Operating instructions Speedbox I

Thank you very much for choosing a RZTec Speedbox I.

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1. General information about your Speedbox
   - Connect the device with the included USB cable to a power source of your choice (USB socket of the PC, USB power supply(not included), Powerbank(not included), etc..)
   - From 2m cable length an active USB hub with own power supply is recommended
   - Place the speedbox as close to the passing locomotive as possible.
   - Set up the Speedbox on a straight piece of rail of at least 2 locomotive lengths.
   - Align the sensors in height more towards the locomotive body, determine the optimum height for your scale by testing with different height settings.

USB port

Height adjustable feet

Sensors

2. <u>Connect Speedbox to the PC and use it</u>

- Driver installation:
  Please install the driver from the website only if Windows does not provide its own!
- Connect the Speedbox to the PC
- If the driver is not installed automatically, you can download it from www.rztec.de/Downloads/ for your operating system.
- On the side of the package you can see which driver you have to use, FTDI or CH340
- Download and install the Speedbox software

- Install the driver package <u>if necessary,</u>
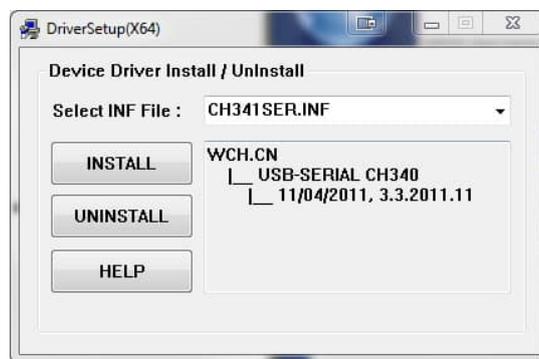
- Download and run the setup file
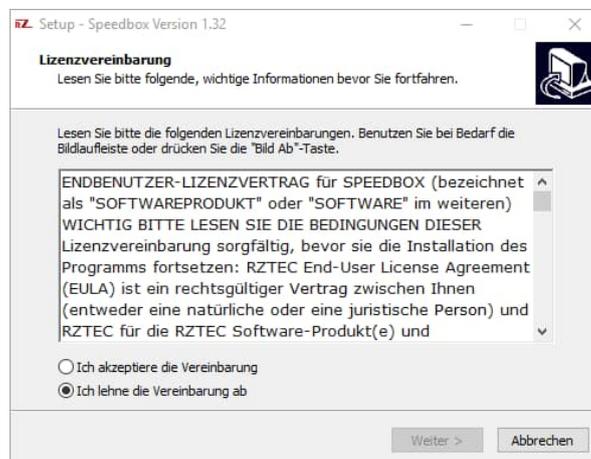
- Let us guide you through the setup
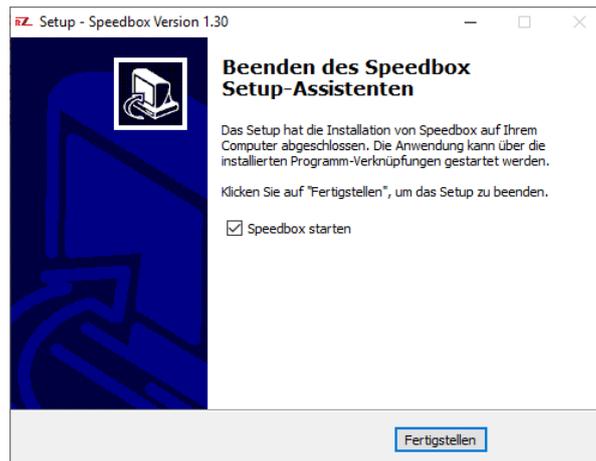
- If you don't get the note below about the ComPort of your Speedbox, please look in the device manager to find out the Comport.
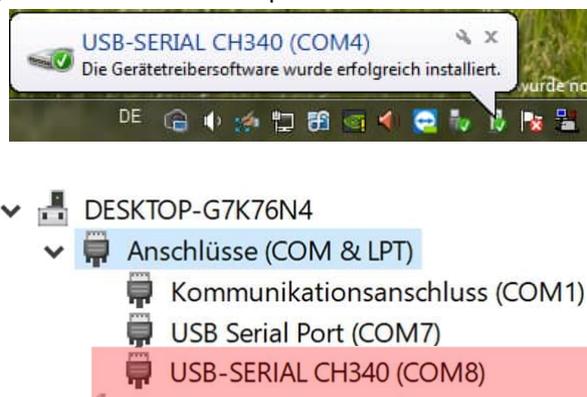
- Launch the Speedbox application.

