

# Wheelchair Builder 4.0

## Quickstart Guide

### Contents

Wheelchair Builder 4.0 .....	1
1 Initialization .....	3
2 Menu bar .....	3
2.1 Application version .....	3
2.2 Application size .....	3
2.3 Open a manual .....	4
2.4 Select the communication port to the ICS system .....	4
2.5 Change the settings of the application .....	5
2.6 Restart the ICS system .....	5
2.7 Recue the master module or a node .....	6
2.7.1 Rescue the master module .....	6
2.7.2 Rescue a node .....	7
2.8 Change the user level .....	7
2.9 Change the language of the application .....	7
3 Start .....	8
3.1 Find matching config file .....	8
3.2 Open another config file .....	9
3.3 Open the config file from a backup .....	10
3.3.1 Connection to the server .....	10
3.4 Open and write sub files .....	11
4 Settings .....	12
4.1 Configuration file .....	12
4.2 Read from ICS .....	13
4.3 Changing values .....	14
4.4 Write to ICS .....	15
4.5 Save as configuration file .....	15
4.6 Read live values .....	16

5	Status.....	17
5.1	Verify the system.....	17
5.2	Update the system .....	18
5.2.1	Update the entire sytem .....	18
5.2.2	Update the firmware of the master module .....	19
5.2.3	Updating the model firmware of the master module .....	19
5.2.4	Updating the UI firmware of the master module .....	20
5.2.5	Updating the firmware of a node .....	20
5.3	Read live status.....	21
5.4	Calibrate a node .....	22
5.5	Change the serial number of the master module or a node .....	23
5.6	Change the actuator type and function type of a node .....	24

## 1 Initialization

When starting the application, it will scan all configuration files.

You can abort the progress by clicking on the 'close' icon, but this will also close the application.

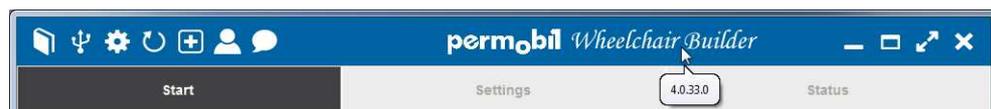


**Hint:** Anything that can be clicked on, will show the cursor as a hand instead of an arrow.

## 2 Menu bar

### 2.1 Application version

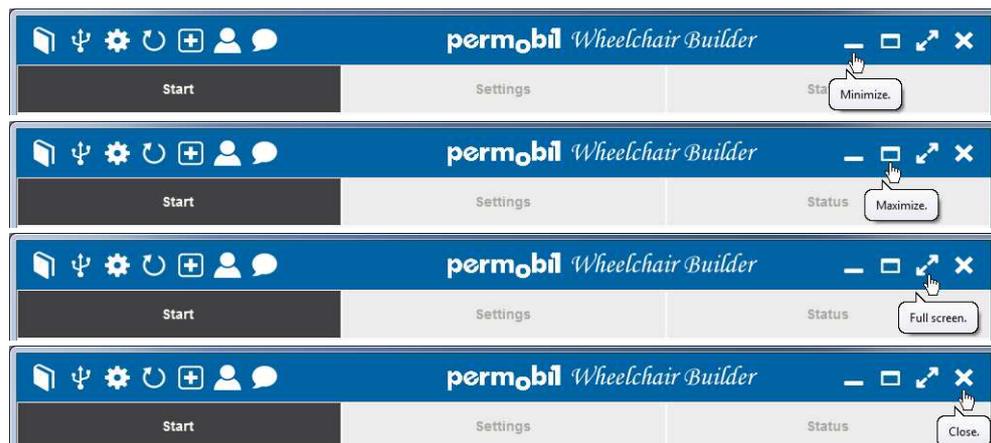
The tool tip of the application name will show the version of the application.



### 2.2 Application size

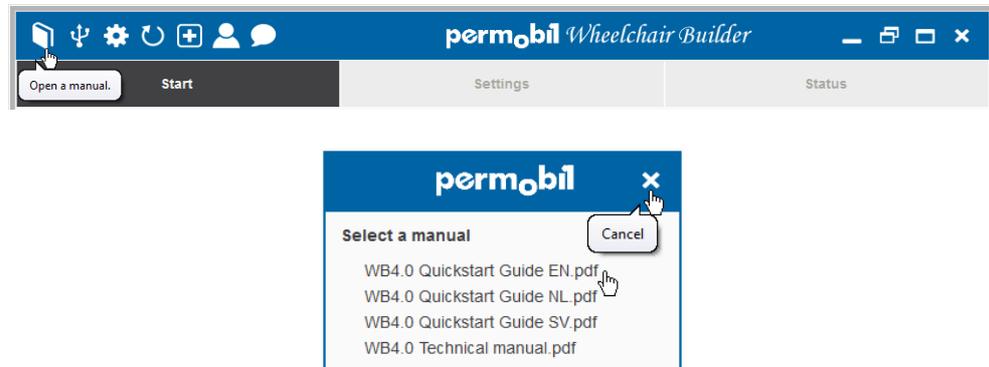
Click on the icons on the right to minimize, maximize, full screen or close the application.

When the application is maximized or full screen, the 'maximize' icon can be used to restore the application to its original size.



## 2.3 Open a manual

Click on the 'manual' icon to select and open a manual.

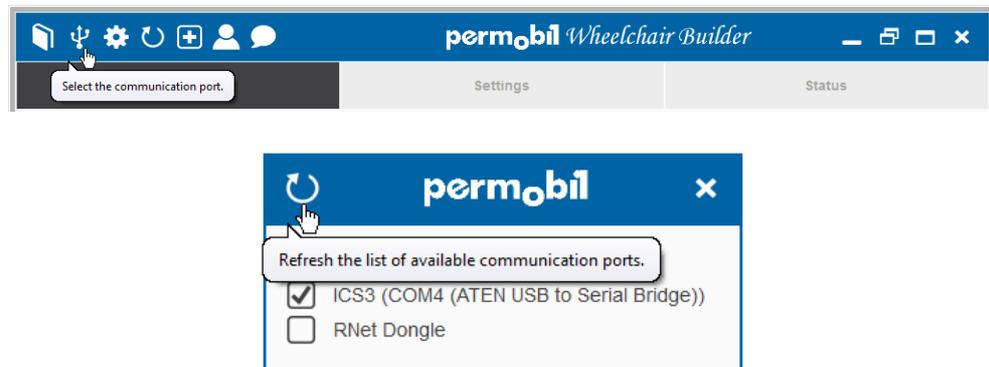


**Hint:** Any sub menu that has a 'close' icon to cancel, abort or close that menu, can also be closed by pressing the 'escape' key of a keyboard.

