IMMI

This is new – 2024

Wölfel

What's New in IMMI 2024

As of: March 25, 2024

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Preliminary Remark

The 2024 version of IMMI was created and tested with great care.

It meets the official test requirements according to RLS-90, Schall 03, RVS 04.02.11, ISO TR 17534-3 and -4, Directive (EU) 2015/996 (BUB, BUF and BEB), DELEGATED DIRECTIVE (EU) 2021/1226 and other regulations.

The software has been successfully quality assured and certified by the A-QNS, Verband zur Förderung der Qualitätssicherung von Software zur Lärmberechnung e.V. (Association for promoting the quality assurance of software for calculating sound), via an independent auditor. Detailed information about the association can be found at https://a-qns.de/.

Nevertheless, the following must be pointed out: Regulations such as those mentioned above are never so strictly formulated that there is no room for interpretation. The further development of a program such as IMMI cannot take place without the possibility of changing calculation results in certain situations and combinations of parameters within this scope.

We therefore recommend following the principle: One project – one program version. We cannot guarantee that exactly the same calculation results will be reproduced in a later recalculation of the project with a newer program version.

Therefore, archiving a project includes archiving the program version of IMMI with which the project was calculated.

1   What's New with IMMI in 2024

## 1.1   Photovoltaic Element Library for Calculating the Glare Effect of PV Systems

The photovoltaic module has undergone some significant enhancements.

1.1.1   Blend Diagram

The results of the glare calculation can be displayed in a glare diagram. In the glare diagram, the positions of the sun at which glare occurs are shown in a diagram.

- The boundary lines are the winter solstice (blue) and the summer solstice (red).
  These two lines represent the lowest and highest position of the sun during the year.

- The diagram begins on the left / in the east, south is the center of the diagram, and ends on the right / in the west.

- The timing can be set. You can choose between the true local time and the current zone time.

- The so-called hour loops (analemma) for the full hour are gray. If true local time is set, the hour loops are simple curved curves; if the zone time is set, the hour loops are octagonal curves.
  (For more details, see also: Wikipedia: Sun position diagram, analemma)
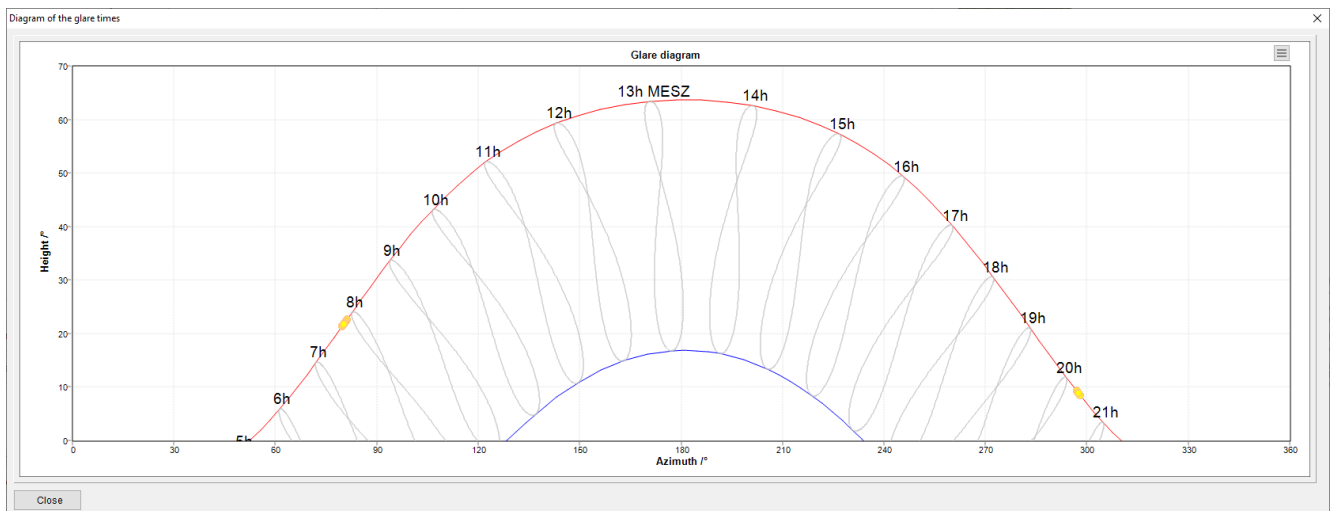
Blend diagram in zone time (top) and true local time (bottom)

Display options can be selected via the menu button ☰ at the top right of the diagram.

- Options:
 - Date format: Format of the date for the results lists
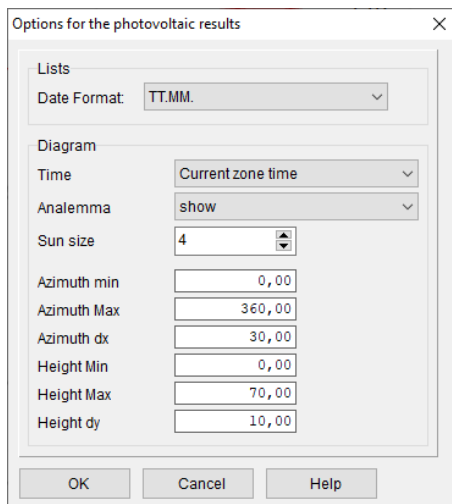
- Time: Selection between *true local time* and *zone time*

- Analemma: The display can be switched on or off.