- Select your determined ComPort of your Speedbox in the selection field and click on connect

- If you have selected an incorrect ComPort, you will receive a message that no Speedbox is connected to the selected port, please select another ComPort in this case.
- Click on "Connect" the speedbox confirms with "Speedbox connected" at the bottom left of the display and in the application the status is confirmed with the scale and version number
- Please select your track size in the selection field, the selection consists of G, I, 0 (UK), 0, 0 (US), S, 00, H0, TT, N (UK), N & Z the selection is then shown in the display of the speedbox
- Select your language in the Settings menu
- In the Settings menu, select units between metric (km/h & cm) and us (mph & inch)
- The selections in the Settings menu only take effect after restarting the app
- The Sppedbox takes over the settings after connecting

3. The information window
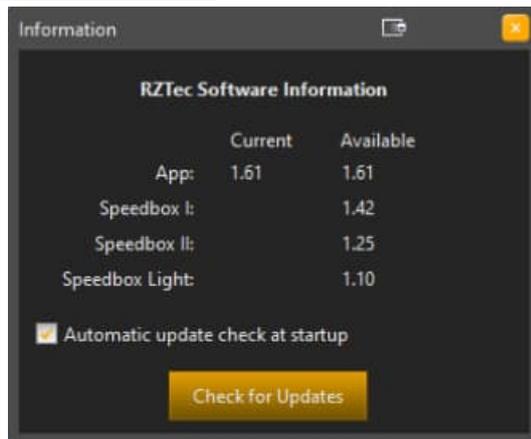
- Here you can check or uncheck the automatic update check when starting the app.
- If the automatic update check is switched off, the available versions can be called up via the button "Check for updates". If a newer version is available, the update is offered immediately via a message window.

- If you are connected to your speedbox, you will be offered an update for your speedbox, if available. The current and available version is displayed.
- We recommend always installing displayed updates, as they contain not only new features, but also bug fixes.

4. Create your own measurement series
- The creation of own measurement series is used for vehicles with irregular driving behavior, to compare the driving behavior at different temperatures or to work out service intervals for his vehicles.
- Measurement series are ideally created on a track oval

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- In the Measurement Series menu, click Create Measurement Series to expand the app and display the Measurement Series field.
- CV measurement is not possible during measurement series creation.
- Click on Start measurement to start the measurement series.
- Up to 95 measurements per measurement series are possible.
- During the current measurement, an average value of the entire measurement series is calculated and displayed under the measurement series.
- If you notice an error, you can immediately start a new measurement series during the measurement by clicking on New.
- A measurement series can be paused or terminated by clicking on Stop measurement
- With a click on Export the respective measurement series can be saved in the formats Excel, CSV and TXT.
- The measurement series field can be closed in the menu Measurement series with Close measurement series, after that a CV measurement is possible again.

5. Determine CV5 for the maximum speed
   - Click Connect in the Speedbox software
   - Read the CV5 on the programming track of your system
   - Enter this value into the CV5 field of the Speedbox software
   - Enter your desired maximum speed in the Speed field

- Click on the button CV 5 and 6
- Drive past the speedbox once at top speed in any direction

- Change CV5 to the specified value
- If your control center supports POM you can do this on the main track as well
- Drive past the speedbox at full throttle one more time
- Change the CV5 back to the specified value
- Repeat the procedure until the message "Speed reached" appears (Usually after 3-4 measurements).

- Click ok and on CV measurement active, the fields will be cleared

6. Determine CV6 for the average speed
    - Click Connect in the Speedbox software
    - Select CV6 in the CV selection field
    - Read the CV6 on the programming track of your system
    - Enter this value into the CV6 field of the Speedbox software
    - Enter your desired average speed in the Speed field

- Click Start measurement
- Drive past the speedbox once at medium speed (speed level 63) in any direction

- Change CV6 to the specified value
- If your control center supports POM you can do this on the main track as well
- Drive past the speedbox one more time at medium speed (speed level 63)
- Change the CV6 of the locomotive back to the specified value
- Repeat the procedure until the message "Desired speed reached" appears (Usually after 3-4 measurements).

