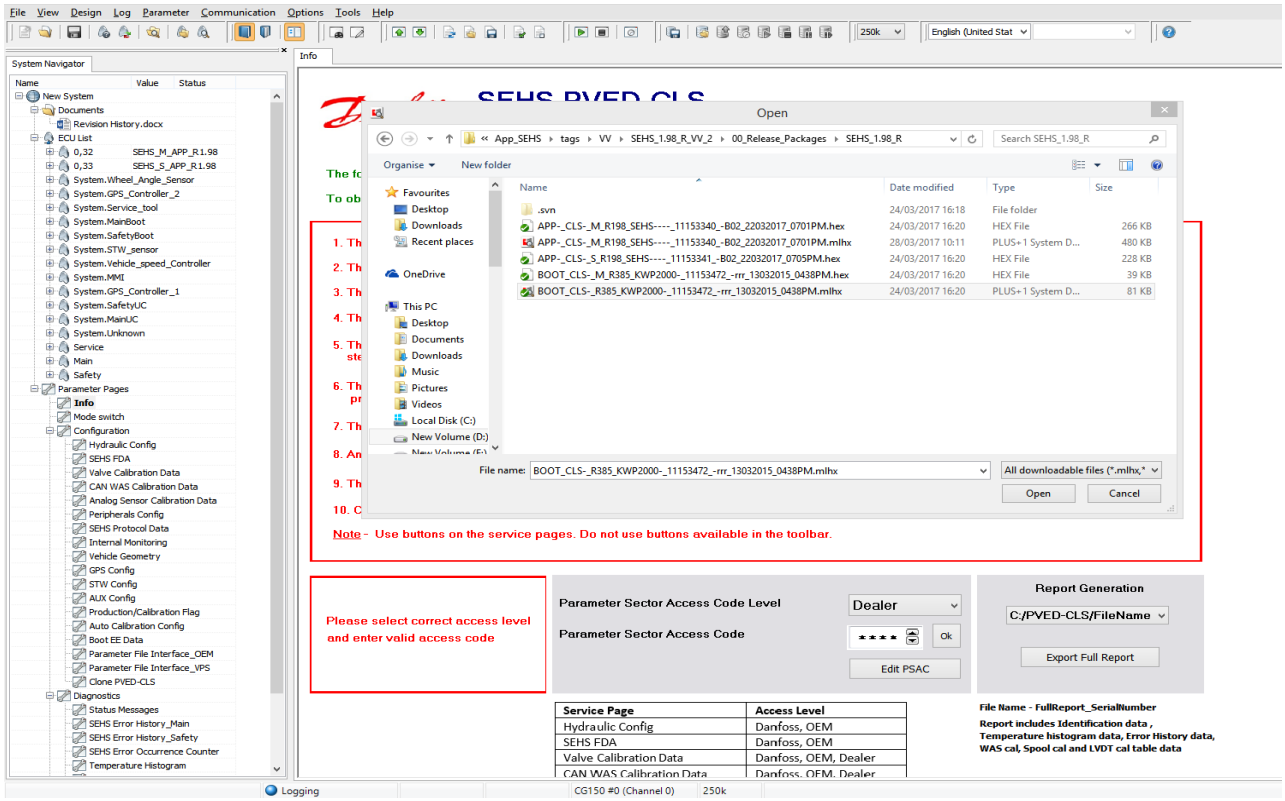
- The installed diagnostic data files can be reviewed under “Installed Diagnostic Data Files” section.
- Click on Close button.

7.2 Download Bootloader .mlhx file

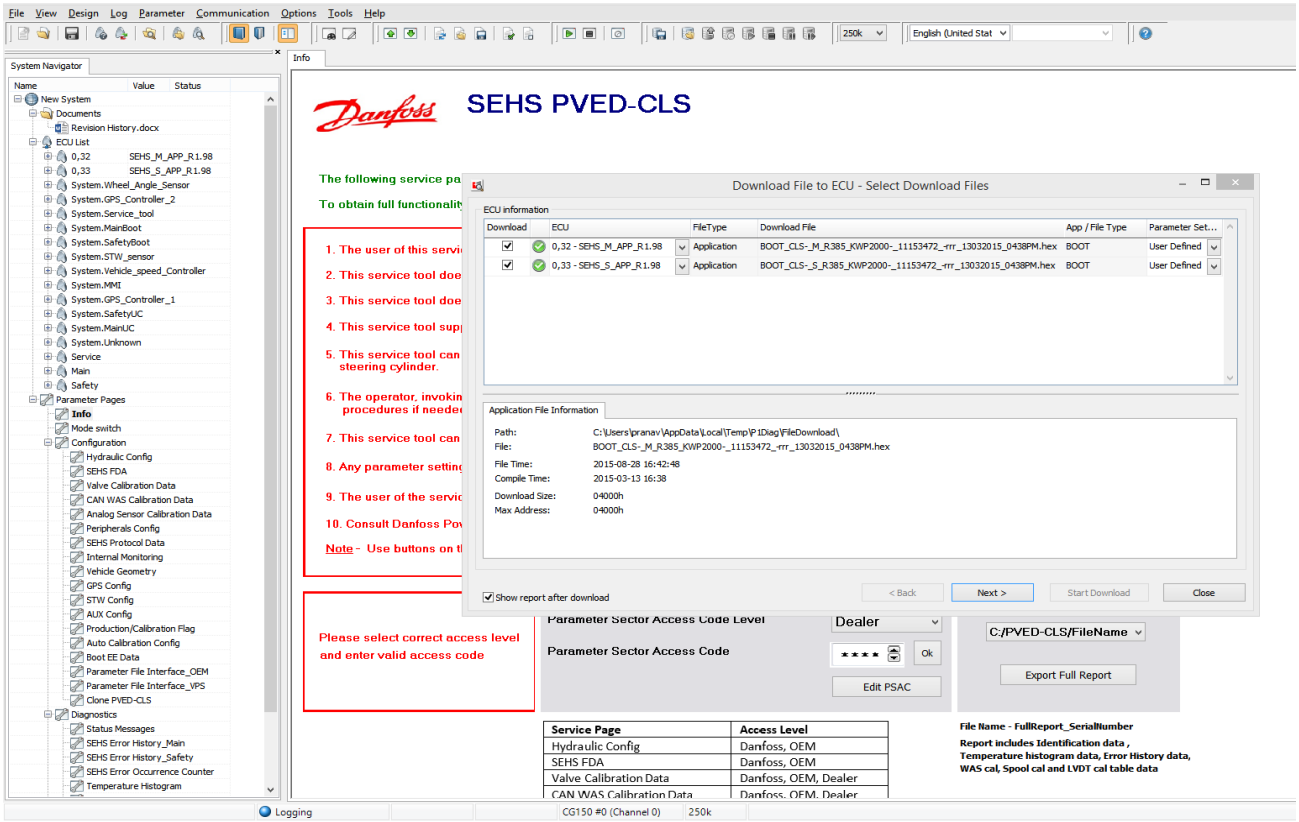
- Select File Menu -> File Download.



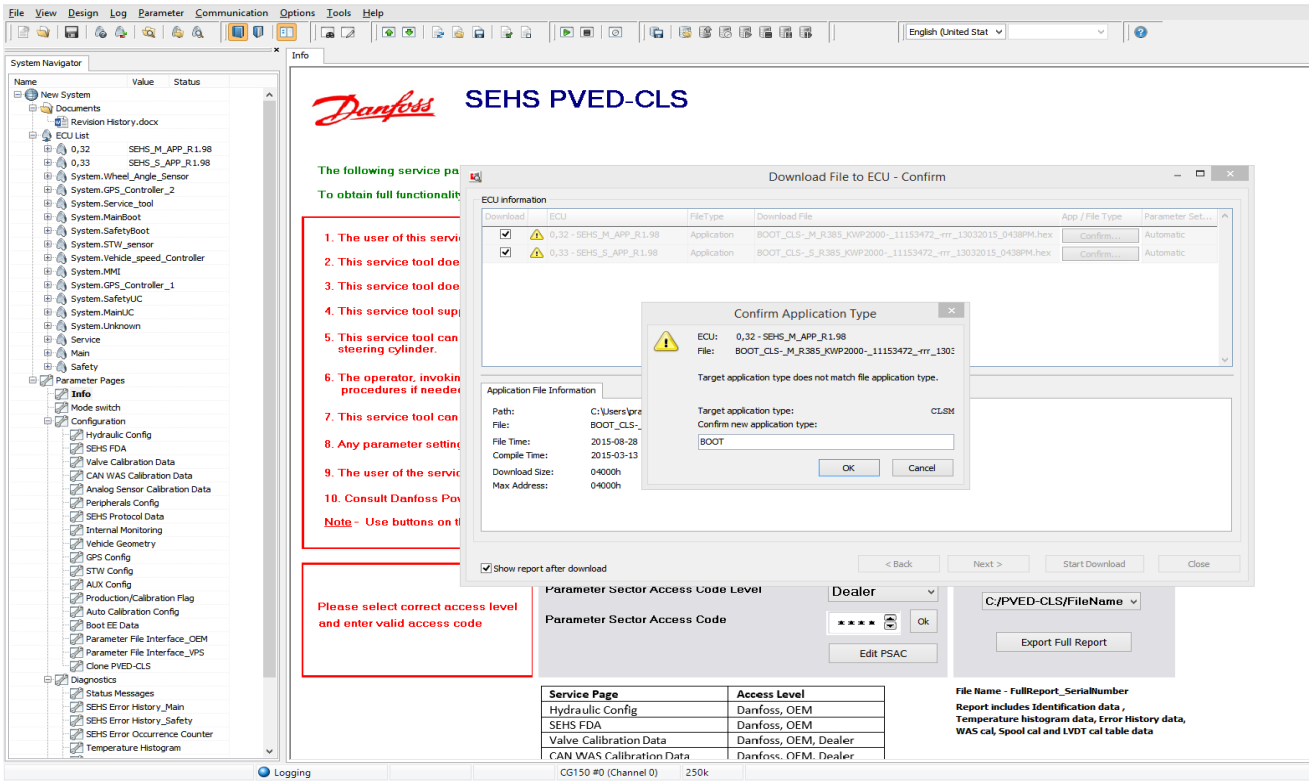
- Select bootloader .mlhx file to download.



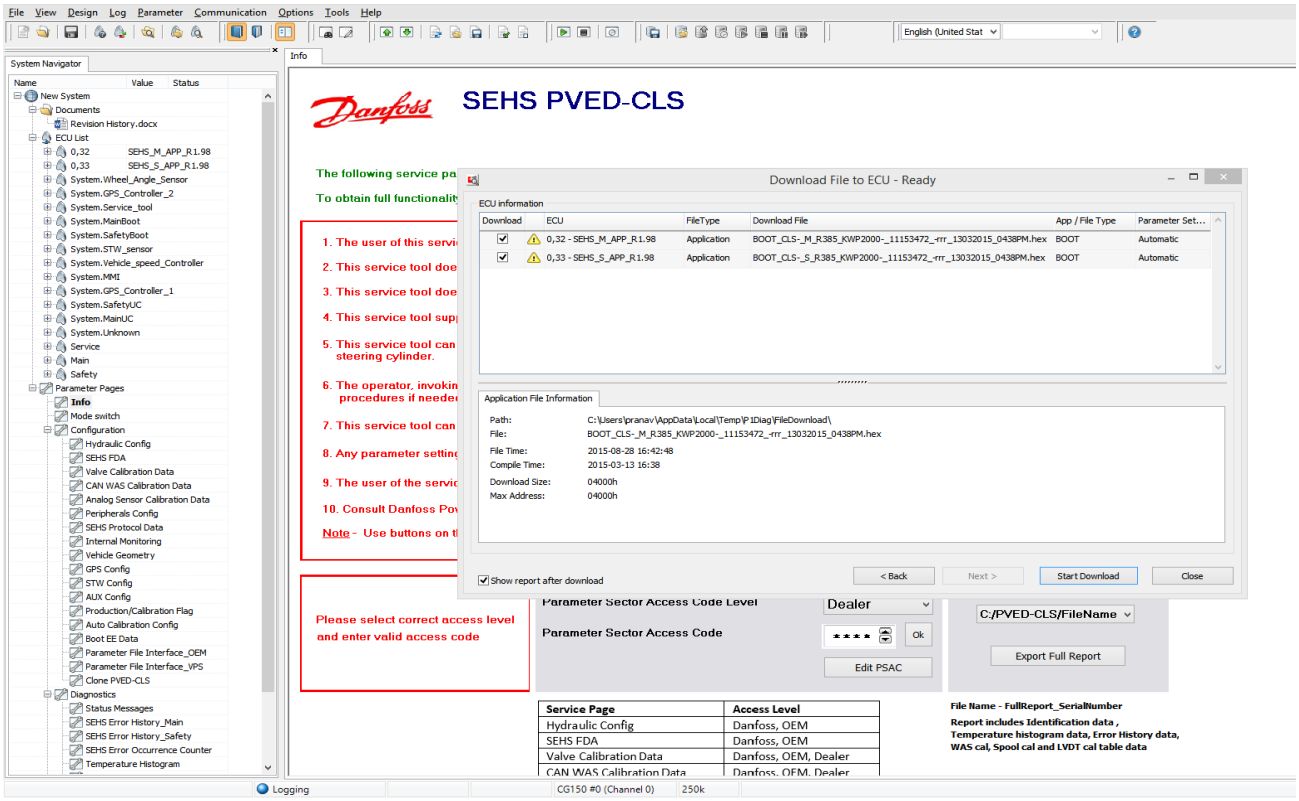
- Click on Next button.



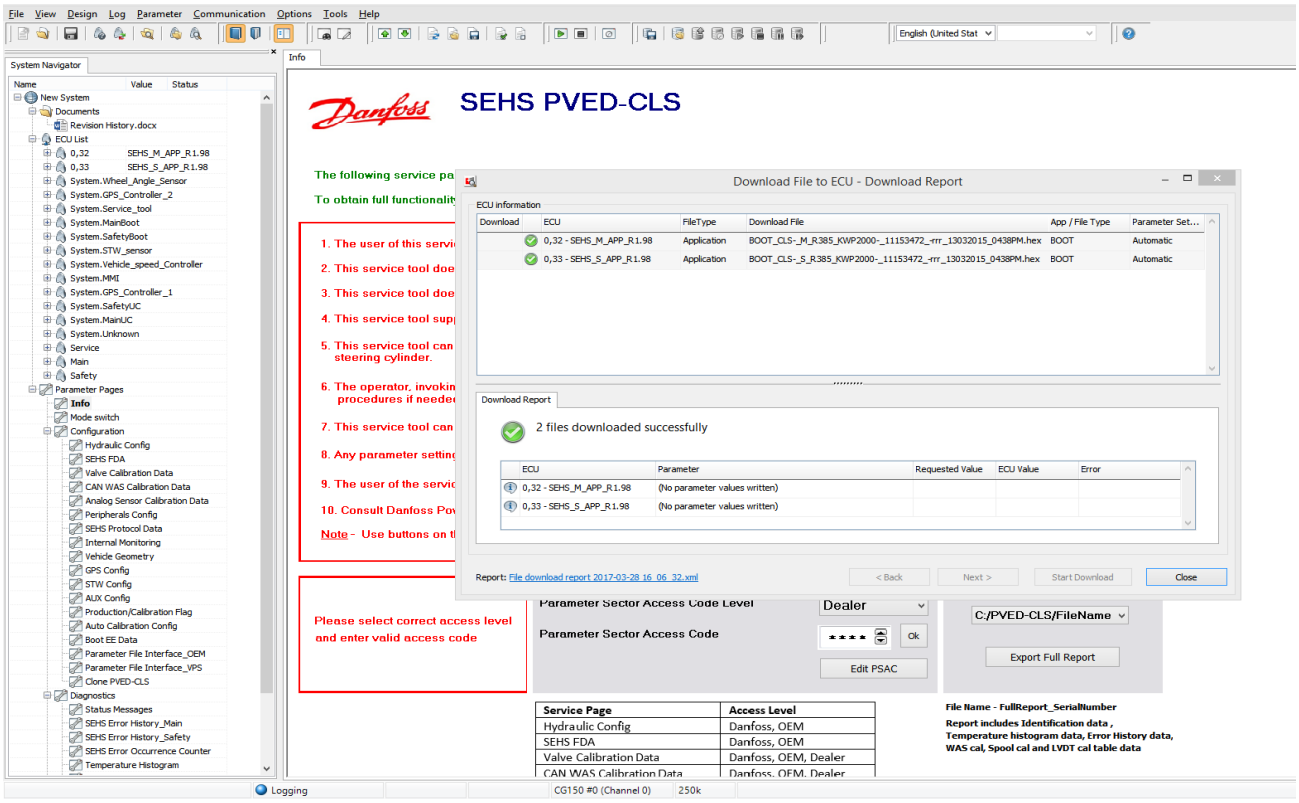
- Change App/File Type. Click on Confirm Button.



