



a product of the company Bozzio AG

Universal Servicemanager Manual

EN_Universal_Servicemanager_Manual_2_V04-170531.docx



BOZZIO

Aarbergstrasse 5
2560 Nidau
Switzerland



Hauptsponsor



Schweizer
Paraplegiker
Stiftung

Sponsoren



STI
Stiftung für technologische Innovation
Fondation pour l'innovation technologique
Foundation for technological innovation

• • • • Berner Fachhochschule
Technik und Informatik

KTI/CTI
ETH FORERUNNERSHIP FOR INNOVATION
L'UNIVERSITÉ POUR LA PROMOTION DE L'INNOVATION
L'UNIVERSITÀ PER LA PROMOZIONE DELL'INNOVAZIONE
THE INNOVATION PROMOTION AGENCY

Content

1	GENERAL	3
2	DISCLAIMER	4
3	WHAT IS SERVICEMANAGER 2.0?	5
3.1	The different application views and their purposes.....	5
3.2	Main screen overview	5
3.3	Status view	7
3.4	Presets View	8
3.5	Systems View	10
3.6	Additional views	11
4	SERVICE PARAMETERS	12
4.1	Parameter Groups	12
4.2	User roles filter	13
4.3	Input lock	14
4.4	Service Parameter input control	15
4.5	Most important Parameters for quick System Setup	16
5	SIMULATOR MODE	21
6	EVENT LOG	22
6.1	Read out the Event Log with the Servicemanager	22
6.2	Analyse the Event Log in the Notepad++	23
6.3	Example of an Event Log analyse	24

1 General

This document describes the joysteer® system.

The handling and installation is to take place by trained personnel **exclusively**, whereby all points need to be carried out as described.

This document describes all **non**-vehicle specific installation steps. Refer to the corresponding vehicle specific manuals for details.

This document applies to the joysteer® system generation 2.0.

The main change from generation 1.0 to generation 2.0 is as following:



Display module

joysteer® generation 2.0



Alarm module

joysteer® generation 1.0

2 Disclaimer

Bozzio AG refuses their product liability if one or more of the following facts are given:

- Driving the system by users who do not possess an appropriate driving licence
Exception: driving accompanied by an authorized driving instructor
- Driving with accompanying driving instructor without installation of an Instructor switch
- Installation/ maintenance/ repairs by companies not trained by Bozzio AG
- Installation/ maintenance/ repairs by personnel not trained by Bozzio AG
- Installation/ maintenance/ repairs not according to the manuals
- Installation/ maintenance/ repairs of components/ modules, which are not mentioned in the part list
- Installation/ maintenance/ repairs of any MMI (Man Machine Interface), which has not been released by Bozzio AG in written form
- Usage of parameter-sets which do not correspond to the “rules” of the Servicemanager
- Any modifications to the cable harness

Important:

- By opening the modules any warranty of the manufacturer is omitted
(Exception: EnergyAlarm module).

3 What is Servicemanager 2.0?

The Servicemanager is the tool needed to survey and modify the functionality of the joysteer driving system. Servicemanager is a Java8 (32bit) application designed for Windows XP/7/8 10 (x86/x64).

Note: Check the Java version of your PC and uninstall older versions than Java 8

The minimal requirements on the laptop are the following:

OS: Windows 7 / 8 / 10

Windows RT does not work

RAM: 4 GB or more

Resolution 1280x720 or more

CPU: intel i3 or higher

Bozzio is recommending the following laptop:

Microsoft Surface Pro 3 (i3, 64GB, 4GB RAM) or higher

Servicemanager uses the CAN dongle for the communication of the user's PC with joysteer. Its main purpose is to change the driving behaviour of the system by modifying service parameters, saving and loading of presets, and performing diagnosis analysis.

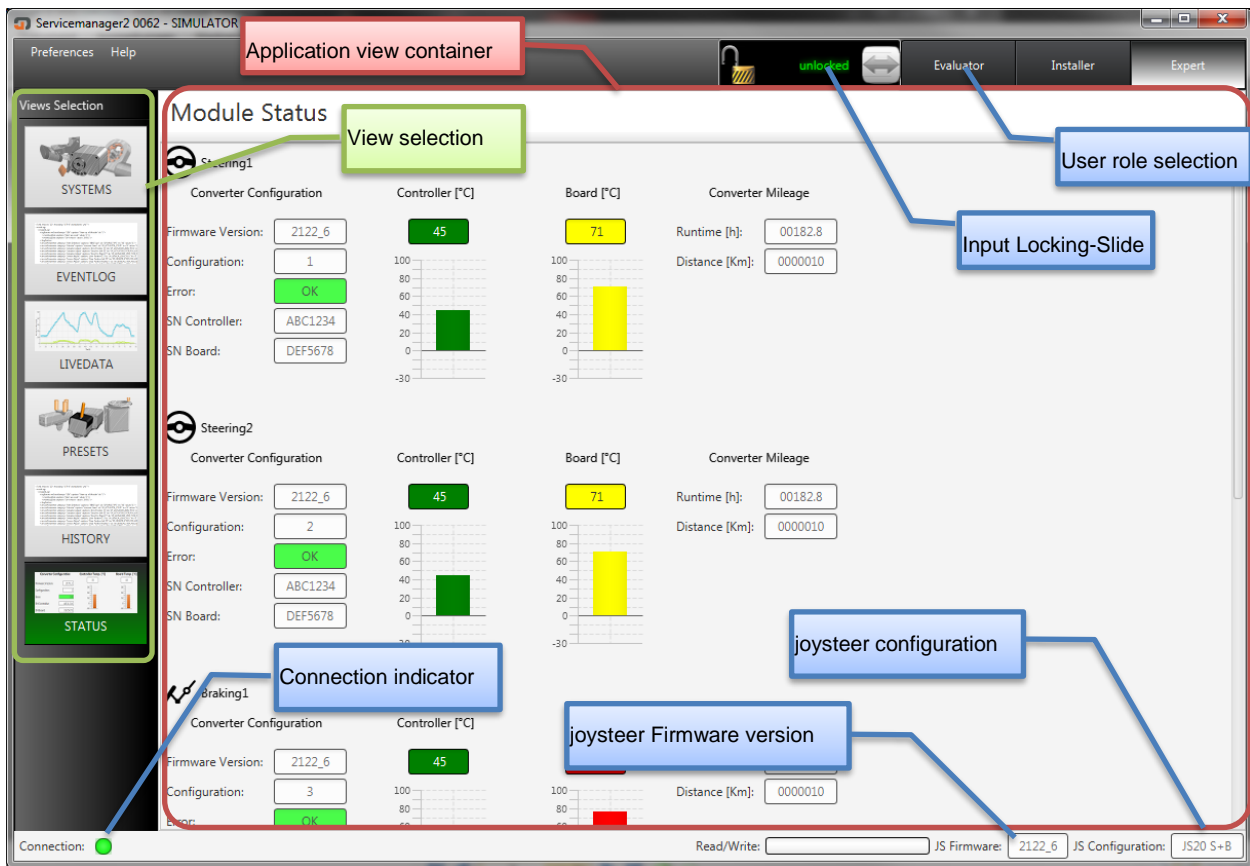
3.1 The different application views and their purposes