- Sun size: Diameter of the sun symbol in pixels.

- Min and max values are used to scale the diagram.

▪ **Display immission points individually:** The fade times of individual immission points can also be displayed. The points to be displayed can be selected for this purpose. In single mode, up to 50 IPs can be selected

▪ **Display immission points together:** The fade times of all calculated immission points are displayed together.

1.1.2   Extension of the "Show solar modules" function

One reason for extending the *Create solar modules* function was to determine the z-coordinates of the generated photovoltaic modules.

▪ Specification of the absolute coordinates: This is not always so easy, especially if the terrain is not flat. A known inclination of the modules cannot be entered so easily

▪ Specification in relative coordinates: Here, the modules follow the terrain. However, this can often lead to the modules having 4 different heights at their 4 nodes and, therefore, not being level. But that is not realistic. It is hardly possible to specify a defined inclination of the modules.

The essential extension of this function is that all modules lie in the plane (= reference plane) spanned by the three points P1, P2, and P3 of the auxiliary line. This means that all modules are flat by definition. The inclination of the modules can be easily specified and refers to the plane on which they are mounted.
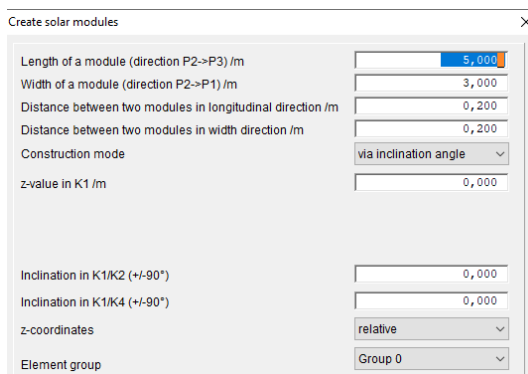
▪ **Create mode: via tilt angle.** This selects the new mode described above.

- **z-value in K1:** Defines the height of node K1 above the reference plane. If the inclination angles are both zero, all four nodes are at this distance above the reference plane.

- **Inclination at K1/K2:** Indicates by how many degrees the modules are inclined. The inclination is set between nodes K1 and K2 (or between K4 and K3).

- **Inclination at K1/K4:** Indicates by how many degrees the modules are inclined. The inclination is set between nodes K1 and K4 (or between zwK2 and K3).

Note: If both inclination angles are zero, this does not mean that the modules are horizontal in the XY plane, but horizontal in the reference plane!

The z-coordinates of the nodes calculated using the method described above can now be saved relative to the terrain or in absolute z-coordinates. If the z-values are saved relative to the terrain and then the terrain is changed, the modules naturally follow the terrain again.

Therefore, it is recommended that the modules not be constructed until the terrain has been ensured to no longer need to be changed.

The **symbolic graphic** with the auxiliary line and the symbolic photo module are now drawn in the same orientation as in the site plan.

1.1.3   System Location

Previously, the user had to manually enter the location of the photovoltaic system in longitude and latitude. As this data is not always readily available, a significant simplification has been made here.

<u>Global coordinate system</u>

The system location can be determined automatically if a global coordinate system is used. For this purpose, a rectangular perimeter around the solar modules is calculated, and the center of this rectangle is used as the system location.

User input is no longer necessary.

> **Plant location**
>
> In global coordinator systems, the system location is determined automatically from the position of the photovoltaic modules.

If an existing project with a global coordinate system is loaded, entering the system location is not initially possible. The system location is determined automatically during a new calculation. However, if the user wants to enter the system location themselves or use the location information of the project that was entered earlier, this is possible via a compatibility switch. This switch can be set on the Settings/Environment/Compatibility page.

<u>Local coordinate system</u>

If a local coordinate system is used, the location **must** be entered, as this cannot be derived from the local system.

> **Plant location**
>
> In the local coordinator system, the location of the plant must be entered manually:
>
> Geogr. width/length of the facility /°   50,00000   10,00000   ▼

Note: The default values 50° North and 10° East are only a suggestion and are generally not valid. These values are not intended as default values that can be used for calculations without changes.

Note: A simple way to determine the system location coordinates is to use Google Maps. To do this, open Google Maps in your browser and click on the location with the right mouse button. A window opens in which the length and width are displayed:

Now click on the coordinates with the left mouse button. They are copied to the clipboard. Using the *From the clipboard* function, you can paste them into the input fields provided.

1.1.4   Calculation Period "Entire Month"

In addition to the previous options of calculating the glare times for an **entire year** or just for **one day** of the year, it is now also possible to select an **entire month**. You make your selection in the menu: Calculation | Calculation parameters | Photovoltaics.

