



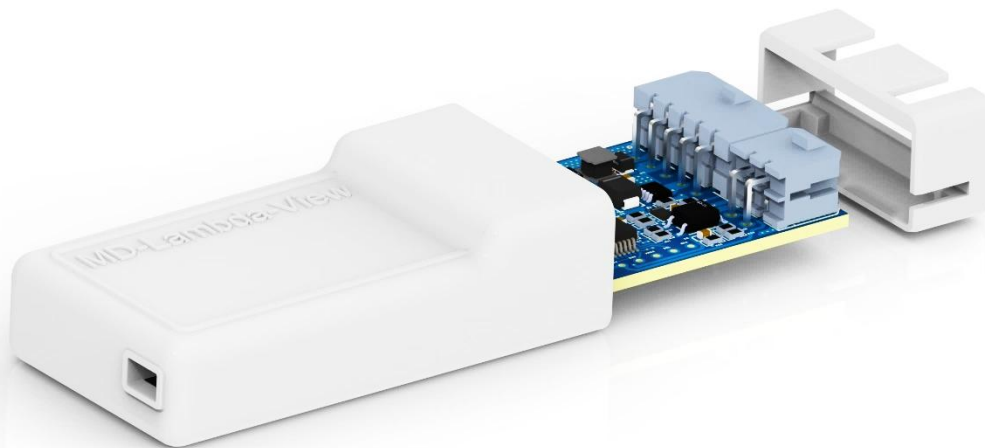
# User Manual

“MD-Lambda-View”

English

**V 3.1**

Software from V037



MD-Lambda-View UG (haftungsbeschränkt)  
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Court of registration: AG Göttingen  
WEEE: DE 52254643

Copyright: MD-Lambda-View  
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www.md-lambda-view.com

Thank you for choosing MD-Lambda-View. I developed this product because, at the moment, there is nothing comparable on the market at an affordable price. My goal is to give the user a tool for determining all the data needed to tune and monitor the combustion process of their internal combustion engine with carburetor or fuel injection system\* — as a complete package, as unobtrusive and as simple as possible.

The product was developed, tested, and assembled by me in Germany with the greatest care.

Please read this document carefully and familiarize yourself with installation and operation. No warranty claims can be made for damages caused by non-observance of this document, and MD-Lambda-View accepts no liability in such cases.

\*Tuning a fuel injection system requires additional software in order to influence the injection data. MD-Lambda-View only determines the essential data on the basis of which the necessary adjustments can be made!

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## 1. Check your shipment



Contents of the shipment depend on what was ordered.

Minimum scope of delivery:

- MD-Lambda-View Box
- Connection cable for supply voltage and lambda sensor
- Fuse holder (not shown)

Optional accessories:

- Connection cable for throttle position sensor and ignition signal
- RGB-LED with connection cable
- 5 mm LED holder, inner reflector
- 5 mm LED holder, outer reflector

## 2. Important notes on safety, approval, and warranty

### **Caution – please observe**

The device must **under no circumstances be opened**.

Opening the device **voids any warranty and guarantee claim** against **MD-Lambda-View**.

A warranty can only be granted in the case of **proper installation** and **intended use on the vehicle**.

### **No road approval**

The device **has no general type approval (ABE)** and **no E-marking**.

Therefore, its use on **public roads is not permitted** and takes place **exclusively at your own risk**.

It is intended exclusively for **diagnostic, tuning, testing, and motorsport purposes**.

### **Disclaimer**

**MD-Lambda-View assumes no warranty or liability whatsoever** for direct or indirect damages resulting from:

- use of the device,
- connection of the device to the vehicle,
- use of the supplied sensors or other accessories.

This applies in particular to **personal injury, property damage** as well as **financial losses**.

### 3. Technical data and functions

Supply voltage:	9 V – 15 V
Current draw:	0.8 A – 4 A (depending on lambda sensor heater current)
Connection protocol:	Wi-Fi, password 8 characters
Inputs:	Engine speed, throttle position, lambda sensor
Outputs:	RGB-LED, web server
Operation and configuration:	Web server
Dimensions:	70 mm x 35 mm x 18 mm

Lambda sensor controller is based on:

[SLCFree by 14point7](#)

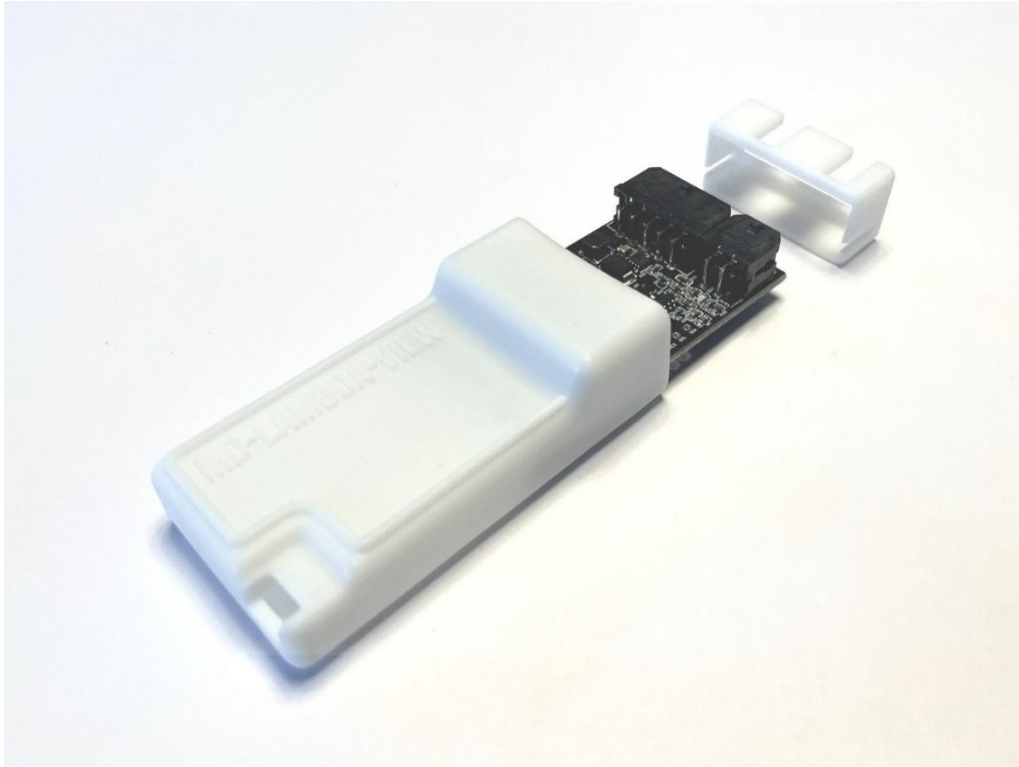
The software used to drive the lambda sensor is licensed under GPL V3. It can be downloaded from the MD-Lambda-View download section.

## Functions

Lambda measurement	0.68 – 1.36
Engine speed measurement	0 rpm – 12,000 rpm
Voltage measurement	9 V – 15 V
RGB-LED	Visualization of the lambda value with 4 colors, each within adjustable limits
Throttle valve / carburetor slide	0% – 100%
Data logger	10Hz – 25Hz
	Lambda, engine speed, vehicle voltage, throttle / carburetor slide via a Wi-Fi capable device with browser

## 4. Connection and operation

### 4.1 MD-Lambda-View Box



The MD-Lambda-View Box consists of three parts: the housing, the PCB, and the cover. The cover is glued to the housing. The PCB has a protective conformal coating to give it additional protection against environmental influences on top of the housing. MD-Lambda-View is not sealed watertight and should be installed in the vehicle in a location protected from splash water.

The PCB has two large connector sockets, which are routed to the outside on one end of the housing. The large 10-pin socket is for connecting the lambda sensor and the supply voltage. The cable colors do not match those of the lambda sensor. The small 4-pin socket is for connecting the throttle position / carburetor slide sensor and the ignition signal. On the opposite end of the housing (flat end) there is a small socket for connecting the RGB-LED. There are two red LEDs on the PCB: one indicates the supply voltage, the other indicates the ignition pulses. If you short the yellow wire (for connection to ignition coil terminal 1) to ground, the ignition pulse LED must light up.

## 4.2 Lambda sensor

The lambda sensor part of MD-Lambda-View is based on the proven concept of [SLCFree by 14point7](#). SLCFree is available under a public license (GPL V3) and can be used freely. The SLCFree system stands out for its high accuracy and does not need to be calibrated. The software can be downloaded from the MD-Lambda-View.com download section.

MD-Lambda-View is designed for a Bosch LSU 4.9 wideband lambda sensor. No guarantee can be given for aftermarket sensors, although it cannot be ruled out that they will work as well.

A connection wiring harness containing the connector for the lambda sensor is included with MD-Lambda-View.

**THE LAMBDA SENSOR MUST NEVER BE CONNECTED OR DISCONNECTED WHILE MD-LAMBDA-VIEW IS POWERED ON!**

To mount a lambda sensor on the vehicle, a hole must be drilled into an exhaust manifold and a weld-in bung with the matching M18x1.5 thread must be welded in. Detailed instructions can be found on the relevant Bosch website or in the download section at <https://www.md-lambda-view.com/downloads>.

The lambda sensor is connected using the supplied 10-pin connector cable (plug to lambda sensor plug). Make sure that the lambda sensor connection is seated properly. Most malfunctions are caused by an improper connection at the lambda sensor plug.