The UI of the Servicemanager consists of different views, each one is used for specific applications.

3.2 Main screen overview

The main screen contains the basic controls used to navigate through the application and change the filter settings and input permission of the views. Plus, it shows essential information about the connected system like firmware version and configuration.

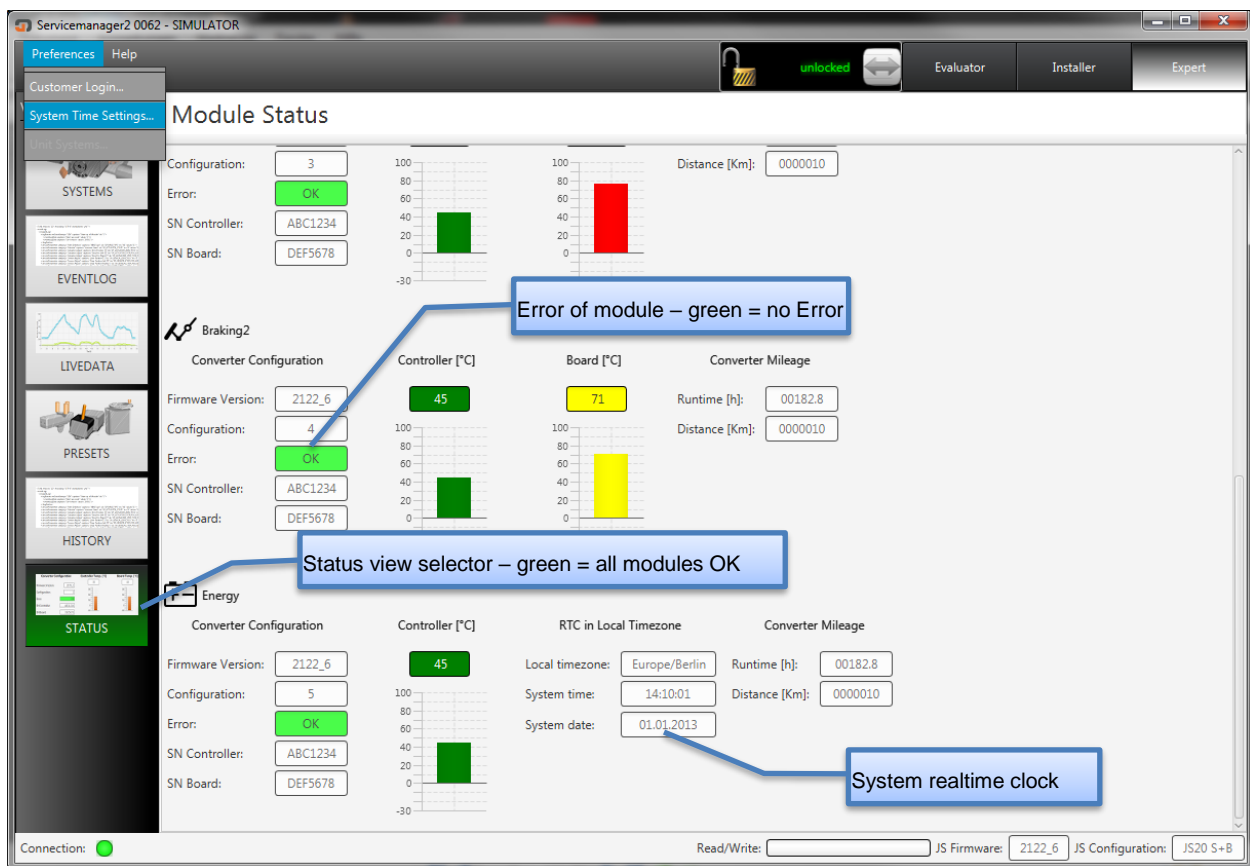
When started up, Servicemanager will try to connect to a joysteer system automatically; it will give information if there are problems when doing so, like unsupported firmware or CAN driver problems.



Main Screen overview

3.3 Status view

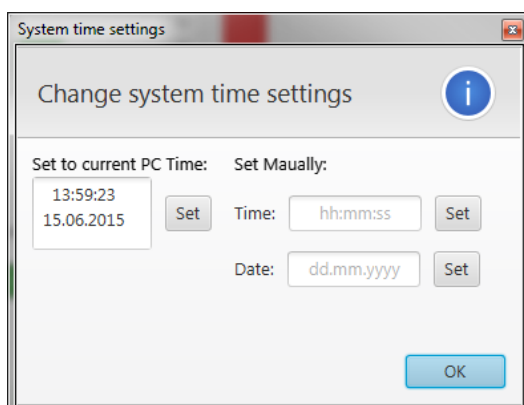
When successfully connected to a joysteer system, the Servicemanager will show the status view first. This view contains vital information about every converter and the energy module.



Status view

The system time is needed for chronological correctness of recorded events, and must be set at commissioning.

