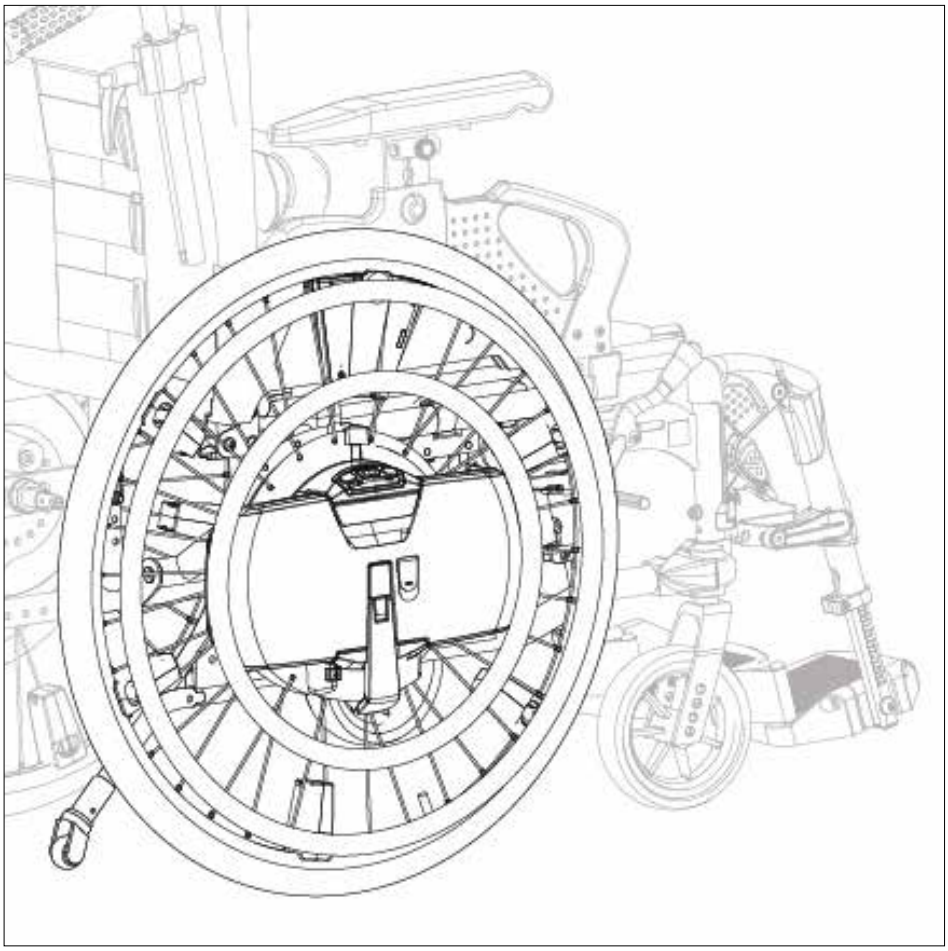
EN



PowerTalk2 User Manual

WheelDrive
Generation 2019

Document ID: E1801_20181018_PowerTalk 2 manual WheelDrive_R2.00_BMS

PowerTalk2 User Manual

Parameter List (Page. 23)

WheelDrive is a product by:

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Document ID: E1801_20181018_PowerTalk 2 manual WheelDrive_R2.00_BMS

1 Introduction

PowerTalk 2 is a PC application that enables communication with products equipped with an esense controller. Esense controllers are generally used to provide intuitive drive support to a broad range of heavy mobile care products. The WheelDrive is one of them.

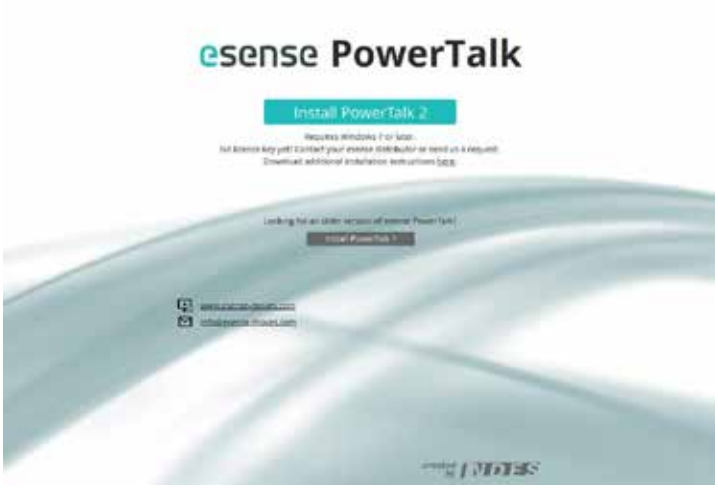
PowerTalk 2 is also a service tool which gives the user an overview of system settings, sensor and parameter values, firmware versions, counters, log information and so on.

The WheelDrive generation 2019 is compatible with PowerTalk 2.

The software runs on Windows 10, Windows 7 and Windows XP.

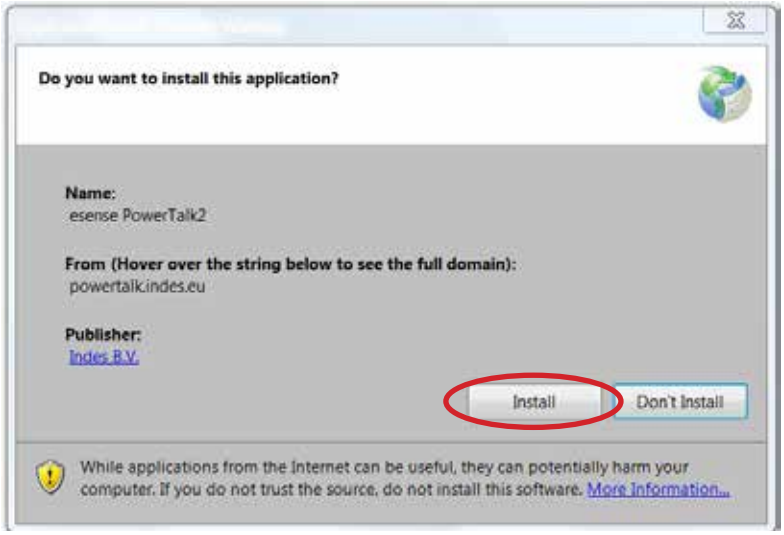
2 Installation PowerTalk2

For the installation of PowerTalk 2 on Windows 10, using the standard web browser.
Visit http://powertalk.indes.eu/



Press ‘Install PowerTalk 2’.

A pop-up appears requesting to save ‘setup.exe’. Save the file in a logical location. By default the file will be stored in your ‘Downloads’ directory.



Run “setup.exe” and install the application.

After installation the program first starts with a Licence screen.

For registration you need a license key file (*.ptl). These are generally provided by email by your Sunrise sales representative.

Press the button ‘Browse..’ to add your license key (*.ptl). Select the file and press ‘Open’.

Notice!: When filling the field ‘Name’, please fill in the name of your organization and your own name, divided by ‘-‘.
For example:
Sunrise Medical – XXXXXX XXXXXXXXX

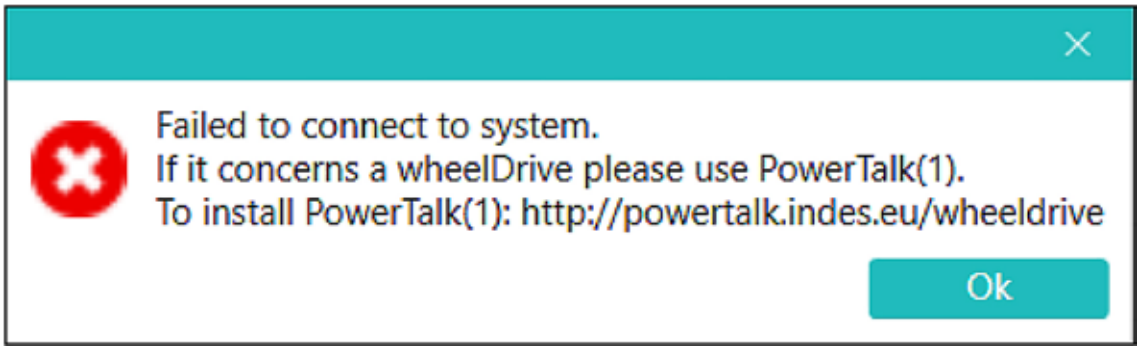
Check and press Ok

PowerTalk 2 is installed and ready for use! You can find the application through your Start Menu or on your desktop.

Notes:

PowerTalk 2 is compatible with WheelDrives (of generation 2019) with serial numbers from: 201810RW5001 and 201810LW5001.