## 2.4 Select the communication port to the ICS system

Click on the 'USB' icon to select and open the communication port.

If the required port is not in the list, check your connections and click the 'refresh' icon to update the list of available ports.



**Note:** Only usable ports for the application will be shown and the last used port will be automatically activated at startup of the application if it is available.

**Note:** This screen will automatically open if communication to the wheelchair is required but no valid port is selected. Then select the proper port to continue.

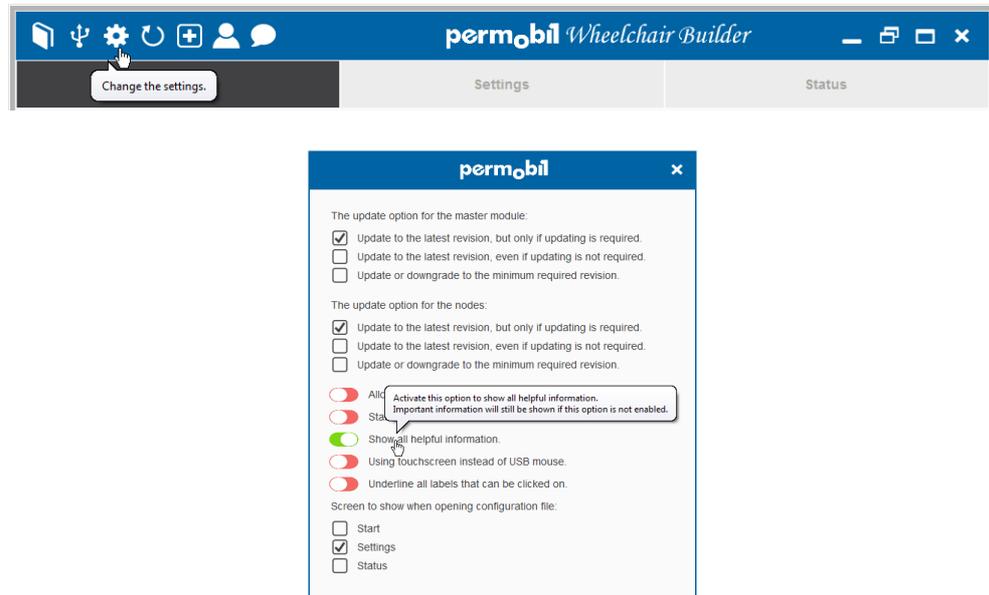
**Hint:** Each checkbox can also be selected by clicking on its text.

**Hint:** A selected port can be closed by clicking once more on that port, what also happens automatically when selecting another port.

## 2.5 Change the settings of the application

Click on the 'settings' icon to change the application settings.

When the application setting 'Show all helpful information' is activated, the tool tips will help you explain the meaning of each setting.

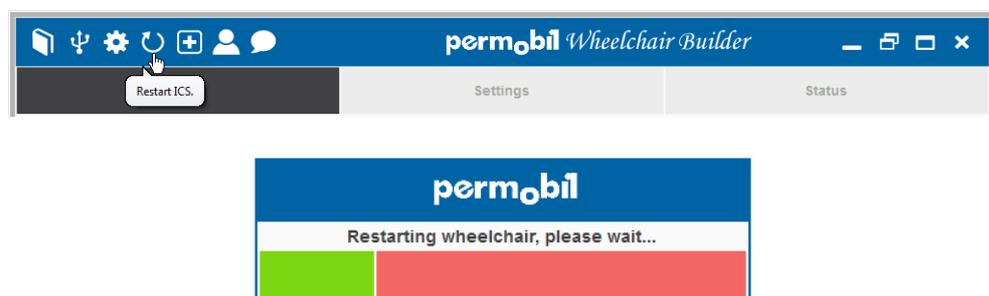


**Note:** The following application settings will be restored to default at each startup of the application:

- The update option for the master module.
- The update option for the nodes.
- Allow serial numbers to be changed.

## 2.6 Restart the ICS system

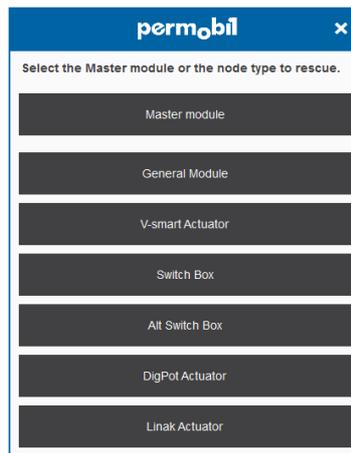
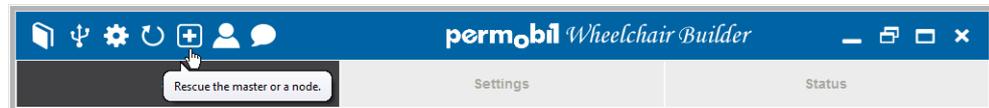
Click on the 'refresh' icon to restart the ICS system.



**Note:** The ICS system will automatically be restarted whenever required, except for when the URIB requires a restart. In that case you will be asked to manually restart the wheelchair.

## 2.7 Recue the master module or a node

Click on the 'rescue' icon to select the master module or a certain type of node.



### 2.7.1 Rescue the master module

Click on the 'Master module' button if you want to load the rescue firmware to the master module.

Click 'yes' to confirm that you are aware that the settings will be erased if doing so, or 'no' to abort.



**Note:** If a configuration file has been opened, the 'Status' screen will be shown after loading the rescue firmware, and the ICS system will be automatically verified and updated.

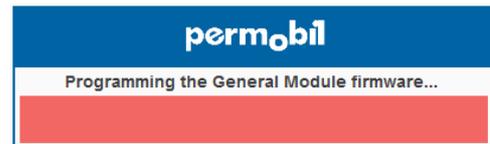
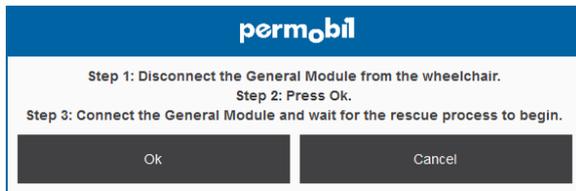
**Hint:** Any question or warning that has 'Ok / Cancel' or 'Yes / No' buttons, can also be confirmed by pressing the 'enter' key, and aborted by pressing the 'escape' key of a keyboard.

### 2.7.2 Rescue a node

Click on the button that corresponds to the type of the node which you want to program.