## 1.1.5   Reading Calculation Results

In every photovoltaic calculation, "SunF" elements are generated for the positions of the sun that produce glare. Depending on which variant or which IPs are calculated, different elements are created here. When reading back results, the sun elements contained in the project are deleted and the elements created during the calculation are loaded and inserted into the project. This means that the results and the sun elements always match.

1.1.6   Reflective side

For solar modules, you can now select whether both sides can generate glare, or only the front or back of the module. It is preset to: "Both sides".
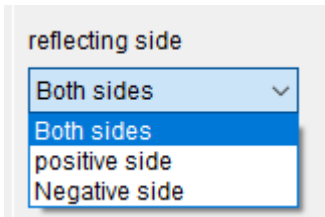
1.1.7   Memory Management

Previously, an element of the type "Sun" was created for each possible position of the sun before a glare calculation. The calculation was then carried out using these elements. As a large number of such elements had to be kept in stock, even if only a few sun positions actually produced glare, a lot of storage was used for this. This procedure has now been implemented in a much more resource-efficient way.

1.2   Dosimeter Function for Determining Noise Exposure at the Workplace

This function can be used to calculate the noise exposure level (L_{EX}) to which a worker is exposed in a workroom. The calculation is made in accordance with:

DIN EN ISO 9612:2009-09 Acoustics – Determination of Occupational Exposure to Noise – Engineering Method (ISO 9612:2009); German version EN ISO 9612:2009

1.2.1   Calculation Basis

The dosimeter evaluation is based on an indoor calculation with the indoor module (noise in workrooms). The individual immission points can represent workplaces where employees spend certain periods of time. Several calculations or calculation variants can be performed and saved and then used to calculate the noise exposure levels.

If an indoor calculation has been performed or loaded, the dosimeter function can be started in the Calculation Control Center via the menu item **Extras | Dosimeter DIN EN ISO 9612**.

1.2.2   The Worker List

This list can be used to manage the employees (workers) for whom the L_{EX} is to be calculated and to calculate the noise exposure.
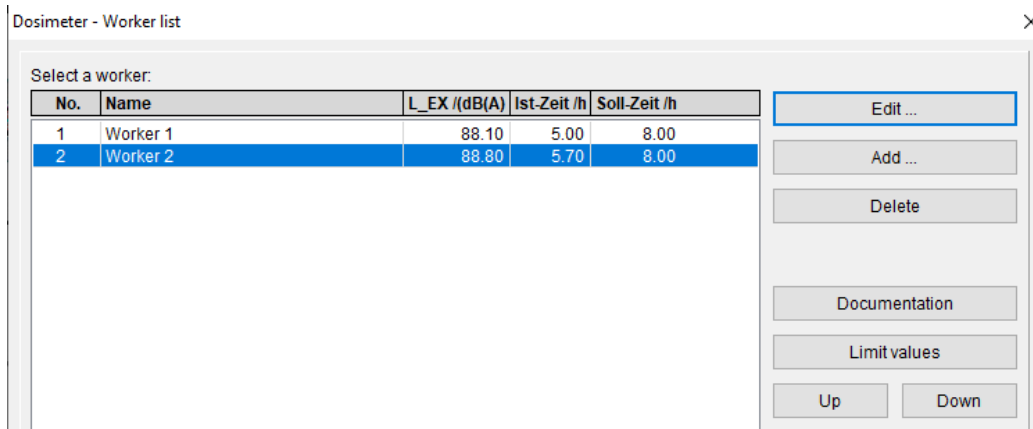
- **Documentation:** Outputs a list of the entered data and the calculated L_{EX} values.
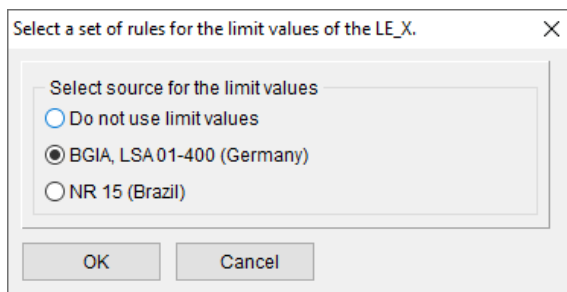
- **Limit values:** Limit values can be defined here, which the L_{EX} of an employee may not exceed. A message is displayed in the dialog and the documentation if the limit is exceeded.

- Sources:
  BGIA, Germany: BGIA, Determination of the Noise Exposure Level at the Workplace. Noise protection worksheet LSA 01-400, October 2007

  Note: LSA 01-400 relates the limit values of the LEX to a working day of 8 hours. IMMI also evaluates the LEX if the total working time deviates from 8 hours.

- NR15 – Unhealthy Activities and Operations, Brazil: https://braziliannr.com/brazilian-regulatory-standards/nr15-unhealthy-activities-and-operations/annex-1-of-nr15-tolerance-limits-for-continuous-or-intermittent-noise/

- **Edit**: Opens the dialog for an employee.

