ETAS INCA-RDE V1.13

Getting Started

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INCA-RDE V1.13 Getting Started EN R01 | 11.2024

Contents

1 Introduction

INCA-RDE is a software that assists test drivers to track the status of real driving emissions measurements in real time. This makes it possible to monitor whether RDE measurements comply with statutory limits. INCA-RDE is as add-on integrated into INCA. Specialists can conduct RDE tests in their familiar working environment for taking in-vehicle measurements, calibrating controls units and diagnostics.

INCA-RDE is used to execute RDE driving tests in a controlled and reproducible manner. The INCA add-on makes it possible to efficiently determine RDE emissions and correlate them with signals from the ECU. For this purpose, it provides special display instruments that enable the test engineers to monitor and evaluate RDE measurements during driving tests.

INCA-RDE Online is a software tool providing a real time evaluation of RDE data during and after a test drive. During a RDE test drive the software provides the following visual information:

– about fulfilled criteria and yet to be fulfilled
– achievement of successful measurement
– distance yet to be travelled in the respective unit (Motorway, Rural, Urban)
– display of current percentage of valid windows
– monitor of the RDE related measurement data like NOx Sensor, GPS, Memory Faults, Battery status etc.
– monitor of the RDE requirements for the route (between 60, 90 & 120 minutes and individual routes with minimum of 16 km)
– notification about an emission measurement start to notify when the emission measurement has been started.

Figure 1-1 shows a general INCA-RDE setup overview:

Figure 1-1: Setup for the INCA RDE Online Software: Connection

INCA-RDE is installed on the calibration notebook receiving data from the PEMS of the vehicle via the ES59x (except the ES590 devices) and simultaneously via CAN/ETK connection from the ECU. The ES59x (except the ES590 devices) assures synchronized data from both measurement sources. The data is displayed in the INCA Experiment Environment and can be recorded there too. In the INCA Experiment Environment, several instruments show for the driver necessary RDE information to check if the driving cycle is still valid. These instruments are explained in more detail in chapter 4.2.

1.1 Intended Use

INCA RDE Online is only validating driving cycles with respect to RDE requirements for calibrating electronic control units regarding engineering tools such as INCA. Any other use of this engineering tool for any activity whatsoever is a misuse of the intended deployment of this tool and ETAS assumes no responsibility whatsoever in the event of misuse or an accident resulting in death, personal injury, or damage to property.

INCA RDE Online permits the online validation of driving cycles with respect to RDE requirements during the development phase of series production development for combustion engine.

NOTE

It is forbidden by law to use INCA RDE for official RDE homologation driving cycle validation. INCA RDE gives the driver during the RDE drive specific hints about the status of the RDE legislation requirements, which would help to change the driving behavior during the official homologation RDE driving cycle. This should be avoided and therefor it is officially forbidden by legislation to use such a tool in an official RDE homologation driving cycle validation.

This document only describes INCA RDE Online. Information about the correct use of INCA can be found in the corresponding manuals.

1.1.1 Obligations and Liability

Knowledge of the basic safety instructions and regulations are vital for the safe use of INCA RDE Online. This manual and in particular the safety notice must be observed by everyone working with INCA RDE Online.

INCA RDE Online has been developed and programmed according to state-of-the-art engineering.

Even so, it is possible for the user and third parties to be exposed to danger during its use and damage to property can occur. For these reasons, INCA RDE Online must only be used for its intended purpose and when in a perfectly safe condition.

Adhere to the ETAS Safety Advice for INCA-RDE. INCA-RDE was developed and approved for automotive applications and procedures as described in the user documentation for INCA-RDE. ETAS GmbH cannot be made liable for damage which is caused by incorrect use and not adhering to the safety instructions.

Refer also to the general safety instructions working with INCA

1.2 Target Group

This software product and this user guide address qualified personnel working in the fields of automotive ECU development and calibration, as well as system administrators and users with administrator privileges who install, maintain, or uninstall software. Specialized knowledge in the areas of measurement and ECU technology is required. This includes calibration procedures, software such as INCA and MDA and software algorithms of systems you would like to calibrate.

1.3 Classification of Safety Messages

Safety messages warn of dangers that can lead to personal injury or damage to property:

DANGER

DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE indicates a situation that, if not avoided, could result in damage to property.

1.4 Safety Information

INCA RDE Online is a development program for validation of driving cycles with respect to RDE requirements. Additional calibration activities govern the behavior of a control unit and the systems influenced by the control unit. These activities can produce unexpected vehicle behavior, increasing the risk of accidents. Arbitrary intervention in the control units of the distributed electronic vehicle components can trigger unexpected vehicle reactions, such as swerving, braking or acceleration.

WARNING

Risk of distraction!

Using INCA-RDE can distract the driver.
During driving the driver must focus to the traffic on public roads and not to any other activity with respect to INCA RDE Online.

WARNING

Unexpected vehicle reactions!

Using INCA-RDE may lead to safety critical situations. Calibration activities influence the behavior of the ECU and the systems controlled by the ECU. This may result in unexpected behavior of the vehicle, such as braking, accelerating, or swerving.
Only well-trained personnel should be allowed to perform calibration activities.

1.5 Privacy Notice

Note that personal or personal-related data respectively data categories are processed when using this product. The purchaser of this product is responsible for the legal conformity of processing the data in accordance with Article 4 No. 7 of the General Data Protection Regulation (GDPR). As the manufacturer, ETAS GmbH is not liable for any mishandling of this data.

1.5.1 Privacy Statement

Your privacy is important to ETAS, so we have created the following Privacy Statement that informs you which data are processed in INCA-RDE, which data categories INCA-RDE uses, and which technical measure you have to take to ensure the users privacy. Additionally, we provide further instructions where this product stores and where you can delete personal or personal-related data.

Data Processing

Note that personal or personal-related data respectively data categories are processed when using this product.

The purchaser of this product is responsible for the legal conformity of processing the data in accordance with Article 4 No. 7 of the General Data Protection Regulation (GDPR). As the manufacturer, ETAS GmbH is not liable for any mishandling of this data.

Data Categories

Note that this product particularly records the following personal or personal-related data respectively data categories for the purposes of assisting with troubleshooting:

Communication data: IP address, date and time

- User data: The user's Windows UserID

As a result of the optional settings selected in the product during the installation respectively running time, particularly the following personal or personal-related data respectively data categories are recorded for the purposes of assisting development:

- Logging mechanism related data, see Storing and Deleting Personal or Personal-Related Information: Windows User Data

When using the ETAS License Manager in combination with user-based licenses, particularly the following personal or personal-related data respectively data categories can be recorded for the purposes of license management:

- Communication data: IP address
- User data: UserID, WindowsUserID

Using this product and, where necessary, with the aid of other add-ons, further personal or personal related data respectively data categories can be recorded for the purposes of further analysis. This may, for example, include vehicle identification numbers (VIN) or vehicle number plates as well as GPS, video, audio or other measuring data. The exact data recorded in each case is determined by you when you configure your measuring system. Note that, in such cases, you are responsible for the legally compliant handling of the data in accordance with applicable national law.

Technical and organizational measures

This product does not itself encrypt the personal or personal-related data respectively data categories that it records. Ensure that the data recorded are secured by means of suitable technical or organizational measures in your IT system, e.g., by using classic anti-theft and access protection on the measurement hardware. Personal or personal-related data in log files can be deleted by tools in the operating system. For the procedure of deleting personal or personal-related data in measure files, see links below.

1.5.2 Storing and Deleting Personal or Personal-Related Information: Windows User Data

Logfiles collected within INCA-RDE (Collect logfiles)

Purpose

INCA-RDE allows a collection of all log-files of INCA-RDE initiated by the user of INCA-RDE may containing the Window account ID to use those log files for debugging purpose of the software development. Those collected log files will be zipped and then send to the ETAS Hotline.

Personal Data

The log files may contain the personal Window account ID of the user.

Location

The log files are stored under your …\ETAS\LogFiles\RDE\1.13 location as default location.

Deletion

Delete the log files in the respective folder (see above). Does not send the automatically opened email.

1.6 Definitions and Abbreviations

CAN
: Controller Area Network

DBC
: Database CAN

PEMS
: Portable Emission Measurement System

RDE
: Real Drive Emission

XCP
: Universal Measurement and Calibration Protocol

2 Installation

2.1 System Requirements

The hardware and software requirements for working with INCA V7.5.x are also sufficient for the add-on INCA-RDE – they are described in the manual "INCA V7.5 - Installation Guide ".

2.2 Installing

Certain system requirements must be met to install the product. Make sure that these system requirements are met before starting the installation.

Use the service pack installer to install INCA-RDE. The service pack installer combines installations of different programs and add-ons in one user dialog window.

To install INCA-RDE

1. Close all open ETAS programs.
2. Depending on your company-specific regulations, the installation files are provided on DVD or on a network drive.
3. By using the DVD, the installation routine starts automatically. If this is not the case, execute the setup file on the DVD manually.
4. If you install the program from a network drive, also execute the setup file.
5. Follow the installation instructions.
6. Click Install.

Since INCA-RDE is an add-on, it is necessary that INCA is installed on the computer to be used.

2.3 Licensing

A valid license is required for using INCA. You can obtain the license file required for licensing either from your tool coordinator or through a self-service portal on the ETAS Internet Site under http://www.etas.com/support/licensing. To request the license file, you must enter the activation number which you received from ETAS during the ordering process.

In the Windows Start menu, select

ETAS → ETAS License Manager

Follow the instructions given in the dialog. For further information about, for example, the ETAS license models and borrowing a license, press F1 in the ETAS License Manager.

2.4 Uninstalling

NOTE

Administrator rights are required to uninstall INCA-RDE Online.

To uninstall INCA-RDE Online

1. Go to the menu "Add or Remove Program" in the control panel.
2. Select "INCA-RDE Online".
3. Click Remove.
4. Click Yes to confirm.

3 Getting Started

3.1 Importing the INCA Configuration

To import the INCA configuration

1. Open INCA.
2. Create a new top folder:
   - In the "Edit" menu, point to Add, and then select Add top folder.
   - Enter a name for the folder (e.g., `RDE Online`) and confirm your input.
3. Select the new created top folder from the Database Objects list.
4. Open the menu Edit → Import.

or

5. Use the shortcut Ctrl+M.
6. Click ..., select the file `\ETASData\INCA7.5\RDE\1.13\Experiment\RDE Online.exp64`, and click OK.

or

7. Click ..., select the file `\ETASData\INCA7.5\RDE\1.13\Experiment\RDE Simulation.exp64`, and click OK.

   The INCA configuration is imported to the new top folder.

3.2 Quick Start INCA-RDE by Starting an RDE Simulation in INCA

Starting with INCA-RDE, the user must choose at first whether to work with INCA-RDE in the "Online-Mode" which requires a PEMS or respective CAN signals via a BoA compatible CAN device or in the "Simulation Mode" which requires only a measurement file based on a MDF or csv data format. For both methods, the user must choose between different INCA export files as described in chapter 3.1. The reason for this is the fact that the calculation in the simulation mode is performed 5 times faster than in the Online-Mode to speed up the simulated RDE drive which usually takes time between 90 and 120 minutes each drive.

> **NOTE**
>
> A virtual device is not supported for the INCA-RDE tool.

If you already installed INCA-RDE as described in chapter 2, you can get a first impression of the tool by using it in simulation mode.

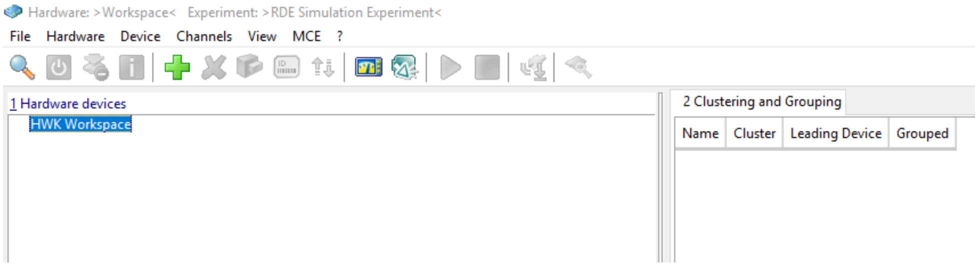
The basic workflow of INCA-RDE is explained in the following:

– To open an RDE configuration.
– To start the communication with the PEMS.
– To stop the communication with the PEMS.

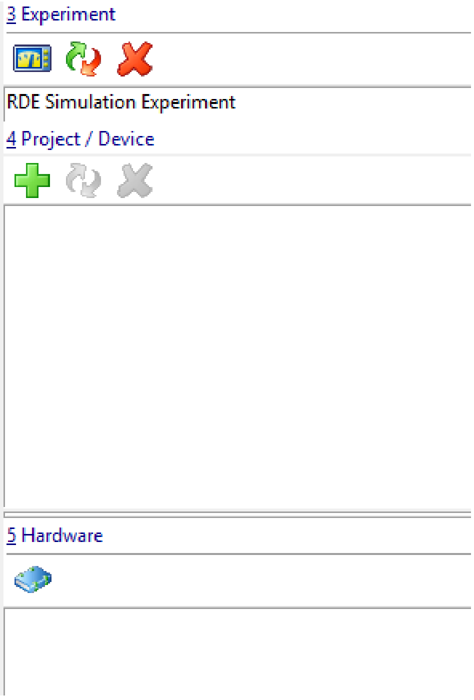
To open the RDE configuration

Having imported the INCA configuration as described in chapter 3.1, proceed as follows:

1. Open the respective Hardware configurator (Hardware) in the project view of INCA by using the RDE Simulation configuration.

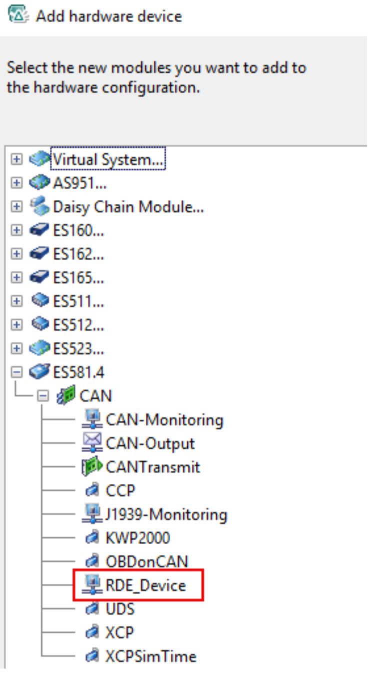


The following view will be displayed:

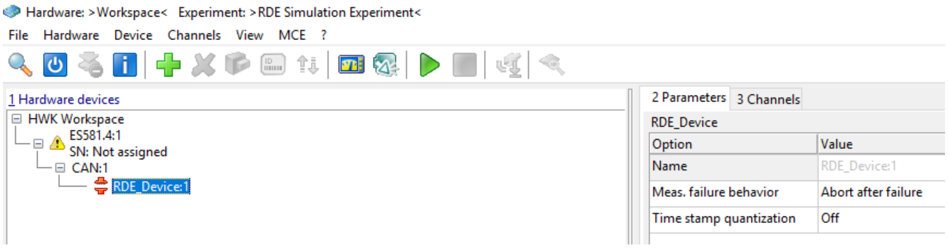


2. Even though an RDE drive is simulated, the simulation configuration in INCA is configured by choosing one of the provided CAN devices in the Hardware Configuration to see a respective RDE device.

Chose for example ES581.4 > RDE_Device.

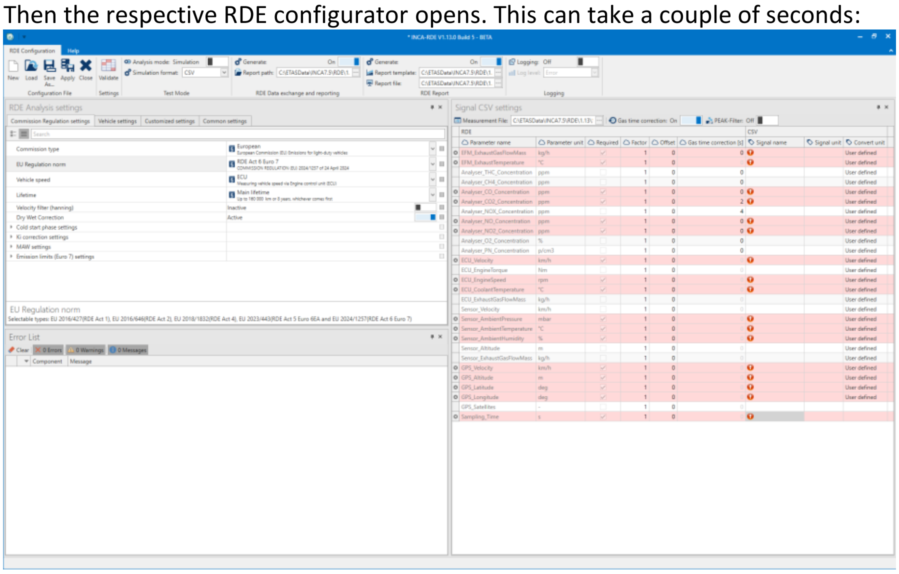


The following view will be displayed:



3. For simulating an RDE drive (and for the RDE Online mode), you must configure the respective RDE configuration. To do this, click **Configure** in the lower right corner of the INCA Hardware Configuration window.

   Then the respective RDE configurator opens. This can take a couple of seconds:



4. On the "RDE Configuration" tab, in the "Configuration File" group, click 

You can choose between two configuration files, which include all necessary configuration parameters (incl. WLTC emission results and mapping of the CAN parameter to the INCA-RDE parameter) for a proper simulation of the two RDE measurement data.