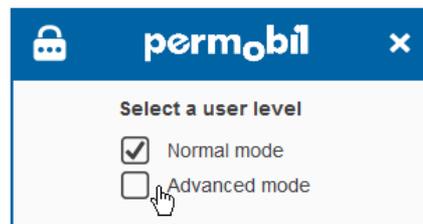
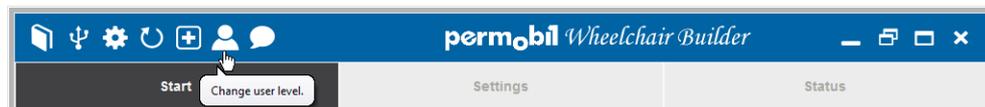
Follow the 3 steps in order to properly execute the rescue process.

The rescue process will be aborted if the node has not been detected within 30 seconds after clicking on 'Ok' in step 2, so make sure you are able to do so before starting this process.



### 2.8 Change the user level

Click on the 'user' icon to select and activate another user level.

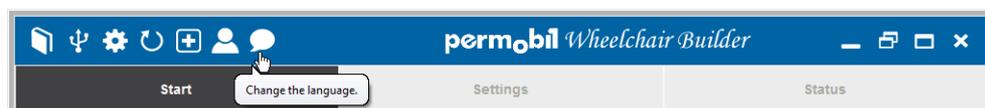


**Note:** Click on the 'lock' icon of the user level screen and enter the correct password to have access to the higher user levels.

### 2.9 Change the language of the application

Click on the 'language' icon to activate another language.

The language will become active without having to restart the application.

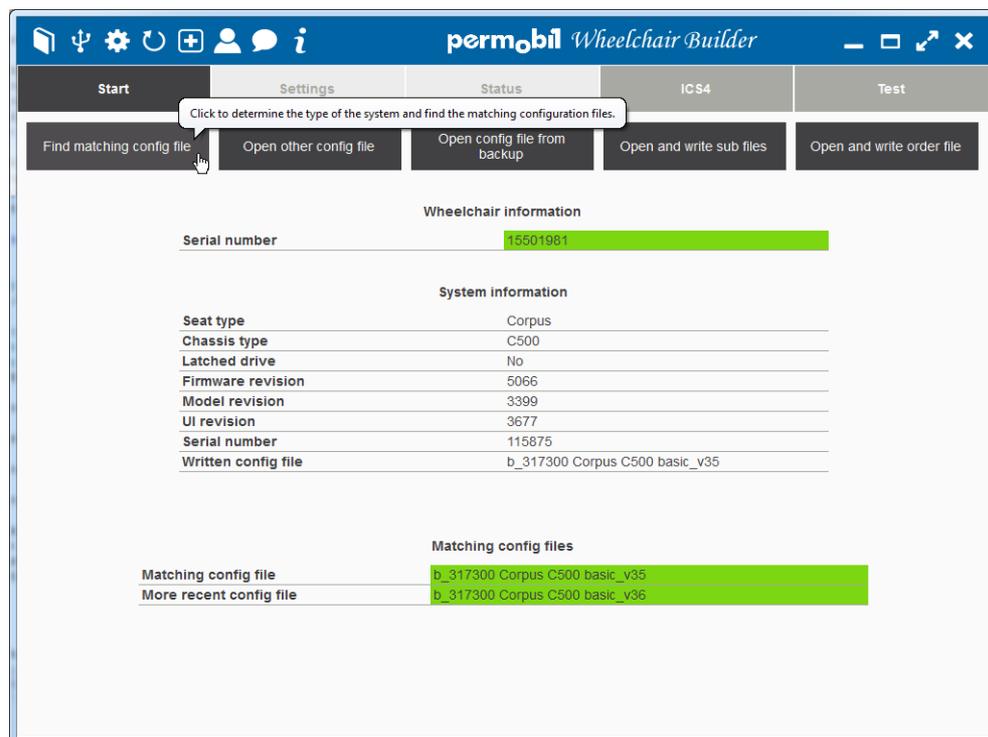


### 3 Start

#### 3.1 Find matching config file

Click on the 'Find matching config file' button in the 'Start' screen to connect to the ICS system and read out the required settings to determine which configuration files are suitable for this system.

The serialnumber of the wheelchair will be shown in the 'Wheelchair information' section. The details of the connected ICS system will be shown in the 'System information' section. The result will be shown in the 'Matching config files' section.



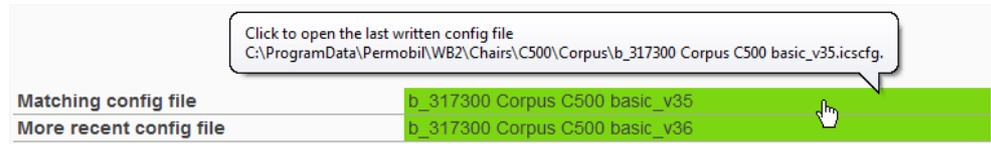
**Note:** It is important for the 'Virtual Seating Coach' that the serial number of the wheelchair is correctly stored in the ICS master module.

Whenever a connection to the wheelchair is made, and this serial number could not be read from the ICS master module, you will be required to enter the wheelchair serial number again. The wheelchair serial number is mentioned on the sticker on the connected wheelchair.

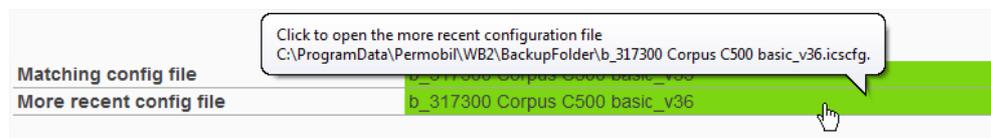
Click on the shown serial number of the wheelchair to enter the wheelchair serial number and to save it to the ICS master module.



Click on the name of the 'Matching config file' (marked in dark green if no update is required, light green if an update is required, or red if a downgrade is required of the master module) to open the configuration file that was last written to the connected ICS system.

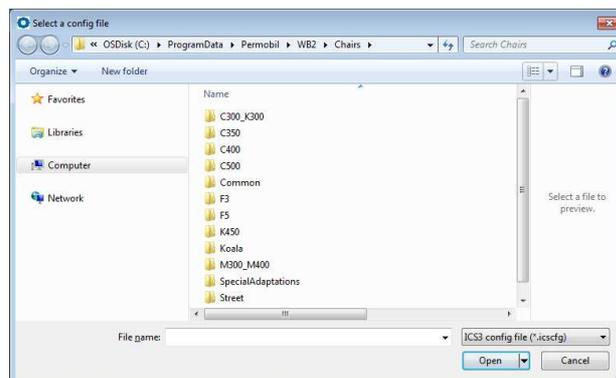


Click on the name of the 'More recent config file' (marked in dark green if a downgrade is not required, or red if a downgrade is required of the master module) to open the more recent version of the matching configuration file.