- **Name**: Free text box

- **Staff No.:**   Free text box

- **Calculation variant:** The variant on which the calculation is based is displayed here. It is not possible to change the variant here. To display a different variant, the corresponding results must be loaded.

- **Emission variant:** The emission variant can be selected here. The L_{EX} is updated immediately.

- **Target time h/day:** This is the number of hours per day that the employee is scheduled to work. This value is the reference time for calculating the L_{EX}.

- **Actual time h/day:** The time that the employee actually works is displayed here. This time is the sum of the individual times that the employee works at the respective workstations.

- **L_{EX} /dB(A)**: The calculated noise exposure level in relation to the target working time.

The individual workstations for an employee are now selected in the following table and the times that the employee spends at this workstation are entered.

- **No.** The serial number of the workstation in the list.

- **Active:** This can be used to remove an individual workplace from the L_{EX} calculation. If Active is switched on or off, the L_{EX} is recalculated immediately.

- **Immission point:** A calculated immission point can be selected here. The immission level of the selected point is entered in the table and the L_{EX} is recalculated.

- **Stay time /min:** The time that the employee spends at this workstation is entered here.
  Note: This time is entered in **minutes**.

- **$L_{EX,i}$**: The exposure level for the individual workplace. (The index i stands symbolically for one of the workplaces).

If the **emission variant** is changed, the levels of the immission points belonging to the selected emission variant are automatically entered and the L_{EX} is recalculated.

- ⊞: Forces the recalculation of the L_{EX}.

- ⊞: Inserts a new input line for a workstation of the selected employee. The new input option is appended to the list.

- ⊟: Deletes the last line of the workstation entries

1.3   Emission Model Road for NF S 31-133

An emission model, according to the document below, was introduced for the calculation rule NF S 31-133. The dispersion calculation is carried out as before in accordance with NF S 31-133:2011. The basis for this is the document:

Sétra: Prévision du bruit routier. 1 – Calcul des émissions sonores dues au trafic routier, Juin 2009

Sétra: Road Noise Prediction. 1- Road noise prediction. 1 – Calculating sound emission from road traffic. June 2009, translated 2011

For reasons of compatibility, the previous input of spectra can still be made for a road element in accordance with NF S 31-133. What is new, however, is the entry of vehicle data.

The vehicle data and road parameters are entered according to the applicable regulations. Please refer to the document cited above for a detailed description of the parameters.

- **Road surface:** Selection: R1, R2, and R3

- **Frequency distribution:** Selection: porous, non-porous

- **Age of the road surface/years:** Free entry of the age of the road surface in years. If the age is greater than 10 years, the road surface is considered "old" within the meaning of the regulation.

- **Driving condition:** Selection of constant travel, accelerating, braking, starting, and stopping.

- **Vehicle classes:** There are two classes of vehicles: **light vehicles** (LV: light vehicles or VL: vehicules légeres) with a gross vehicle weight of less than 3.5 tons and heavy vehicles (HGV: heavy goods vehicles or PL: Poids lourds) with a weight over 3.5 tons. The traffic density in vehicles/h and the speed in km/h can be entered for these classes. When a parameter is changed, the sound power Lw'eq,A is immediately calculated and displayed in dB(A).

- : This button details the emission calculation. All parameters from the dialog are used. The user must enter only the gradient to be used in the calculation.

- : This button displays the L$_{W/m}$ diagrams for the two vehicle classes and a desired gradient. Vehicle class and gradient can be entered before the display.
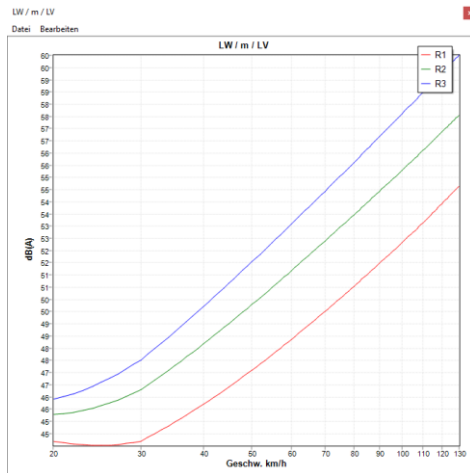
Here is an example: the diagram L$_{W/m}$ LV for light vehicles at 0% gradient.

Note on the road gradient: The formula of the regulation is only defined for road gradients of +/- 6%. As the road gradient is normally determined from the terrain during the calculation, gradients outside this range can of course also occur. The library parameters can be used to specify how to proceed in such cases:

- **Limit the gradient to 6% and calculate:** If the gradient resulting from the terrain is outside the interval [-6%, +6%], the amount of the gradient is set to 6% and the calculation is carried out.

- **Don't calculate project:** The calculation is not carried out as soon as the gradient of a geometry section of a road is outside the permissible range. The user must then adjust the terrain to ensure that the gradients of all roads are within the permissible range.

1.4   New Level Calculator

A new level calculator has been implemented for the addition of levels (energetic addition).

The upper, larger field shows the entries and the results. The lower, smaller field accepts the entries.