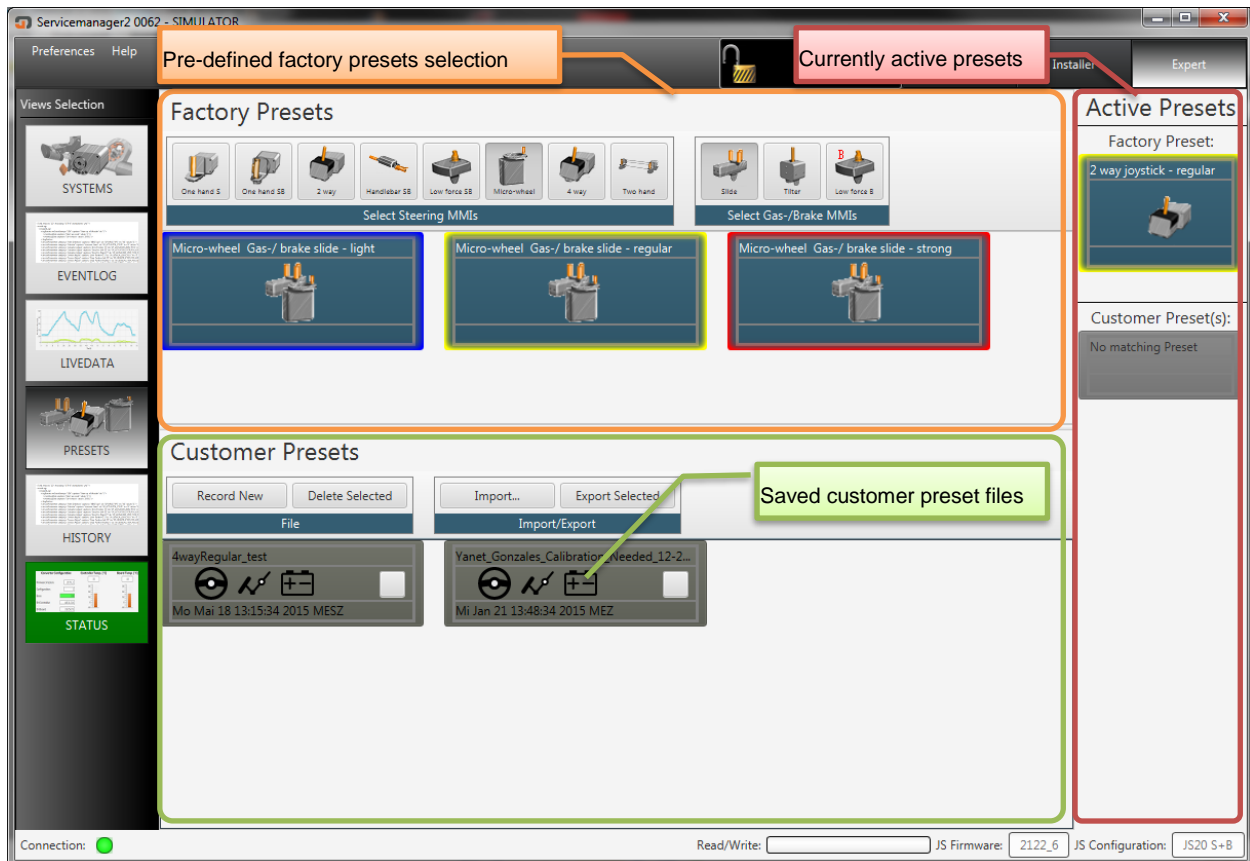
It can be set to current PC time, or to a manually entered value.



Real time clock setting

3.4 Presets View

The Presets view allows the user to save and load a certain system setup. All joysteer service parameters of the currently connected system can be saved into one file, a so called preset. This can be thought of as an “image” of the system, similar to a backup of a PC hard drive. Like that, a previously saved system setup can easily be restored by just clicking the desired preset. This comes especially handy when using a demovan with multiple customers.



Presets view

The view is split in an upper- and a lower part. In the upper part, the user can select the pre-defined presets for all MMIs. Those are integrated in the Servicemanager application and can be used as a starting point to parametrisation when commissioning a new system.

The right column shows if the current service parameters on the system match a certain preset.

By choosing a desired MMI combination in the MMI selection, three presets show up for this combination.

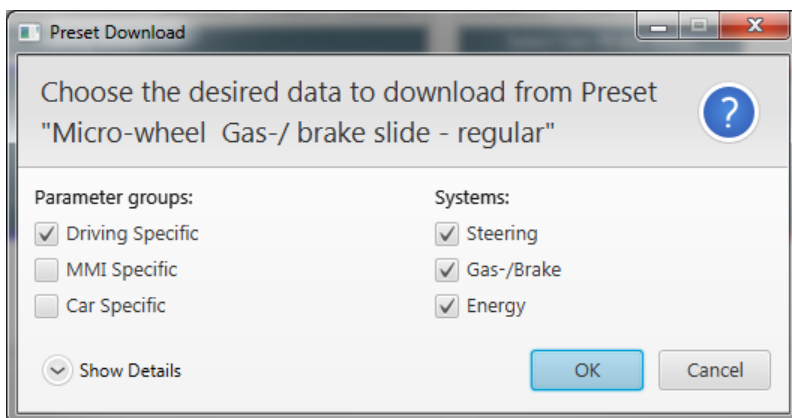
1. “light”,
2. “regular”,
3. “strong”

These names refer on the force feedback setting in the relevant preset. Meaning the “light” preset will setup the system to be driven with less feedback, the “strong” with more feedback.

When clicking on a preset, a dialog shows up asking the user which data should be downloaded to the joysteer system.

A preset made from a joysteer steer + brake configuration will contain parameters for the steering, braking and energy modules, therefore the user can select the modules to be overwritten.

joysteer service parameters are grouped into three functional categories. The user can also select the categories of parameters he would like to download. For the explanation of the parameter groups please see chapter 4.1