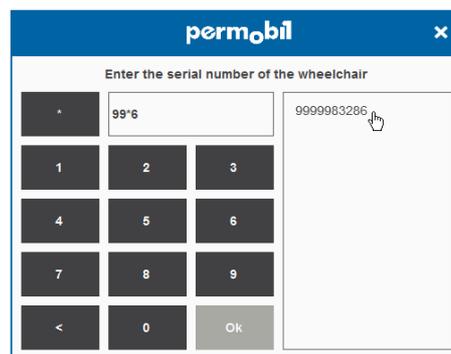
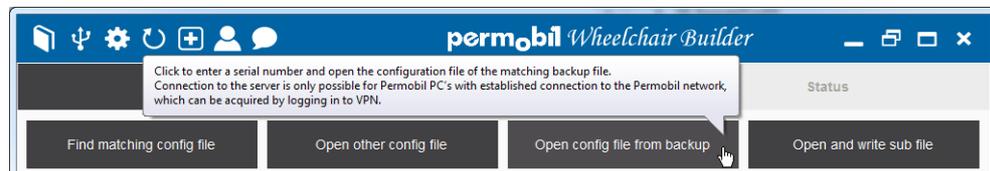
### 3.2 Open another config file

Click on the 'Open other config file' button if no matching configuration files could be found, or you want to manually select the configuration file.



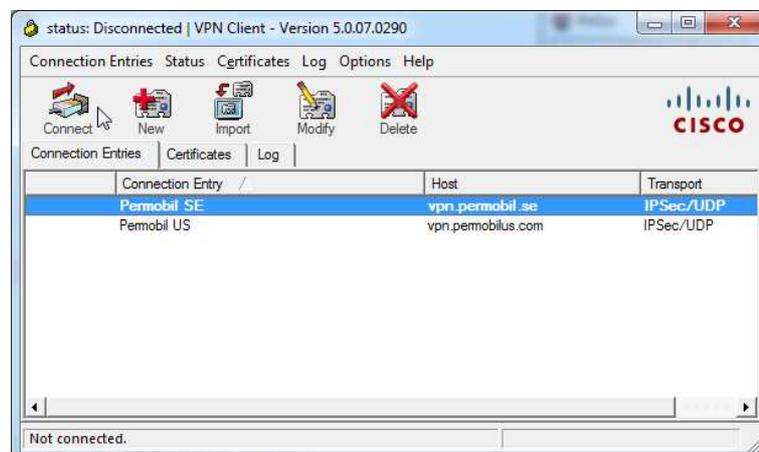
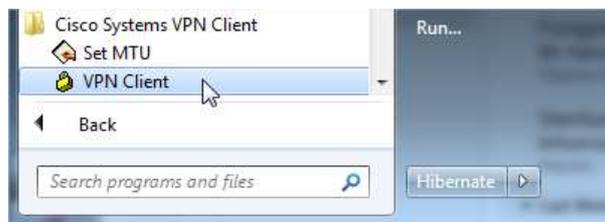
### 3.3 Open the config file from a backup

Click on the 'Open config file from backup' button if you want to enter the serial number of the wheelchair and search on the server for the corresponding backup, to copy that configuration file to your backup folder and open it from there.



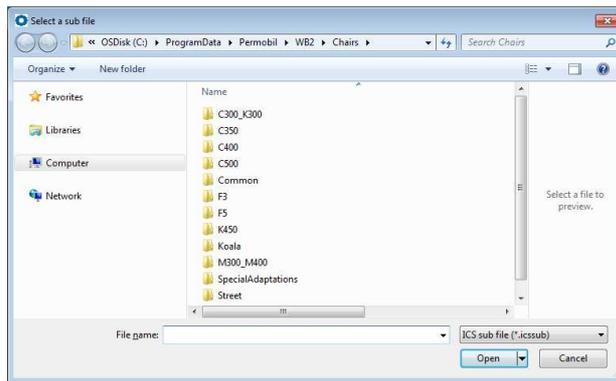
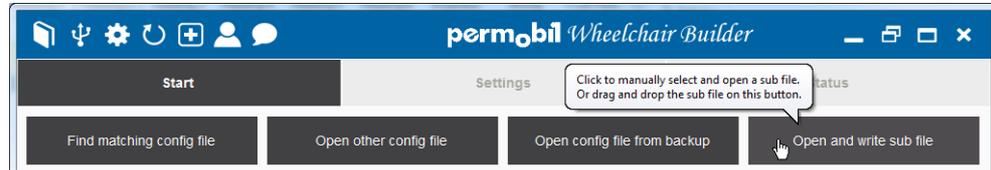
#### 3.3.1 Connection to the server

Connection to the server is only possible for Permobil PC's with established connection to the Permobil network, which can be acquired by logging in to VPN.



### 3.4 Open and write sub files

Click on the 'Open and write sub files' button to select and write one or more sub files to the connected ICS system.

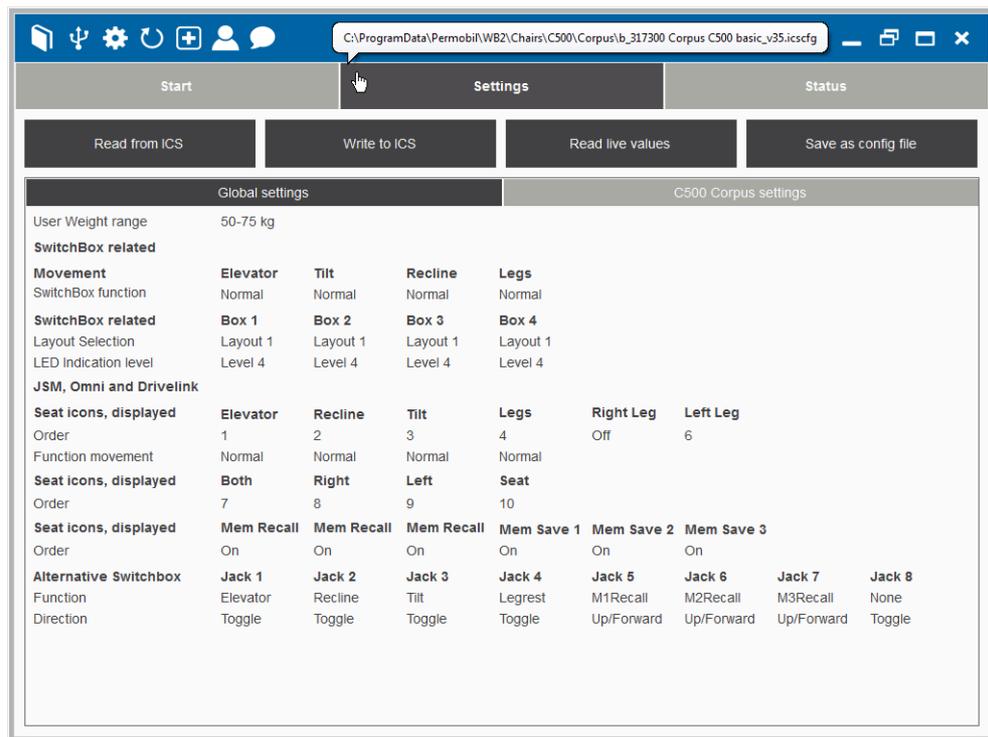


## 4 Settings

### 4.1 Configuration file

After selecting and opening a configuration file, the 'Settings' and 'Status' screens will become available.