Calculations can be entered directly in the input field.

Possible are (energetic) addition, subtraction and multiplication. Press the Enter button to complete the entry, calculate the result, and display it in the results area.

Note:

Multiplication is not commutative, i.e., 3*60 is not equal to 60*3!

In general: R*P is executed according to:

$$R * P = 10 * \log(R * 10^{\frac{P}{10}})$$

Additional key function:

- ▪ "Cursor UP" and "Cursor DOWN" to bring the last entries from the history area back into the input.

- ▪ C: (**C**lear) deletes the history

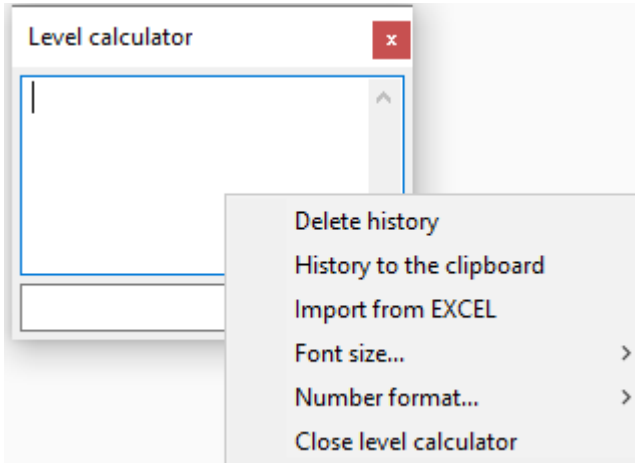- ▪ L: (C**L**ipboard) copies the content of the history area to the clipboard

- ▪ E: (Exit) Exits the level calculator

There is also the option of using the local menu:

- • Set the number of decimal places

- • Set the font size and, thus, the overall size of the calculator

- • Import data from Excel and calculate the level sum:
  To do this, select a contiguous area with valid numbers (columns or rows) in EXCEL and copy this area to the clipboard.
  Then select: Import from EXCEL. The content of the clipboard is imported, and the figures are added energetically.

If you do not want the new level calculator, you can use the compatibility switch: Use the old level calculator and use the previous calculator again.

1.5   New Directory Management, Saving Settings

1.5.1   Previous Procedure for Loading and Saving Settings

- ▪ All settings are saved in configuration files. (e.g. IMMI.INI or IMMI.HIS, IMI_StartInfo.INI etc.) In addition to these files, there are directories that contain additional data used by IMMI, such as the DB directory, which contains the spectra databases.

- ▪ All this data is stored in the directory:
  C:\ProgramData\IMMI
  This directory is not visible to many users but can be accessed via
  C:\Users\All Users\IMMI
  (The drive letter C can also point to another, usually local drive)

- ▪ This directory can be read from, but less and less can be written to. (Especially with Windows 10 and newer)

- ▪ Missing write permissions caused an error message to appear at the end of the program, indicating that the configurations could not be saved.

- ▪ The following solutions have so far been available for this problem:

  - • Create the new folder C:\Users\fr\AppData\Roaming\IMMI.

  - • Copy the complete contents of C:\ProgramData\IMMI to the new folder.

- Delete the folder C:\ProgramData\IMMI.
- If IMMI cannot find the default folder C:\ProgramData\IMMI, it automatically searches in the new folder, which normally has write permissions.
- Another possibility is:
  - Create any directory with write permissions (e.g. C:\My directory)
  - Copy the contents of C:\ProgramData\IMMI to this folder
  - Create a link to IMMI (e.g. on the desktop)
  - Access IMMI with /APPDATA="C:\My directory"
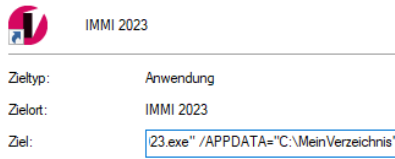
  - When IMMI is started, the call parameter is now evaluated and the directory transferred with /APPDATA is used as the configuration directory.

1.5.2   New Functions for Loading and Saving Settings

- To avoid having to work with a call parameter, the directory in which the IMMI configuration is saved can now be set in the program itself. However, this storage location must be saved in order to be available again the next time the program is started. Therefore, the directory is now saved in the registry database under the key: HKEY_CURRENT_USER\Software\Woelfel\IMMI.
- The configuration directory can be set via Settings/Environment/Directories:
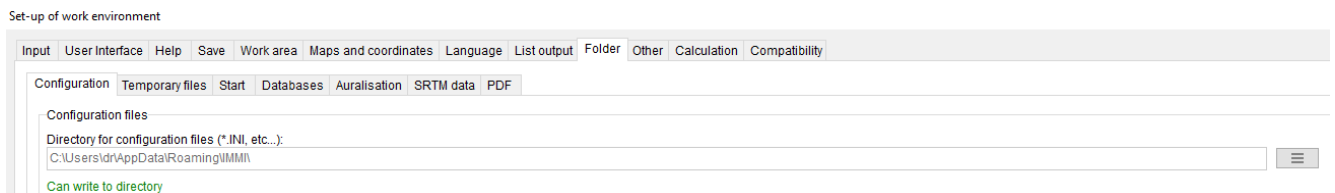
This page displays the directories for various use cases. It also indicates whether the directory can be written to.