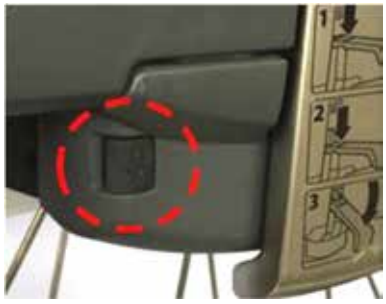
When a WheelDrive of generation 1 is connected to PowerTalk 2, a pop-up box will be displayed showing that PowerTalk 1 should be used:



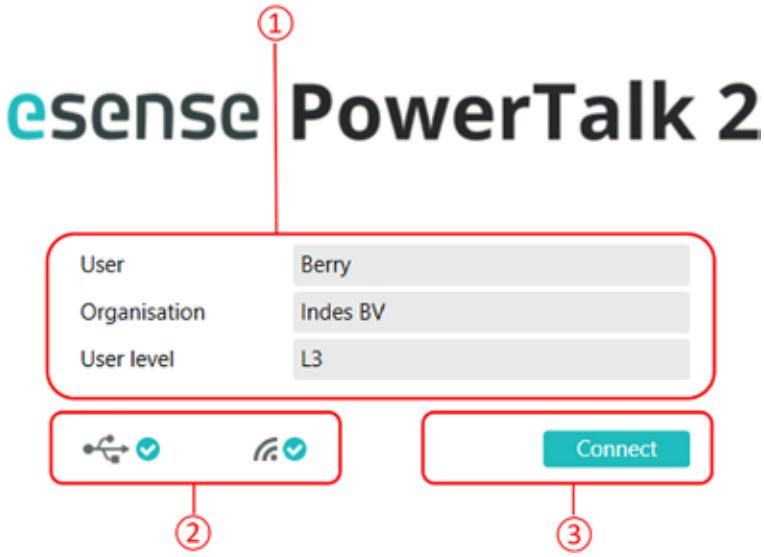
When connecting a WheelDrive generation 2019 to PowerTalk 1, it is not possible to make a connection. PowerTalk 1 will not show a pop-up box.

3 Connection

Connect the WheelDrive with a USB cable (mini to normal) to your pc and switch on the WheelDrive.

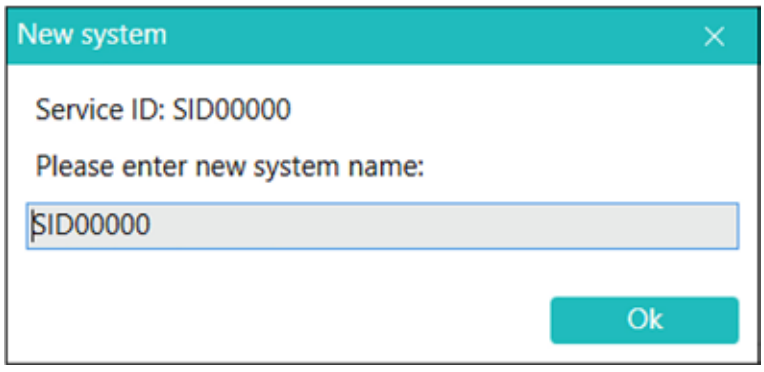


Start PowerTalk.
When PowerTalk updates are available, you will be asked to update the software.
A start-up screen will be opened.

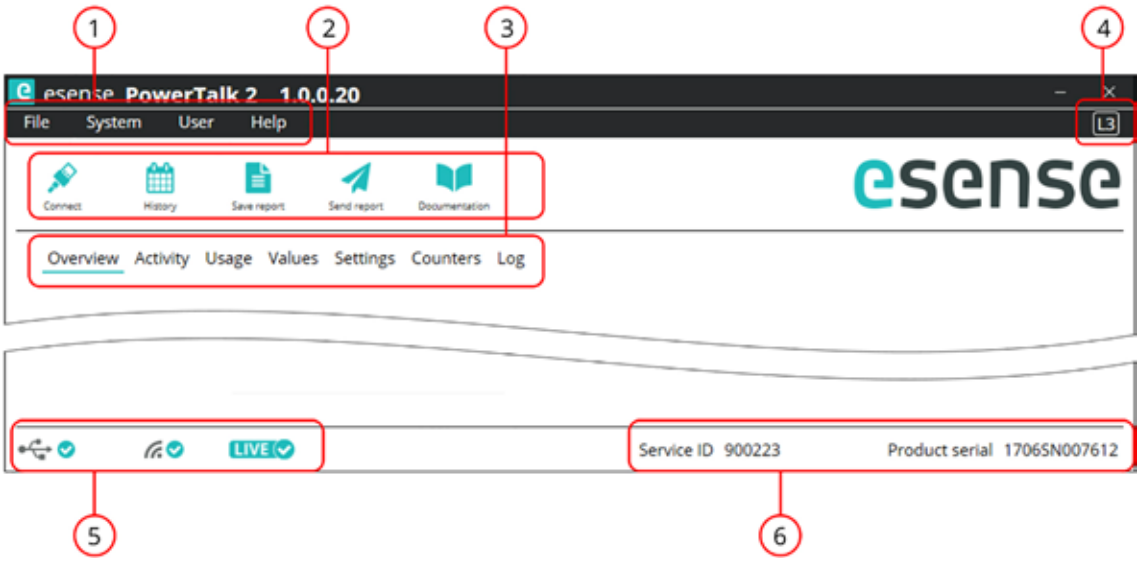


1. This field gives information about the registered user of PowerTalk and the applicable User Level. Functionality of PowerTalk 2 depends on User Level and the esense system configuration. The highest User Level described in this manual is L3. When a setting is only available in level 3 or level 4, this will be indicated by: [L3] or [L4]
2. This field gives information about the USB connection status (left) and the WIFI connection (right)
3. By pressing this button, you connect the WheelDrive to PowerTalk

Note: When connecting a new WheelDrive to PowerTalk for the first time, you will be prompted to fill in a new system name. The information that PowerTalk collects during the session will be stored on the local hard disk of the pc that is connected and this name will be used.
When the same WheelDrive is connected again, the information will automatically be stored and the pop-up box below will not show up again.



4 Interface



This field indicates the pulldown menus that can be used for below operations:

File

Connect
Use to manually connect to the WheelDrive when automatic connection failed or when the connection was lost.

Open history
Every time a connection is made with the same product a history of reports is build up on your pc-environment. When connected to a system and there are multiple reports present you can select one of this stored report. Note: when a report is selected you are no longer “LIVE”.

Import system
Use to import a system file (containing multiple reports of 1 system) into your own pc-environment.

Open system
Opens a system file stored on your own pc-environment. With this you are able to view reports of a system without connecting to the system. Note: when you open a system you are not “LIVE”.

Export system
Use to share your system file with others. Select a system and store the system file (*.pts) on a location.

Delete system
Removes a system file from your pc-environment.

Save report
Use to save the systems report to a location. The report is stored in html format. You can view the report with any browser.

Send report
Sends manually the report of your system to Indes. Used when service is requested from Indes.

Exit
Use to quit the program.

System

Set system type
Use to select the system type that you want to connect to PowerTalk if you have different systems that you want to analyse.

Set system ID
Use to set some system identification values.
3 parameters can be used to fill in custom information:
Product type [L4] , Facility (e.g. location of product) , Location (e.g. detailed location)

Sync system time
Use to synchronise the system time with your computer time.

Set periodic check [L3]
Use to set the next periodic check after service.

Reset
Use to perform reset actions on your system. It is possible to reset to factory defaults in 2 ways:

> ***Reset driving settings***
> When “RESET_DRIVING” is entered, all the custom settings become a copy of the normal settings and the default select profile is normal
>
> ***Factory reset [L3]***
> When “FACTORY_RESET” is entered, same settings as “RESET_DRIVING” plus below values will be set: These counters will be set to 0: max speed, Assist and Drive rim distances, foil errors, hall errors. And “auto off time” = 15 min, “beeps” = on, “Facility” = empty box, “Location” = empty box, “LOG” =clear
>
> A “FACTORY_RESET” can be used when the WheelDrive transfers to a new end-user.