**Hint:** You can always see the path of the opened configuration file in the tool tip of the 'Settings' button.



**Warning:** The values that are shown in the 'Settings' screen after opening a configuration file, are the values that are stored in the configuration file.

So the actual settings in the connected ICS system might be different from the ones shown in the 'Settings' screen until you have read from ICS.

A warning will be shown when trying to change a value in the 'Settings' screen or trying to write to ICS, while you have not read from ICS yet.



## 4.2 Read from ICS

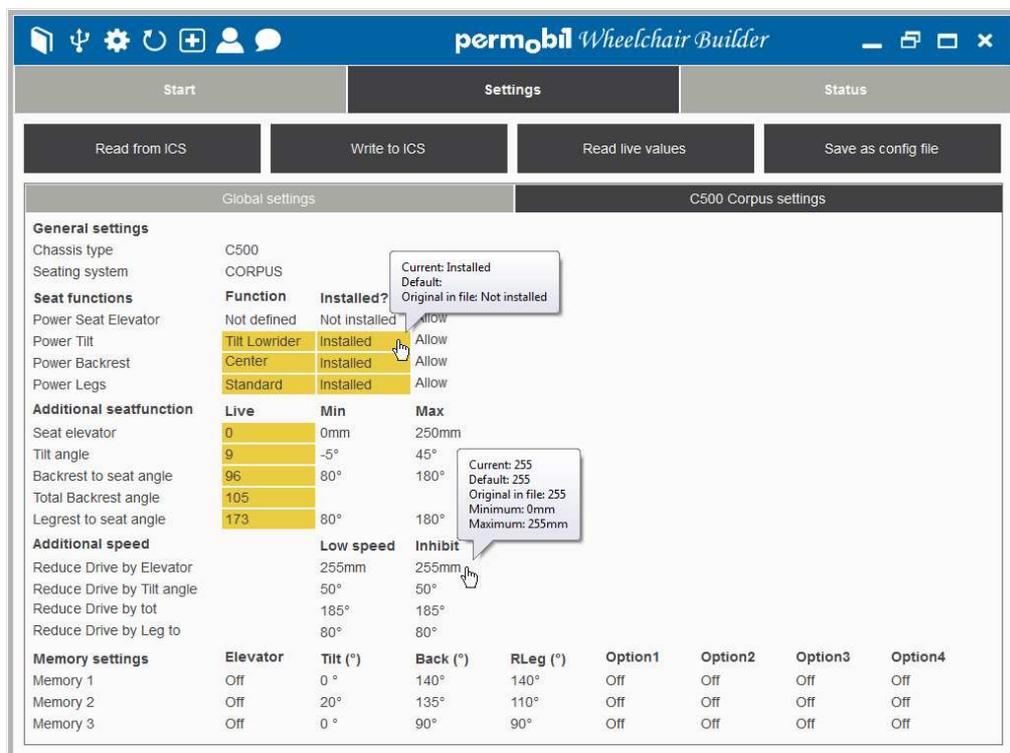
Click on the 'Read from ICS' button to read all actual settings in the connected ICS system. This includes the current values of all live settings.



When reading has completed, the actual values from the connected ICS system will be shown in the 'Settings' screen.

All values that are different from the original values in the opened configuration file, and all live values (which are not stored in the configuration file), will be shown in yellow.

**Hint:** You can see the current value (handy when the current value can not be shown completely) and the original value of the opened configuration file, and where applicable also the minimum and maximum allowed values, in the tool tip of the shown value.



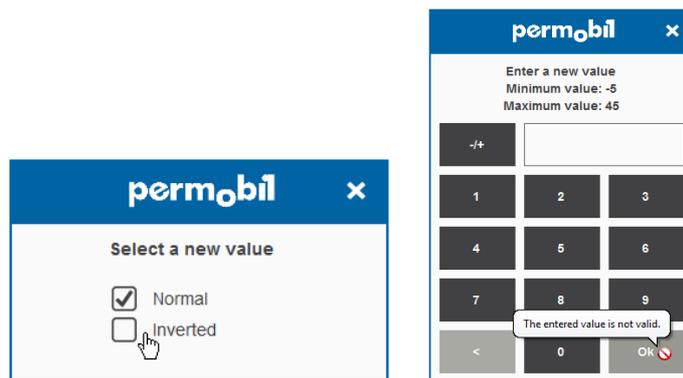
### 4.3 Changing values

If a value in the 'Settings' screen can be changed, you will see the hand cursor when placing the mouse cursor on the value.

**Hint:** You will also see the value that can be changed as underlined if the application setting 'Underline all fields that can be clicked on' is activated.

General settings			
Chassis type	C500		
Seating system	CORPUS		
Seat functions	Function	Installed?	Operable?
Power Seat Elevator	<u>Not defined</u>	<u>Not installed</u>	<u>Allow</u>
Power Tilt	<u>Tilt Lowrider</u>	<u>Installed</u>	<u>Allow</u>
Power Backrest	<u>Center</u>	<u>Installed</u>	<u>Allow</u>
Power Legs	<u>Standard</u>	<u>Installed</u>	<u>Allow</u>

Click on such a value to see a selection screen or a numeric input screen, to select or enter a new value, or click on the 'close' icon to abort.

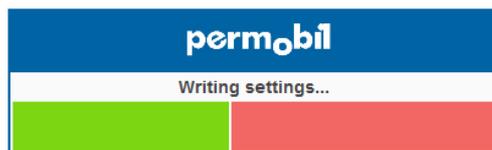


**Hint:** The keyboard can also be used to enter a numeric value. See the tool tips of the sign, return and confirm buttons to see more information on how to use them.