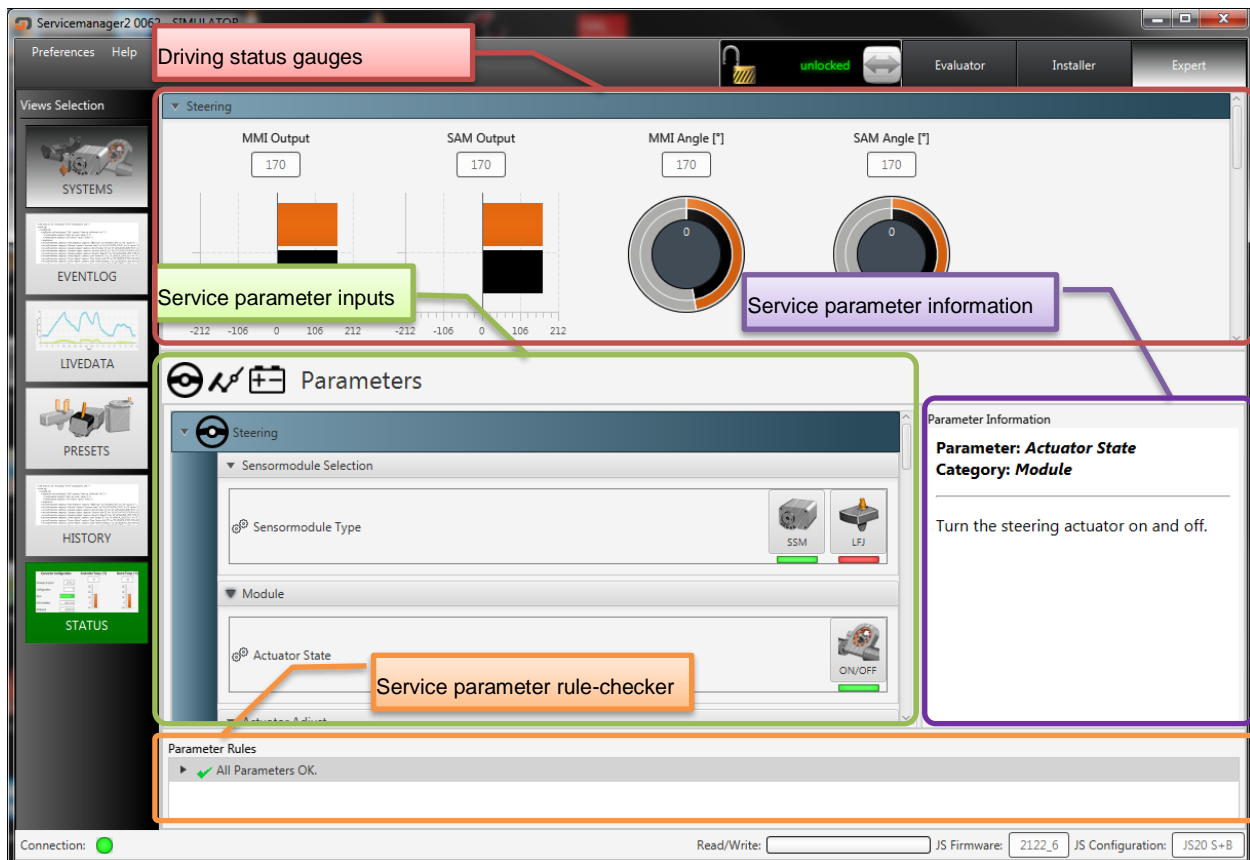


Preset Download dialog

3.5 Systems View

The systems view is the “core” of the actual adjustment and overview of the systems behaviour. Here the user can change all the single service parameters of all available modules. At the same time, there is essential driving status information provided by multiple gauges for inputs and outputs of the steering, braking and energy modules.

There is also an information window describing every selected service parameter, and a rules-checker which shows alerts if the entered parameters are violating safety relevant directives.


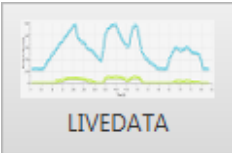



Systems view

The view is split in an upper- and a lower part. The upper part contains the driving status gauges for steering, braking and energy. The lower part contains the service parameter inputs. Both view parts are scrollable, in the image above only the steering driving status and parameters are shown.

3.6 Additional views

There are several other views used for specific purposes; however, the detailed description of those would exceed the coverage of this manual, therefore a quick overview:

View	Description
	Used to readout the eventlog of the Joysteer system. Returns an XML file to be analysed. See also Chapter 6.
	Printout of various system data in a XY chart
	Shows parameter changes carried out

4 Service Parameters

A service parameter is a safely stored variable value that affects the behaviour of the control- and diagnosis algorithms of joysteer.

The philosophy of joysteer is to be as versatile as possible; therefore, there are quite a lot of different service parameters. All system setup is done by modifying according parameters.

4.1 Parameter Groups

Service parameters are divided into logical groups. This is because there are certain adjustments that normally don't need to be changed when adapting the driving behaviour of the system by the loading of a preset. For instance, the MMI zero- and end stop positions don't need to be changed if a user just wants to try a preset with stronger force feedback in it.

Being the fact that **all** system parameters are stored in a preset, the user must have the possibility to select only those affecting what he actually wants to change. Therefore, those three groups have been defined:

Group	Description	Example
Driving specific	Parameters that affect the driving behaviour of the system.	<ul style="list-style-type: none">• Force feedback• steering linearity• brake progression• ...etc.
MMI specific	Parameters defining MMI positions	<ul style="list-style-type: none">• Straight forward position• Left end stop• Right end stop
Car specific	Parameters taking care of car depending mechanical properties	<ul style="list-style-type: none">• Actuator friction offsets• Actuator absolute forward position• Braking pressures to reach• Speed signal calibration• ...etc

These groups only matter when using presets, they will not be marked in a special way when modifying them manually via the systems view.

When loading a factory preset, as default only the driving specific parameters are checked for download. It's assumed that the user will, or already has calibrated the MMI end stops and the offsets.

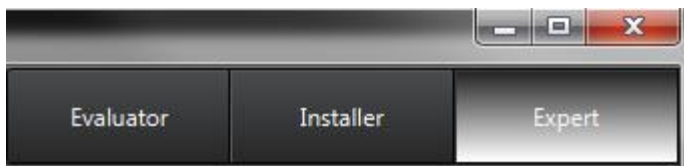
4.2 User roles filter

Because there are a lot of service parameters and views, the available input content in Servicemanager can be filtered to adapt to the needs of the user. For instance, an evaluator who is doing driving lessons with multiple clients only needs to have presets available for each client, and maybe be able to adjust the MMI positions. All the remaining parameters and views can be masked out, to keep the UI simple and clear.

There are three user roles defined, each one showing only inputs according to the possible needs of this role.