- Enter Application Type as “BOOT”.
- Click on Ok button.



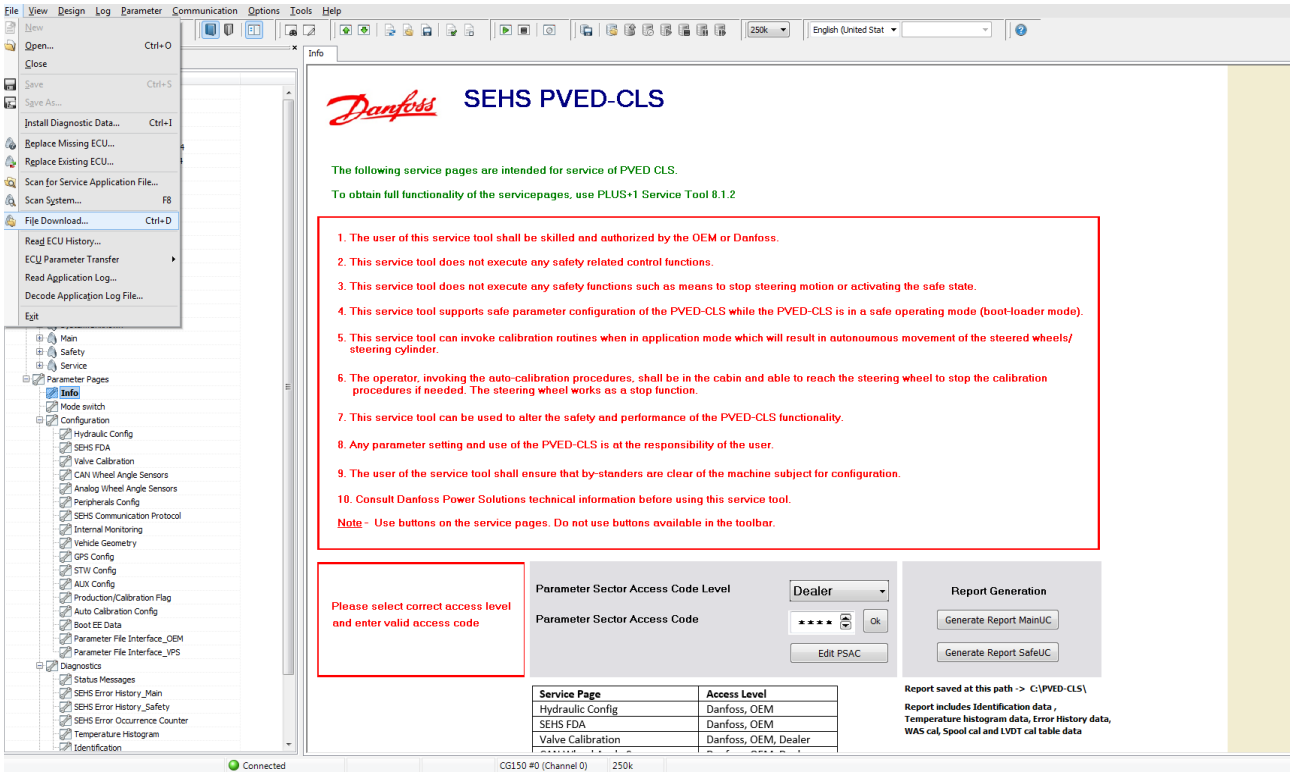
- Click on Start download button.



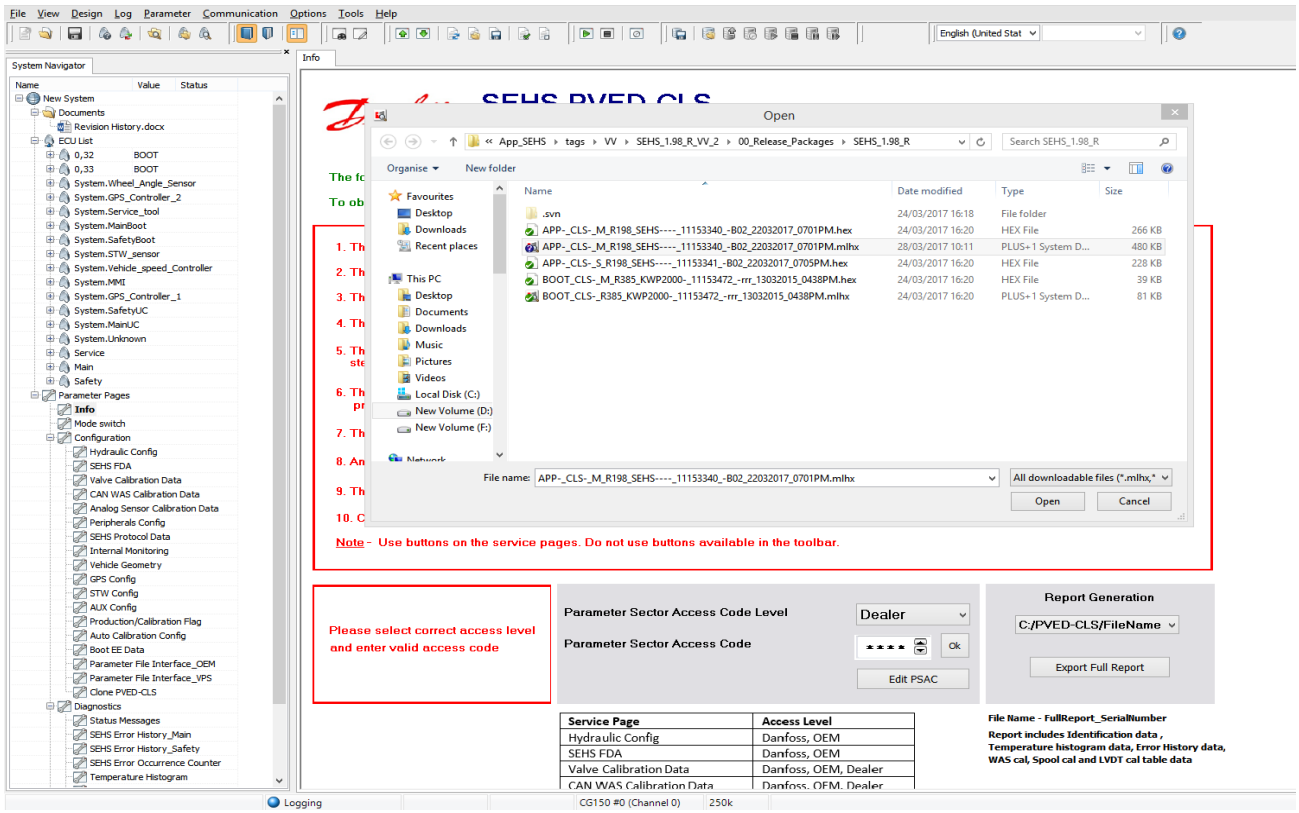
- Click on Close button.

7.3 Download Application .mlhx file

- Select File Menu -> File Download.

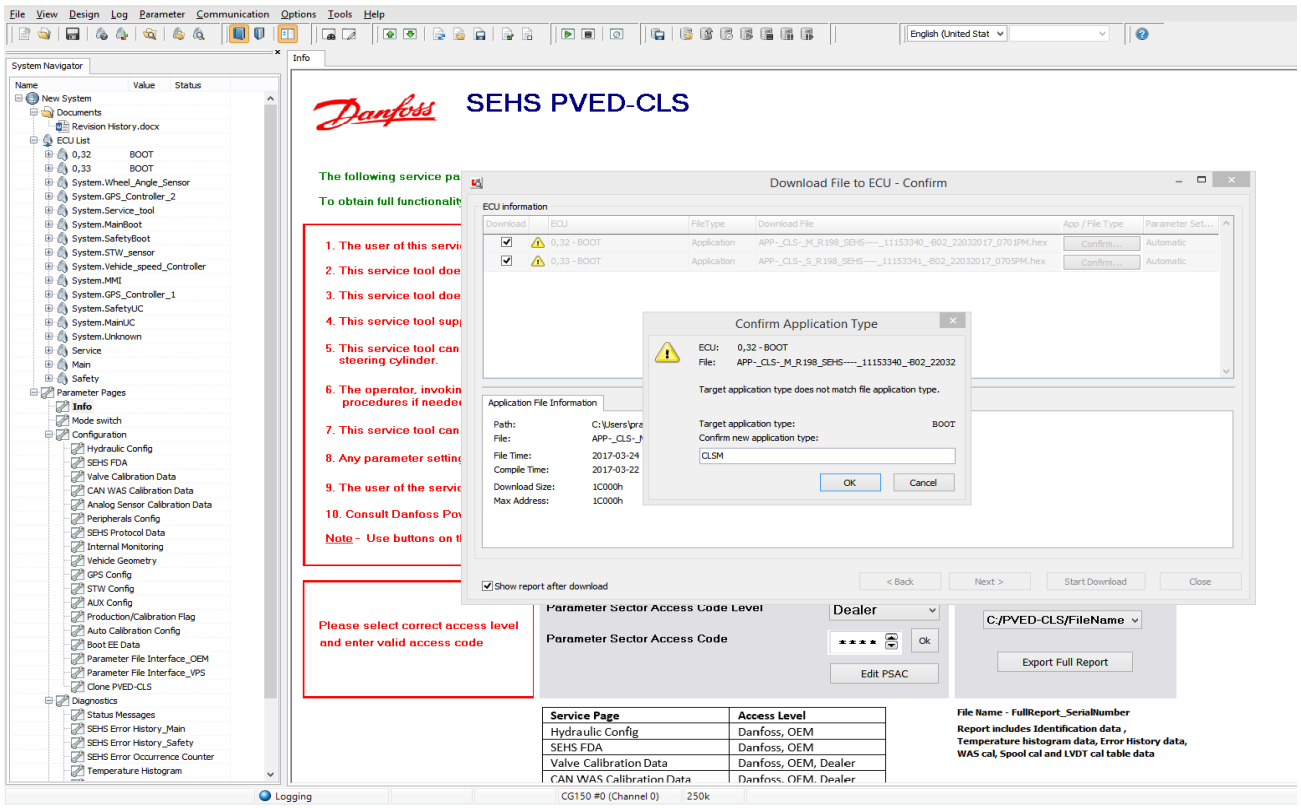


- Select application .mlhx file to download.

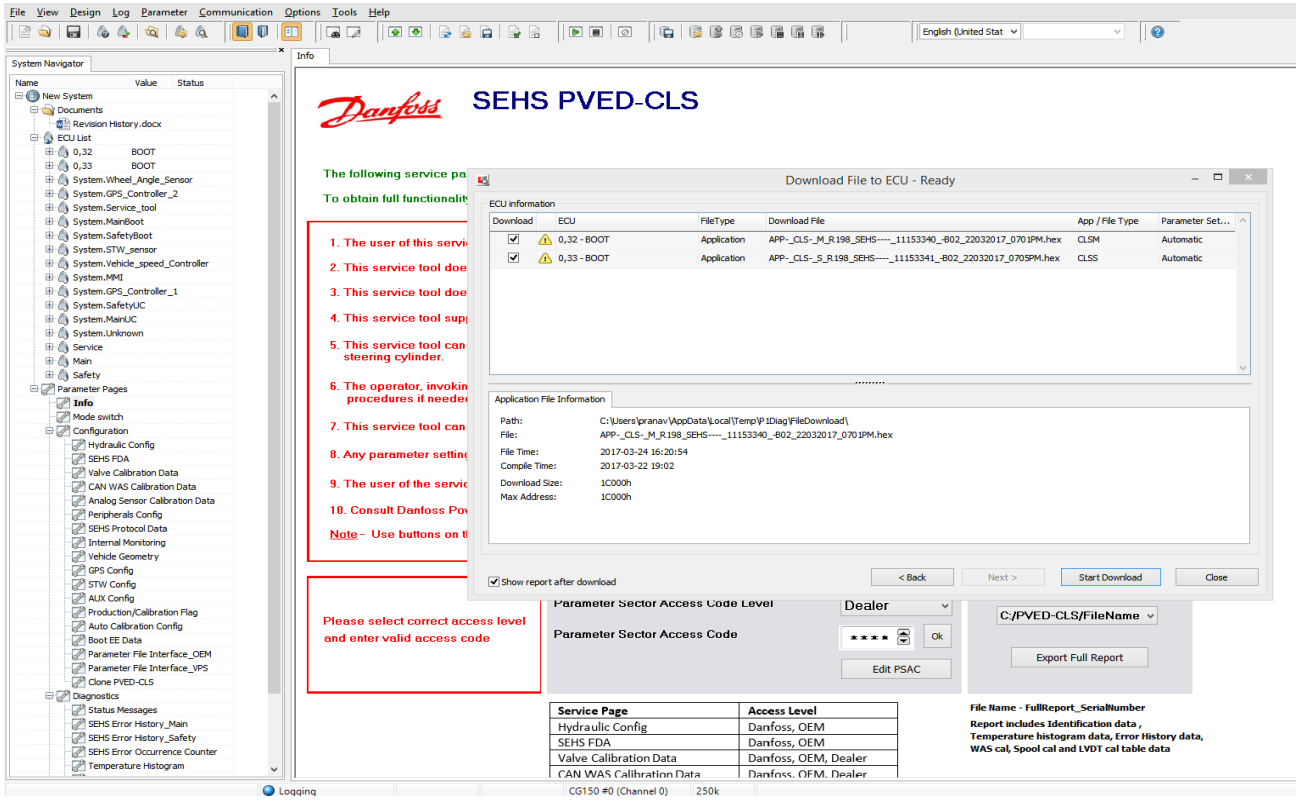


- Click on Next button.