User

Change user
Use to change PowerTalk user information and to use a different license file

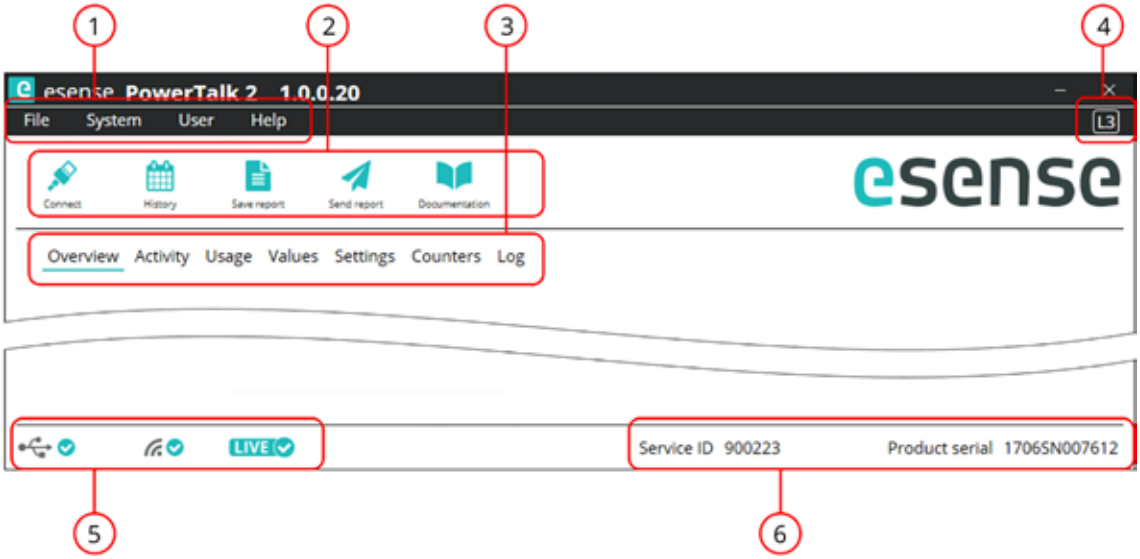
Language
Use to change the language of PowerTalk interface. Dutch or English is available.

Autoconnect
Use to skip the login screen. When set, PowerTalk2 will automatically connect to your system. The setting is stored in the application, user independent.

Help

Documentation
Use to find more documentation about products that can be connected to PowerTalk. New WheelDrive special web-link will be available in future.

About
Displays the PowerTalk software version and the installation domain.



2. These buttons are shortcuts to the most used menu items as described in 1

3. The tabs displayed in this field are explained in chapter 5.

4. This field displays the actual user level.

5. The icons in this field display the connection status of:
   - Left icon: USB connection to the WheelDrive
   - Middle icon: Internet connection
   - Right icon: PowerTalk displays information from the connected system

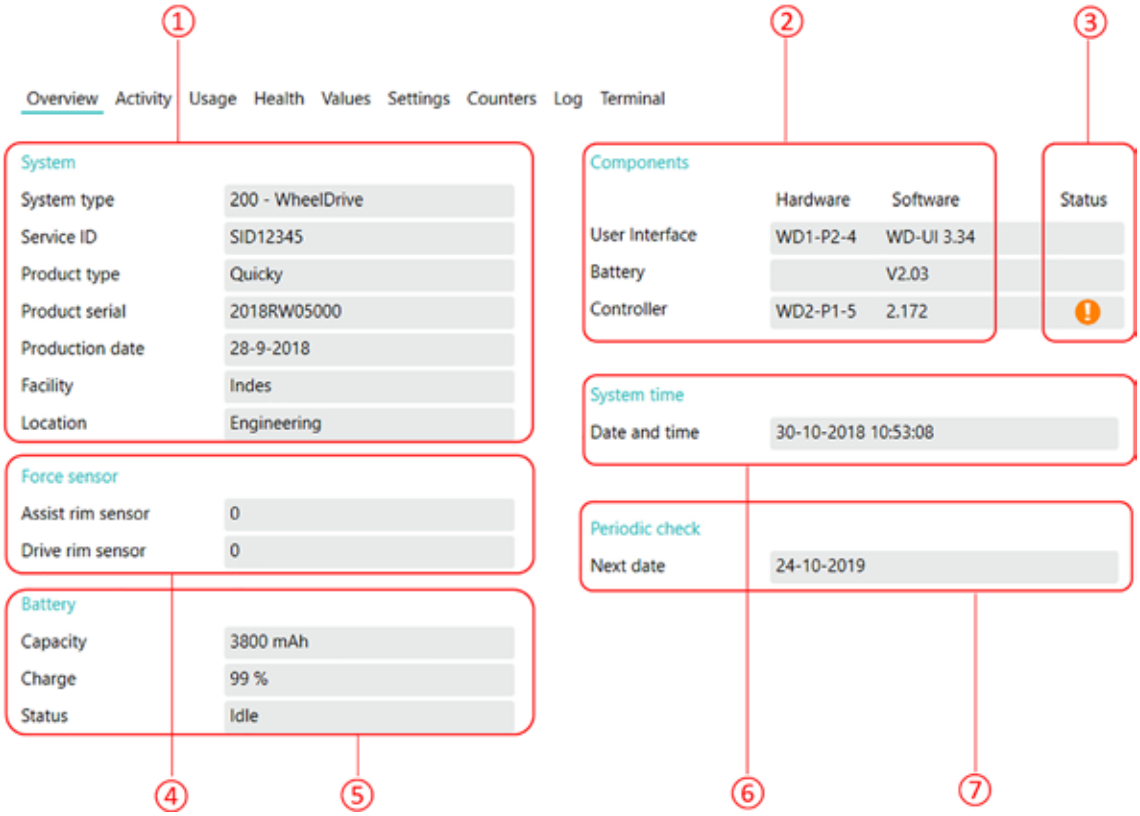
   Note: When the WheelDrive is connected to PowerTalk and an internet connection is available, a status report will automatically be send to Indes.

6. This field displays the Service ID and the Product serial number of the system connected. These are unique numbers for each system.

5 Tabs

5.1 Overview

The overview tab gives a global summary of information from the connected WheelDrive.
This information is not adjustable and described below.



1. This field gives system information.

2. This field gives all hardware and software information of User Interface, Battery pack and Controller.

3. This field gives information about the availability of new software versions. By clicking on the “!” symbol, a new software version can be installed on the system. You will be asked if you want to install the new available software version.
   Warning: it is not possible to go back to previous software versions once the installation has been started. Disconnecting the WheelDrive during update session will result in an unusable system. Please make sure that internet connection is stable during update process and your pc has enough power.

4. This field gives the real-time values of Assist rim sensor and Drive rim sensor. The values for a sensor in rest are “0”.
   Maximum values Assist rim: Forward = 200, Backward = - 100
   Maximum values Drive rim : Forward = 400, Backward = - 400

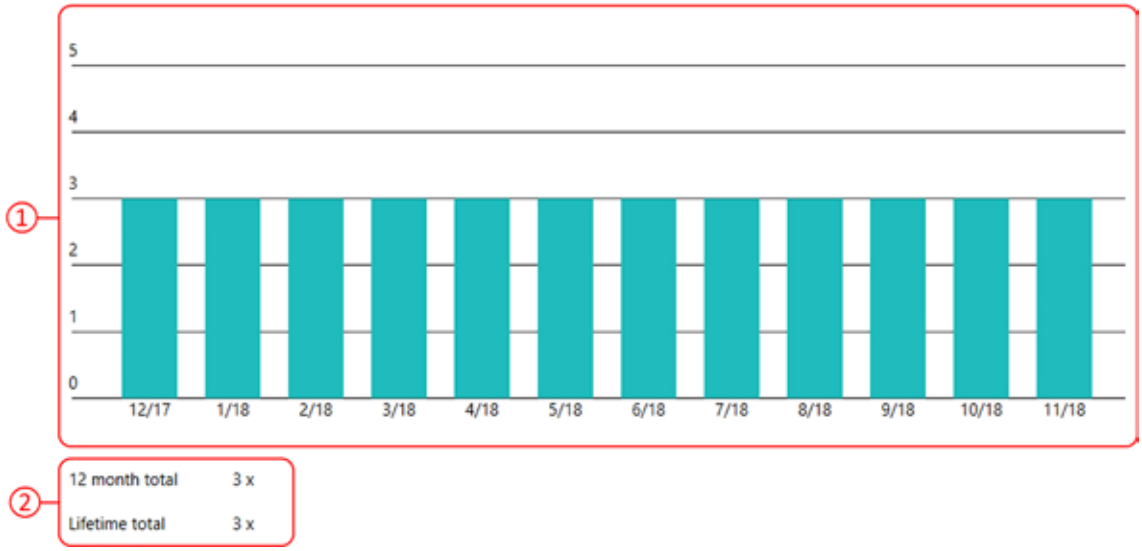
5. This field gives information about the battery pack connected to the WheelDrive. The maximum capacity is 3800 mAh.

6. This field gives date and time from the WheelDrive internal clock.
   The clock will be automatically synchronized when if deviates for more than 1 minute.

7. This field shows when the next periodic check needs to be executed.

5.2 Activity

The Activity tab gives graphical information about the charging cycles.