User role	Description	Visible inputs
Evaluator	Used for driving lessons, all necessary setup has been done in advance, only loading of presets and basic adjustments	<ul style="list-style-type: none">• Systems view with basic driving specific parameters• Presets view
Installer	Used for preforming necessary car specific adjustments when commissioning the systems	<ul style="list-style-type: none">• Systems view with all MMI and car specific parameters• Presets view• History view showing all carried out parameter changes
Expert	Full access	<ul style="list-style-type: none">• All available views• All parameters


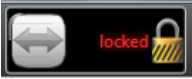
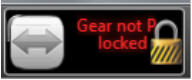
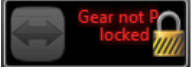
The user role can be changed on-the-fly, by just clicking the desired role in the user role selector in the top right angle.



User role selection

4.3 Input lock

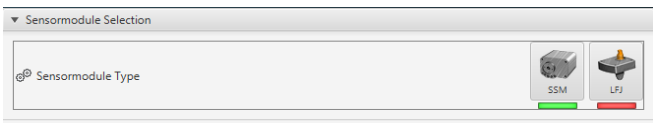


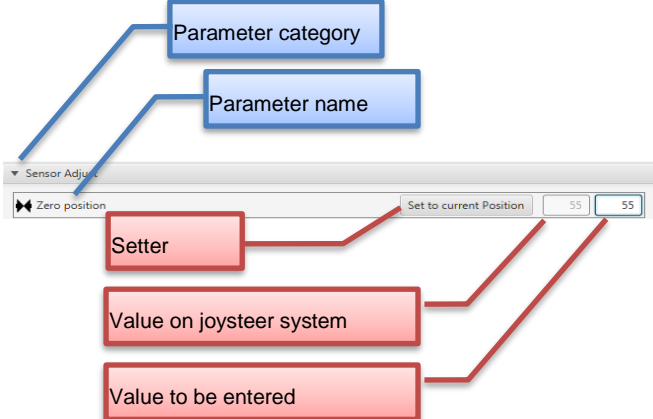
Changing parameters while driving is generally not a good idea, because the behaviour of the system can change abruptly. Because Servicemanager can also run from touchscreen enabled devices, there is a function called input-lock, which prevents the user from changing parameters unintentionally.

Lock states	Description
	Unlocked: All inputs enabled.
	Locked and gear in P: All inputs disabled, can be unlocked unlimited.
	Locked and gear not in P: Expert user role can unlock, will fall back after 1 minute.
	Disabled and gear not in P: Other user roles are not allowed to unlock.

The input lock works like the slider known from smartphones, it has to be grabbed and dragged aside.

4.4 Service Parameter input control

There are several input controls for changing the value of a service parameter.

Input	Look	How to use
Parameter selection		Non-numeric control that shows a selection. The selection is made by clicking one of the buttons. The currently selected item has a green control lamp.
Parameter toggle		Non-numeric control that shows a toggle. Toggle is made by clicking the button. The active state is shown by a green control lamp.
Regular parameter		Numeric control, with a text field for entering the desired value. As soon as the user presses ENTER or leaves focus on the text field, the value is downloaded to the system.
Parameter calibration		<p>Same as regular parameter, but has a setter button which sets the value to the current driving status.</p> <p>If the text field is highlighted RED, this means that both converter modules have not the same value for this parameter, and it needs to be set again.</p>

4.5 Most important Parameters for quick System Setup

For a detailed description of all service parameters, please refer to the document:

joysteer parameters.xlsx.pdf

This document can be found with the firmware release.

Please find also the **Evaluator manual** or the **Commissioning Manual** which can be downloaded from the login part of www.joysteer.ch.

This section will only treat the most important parameters to quickly get started with a system setup and satisfy most of a client's wishes. For the numerical ranges of the manipulations please see parameter information in Servicemanager.

4.5.1 The speed dependency

Most of the driving specific service parameters are speed dependent, that means they have a value for the lowest speed and a value for the highest speed, and will be a gradient in between those two. Therefore, the speed-limits must be set to let the speed dependency work correctly.

Category	Parameter	Value to set
V dependency	V-max [km/h]	End speed for speed dependency (typ. = 80)
V dependency	V-min [km/h]	Start speed for speed dependency (typ. = 20)

To convert mph in km/h please note:

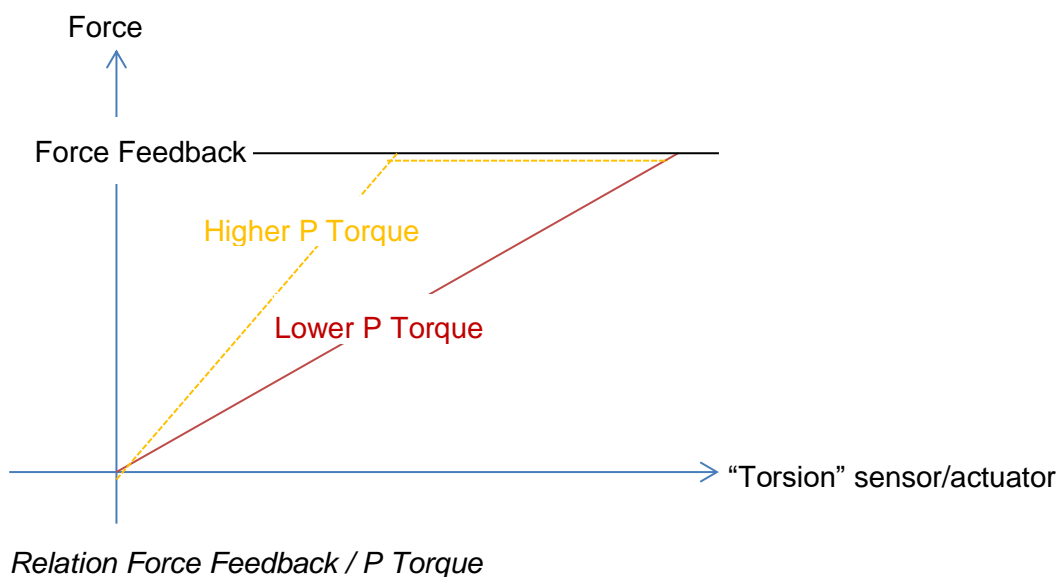
$$1 \text{ mile} = 1.61 \text{ km}$$
$$\text{miles} \approx (\text{km} * 2) - 20\%$$

4.5.2 The Force Feedback

The force feedback serves as haptic user feedback for the “torsion” (difference) between the position of the steering sensor and the steering actuator.