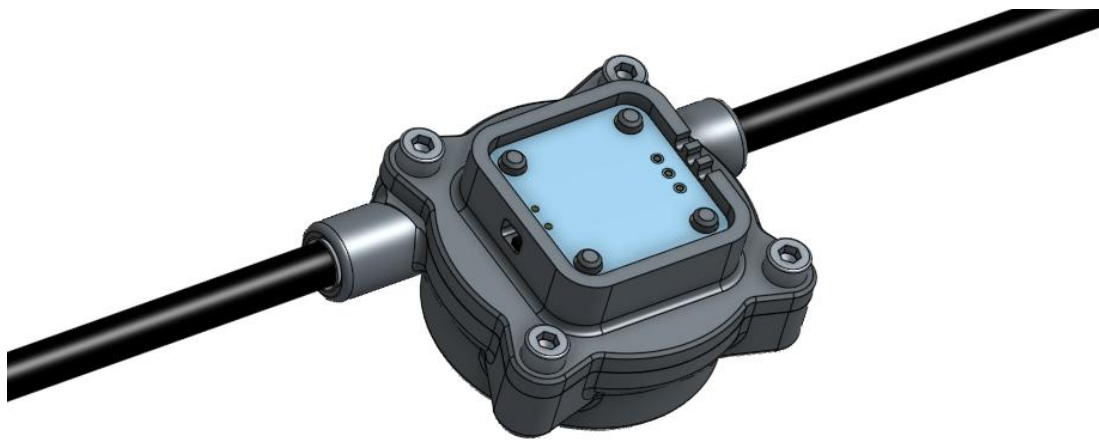


Connection cable to the lambda sensor and power supply

## 4.3 Determining the position of the throttle valve or carburetor slide

MD-Lambda-View has an analog input to measure a voltage of 0 – 5 V, a 5 V voltage output, and a ground line for connecting various sensors. We recommend using the MD-Lambda-View cable pull sensor, a potentiometer, or a linear Hall sensor in combination with a magnet.

### 4.3.1 MD-Lambda-View cable pull sensor



The MD-Lambda-View cable pull sensor was developed specifically to avoid the often complicated installation of potentiometers or throttle position sensors. In addition — and this is a very big advantage — it makes it possible to measure the carburetor slide position on conventional carburetors, where there is no way to connect a potentiometer or similar device.

The cable pull sensor is shipped with one cable end on each side. Both cable ends are bare, i.e. the cable core has no nipple. Two screw-on nipples are included in the delivery.

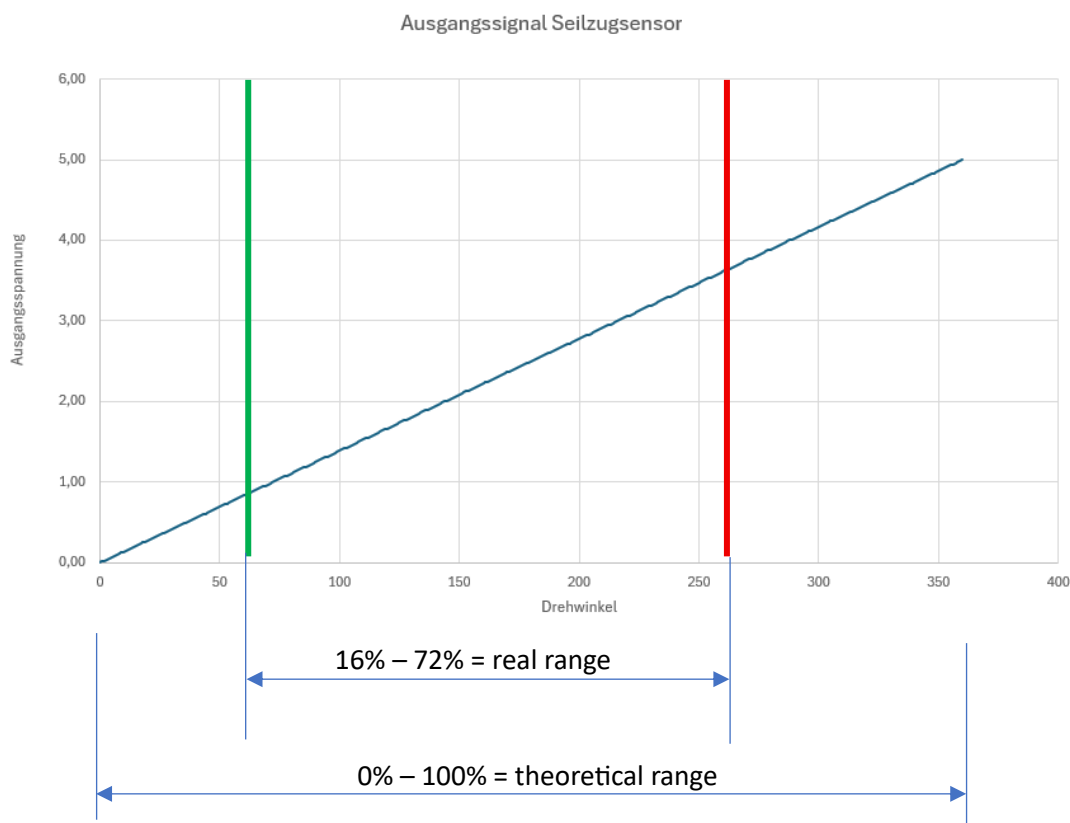
The cable pull sensor behaves like a conventional throttle cable. Every action on the throttle grip is transmitted both to the carburetor or throttle valve and at the same time to the position sensor. The position sensor inside the MD-Lambda-View cable pull sensor works contact-free via a Hall effect sensor. The number of cycles is therefore unlimited, and no additional actuation forces are introduced as would be the case, for example, with a potentiometer.

The output signal of the cable pull sensor is 0.5 V – 4.5 V, calibrated to the respective cable travel. It therefore does not matter how long the cable travel on your vehicle is. The sensor is always calibrated to idle and wide-open throttle. In the MD-Lambda-View settings you can then enter a correction factor in order to set the percentage values needed for your throttle or carburetor slide. For example, it is possible to set wide-open throttle to just 85% instead of 100%.

More detailed information can be found in the user manual for the cable pull sensor in the download section at [www.md-lambda-view.com](http://www.md-lambda-view.com).

For potentiometers, the output value will be somewhere above 0% and somewhere below 100%. As an example, assume that the value shown in the web interface for the closed throttle valve is 16%, and the value for the fully open throttle valve is 72%. These two values are entered in the MD-Lambda-View settings menu as Throttle-low and Throttle-high in order to use them as the basis for calculation. Once this is done, the throttle position will show 0% in the closed state and 100% in the open state.

These entries are made in the MD-Lambda-View settings menu under section 5.2.6.6. If you have made a mistake somehow, simply enter 0 again for Throttle-low and 100 for Throttle-high and start the calibration over.



By entering the real values for Throttle-low and Throttle-high, MD-Lambda-View maps the theoretical range of 0% to 100% onto the real range of 16% to 72%, so that the green line becomes 0% and the red line becomes 100%. The position of the green and red lines in the diagram remains unchanged. The downside is that resolution decreases. In this example, resolution would drop from 0.087° to 0.16°, which is more than acceptable.

### 4.3.2 Hall sensor

Another very convenient way to determine the throttle position is to use a linear Hall sensor. A diametrically magnetized round magnet is glued, using a spacer, to the center of the throttle shaft. The Hall sensor is rigidly attached to the carburetor body and positioned close to the mounted magnet. When the magnet rotates about its longitudinal axis, the change in position of the magnetic field is detected and output by the Hall sensor as a linear voltage of 0.5 V – 4.5 V.



Source: TDK Europe homepage

If you want to try this approach, I recommend the Honeywell SS49 Hall sensor. It can be soldered directly to the sensor cable. The magnet should be attached to the throttle shaft using a spacer. If it is glued directly to the shaft, the magnetic field disperses too much and measurement results will be worse.

There are various ready-made modules on the market for vehicle mounting. I would like to point out the ZF sensor ANG-21HAW1. It offers the possibility of mounting via fastening tabs. The sensor outputs two opposing signals, which allows both clockwise and counter-clockwise rotation to be detected.

Sensor datasheet: [Datasheet ANG Letter EN 2024-08-01.pdf](#)

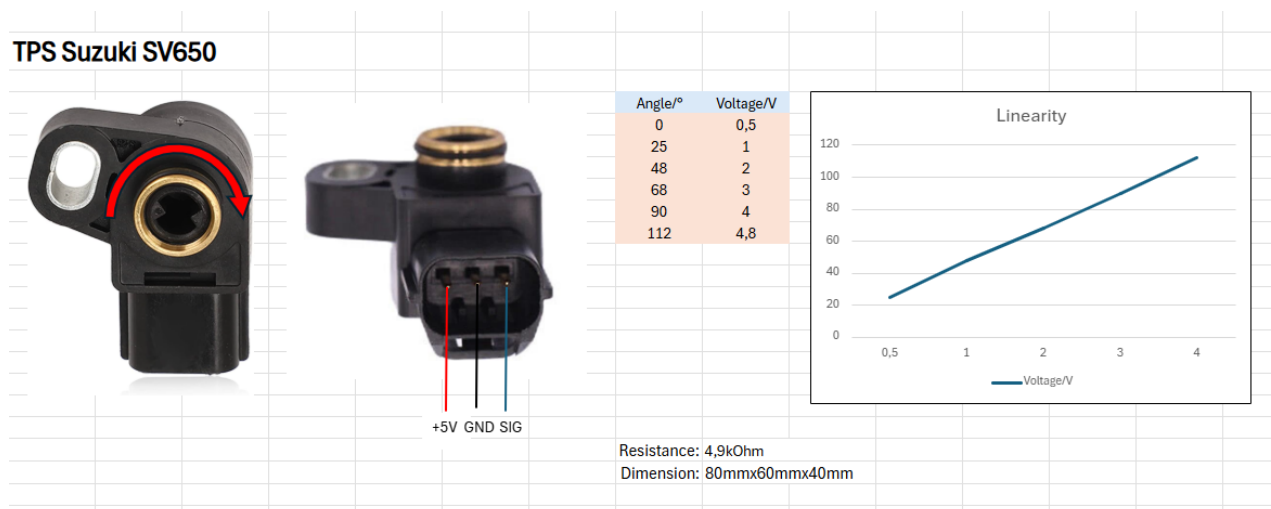
A magnet with holder is also required for position detection. This is likewise described in the datasheet. The sensor and magnet can be ordered, for example, from Conrad.