Various help functions are available to make it easier to set and change the configuration directory:
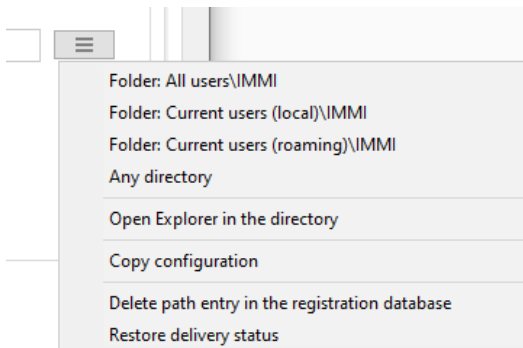
  - **Directory: All users\IMMI:** Selects the directory: C:\ProgramData\IMMI
  - **Directory: Current users (local)\IMMI:** Selects the directory: C:\User\xxx\AppData\Local\IMMI (xxx stands for the name of the logged-in user)
  - **Directory: Current users (roaming)\IMMI:** Selects the directory: C:\User\xxx\AppData\roaming\IMMI (xxx stands for the name of the logged-in user)

- **Any directory:** Here the user can select any directory for saving the configuration.

If a new directory has been defined with one of the above functions, you can select whether:

- The configuration should be copied from the old to the new directory

- The configuration will be moved from the old to the new directory.

- Only the directory should be changed, but no data should be moved.

- **Open Explorer in the directory:** Opens the File Explorer in the current configuration directory. This function simplifies the search for the configuration files currently in use.

- **Copy configuration:** Opens a dialog in which two directories can be selected. The contents of the source directory can then be copied or moved to the target directory.

- **Delete path entry in the registration database:** This function removes the path entry that specifies where the configuration files are located. It is only used for cleanup work or if there are problems with the registry.

- **Restore the delivery status:** This function should be used with caution.

  - The program searches for files with the name IMMI.INI in all the "usual" directories (see the first three entries above). If INI files are found in these directories, they are deleted.

  - The path for the configuration is reset to C:\ProgramData\IMMI

  - An entry in the registry database that stores the path to the configuration directory is deleted.

  This condition corresponds to the condition when IMMI was delivered new.

1.5.3   Program Behavior During New Installation

When IMMI is reinstalled, the configuration data is created in C:\ProgramData\IMMI. There is no file with the name IMMI.INI yet. As long as the configuration directory is not changed, the program always attempts to write to this directory. If it is not possible to write there, the configuration directory should be set as described above.

Note: The call parameter /APPDATA= continues to function as before. If the APPDATA call parameter is specified when the program is started, this is used, and the configuration is searched for in the specified directory.

If there is no file with the name IMMI.INI in the specified folder, the system searches for an INI file in the following order:

- In the directory that is specified in any existing registry key. (see above)

- In folder C:\ProgramData\IMMI

- In the folder C:\User\xxx\Appdata\Roaming\Immi

- In the folder C:\ User\xxx\Appdata\local\Immi

If no file with the name IMMI.INI is found, the configuration cannot be loaded or saved.

1.6   Customer Area

The customer area can now be accessed via the footer at the bottom of the IMMI website.

https://immi.woelfel.de/en/customer-area.html

In the customer area you will find the current IMMI version for download, the declarations of conformity and interesting information. Access data is no longer required.

1.7   Other New Features

- **Assessment DIN 18005 (2023):** The two new assessments
    - DIN 18005 (2023) Industry
    - DIN 18005 (2023) Traffic

were introduced together with the guide values defined therein.

- **Site plan: Mirror element(s):** It is now possible to mirror elements on an auxiliary line in the site plan. Proceed as follows:

    - **Create the mirror axis.** This must be an element of the type "Guideline" that has exactly two nodes.

    - Select the elements that are to be mirrored. (multiple selection also possible) Select the pop-up menu item "Elements…/Mirror elements".

    - Select the auxiliary line to be used as the mirror axis.

    - Specify whether the original elements should be deleted after the mirroring process. (Only the mirrored elements are then retained)

    - After mirroring, the mirror axis may be deleted.

- **Color scales for noise mapping Spain:** Three color scales specifically required in Spain for noise mapping have been added.

- **Display of the element info:** Name, library name and element group can now also be displayed directly on the mouse pointer in the site plan.

    This behavior can be irritating with a large number of closely spaced elements. Therefore, this display can also be switched off. Right-click the mouse button on the map axis. Then activate/deactivate the Site plan/element notes function.

- **Level table:** If the height is displayed in the level table, this column is given the heading "H" or "Height."

- **Peak levels in level markers and level tables.** If peak levels were calculated in addition to the immission levels, these can now be displayed as level markers or in the level tables. The selection is made in the dialog of the display parameters for immission levels.