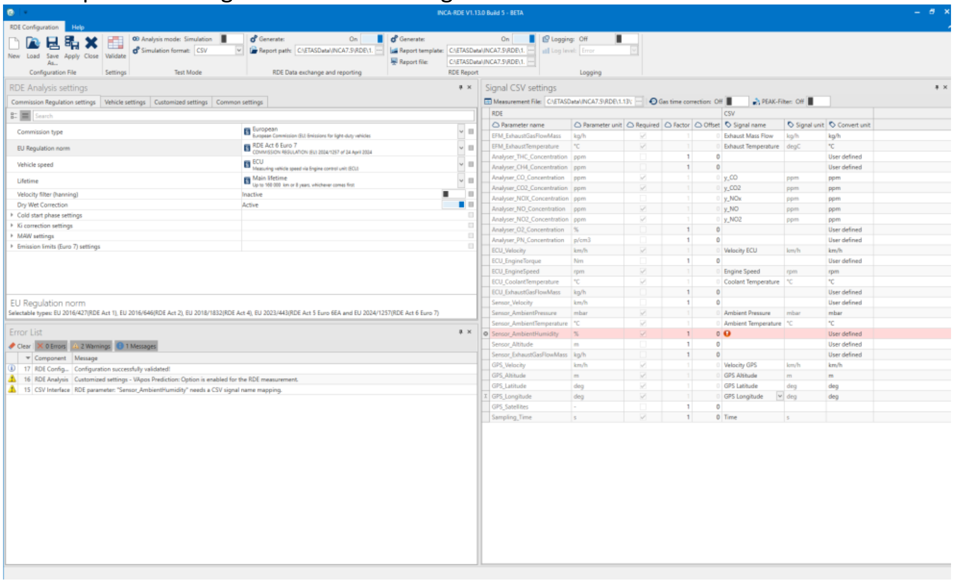
5. Do one of the following:

   – If you want to use the simulation RDE_Simulation_Diesel.csv select this file:
   `\ETASData\INCA7.5\RDE\1.13\Simulation\ rde_configuration_Example_Diesel.json`

or

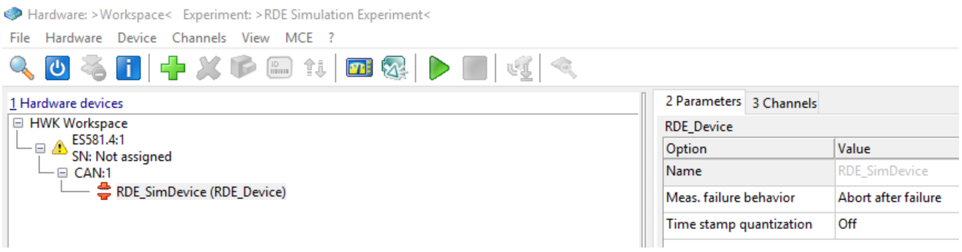
   – If you want to use the simulation `RDE_Simulation_Gasoline.csv` select this file:
   `\ETASData\INCA7.5\RDE\1.13\Simulation\rde_configuration_Example_Gasoline.json`

6. The respective configuration in the configurator will be shown:

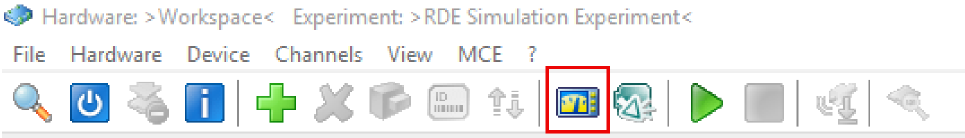


7. Click **Apply** and **Yes**. The configurator will be closed, and the user is back in the INCA Hardware Configurator (HWC).

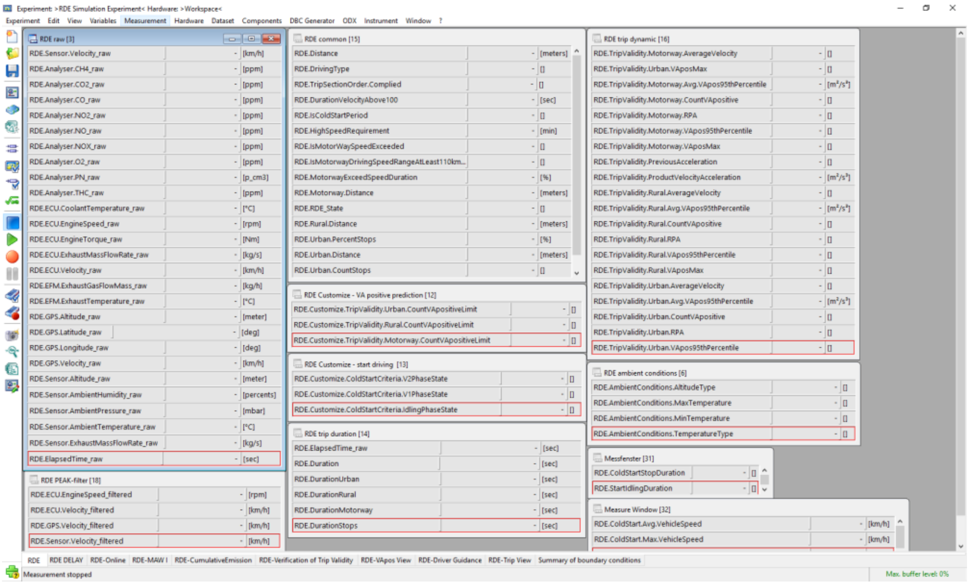
   Now the HWC shows the RDE device as a simulation device (RDE_SimDevice, RDE_Device):



8. Click **Apply** and then the experiment environment button.



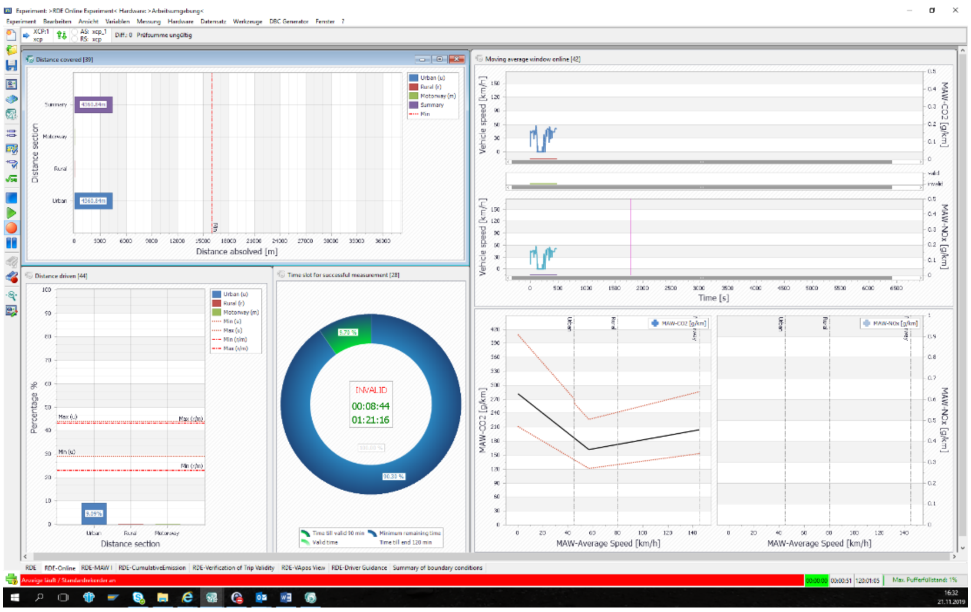
The respective INCA experiment will be opened.



To start the communication with PEMS

– In the INCA Experiment Environment, click or .

The simulation or real PEMS starts to run. The data will be visualized in the INCA Experiment Environment.



The different tabs in the INCA experiment allow seeing different views and evaluation criteria of the RDE drive.

To stop the communication with the PEMS

1. In the INCA Experiment Environment, click and the communication and calculation of the RDE analysis stops.
2. You can restart the RDE analysis calculation and measurement (or recording) by pressing any time the **Start Visualization** or **Start Recording** button (see above).

4 Working with INCA-RDE

4.1 Getting to Know the INCA-RDE User Interface

4.1.1 Getting to Know the Ribbon Tabs

The INCA-RDE ribbon consists of the following:

"RDE Configuration"

Consists of six different groups:

- "Configuration File" where you find buttons to create, load, save and save as the INCA-RDE configuration.
- "Settings" with a button to validate the INCA-RDE settings.
- “Test Mode” where can turn online/simulation the analysis mode and select a simulation format MDF or CSV of the RDE simulation.
- “RDE Data exchange and reporting” with the option whether the RDE reports should be generated or not and to select their respective path.
- "RDE Report" with the option to generate a RDE report in a PowerPoint format in a respective path based on a template corresponding with the chosen commission type.
- "Logging" with an option if the INCA-RDE logging should be generated or not.

"Help"

Consists of three different groups:

- "News" where you find buttons to open the What’s new and Release Notes documents.
- “Help Manual” here you can find the help manual.
- “Logfiles” with an option to open the mail client with attached RDE log files and a button Open Explorer that opens the window explorer with the RDE log file folder.

4.1.2 Getting to Know the Windows

The INCA-RDE windows in the RDE Analysis Settings window is as follows:

"Commission Regulation settings”

In this window, you can configure parameters related to the respective commission regulations. They are relevant for a correct analysis of the RDE drive (window “Commission Regulation settings”).

Within the window **“Commission Regulation settings”**, the user must define certain parameters to meet the right legislation for the RDE drive:

- Commission Type: you can choose between the different commission types for light-duty vehicles: European Commission, Chinese Commission, Chinese Commission or Brazil Commission.
- Regulation norm: depending on the used commission types, the user can choose between different regulation norms: when using the commission type of the European Union the RDE Act1, RDE Act2, RDE Act4, RDE Act5 6EA, RDE Act5 6EB and RDE Act 6 Euro7; for Chinese commission type C6b (China 6b); for India commission type India BS VI; for Brazil commission type LA 7 (Brazil L7)

- Measuring vehicle ground speed type: allows the choice with which device the vehicle speed will be measured:
  - GPS: measuring vehicle speed via Global Positioning System (GPS)
  - Sensor: measuring vehicle speed via external sensor
  - ECU: measuring vehicle speed via Engine Control Unit (ECU)
- Using a T4253 Hanning filter (on/off): allows to smooth (on) the vehicle speed by using a T4253 Hanning filter

NOTE

When using the Hanning filter be aware that using this filter has a high impact on the elevation gain calculation because of the filter effect the resulted distance calculation might result values of the elevation gain around „zero ".

- Using Dry Wet Correction (on/off): allows to use (on) a dry wet correction from the PEMS raw emission or not (off)
- Cold start phase settings:
  - Cold start time: allows to include/exclude the cold start in the vehicle test time
  - Engine average temperature at test start: allows to use the engine average temperature for the normal or extended range (The emissions during this cold start time interval calculated shall be divided by a value ext. (1.6))
- Ki correction settings: Adaption of Ki correction for all emission results by vehicle type with a periodically regenerating system. Customer is only allowed to choose the Ki Correction Mode:
  - None: no Ki correction is calculated to the final results
  - Additive: an additive Ki correction is calculated to the final results
  - Multiplicative: a multiplicative Ki correction is calculated to the final results
- MAW settings: see chapter 4.2.7
- Euro 7, EURO 6, China 6b, India VI or Brazil L7 emission limits settings: see chapter 4.2.7

All other parameters in this sheet cannot be changed because they are fixed by European, Chinese, India or Brazil legislations. For further information about these parameters, please look in chapter 4.2.7.

"Vehicle settings"

- Vehicle type: type of vehicle, freely configurable
- Vehicle manufacturer: vehicle manufacturer, freely configurable
- Vehicle model year: vehicle model year, freely configurable
- Vehicle model ID: vehicle identifier [VIN code]
- Vehicle category: defines which type of vehicle will be tested. The user can choose between the types undefined, M1, M2, N1 and N2.
- Reference mass: defines the mass of the vehicle depending on the vehicle category
- Propulsion type: defines the vehicle type for the RDE test. The user can choose between the ICE (Internal Combustion Engine), NOVC-FCHV (Not Off Vehicle Charge Fuel Cell Hybrid Vehicle), OVC-HEV (Off Vehicle Charge Hybrid Electric Vehicle) and NOVC-HEV(Not Off Vehicle Charge Hybrid Electric Vehicle).
- Engine type: defines the type of internal combustion engine:
  - compressed ignition engine (Diesel)

- positive ignition engine (gasoline)

– Fuel type: defines the type of fuel used for the internal combustion engine. For European Act1 – Act4, Chinese or India legislations:
  - Diesel
  - Ethanol
  - CNG
  - LPG
  - Petrol E10
  - Ethanol E85

  For European Act5 6EA legislation:
  - Diesel
    - Diesel B0
    - Diesel B5
    - Diesel B7
  - Ethanol
  - CNG
  - LPG
  - Petrol
    - Petrol E0
    - Petrol E5
    - Petrol E10
  - Ethanol E85

  For Brazil legislation:
  - Diesel
  - Petrol E0
  - CNG
  - Petrol E22
  - Petrol E61
  - Ethanol E100

– Engine rated power: defines the engine rated maximum power, freely configurable
– Vehicle test mass: defines the vehicle test mass, freely configurable
– Reference emissions mass settings: For European and Chinese is used (WLTC): Result of WLTP emission cycle
  - Reference mass CO2: WLTP reference mass (result) of WLTP Emission test in kg/Cycle
  - Reference mass CO2 Low Phase: WLTP reference mass (result) of WLTP Emission test during low phase in g/km
  - Reference mass CO2 Middle Phase: WLTP reference mass (result) of WLTP Emission test during middle phase in g/km
  - Reference mass CO2 High Phase: WLTP reference mass (result) of WLTP Emission test during high phase in g/km
  - Reference mass CO2 Extra High Phase: WLTP reference mass (result) of WLTP Emission test during extra high phase in g/km

  For India is used (MIDC):

- Reference mass CO2: MIDC reference mass (result) of MIDC Emission test in kg/Cycle
- CO2 emissions in Urban Phase: MIDC reference mass (result) of MIDC Emission test during urban phase in g/km
- CO2 emissions in extra Urban Phase: MIDC reference mass (result) of MIDC Emission test during extra urban phase in g/km

For Brazil is used (ABNT NBR 6601):

- Reference mass CO2: ABNT NBR 6601 reference mass (result) of ABNT NBR 6601 Emission test in kg/Cycle
- CO2 emissions in Phase 2: ABNT NBR 6601 reference mass (result) of ABNT NBR 6601 Emission test during urban phase in g/km
- CO2 emissions in Phase 3: ABNT NBR 6601 reference mass (result) of ABNT NBR 6601 Emission test during urban phase in g/km

"Customize settings"

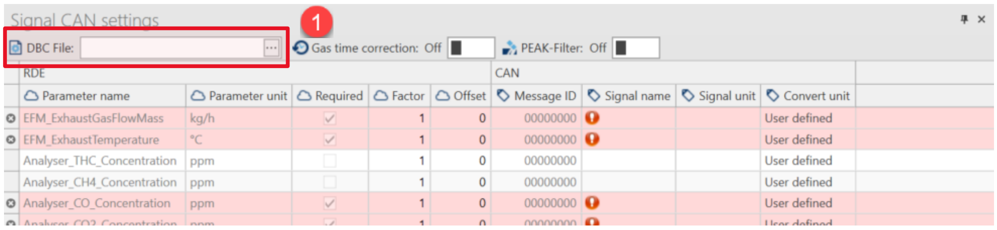
The window “Customize settings” provides a possibility to customize, based on defined parameters, an online evaluation after engine start and a defined car take-off procedure (option “Start drivings settings”). The option “VApos prediction settings” allows a V*Apos prediction of the RDE drive. Here you can customize specific RDE settings. These settings are described in detail in chapter 4.2.9.

"RDE Common settings"

A “User”, “Dataset”, “Project name” and “Project comment” can be individually added.

Signal CAN Settings window

The INCA-RDE windows in the **Signal CAN Settings** window (will be shown when Analysis mode is “Online”) is as follows:

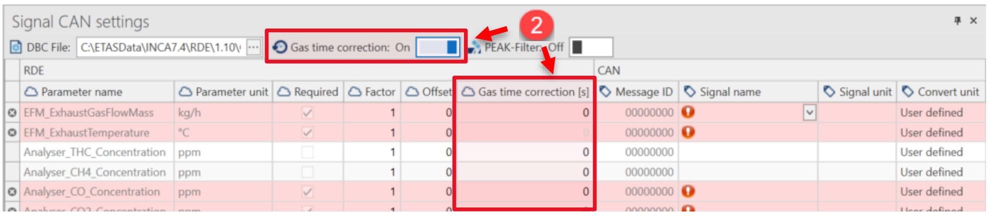


You can change here the settings of the communication with the PEMS via CAN bus. At the very top of the window, the user can choose the used DBC File for the PEMS communication. For a proper RDE analysis, you must map the measurement parameters of the PEMS correctly to the respective parameters of the INCA-RDE tool.

In the lower part of the window, you can set these kinds of assignments. You can see the chosen DBC file 1, which should contain the correct measurements parameters of the PEMS, as "Signal name" with "Signal unit" and the respective "Message ID". On the left side of the column "Parameter name" and "Parameter unit", the respective INCA-RDE parameters are shown. In the column "Required" it is marked which of the parameters are necessary to perform an online RDE analysis. For the "Parameter name" choose the corresponding CAN message of the CAN DBC file.