### 4.3.2 Potentiometer

When using a potentiometer, the shaft of the potentiometer is connected to the throttle shaft. The body of the potentiometer should be rigidly connected to the throttle body. When the throttle is closed, the potentiometer shaft should be near, but not all the way at, the potentiometer endstop whose terminal is connected to the ground line (black). The 5 V supply line (red) from MD-Lambda-View is connected to the opposite end of the potentiometer (wide-open throttle). The measurement line (blue) from MD-Lambda-View is connected to the wiper contact of the potentiometer. If the measured value for the throttle position decreases when you operate the throttle grip, swap the red and black wires at the potentiometer. The wiper tap (blue wire) remains untouched.

In the automotive sector there are ready-made throttle position sensors in countless variations. Most of them can be used with MD-Lambda-View. It is important that they have a linear characteristic and a resistance that is not too low. A resistance that is too low would put too much load on the MD-Lambda-View voltage regulator. A resistance of approx. 5 k $\Omega$  should not be undercut.

Two commercially available sensors are discussed below.

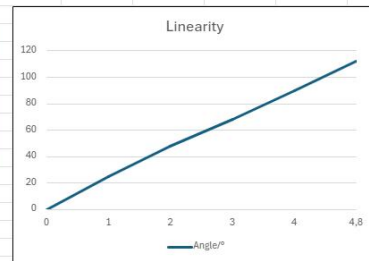


## TPS Polaris Sportsman 500



Angle/°	Voltage/V
0	0
25	1
48	2
68	3
90	4
112	4,8
114	0

At the end the signal turns to 0V!!!



Resistance: 5,5kOhm  
Dimension: 55mmx60mmx25mm  
Rotation: CW (view into axis)

Unfortunately, no universal adapter can be offered for connecting the sensor to the throttle shaft, since the differences from carburetor to carburetor and from sensor to sensor are too large. You will have to improvise here.

Of course, any conventional potentiometer with a total resistance of at least 5 k $\Omega$  – 10 k $\Omega$  can be used. It is important that it has a linear characteristic. Audio potentiometers often have a logarithmic characteristic; this works too, but the measured values then do not match the actual throttle position. Water-tightness should also be considered.

### 4.3.3 Tapping the 5V signal from an existing throttle position sensor

Many newer bikes already have a throttle position sensor installed. If the output signal is somewhere between 0 V – 5 V and it is a classic 3-pin potentiometer, you can tap the output and use the signal for MD-Lambda-View. **Unfortunately, this voids the general operating permit (ABE) as well as the vehicle warranty, since you are intervening in the engine management (just for your information).** This variant of signal acquisition should therefore be reserved for the brave and for experienced mechanics. The throttle position measurement input on MD-Lambda-View has a very high input impedance and should not influence the vehicle ECU.

**However, no guarantee can be given by MD-Lambda-View in this case.**

Please research the linearity of the throttle potentiometer carefully. Some manufacturers use throttle potentiometers with non-uniform slopes. For example, the slope at low throttle angles may be steeper to provide better resolution in the lower partial-load range. At larger throttle angles the slope of the curve is then flatter (e.g. Moto Guzzi V10).

## 4.4 Tachometer

### 4.4.1 Vehicles with TCI or breaker-point ignition

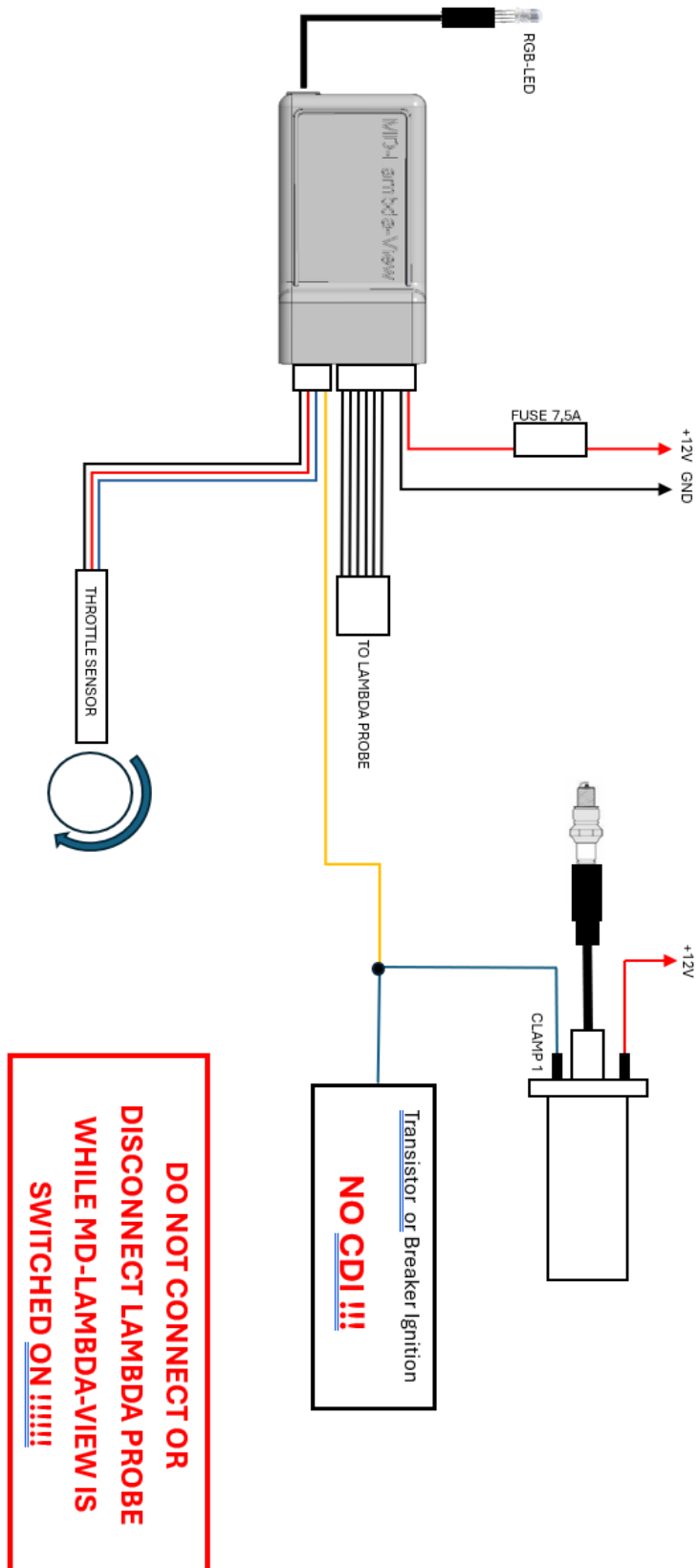
TCI = Transistor Controlled Ignition

The MD-Lambda-View tachometer can be connected to any ignition system that uses a conventional ignition coil.

The yellow connection cable is connected to terminal 1 (switched ground from the ECU or the breaker) of any ignition coil. Connection to CDI ignitions (some scooters, quads, enduros) is possible using a separate adapter, e.g. the motogadget ignition signal pickup (item 9000001). For correct operation of the rpm display, the ignition system must be properly suppressed. Please refer to the notes in section 5.2.5.6. If you have problems determining the rpm, the motogadget ignition signal pickup (4.4.2) can also be used for conventional ignition systems.

**CAUTION! THE YELLOW WIRE IS CONNECTED TO THE PRIMARY CIRCUIT OF THE IGNITION COIL. IT MUST NEVER MAKE ELECTRICAL CONTACT WITH THE HIGH-VOLTAGE CIRCUIT (SPARK PLUG LEAD)!**

## MD-Lambda-View Wiring Diagram for Transistor or Breaker Ignition System



#### 4.4.2 Vehicles with CDI

CDI = Capacitor Discharge Ignition.