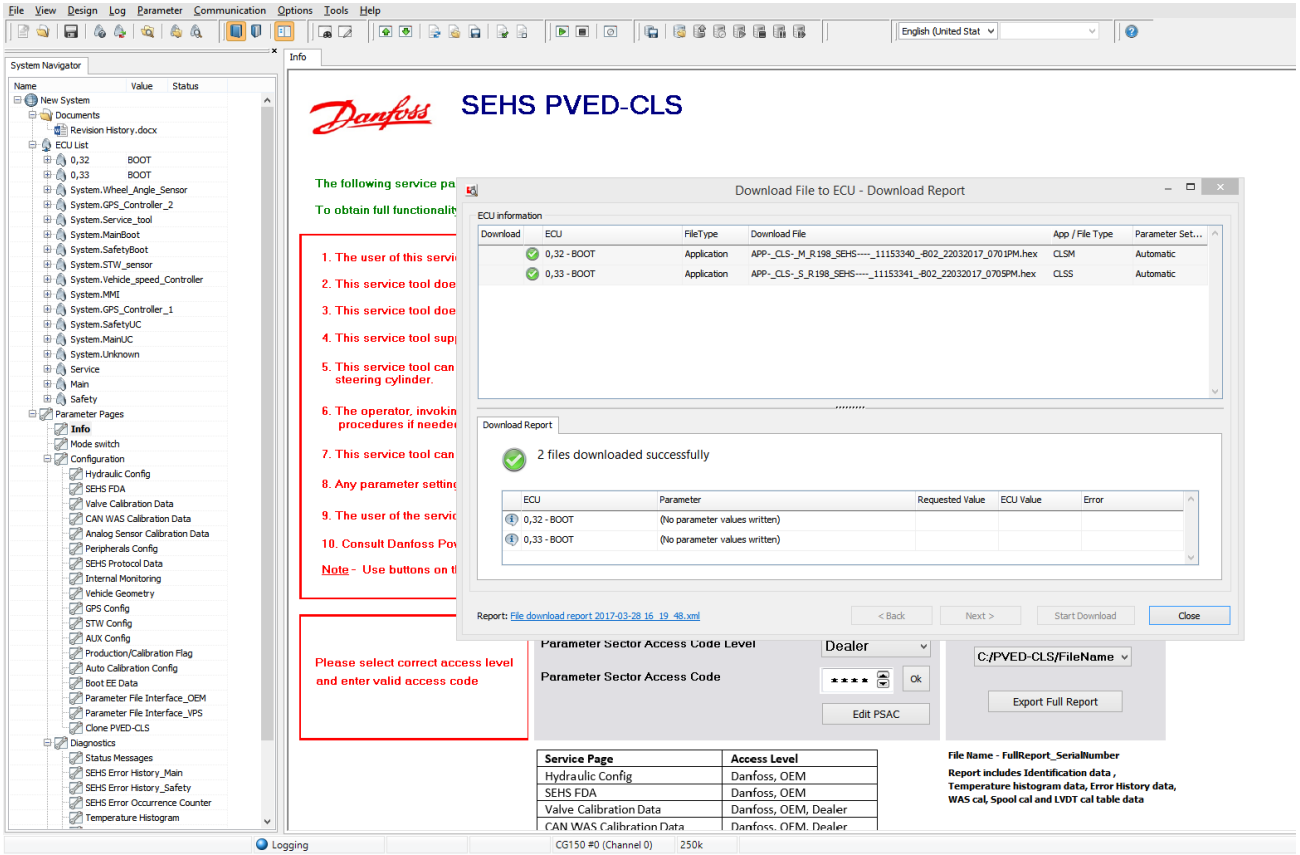
- Enter Application type as “CLSM” for MainUC and “CLSS” for SafetyUC.



- Click on Ok button.



- Click on Start Download button.



- Click on Close button. The Status will show OK during System scan if Application downloaded correctly.

8. Guidelines for using Parameter File Interface Service pages

Parameter File Interface OEM page: 1)OEM's can use this page to get the parameter values of all (PAE + VPS) parameters or of those PAE parameters which have been modified with respect to their default values.
2) However, there is no restriction for dealer to use this page.
3) Files exported from this page cannot be imported and downloaded.

Parameter File Interface VPS page: 1) Manufacturer (Danfoss) can use this page. The following sectors are VPS parameters

- Boot EE Data
- Device Identification
- SVC Params
- Control Data
- Safety Data, Protocol Data
- Diagnostics Data
- Calibration Tables.

2. VPS parameter file button can only be used for importing VPS parameters and parameters not belonging to any of the above sectors are ignored while downloading parameters from this file.
3. The VPS parameter file should always contain CRC and signature CRC values for the parameter(s) and the service tool will not perform automatic CRC and signature calculation of the data.

Attention

This page can make the unit inoperable and shall not be used unless instructed by Danfoss.

Clone PVED-CLS page: 1) OEM's as well as Dealers can use Clone PVED-CLS page for cloning PVED-CLS.
2) By cloning PVED-CLS, it is possible to transfer the configuration from one PVED-CLS to another PVED-CLS. The exported file contains the following calibration sectors:

- Hydraulic Config
- SEHS FDA
- Peripherals Config
- SEHS Protocol Data
- Internal Monitoring
- Vehicle Geometry
- GPS Config
- STW Config
- AUX Config
- Auto Calibration Config sector

The file excludes the following calibration sectors, as these will not be valid for a new unit.

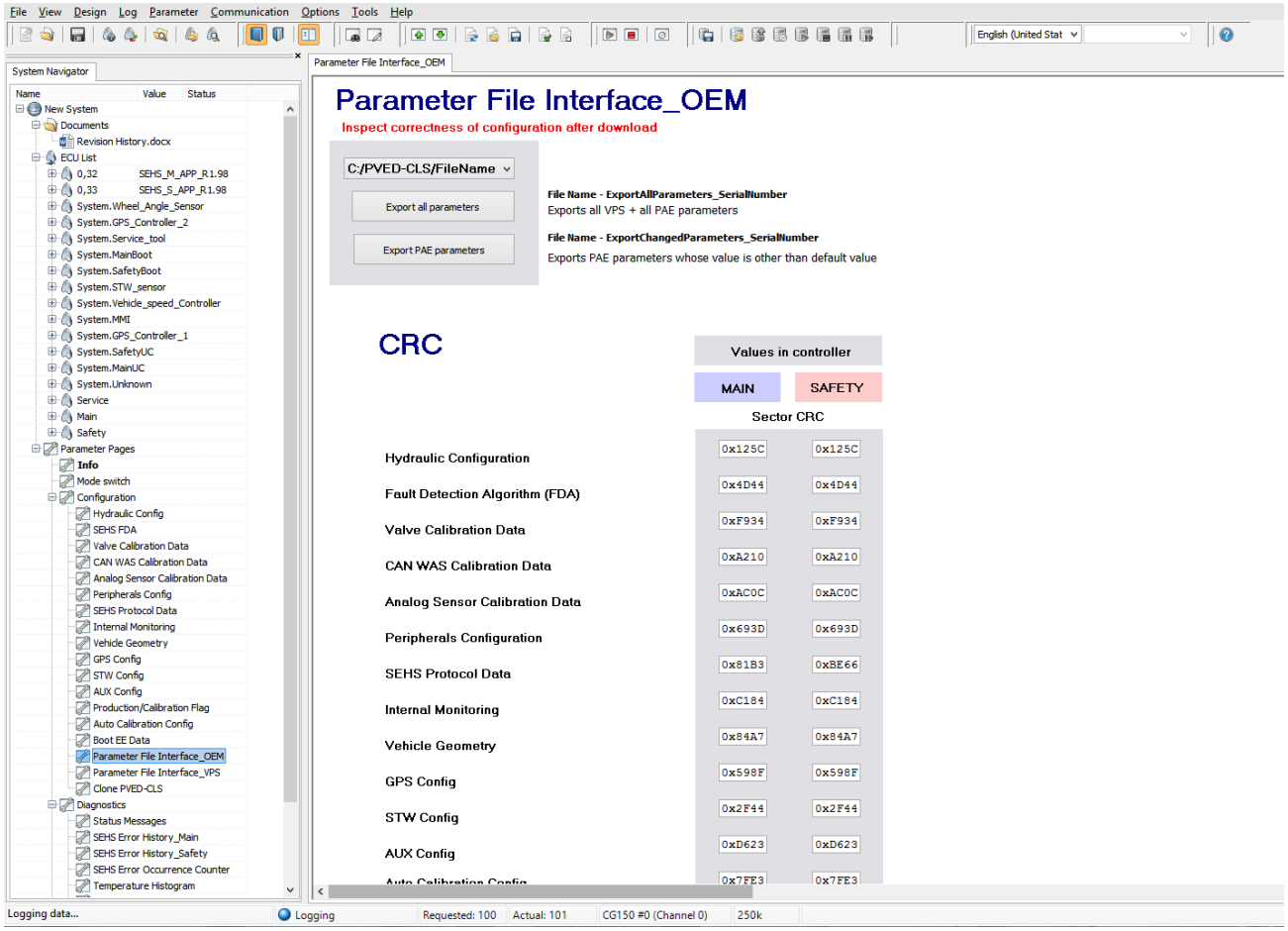
- Valve Calibration Data
- CAN WAS Calibration Data
- Analog Sensor Calibration Data
- Production/Calibration Flag

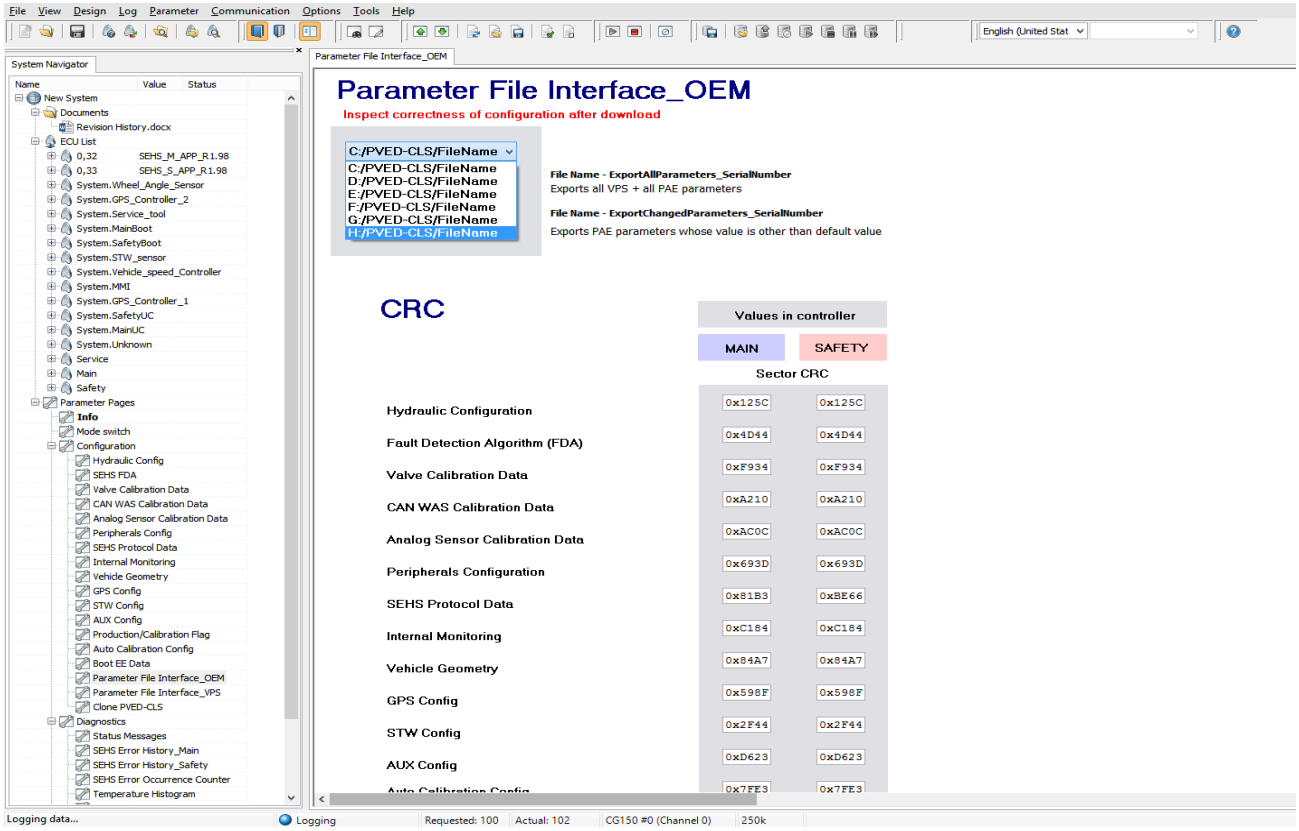
Attention

When cloning a PVED-CLS, it must be calibrated to ensure the optimum performance.

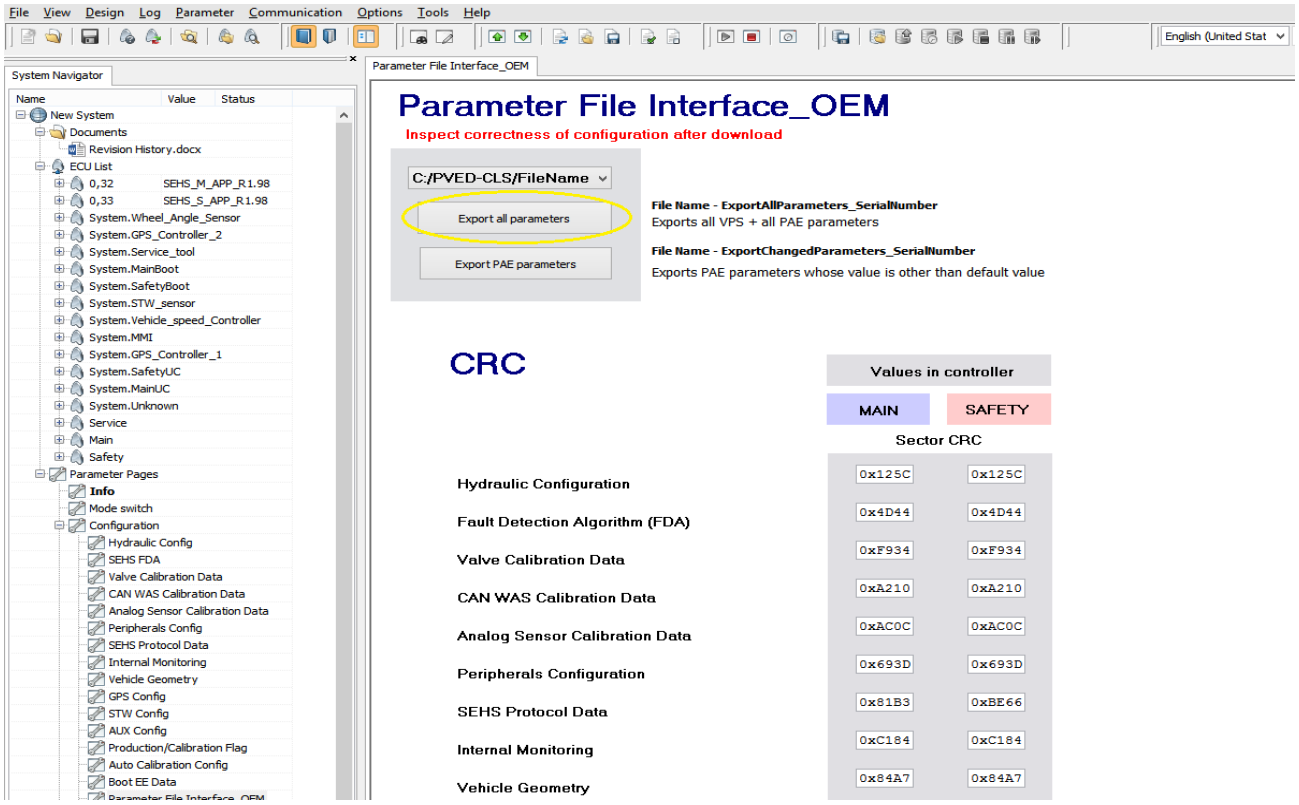
8.1 How to use Parameter File Interface OEM page

- Go on Parameter File Interface_OEM page of P1D.