- Click Stop measurement, the fields will be cleared

7. <u>Calibration with Traincontroller Gold (from version 9)</u>
   - Make sure that the locomotive to be measured is just in front of the speedbox and points forward in the direction of the speedbox.
   - Launch the Speedbox application
   - Click Connect
   - <u>Do not</u> enter values in CV5 and V Max
   - Start Traincontroller
   - Open the properties of the locomotive selected for calibration
   - Switch to the "Drive" tab and click here on Automatic mode
   - Click on "Advanced Fine Tuning..."
   - Switch to the "Speed profile" tab and open the Measurement selection field
   - From this, select the item "Measurement of the entire velocity profile with a third-party measuring device".
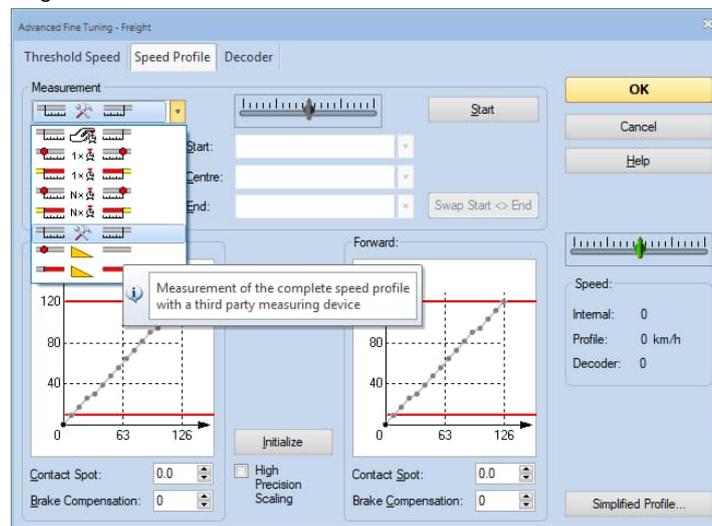
   - Choose the outlet so large that it is at least twice the length of the locomotive.
   - Now click on "Start measurement" in the Speedbox application, the application now always remains automatically in the foreground
   - Click on "Start" in the Traincontroller window
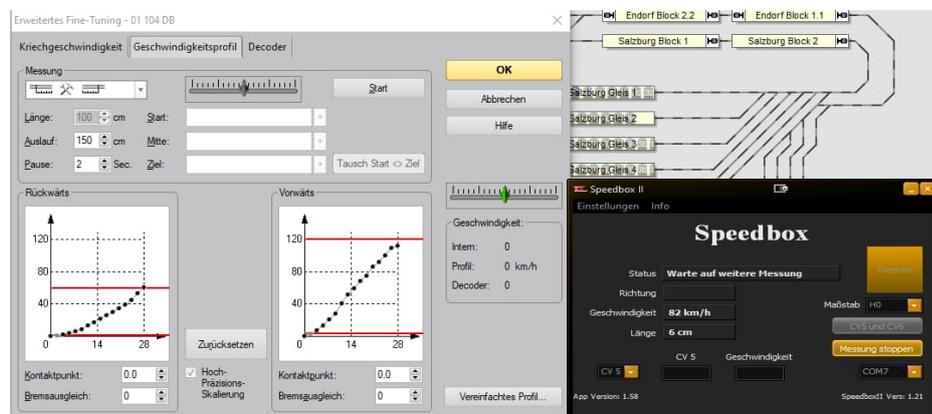
   - And then on "Automatic transfer
   - Now the automatic calibration process of Traincontroller starts

- The determined speeds of the speedbox are automatically transferred to Traincontroller.
- After completion the locomotive is calibrated and can be used in Traincontroller.
- Click on "Stop measurement" in the Speedbox application to end the value transfer to Traincontroller.
- Click on "Connected" to disconnect from the Speedbox.