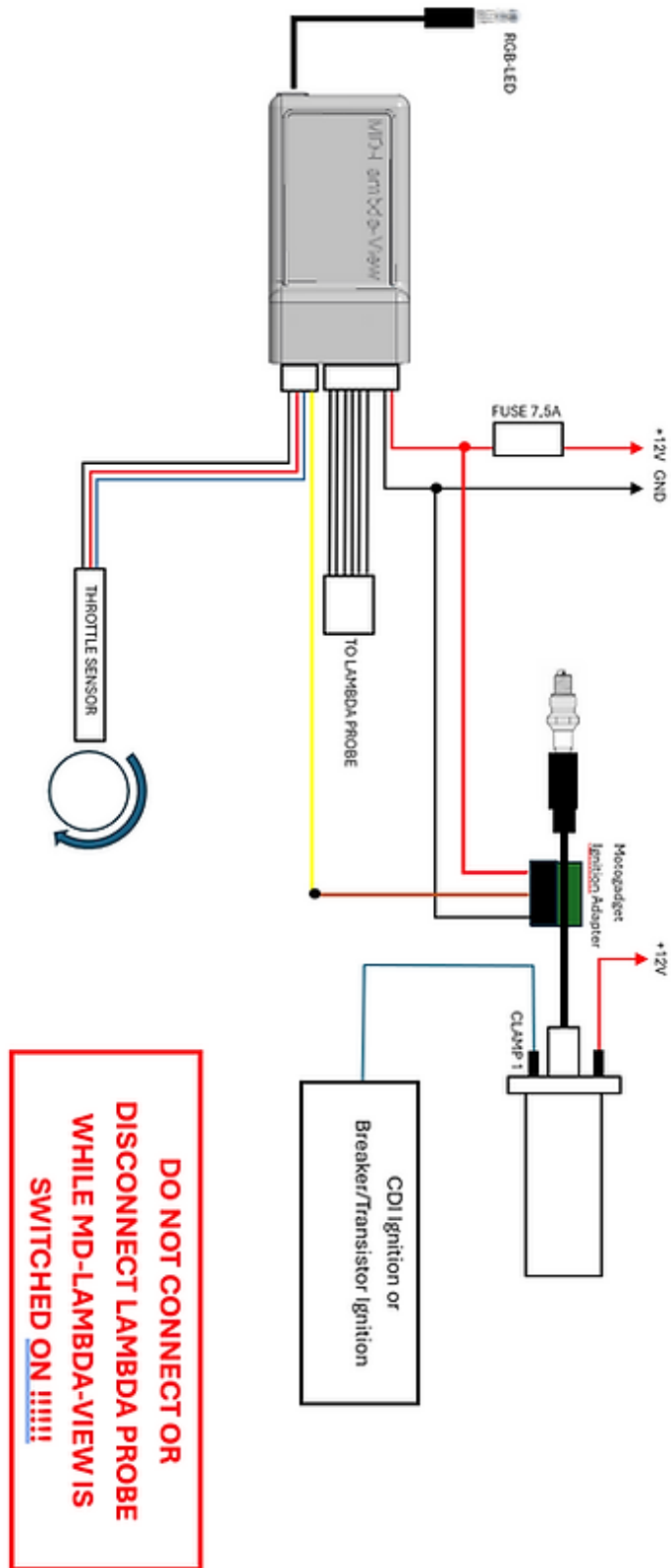
For vehicles with a CDI ignition system, a separate ignition pickup is required for the spark plug lead. A compatible ignition pickup is sold, for example, by motogadget® Berlin.



Image source: motogadget®

Link to the motogadget online shop®: [Ignition signal pickup | motogadget GmbH](#)

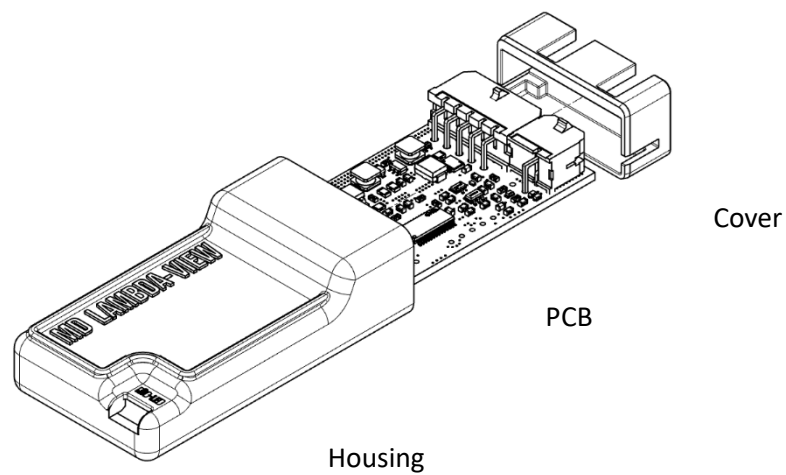
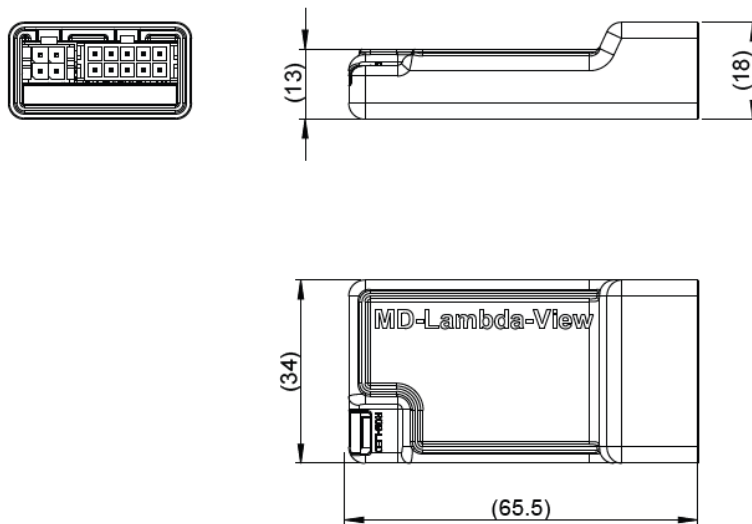
(item no. 9000001)



MD-Lambda-View Wiring Diagram for CDI Ignition System or Breaker Ignition System

## 4.5 MD-Lambda-View dimensions

MD-Lambda-View contains a double-sided populated 2-layer PCB. The connection cables are attached via three connector strips. The dimensions can be seen in the figure.

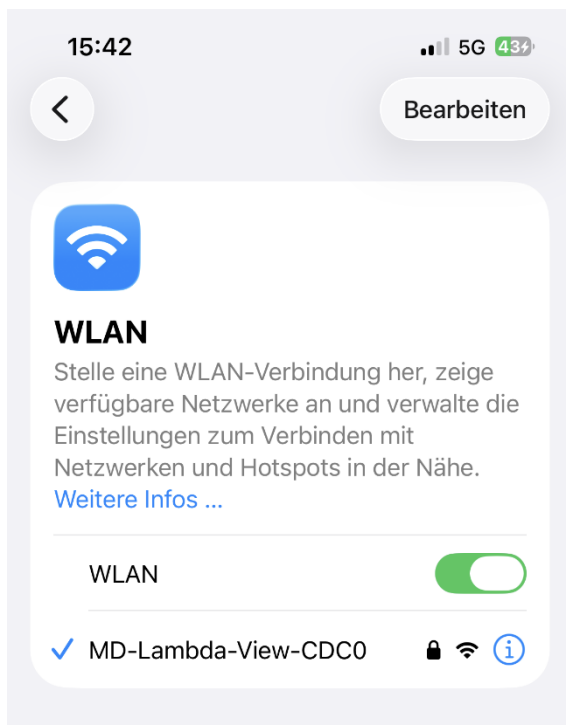


## 5. Connecting a Wi-Fi capable device

### 5.1. Connecting to the Wi-Fi network “MD-Lambda-View-XXXX”

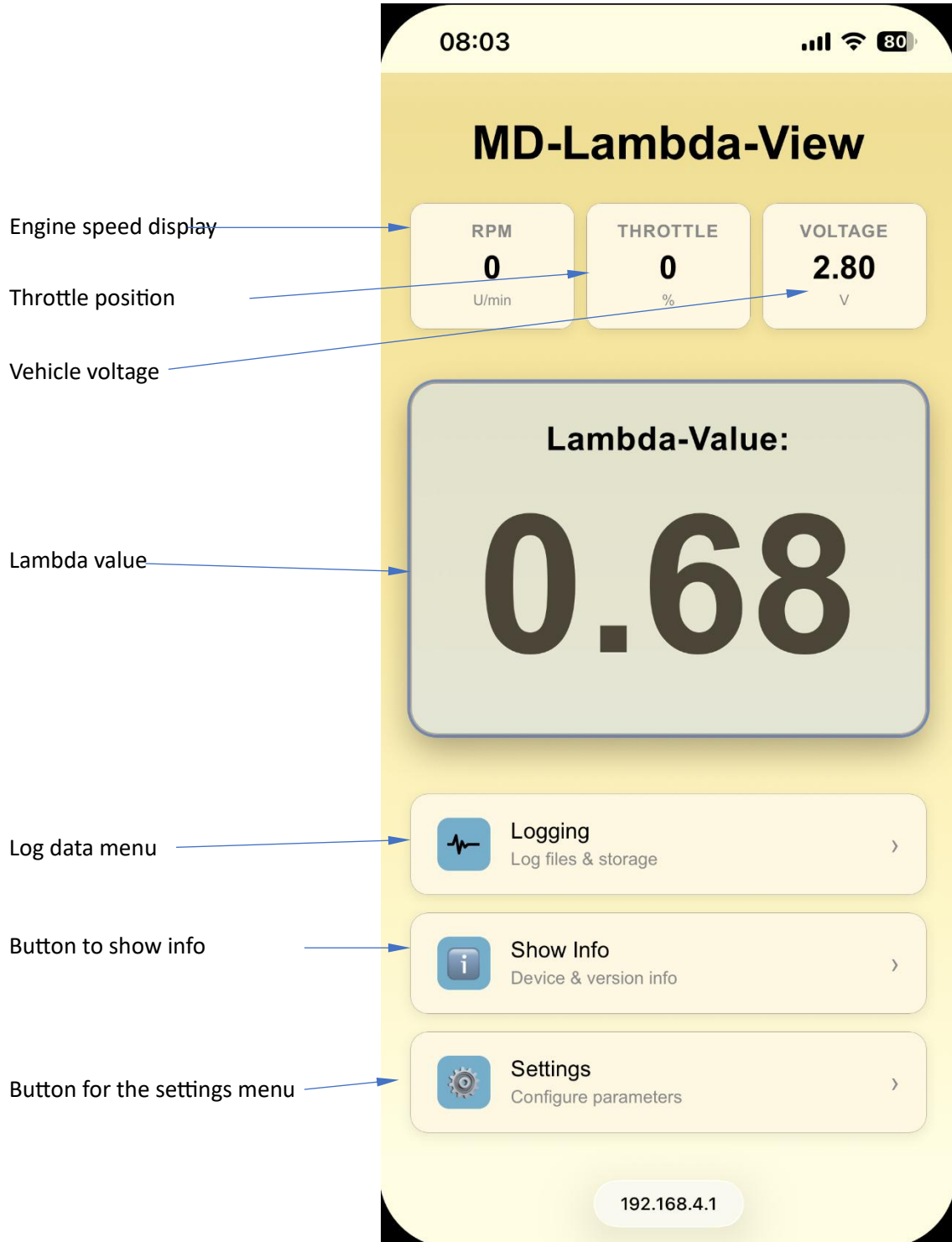
As soon as it is powered on, MD-Lambda-View opens a Wi-Fi network named “MD-Lambda-View” plus a unique identifier, e.g. “CDC0”, which is derived from the processor MAC address. Connect to this Wi-Fi network with your device. On first connection, the preset initial password is requested. It is supplied with the product when you purchase it. Please enter it in the password prompt on your device. You can change the password at any time via the web interface on your device. The password must be exactly 8 characters. Not more and not less! More information about this can be found in section 5.2.6.9.