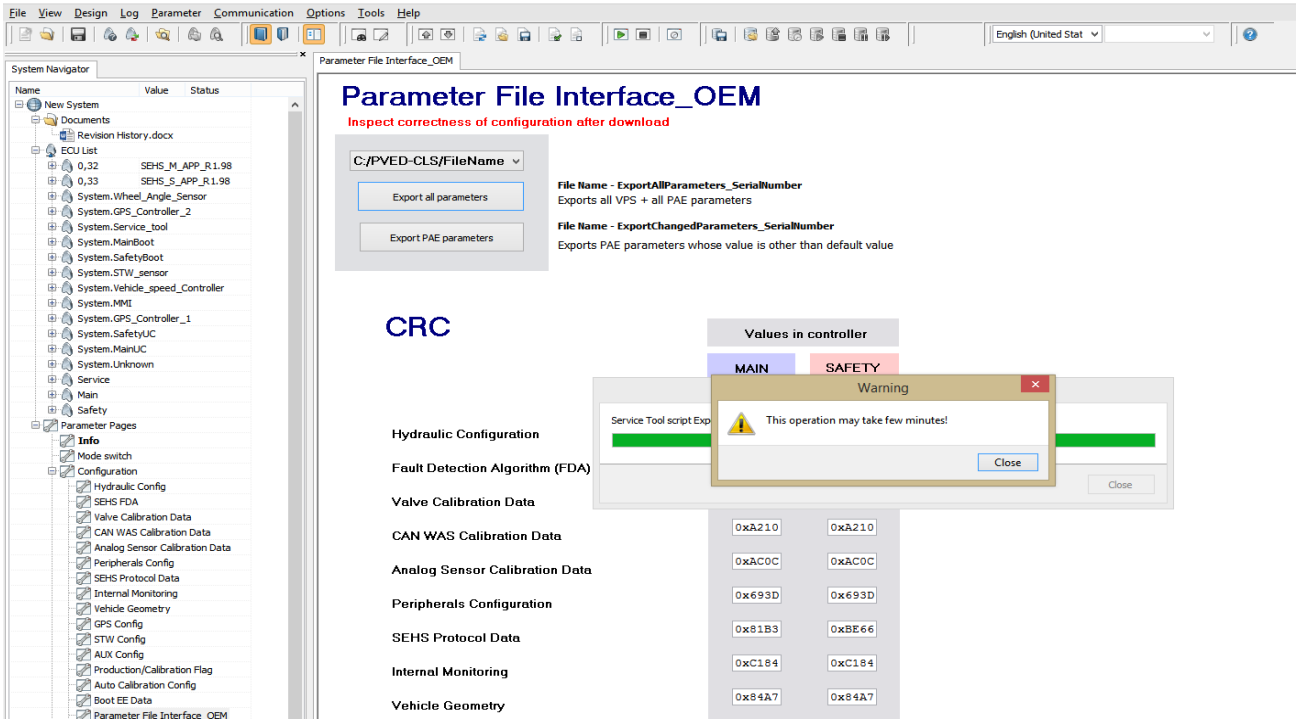

File View Design Log Parameter Communication Options Tools Help
English (United Stat
System Navigator
Parameter File Interface_OEM
Name Value Status
New System
Documents
Revision History.docx
ECU List
0,32 SEHS_M_APP_R1.98
0,33 SEHS_S_APP_R1.98
System.Wheel_Angle_Sensor
System.GPS_Controller_2
System.Service_tool
System.MainBoot
System.SafetyBoot
System.STW_sensor
System.Vehicle_speed_Controller
System.MMI
System.GPS_Controller_1
System.SafetyUC
System.MainUC
System.Unknown
Service
Main
Safety
Parameter Pages
Info
Mode switch
Configuration
Hydraulic Config
SEHS FDA
Valve Calibration Data
CAN WAS Calibration Data
Analog Sensor Calibration Data
Peripherals Config
SEHS Protocol Data
Internal Monitoring
Vehicle Geometry
GPS Config
STW Config
AUX Config
Production/Calibration Flag
Auto Calibration Config
Boot EE Data
Parameter File Interface_OEM
Parameter File Interface_VPS
Clone PVED-CLS
Diagnostics
Status Messages
SEHS Error History_Main
SEHS Error History_Safety
SEHS Error Occurrence Counter
Temperature Histogram
Parameter File Interface_OEM
Inspect correctness of configuration after download
C:/PVED-CLS/FileName
Export all parameters
Export PAE parameters
File Name - ExportAllParameters_SerialNumber
Exports all VPS + all PAE parameters
File Name - ExportChangedParameters_SerialNumber
Exports PAE parameters whose value is other than default value
CRC
Values in controller
MAIN
SAFETY
Sector CRC
Hydraulic Configuration 0x125C 0x125C
Fault Detection Algorithm (FDA) 0x4D44 0x4D44
Valve Calibration Data 0xF934 0xF934
CAN WAS Calibration Data 0xA210 0xA210
Analog Sensor Calibration Data 0xAC0C 0xAC0C
Peripherals Configuration 0x693D 0x693D
SEHS Protocol Data 0x81B3 0xBE66
Internal Monitoring 0xC184 0xC184
Vehicle Geometry 0x84A7 0x84A7
GPS Config 0x598F 0x598F
STW Config 0x2F44 0x2F44
AUX Config 0xD623 0xD623
Logging data...
Logging
Requested: 100
Actual: 101
CG150 #0 (Channel 0)
250k



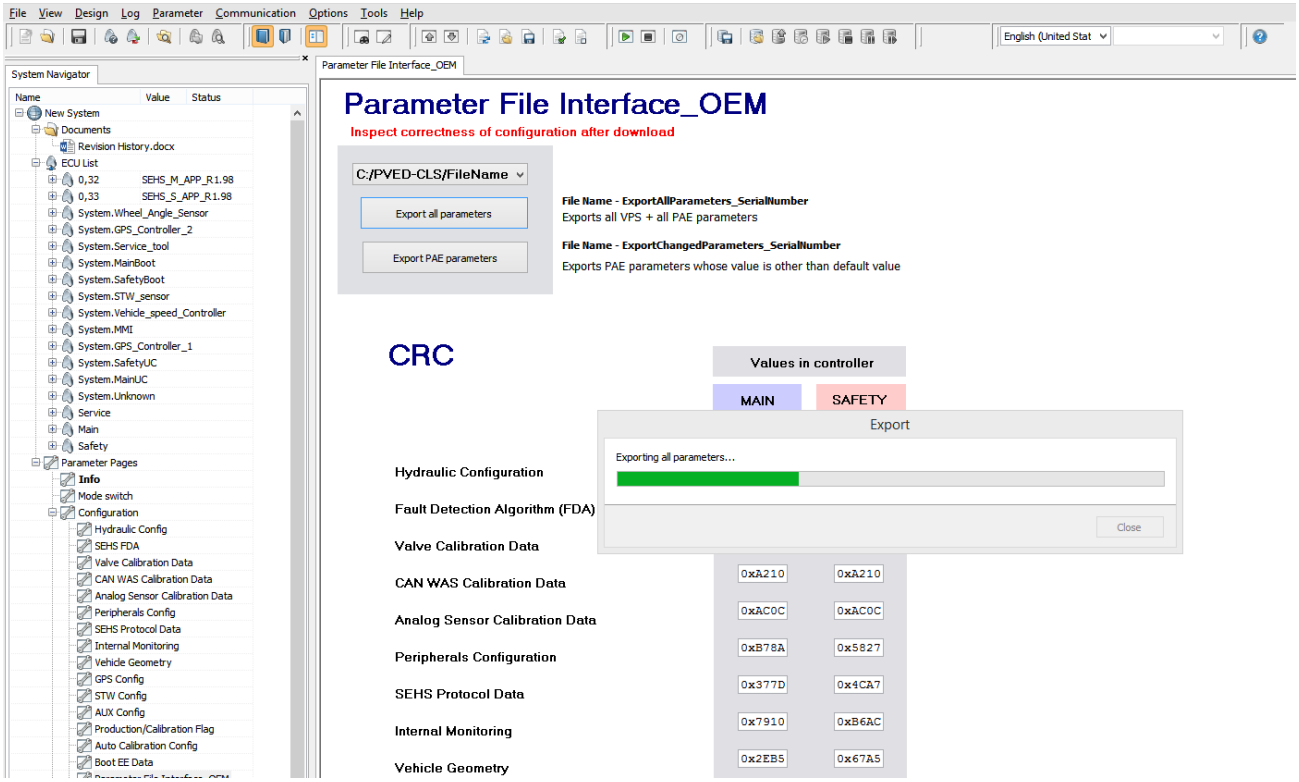
- Select path of the xml file where it is to be exported to.



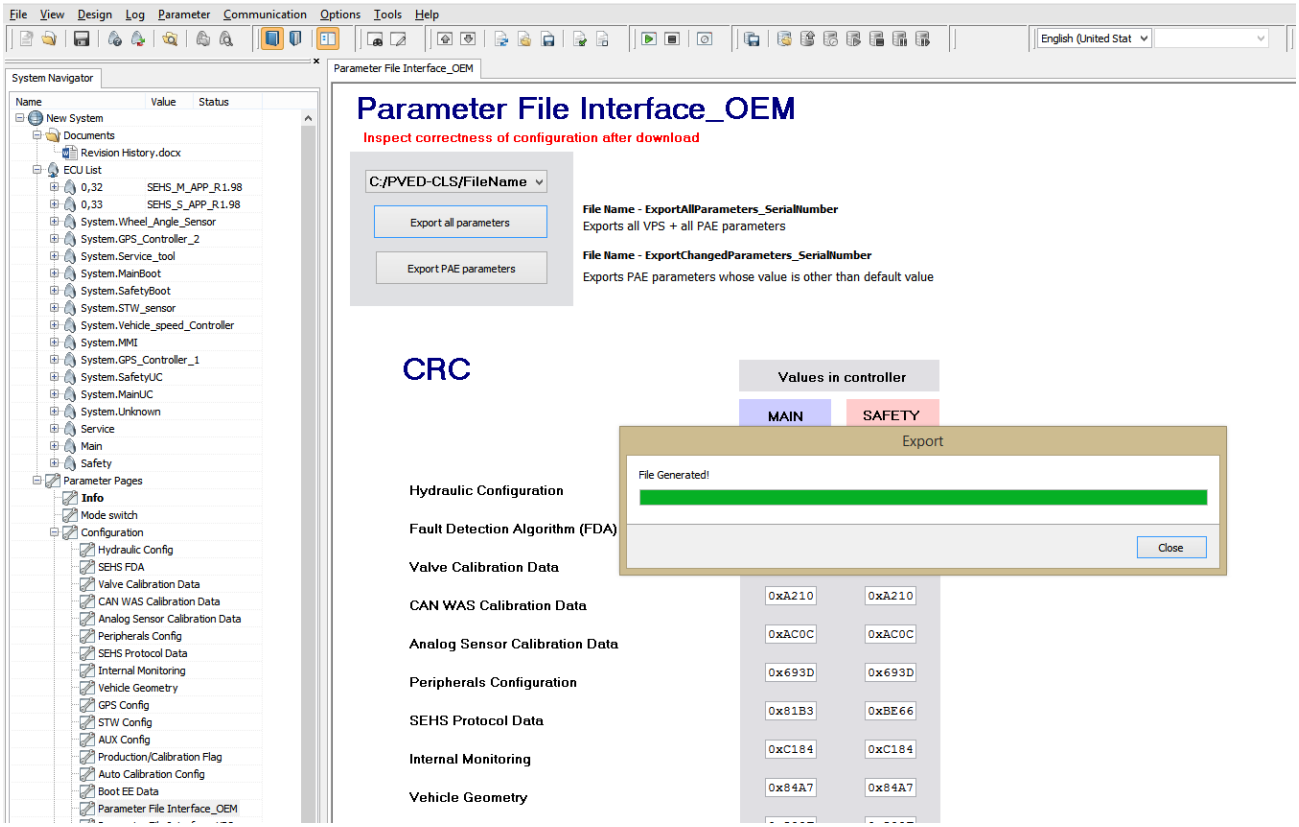
- Click on “Export all parameters” to export all VPS + PAE parameters to the xml file.



- Click on close.



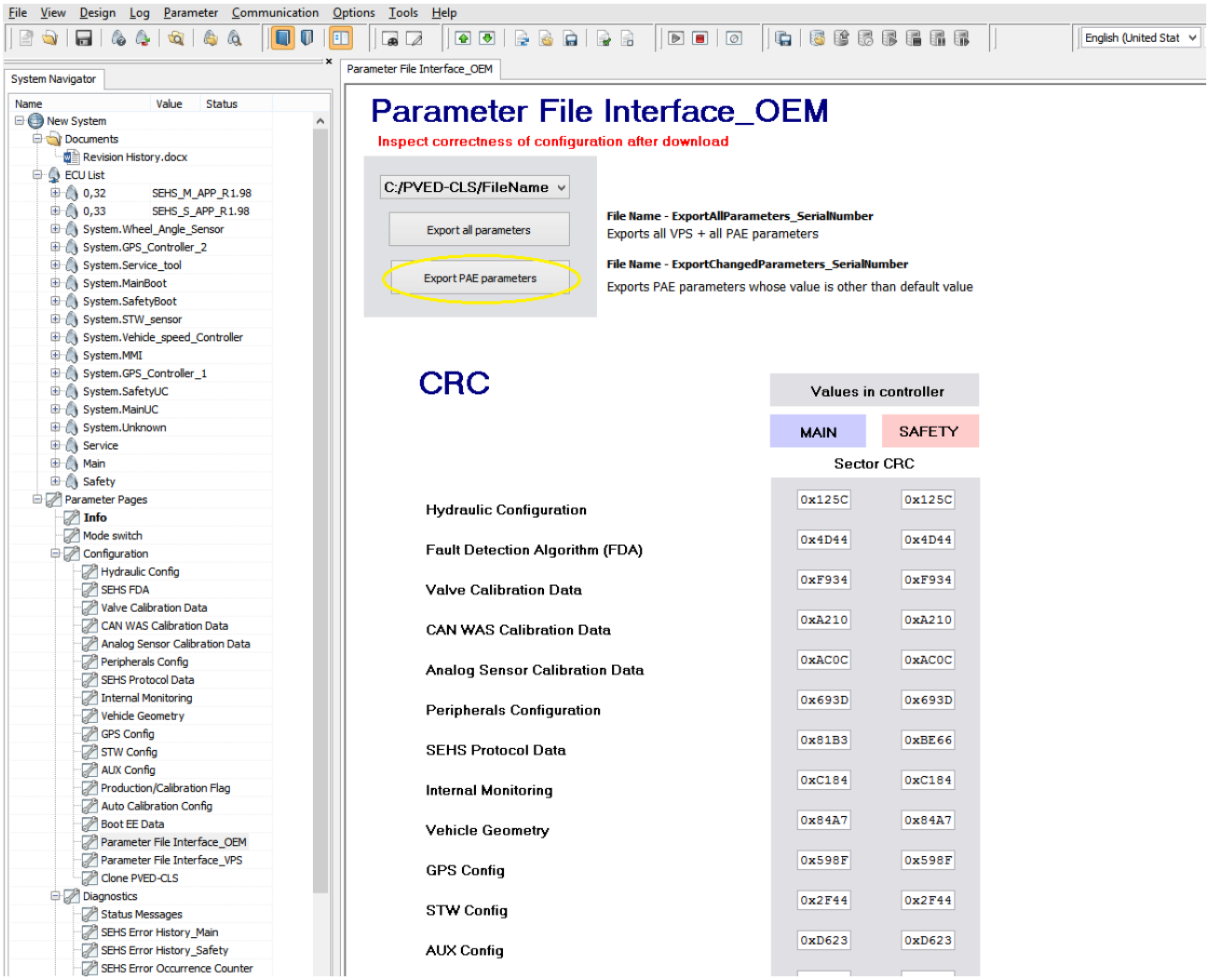
- All parameter values will be exported this way into an xml file.



- Click on “close” and the xml file with the values of all VPS + all PAE parameters will be generated at the given path.