8. Calibration with Win-Digipet (from version 2018-1)
   Create Speedbox in Win-Digipet
   - Start Win-Digipet
   - Under File→ System settings you can manage your digital systems
   - Add the RZTec Speedbox at the next free position under Digital Systems
   - Select the correct port for the Speedbox under Com-Port
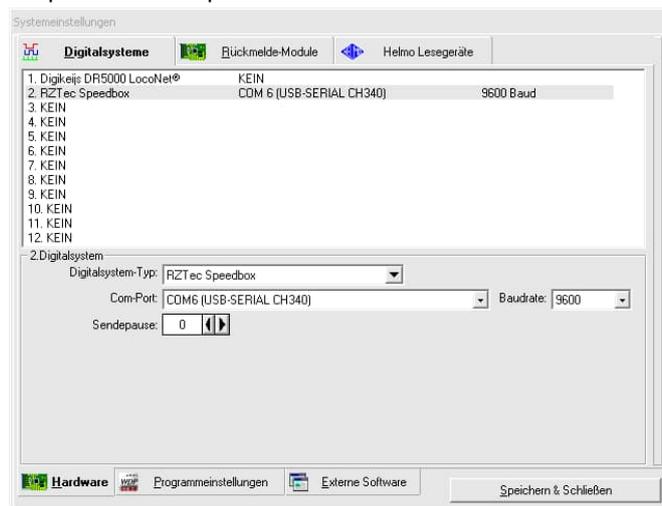
   - Save & close the system settings

   Calibrate locomotive with Speedbox in Win-Digipet

   - Now click on Calibrate locomotives under Vehicles
   - Select the speedbox in the upper DropDown field
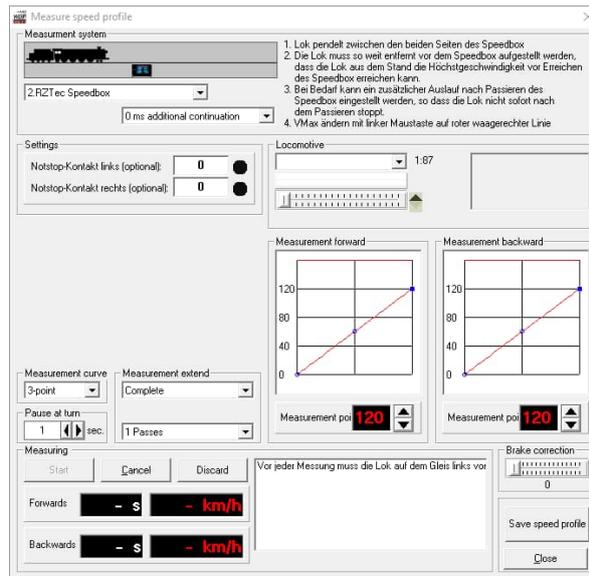
- Make sure that the locomotive to be measured is facing forward in the direction of the speedbox.
- Select the locomotive under Locomotive
- Select a measuring method 3 or 15 point characteristic curve
- Click Start and wait until the measurement process is completed
- Click Save Speed Profile

6.1. Troubleshooting under Win-Digipet

- Should the Speedbox not respond under Win-Digipet once
- Disconnect the Speedbox from the USB for approx. 10 seconds and reconnect.
- Click in Win-Digipet on the number of the digital system under which you have created the speedbox.
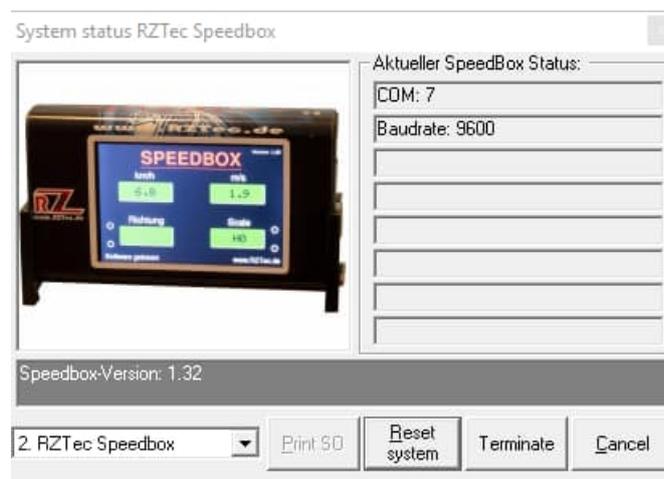
- Click Reset System once, then the Speedbox is ready for use again