**Note:** The 'Ok' button will be disabled until a valid value has been entered.

#### 4.4 Write to ICS

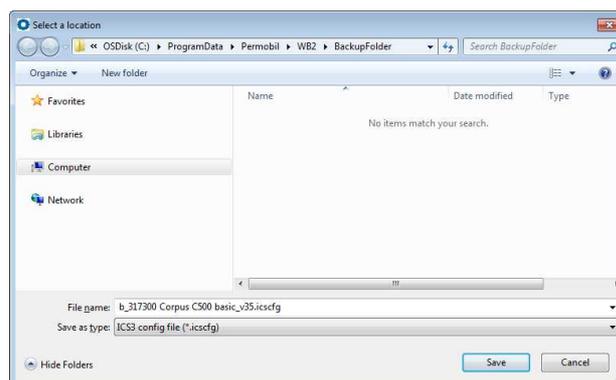
Click on the 'Write to ICS' button to write all settings, as shown in the 'Settings' screen to the connected ICS system.



When writing has completed, the ICS system will be automatically restart and you will be asked if you want to save the written setting as a configuration file.

#### 4.5 Save as configuration file

Click on the 'Save as config file' button to select a location and save all settings as currently shown in the 'Settings' screen as a new configuration file.



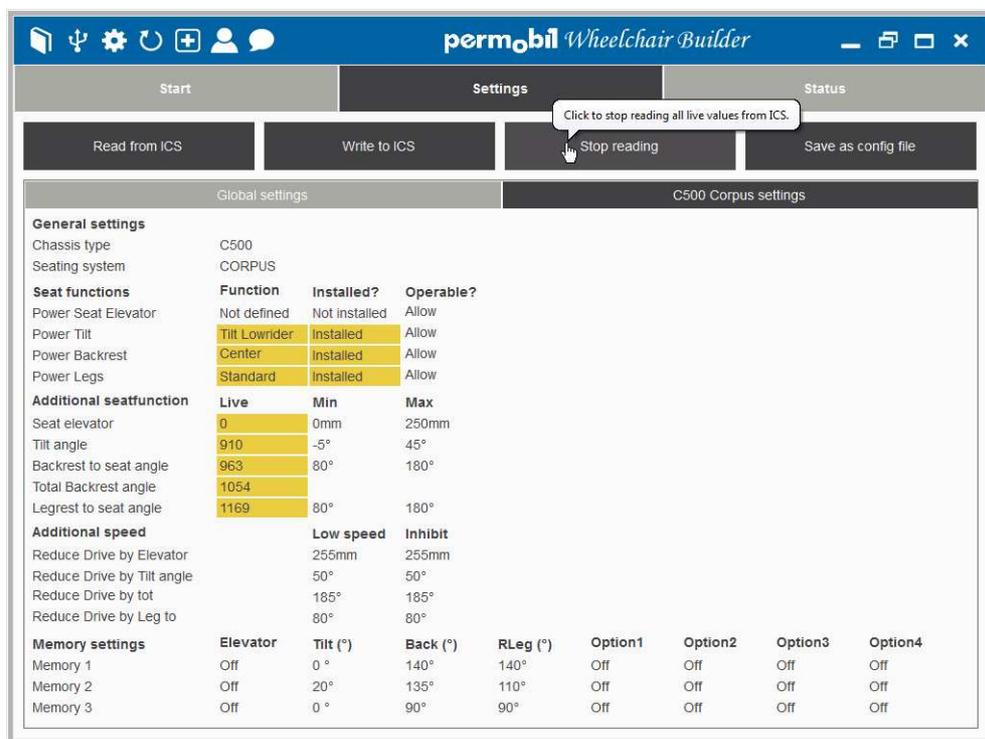
### 4.6 Read live values

Click on the 'Read live values' button to start the loop that continuously reads all live values from the connected ICS system.



Note that the button text will have changed to 'Stop reading', which can then be used to stop reading the live values.

**Hint:** You will see the value of a live setting blink yellow when it has just been read.



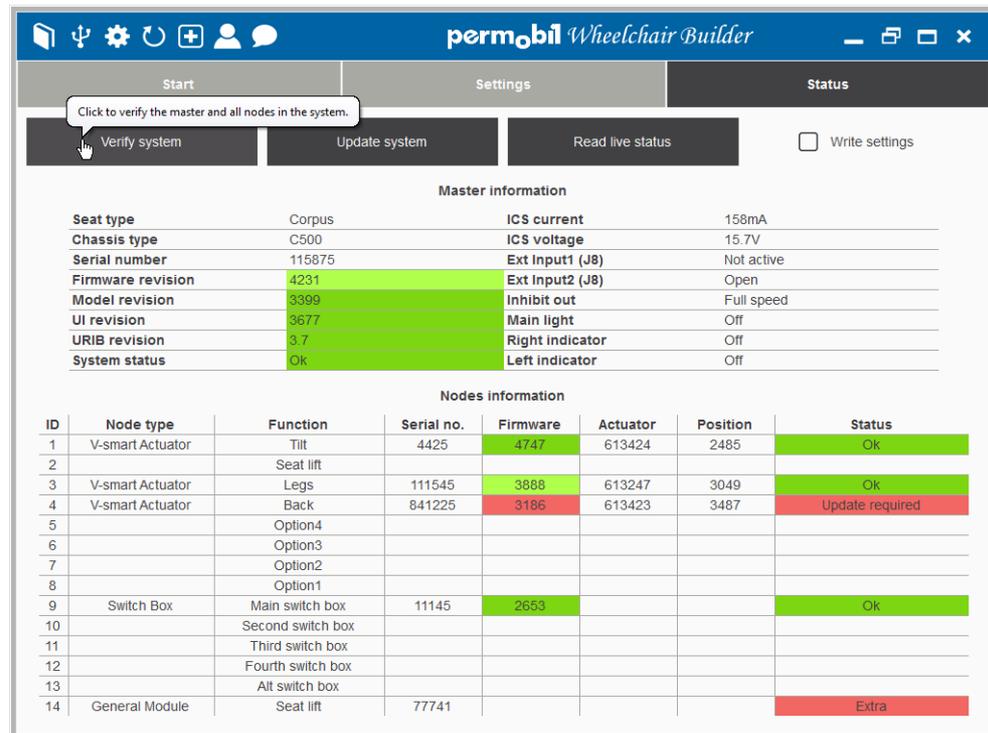
If you would click on any other button while reading live values, you will be notified.



## 5 Status

### 5.1 Verify the system

Click on the 'Verify system' button to verify the status of the master module and all connected nodes.



**Hint:** You will see the fields that can be clicked as underlined if the application setting 'Underline all fields that can be clicked on' is activated.