The columns "Factor" and "Offset" show a default scaling based on a plausibility check of the "Parameter unit" and the corresponding "Signal unit". You can change the default conversion. If a wrong conversion has been defined, the row turns red, and the symbol appears in front of the corresponding unit.

The option "Using gas time correction"



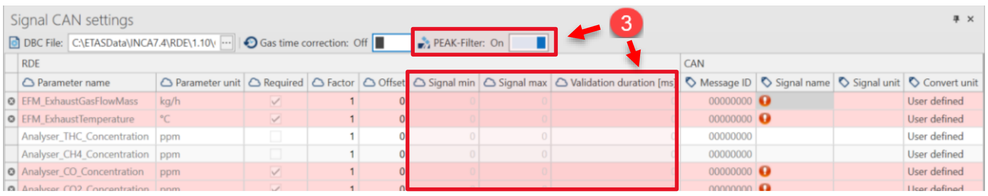
The option "Using gas time correction" 2 offers the opportunity to define the time delay between the emission creation in the engine and the final analysis of this emission with the PEMS system (like EFM exhaust gas flow mass, Analyser THC concentration, Analyser CH4 concentration, Analyser CO concentration, Analyser CO2 concentration, Analyser NOx concentration, Analyser NO concentration, Analyser NO2 concentration, Analyser O2 concentration, Analyser PN concentration).

Usually, the customer knows this time delay for each of these emissions. The user must define in the column "Gas time correction" the values for the respective emissions. All calculated RDE relevant parameters, which have PEMS emission values, as an input, will then be delayed based on the slowest value of those emissions. Values that are not PEMS related will still be calculated in real-time (e.g., vehicle speed, acceleration). The original signal (*_raw) and the delayed signal (*_) will be shown in the respective window of the INCA experiment and stored in the measurement file.

The delayed parameter will then be shown in the INCA experiment with delay corresponding to the defined delay time with respect e.g., to the vehicle speed during the RDE drive. In addition, it will start the visualization of the respective parameter with the defined delay time and stop the visualization accordingly.

Please be aware to use only this option when the PEMS system is NOT considering the time delay of the emission data before putting it on the CAN. The user defines for each of the emission the respective time delay in the respective cell of the column "Gas time correction".

The option "PEAK-Filter"

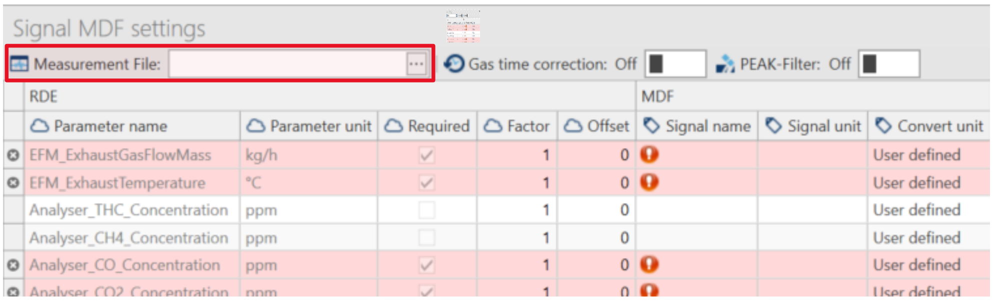


The option "PEAK-Filter" 3 offers the opportunity to make a plausibility check of specific CAN signals (velocity and engine speed, like ECU engine speed, ECU velocity, GPS velocity and Sensor velocity) to avoid incorrect peak signals from the CAN bus with the respective impact on the customizable settings (Start procedure e. g.). It allows defining the range of plausible CAN signals (Signal min/Signal max). If the CAN signal is outside this defined range, the respective signal will be set to the last valid value of this signal. Should the implausible CAN signal last longer than a defined period (“Validation duration”), the respective signal would be set to NaN (Not a Number). The original signal (*_raw) and the filtered signal (*_filtered) will be shown in the respective window of the INCA experiment and stored in the measurement file.

Both options (“Using gas time correction” and “PEAK-Filter”) can also been chosen in the simulation mode when using “Signal MDF settings” or “Signal CSV settings”.

The INCA-RDE windows in the **Signal CSV Settings (Simulation format “CSV”)** or **Signal MDF Settings (Simulation format “MDF”)** (will be shown when Analysis mode is “Simulation”) is as follows:

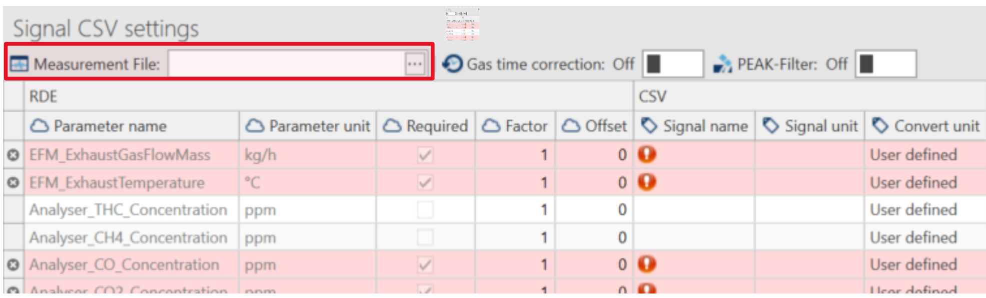
"Signal MDF settings"



Here you can change the settings of the communication with the simulation format MDF. On the top of the window, there are boxes to configure the measurement file (MDF 3.0 and MDF 4.0) 1, the gas time correction and the peak filter. For a proper RDE analysis, you must map the measurement parameters of the MDF correctly to the respective parameters of the INCA-RDE tool. In the lower part of the window, you can set these kinds of configurations. You can see the chosen measurement file, which should contain the correct measurements parameters of the PEMS, as "Signal name" with "Signal unit". The left side of the column "Parameter name" and "Parameter unit", shows the respective INCA-RDE parameters. In the column "Required" it is marked which of the parameters are necessary to perform a simulation RDE analysis. For the "Parameter name" choose the corresponding signal of the measurement file.

The columns "Factor" and "Offset" show a default scaling based on a plausibility check of the "Parameter unit" and the corresponding "Signal unit". You can change the default conversion. If a wrong conversion has been defined, the row turns red and appears in front of the corresponding unit.

“Signal CSV settings"



Here you can change the settings of the communication with the simulation format CSV. On the top of the window, there are boxes to configure the measurement file (CSV) 1, the gas time correction and the peak filter. For a proper RDE analysis, you must map the measurement parameters of the CSV correctly to the respective parameters of the INCA-RDE tool. In the lower part of the window, you can set these kinds of configurations. You can see the chosen measurement file, which should contain the correct measurement parameters of the PEMS, as "Signal name" with "Signal unit". The left side of the column "Parameter name" and "Parameter unit", shows the respective INCA-RDE parameters. In the column "Required" it is marked which of the parameters are necessary to perform a simulation RDE analysis. For the "Parameter name" choose the corresponding signal of the measurement file.

The columns "Factor" and "Offset" show a default scaling based on a plausibility check of the "Parameter unit" and the corresponding "Signal unit". You can change the default conversion. If a wrong conversion has been defined, the row turns red and appears in front of the corresponding unit.

Error List window

The INCA-RDE windows **"Error List"** is a list of the occurring errors, warnings or massages related to the validation of the RDE configuration. To delete the massages, click Clear.

4.1.3 Customizing the Window Layout

By default, the windows of the RDE Analysis settings, Vehicle settings, Customized settings and the RDE Common settings are combined in one window, which is docked on the left side. The window of CAN Device settings is docked on the left side and the window of the Error List is docked on the bottom. You can change the default position of the windows:

You can perform the following actions:

- Hide a window
- Autohide a window
- Undock a window
- Dock a window
- Hide and Unhide the ribbon
- Show the quick access toolbar below the ribbon

To hide a window

- To hide an open window, click .

To autohide a window

1. In the toolbar of the window, click .
2. Depending on its previous position, the window is shown as a tab at the left or right edge of INCA-RDE.
3. When you hover over the title, the window temporarily displays again until you move the mouse off the window.
4. To stop autohiding the window, click .

To undock a window

To display a window floating above the other INCA-RDE windows, do one of the following:

1. Click on the title bar of the window.
2. While keeping the mouse button pressed, move the window to another position.

or

3. Right-click the title bar of the window.

4. In the context menu, click **Float**.

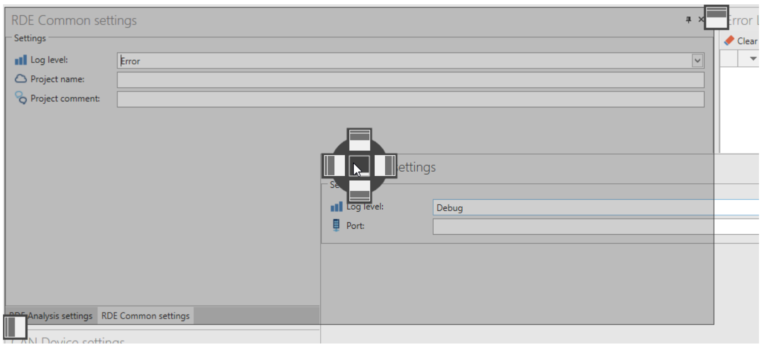
To dock a window

1. Drag the title bar of a floating window to a new position.
2. Do one of the following:
3. Move the cursor to one of the graphical elements.

   The future position of the window is displayed in light grey.

   If you move, the cursor to the graphical element in the centre the window will be docked as tab to another window.

   The future position of the window is displayed in light grey.



4. If the position is correct, release the mouse button.

To hide and unhide the ribbon

1. Do one of the following:

- Click the arrow on the right side of the ribbon.
- Double-click on one of the ribbon labels "RDE Configuration", "Real Drive Emission" or "Help".

  The ribbon is no longer displayed.

2. To show the hidden ribbon, redo one of the actions described under step 1.

To show the quick access toolbar below the ribbon

1. To show the quick access toolbar below the ribbon, click the arrow.

2. Select **Show Quick Access Toolbar Below the Ribbon**.
3. To relocate the quick access toolbar again, click the arrow and select **Show Quick Access Toolbar Above the Ribbon**.

4.2 Getting to Know the RDE Specific INCA Instruments

This chapter gives you an overview about the available INCA instruments. All PEMS measurement signals can be visualized and recorded within INCA.

Figure 4-1 shows specific INCA instruments.

1: Distance Instruments

2: Trip Validity Instruments

3: Moving Average Windows (MAW)

Figure 4-1: Specific INCA instruments from the RDE online evaluation

4.2.1 Distance Instruments

The INCA-RDE instruments for driven distance provide easy-to-understand diagrams that visualize the absolved distance in meters divided in distance sections and the driven distance in the different sections in percent.

The red lines indicate the absolute minimum and the yellow line (see Figure 4-2 and Figure 4-3) indicates the relative minimum of the required driven distance according to legal requirements of RDE legislation.

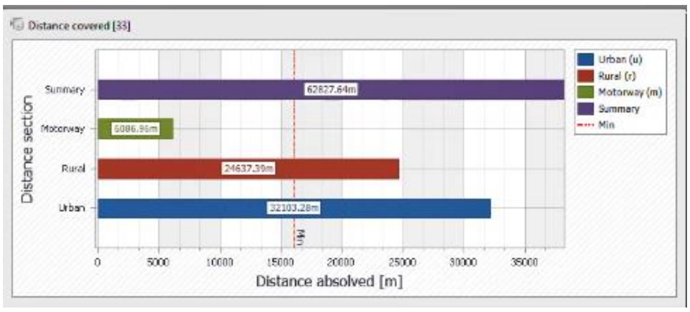


Figure 4-2: Distance covered instruments of INCA-RDE

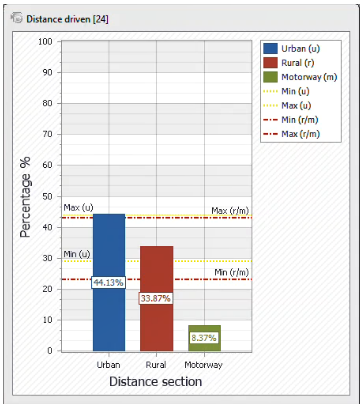


Figure 4-3: Driven distance instruments of INCA-RDE

4.2.2 Trip Validity Instruments

The INCA-RDE cycle time instrument provides an orientation of the minimum and maximum of required valid driving time. The outer ring visualizes the minimum of 90 minutes valid time divided in absolved and remaining time. The inner ring appears after 90 minutes of valid time and represents a countdown of 30 minutes until the maximum of 120 minutes are reached.

1: Validity period specified

2: Total time

3: Countdown

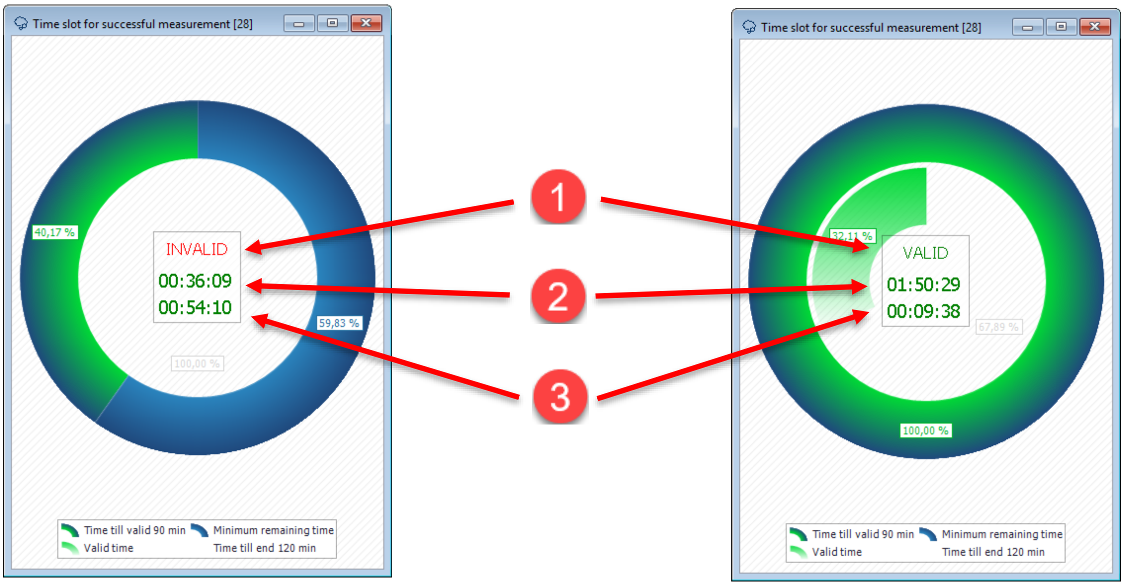


Figure 4-4: RDE cycle time indicator of INCA RDE Online

NOTE

Delay of data display calculation of V*Apos by one second (only for online use case).

The acceleration for the V*Apos calculation is defined by law by using three defined values with the following defined time stamps: t-1, t, t+1; t represents the current time stamp. The time stamp t+1 lies in the future and therefore this requirement cannot be implemented in this direct way for an online calculation. The solution is to shift the complete acceleration calculation one time stamp in the past. This results in a V*Apos calculation which is shifted one time stamp behind the current value, so that the V*Apos calculation will be shown one time stamp behind the current value.

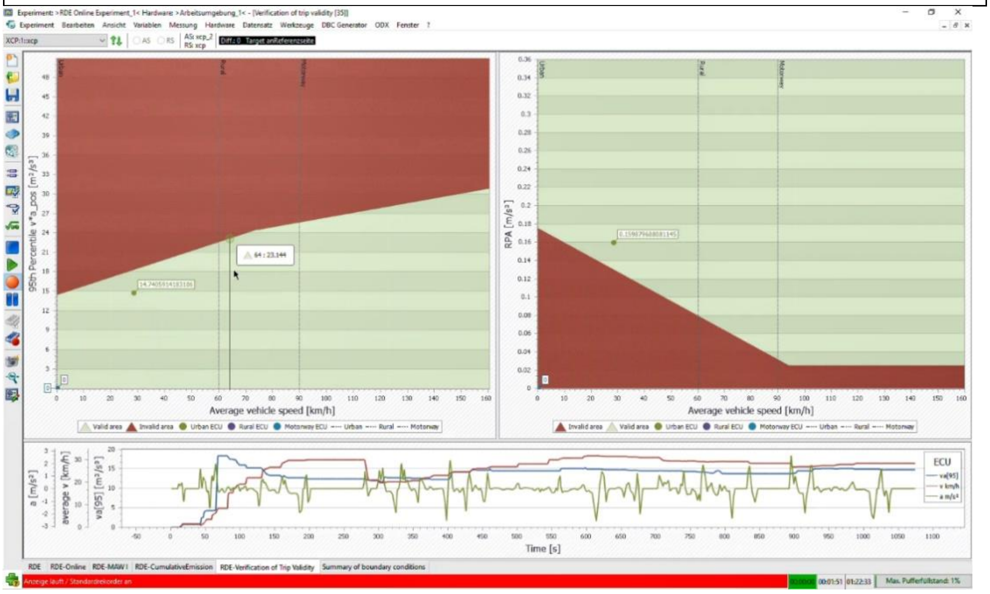
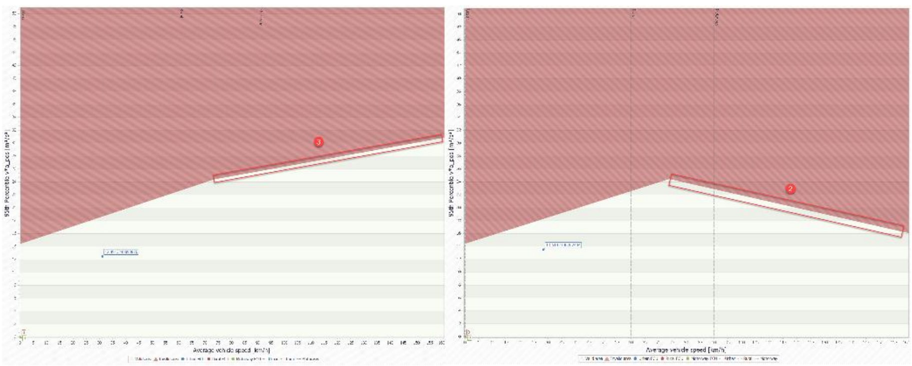


Figure 4-5: Instruments of INCA RDE Online of trip validity

The windows in Figure 4-5 show the verification of the trip validity with respect to the acceleration and vehicle speed.