9. <u>Calibration with iTrain (from version 5)</u>

<u>Create speedbox in iTrain</u>

- Connect your Speedbox to the PC or Mac
- Open the preferences under Edit→ Interfaces
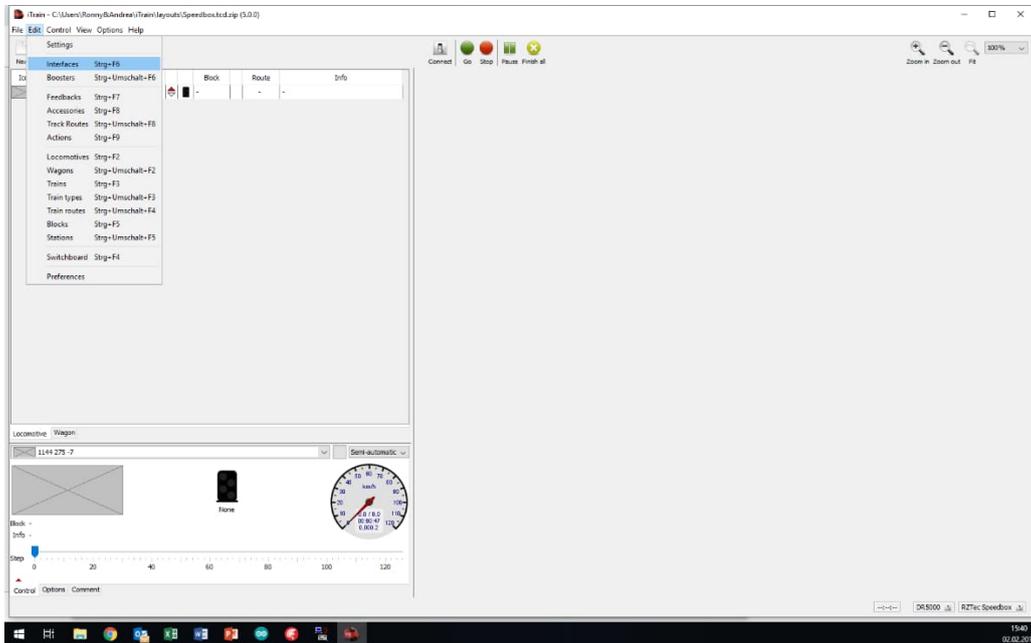
- Create a new interface and name it Speedbox
- Select the RZTec Speedbox under Type
- Select the correct port for the speedbox (see device manager)
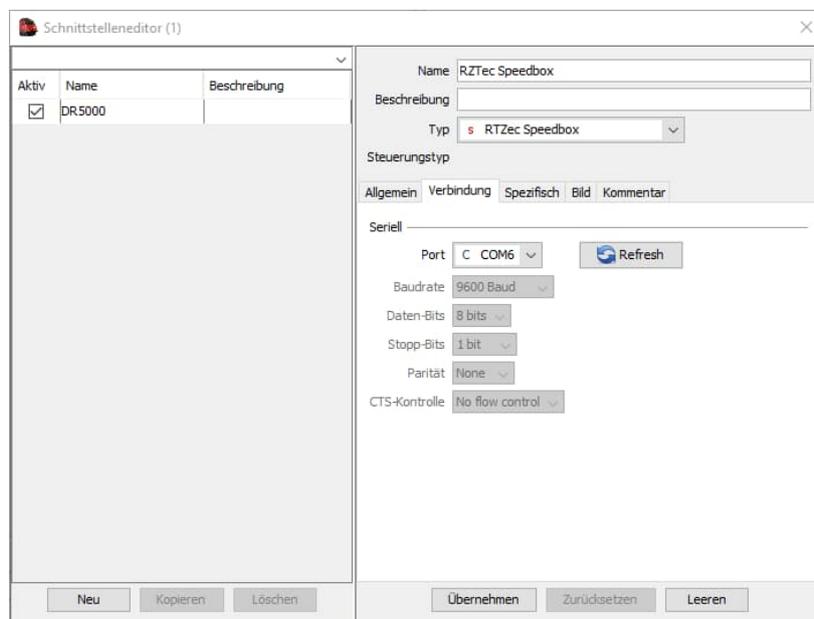
- Finish the input with Apply