Network menu iPhone

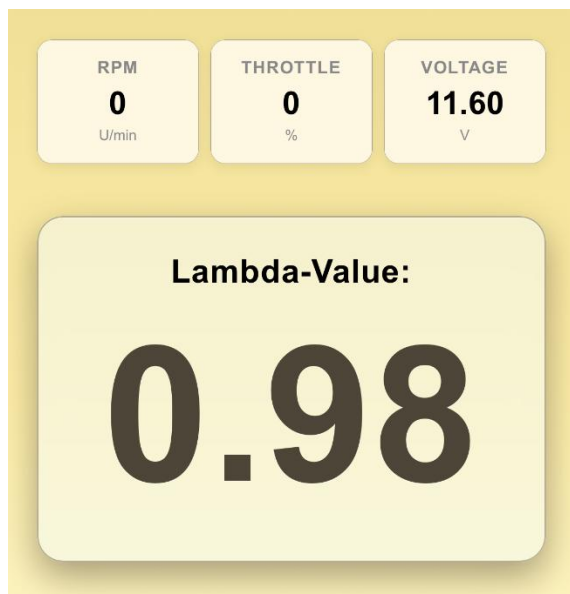


## 5.2 Opening the MD-Lambda-View web interface

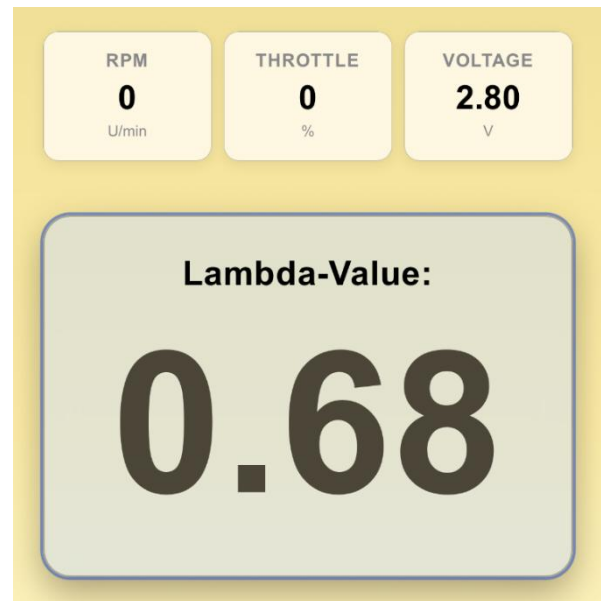
After successfully connecting to the Wi-Fi network “MD-Lambda-View-XXXX”, open your browser and go to the address 192.168.4.1. The web interface of your MD-Lambda-View should now open.



## 5.2.1 Displaying the current measured values in the web interface



Live readings, logging inactive



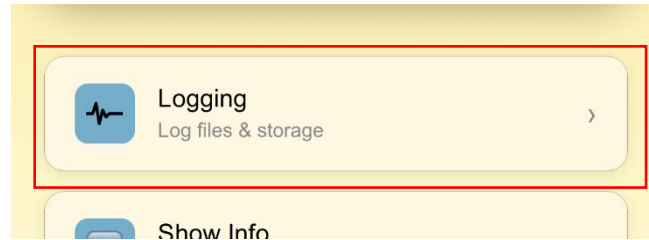
Live readings, logging active

The web interface contains an area for displaying the current measured values. It shows engine speed, throttle position, vehicle voltage, and lambda value. The update rate is 10 Hz, i.e. one update every 0.1 s. The lambda value is shown extra large as the main value so that it can also be read well while riding, in case you decide to mount your phone on the tank or handlebar.

You can also rotate your device to landscape orientation; the display can then be enlarged so that the lambda value fills the entire screen. This can be very useful, for example, in the workshop or during a test ride.

The container for the lambda value also indicates the logging status. When logging is active — i.e. data is being written to the log file — the background color of the container changes and it gets an additional border. The background and border colors vary depending on the selected theme, but are always clearly recognizable.

## 5.2.2 Logging menu



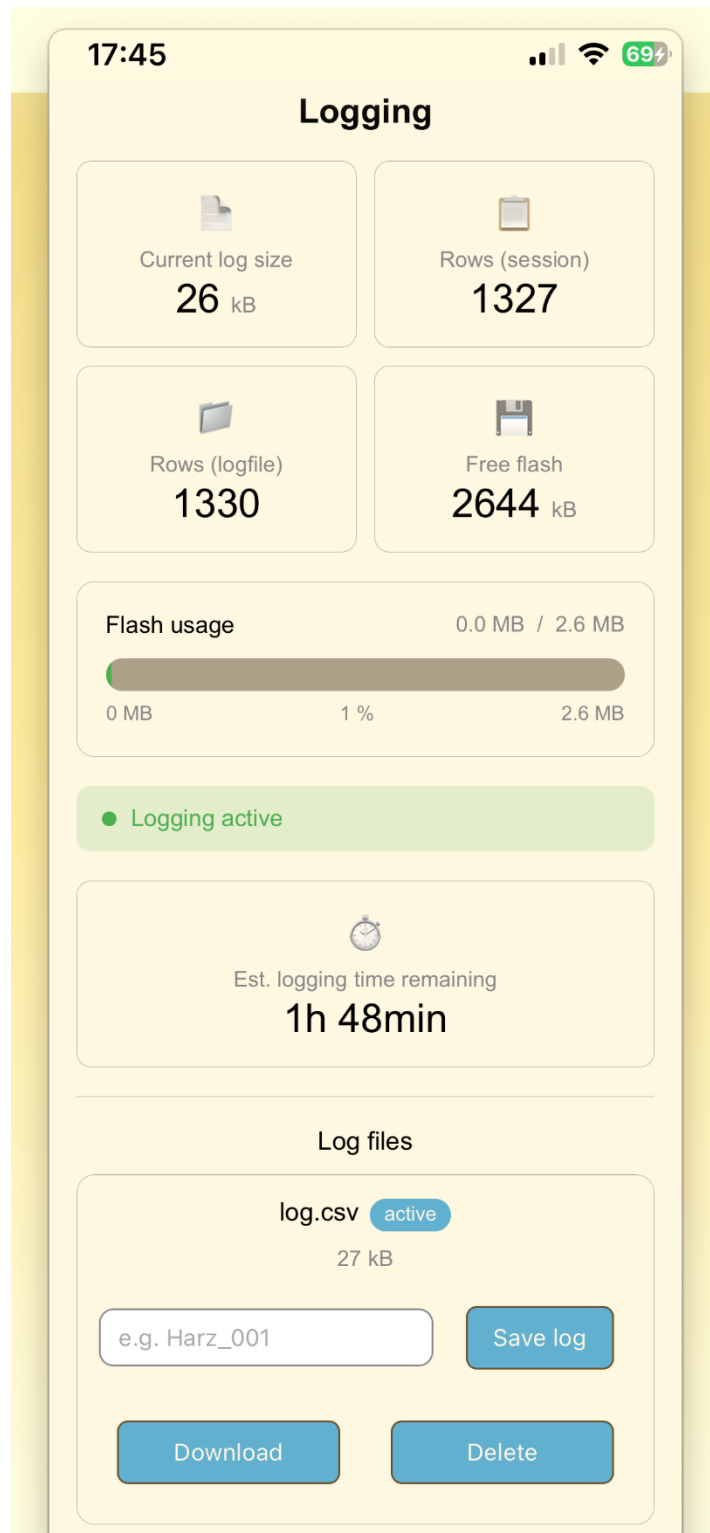
The “Logging” button opens the log menu, which appears at the bottom of the web page. MD-Lambda-View permanently logs all four measured values (engine speed, throttle position, vehicle voltage, and lambda value). The logging frequency is set to 10 Hz by default, but can be increased to up to 25 Hz in the settings menu. More information can be found in section 5.2.6.7.

MD-Lambda-View only writes new log entries to the file when at least one of the four values has changed compared to the previous reading. This avoids duplicate entries that are not needed for analysis and also saves storage space.

**IMPORTANT:** As soon as MD-Lambda-View is powered and certain conditions are met, logging begins. See section 5.2.6.9 for details. Logging is paused for implausible values.

An implausible value could be, for example, a lambda value of 1.36 at higher engine speed with the throttle open. Such a condition can occur during sudden acceleration: the mixture leans out very strongly for a short moment. Such values would heavily distort the analysis of the logged data and are therefore ignored. The timestamps in the log file can therefore have gaps; this is normal.