Depending on the vehicle settings with the respective engine rated power and vehicle test mass, the settings in the INCA RDE-Online Experiment will change in the instrument “Verification of trip validity” with the 95th Percentile VApos chart.



Standard vehicle class

Vehicle class ≤ 44 W/kg

The window in Figure 4-6 shows the current VApos value and the 95th percentile of the VApos of each section of the trip validity.

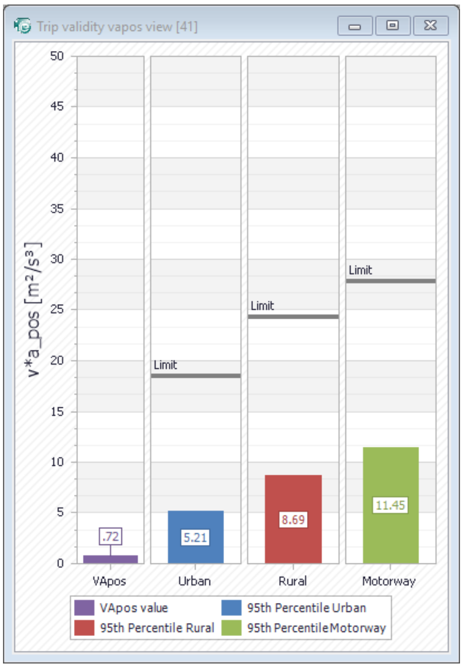


Figure 4-6: RDE VApos view of trip validity

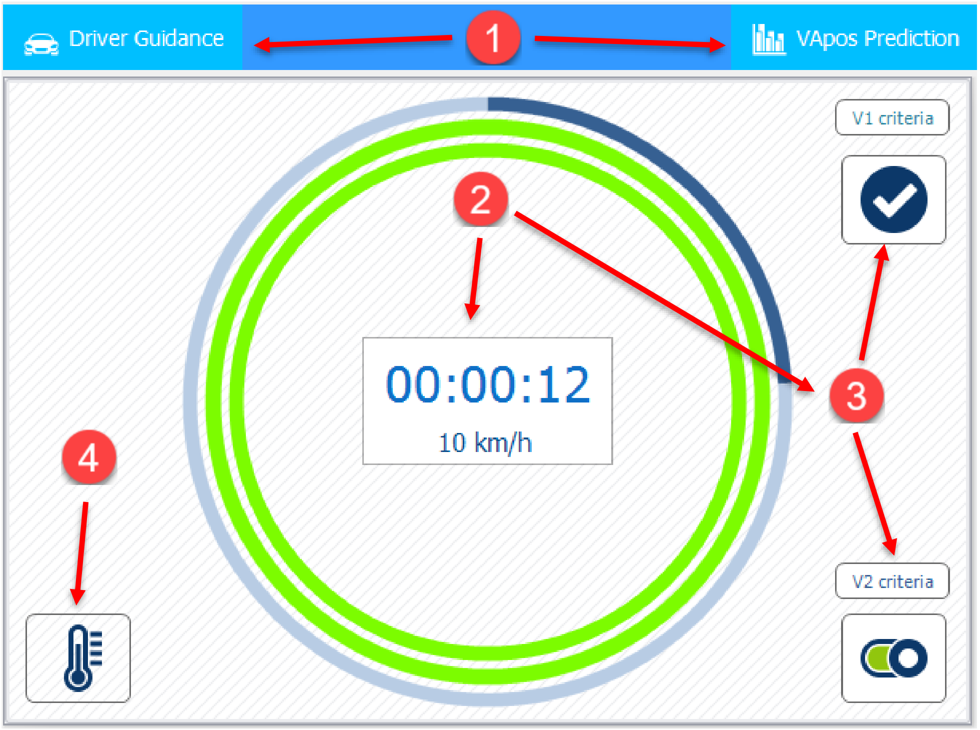


Figure 4-7: RDE Analysis customizing driver guidance instrument

1: Buttons for the driver guidance and VApos prediction view

2: Countdown refers to the rings

3: V1 and V2 phases condition successful or failed

4: Cold start condition completed

The window in shows a special visualization for a driver guidance during the cold start and car take-off situation directly after engine start. Clicking Driver Guidance or VApos Prediction switches to the respective visualization.

The visualization “Driver Guidance” contains of three rings. The inner ring contains the idling phase, the middle ring contains the V1 criterion, and the outer ring contains the V2 criterion (see below in Figure 4-8). After having completed the idling phase, it will appear a countdown view for the following V1 and V2 criterion. When both criteria will be successfully fulfilled, they will be check-marked.

Figure 4-8 shows the respective configuration menu for the cold start and car take-off procedure:

The cold start phase is defined by its duration time with tolerance; the V1 and V2 criterion will be defined by its duration with tolerance time and the target velocity with a defined tolerance. The respective setting will be shown in the “Start Driving Chart”.

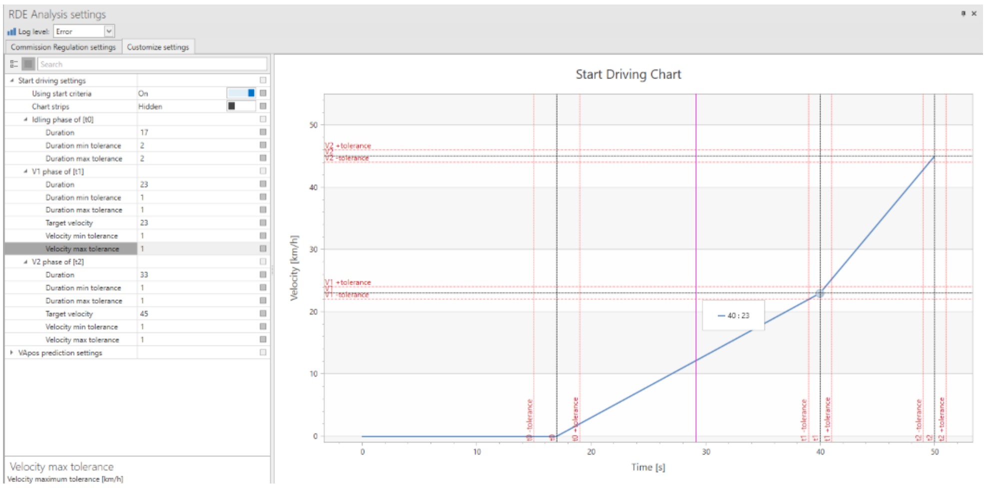


Figure 4-8: Configuration of the cold start and car take off procedure

By clicking on VApos Prediction the visualization switches to the respective window shown in Figure 4-9. It shows the current VApos value and the 95th percentile of the VApos with the VApos prediction of each section of the trip validity. The idea of this visualization is to perform a RDE “Worst Case” emission conformity with respect to maximum allowed acceleration. This function allows based on a defined “target average velocity” configured for each speed bin in the VApos prediction settings a prediction of necessary accelerations to meet the borderline of the VApos regulation (see also Figure 4-9).

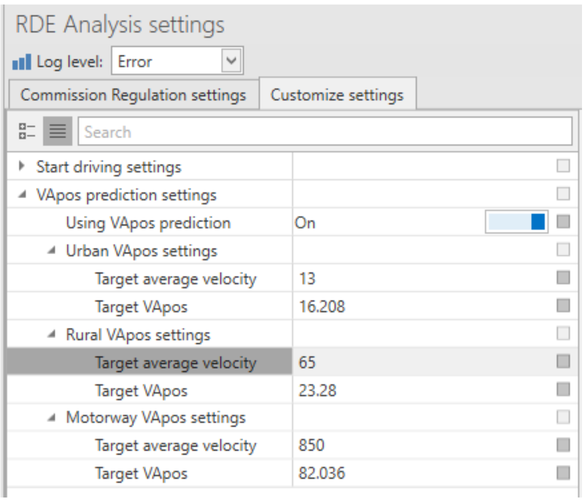


Figure 4-9: VApos prediction settings

The respective instrument in INCA is shown in Figure 4-10: The speed bin calculation is divided in 4 sections: the speed bins urban, rural und motorway and the current VApos value on the very left. The numbers in the bars reflect the current (95 percent) value of VApos. The grey crossline shows the maximum allowed 95 percent VApos threshold value based on the defined average velocity for each speed bin. The numbers below (or above) the crossline indicates the driver how many accelerations above or below the 95 percent threshold value are necessary to meet exactly this defined threshold.

1: VApos prediction of each section

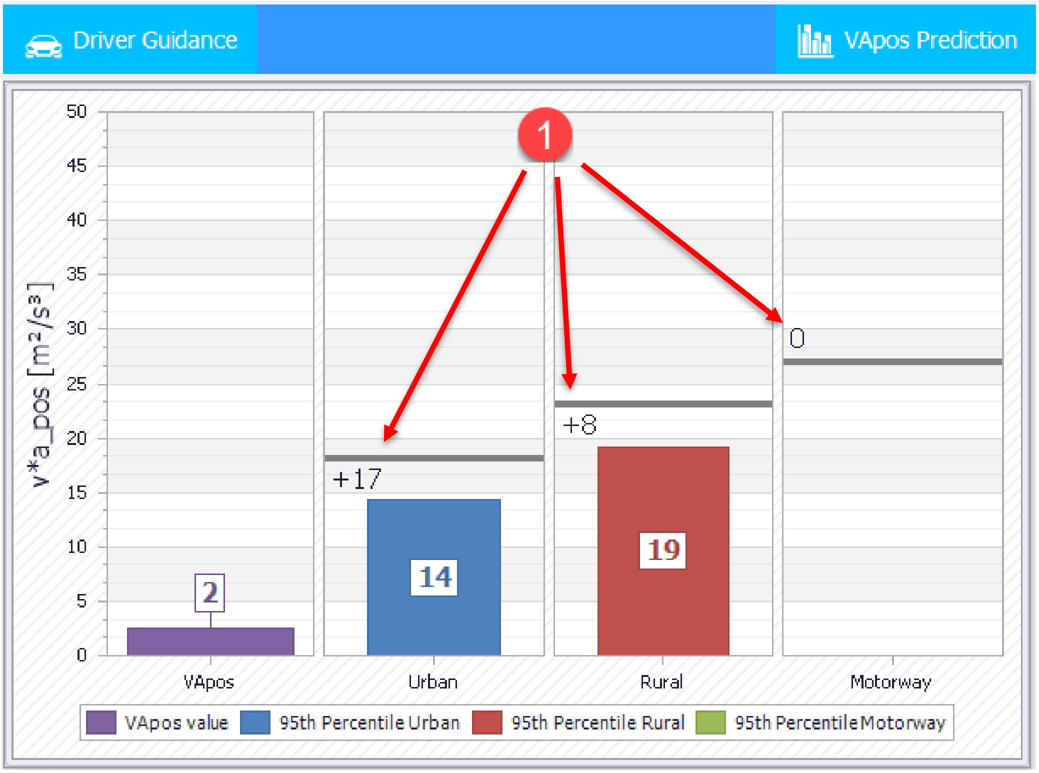


Figure 4-10: RDE Analysis customizing VApos prediction instrument

4.2.3 Moving Average Window (MAW)

Figure 4-11 shows the Moving Average Window (MAW) calculation of the CO_2 and NOx emissions over time. It also contains the evaluation of the values with respect to the characteristic curve between the upper and lower tolerance bands.

1: Averaged CO_2 emissions over time, starting with the first averaging window

2: Averaged NOx emissions over time, starting with the first averaging window

3: CO_2 characteristic curve

4: Calculation of Moving Average Window NOx versus averaged speed

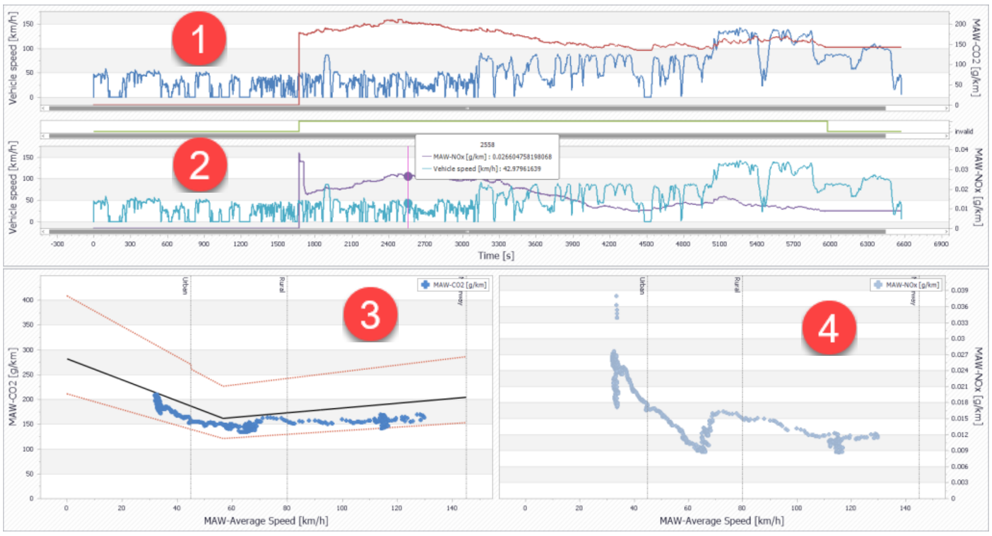


Figure 4-11: MAW calculation for CO2 and NOx as well as vehicle speed

Figure 4-12 shows the modal and cumulative CO_2 and NOx emissions over time of the driving cycle. Additionally, the vehicle speed of the driving cycle over time is displayed.

1: Cumulated CO_2 emissions and speed versus time.

2: Cumulated CO emission and speed versus time.

3: Cumulated NOx emission and speed over time.

