These release notes are describing changes in LIMES 2000 since version 17.0228.883. The new release mainly deals with features for power measurement and displaying electrical, respectively, temperature data. Stabilization and reporting was improved. Besides, a number of cosmetic issues and errors discovered since the introduction of the last version have been fixed.

Installation

LMTAO version 1.2.70 or higher is required for LIMES 2000 rev. 17.0922.942. If the LMTAO library is not installed or shows a wrong version, Limes and LimesControl will not start. LMTAO is available for download on the LMT homepage.

Symmetrisation (Lighting application)

The order for symmetrisation and correction has been changed. Now correction is performed first and afterwards a potential symmetrisation is done. If the user choses to correct to average, this sequence preserves the flux. The luminous flux value shown in the header is calculated in the same manner and will not differ any more from the tabled value.

In case correction was used, the cd/klm did not fit to the cd reading divided by the flux. The bug was fixed.

Luminaire offsets for angle C could lead in cone measurements to missing data for C0. The bug was fixed.

Zonal flux (Lighting application)

In older revisions of Limes 2000 the intensity values within the zonal flux table were given in cd/klm in case the lamp flux is known. Otherwise, e.g. for absolute photometry with no lamp flux available, it was displayed in cd.

From now on the zonal flux in this situation is always in cd/klm. However, for calculation the absolute intensity (in cd) of the luminaire is used.

Data import/export

The electrical and temperature protocol is available after saving as .csv file format for successive evaluation in MS Excel.

GEOTYPE and OPTTYPE in the PHILUM data format will be evaluated in accordance to the given geometry data. Formerly, they have been always zero.
In addition, the MCOD, STATUS and APPL parameter will not be changed automatically anymore.
The LAFLUX value is calculated as the summed flux of all lamps divided by the number of lamps. If this value is not set or zero, the measured flux of the luminaire will be used. The INVO and INPW parameter is calculated as the average of the first distribution which has an electrical table.

LAFLUX, INPW, INVO and NLPS parameter of the PHILUM data format can be saved automatically. In case the test data are saved after the measurement the parameter mentioned above will be filled with measurement data. This is enabled via a checkbox in the PHILUM special data settings. The default setting for this checkbox is the checked status.

EULUMDAT import now supports absolute photometry data, however, only for number of lamps equal to -1. Dimensions of the luminaire are imported correctly (in similar manner as luminaire area).

Stabilization

While implementing temperature stabilization a bug was introduced leading sometimes to infinite stabilization times, e.g. no end although the lamp had stable intensity readings. The bug was fixed.

Within the stabilization window the right top label of the diagram for temperature deviation was changed from [%] to [°C]. The dialogue coming up after stabilization failure was improved.

In case stabilization in advance of every C-plane measurement is activated, the audio buzzer will signal the measurement start of the next plane.

The stabilization diagram offers auto scale for both x and y axes. Furthermore the tolerance box will be visible in the report diagram, either green indicating the success of stabilization or red in case of failure. Unfortunately, stabilization data recorded with older versions of Limes 2000 are not compatible and will not be displayed like new data.