**Hint:** Different colors are used to indicate the firmware status of the master module and the nodes:

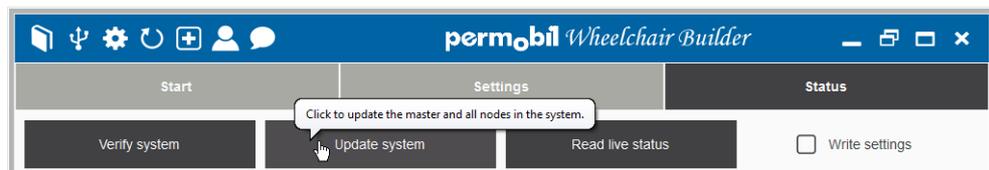
- Dark green: The version complies with the minimum required version according to the opened configuration file, and there is no newer version available.
- Light green: The version complies with the minimum required version according to the opened configuration file, but there is a newer version available. Please note that updating is not required in this case.
- Red: The version does not comply with the minimum required version according to the opened configuration file, and therefore needs to be updated.

**Note:** The model and UI revision of the master module each need to have exactly the same version as mentioned in the opened configuration file, so these can only have the color dark green or red.

## 5.2 Update the system

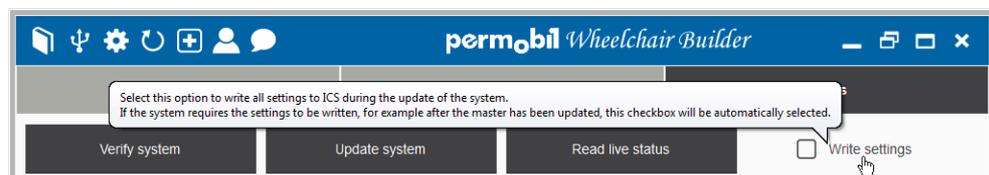
### 5.2.1 Update the entire system

Click on the 'Update system' button to update the master module and the nodes as required according to the opened configuration file, and depending on the application settings 'The update option for the master module' and 'The update option for the nodes'.



**Hint:** If the system has not yet been verified when clicking on the 'Update system' button, it will automatically be verified first, so there is no need to manually click on the 'Verify system' button first.

The checkbox 'Write settings' determines if the settings, as they are shown in the 'Settings' screen, will be written to ICS during updating of the entire system. This checkbox will automatically be activated, if not done manually, if the system would require the settings to be written, for example if it was required to update the master firmware.



### 5.2.2 Update the firmware of the master module

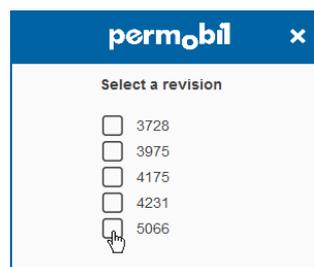
Click on the firmware revision of the master module to update the master firmware to a specific version. This can be done even if the firmware already has the latest version.

**Note:** If updating the firmware of the master module is required, this will automatically be done during the update of the entire system, depending on the application setting 'The update option for the master module'.

Master information			
Seat type	Corpus	ICS current	172mA
Chassis type	C500	ICS voltage	16.9V
Serial number	1		Not active
Firmware revision	4231	Ext Input2 (J8)	Open
Model revision	3399	Inhibit out	Drive inhibit
UI revision	3677	Main light	Off
URIB revision	3.6	Right indicator	Off
System status	Update required	Left indicator	Off

All available firmware versions for the master module which comply to the minimum required version according to the opened configuration file, will be shown.

Click on one of the firmware versions to start updating or click on the 'close' icon to cancel.



### 5.2.3 Updating the model firmware of the master module

If the model revision does not comply with the required model version according to the opened configuration file, it will be indicated in red.

Click on the model revision to update the model firmware to the required version.

**Note:** If updating the model firmware is required, this will automatically be done during the update of the entire system.

Master information			
Seat type	Corpus	ICS current	172mA
Chassis type	C500	ICS voltage	19V
Serial number	1		Not active
Firmware revision	4231		Open
Model revision	3399	Inhibit out	Drive inhibit
UI revision	3677	Main light	Off
URIB revision	3.6	Right indicator	Off
System status	Update required	Left indicator	Off

### 5.2.4 Updating the UI firmware of the master module

If the UI revision does not comply with the required UI version according to the opened configuration file, it will be indicated in red.

Click on the UI revision to update the UI firmware to the required version.

**Note:** If updating the UI firmware is required, this will automatically be done during the update of the entire system.

Master information			
Seat type	Corpus	ICS current	172mA
Chassis type	C500	ICS voltage	17V
Serial number	1	Ext Input1 (J8)	Not active
Firmware revision	4231		Open
Model revision	3399		Drive inhibit
UI revision	3677	Main light	Off
URIB revision	3.6	Right indicator	Off
System status	Update required	Left indicator	Off

### 5.2.5 Updating the firmware of a node

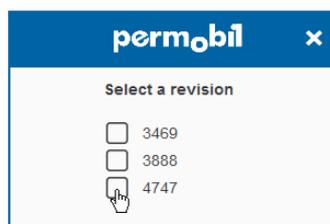
Click on the firmware revision of a node to update the firmware of that node to a specific version. This can be done even if the firmware already has the latest version.

**Note:** If updating the firmware of a node is required, this will automatically be done during the update of the entire system, depending on the application setting 'The update option for the nodes'.

Nodes information							
ID	Node type	Function	Serial no.	Firmware	Actuator	Position	Status
1	V-smart Actuator	Tilt	1	4747	613424	2483	Ok
2		Seat lift					
3	V-smart Actuator	Legs	3	3888			Ok
4	V-smart Actuator	Back	4	3186	613423	3488	Update required
5		Option4					
6		Option3					
7		Option2					
8		Option1					
9	Switch Box	Main switch box	9	2653			Ok
10		Second switch box					
11		Third switch box					
12		Fourth switch box					
13		Alt switch box					
14	General Module	Seat lift	2				Extra

All available firmware versions for that node which comply to the minimum required version according to the opened configuration file, will be shown.

Click on one of the firmware versions to start updating or click on the 'close' icon to cancel.