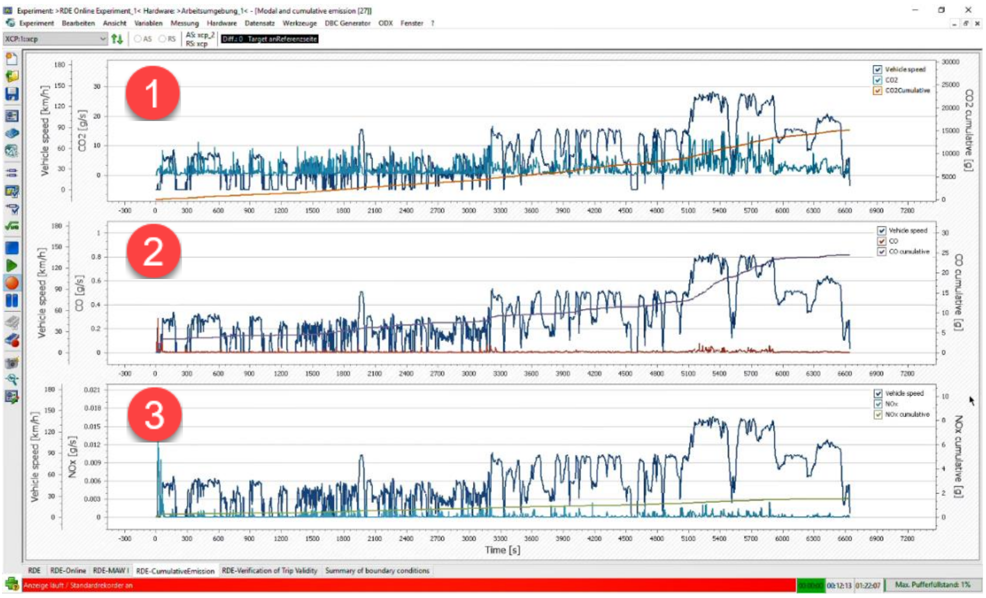


Figure 4-12: Modal and cumulative emission

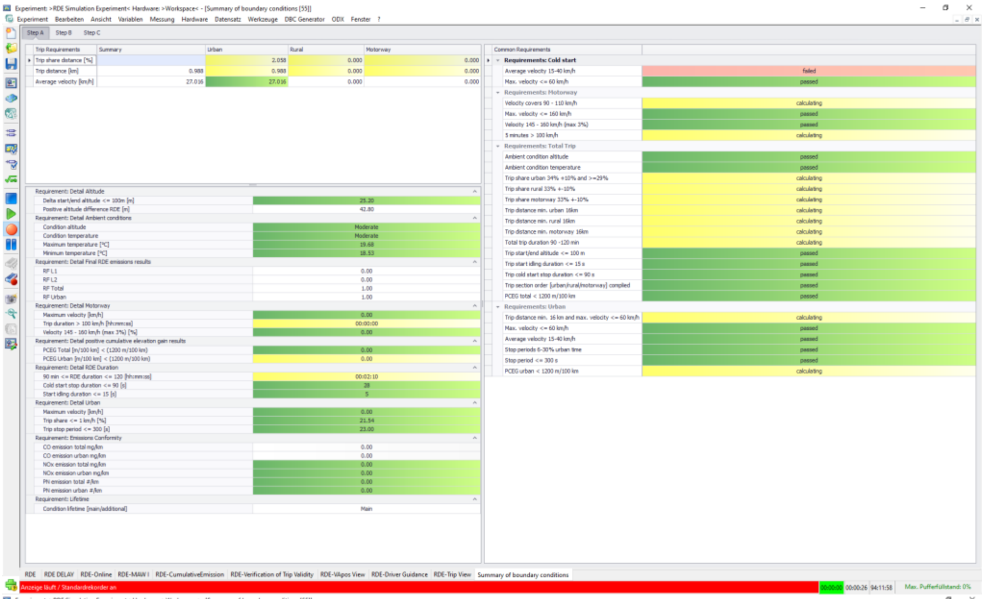
4.2.4 Trip Section Order Compliance

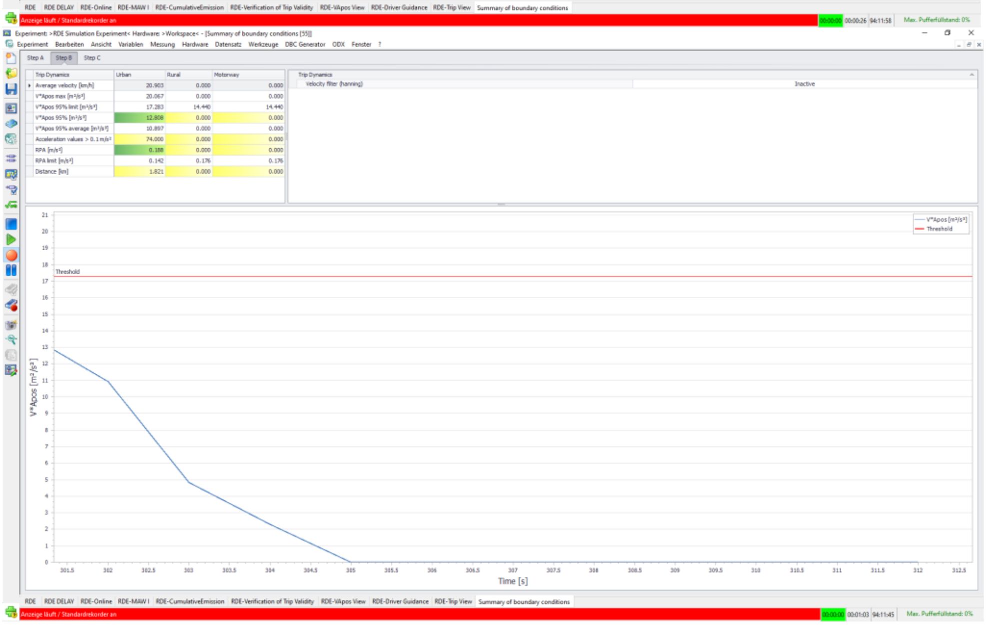
Figure 4-13 shows a trip sections visualization divided in a distance-specific chart and a time-specific chart

Figure 4-13: Distance-specific and time-specific chart

4.2.5 Summary of Boundary Conditions

The data for the overall boundary conditions are shown in the tabulator "Summary of boundary conditions" in INCA in the field "Boundary Conditions". They are divided in three different sheets “Step A”, “Step B” and “Step C” as shown in the Figure 4-14.





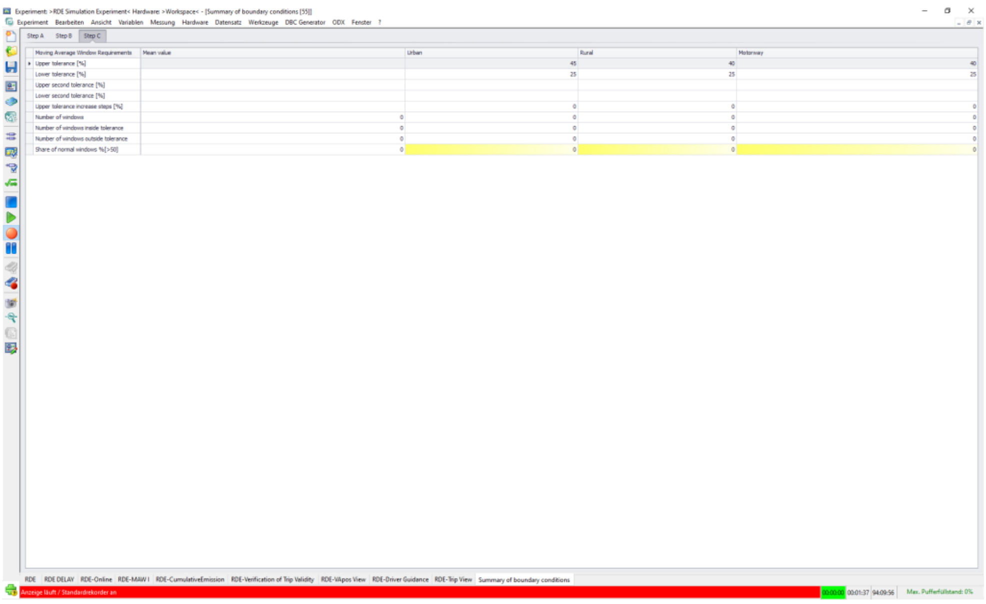


Figure 4-14: The three different sheets Step A, Step B and Step C with the different boundary conditions shown in a table for the attributes "Trip Requirements", "Detail Altitude“, “Common Requirements" (Step A), “Trip Dynamics” (Step B) and “Moving Average Window Requirements” (Step C)

The shown parameter in the sheet “Step A” are divided in the table "Trip Requirements", "Detail Altitude" and "Common Requirements" and have the following meaning (in this case representative for the EU legislation):

Step A

Trip Requirements:

Parameter	Description
Trip share distance [%]	Percentage distribution of the complete driven distance for the sections "Urban", "Rural" and "Motorway" in percentage. No summary section.
Trip distance [km]	Driven distance for the sections "Urban", "Rural" and "Motorway" in km. The summary section shows the sum of all section values.
Average velocity ECU [km/h]	Averaged velocity divided in "Urban", "Rural" and "Motorway". The summary section shows the averaged velocity of all averaged velocities of the different sections (Urban, Rural and Motorway) with respect to their share on the current complete driving cycle in km/h.

Requirement - Detail Altitude:

Parameter	Description
Delta start/end altitude <= 100 m [m]	Verification if the altitude between RDE drive cycle start and end is lower than 100 meters in meters.
Positive altitude difference RDE [m]	The absolute positive altitude difference during the whole RDE drive cycle in meters.

Requirement – Detail Ambient Conditions

Parameter	Description
Condition altitude	Current altitude condition
Condition temperature	Current temperature condition
Maximum temperature [°C]	Current maximum temperature
Minimum temperature [°C]	Current minimum temperature

Requirement – Detail Final RDE emission results

Parameter	Description
RF L1	This is the first parameter of the function used to calculate the result evaluation factor.
RF L2	This is the second parameter of the function used to calculate the result evaluation factor.
RF Total	This is the result evaluation factor calculated for the total RDE trip.
RF Urban	This is the result evaluation factor calculated for the urban RDE trip.

Requirement - Detail Motorway:

Parameter	Description
Maximal velocity ECU [km/h]	Absolute maximum velocity during the RDE drive in km/h.
Trip duration >= 100 km/h [hh:mm:ss]	The time where the RDE drive cycle has been higher than 100 km/h in the format hh:mm:ss.
Velocity 145 – 160 km/h (max. 3%) [%]	The percentage value based overall RDE drive cycle where the velocity has been between 145 km/h and 160 km/h.

Requirement - Detail positive cumulative elevation gain (PCEG) results. The calculated normalized value per 100 km is not allowed to exceed 1200 meter for total and urban section of the cycle:

Parameter	Description
PCEG Total	Current PCEG value for the complete cycle
PCEG Urban	Current PCEG value for the urban cycle

Requirement - Detail RDE Duration:

Parameter	Description
90 min <= RDE duration <= 120 min [hh:mm:ss]	Absolute time for the RDE drive in the format hh:mm:ss.
Cold start stop duration <= 90 [s]	The time shall not exceed in the cold start in total 90 seconds.
Start idling duration <= 15 [s]	The vehicle shall move within 15 seconds.

Requirement - Detail Urban:

Parameter	Description
Maximum velocity [km/h]	Maximum velocity in the urban cycle
Trip share <= 1km/h [%]	The percentage value based overall RDE drive cycle where the velocity has been lower than 1km/h.
Trip stop period <= 300 [s]	The time shall not exceed stop period in total 300 s.

Requirement – Emissions conformity:

Parameter	Description
CO emission total mg/km	CO emissions for total cycle
CO emission urban mg/km	CO emissions for urban cycle
NOx emission total mg/km	NOx emissions for total cycle
NOx emission urban mg/km	NOx emissions for urban cycle
PN emission total #/km	PN emissions for total cycle
PN emission urban #/km	PN emissions for urban cycle

Requirement – Lifetime:

Parameter	Description
Condition Lifetime [main/additional]	Main lifetime up to 160.000 km or 8 years (whichever comes first). Additional lifetime up to 200.000 km or 10 years (whichever comes first) allows 1.2 gaseous pollutants compared to the main lifetime threshold.

The table "Common Requirements" shows the status for several common requirements of the RDE legislation. The status values have different meanings and are as follows:

– offline: not initialized
– online: currently initialize but not started
– calculating: not yet fulfilled but can still be fulfilled
– pass: currently or finally (at the end of the cycle) fulfilled
– fail: currently not fulfilled or finally (at the end of the cycle) not fulfilled

Requirements – Cold start

Parameter	Description
Average velocity 15-40 km/h	Valid if the average velocity in the cold start phase is between 15 km/h and 40 km/h.
Max. velocity <= 60 km/h	Valid if the vehicle speed in the cold start phase is small/equal 60 km/h

Requirements - Motorway

Parameter	Description
5 minutes >= 100 km/h	Valid if the vehicle speed has been at least for 5 minutes of the whole RDE drive cycle higher than or equal to 100 km/h.
Velocity covers 90 – 110 km/h	Valid if the vehicle speed during the whole RDE drive cycle covers a range between 90 km/h and 110 km/h.
Max. velocity <= 160 km/h	Valid if the vehicle speed during the whole RDE drive cycle has been lower than or equal to 160 km/h.
Velocity 145 – 160 km/h (max. 3%)	Valid if the vehicle speed has been between 145 km/h and 160km/h for a maximum of 3 percent of the whole RDE driving cycle.

Requirements - Total Trip:

Parameter	Description
Ambient condition altitude	Valid if the altitude has a state moderate or extended.
Ambient condition temperature	Valid if the temperature has a state moderate or extended.
Trip share urban 34% + 10% and >= 29%	Valid if the urban trip share is between 29% and 34% (+ 10%).
Trip share rural 33% +- 10%	Valid if the rural trip share is less than 33% (+- 10%).

Trip share motorway 33% +- 10%	Valid if the motorway trip share is less than 33% (+- 10%).
Trip distance min. urban 16 km	Valid if the urban share of the trip distance is at least 16 km.
Trip distance min. rural 16 km	Valid if the rural share of the trip distance is at least 16 km.
Trip distance min. motorway 16 km	Valid if the motorway share of the trip distance is at least 16 km.
Total trip duration 90 – 120 min.	Valid if the total duration of the trip is between 90 and 120 minutes.
Trip start/end altitude <= 100 m	Valid if the altitude between RDE drive cycle start and end is lower than 100 meters in meters.
Trip start idling duration <= 15 s	Valid if the Idling duration at trip start will be less/equal 15 seconds
Trip cold start stop duration <= 90 s	Valid if during cold start the stop duration will be less/equal 90 seconds
Trip section order (urban/rural/motorway) complied	Valid if all requirements for the section order for the urban, rural and motorway cycle are fulfilled and completed
PCEG total < 1200 m /100 km	Valid if PCEG value (< 1200 m /100 km) is fulfilled for the complete RDE cycle

Requirements - Urban:

Parameter	Description
Trip distance min. 16 km and max. velocity <= 60 km/h	Valid if urban trip distance is at least 16 km and the vehicle speed is small/equal 60 km/h
Max. velocity <= 60 km/h	Valid if urban trip the vehicle speed is small/equal 60 km/h
Average velocity 15-40 km/h	Average velocity in urban cycle between 15 and 40 km/h
Stop periods 6-30% urban time	Stop periods in urban cycle between 6 and 30 percent of whole cycle time
Stop period <= 300 s	Valid if during urban the stop duration will be less/equal 300 seconds
PCEG urban < 1200 m/100 km	Valid if PCEG value (< 1200 m /100 km) is fulfilled for the urban RDE cycle

The data for the trip dynamics are shown in the “Step B” sheet of the tabulator "Summary of boundary conditions" in INCA in the field "Trip Dynamics" as shown in the Figure 4-14.

The shown parameters in this table have the following meaning:

Parameter	Description
Average velocity ECU	Average velocity divided in "Urban", "Rural" and "Motorway". The section "Summary" shows the averaged velocity of all averaged velocities of the different sections (Urban, Rural and Motorway) with respect to their share on the current complete driving cycle in km/h.

V*Apos 95% max	Maximum sampled value for the 95th percentile of the product of vehicle speed per positive acceleration greater than 0,1 m/s in m²/s³ for the sections "Urban", "Rural" and "Motorway". The 95th percentile represents the calculated v*Apos values ranked in ascending order. The summary section shows the averaged velocity of all values of those sections with respect to their share on the current complete driving cycle.
V*Apos 95% limit	Maximum allowed value for the 95th percentile of the product of vehicle speed per positive acceleration greater than 0,1 m/s in m²/s³ divided in the section "Urban", "Rural" and "Motorway". The summary section shows the current value independent from the current section.
V*Apos 95%	Current value of the 95th percentile of the product of vehicle speed per positive acceleration greater than 0,1 m/s in m²/s³ for the sections "Urban", "Rural" and "Motorway". The summary section shows the current value independent from the current section.
V*Apos 95% average	Average value of all sampled values of the 95th percentile of the product of vehicle speed per positive acceleration greater than 0,1 m/s in m²/s³ for the sections "Urban", "Rural" and "Motorway". The summary section shows the current men value.
Acceleration values > 0.1	Value of acceleration higher than 0.1 m/s² divided in "Urban", "Rural" and "Motorway". The summary section shows the sum of all section values.
RPA Value	Relative positive acceleration for "Urban", "Rural" and "Motorway" shares in m/s². The summary section shows the sum of all section values.
RPA limit	Maximum allowed relative positive acceleration value in m/s² for "Urban", "Rural" and "Motorway" shares in m/s². The summary section shows the current value independent from the current section.
Distance	Current absolved distance in km. The summary shows the sum of all section values.
Velocity filter (hanning)	Shows if the (Hanning) velocity filter is activated or not.

The “Moving Average Window Requirements” are visualized in the sheet Step C as shown in the Figure 4-14.

The shown parameters in this table have the following meaning:

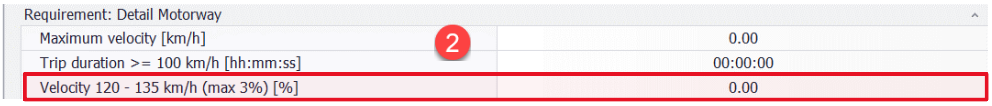
Parameter	Description
Upper tolerance [%]	The upper tolerance value for the sections "Urban", "Rural" and "Motorway" in percent.
Lower tolerance [%]	The lower tolerance value for the sections "Urban", "Rural" and "Motorway" in percent.
Upper tolerance increase steps [%]	The upper positive tolerance tol1H may be increased by steps of 1 % until the 50 % target is reached (only for NOVC- and OVC-HEVs).

Number of windows	Value contains the number of all windows for the sections "Urban", "Rural" and "Motorway".
Number of windows inside tolerance	Value contains the number of windows for the sections "Urban", "Rural" and "Motorway" that are inside the valid tolerance.
Number of windows outside tolerance	Value contains the number of windows for the sections "Urban", "Rural" and "Motorway" that are outside the valid tolerance.
Share of normal windows & [> 50]	The minimum share of 50 % for the sections "Urban", "Rural" and "Motorway" that are inside tolerance.