Although there are almost as many parameters for the steering actuator as for the steering sensor, it is best practice to load a preset and only alter the parameters for the steering sensor.

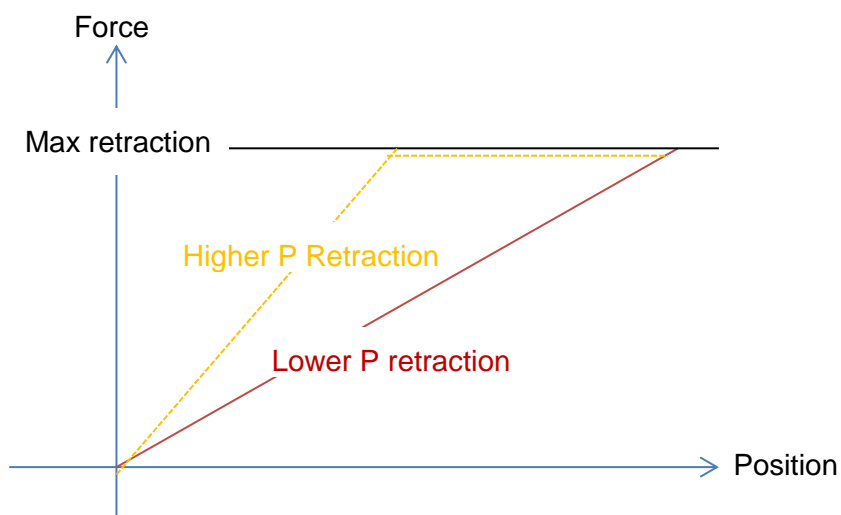
Category	Parameter	Manipulation
Sensor	Force Feedback	The maximal Force Feedback the system will put out. Increase/decrease for harder/softer feel.
Sensor	P Torque @ V-min	How fast max. Force Feedback is reached
Sensor	P Torque @ V-max	How fast max. Fore Feedback is reached



4.5.3 The retraction

The retraction is a part of the force feedback, and describes the desire of the sensor / actuator to return into zero position.

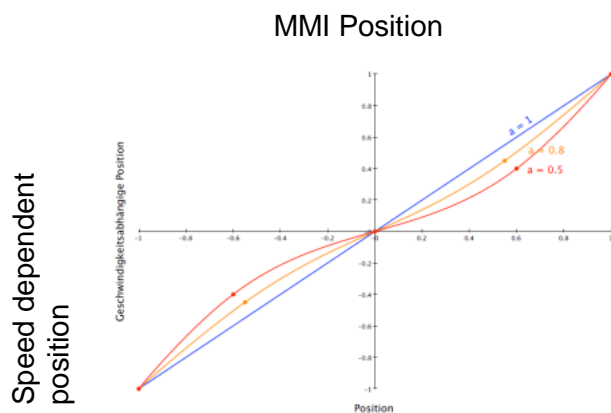
Category	Parameter	Manipulation
Sensor	Max Retraction @ V-max	Increase/decrease for more/less maximal retraction
Sensor	Max Retraction @ V-min	Increase/decrease for more/less maximal retraction
Sensor	P Retraction @ V-max	How fast maximal retraction is reached (typ. 25% of max retraction)
Sensor	P Retraction @ V-min	How fast maximal retraction is reached (typ. 25% of max retraction)



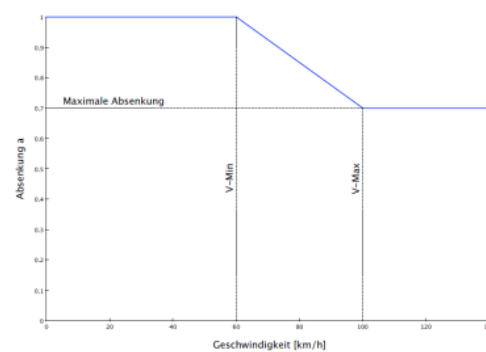
Relation Max Retraction / P Retraction

4.5.4 The steering linearity

This is one of the most important parameters; it lets the steering become more or less “sensitive” to user input, by increasing/decreasing the linearity. This means, the user has to make more/less input around the zero position to generate a corresponding steering output.



Steering linearity correction curve

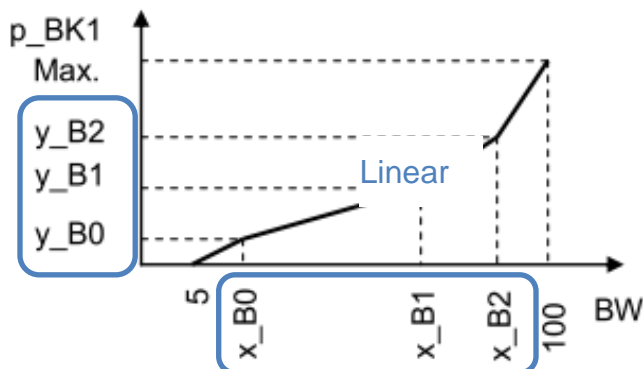


Maximum progressivity of correction curve

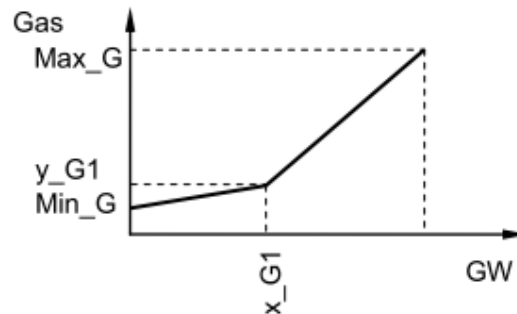
Category	Parameter	Manipulation
V dependency	Steering Linearity @ V-max	Lower/higher value, more/less progression
V dependency	Steering Linearity @ V-min	Lower/higher value, more/less progression

4.5.5 The gas / brake curves

This is also a progression adjustment, it lets the braking /gas become more/less “sensitive” to user input, by increasing/decreasing the linearity, although it is not speed dependent.