When the vehicle is started again, MD-Lambda-View continues the log file. The timestamps of the new entries start over from the beginning. Please don't let this confuse you. The time column is only for orientation. For analysis with MD-Lambda-View 3D-Surface, the time column is not relevant. When analyzing the data with, for example, Excel, the time column can also be removed.



Size of the active log file

Number of lines written since power-up

Number of lines in the active log file

Currently remaining free storage

Logging status

Storage usage overview

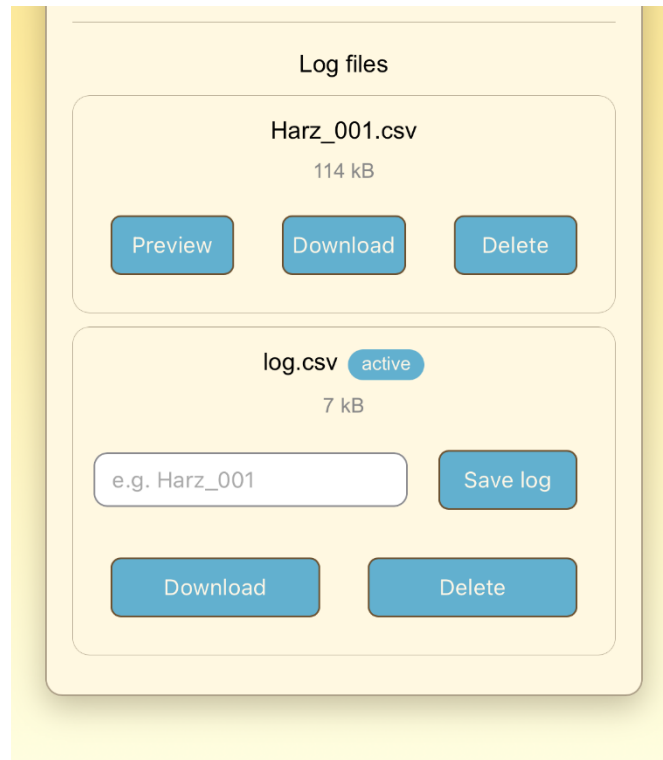
Estimated remaining logging time

Here you can create a backup of the active log file.

Download or delete the active log file.

The image shows the logging menu after a log file has been saved. When saving, the active log file log.csv is saved under a new name. The active log file then starts over with 0 lines, i.e. empty.

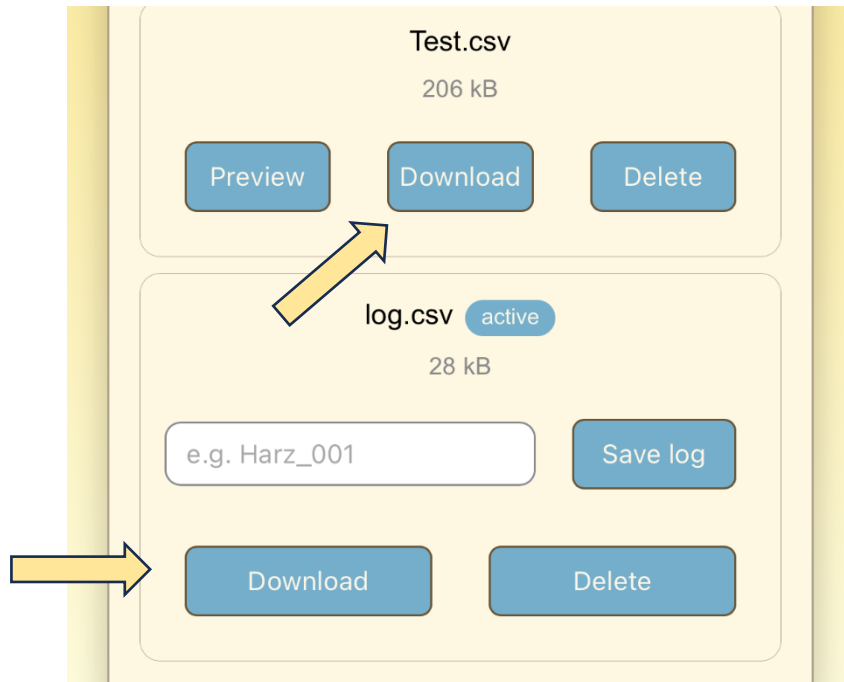
Imagine you take several carburetor main jets with you and start a test ride with the first jet. After half an hour you stop, save the active log file as, for example, "180-main-jet", install the next jet, and start the next test ride. At the end of the day you might have 5 log files: 180-main-jet, 185-main-jet, 190-main-jet, and so on. You can then download these log files individually from MD-Lambda-View and analyze them.



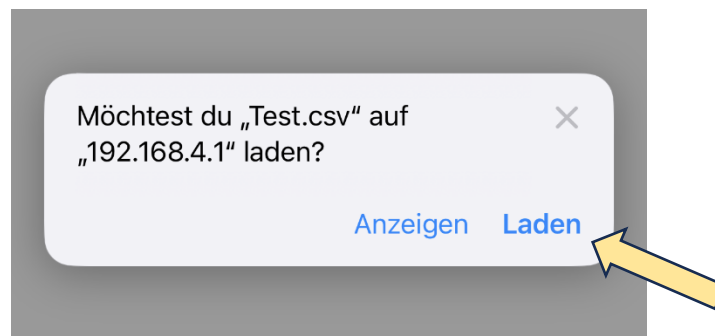
If there is no longer enough storage space to save the active log file under any name, a notice appears and the "Save log" button is inactive. Of course, you can always free up storage space by downloading saved log files to your phone or PC and then deleting them from MD-Lambda-View.

The "Preview" button shows the last 200 lines of the selected log file. This is purely informational, since displaying more lines would be problematic and would not really add value. Sometimes the processor is busy with other tasks and the preview closes again immediately. In that case, please just try again.

### 5.2.3 Downloading log data

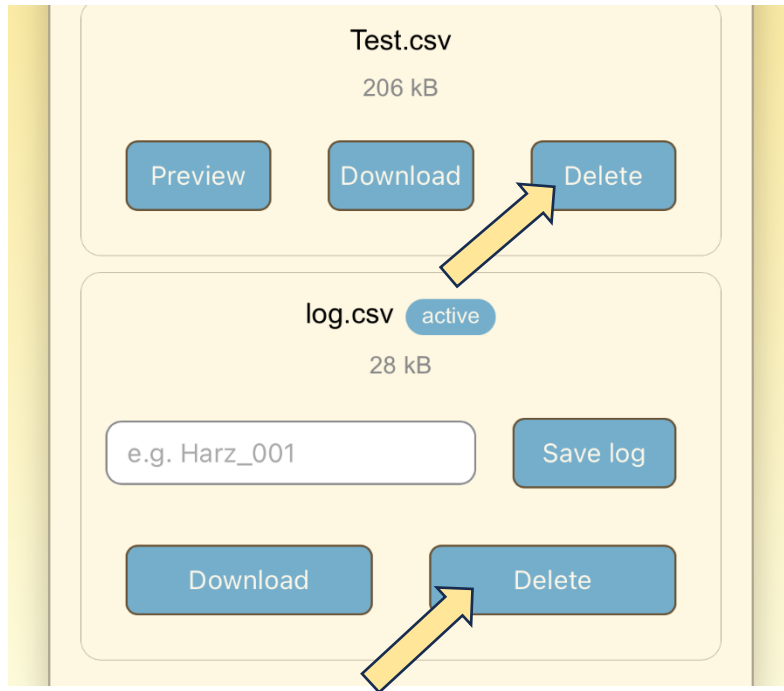


The “Download” button opens the download window for the selected log file.



A tap on “Load” saves the file to the download folder of the device used, under the name assigned in MD-Lambda-View. It can then be analyzed with MD-Lambda-View 3D-Surface, 2D-Graph, or other programs such as Excel.

## 5.2.4 Deleting log files

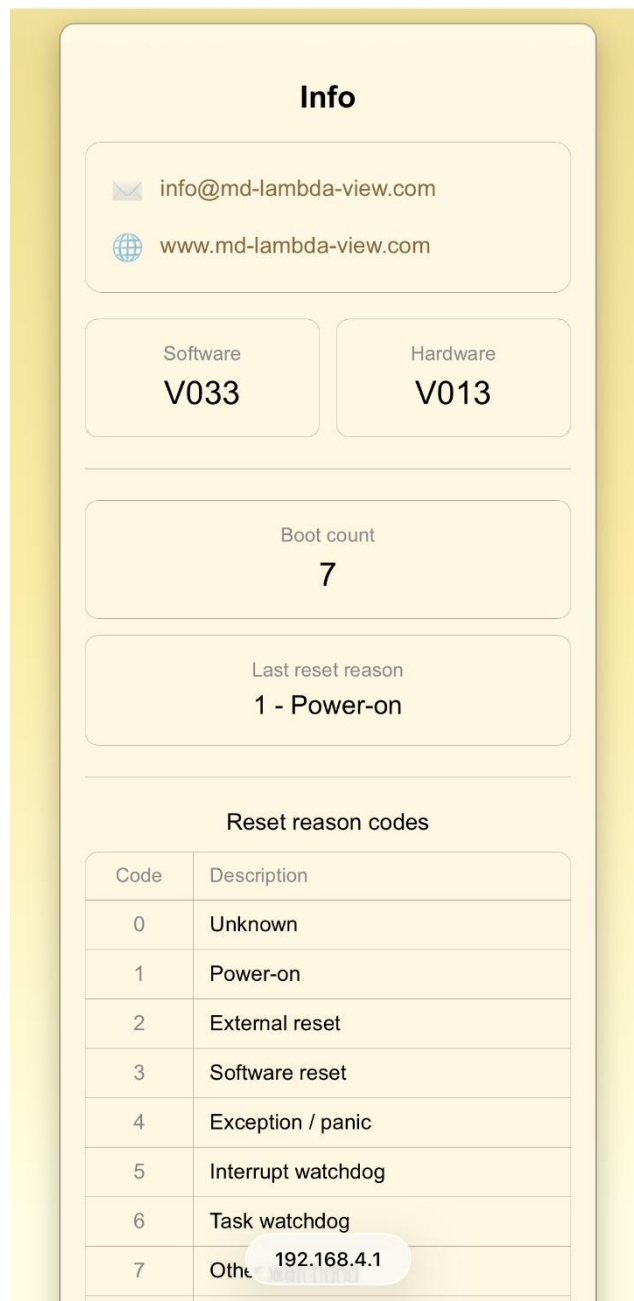


Pressing “Delete” only deletes the selected log file. All other log files remain in storage. The log.csv file cannot really be deleted, since it is needed for the permanent logging process. When deleted, it is simply emptied.