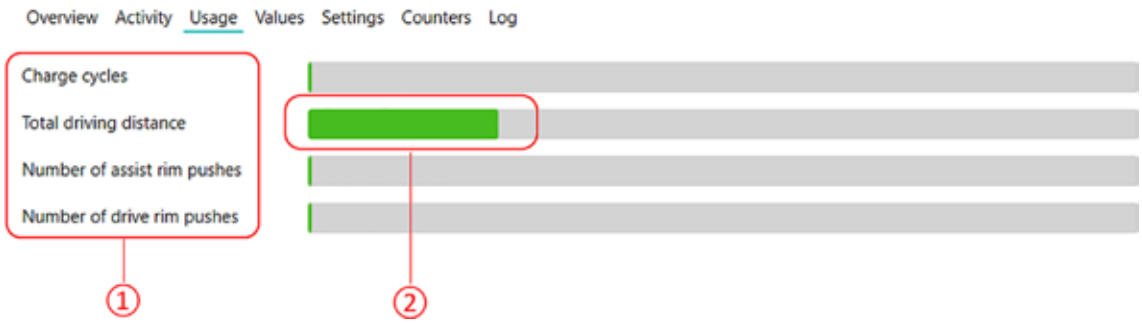


1. This field shows a charging cycle graph with on vertical axis the number of charging cycles and on the horizontal axis the charging months. In this specific graph it becomes clear that in December of 2017 the battery was charged 3 times and in the months after that, the battery was not charged. The graph only displays full charging cycles, meaning that partial cycles are not counted.

2. This field shows the number of charge events over the last 12 months and over the total lifetime of the battery pack.

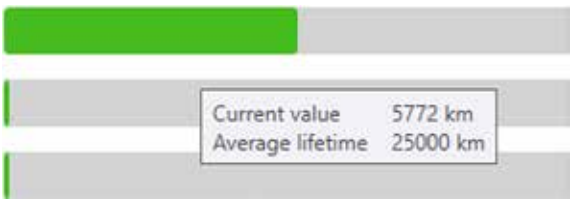
5.3 Usage

The usage tab gives information about the system usage, related to the expected life-time.



1. This field gives the usage of the battery pack in charging cycles, the total driven distance with both rims and the number of pushes with Assist and Drive rim.

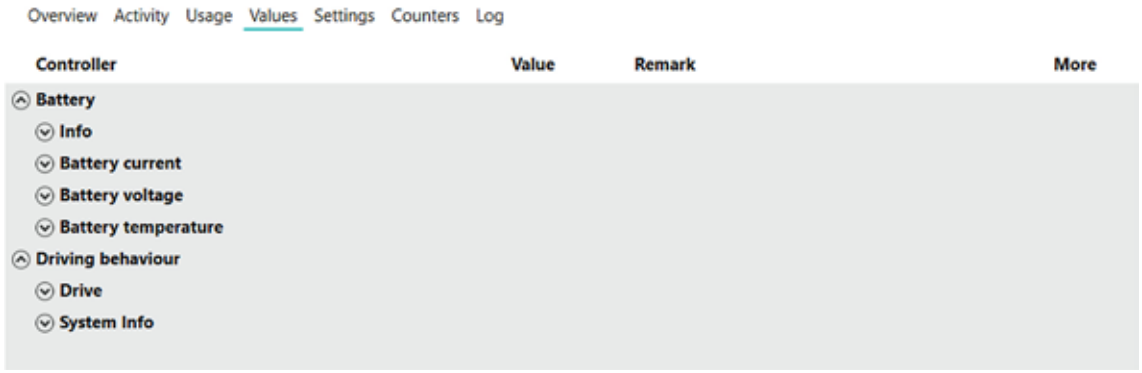
2. This field graphically displays the usage of counters mentioned above and related to the expected life-time. When pointing with the cursor over the green or grey rows, detailed information is displayed, e.g.:



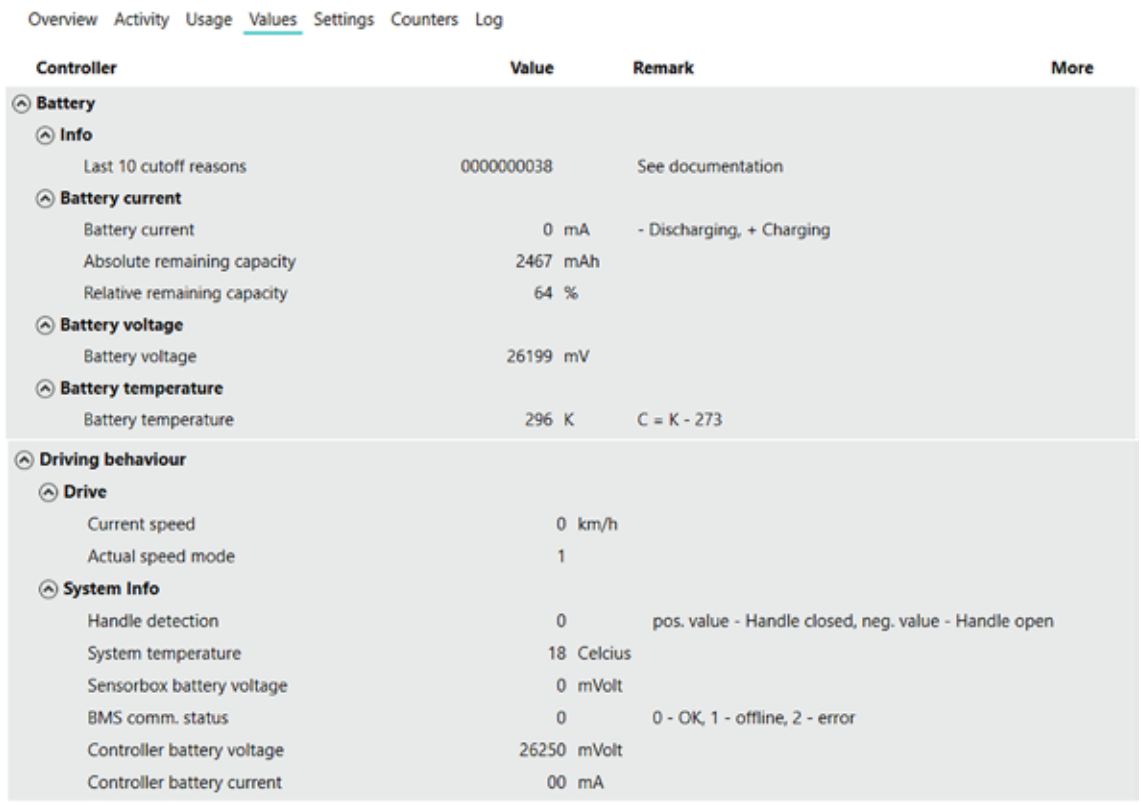
5.4 Values

The “Values” tab gives information about the parameter values stored in the battery pack and in the WheelDrive controller (driving behaviour).
This information can be used to analyse the battery and system status.

Detailed information about the parameter values can be found in this document:
E1801_yyyymmdd_WheelDrive Gen 2018 parameter list_Rx.xx_yyy



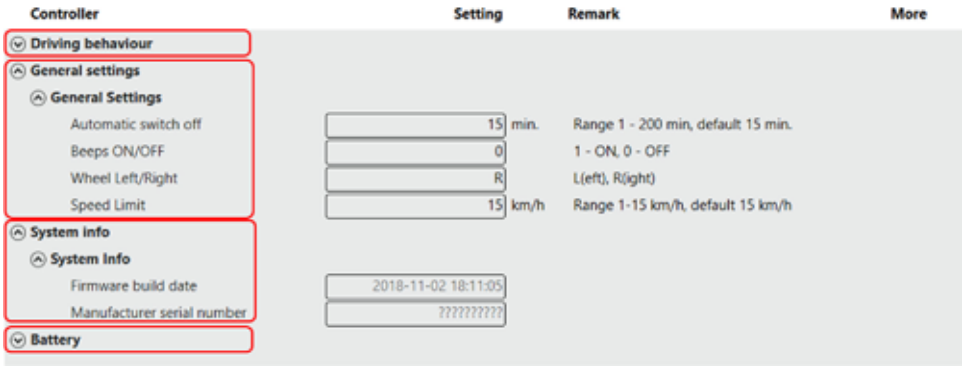
Example:



5.5 Settings

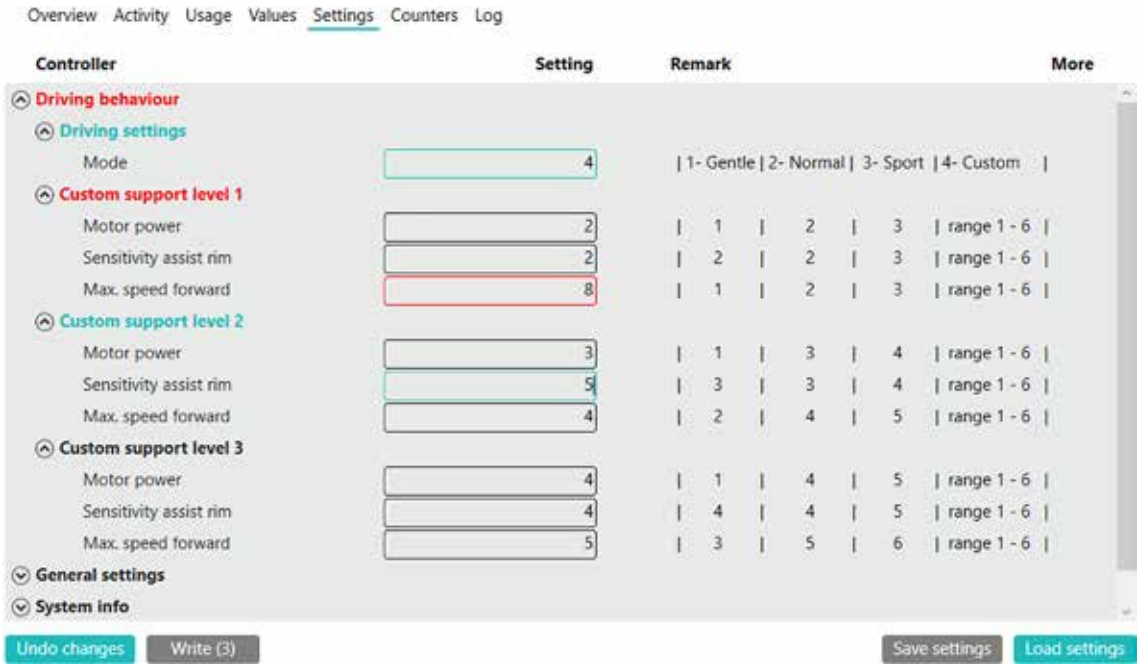
The default factory setting is the most common settings profile that suits most users, but several settings can be personalized for users with special needs or wishes. These customizable settings are: Driving behavior, Automatic switch off time, Beeps ON/OFF and Speed Limit.
This chapter explains how to adjust and write these settings.

Note:
The Left and Right wheel needs to be set individually, but settings from one wheel can be saved and load to the other wheel. See chapter 4.5.2.



5.5.1 Driving Behaviour

Within this tab the settings related to driving behaviour can be made:

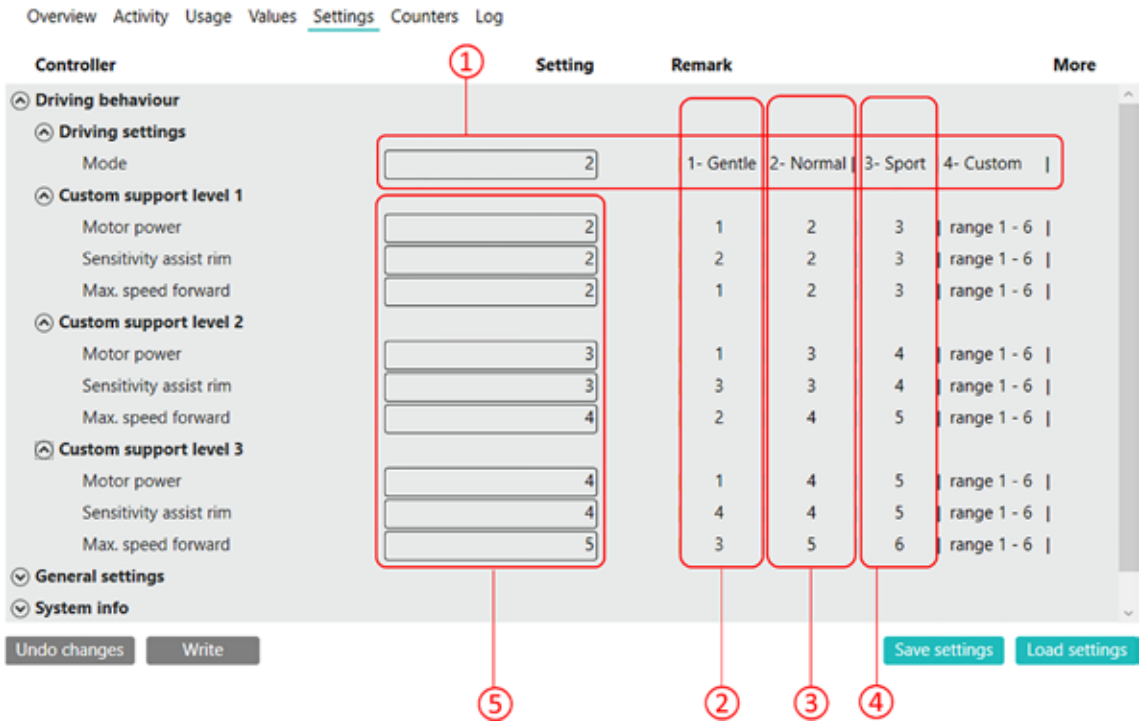


Explanation of graphical display changes.

- Green highlighted field: The field is changed compared to the last written setting.
- Red highlighted field: The field contains an incorrect value.
- Undo changes: The last written settings are filled in, all changes will be undone.
- Write: All changes are written to the wheel. Number behind write indicates the number of changes made before written.

Pre-sets

The WheelDrive is provided with 3 preset's (Gentle, Normal and Sport) and the possibility to make custom settings.



This is the input field, used to set the "Mode".
By entering "1, 2, 3 or 4" you activate one of the modes explained below:

"1" = Gentle: Mode Gentle is suitable for people with low reaction speed who use the wheels mainly indoors. The values that belong to this mode are displayed in field 2

"2" = Normal: Mode Normal is the standard setting and suitable for most people
The values that belong to this mode are displayed in field 3

"3" = Sport: Mode Sport is suitable for active people who often drive long distances outside or use it on hilly terrain regularly.
The values that belong to this mode are displayed in field 4

"4" = Custom: Mode Custom makes it possible to create a personalized setting. There are 3 parameters to set per support level, the range is 1-6. The 3 custom support levels correspond with the 3 buttons on the User Interface.
The values can be entered in field □ and can only be written when the Mode is set to "4".

Explanation of parameters:

Motor power:
The motor power is a combination of torque and acceleration. With a high value it becomes more powerful and the time to reach full power is shorter.

Sensitivity assist rim:
Determines the amount of assist rim displacement you need to apply to get support. With a high value, the movement starts with a little displacement of the assist rim; with a low value it starts later, after more displacement.

Max. speed forward:
This determines the max. speed you can reach with the drive rim on flat surfaces. The maximum speed is 6 km/u, corresponding with value 6.

Steps to set driving behaviour

1. Go to tab Settings > Driving behaviour
2. Unfold all 4 sub menus within Driving behaviour.
3. Fill in the desired Mode under Driving Settings: Gentle, Normal, Sport or Custom
4. In case mode Custom is chosen: fill in all 9 input fields within Custom support level 1, 2 and 3.

   Note: In case mode is NOT on custom (“4”) , the values within custom support level 1,2 and 3 are ignored.

5. Write the settings to the wheel by pressing button Write on the bottom.
6. Do the same for the second wheel (see paragraph “save and load settings” for an exact copy of the settings to the second wheel).

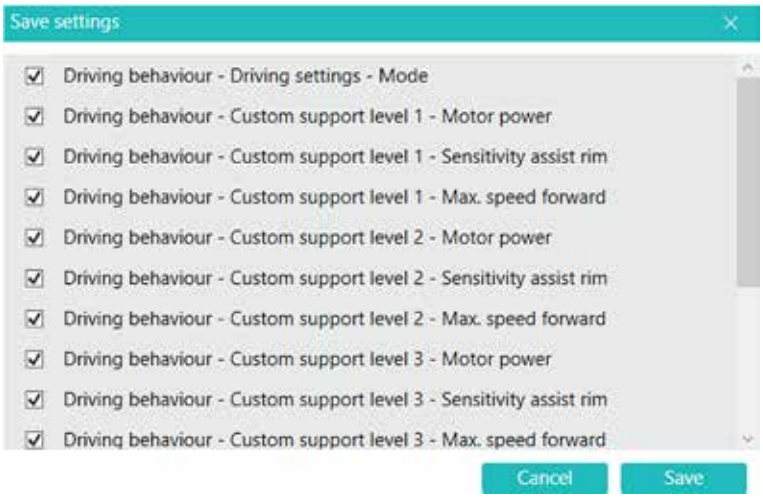
5.5.2 Save and Load Settings

The values within tab Settings can be saved and loaded.

Steps to save:

1. Press Save settings
2. Select the settings you want to save.

   Warning: Left/Right wheel setting is also in the list. Deselect if you do not want to get the setting changed!