<u>Calibrating a locomotive with the Speedbox in iTrain</u>

- Click Connect
- Your control center and the speedbox should be in green status.
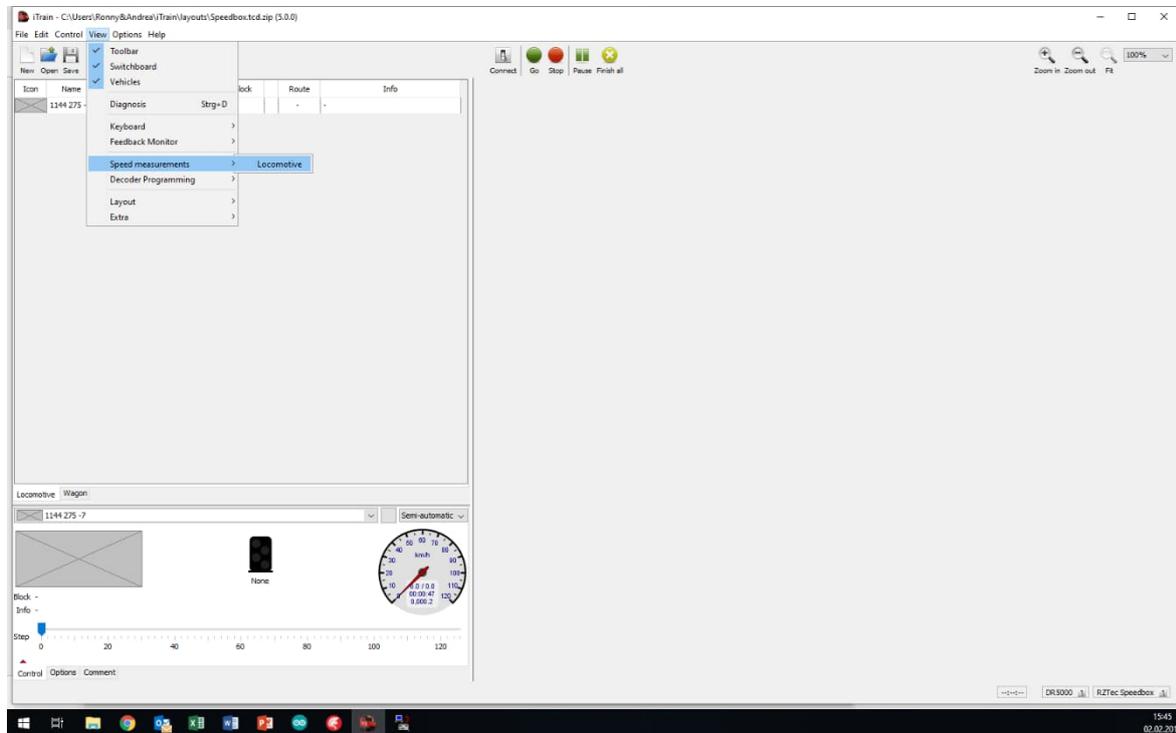
- Click on Display→ Speed measurements→ Locomotive
- There you select under type device
- Select the locomotive to be measured
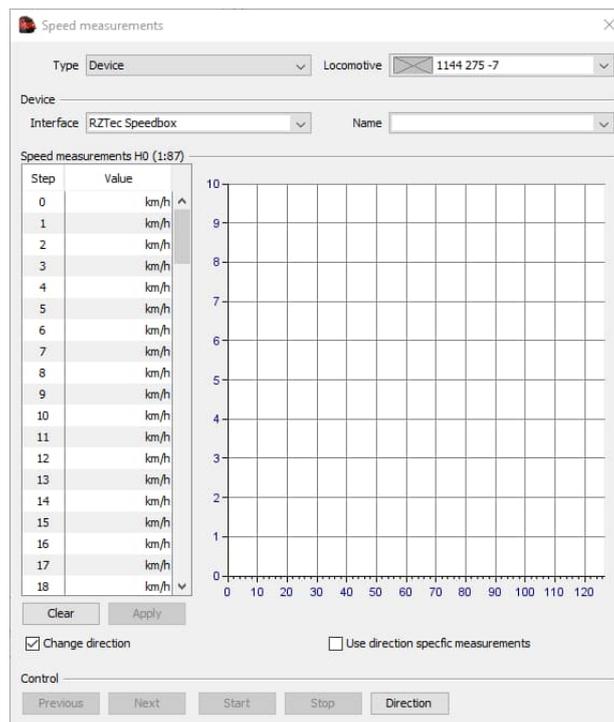
- Select one, several or all speed levels
- When selecting, the order is important whether to measure in ascending or descending order.
- Check Change direction of travel if you are not measuring on a track oval.
- If you want to create a speed curve for forward and backward, check "Use direction-dependent measurements".