## 5.2.5 Information menu

The “Show Info” button displays the MD-Lambda-View website and email address as well as the current software and hardware version. The web and email addresses are links and lead directly to the MD-Lambda-View homepage or open your mail program.

Additional troubleshooting information is also shown. This can be helpful for diagnosing problems in case of a malfunction.



The screenshot displays the 'Info' menu with the following content:

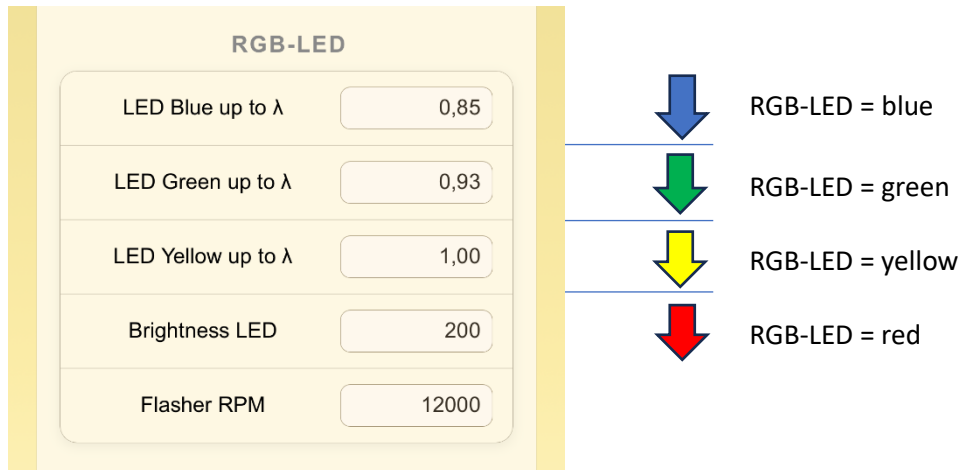
- Info**
- Contact information: [info@md-lambda-view.com](mailto:info@md-lambda-view.com) and [www.md-lambda-view.com](http://www.md-lambda-view.com)
- Software version: **V033**
- Hardware version: **V013**
- Boot count: **7**
- Last reset reason: **1 - Power-on**
- Reset reason codes table:

Code	Description
0	Unknown
1	Power-on
2	External reset
3	Software reset
4	Exception / panic
5	Interrupt watchdog
6	Task watchdog
7	Other 192.168.4.1

## 5.2.6 Settings menu

The Settings menu is organized into submenus for the respective areas of the software.

### 5.2.6.1 RGB-LED



These three values configure the behavior of the RGB-LED.

Below “LED blue up to  $\lambda$ ” the RGB-LED is always blue.

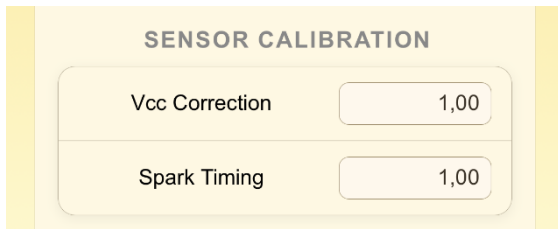
Above “LED yellow up to  $\lambda$ ” the RGB-LED is always red.

The input fields only accept values in the range 0.67 – 1.25!

“Brightness LED” controls the brightness of the RGB-LED and can take a value from 1 to 255, where 1 is the lowest and 255 the highest brightness.

“Flasher PWM” is a freely configurable shift light. It can be set for engine speeds from 3000 to 12000 rpm in steps of 100. The RGB-LED then flashes very quickly in white.

## 5.2.6.2 Sensor Calibration



SENSOR CALIBRATION	
Vcc Correction	1,00
Spark Timing	1,00

MD-Lambda-View continuously measures the current vehicle voltage. Due to component tolerances, resistors, etc. there can be minimal deviations from the real vehicle voltage. If you want it to be very precise, you can check the actual vehicle voltage with a multimeter and enter a correction factor in volts in this menu item. The correction factor entered must be within a range of -3.0 to +3.0.

The Spark Timing value adapts the rpm measurement to the ignition behavior of the engine. For multi-cylinder engines with so-called “wasted spark” the value must remain at 1. That is, ignition occurs on every crankshaft revolution, also during the exhaust stroke.

For engines that only fire on the power stroke, the value must be set to 2; otherwise MD-Lambda-View will only show half the crankshaft speed. For multi-cylinder engines with a distributor, a value less than 1 can be entered.

Example:

The engine has 8 cylinders and a distributor, i.e. it fires 4 times per crankshaft revolution. In this case a value of 0.25 must be entered.

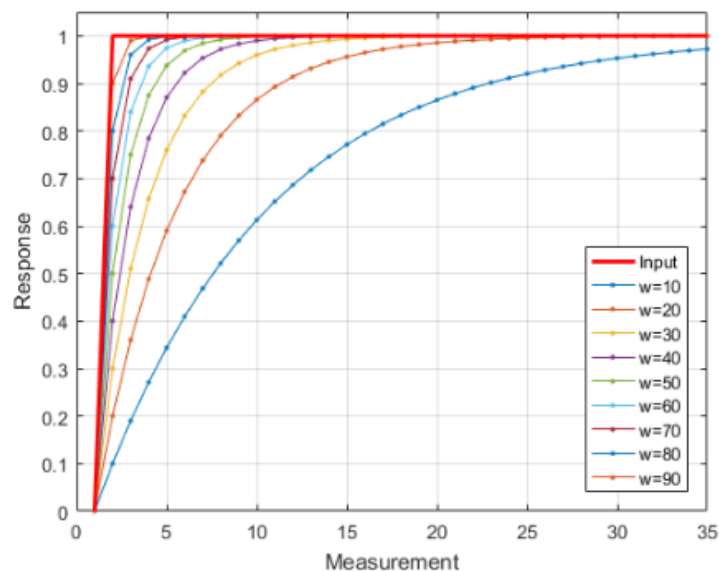
### 5.2.6.3 Value Damping

VALUE DAMPING	
Throttle	<input type="text" value="50"/>
RPM	<input type="text" value="25"/>
Lambda $\lambda$	<input type="text" value="50"/>

The measured values for engine speed, throttle position, and lambda value are damped in software. That is, previously measured values and new values are weighted against each other. The filter value describes how new data is included in the calculation of the average. High values favor new measurements over old ones. Low values favor old measurements over new ones. **In short: the smaller the value entered, the stronger the damping.**

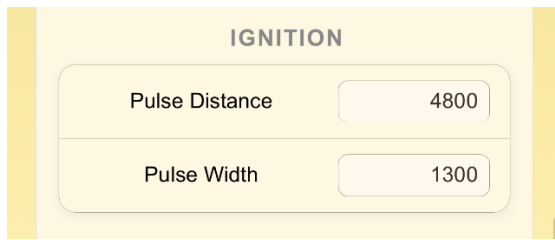
The following diagram illustrates this more clearly. The red graph represents the measured value. Here it is 1 and is, without damping, taken directly as 1.

The smaller the filter value, the stronger the damping. That is, more samples are required before the measured value of 1 is actually output as 1.



Source: [www.megunolink.com](http://www.megunolink.com)

## 5.2.6.4 Ignition



### 5.2.6.4.1 Pulse Distance

**Pulse Distance** defines the minimum interval between two valid ignition pulses. Due to disturbances in the vehicle electrical system, which are completely normal in a motor vehicle, voltage pulses can occur at terminal 1 of the ignition coil. To prevent these from negatively affecting the rpm calculation, a time span of  $4800\mu\text{s} = 4.8\text{ ms}$  is preset by default, during which all pulses since the last valid pulse at terminal 1 are ignored. 4.8 ms corresponds to an engine speed of 12,500 rpm if ignition occurs on every revolution. If ignition only happens on the power stroke, Pulse Distance can be set to a value of  $9600\mu\text{s} = 9.6\text{ ms}$ .