3. Press save and select a location.

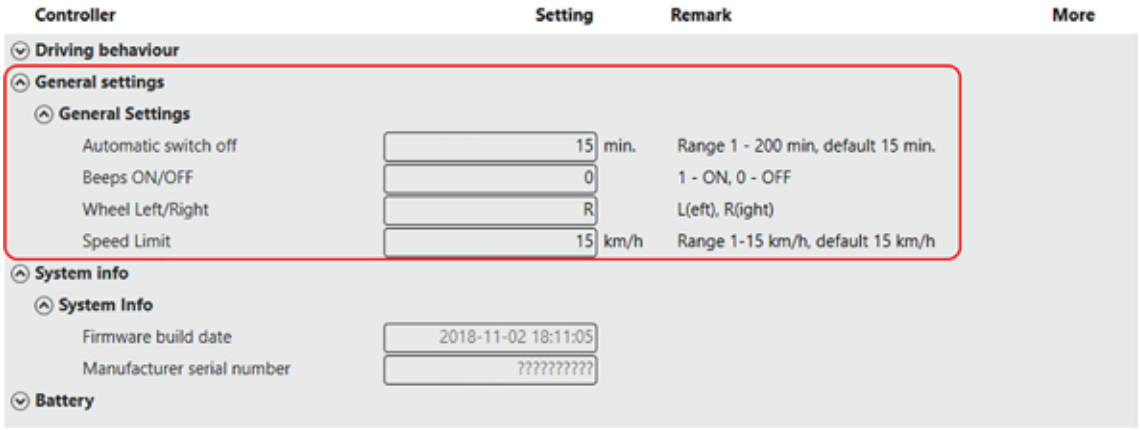
Steps to load:

1. Press load setting
2. Select and open a file

   Note: All changed fields are highlighted green

3. Write the settings to the wheel by pressing button Write on the bottom.

5.5.3 General Settings



4 general settings can be personalized:

Automatic switch off time: Determines after how many minutes the wheel switches off when not used.

Beeps ON/OFF: When selecting OFF, the wheel will not give any beeps. This also counts for warning beeps.

Wheel Left/Right: [L3] With this setting it is possible to re-configure the type of wheel. Normally this setting is only used in case a Left wheel is rebuilt into a Right wheel or vice versa.

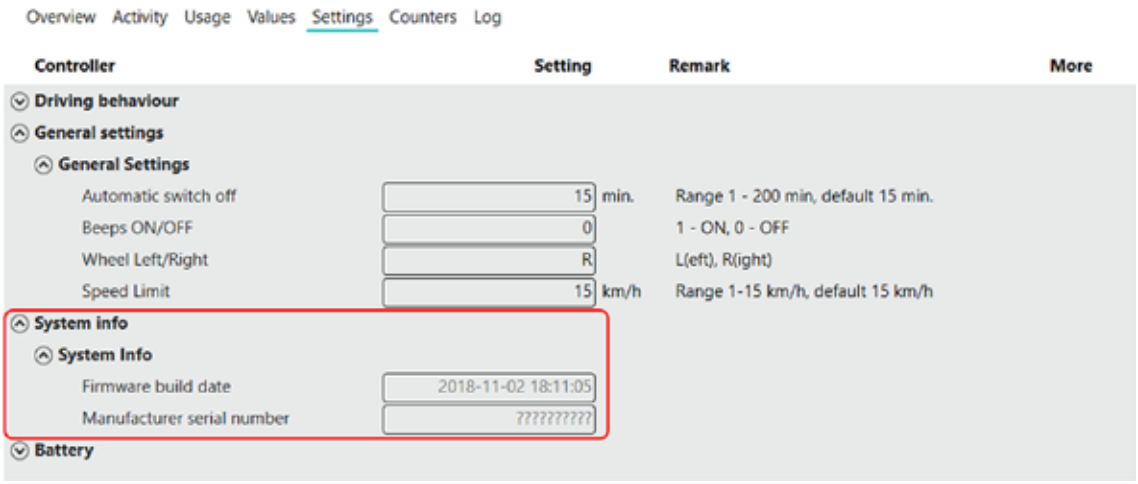
Warning: Make sure to configure the correct type of wheel.

Speed Limit: The WheelDrive can speed up to the value filled-in.

Steps to set general settings:

1. Fill in the desired values for
   - Automatic switch off time
   - Beeps ON/OFF
   - Speed Limit
2. Write the settings to the wheel by pressing button Write on the bottom.
3. Do the same for the second wheel. (see paragraph “save and load settings” for an exact copy of the settings to the second wheel).

5.5.4 System Information



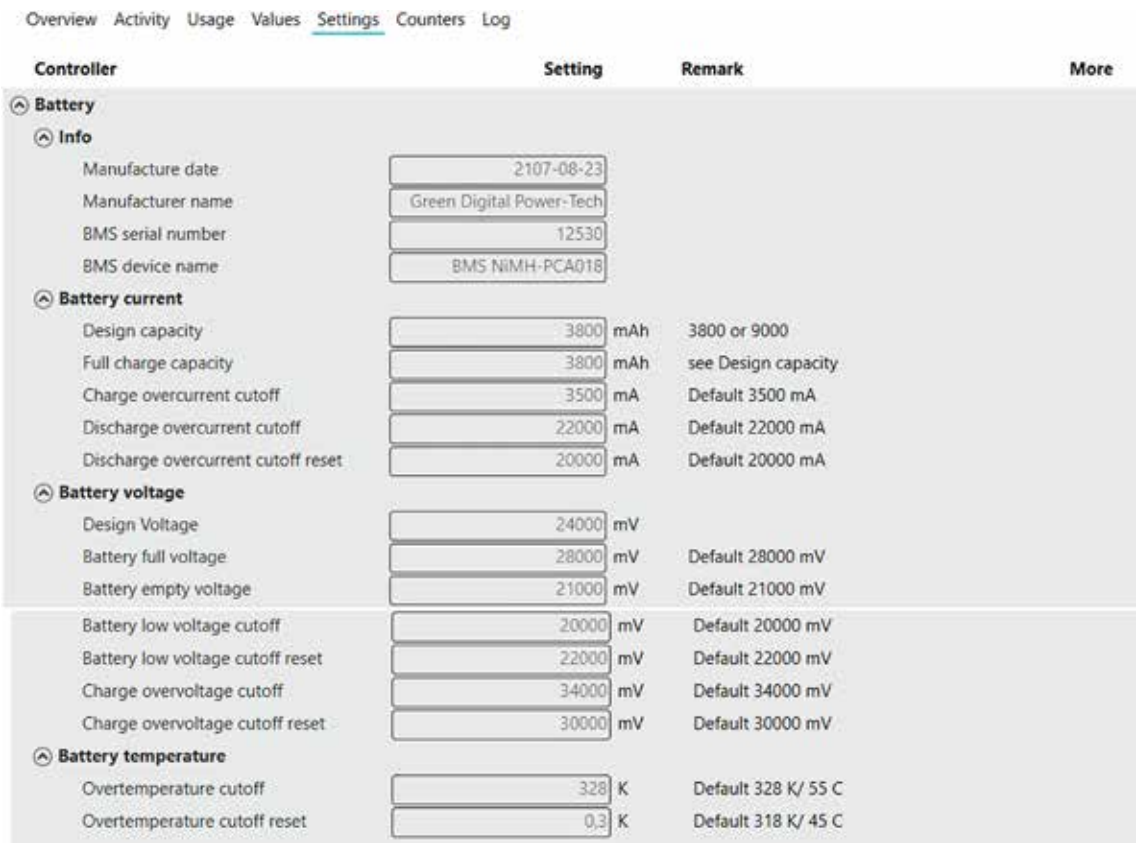
This field displays the system info.

Firmware build date: Displays the production date of the firmware

Manufacturer serial number: Displays the serial number of the motor controller

5.5.5 Battery

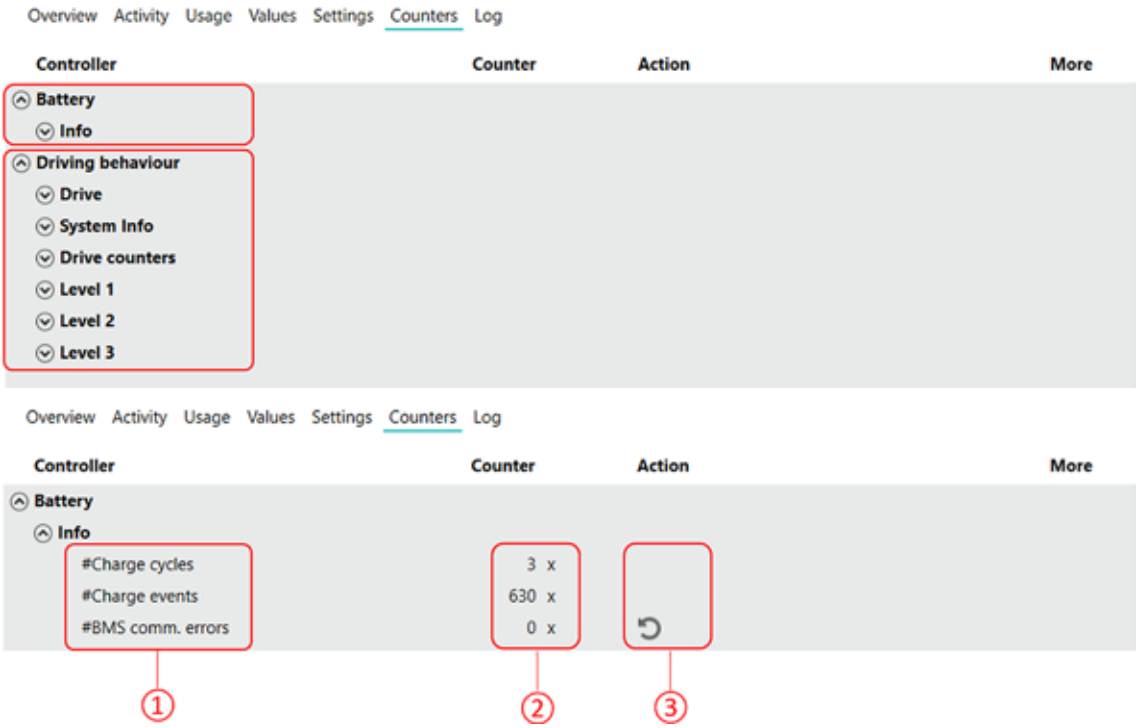
This field displays the battery settings. These settings are defined by the manufacturer and cannot be adjusted. The settings give general information about the battery and can be useful during service.
The complete list of battery settings is displayed below:



5.6 Counters

In tab “counters” relevant built in counters for Battery and Driving behaviour can be displayed and some of them can be reset.

Detailed information about the parameter values can be found in this document:
E1801_yyyymmdd_WheelDrive Gen 2018 parameter list_Rx.xx_yyy



- Field displays names of counters
- Field display the counter number
- Field displays if a counter can be reset to zero. By clicking the arrow symbol, the values will be reset. [L3]

Note: These fields are also available for driving behaviour.

Counters related to driving behaviour are displayed below.

Controller	Counter	Action	More
Driving behaviour			
Drive			
Maximum speed	7,9 km/h	↺	
System Info			
#Unexpected power off	36	↺	
#Assist rim pushes	1576	↺	
#Drive rim pushes	776	↺	
#Foil errors	116	↺	
#Hall sensor errors	17		
Drive counters			
Total driving distance	5,772 km		
Assist rim driving distance	0,59 km	↺	
Drive rim driving distance	1,017 km	↺	
Level 1			
Total driving distance	0,315 km		
Assist rim driving distance	0,086 km		
Drive rim driving distance	0,197 km		
Level 2			
Total driving distance	0,142 km		
Assist rim driving distance	0,063 km		
Drive rim driving distance	0,073 km		
Level 3			
Total driving distance	1,239 km		
Assist rim driving distance	0,441 km		
Drive rim driving distance	0,747 km		

Reset actions are only available for [L3], except the “unexpected power off”.

5.7 Log

The WheelDrive firmware will create a log file to store all important events that happened when using the product. This log file is very useful for service repairs and to help customers with complaints. In the log file approx. 1500 lines of data can be stored and when more events happen, then the oldest line will be erased.

Overview Activity Usage Values Settings Counters Log

	Date	Code	Event	More
2716	2018-10-30 12:44:33	800402	042 CONNECTED TO POWERTALK (tripel tone beep up)	
2715	2018-10-30 12:43:32	800402	042 CONNECTED TO POWERTALK (tripel tone beep up)	
2714	2018-10-30 12:43:26	800402	001 WHEELDRIVE STARTED (1 beep)	

① ② ③ ④

- Prior to every event a line number will be displayed. This number can be used for communication. A newly added event will be stored on top of the list.
- The “date” field displays the date and time an event was stored. An event will be stored immediately after the event happened. With the date you are able to track back when an event happened and how many time there was in between certain events. This information can be usefull to make proper analysis of events, especially in case of problems or questions from end-users.
- This field displays a unique code for a certain type of event. From this code more detailed information than displayed in the event column can extracted by Indes if required.
- The “Event” field shows the description of the event that was stored. The description always starts with a unique number for a pre-defined event, followed by a description and when relevant between brackets a beep signal.

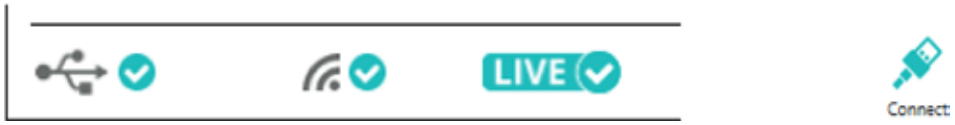
Overview of log events and their meaning:

	LOG EVENT	EXPLANATION
010	RELEASE HANDLE OPEN	An open release handle was detected
015	MOTOR SENSOR ERROR	An interrupted signal from the Hall sensor to controller was detected
036	LEVEL 1	Button 1 from user interface was pressed
038	LEVEL 2	Button 2 from user interface was pressed
040	LEVEL 3	Button 3 from user interface was pressed
042	CONNECTED TO POWERTALK	USB connection between WheelDrive and PowerTalk was detected
002	BATTERY COMMUNICATION ERROR	An interrupted data signal from battery to controller was detected
009	CHARGER CONNECTED	The WheelDrive charger was connected
020	CHARGER DISCONNECTED	The WheelDrive charger was dis-connected
001	WHEELDRIVE STARTED	The WheelDrive was started by pressing power ON button
052	WHEELDRIVE STOPPED	The WheelDrive was shut down by pressing power OFF button
019	ABRUPT SHUTDOWN	Removal of battery pack when system was on was detected
017	ASSIST RIM STUCK	Assist rim was hold for ¾ of rotation was detected
007	ASSIST RIM ERROR	An interrupted data signal from assist rim sensor was detected
004	ASSIST RIM NOT 0 AT START	The assist rim sensor signal was not 0 during start-up
008	ASSIST RIM BATTERY EMPTY	A voltage below 2.4 V from sensor box batteries was detected
003	DRIVE RIM NOT 0 AT START	The drive rim sensor signal was not 0 during start-up
060	DRIVE RIM SENSOR REF ERROR	An invalid sensor foil reference signal was detected
005	DRIVE RIM SENSOR RES ERROR	A sensor foil resistance value out of range was detected
022	POTI WIPER OFF	A lost connection between wiper and sensor foil was detected
021	UI COMMUNICATION ERROR	An interrupted data signal from user interface was detected
034	VOLTAGE HIGH >30V	A voltage higher than 30V was detected
012	DOUBLE RIM INPUT	A double input signal (input both rims at same time) was detected
016	LOW POWER / >50°C	Power was reduced due to detection of temperature above 50°C
024	LOW POWER / <0°C	Power was reduced due to detection of temperature below 0°C

6 Troubleshooting

When a connection to the WheelDrive fails, follow these steps:

1. Close PowerTalk
2. Remove USB cable from WheelDrive or PC.
3. Restart the WheelDrive
4. Reconnect the USB cable
5. Restart PowerTalk
6. If “USB” or “Live” icons below are not green, press connect button



If the steps described above do not work, the failed connection can be related to the COM port number that is used. PowerTalk only accepts COM port numbers from 1 to 9.

Follow the instructions in this hyperlink to change the COM port number on the PC:
https://thinksmartbox.com/answer/changing-the-com-port-for-a-usb-device/

Note: The comport numbers will increase every time a new WheelDrive is connected, so it is advised to start with number 1.

7 Introduction

This document describes all parameters available in the ‘WheelDrive’ Generation 2019 software. These parameters can be monitored, changed or reset with PowerTalk 2.

Notice!

For full functionality the WheelDrive motor controller must be programmed with Main controller firmware version: 2.172 (or later).

All parameters are grouped in ‘function blocks’ in PowerTalk. Availability of function blocks depends on the system type configuration. This configuration is defined by the product connected to the system.

Function Block	Availability
WheelDrive System	WheelDrive gen 2019
WheelDrive Firmware	WheelDrive gen 2019
WheelDrive General	WheelDrive gen 2019
WheelDrive UI	WheelDrive gen 2019
WheelDrive	WheelDrive gen 2019
Battery	All systems with batterypack

The right to change or reset parameters under the tabs settings and counters is defined by the Powertalk license key. Three levels are defined; for end-users, service engineers and system integrators.

- L1 - License for end-users. No rights to change or reset parameters.
- L2 - License for regular service engineers. Right to change a limited number of settings and counters.
- L3 - for certified service engineers and system integrators. Right to change an extensive number of settings and counters.

The table in chapter 4 lists what level is required to change a setting. Please contact info@esense-moves.com for information on availability and pricing of Powertalk license keys.