2   Optimizations in IMMI 2024

- **Menu item Extras/Macros**: This menu item has been completely removed. Functions have been moved to other menus where they fit better thematically.

  - Moving and transforming nodes can now be found under:
    Project/Accessibility/All nodes...

  - The coordinate manipulation "Add or remove the stripe zone" is now available in the Coordinate systems dialog:

  - Disturbance for elevation points
    This function can now be found in the "Terrain model/Options" dialog under "Terrain auxiliary functions."

- **Dialog collections:** The "Apply collections" button has been renamed "Additional functions" and provided a click-down icon.

  Some visual details have been improved.

- **Assessment:** When changing the assessment and switching the assessment on/off, only a dialog now appears in which the desired change is indicated, and the emission data can be reset.

  This dialog appears when you change the assessment.

- **Display of IP and façade level markers:** In addition to *Display ON* or *OFF*, you can now also select here:

  Display the level marker "Yes, if IP/façade point calculated."

- **Import/export of settings:** The "Settings/Export settings" function has not been maintained for some time. As a result, many settings could not be exported and re-imported into other projects. This function has now been significantly expanded. Over seventy settings can now be exported easily and clearly in a newly designed dialog:

- **Directionality XHN and CLF Balloons:** A new feature is the rotation angle by which a directional balloon (XHN or CLF) can be rotated around its main direction of radiation. Until now, the main direction of radiation could point in any direction in space, but the balloon itself could not be rotated around this axis. This is now possible.

- **Element library name:** To make it easier to identify elements in the site plan, the long form of the library is now displayed in the status bar in addition to the name and short form of the library:

  Example: Short form: **St31**

  Long form: **Street /NF S 31-133**

- **Display of the directional arrow:** If directionality is activated, the directionality vector (arrow) can now also be displayed on lines and area sources. For these elements, the arrow is drawn at the first node of the geometry.

- **Scale vehicle data:** A macro has been added for Cnossos rail vehicles with which the "Vehicles/h" parameter can be scaled.

  A separate factor can be entered for each emission period (day, night rest, etc.), which is then used to multiply the existing vehicle figures.

- **Input format limit values:** The number format for the limit values for exceeding the guide value has been extended from one to two decimal places.

- **The local menu of the map axis** has been tidied up a bit. Some functions that are generally rarely used have been moved to the **Site plan** sub menu.

- **Calculation of sound power** according to DIN EN ISO 3744 is now available for all users (Menu: Extras). The VDI 3760 option is no longer required for this.

- **The negative detour is displayed in the profile section.** However, this detour is only the negative detour with regard to the terrain. This has now been noted in the diagram legend, so no more confusion can arise.

  The menu item "Reset spectra" has been added to the spectra input dialog. This sets all level values in all thirds/octaves to the value "not yet entered."

- **Element groups and variants:** It is now possible to select more than one variant or more than one group. With this selection, the functions *move*, *delete*, *left/right,* and *up/down* are now possible.

- **Site plan name:** You can now set whether the site plan name:

  - Also contains the name of the coordinate system

  - Contains the name of the result layer for level tables.
    For level tables, the layer name in the site plan is not really useful because the layers are displayed in the table itself.

  The name of the site plan appears on the screen in the title bar of the plan and on the report pages.

- **GeoTIFF import.** Until now, GeoTIFFs containing individual tiles could not be read. The import was canceled with an error message. It is now possible to read such GeoTIFFs.
  (In particular, the federal state of Hesse provides current TIFFs in tile format for terrain data)

  Line elements nestle against the terrain. This function was previously only available for individual roads. A whole selection of line elements can now be added to the terrain from the list of elements.

- **3D Viewer comfortable**: with newer PC hardware, it may be necessary to set a special mode for calculating the 3D scene. This parameter can now be set conveniently via the interface.
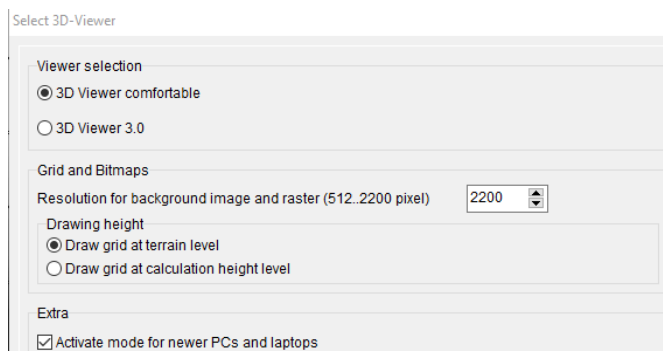
  Activating this option is necessary if the 3D Viewer (comfortable) no longer starts or no longer displays the 3D scene in a meaningful way.

- **Thematic plans:** Here, the emission of the road can be displayed in color. To make it easier to see the color of the lines, the display width of the road can now be entered as any scaling factor.

  In addition, this factor is saved at runtime, so it does not have to be re-entered each time the thematic plan is accessed.