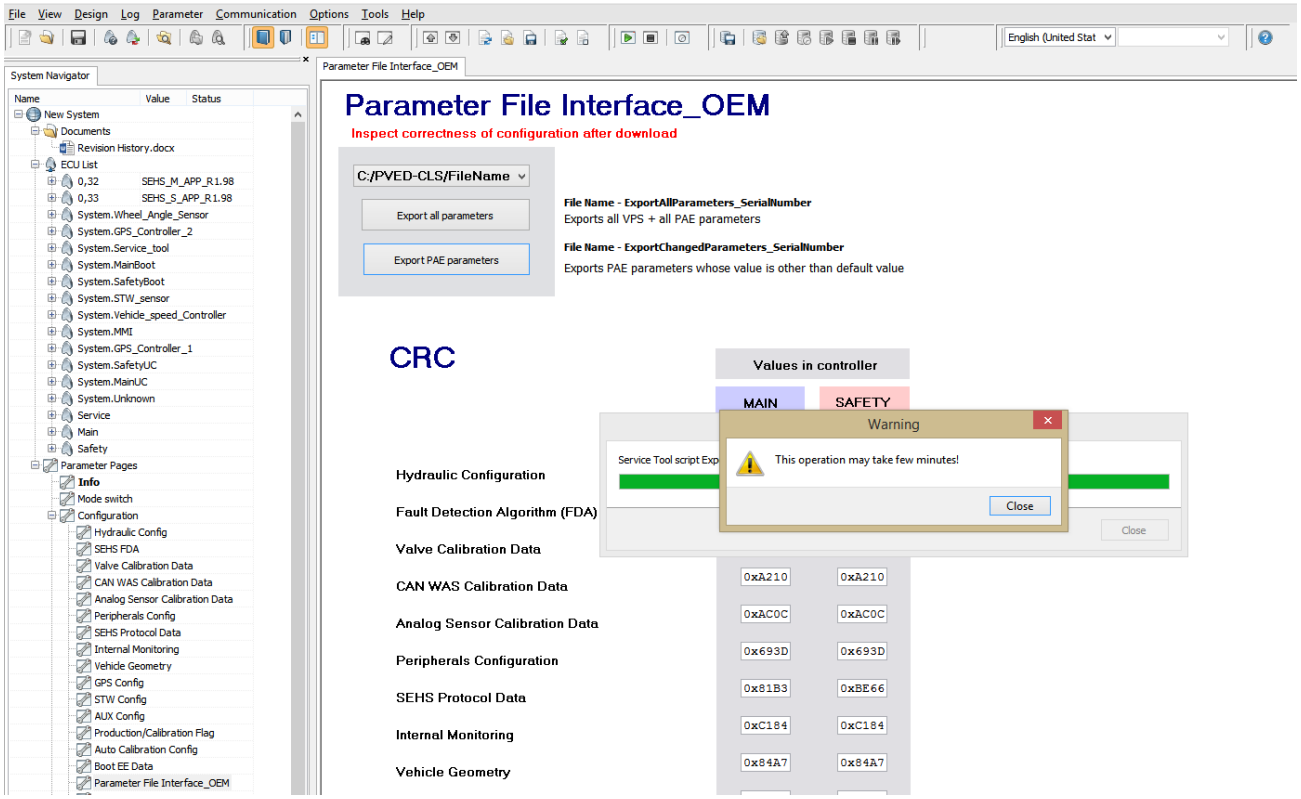
Important

If there is any existing file with same name at same location then it will be replaced.

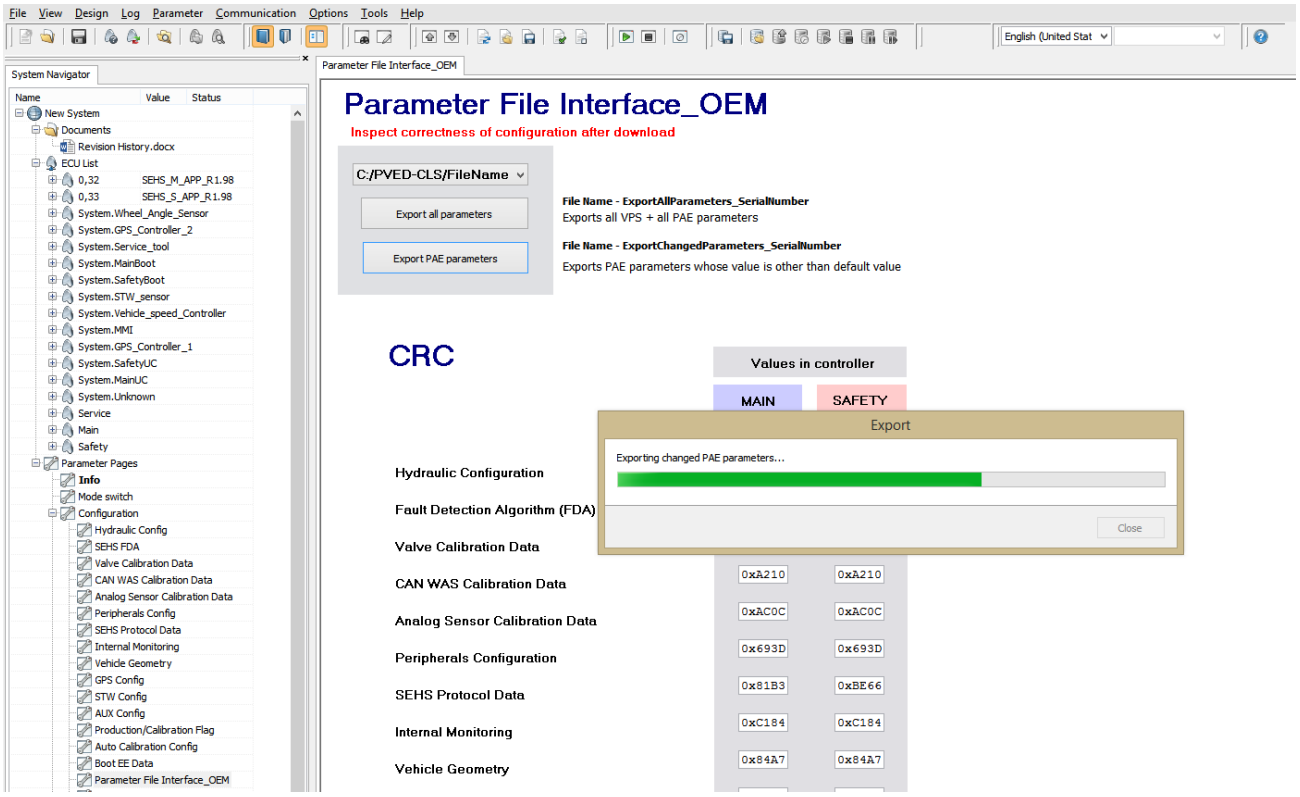


- Click on "Export PAE parameters" button to export PAE parameter values of following sectors which have been modified with respect to their default values.

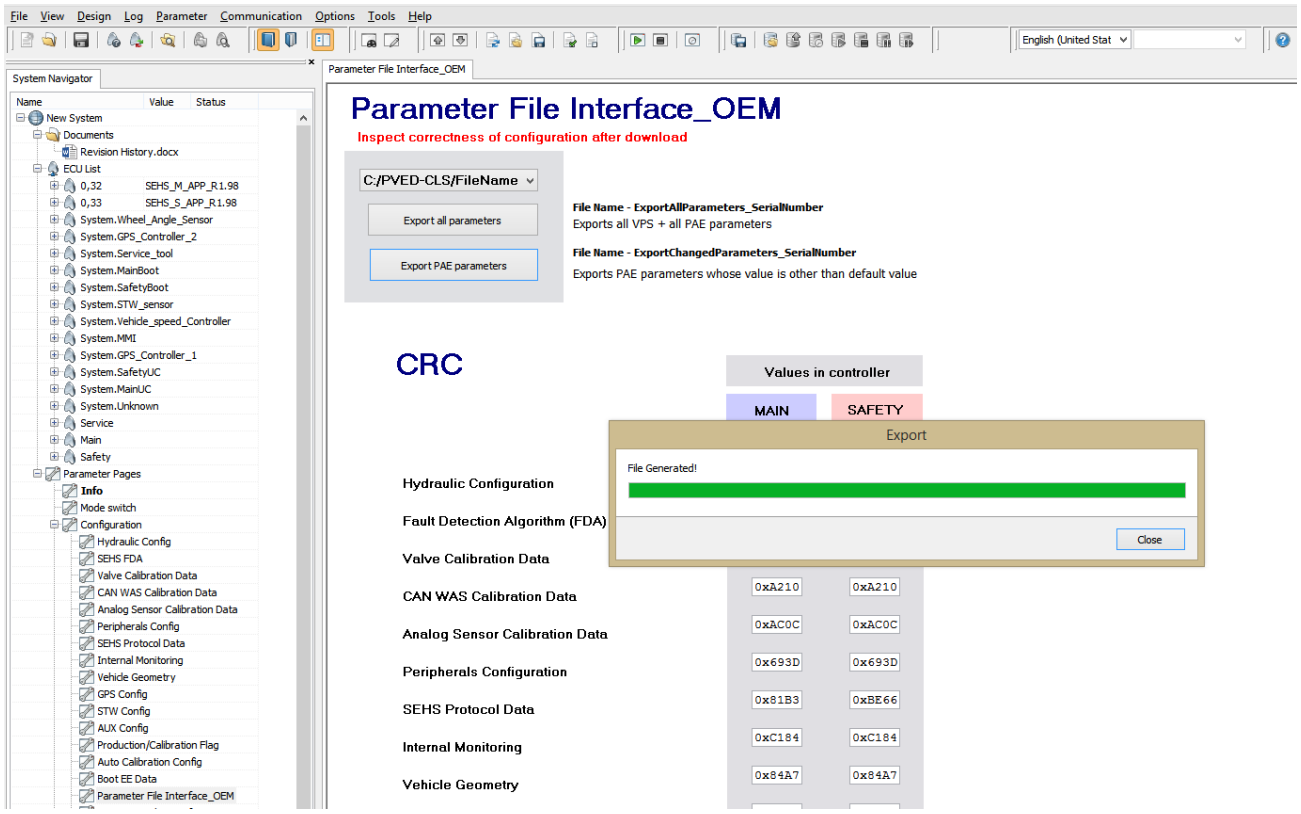
  - Hydraulic Config
  - SEHS FDA
  - Valve calibration data
  - CAN Wheel Angle Sensor Calibration data
  - Analog Sensor calibration data
  - Peripherals Config
  - SEHS Protocol Data
  - Internal Monitoring
  - Vehicle Geometry
  - GPS Config
  - STW Config
  - AUX Config
  - Production/Calibration Flag
  - Auto Calibration Config sector



- Click on “close” button.



- The progress window for exporting PAE parameters into an xml file will appear this way.

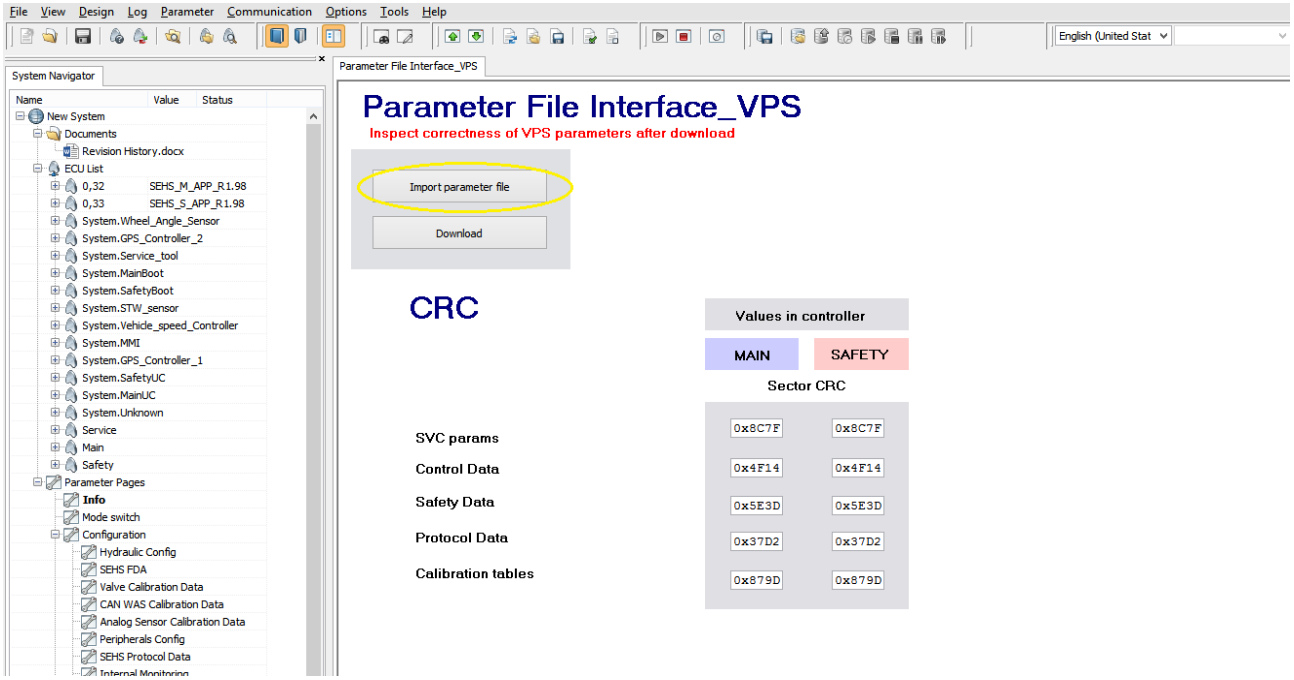


- Click on “close” button and the xml file with the PAE parameters values that have been modified with respect to their default values will be generated at the given path.

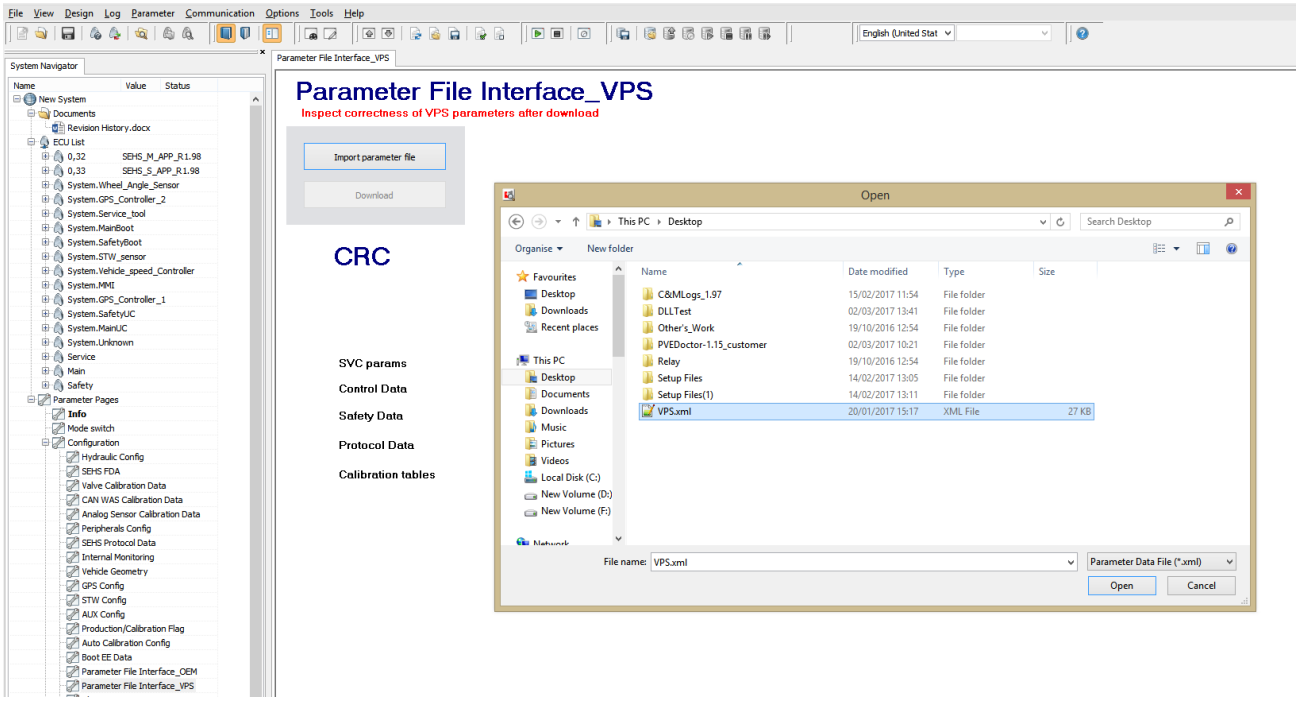
Important
If there is any existing file with same name at same location then it will be replaced.