Braking progression curve parameters



Gas progression curve parameters

Category	Parameter	Manipulation
Brake	x_{B0} [%]	Set the points to generate a curve with desired progression.
Brake	y_{B0} [%]	
Brake	x_{B1} [%]	
Brake	y_{B1} [%]	
Brake	x_{B2} [%]	
Brake	y_{B2} [%]	
Gas	x_{G1} [%]	
Gas	y_{G1} [%]	

4.5.6 The Gas limitation

This parameter is there to limit the accelerator output of the system, so that a new, unexperienced customer can be constrained in how fast he can go.

Category	Parameter	Manipulation
Gas	Gas limitation [%]	Limit the accelerator output from 0...100%

4.5.7 The offsets

The offsets are used to overcome mechanical friction in the steering and braking actuators, as in the steering sensor module. This is needed so that the control can work flawlessly.

Category	Parameter	Manipulation
Sensor	Offset	Compensate the friction of the steering actor module. Increase value until MMI starts vibration. Then go 20% back. (typ. 100...500)
Actuator	Offset	Compensate the friction of the steering actuator. Increase value until steering actuator starts vibrating. Then go 20% back. (typ 300....600)
Brake	Braking Offset 1	<ul style="list-style-type: none"> • Use for both parameters the default value 8. • Use the livedata view to show B1 and B2 actuator positions • Start the live data • Slowly increase the brake and check the graph for both positions. Both lines should increase on the same time. If not, decrease the value of the retarded position • Try again until both positions rise at the same time.
Brake	Braking Offset 2	

5 Simulator mode

The Servicemanager can be launched in a simulator mode, without the need to be connected to a joysteer system. Start Servicemanager-2.0-00xx-Simulator.cmd

6 Event Log

Reading the Event Log needs some experience. Normally this should be done by a technician from Bozzio AG. If possible, send the Event Log by email to Bozzio AG:

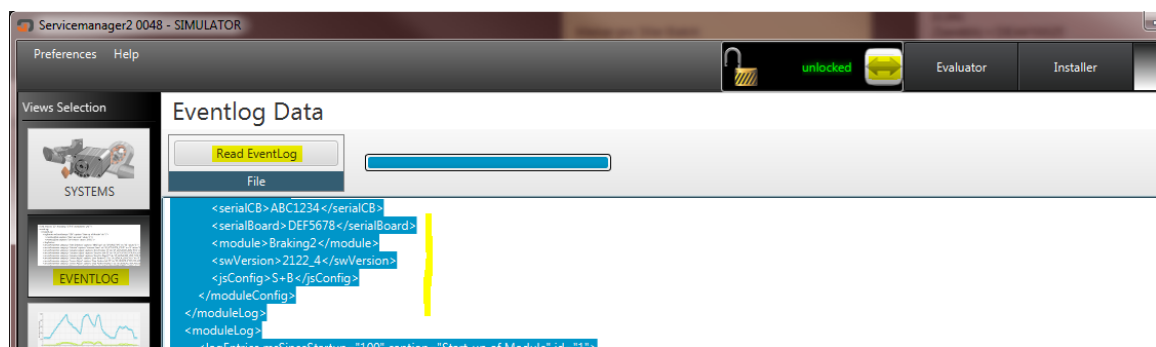
support@bozzio.ch

For a better Event Log analyse, please install the freeware ,Notepad++'. You can download this software for free from the internet:

<http://notepad-plus-plus.org>

6.1 Read out the Event Log with the Servicemanager

1. Connect the Servicemanager and go the Expert mode.
2. unlock the software
3. go to the menu Event Log and click on 'Read Event Log'
4. when the readout is done, click on the log data and press 'Ctrl-A' and then 'Ctrl-C' to mark all data and copy it (you can do the same with the right mouse button)



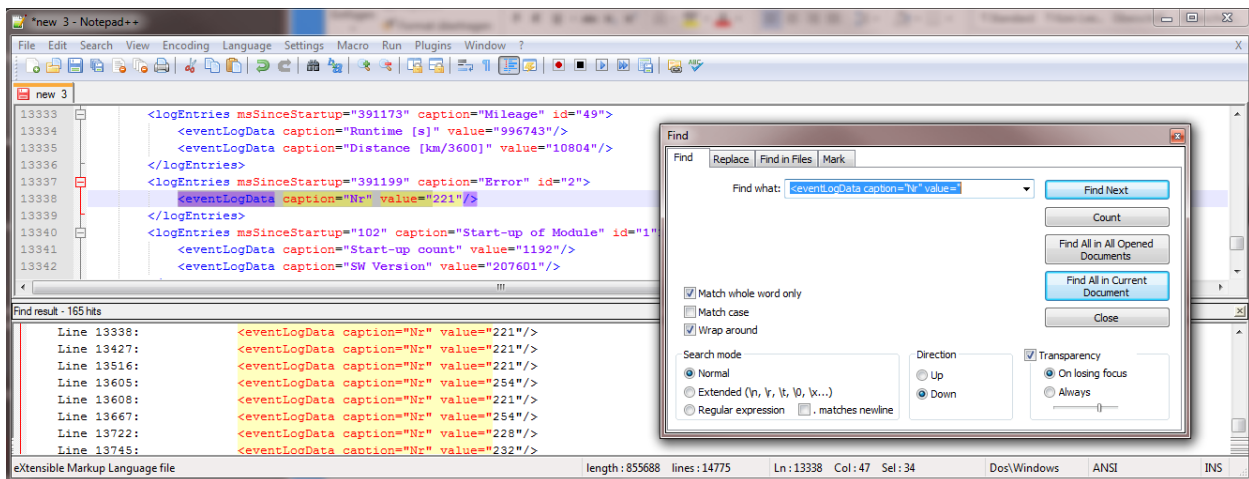
Event Log view

6.2 Analyse the Event Log in the Notepad++

1. Open Notepad++
2. Go to 'File' and press 'New'
3. Paste the Event Log data in this new file 'Ctrl-V' (or use the right mouse button)
4. Go to 'Language' and press on 'XML'. This will give you a better view of the data.
5. Go to 'Search' and press 'Find...'. Here you should search for your errors with following text:

eventLogData caption="Nr"

6. Press on 'Find all in current document'. This will now show you a list (on the bottom) of all errors in your Event Log.
7. Search your error number you had and click on it. This will show you the entry in the Event Log.