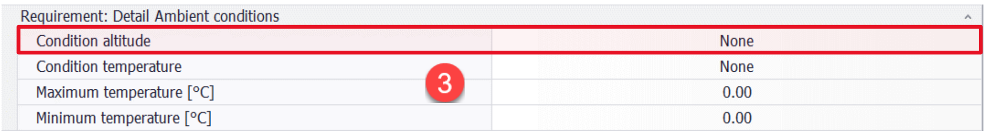
China specific adaption of the INCA instruments in the “Summary of boundary conditions”

Because the China 6b legislation differs at some points from the EU legislation, the respective values must be adapted in the INCA instruments. This will be automatically performed when the user chooses the China commission type. The differences in the INCA instruments are as followed:

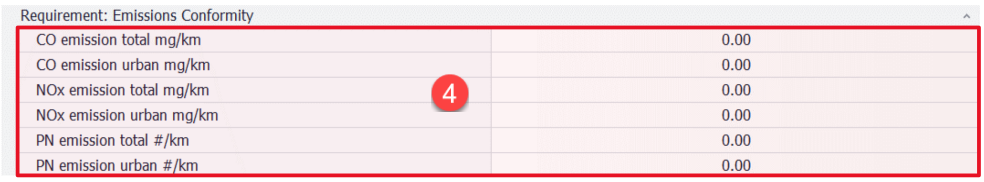
1: Instrument: Summary of boundary conditions, Step A, Requirements Motorway



2: Instrument: Summary of boundary conditions, Step A, Requirement Detail Motorway



3: Instrument: Summary of boundary conditions, Step A, Requirement Detail Ambient conditions, Moderate: < 700 m, Extended: 700-1300 m, further extended: 1300-2400 m



4: Instrument: Summary of boundary conditions, Step A Requirement Emissions Conformity, Final RDE Emission Calculation for OVC-HEV Vehicle

Moving Average Window Requirements	Mean value	Urban	Rural	Motorway
Upper tolerance [%]		25	25	25
Lower tolerance [%]		25	25	25
Upper second tolerance [%]		50	50	50
Lower second tolerance [%]		50	50	50
Upper tolerance increase steps(0-24) [%]		0	0	0
Number of windows				
Number of windows inside tolerance				
Number of windows outside tolerance				
Share of normal windows %[>50]				

5: Instrument: Summary of boundary conditions, Step C, Moving Average Window Requirements, Upper Tolerance Increase Steps (0 – 24) [%]

India specific adaption of the INCA instruments

Also, the India BS VI legislation differs at some points from the EU and China legislation. The respective values must be adapted in the INCA instruments. This will be automatically performed when the user chooses the India commission type. The differences in the INCA instruments are as follows:

Requirements: Motorway	
5 minutes >= 100 km/h	offline
Velocity covers 90 - 110 km/h	offline
Max. velocity <= 160 km/h	offline
Velocity > 100 km/h (max 3%)	offline

1: Instrument: Summary of boundary conditions, Step A, Requirements Motorway

Requirement: Detail Motorway	
Maximum velocity [km/h]	0.00
Trip duration >= 100 km/h [hh:mm:ss]	00:00:00
Velocity > 100 km/h (max 3%) [%]	0.00

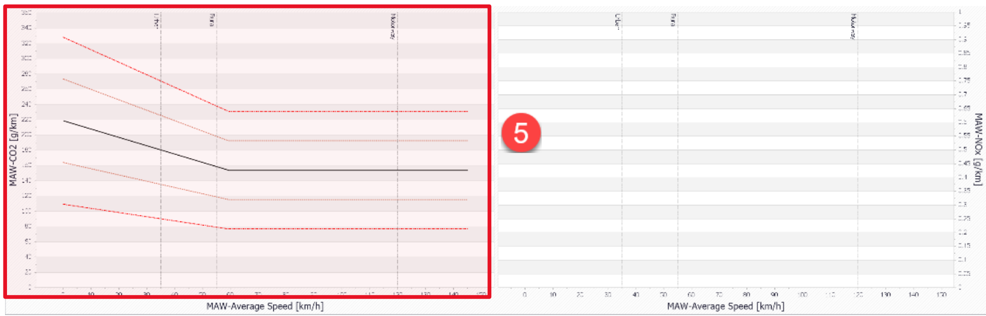
2: Instrument: Summary of boundary conditions, Step A, Requirement Detail Motorway

Requirements: Urban	
Max. velocity <= 60 km/h	offline
Average velocity 15-30 km/h	offline
Stop periods 6-30% urban time	offline
Stop period <= 300 s	offline
PCEG urban < 1200 m/100 km	offline
Max. velocity < 45 km/h	offline

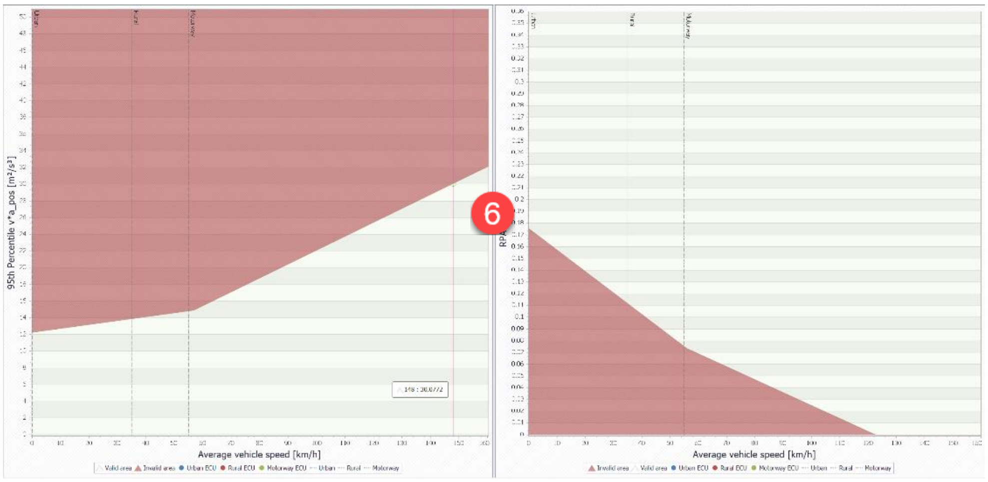
3: Instrument: Summary of boundary conditions, Step A, Requirement Detail Urban

Common Requirements	
Requirements: Cold start	
Average velocity 15-30 km/h	offline
Max. velocity < 45 km/h	offline

4: Instrument: Summary of boundary conditions, Step A Requirement Cold start



5: Instrument: Moving average window, characteristic curve diagram



6: Instrument: Verification of trip validity, 95th percentile VA pos and RPA diagrams

Additionally, the India BS VI low powered vehicle legislation must also be adapted within the INCA instruments. The differences in the INCA instruments are as follows:

Requirements: Extra Urban	
5 minutes >= 55 km/h	offline
Velocity covers 45 - 70 km/h	offline
Max. velocity <= 70 km/h	offline

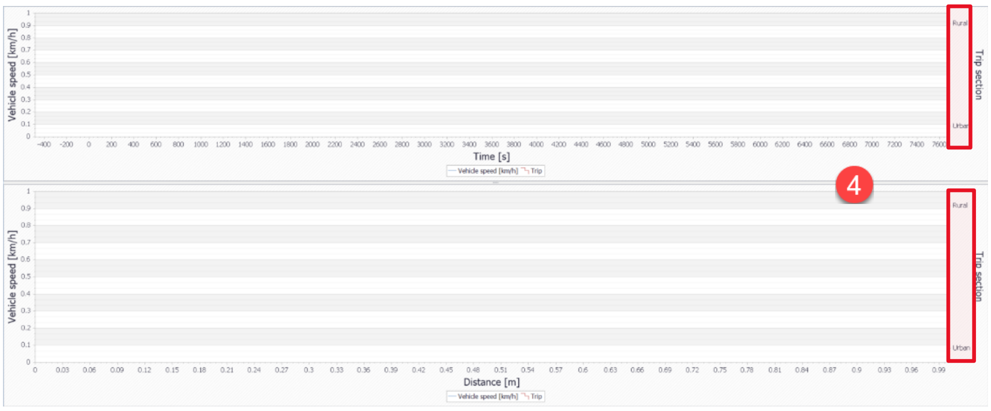
1: Instrument: Summary of boundary conditions, Step A, Requirements Extra Urban

Requirement: Detail Extra Urban	
Maximum velocity [km/h]	0.00
Trip duration >= 55 km/h [hh:mm:ss]	00:00:00

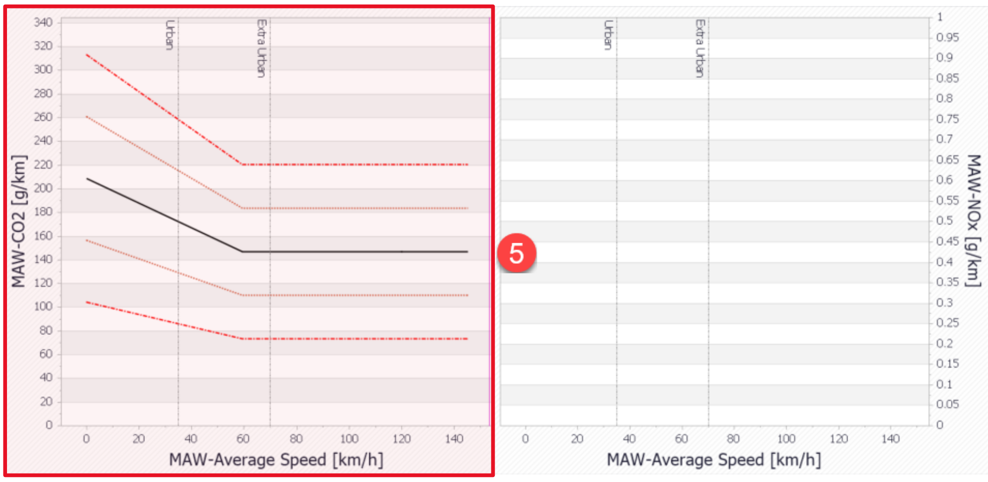
2: Instrument: Summary of boundary conditions, Step A, Requirement Detail Extra Urban

Common Requirements	
Requirements: Cold start	
Average velocity 15-30 km/h	offline
Max. velocity < 45 km/h	offline
Requirements: Extra Urban	
5 minutes >= 55 km/h	offline
Velocity covers 45 - 70 km/h	offline
Max. velocity <= 70 km/h	offline
Requirements: Total Trip	
Ambient condition altitude	offline
Ambient condition temperature	offline
Trip share urban 50% +-10%	offline
Trip share extra urban 50% +-10%	offline
Trip distance min. urban 24km	offline
Trip distance min. extra urban 24km	offline
Total trip duration 90 -120 min	offline
Trip start idling duration <= 15 s	offline
Trip cold start stop duration <= 90 s	offline
Trip start/end altitude <= 100 m	offline
PCEG total < 1200 m/100 km	offline
Requirements: Urban	
Average velocity 15-30 km/h	offline
Stop periods 6-30% urban time	offline
Stop period <= 300 s	offline
PCEG urban < 1200 m/100 km	offline
Max. velocity < 45 km/h	offline

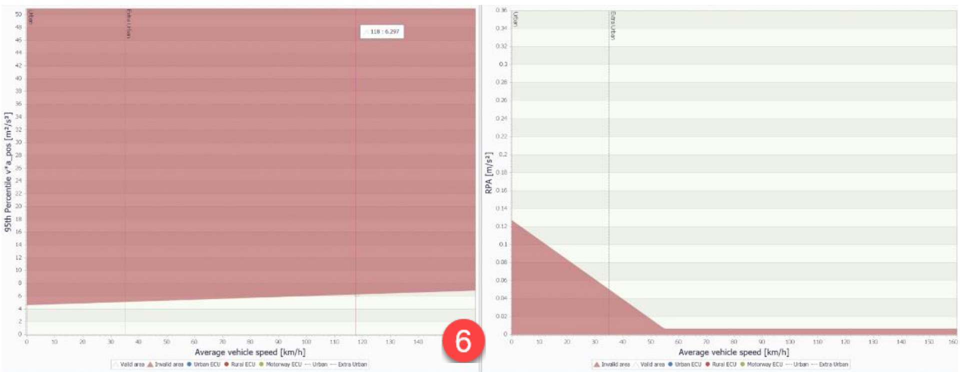
3: Instrument: Summary of boundary conditions, Step A, Common Requirement



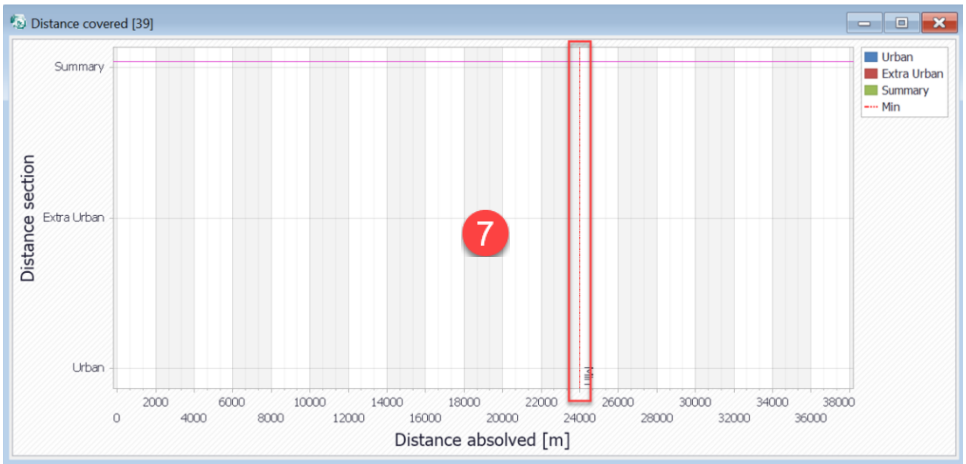
4: Instrument: Trip Sections, time- and distance specific diagrams



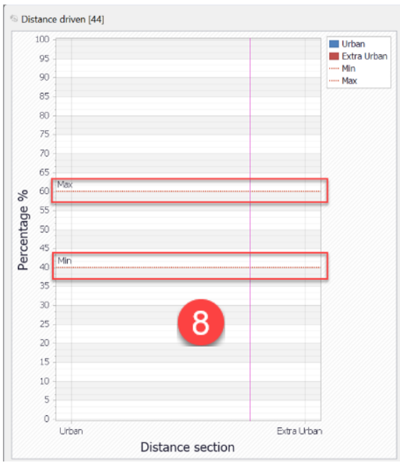
5: Instrument: Moving average window, MAW CO2 diagram



6: Instrument: Verification of trip validity, 95th percentile VA pos and RPA diagrams



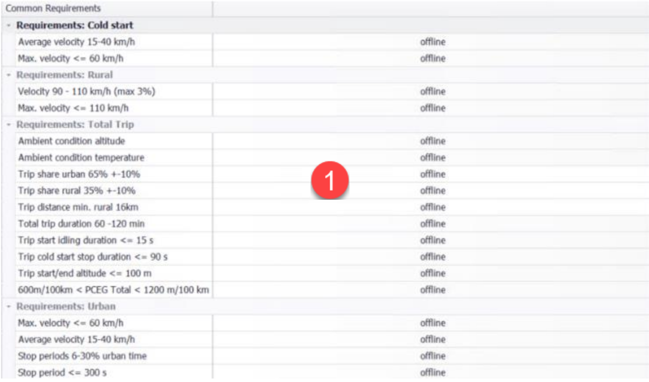
7: Instrument: Distance covered, threshold



8: Instrument: Distance driven, thresholds

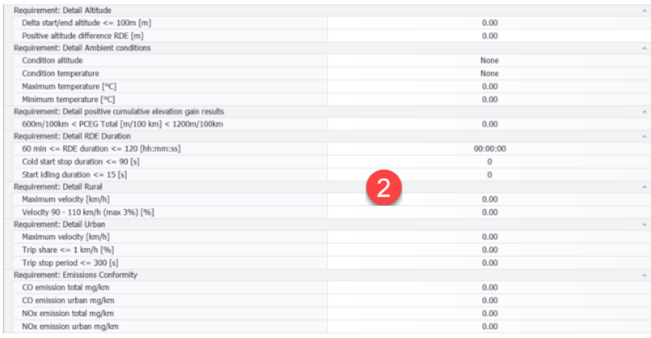
Brazil specific adaption of the INCA instruments

The Brazil proconve L7 legislation differs at some points from the EU, China and India legislation, the respective values must be adapted in the INCA instruments. This will be automatically performed when the user chooses the Brazil commission type. The differences can be seen in the different INCA instruments are as followed:



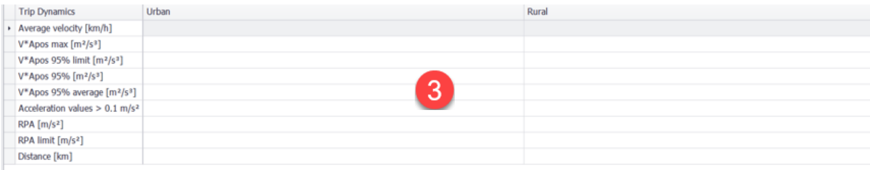
Common Requirements	
Requirements: Cold start	
Average velocity 15-40 km/h	offline
Max. velocity <= 60 km/h	offline
Requirements: Rural	
Velocity 90 - 110 km/h (max 3%)	offline
Max. velocity <= 110 km/h	offline
Requirements: Total Trip	
Ambient condition altitude	offline
Ambient condition temperature	offline
Trip share urban 65% +-10%	offline
Trip share rural 35% +-10%	offline
Trip distance min. rural 16km	offline
Total trip duration 60 -120 min	offline
Trip start idling duration <= 15 s	offline
Trip cold start stop duration <= 90 s	offline
Trip start/end altitude <= 100 m	offline
600m/100km < PCEG Total < 1200 m/100 km	offline
Requirements: Urban	
Max. velocity <= 60 km/h	offline
Average velocity 15-40 km/h	offline
Stop periods 6-30% urban time	offline
Stop period <= 300 s	offline