8.2 How to use Parameter File Interface VPS page

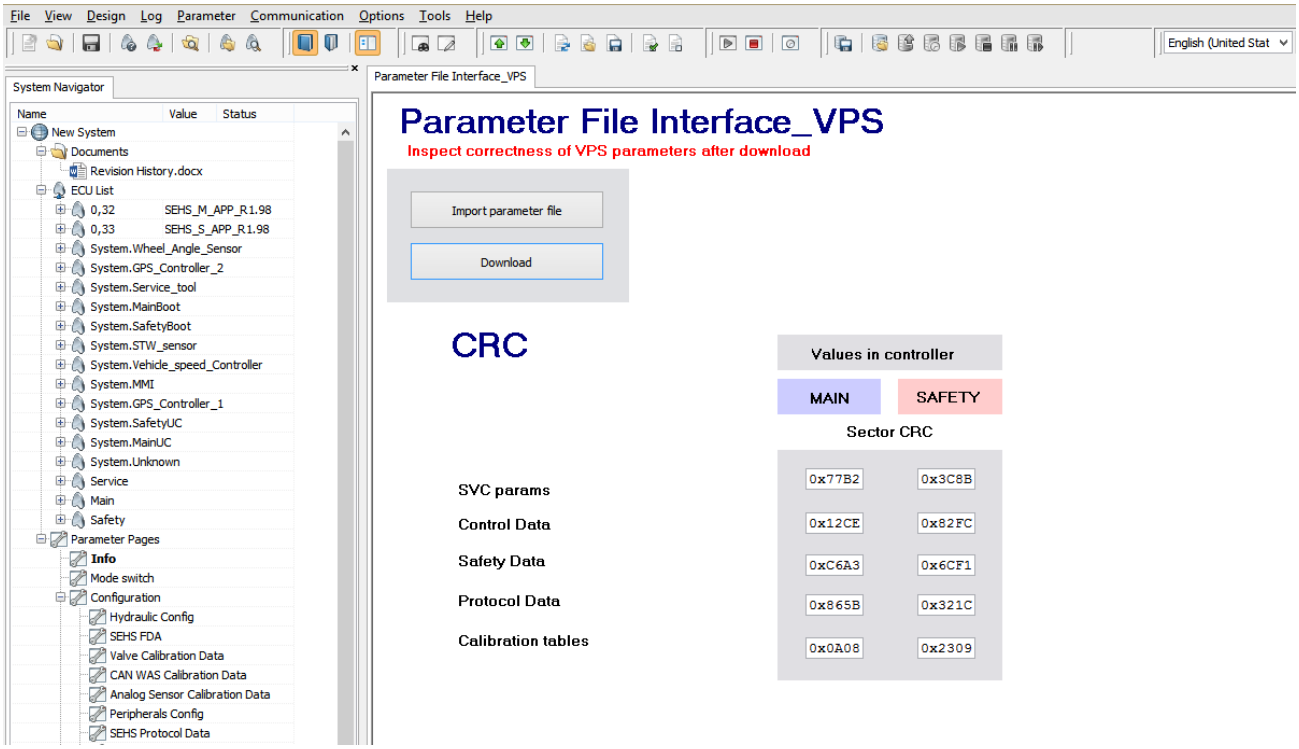
- Go on Parameter File Interface_VPS page of P1D.



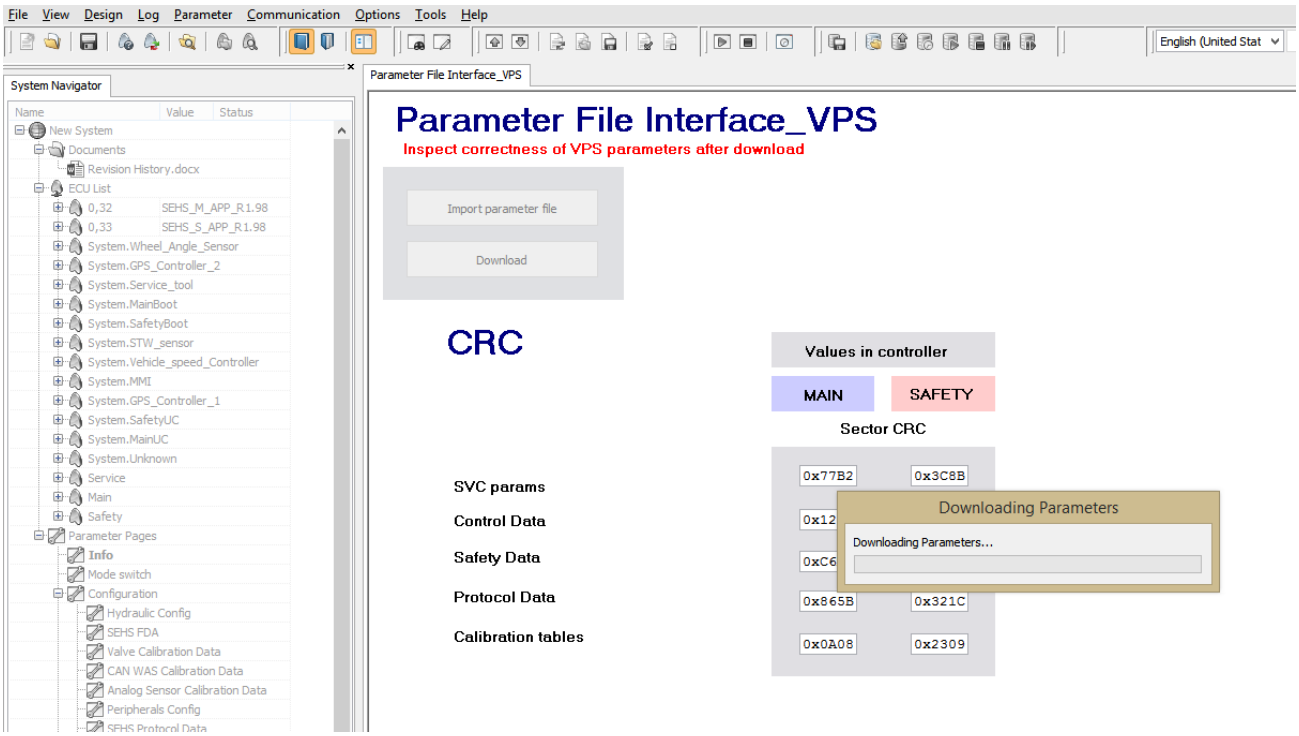
- Click on “Import parameter file” button to import VPS parameter values from xml.

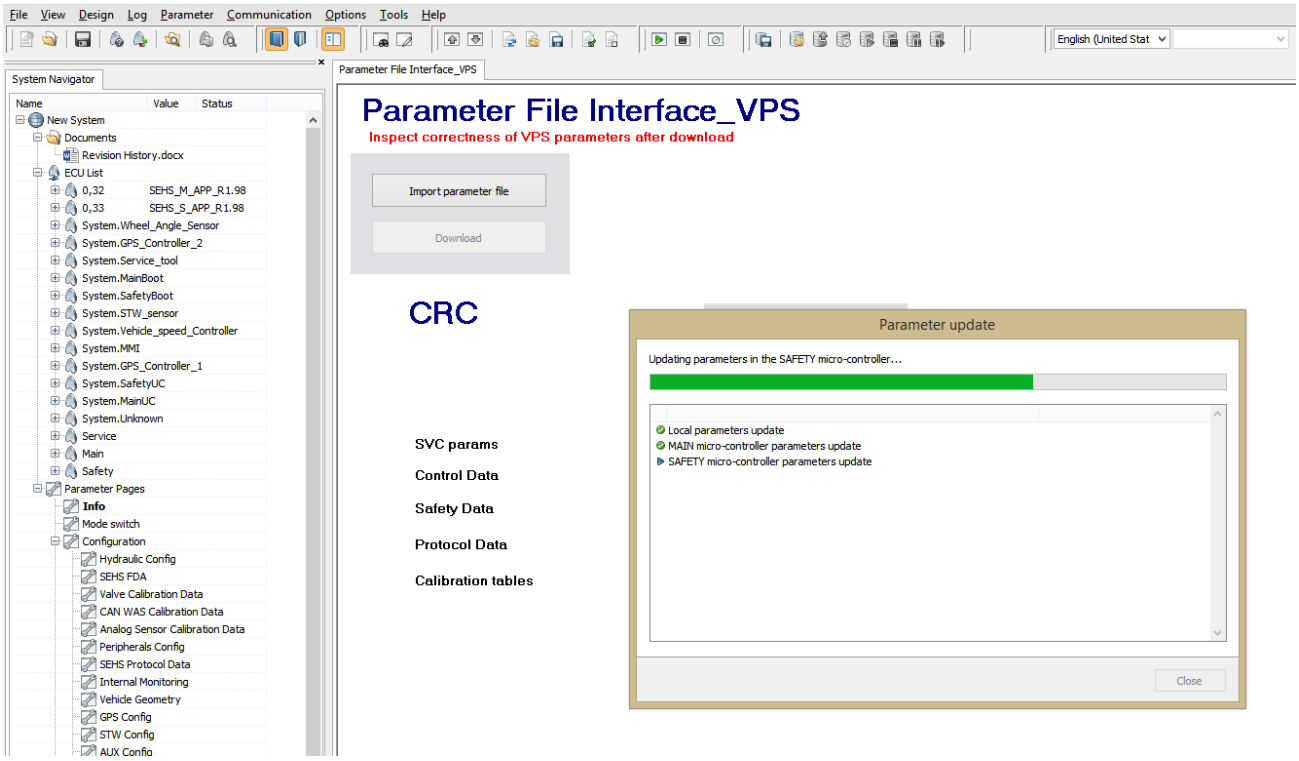


- Select the xml file that contains VPS parameter values.

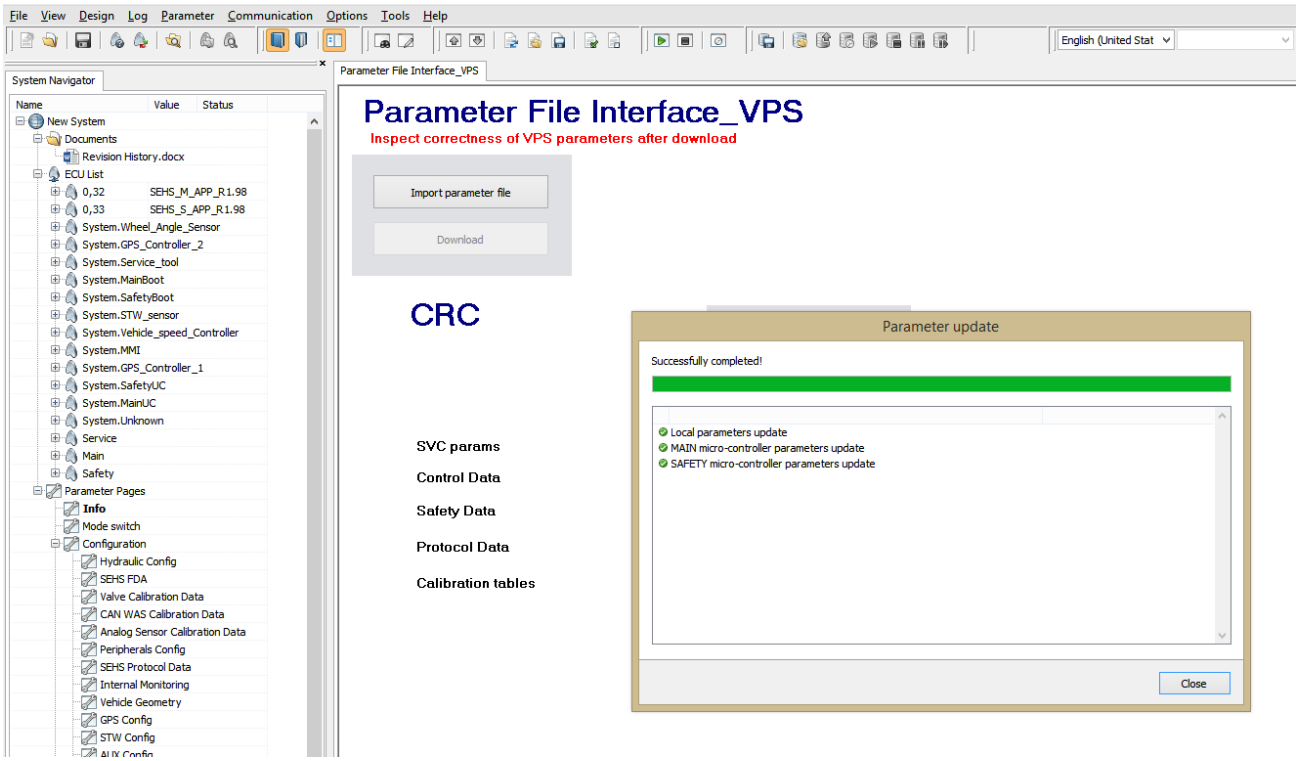


- Click on “Download” button to download the VPS parameters into the PVED-CLS.





- The progress window for download will appear as shown above.

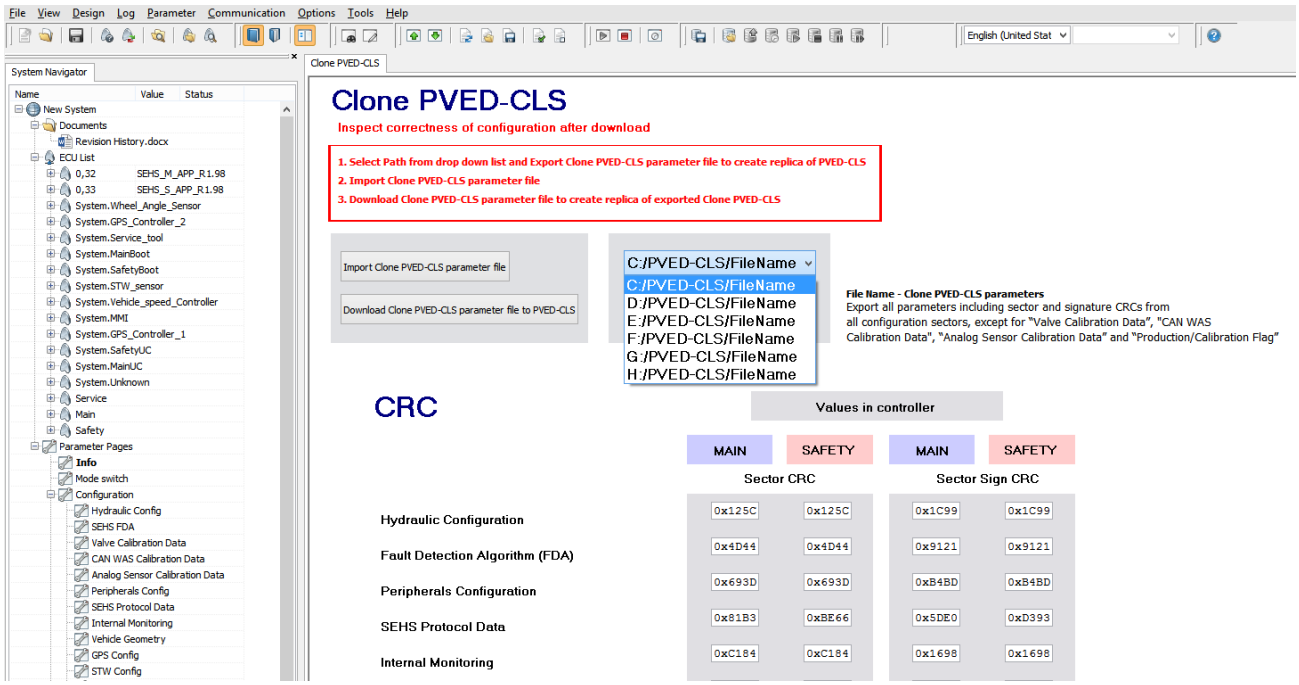


- Click on close button once the VPS parameters are downloaded into the main and safety controllers.