Notepad ++

6.3 Example of an Event Log analyse.

- Assumption: the System had error 5133.
- In the error list (see 'Universal system manual'), we can see that this error comes from the EnergyAlarmModule (5xxx). Further we can see that this error showed up because of an undervoltage on the Board battery (X133)

X	System
1	L1 (Steering 1)
2	L2 (Steering 2)
3	B1 (Braking 1)
4	B2 (Braking 1)
5	EAM (EnergyAlarm Module)

Error X133 EAM Undervoltage	<ul style="list-style-type: none"> • Check parameter "Undervoltage Level" • Charge board battery and backup battery • Check alternator of the vehicle 	$U_{board} < P(EAM \rightarrow \text{Undervoltage level})$ $U_{backup} < P(EAM \rightarrow \text{Undervoltage level})$
-----------------------------	--	---

When searching for this error number in the Event Log, we can check all information above and below this line where the error appeared. What we can see is following:

Log entry	Interpretation / Explanation
"Start-up count" value="8".	This is the start-up counter of each module.
"SW Version" value="212204".	This shows the installed firmware version (Version 2122_04)
"Controller board Temp [°C] :" value="14".	This shows the PCB temperature.
"day" value="7".	This shows the date and time when the error appeared.
"EventLogData caption="Nr" value="133".	This is our error number (error x133)
msSinceStartup="16511	". This shows the time since the system started up in ms. 16511ms = 16 sec.
U Board Init 1 [mV]" value="10103".	Here I can see the results of the battery test during the start up. The voltage was only 10.103V.


```

14337 <logEntries msSinceStartup="102" caption="Start-up of Module" id="1">
14338   <eventLogData caption="Start-up count" value="8"/>
14339   <eventLogData caption="SW Version" value="212204"/>
14340 </logEntries>
14341 <logEntries msSinceStartup="673" caption="Temperatur at Start-up" id="50">
14342   <eventLogData caption="Controllerboard Temp [°C] :" value="14"/>
14343   <eventLogData caption="Converter Temp [°C] :" value="65535"/>
14344 </logEntries>
14345 <logEntries msSinceStartup="2304" caption="Real Time Clock" id="36">
14346   <eventLogData caption="sec" value="36"/>
14347   <eventLogData caption="min" value="17"/>
14348   <eventLogData caption="hour" value="7"/>
14349   <eventLogData caption="day" value="7"/>
14350   <eventLogData caption="month" value="11"/>
14351   <eventLogData caption="year" value="13"/>
14352 </logEntries>
14353 <logEntries msSinceStartup="7102" caption="State Change" id="9">
14354   <eventLogData caption="Old State" value="1"/>
14355   <eventLogData caption="New State" value="2"/>
14356 </logEntries>
14357 <logEntries msSinceStartup="7102" caption="State Change" id="9">
14358   <eventLogData caption="Old State" value="2"/>
14359   <eventLogData caption="New State" value="3"/>
14360 </logEntries>
14361 <logEntries msSinceStartup="16511" caption="Error" id="2">
14362   <eventLogData caption="Nr" value="133"/>
14363 </logEntries>
14364 <logEntries msSinceStartup="16511" caption="Energy System Pulse Test" id="14">
14365   <eventLogData caption="U Backup Init 1 [mV]" value="12721"/>
14366   <eventLogData caption="U Backup Init 2 [mV]" value="12773"/>
14367   <eventLogData caption="U Backup 1 [mV]" value="12721"/>
14368   <eventLogData caption="U Backup 2 [mV]" value="12773"/>
14369   <eventLogData caption="U Relay 1 [mV]" value="250"/>
14370   <eventLogData caption="U Relay 2 [mV]" value="275"/>
14371   <eventLogData caption="U Board Init 1 [mV]" value="10103"/>
14372   <eventLogData caption="U Board Init 2 [mV]" value="10120"/>
14373   <eventLogData caption="U Board 1 [mV]" value="10110"/>
14374   <eventLogData caption="U Board 2 [mV]" value="10122"/>
14375 </logEntries>
14376 <logEntries msSinceStartup="16713" caption="State Change" id="9">
14377   <eventLogData caption="Old State" value="3"/>
14378   <eventLogData caption="New State" value="4"/>
14379 </logEntries>

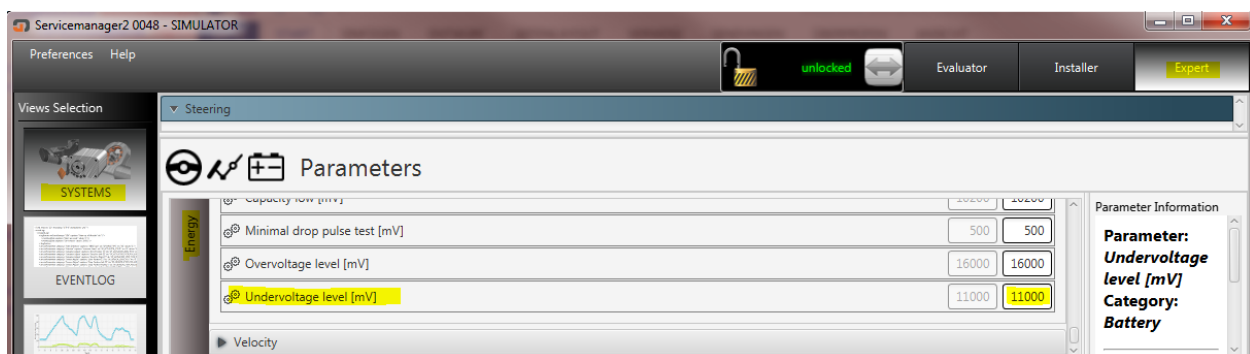
```

Find result - 165 hits

Line 13830:	<eventLogData caption="Nr" value="232"/>
Line 14273:	<eventLogData caption="Nr" value="76"/>
Line 14362:	<eventLogData caption="Nr" value="133"/>
Line 14451:	<eventLogData caption="Nr" value="76"/>
Line 14540:	<eventLogData caption="Nr" value="76"/>
Line 14625:	<eventLogData caption="Nr" value="76"/>
Line 14714:	<eventLogData caption="Nr" value="76"/>

List of errors in log

When checking in the Servicemanager, the error threshold for the service parameter 'Undervoltage level [mV]' is set to 11.000mV.



The conclusion of this error is that the error level was set wrong, or there is a problem with the board battery or alternator.