1: Instrument: Summary of boundary conditions, Step A, Common Requirements



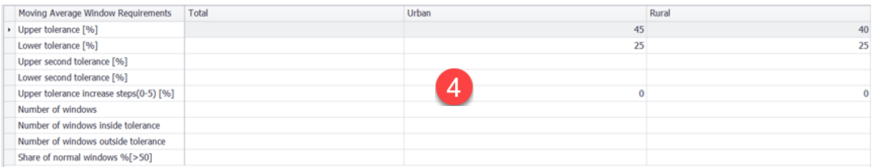
Requirement: Detail Altitude	
Delta start/end altitude <= 100m [m]	0.00
Positive altitude difference RDE [m]	0.00
Requirement: Detail Ambient conditions	
Condition altitude	None
Condition temperature	None
Maximum temperature [°C]	0.00
Minimum temperature [°C]	0.00
Requirement: Detail positive cumulative elevation gain results	
600m/100km < PCEG Total [m/100 km] < 1200m/100km	0.00
Requirement: Detail RDE Duration	
60 min <= RDE duration <= 120 [hh:mm:ss]	00:00:00
Cold start stop duration <= 90 [s]	0
Start idling duration <= 15 [s]	0
Requirement: Detail Rural	
Maximum velocity [km/h]	0.00
Velocity 90 - 110 km/h (max 3%) [%]	0.00
Requirement: Detail Urban	
Maximum velocity [km/h]	0.00
Trip share <= 1 km/h [%]	0.00
Trip stop period <= 300 [s]	0.00
Requirement: Emissions Conformity	
CO emission total mg/km	0.00
CO emission urban mg/km	0.00
NOx emission total mg/km	0.00
NOx emission urban mg/km	0.00

2: Instrument: Summary of boundary conditions, Step A, Details Requirements



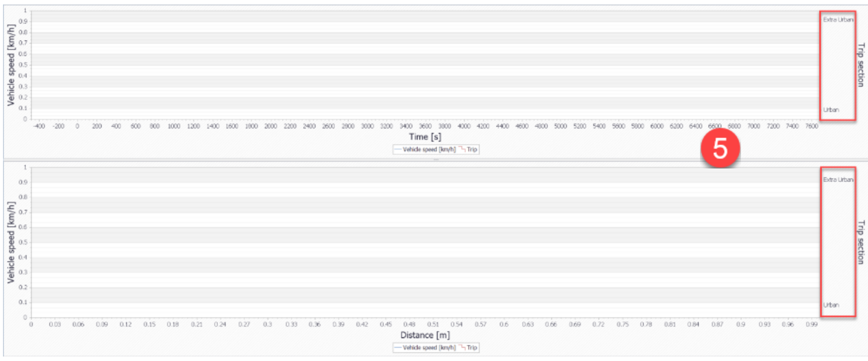
Trip Dynamics	Urban	Rural
Average velocity [km/h]		
V*Apos max [m²/s³]		
V*Apos 95% limit [m²/s³]		
V*Apos 95% [m²/s³]		
V*Apos 95% average [m²/s³]		
Acceleration values > 0.1 m/s²		
RPA [m/s²]		
RPA limit [m/s²]		
Distance [km]		

3: Instrument: Summary of boundary conditions, Step B, Trip Dynamics

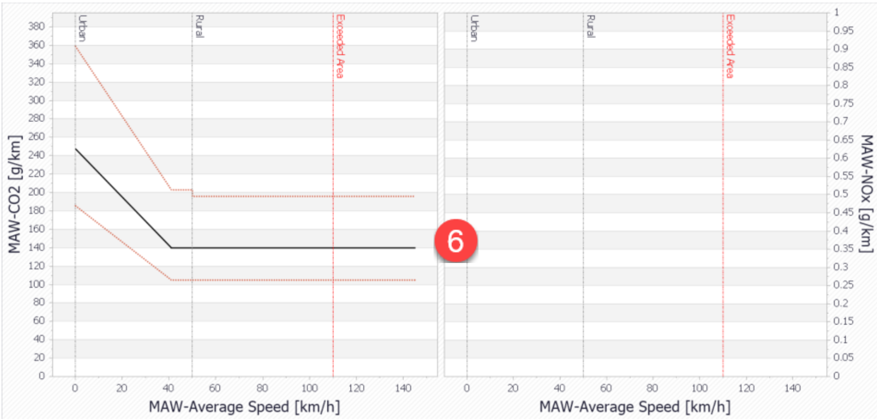


Moving Average Window Requirements	Total	Urban	Rural
Upper tolerance [%]		45	40
Lower tolerance [%]		25	25
Upper second tolerance [%]			
Lower second tolerance [%]			
Upper tolerance increase steps(0-5) [%]		0	0
Number of windows			
Number of windows inside tolerance			
Number of windows outside tolerance			
Share of normal windows %[>50]			

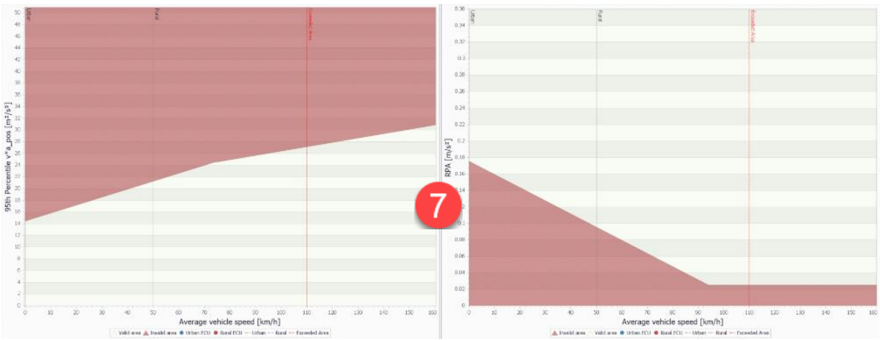
4: Instrument: Summary of boundary conditions, Step C, MAW Requirements



5: Instrument: Trip Sections, time-specific and distance-specific diagrams

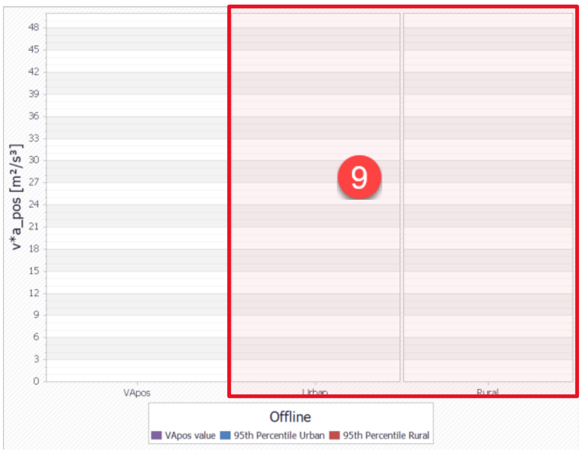


6: Instrument: Moving average window, MAW- CO2 and NOx diagrams

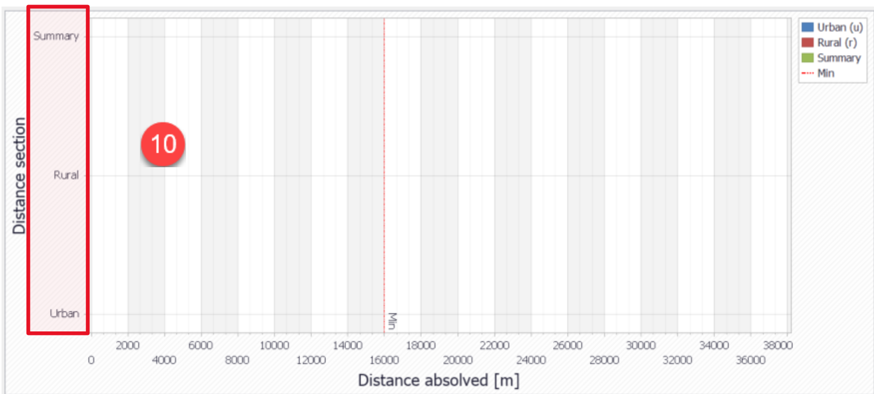


7: Instrument: Verification of trip validity, 95th percentile VA pos and RPA diagrams

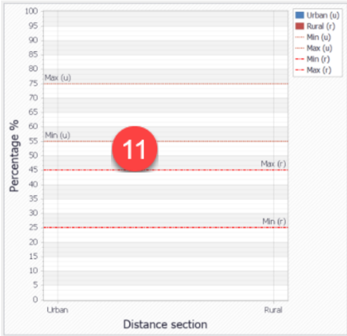
8: Instrument: Trip validity VA pos view, only 2 sections (urban and rural)



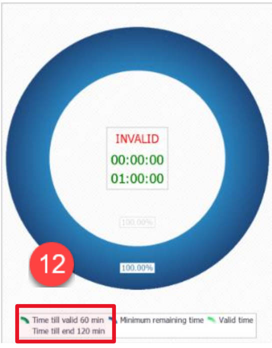
9: Instrument: Driver guidance view, only 2 sections (urban and rural)



10: Instrument: Distance covered, thresholds for urban and rural



11: Instrument: Distance driven, thresholds for urban and rural



12: Instrument: Time slot, time valid range from 60 min - 120 min

4.2.6 Attachments

In this chapter, you find additional information about the parameters that are used in the RDE configuration, and which are necessary for legislation purpose, and cannot be changed. Additionally, it provides an overview of necessary and unnecessary measurement channels for the configuration from the PEMS to the INCA-RDE Online tool.

4.2.7 Additional Parameters of the RDE Analysis Settings – Commission Regulation Settings

You find the following parameters under the "Molar Mass Settings". Physical and chemical laws define these parameters.

Attribute	Unit	Description
Molar mass CO	g/mol	Molar mass CO
Molar mass NOx	g/mol	Molar mass NOx
Molar mass Exhaust	g/mol	Molar mass Exhaust
Molar mass CO2	g/mol	Molar mass CO2
Molar mass CH4	g/mol	Molar mass CH4
Molar mass NMHC	g/mol	Molar mass NMHC
Molar mass NO2	g/mol	Molar mass NO2
Molar mass HC	g/mol	Molar mass HC

You can find the Moving Average Window (MAW) parameters under the attribute "MAW Settings":

Parameters for "Vehicle CO2 Characteristic Curve", Urban:

Attribute	Unit	Description
Upper tolerance of the CO2 curve (primary)	%	First point of characteristics curve for MAW: upper tolerance band for CO2 vehicle speed
Lower tolerance of the CO2 curve (primary)	%	First point of characteristics curve for MAW: lower tolerance band for CO2 vehicle speed
Upper tolerance of the CO2 curve (secondary)	%	Second point of characteristics curve for MAW: upper tolerance band for CO2 vehicle speed
Lower tolerance of the CO2 curve (secondary)	%	Second point of characteristics curve for MAW: lower tolerance band for CO2 vehicle speed

Parameters for "Vehicle CO2 Characteristic Curve", Rural:

Attribute	Unit	Description
Upper tolerance of the CO2 curve (primary)	%	First point of characteristics curve for MAW: upper tolerance band for CO2 vehicle speed
Lower tolerance of the CO2 curve (primary)	%	First point of characteristics curve for MAW: lower tolerance band for CO2 vehicle speed
Upper tolerance of the CO2 curve (secondary)	%	Second point of characteristics curve for MAW: upper tolerance band for CO2 vehicle speed
Lower tolerance of the CO2 curve (secondary)	%	Second point of characteristics curve for MAW: lower tolerance band for CO2 vehicle speed

Parameters for "Vehicle CO2 Characteristic Curve", Motorway:

Attribute	Unit	Description
Upper tolerance of the CO2 curve (primary)	%	First point of characteristics curve for MAW: upper tolerance band for CO2 vehicle speed
Lower tolerance of the CO2 curve (primary)	%	First point of characteristics curve for MAW: lower tolerance band for CO2 vehicle speed
Upper tolerance of the CO2 curve (secondary)	%	Second point of characteristics curve for MAW: upper tolerance band for CO2 vehicle speed
Lower tolerance of the CO2 curve (secondary)	%	Second point of characteristics curve for MAW: lower tolerance band for CO2 vehicle speed

Parameters for "Vehicle CO2 Characteristic Curve"

Attribute	Unit	Description
Urban speed threshold	Km/h	Average vehicle speed threshold of urban section
Rural speed threshold	Km/h	Average vehicle speed threshold of rural section

Motorway speed threshold	Km/h	Average vehicle speed threshold of motorway section

Parameters for "WLTP Cycle":

Attribute	Unit	Description
Average speed of the Low Speed phase	km/h	Average speed of the Low-Speed phase
Average speed of the Medium Speed phase	km/h	Average speed of the Medium Speed phase
Average speed of the High Speed phase	km/h	Average speed of the High-Speed phase
Average speed of the Extra High Speed phase	km/h	Average speed of the Extra High-Speed phase
CO2 Factor for the Low Speed phase	-	CO2 Factor for the Low-Speed phase
CO2 Factor for the Medium Speed phase	-	CO2 Factor for the Medium Speed phase
CO2 Factor for the High Speed phase	-	CO2 Factor for the High-Speed phase
CO2 Factor for the Extra High Speed phase	-	CO2 Factor for the Extra High-Speed phase

Parameters "Conformity Factor":

Attribute	Unit	Description
Conformity factor CO	-	Conformity factor for CO emissions
Conformity factor CO2	-	Conformity factor for CO2 emissions
Conformity factor HC	-	Conformity factor for HC emissions
Conformity factor NOx	-	Conformity factor for NOx emissions
Conformity factor NO2	-	Conformity factor for NO2 emissions
Conformity factor CH4	-	Conformity factor for CH4 emissions
Conformity factor NMHC	-	Conformity factor for NMHC emissions
Conformity factor kNOx	-	Conformity factor for kNOx emissions
Conformity factor PN (* 10^{11})	-	Conformity factor for PN emissions

Parameters for "Cold Start Settings":

Attribute	Unit	Description
Engine temperature	°C	Minimum engine coolant temperature for end of cold start
Engine temperature stable over	s	Minimum start time for end of cold start
Maximum cold start duration	s	Maximum duration of cold start

Parameters for "Clear Analysis" (Evaluation after clear method, currently not implemented):

Attribute	Unit	Description
Reference speed	km/h	Reference vehicle speed
Reference acceleration	m/s^2	Reference acceleration
Upper limit for city	km/h	Upper limit for city cycle detection
Upper limit for country	km/h	Upper limit for country cycle detection

The categories for the Euro 6 or China 6b emission limits can be found under the attribute "Euro 6 emission limits settings" respectively “China 6b emission settings”, “India VI settings” or “Brazil L7 settings”:

Attribute	Unit	Description
Category M1/M2, Class 0, Reference mass all, Positive Ignition: Mass of carbon monoxide (CO)	mg/km	Mass CO of EURO/CHINA/INDIA/Brazil emission limits in category M1/M2 class 0 by positive ignition
Category M1/M2, Class 0, Reference mass all, Positive Ignition: Mass of total hydrocarbons (THC)	mg/km	Mass THC of EURO/CHINA/INDIA/Brazil emission limits in category M1/M2 class 0 by positive ignition
Category M1/M2, Class 0, Reference mass all, Positive Ignition: Mass of total non-methane hydrocarbons (NMHC)	mg/km	Mass NMHC of EURO/CHINA/INDIA/Brazil emission limits in category M1/M2 class 0 by positive ignition
Category M1/M2, Class 0, Reference mass all, Positive Ignition: Mass of oxides of nitrogen (NOx)	mg/km	Mass NOx of EURO/CHINA/INDIA/Brazil emission limits in category M1/M2 class 0 by positive ignition
Category M1/M2, Class 0, Reference mass all, Positive Ignition: Mass of total hydrocarbons oxides and oxides of nitrogen (THC + NOx)	mg/km	Mass THC & NOx of EURO/CHINA/INDIA/Brazil emission limits in category M1/M2 class 0 by positive ignition
Category M1/M2, Class 0, Reference mass all, Positive Ignition: Mass of particulate matter (PM)	mg/km	Mass PM of EURO/CHINA/INDIA/Brazil emission limits in category M1/M2 class 0 by positive ignition
Category M1/M2, Class 0, Reference mass all, Positive Ignition: Number of particles (P)	numbers/km	Number of particle of EURO/CHINA/INDIA/Brazil emission limits in category M1/M2 class 0 by positive ignition
Category M1/M2, Class 0, Reference mass all, Compression Ignition: Mass of carbon monoxide (CO)	mg/km	Mass CO of EURO/CHINA/INDIA/Brazil emission limits in category M1/M2 class 0 by compression ignition
Category M1/M2, Class 0, Reference mass all, Compression Ignition: Mass of total hydrocarbons (THC)	mg/km	Mass THC of EURO/CHINA/INDIA/Brazil emission limits in category M1/M2 class 0 by compression ignition

Attribute	Unit	Description
Category M1/M2, Class 0, Reference mass all, Compression Ignition: Mass of total non-methane hydrocarbons (NMHC)	mg/km	Mass NMHC of EURO/CHINA/INDIA/Brazil emission limits in category M1/M2 class 0 by compression ignition
Category M1/M2, Class 0, Reference mass all, Compression Ignition: Mass of oxides of nitrogen (NOx)	mg/km	Mass NOx of EURO/CHINA/INDIA/Brazil emission limits in category M1/M2 class 0 by compression ignition
Category M1/M2, Class 0, Reference mass all, Compression Ignition: Mass of total hydrocarbons oxides and oxides of nitrogen (THC + NOx)	mg/km	Mass THC & NOx of EURO/CHINA/INDIA/Brazil emission limits in category M1/M2 class 0 by compression ignition
Category M1/M2, Class 0, Reference mass all, Compression Ignition: Mass of particulate matter (PM)	mg/km	Mass PM of EURO/CHINA/INDIA/Brazil emission limits in category M1/M2 class 0 by compression ignition
Category M1/M2, Class 0, Reference mass all, Compression Ignition: Number of particles (P)	numbers/km	Number of particle of EURO/CHINA/INDIA/Brazil emission limits in category M1/M2 class 0 by compression ignition
Category N1/N2, Class I, Reference mass ≤ 1305 kg, Positive Ignition: Mass of carbon monoxide (CO)	mg/km	Mass CO of EURO/CHINA/INDIA/Brazil emission limits in category N1/N2 class I by positive ignition
Category N1/N2, Class I, Reference mass ≤ 1305 kg, Positive Ignition: Mass of hydrocarbons (THC)	mg/km	Mass THC of EURO/CHINA/INDIA/Brazil emission limits in category N1/N2 class I by positive ignition
Category N1/N2, Class I, Reference mass ≤ 1305 kg, Positive Ignition: Mass of non-methane hydrocarbons (NMHC)	mg/km	Mass NMHC of EURO/CHINA/INDIA/Brazil emission limits in category N1/N2 class I by positive ignition
Category N1/N2, Class I, Reference mass ≤ 1305 kg, Positive Ignition: Mass of oxides of nitrogen (NOx)	mg/km	Mass NOx of EURO/CHINA/INDIA/Brazil emission limits in category N1/N2 class I by positive ignition
Category N1/N2, Class I, Reference mass ≤ 1305 kg, Positive Ignition: Combined mass of total hydrocarbons and oxides of nitrogen (THC + NOx)	mg/km	Mass THC & NOx of EURO/CHINA/INDIA/Brazil emission limits in category N1/N2 class I by positive ignition
Category N1/N2, Class I, Reference mass ≤ 1305 kg, Positive Ignition: Mass of particulate matter (PM)	mg/km	Mass PM of EURO/CHINA/INDIA/Brazil emission limits in category N1/N2 class I by positive ignition