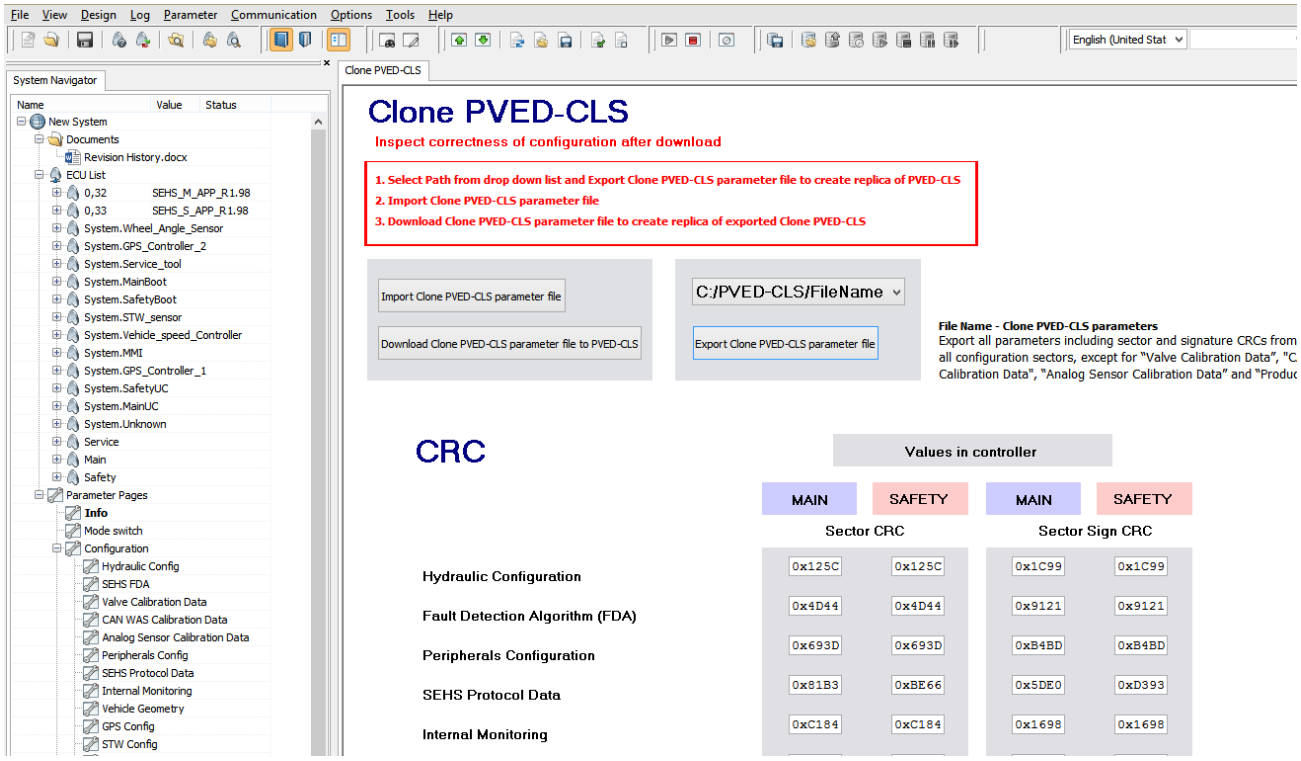
8.3 How to use Clone PVED-CLS page

- Go on Clone PVED-CLS page of P1D.

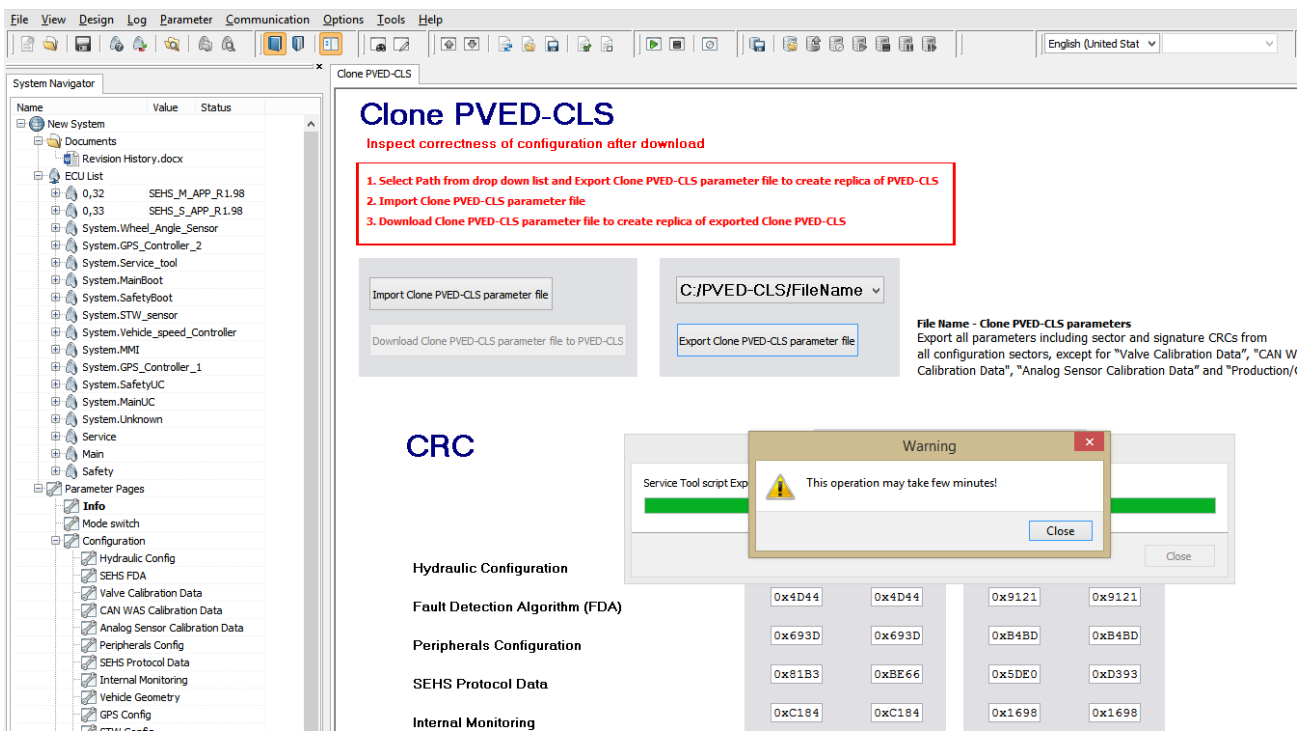
Important
The export button of this page will export all PAE parameters including sector and signature CRC's from all following configuration sectors:
- Hydraulic Config
- SEHS FDA
- Peripherals Config
- SEHS Protocol Data
- Internal Monitoring
- Vehicle Geometry
- GPS Config
- STW Config
- AUX Config
- Auto Calibration Config sector



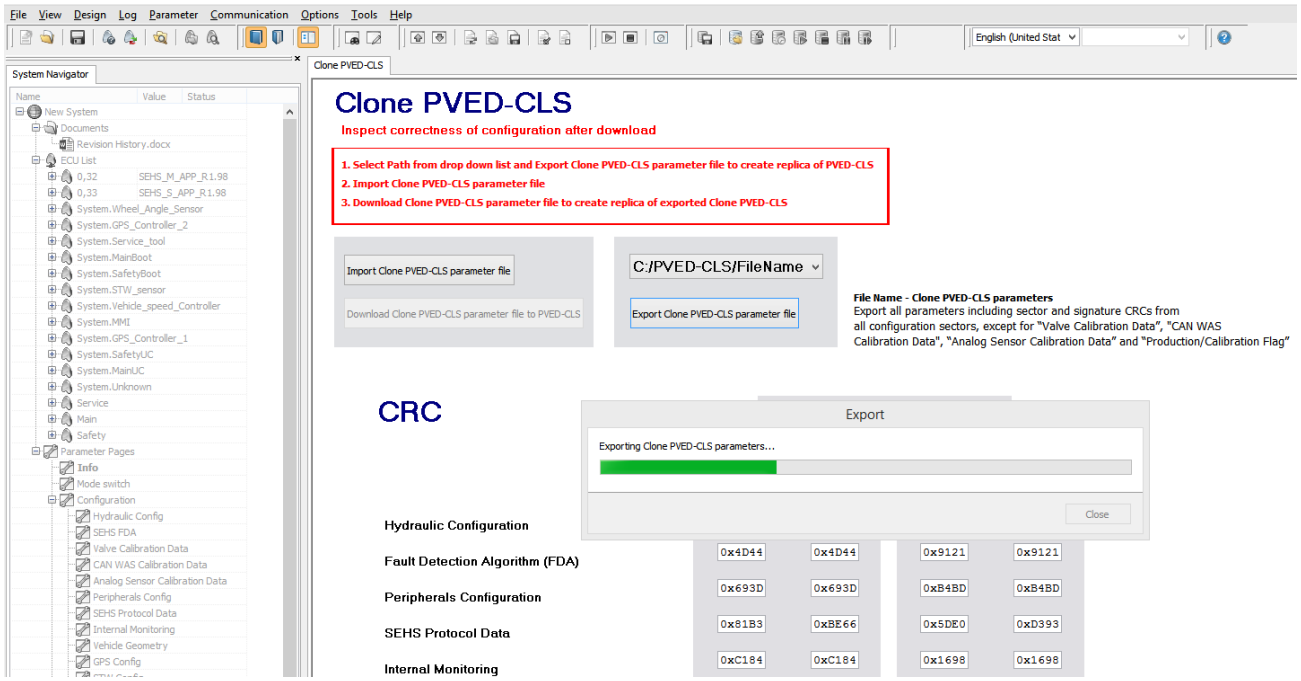
- Select the path of the xml file where it is to be exported to.



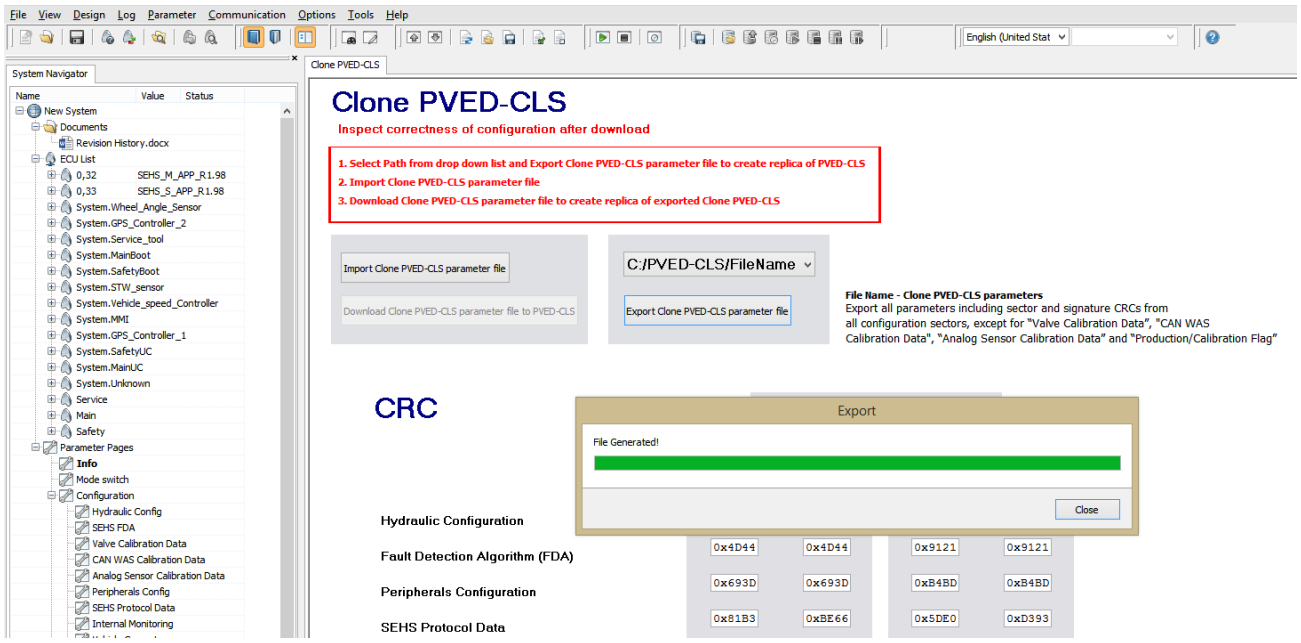
- Click on "Export Clone PVED-CLS parameter file" button.



- Click on "close" button.



- The progress bar for exporting xml parameter file will be seen as above.

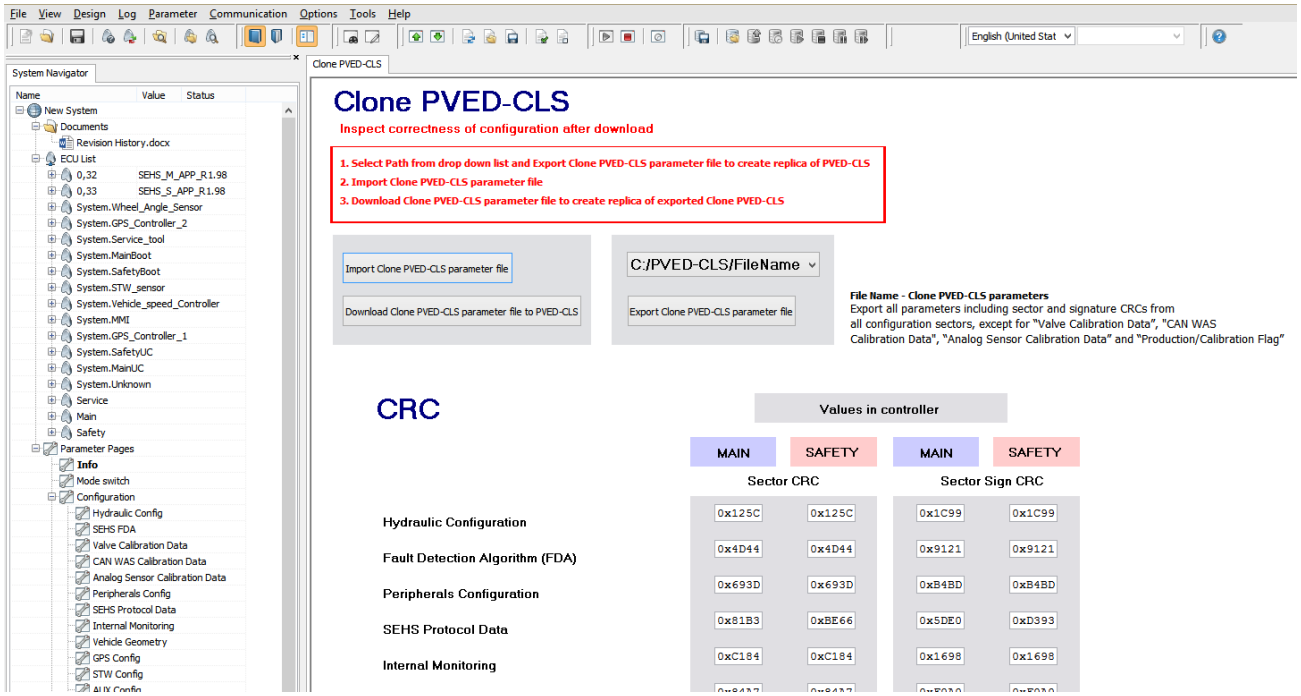


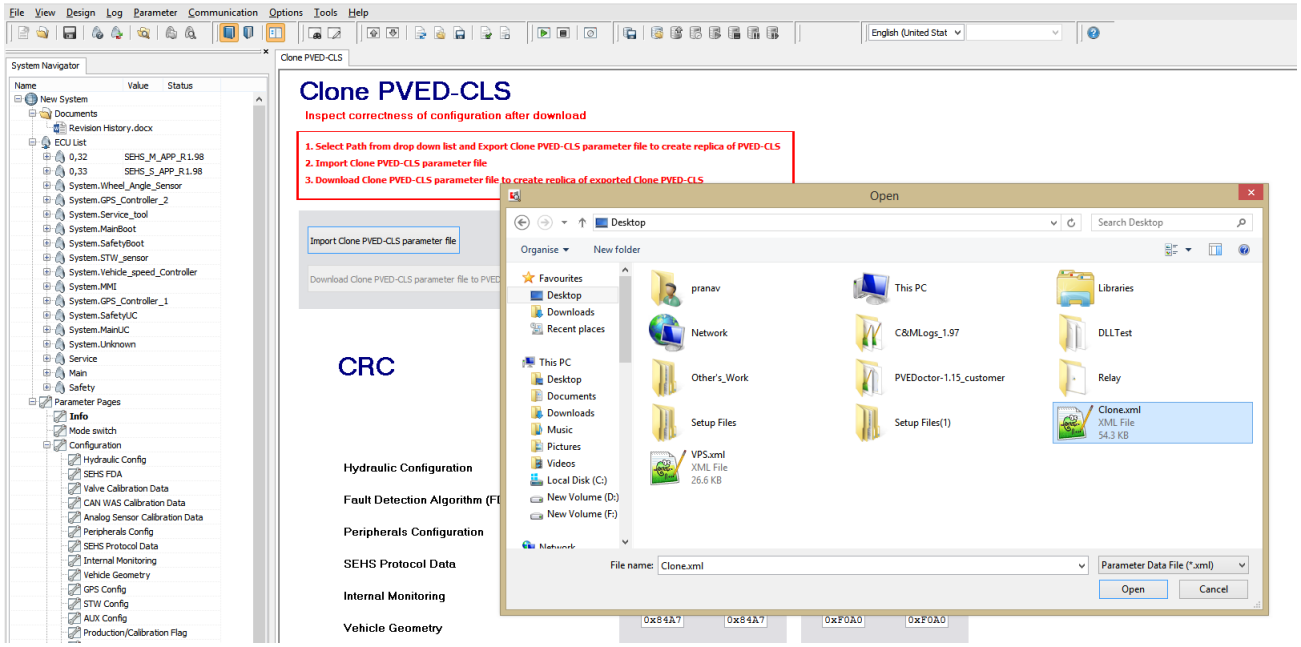
- Click on close button and the xml file will be generated at the specified location.