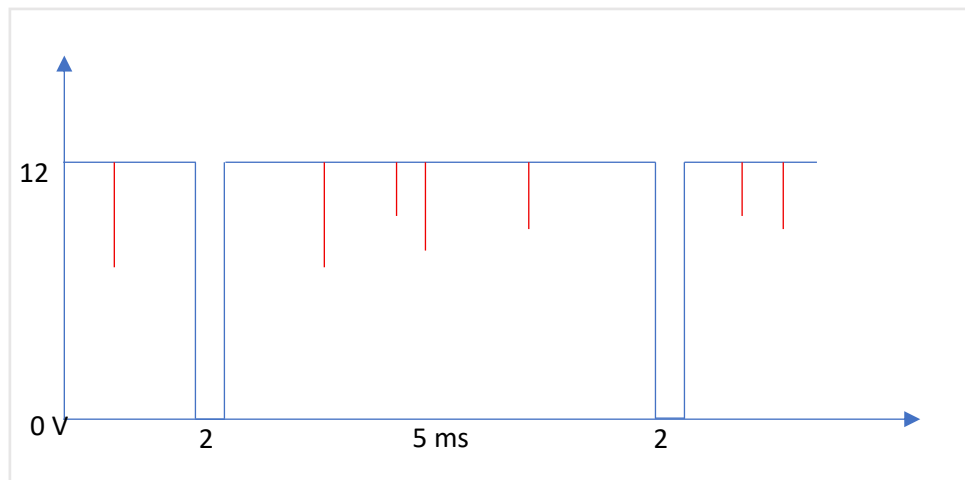
$$\text{Ign. Pulse Dist.} = \frac{60}{U/\text{min}} * 1000000 \mu\text{s}$$
$$\text{Ign. Pulse Dist.} = \frac{60}{12500} * 1000000 = 4800\mu\text{s}$$

### 5.2.6.4.2 Pulse Width

**Pulse Width** defines the minimum length an ignition pulse (the breaker dwell time) must have in order to be used for the rpm measurement. Narrow pulses, such as those caused by electrical interference, are thereby ignored. The default value is  $1300\mu\text{s} = 1.3\text{ ms}$ . Feel free to experiment here if the rpm reading appears implausible. If the value is set larger than the actual pulse width, all ignition pulses will be ignored.

Electronic ignition systems typically have a constant dwell time of around 2 ms across the entire rpm range, whereas breaker-point ignitions have a constant dwell angle. That is the angle of rotation of the ignition cam during which the breaker remains closed. Here, the dwell time changes with the engine speed: low rpm means long dwell time, high rpm means short dwell time.

For example, with a constant dwell angle of 60°, the dwell time is 10 ms at 1000 rpm. At 9000 rpm it is only 1.1 ms. In this case “Pulse Width” would have to be set to 1000 in order to still reliably detect the pulse.



The blue line shows a typical voltage waveform measured by MD-Lambda-View. The red lines represent interference pulses, which are ignored. For completeness: MD-Lambda-View does not evaluate the high positive voltages at terminal 1 of the ignition coil, as is commonly done, but rather the moment when the supply voltage of the ignition coil drops to 0 V, because the breaker or the output stage in the ignition control unit shorts it to ground and charges the ignition coil. (Dwell time / dwell angle)

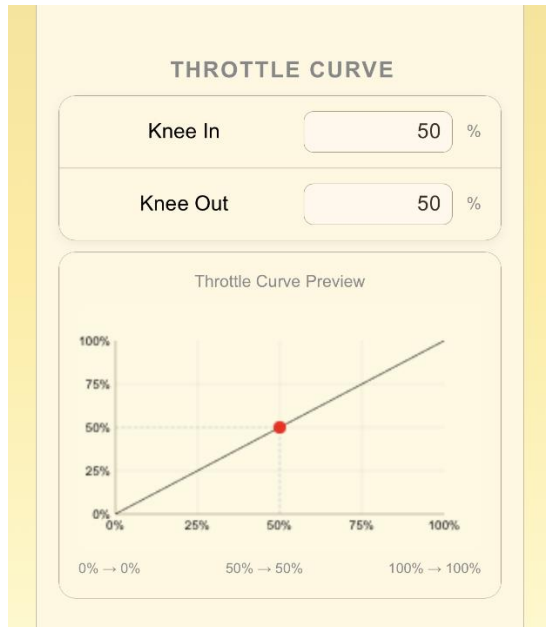
#### 5.2.6.6 Throttle position calibration

THROTTLE CALIBRATION	
Throttle low	<input type="text" value="0"/>
Throttle high	<input type="text" value="100"/>

This menu is used to calibrate the input signal from the cable pull sensor or a throttle potentiometer.

As an example, assume that the value shown in the web interface for the closed throttle is 16% and the value for the fully open throttle is 72%. These two values are entered in the MD-Lambda-View settings menu as Throttle-low and Throttle-high to use them as the basis for calculation. Once this is done, the throttle position will show 0% in the closed state and 100% in the open state.

Since software version V037, it is possible to define a transfer curve for the throttle position sensor. Many throttle position sensors — e.g. on Weber or Marelli fuel injection systems from the late 1990s — have non-uniform slopes.



**Important!** First calibrate Throttle-low and Throttle-high. Then you can configure the curve. The X-axis represents the input signal, the Y-axis the output signal.

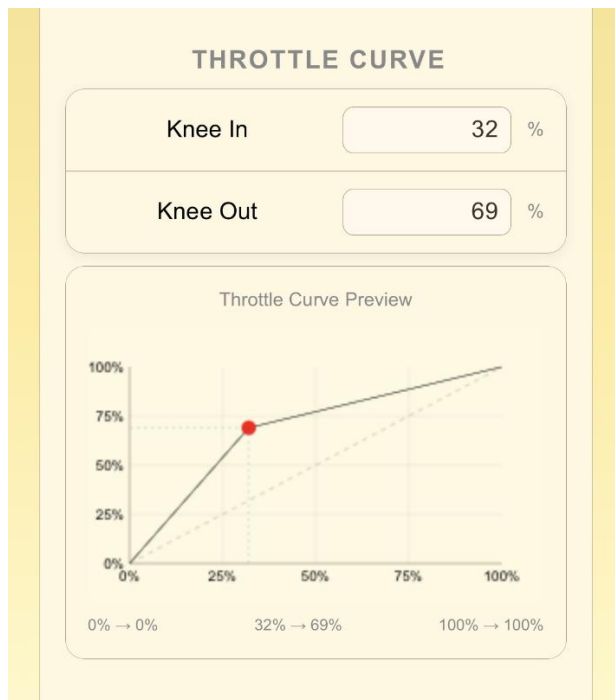
100% on the X-axis corresponds to the theoretical angle of rotation of the throttle position sensor. 100% on the Y-axis corresponds to the theoretical output voltage of the associated throttle position. Since MD-Lambda-View is generic, the Y-axis is also given in %, which requires a little arithmetic. The default for the curve is 50% on both axes, which corresponds to a linear characteristic.

Example:

Suppose the throttle sensor characteristic has a knee at 32% angle of rotation and outputs a voltage of exactly 3.45 V at that point. After that the curve continues linearly to the endstop. The maximum output voltage is 5 V.

$$3.45 \text{ V} = 69\% \text{ of } 5 \text{ V}$$

So, in the curve diagram, at 32% on the X-axis the Y-axis must read 69%. Accordingly, you enter 32 for "Knee in" and 69 for "Knee out". The result then looks like this.



#### 5.2.6.7 Logging

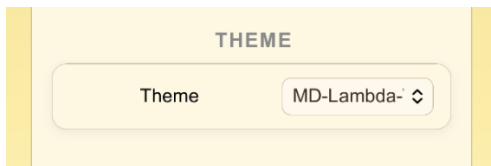
### LOGGING

Time to Log	<input style="width: 60px;" type="text" value="300"/>
Min. RPM to Log	<input style="width: 60px;" type="text" value="800"/>
Log Frequency (Hz)	<input style="width: 60px;" type="text" value="25"/>

For MD-Lambda-View to write data to the log file, a minimum time after startup (ignition on) must have elapsed and a minimum engine speed must be present. The time of 300 s (default) ensures that the engine and the lambda sensor are sufficiently warmed up to yield plausible lambda values. The timer starts as soon as the ignition is switched on — please always keep that in mind. The minimum engine speed ensures that no data is written while the engine is not running.

Log Frequency sets how many records per second are written to the log file. Values from 10 Hz to 25 Hz can be selected. The log frequency has a direct influence on the maximum logging time before storage is full.

## 5.2.6.8 Theme



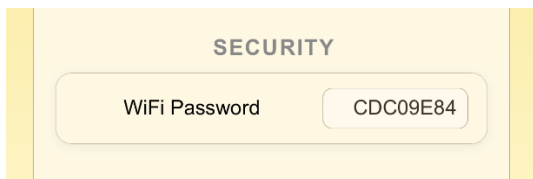
MD-Lambda-View offers 5 different themes to choose from.

From left to right:

- MD-Lambda-View
- Ice
- Nature
- Ocean
- Dark



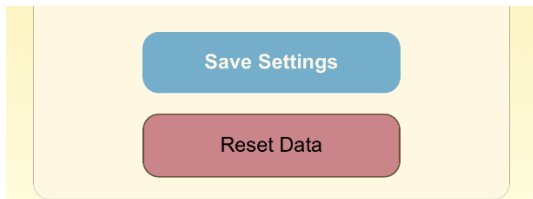
### 5.2.6.9 Security



If you want to change the initial password, you can do so here. The new password only becomes active after restarting MD-Lambda-View. The new password must be 8 ASCII characters long. Requirements such as upper and lower case or special characters are not necessary, but are allowed. Smileys or similar are not permitted.

The password change only takes effect after pressing the Save button and then restarting MD-Lambda-View.

### 5.2.6.10 Save & Reset



Pressing the “Save Settings” button writes all values in the Settings area to the EEPROM of MD-Lambda-View and the software adopts them permanently. If you do not save, on the next startup the values currently in storage will be used.

The saved settings values are retained even when MD-Lambda-View is powered off.

Pressing the Reset button resets all values in the Settings area to the factory state. **Caution: the password will of course also be reset to the initial password.**

## 6. Product conformity

The declaration of conformity can be downloaded from the download section.

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