Speed measurements H0 (1:87)

Step	Forward	Backward
0	0.0 km/h	0.0 km/h
1	4.1 km/h	4.1 km/h
2	4.7 km/h	5.0 km/h
3	6.3 km/h	6.6 km/h
4	8.5 km/h	8.8 km/h
5	10.0 km/h	10.3 km/h
6	12.5 km/h	12.8 km/h
7	14.1 km/h	14.7 km/h
8	16.9 km/h	17.2 km/h
9	20.0 km/h	20.4 km/h
10	23.2 km/h	23.8 km/h

Clear   Apply

☑ Change direction   ☑ Use direction specfic measurements
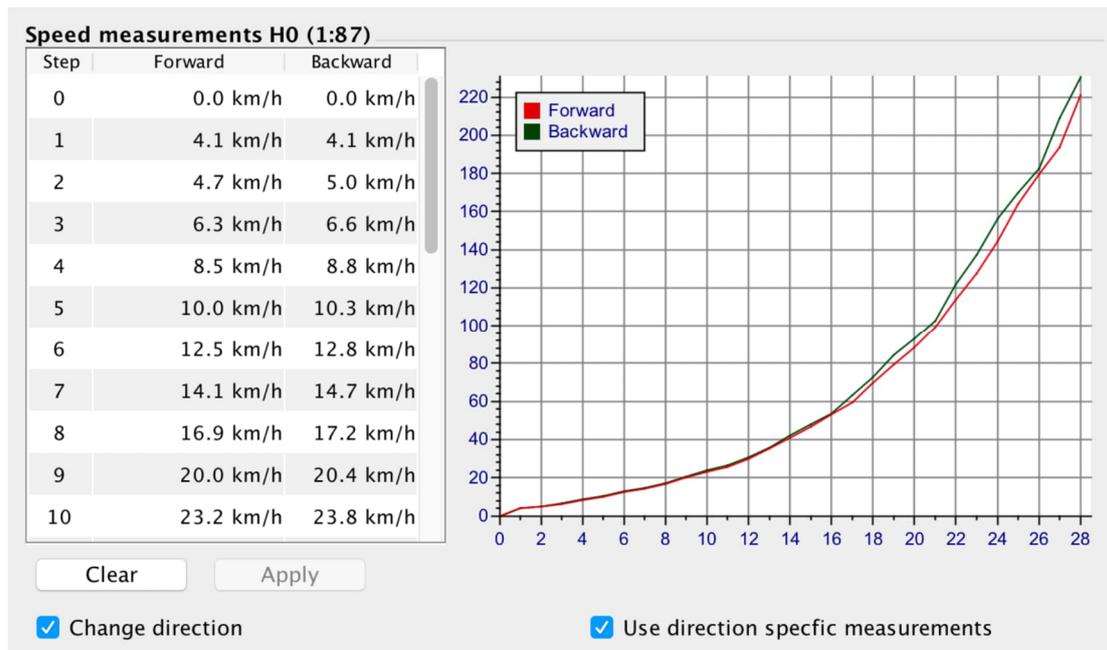
10. Standalone operation of the Speedbox

- Connect the Speedbox to a USB power supply or the PC to supply the Speedbox with power.
- The Speedbox needs a connection to a Windows computer with installed Speedbox software to get its settings.
- Open the software. You can already pre-select the settings such as language, units of measurement from the settings and the scale without connection.
- If the language or the units of measurement are changed, the software must be restarted.
- Connect the Speedbox to the software by clicking Connect.
- Now the Speedbox takes over the settings from the software.
- After that, the connection can be disconnected and you can read the speeds and lengths of the passing vehicles on the display of your Speedbox on a USB power supply or power bank with USB connection without connection to a computer.
- To measure the length of a train or locomotive, drive past the speedbox in any direction at a constant average speed.
- Attention, especially with longer trains that drive out of or into a curve or over switches during the measurement, the measured length can be falsified. The reason for this is the higher friction of the wheelsets in the curves or the load control of the installed decoders and the resulting speed deviation.