Important

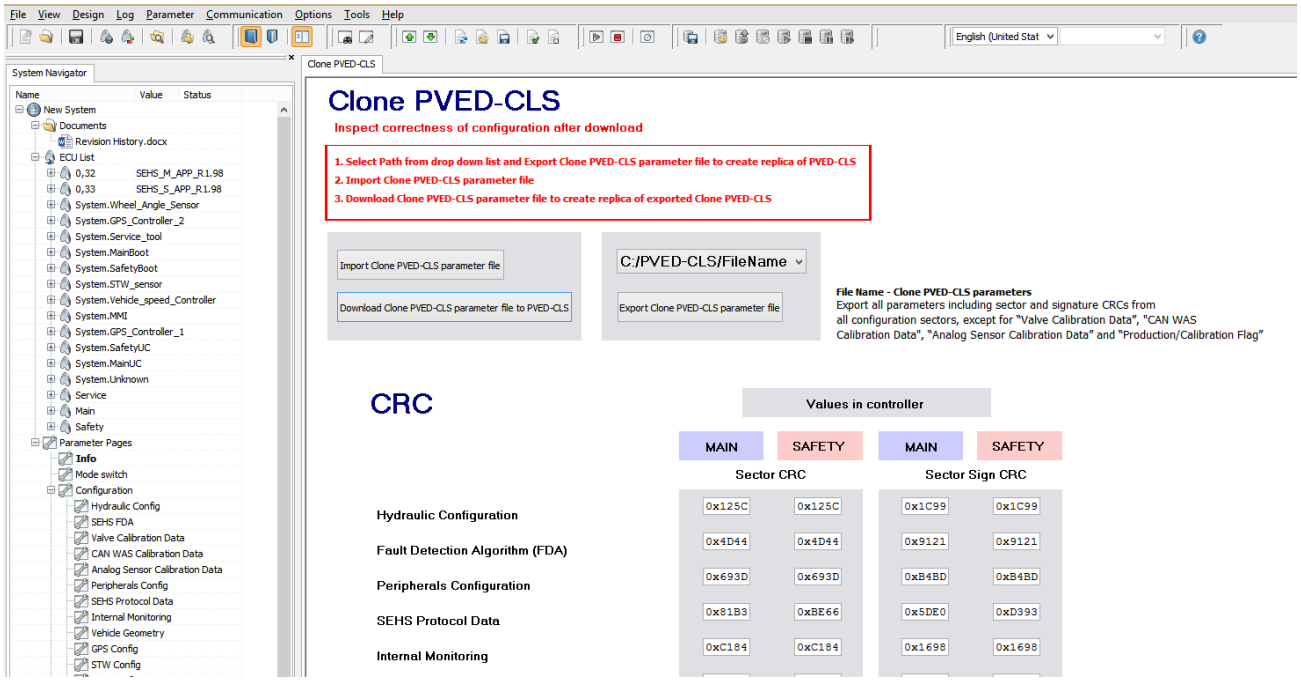
If there is any existing file with same name at same location then it will be replaced.

- To import an xml file that contains required parameter values, click on "Import Clone PVED-CLS parameter file" button.

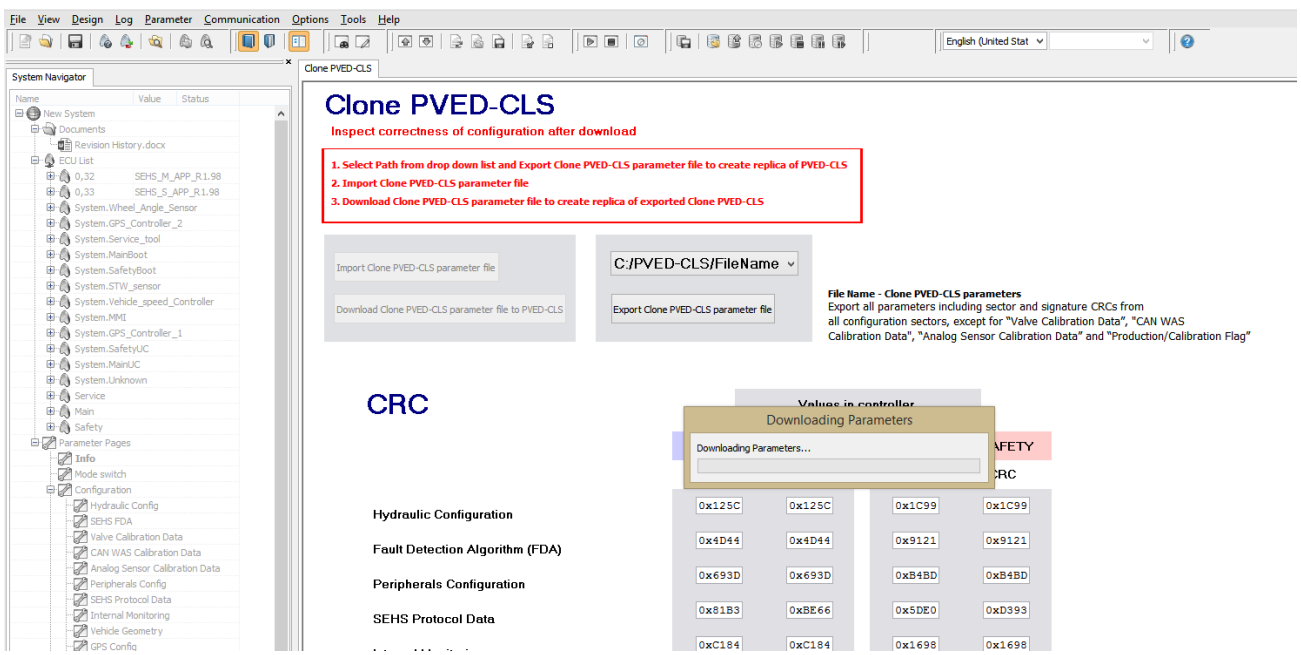


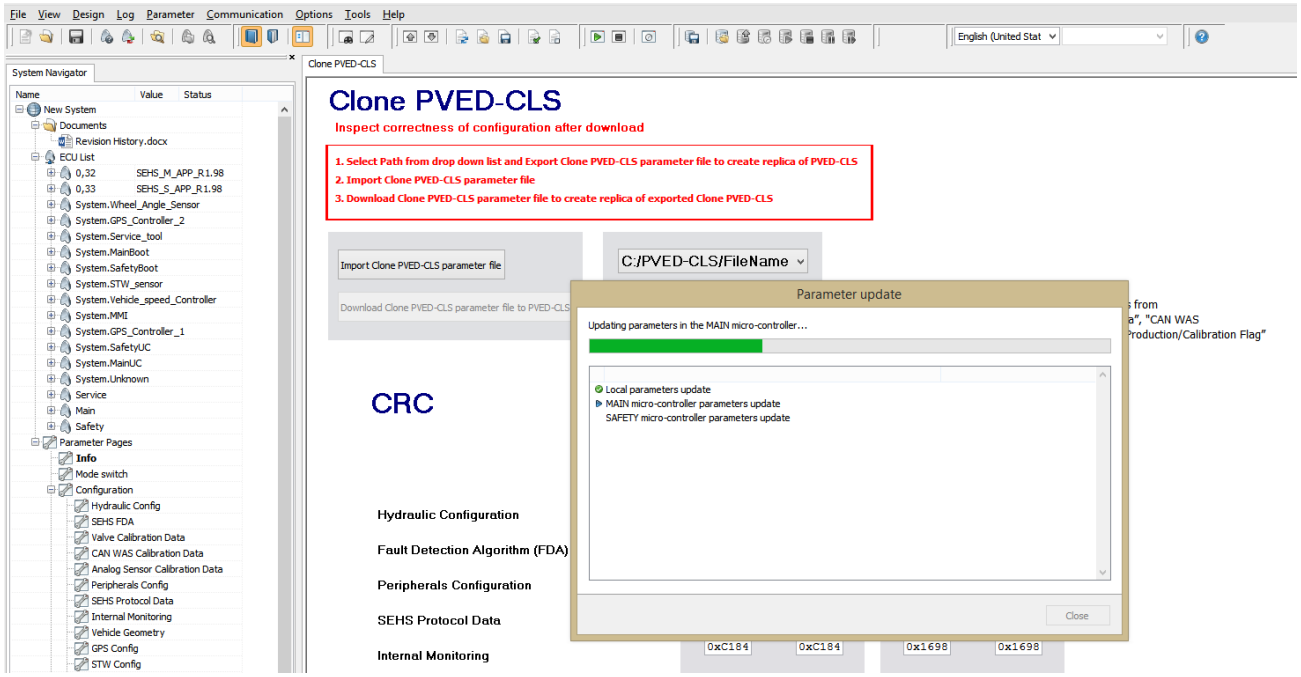


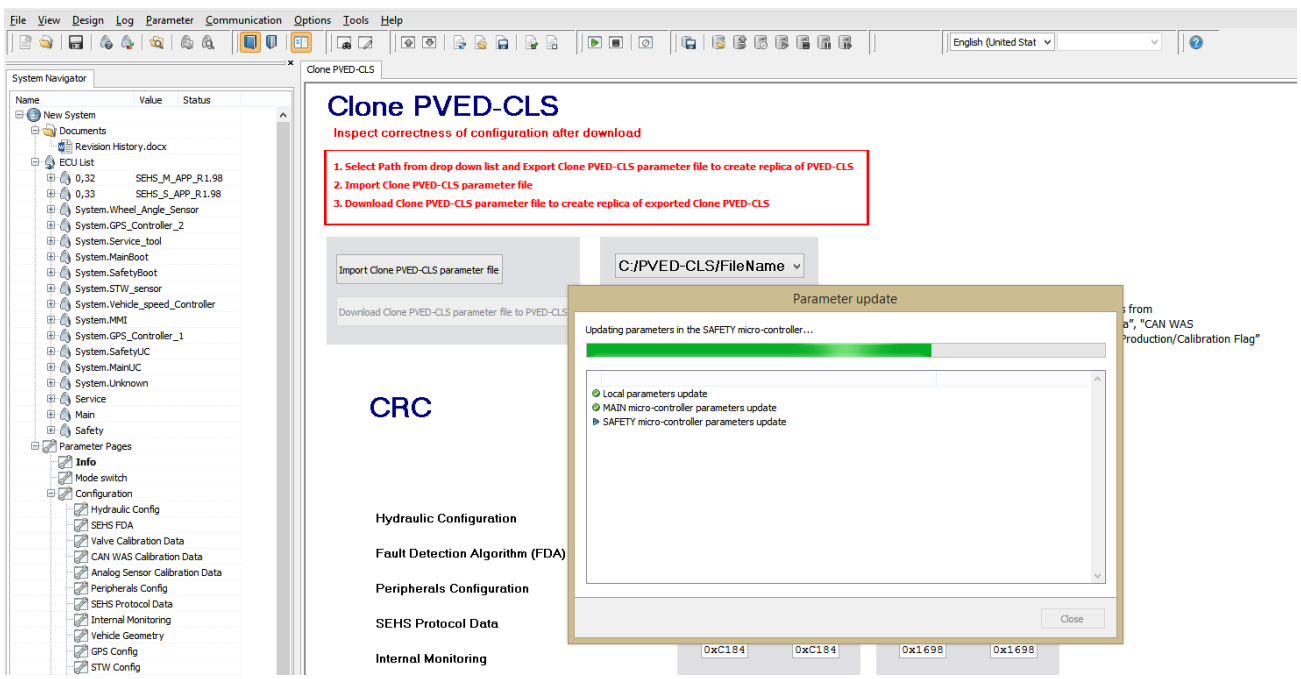
- Select the xml file that is to be imported.



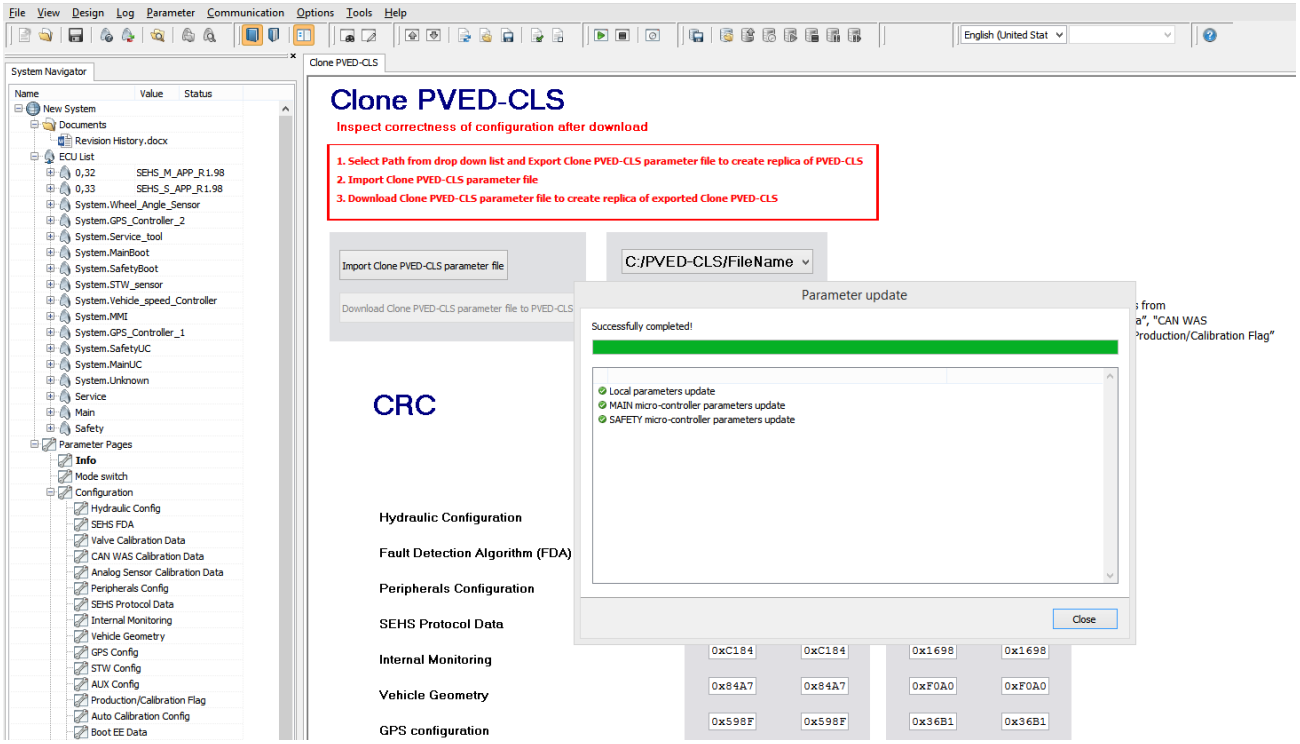
- Click on "Download Clone PVED-CLS parameter file to PVED-CLS" button to download the xml file that was imported before.







- The progress bar for downloading into Main and Safety micro-controllers can be seen as shown above.



- Click on close button and the required parameter values will be downloaded to the Main and Safety micro-controllers.

9. Contact

In case of questions, contact your nearest Danfoss Product Application Engineer.