Attribute	Unit	Description
Category N1/N2, Class I, Reference mass ≤ 1305 kg, Positive Ignition: Number of particles (P)	numbers/km	Number of particle of EURO/CHINA/INDIA/Brazil emission limits in category N1/N2 class I by positive ignition
Category N1/N2, Class I, Reference mass ≤ 1305 kg, Compression Ignition: Mass of carbon monoxide (CO)	mg/km	Mass CO of EURO/CHINA/INDIA/Brazil emission limits in category N1/N2 class I by compression ignition
Category N1/N2, Class I, Reference mass ≤ 1305 kg, Compression Ignition: Mass of hydrocarbons (THC)	mg/km	Mass THC of EURO/CHINA/INDIA/Brazil emission limits in category N1/N2 class I by compression ignition
Category N1/N2, Class I, Reference mass ≤ 1305 kg, Compression Ignition: Mass of non-methane hydrocarbons (NMHC)	mg/km	Mass NMHC of EURO/CHINA/INDIA/Brazil emission limits in category N1/N2 class I by compression ignition
Category N1/N2, Class I, Reference mass ≤ 1305 kg, Compression Ignition: Mass of oxides of nitrogen (NOx)	mg/km	Mass NOx of EURO/CHINA/INDIA/Brazil emission limits in category N1/N2 class I by compression ignition
Category N1/N2, Class I, Reference mass ≤ 1305 kg, Compression Ignition: Combined mass of total hydrocarbons and oxides of nitrogen (THC + NOx)	mg/km	Mass THC & NOx of EURO/CHINA/INDIA/Brazil emission limits in category N1/N2 class I by positive ignition
Category N1/N2, Class I, Reference mass ≤ 1305 kg, Compression Ignition: Mass of particulate matter (PM)	mg/km	Mass PM of EURO/CHINA/INDIA/Brazil emission limits in category N1/N2 class I by positive ignition
Category N1/N2, Class I, Reference mass ≤ 1305 kg, Compression Ignition: Number of particles (P)	numbers/km	Number of particle of EURO/CHINA/INDIA/Brazil emission limits in category N1/N2 class I by positive ignition

The same parameters are also relevant for Class II with a reference mass (RM) which fulfils the inequality 1305 kg < RM ≤ 1760 kg and for Class III with a reference mass (RM) fulfilling the inequality 1760 kg < RM. This is also valid for vehicles in the category N2 for all reference masses.

Be aware that in the India BS VI legislation the engine rated power and the vehicle mass has an impact on the RDE analysis. When defining a low powered vehicle (<=16,7 W/kg) the maximum design speed must be lower than 70 km/h and only two RDE drive cycle types will be calculated (Urban and Extra Urban). The RDE analysis considers this with the respective calculation and the INCA EE instruments will be adapted to this configuration.

4.2.8 Overview of Necessary RDE Signal Data

The following table shows the measurement channels that are necessary to calculate the correct values in INCA-RDE:

*: Either one of the vehicle speed signals is necessary.

+: Either NOx emission measurement channel or NO and NO2 emission channel is necessary.

Signal_Id	Description	Necessary for Online RDE Analysis	Necessary for RDE Report	Necessary parameters for PEMS online evaluation	Name in simulation mode (offline)
Time	Time of measurement of signal	Not used	Not used	-	Time
ECU_Velocity	Vehicle speed measured by ECU	Used	Used	Vehicle Speed*	Velocity ECU
GPS_Velocity	Vehicle speed dependant on GPS Position	Used	Used	Vehicle Speed*	Velocity GPS
GPS_Latitude	Latitude Position depends on GPS Position	Used	Used	GPS_Latitude	GPS Latitude
GPS_Longitude	Longitude of Vehicle depend on altitude	Used	Used	GPS_Longitude	GPS Longitude
GPS_Altitude	Altitude in meter dependant on GPS	Used	Used	Altitude	GPS Altitude
Sensor_AmbientPressure	ambient pressure	Used	Used	Ambient Pressure	Ambient Pressure
Sensor_AmbientTemperature	ambient temperature	Used	Used	Ambient Temperature	Ambient Temperature
Sensor_RelativeHumidity	relative humidity	Used	Used	Relative Humidity	Relative Humidity
Analyser_THC_Concentration	total hydrocarbons concentration [ppm]	Not used	Used	-	y_THC
Analyser_CH4_Concentration	Methane concentration [ppm]	Used	Used	-	y_CH4
Analyser_CO_Concentration	Carbon monoxide concentration [ppm]	Used	Used	CO Emission	y_CO
Analyser_CO2_Concentration	Carbon Dioxide concentration [ppm]	Used	Used	CO2 Emission	y_CO2
Analyser_NOx_Concentration	Nitrogen Oxides concentration [ppm]	Used	Used	NOx Emission+	y_NOx
Analyser_NO_Concentration	Nitrogen Monoxide concentration [ppm]	Used	Used	NO Emission+	y_NO
Analyser_NO2_Concentration	Nitrogen Dioxide concentration [ppm]	Used	Used	NO2 Emission+	y_NO2
Analyser_O2_Concentration	Oxygen concentration [ppm]	Used	Used	-	y_O2
Analyser_PN_Concentration	particle number concentration [p/cm³]	Used	Used	-	c_PN
EFM_ExhaustGasFlowMass	The exhaust mass flow rate [kg/h]	Used	Used	Exhaust Mass Flow	Exhaust Mass Flow
EFM_ExhaustTemperature	exhaust gas temperature	Used	Used	-	Exhaust Temperature
ECU_EngineSpeed	engine speed of vehicle	Used	Used	Engine Speed	Engine Speed
ECU_EngineTorque	Torque of vehicle	Used	Used	-	Torque
ECU_CoolantTemperature	temperature of the engine coolant of an internal combustion engine	Used	Used	Engine Coolant Temperature	Engine Coolant Temperature

4.2.9 Additional Parameters of the RDE Analysis Settings – Customize Settings

You find the following parameters under the "Start driving settings":

Attribute	Unit	Description
Using start criteria		Option if cold start criteria is using or not
Chart strips		Option if strips is shown in start driving chart or not

Parameters for "Idling phase of [t0]":

Attribute	Unit	Description
Duration	s	Duration of idling phase
Duration min tolerance	s	Minimum duration of idling phase end
Duration max tolerance	s	Maximum duration of idling phase end

Parameters for "V1 phase of [t1]":

Attribute	Unit	Description
Duration	s	Duration of V1 phase
Duration min tolerance	s	Minimum duration of V1 phase end
Duration max tolerance	s	Maximum duration of V1 phase end
Target velocity	km/h	Target velocity of the V1 phase
Velocity min tolerance	km/h	Minimum velocity of V1 phase end
Velocity max tolerance	km/h	Maximum velocity of V1 phase end

Parameters for "V2 phase of [t2]":

Attribute	Unit	Description
Duration	s	Duration of V2 phase
Duration min tolerance	s	Minimum duration of V2 phase end
Duration mx tolerance	s	Maximum duration of V2 phase end

Target velocity	km/h	Target velocity of the V2 phase
Velocity min tolerance	km/h	Minimum velocity of V2 phase end
Velocity max tolerance	km/h	Maximum velocity of V2 phase end

You find the following parameters under the "VApos prediction settings":

Attribute	Unit	Description
Using VApos prediction		Option if VApos prediction is used or not

Parameters for "Urban VApos settings":

Attribute	Unit	Description
Target average velocity	km/h	Target velocity of the urban section. The velocity is used to calculate VApos limit.
Target VApos	m^2/s^3	Target velocity * positive acceleration m^2/s^3

Parameters for "Rural VApos settings":

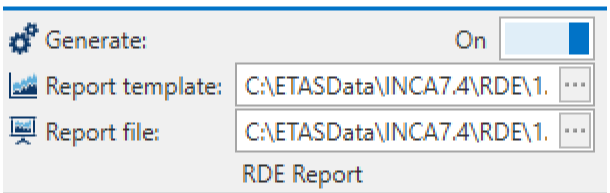
Attribute	Unit	Description
Target average velocity	km/h	Target velocity of the rural section. The velocity is used to calculate VApos limit.
Target VApos	m^2/s^3	Target velocity * positive acceleration m^2/s^3

Parameters for "Motoway VApos settings":

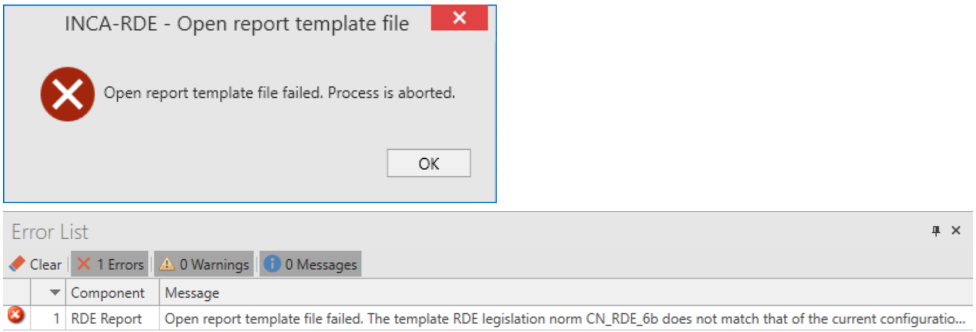
Attribute	Unit	Description
Target average velocity	km/h	Target velocity of the motorway section. The velocity is used to calculate VApos limit.
Target VApos	m^2/s^3	Target velocity * positive acceleration m^2/s^3

4.3 Report Generator

This chapter describes how to generate a report (as a PowerPoint document) after having finalized the RDE drive with an INCA measurement. Reports will be generated each time after stopping the measurement or the recording in INCA when having activated the report generation:



With “Report template” the user must define the respective template for the report. The provided templates are directly connected with an ID to the respective legislation (“Commission type”); if the “Commission type” does not fit with the chosen template, an error message will be given to the user:



These templates can be found under the folder

...\ETASData\INCA7.5\RDE\1.13\ReportGen\templates and is static.

There exist basically 7 templates with respect to the different RDE legislation:

- RDE EU Act6: RDE_Report_Template_EU_Act6_E7.pptx
- RDE EU Act5: RDE_Report_Template_EU_Act5_6EA.pptx
- RDE EU Act4: RDE_Report_Template_EU_Act4.pptx
- India BS6: RDE_Report_Template_IN_BS6.pptx
- India BS6 low powered vehicles:
- RDE_Report_Template_IN_BS6_Low_Powered_Vehicles.pptx
- China 6b: RDE_Report_Template_China_6b.pptx
- Brazil L7: RDE_Report_Template_BR_LA7.pptx

NOTE

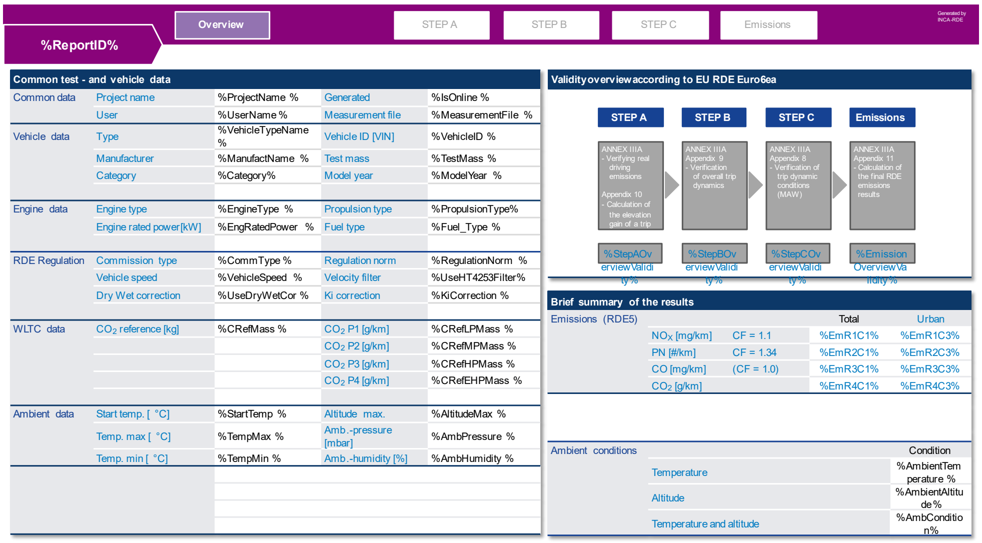
Please consider the special legislation rules for the China 6b and India BS6 legislation in the respective templates:

China 6b: Even though the reference maximum for the “maximum speed” in the template is 135 km/h, the evaluation will put the state “passed” if the vehicle speed is higher than this maximum due to the special legislation in China which defines this vehicle speed as the maximum but allows to be higher than this limit because the PEMS related data for this vehicle speed will not be considered for the evaluation (see also China 6b, Appendix D D.3.2.5.7)

India BS6: for the condition “maximum speed in a cold start” (80 >, meaning 80 km/h and higher), “maximum speed” and “trip duration speed > 70/75 km/h” the limit depends on the specific vehicle class. This is the reason for having defined for the “reference maximum” a respective condition ranges respectively two values for “trip duration speed > 70/75 km/h” (see also Amendment 2 (01/2020) To AIS 137 (Part 3), CHAPTER 20 - VERIFYING REAL DRIVING EMISSIONS, 6.0 Trip Requirements). The evaluation of the respective states will be performed depending on the defined vehicle class in the RDE configurator.

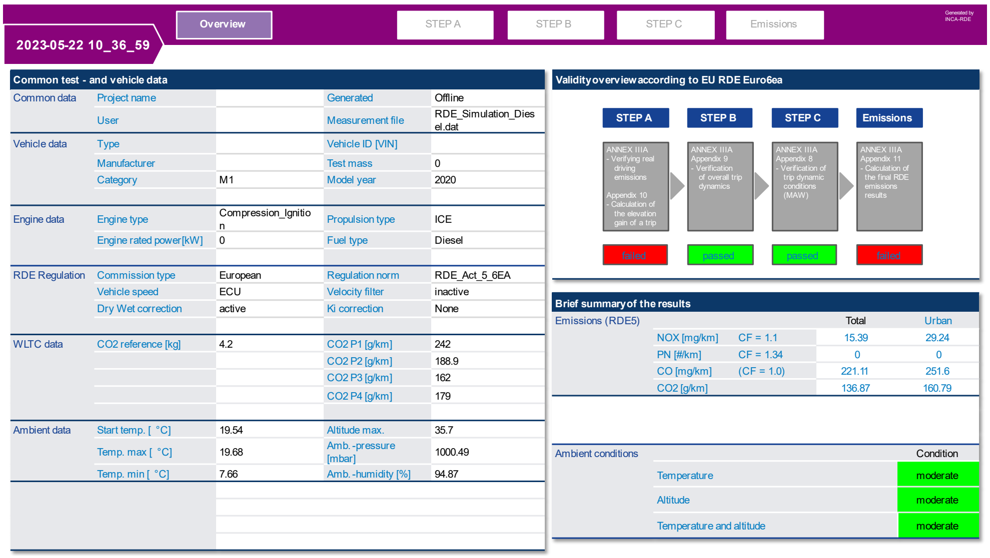
Brazil L7: Even though the reference maximum for the “maximum speed” in the template is 110 km/h, the evaluation will put the state “passed” if the vehicle speed is higher than this maximum due to the special legislation in Brazil, which defines this vehicle speed as the maximum but allows to be higher than this limit because the PEMS related data for this vehicle speed will not be considered for the evaluation (see also Brazil L7, Chapter 5.4.6).

The respective layout of the text and graphic configuration especially their corresponding keywords in the textboxes and the graphic objects should not be changed to assure proper report generation. The template consists of 5 slides showing all relevant requirements of the respective RDE legislation:



With “Report file” the user defines the name of the generated document in his dedicated folder.

When having finalized the RDE drive the generated report will be stored in the folder as defined in “Report file”. It will show the respective configuration parameters of the RDE configurator as well as the results of the finalized RDE drive. This will look e. g. like this:



5 Contact Information

Technical Support

For details of your local sales office as well as your local technical support team and product hotlines, take a look at the website: www.etas.com/hotlines

ETAS Headquarters

ETAS GmbH		
Borsigstraße 24	Phone:	+49 711 3423-0
70469 Stuttgart	Fax:	+49 711 3423-2106
Germany	Internet:	www.etas.com