11. The update of the app
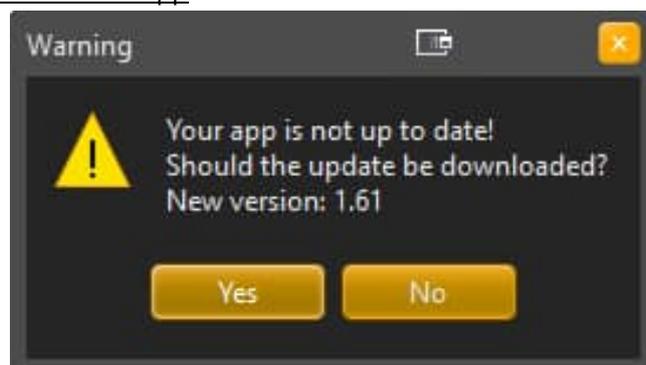
- If a newer version of the app is available, you will be offered to download it when you start the app (prerequisite: automatic update check is turned on)
- If the automatic update check is switched off, an update can be retrieved via the info field
- By clicking Yes, the update will be downloaded via your browser
- Please unzip this and install as usual

12. <u>The update of the speedbox</u>

- If an update is available for your Speedbox, this will be displayed when you connect to your Speedbox (assuming automatic updates are enabled).
- If the automatic update check is switched off, a possible update can be requested via the info window when the Speedbox is connected.
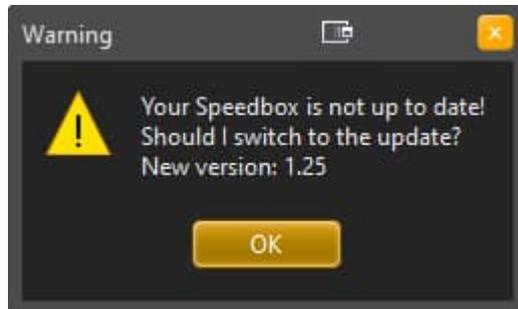
- With a click on OK the software changes into the update mode.
- From here on, do not disconnect the Speedbox from the computer until the update is complete.
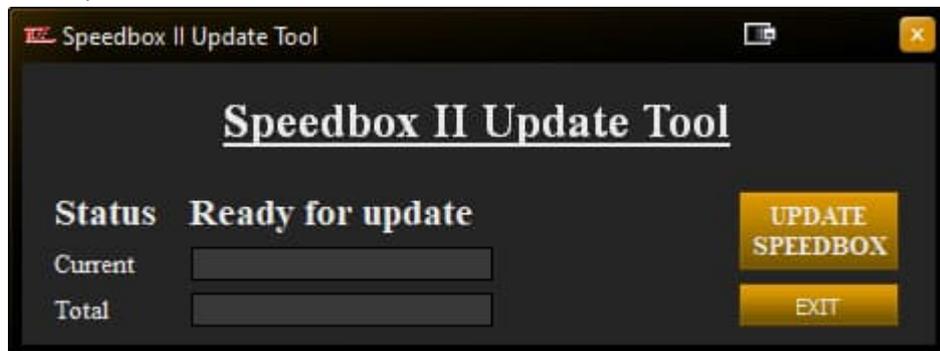
- Click on "Update Speedbox" the update runs fully automatically

- After successful update and click OK the app closes
- Now disconnect the Speedbox from the PC for 10 seconds
- After reconnecting, restart the app and connect to your Speedbox as usual.

13. Double start of the app

- Multiple start of the app is possible
- This allows several speedboxes to be operated at once.
- However, we recommend this feature only to experienced users, as dealing with multiple Comports and evaluating the different displays can lead to confusion.

14. Troubleshooting

- Make sure that there is nothing in the "field of view" of the sensors (wagons, wall, objects etc.) Behind the speedbox there must be at least 10cm free space without objects.
- An ideal measuring environment: Place the Speedbox as close as possible to the passing object to be measured, align the sensors more towards the locomotive body, not necessarily exactly on the buffers
- Find out the ideal height of the speedbox by testing different heights
- Due to free-standing (open) bogies, faulty measurements may occur under certain circumstances. The remedy here is to fold a "hood" of white paper or cardboard and put it over the locomotive for the duration of the measurement process.

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