### 5.3 Read live status

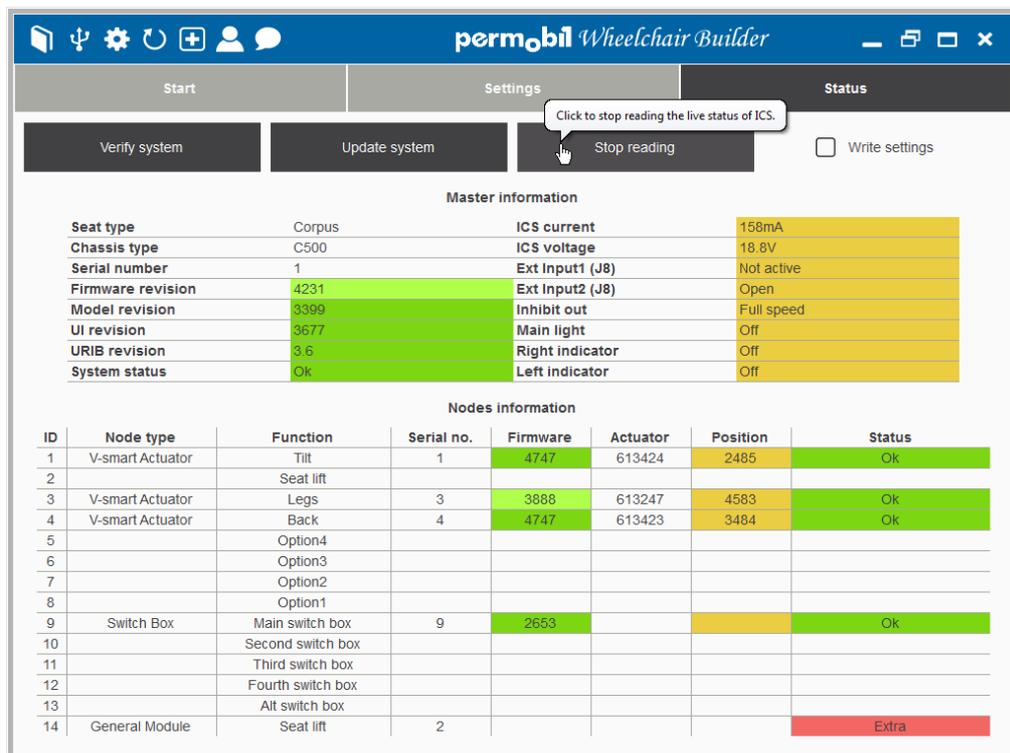
Click on the 'Read live status' button to start the loop that continuously reads all live status values from the connected ICS system.

This requires that the system has been verified, which needs to be done manually.



Note that the button text will have changed to 'Stop reading', which can then be used to stop reading the live status.

**Hint:** All live values are shown in yellow and you will see each value blink yellow when it has just been read.



If you would click on any other button while reading the live status, you will be notified.



### 5.4 Calibrate a node

Click on the current position value of a node to start calibrating that node.

Nodes information								
ID	Node type	Function	Serial no.	Firmware	Actuator	Position	Node	Status
1	V-smart Actuator	Tilt	1	4747	613424	248		
2		Seat lift						
3	V-smart Actuator	Legs	3	3888	613247	3491	Ok	Ok
4	V-smart Actuator	Back	4	4747	613423	3483	Ok	Ok
5		Option4						
6		Option3						
7		Option2						
8		Option1						
9	Switch Box	Main switch box	9	2653				Ok
10		Second switch box						
11		Third switch box						
12		Fourth switch box						
13		Alt switch box						
14	General Module	Seat lift	5					Extra

Click 'yes' to confirm that the actuator is properly installed, or 'no' to abort.



During calibration of the node, the ICS current and the position of the node will be updated. Let the node finish calibrating or click on the 'cancel' icon to abort the calibration.

Nodes information								
ID	Node type	Function	Serial no.	Firmware	Actuator	Position	Node	Status
1	V-smart Actuator	Tilt	1	4747	613424	2485		Ok
2		Seat lift						
3	V-smart Actuator	Legs	3	3888	613247	3127		Ok
4	V-smart Actuator	Back	4	4747	613423	3486		Ok
5		Option4						
6		Option3						
7		Option2						
8		Option1						
9	Switch Box	Main switch box	9	2653				Ok
10		Second switch box						
11		Third switch box						
12		Fourth switch box						
13		Alt switch box						
14	General Module	Seat lift	2					Extra

### 5.5 Change the serial number of the master module or a node

If allowed by the application setting 'Allow serial numbers to be changed', click on the serial number of the master module or a node to enter a new serial number for the master module or that node.

The screenshot shows the 'permobil Wheelchair Builder' interface. At the top, there are navigation icons and a title bar. Below the title bar, there are three main sections: 'Start', 'Settings', and 'Status'. Under 'Settings', there are buttons for 'Verify system', 'Update system', and 'Read live status', along with a 'Write settings' checkbox. The 'Master information' section contains a table with the following data:

Property	Value	Property	Value
Seat type	Corpus	Ext Input1 (J8)	158mA
Chassis type	C500	Ext Input2 (J8)	18.7V
Serial number	115875	Inhibit out	Not active
Firmware revision	4231	Main light	Open
Model revision	3399	Right indicator	Full speed
UI revision	3677	Left indicator	Off
URIB revision	3.6		Off
System status	OK		Off

The 'Nodes information' section contains a table with the following data:

ID	Node type	Function	Serial no.	Firmware	Actuator	Position	Status
1	V-smart Actuator	Tilt	4425				Ok
2		Seat lift					
3	V-smart Actuator	Legs	111545	3888	613247	4583	Ok
4	V-smart Actuator	Back	841225	4747	613423	3484	Ok
5		Option4					
6		Option3					
7		Option2					
8		Option1					
9	Switch Box	Main switch box	11145	2653			Ok
10		Second switch box					
11		Third switch box					
12		Fourth switch box					
13		Alt switch box					
14	General Module	Seat lift	77741				Extra

The dialog box is titled 'permobil' and contains the text 'Enter a new serial number'. It features a numeric keypad with buttons for digits 0-9, a decimal point (./+), a backspace (<), and an 'Ok' button.

**Warning:** It is not allowed to give a node the same serial number as one of the other nodes. In that case a warning will be shown.

### 5.6 Change the actuator type and function type of a node

Click on the function of a node to change the actuator type and/or the function type of that node.

Nodes information							
ID	Node type	Function	Serial no.	Firmware	Actuator	Position	Status
1	V-smart Actuator	Tilt	4425	4747	613424	2485	OK
2		Seat lift					
3	V-smart Actuator	Legs	111545	3888	613247	4579	OK
4	V-smart Actuator	Back	841225	4747	613423	3483	OK
5		Option4					
6		Option3					
7		Option2					
8		Option1					
9	Switch Box	Main switch box	11145	2653			OK
10		Second switch box					
11		Third switch box					
12		Fourth switch box					
13		Alt switch box					
14	General Module	Seat lift	77741				Extra

Select the actuator type and function type and click on the 'Update system' button to update the system as such, or click on the 'close' icon to abort.

permobil
×

**Select actuator and function type**

System ID: 14  
Serial number: 77741

**Actuator types:**

- Tilt
- Seat lift
- Legs
- Back
- Option4
- Option3
- Option2
- Option1

**Function types:**

- 1: Lift GM switch (315930) LIFT
- 2: Lift GM softpot (315930) LIFT

Update system