- The "Standard" **emission spectra and attenuation spectra database** have been renamed "VDI 2571".
  (This is also the source of these spectra)
  Six spectra were missing in the emission spectra database; these have now been added.

- **Conversion from A-octave spectra to A-third octave spectra (and vice versa)**
  There are basically two possibilities here:

  - Three A-weighted third-octave bands forming an octave are directly added energetically.
    The A-sum level of the resulting octave spectrum is the same as that of the A-weighted third octave spectrum.
    (The same applies to the energetic distribution of an octave band over 3 third octave bands)

  - The A-weighted third octave spectrum is converted into a linear spectrum
    Three third octave bands are energetically added to form an octave band.

The resulting octave spectrum is A-weighted again.
The A-sum level of the third octave and octave spectrum are slightly different.
This procedure was previously standard in IMMI.

You can now set how this conversion is to be carried out.
This setting only applies to the conversion in the input dialog of the spectra databases!
Calculation results are <u>not</u> affected by this.

- **Daily cycles:** The procedure for switching daily cycles on/off was somewhat confusing. In particular, the removal of the "Daily cycle" switch could give the impression that the standard emission without daily cycle would be restored, but this was not the case.
A new menu button now clearly controls which action is to be carried out:

- **The program language "Slovak"** has been added.

- **New interface for displaying the results list** when calculating individual points.
As usual in all other parts of the program, this action can now be accessed directly by clicking on a button on the page where the results lists can be activated. The new interface has replaced the somewhat outdated "tree" display.

Buttons that do not make sense in the context of the results are not displayed.
The options for the individual lists can now be easily accessed via a menu button.

The name of the result file is displayed above the buttons.

3   Corrections in IMMI 2024

- **Construction of vertical surfaces:** Solar modules can now be constructed vertically here.

- **Interior module:** When checking the material assignment with persons, the message could appear that the assignment was incorrect or incomplete, although the definition was correct. The assignment is now recognized correctly.

- **Spectra databases:** The "Save selected list entries" function led to crashes in the internal spectra databases. This has been fixed. The "Only user-defined entries" function is disabled as all entries are user-defined. (The program does not specify fixed entries here.)

- **Create macro immission points on the house:** In this macro, reference values could be entered for the generated immission points, even if an assessment was activated in the project. However, this does not make sense because the assessment determines the guide values. The assessment then overwrote the manual entry. The input fields for the guide values are now locked when an assessment is switched on.

- **CNOSSOS-EU block functions:** If the DTV (in Austria, the JDTV) is set via the block functions, the values for Q and v must be calculated so that they can be displayed correctly. This did not happen in every case. The problem has now been fixed.

- **Type change RLS-90 Road:** In the case of multiple changes to the element type of RLS-90 road elements (e.g., to RLS 19 roads), the type change was not always carried out. The problem is now fixed.

- **CDiffus at industry sources:** This parameter used in the "Internal level" input type was not evaluated correctly for Cnossos industrial sources. This has now been fixed.

- **Daily cycles with the same key:** When loading older projects, it could happen that several daily cycles in the daily cycle list had the same key (namely 0). In this case, it was not possible to clearly assign the sound source to the daily cycle. If this status is detected, a "Reassign numbers" button appears in the list of daily cycles, which is used to renumber the daily cycles within the list.
  <u>Note:</u> After renumbering, the daily cycles must be reassigned to the sound sources.

- **On the CNOSSOS library page**, vegetation attenuation was marked as "not taken into account." This is correct, with the exception of Austria. However, if the "National features" selection is set to "Austria," vegetation attenuation is active and is now also marked accordingly.

- **Terrain import:** ArcGIS text files and XYZ text files containing terrain were not imported correctly if they contained blank lines. The blank lines are now skipped, and the file can be read in full.
  In addition, numbers can now be read if the decimal separator is a comma. Previously, only the decimal point was allowed.

- **Photovoltaic blend calculation:** In exceptional cases, reflected rays could be found where the reflection point was not on a photovoltaic module. This does not make sense and has now been rectified.

- **Dialog terrain model:** When assigning the element group to the height point elements, it could happen that the wrong element group was assigned. This has been corrected.

- **Macro: Move all nodes:** Sound sources on houses were not moved correctly.

- **Room acoustics module:** In very small rooms (2..8. m²), a large number of beam paths with a large number of reflection points can be created. This caused the list of beam paths to overflow, and a runtime error occurred. This problem has now been fixed.

- **Rotate sound sources with directional effect:** If a source was rotated in the site plan, the directivity vector was also not rotated. Now, the directivity vector follows the rotation of the element.

- **Shape export of RLS 19 roads** did not work in the English interface. Corrected.

- **Tunnel according to RLS 19:** When editing this element, runtime errors occurred when opening the dialog. Corrected.

- **Compact stored elevation points:** Runtime errors could occur when decompressing such elements. This has been fixed.

- **sonROAD18** - Correction: If sonROAD18 roads were set to the input type "Q and V" and the Q values were explicitly entered or imported, incorrect Q values were displayed in the "Enter emission data: Road sonROAD18". This error has been corrected.

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