8 Values

8.1 Battery

Parameter	Meaning
Info	
Last 10 cutoff reasons	This value functions as a log for cut-off of the battery. In these situations, power from the battery is temporarily switched off by the battery electronics, because an unusual and potentially harmful event happened. The log fills from right to left; so the most right number is the latest event. Meaning of the numbers is as below: 0. No error/ normal mode 1. Battery voltage too low 2. Discharge current too high 3. Battery temperature too high 4. Charge voltage too high 5. Charge current too high Typically, the battery power remains switched off until the cause of cut-off is solved. This solution may for instance be recharging of the battery (cause 1), cooling of the battery over time (cause 3) or removal of the charger (cause 4 and 5).
Battery Current	
Battery current	This value shows the current to and from the battery. A positive value indicates charging of the battery, a negative value indicates discharging of the battery.
Absolute remaining capacity	This value shows the capacity in mAh that is still available in the battery.
Relative remaining capacity	This value shows the capacity that is still available in the battery as a percentage of the full capacity of the battery.
Battery Voltage	
Battery voltage	This value shows the voltage of the battery.
Battery Temperature	
Battery temperature	This value shows the real-time battery temperature, measured in degrees Kelvin. The temperature in degrees Celsius is the value in degrees Kelvin minus 273; 300 degrees Kelvin equals 27 degrees Celsius.

8.2 Driving Behaviour

Parameter	Meaning
Drive	
Current Speed	This value shows the real-time speed of the WheelDrive in km/h.
Actual Speed	This value shows the user interface button that is chosen (1, 2 or 3).
System Info	
Handle detection	This value shows the real-time sensor value for the detection of the handle position. A positive value means the handle is closed. A negative value means the handle is open. The WheelDrive will shut down when the handle is open. The sensor switch value is set to 520.
System temperature	This value shows the real-time system temperature, measured in degrees Celsius. This temperature is measured by the controller.
Sensorbox battery voltage	This value shows the real-time voltage of the sensorbox battery in mV. The minimum voltage for this battery is 2.4 V. At this voltage the sensorbox starts beeping 5 times and batteries need to be replaced.
BMS comm. status	This value shows the communication status with the BMS in the battery pack. Value 0=OK, value 1=offline, value 2=error. When the communication fails the value will be 2.
Controller battery voltage	This value shows the actual battery pack voltage in mV
Controller battery current	This value shows the actual battery pack used current in mA

9 Settings

9.1 Battery

Parameter	L	Meaning
Info		
Manufacture date	4	Battery management electronics ID information. Set in factory.
Manufacturer name	4	Battery management electronics ID information. Set in factory.
BMS serial number	4	Battery management electronics ID information. Set in factory.
BMS device name	4	Battery management electronics ID information. Set in factory.
Battery Current		
Design capacity	4	The full capacity of the batterypack. Set in factory.
Full charge capacity	4	This setting is equal to the design capacity.
Charge overcurrent cutoff	4	Safety threshold. Set in factory.
Discharge overcurrent cutoff	4	Safety threshold. Set in factory.
Discharge overcurrent cutoff reset	4	This value shows the actual battery pack voltage in mV
Battery Voltage		
Battery full voltage	4	Battery full voltage level. Only used as backup capacity calculation. Set in factory.
Battery empty voltage	4	Battery empty voltage level. Only used as backup capacity calculation. Set in factory.
Battery low voltage cutoff	4	Safety threshold. Set in factory.
Battery low voltage cutoff reset	4	Reset threshold. Set in factory.
Charge overvoltage cutoff	4	Safety threshold. Set in factory.
Charge overvoltage cutoff reset	4	Reset threshold. Set in factory.
Battery temperature		
Overtemperature cutoff	4	Safety threshold. Set in factory.
Overtemperature cutoff reset	4	Reset threshold. Set in factory.

9.2 Driving Behaviour

Parameter	L	Meaning
Info		
Mode	1	In this field the driving mode can be set by entering “1” for Gentle driving, “2” for Normal driving, “3” for Sport. These are the 3 predefined setting. When customization is required Custom setting “4” must be set. Only when setting “4” is set, the custom support levels below apply.
Custom support level 1		The settings in this pulldown belong to User Interface button 1
Motor power	2	The motor power value can be set from 1 to 6. A higher value means a higher torque and faster acceleration.
Sensitivity assist rim	2	The sensitivity value determines how much displacement of the assist rim you need to get support. With a high value, the movement starts with a little displacement of the assist rim; with a low value it starts later, after more displacement.
Max. Speed Forward	2	This value determines the maximum speed you can reach with the Drive rim on flat surfaces. The maximum is 6 km/u, corresponding with value “6”.
Custom support level 2		The settings in this pulldown belong to User Interface button 2
Motor power	2	See “Custom support level 1”
Sensitivity assist rim	2	See “Custom support level 1”
Max. speed forward	2	See “Custom support level 1”
Custom support level 2		The settings in this pulldown belong to User Interface button 3
Motor power	2	See “Custom support level 1”
Sensitivity assist rim	2	See “Custom support level 1”
Max. speed forward	2	See “Custom support level 1”

9.3 General Settings

Parameter	L	Meaning
General settings		
Automatic switch off	1	This value in minutes determines after how much time the wheel switches off after not being used.
Beeps ON/OFF	1	When selecting OFF (0), the system will not give any beeps. Also warning beeps are disabled.
Wheel Left/Right	3	This value is set during factory setup and determines the type of wheel (left or right)
Speed limit	2	The WheelDrive can speed up to the value set. Range is 1-15 km/h, default is 15 km/h. When the slope is too steep, the speed cannot be controlled to this value and the WD will speed up.

9.4 System Info

Parameter	L	Meaning
System Info		
Firmware build date	4	The time and date that the system software for the main controller was created. This parameter is set by the software engineer at Indes.
Manufacturer firmware	4	The name of the firmware developer
Manufacturer serial number	4	The serial number of the motor controller.
Reset to factory defaults	3	By typing “RESET_DRIVING” all the custom settings become a copy of the normal settings and the default select profile is normal By typing “FACTORY_RESET” same settings as “RESET_DRIVING” plus below values will be set: These counters will be set to 0: max speed, Assist and Drive rim distances, foil errors, hall errors And “auto off time” = 15 min, “beeps” = on, “Facility” = empty box, “Location” = empty box, “LOG” =clear A “FACTORY_RESET” can be used when the WheelDrive transfers to a new end-user.

10 Counters

10.1 Battery

Parameter	L	Meaning
System Info		
#Charge cycles	4	Number of times the battery has been fully charged. A charge cycle is counted when the battery is charged with a total of the design capacity of the battery pack (see settings). A single charge cycle can comprise multiple charge events. Example: A battery pack with a design capacity of 9 Ah is charged on day 1 with 4 Ah. On day 2 it is charged with 2 Ah and on day 3 with 3 Ah. The total of all 3 days equals the design capacity and is counted as 1 charge cycle.
#Charge events	4	Number of charge events communicated by the battery management electronics. This number is not of relevance in judgement of system health.
#BMS comm. errors	3	This number is not relevant in judgement of system health. The value can be reset by clicking the arrow symbol.

10.2 Driving Behaviour

Parameter	L	Meaning
Drive		
Maximum speed	3	This value shows the maximum driven speed with the WheelDrive in km/h. The value can be reset by clicking the arrow symbol.
System info		
Unexpected power off	2	This value gives the number of unexpected “shut downs” of the system. This can for example happen when the battery is taken off without using the on/off button on the User Interface. The value can be reset by clicking the arrow symbol.
Assist rim pushes	3	This value gives the number of pushes made with the Assist rim. The value can be reset by clicking the arrow symbol.
Drive rim pushes	3	This value gives the number of pushes made with the Drive rim. The value can be reset by clicking the arrow symbol.
Foil errors	3	This value gives the number of sensor foil errors detected by the controller. Detailed information can be found in the log file.
Hall sensor errors	4	This value gives the number of hall sensor errors detected by the controller. The hall sensor is part of the motor and used for positioning and driving of the motor.
Drive counters		
Total driving distance	4	This value is the sum of the total driving distances of levels 1, 2 and 3 displayed in km.
Assist rim driving distance	3	This value is the sum of the total Assist rim driving distances of levels 1, 2 and 3 displayed in km.
Drive rim driving distance	3	This value is the sum of the total Drive rim driving distances of levels 1, 2 and 3 displayed in km.
Level 1		
Total driving distance		This value is the sum of Assist rim and Drive rim driven distance in level 1, displayed in km.
Assist rim driving distance		This value is the total driven distance with the Assist rim within level 1
Drive rim driving distance		This value is the total driven distance with the Drive rim within level 1
Level 2		
Total driving distance		This value is the sum of Assist rim and Drive rim driven distance in level 2, displayed in km.
Assist rim driving distance		This value is the total driven distance with the Assist rim within level 2
Drive rim driving distance		This value is the total driven distance with the Drive rim within level 2
Level 3		
Total driving distance		This value is the sum of Assist rim and Drive rim driven distance in level 3, displayed in km.
Assist rim driving distance		This value is the total driven distance with the Assist rim within level 3
Drive rim driving distance		This value is the total driven distance with the Drive rim within level 3

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