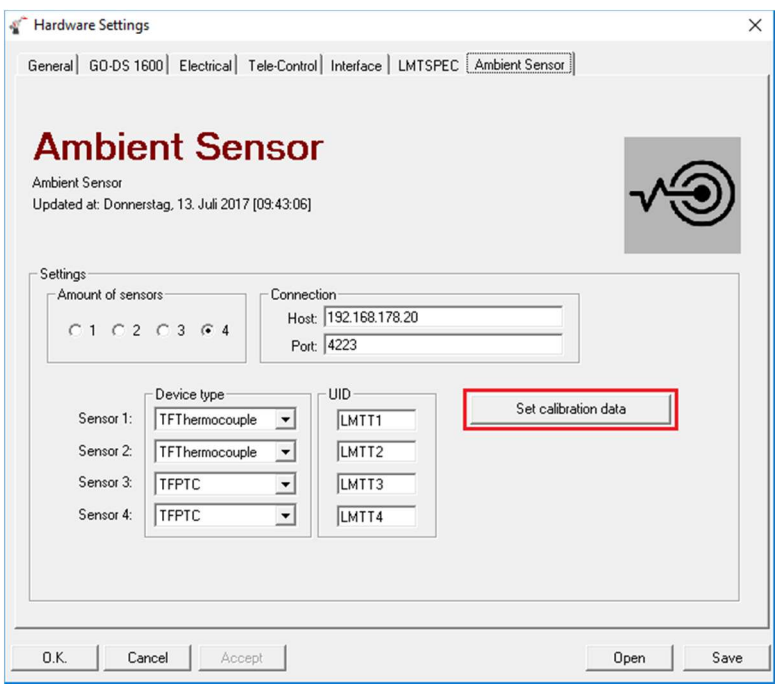
Reports

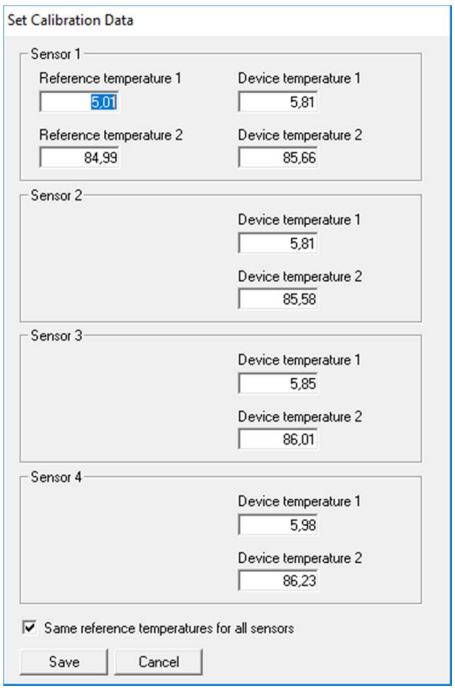
- Several minor bugs with regard to printing of reports were fixed. Colours visible in the grid data on screen as well as colours defined to indicate that a result is ok will now be as well visible in the printout. However, this only works if the grid template is not an LMT standard setting since the latter are protected.
- For both general lighting and automotive applications, instead of cd or lx the unit displayed for data measured with a colorimeter has been cd/klm. This bug has been fixed, however, in order to apply the desired unit for colorimeter data, the measurement program has to be opened and saved again.
- License plate measurements are based on length dimension (instead of degrees for H and V). The typical unit is mm which will be given in the header of the printout.
  In addition, in the past H or V values have been truncated at 180 since they were treated like goniometer angles. The bug was fixed for both report and printout of the program.
- The re-aim column will be suppressed if re-aim is not activated in a specific measurement. This is done even if the re-aim column is selected by the grid.
- Limes 2000 now uses for display the *Report Grid* which is used as well for printout. Hence, columns will be shown in the same manner both in display and printout.

- During evaluation of test reports the grid name shown in options has not been the one which the user had chosen while editing the test data. This has been corrected.
- The *Remark* column in grid data shows the resolution of maximum functions. In future the word *Save* will be printed as well in case the distribution is saved.

Ambient Sensors

Calibration data of the ambient sensors can now be set in the *EditHardware* dialogue in Limes via the button *Set calibration data* in the tab *ambient sensor*. A dialogue (see below) will open in which the advanced user can enter the calibration data provided by the calibration certificate from LMT.





Spectrometer operation

The temporary spectrum file saved by LimesControl will be saved from now on locally in the directory in which LimesControl is installed instead of using the file folder of the current database. This enhances performance, especially in case of network based file storing since large access times are avoided.

Colour measurement

During color scans with a C3300 colorimeter signal averaging is obviously not possible. However, in case of very low signal the uncertainty of chromaticity coordinates will drastically increase. Therefore, measurements having a sum of X + Y + Z < 1.5 (e.g. less than 1500 digits) will not be used any more to calculate chromaticity coordinates or correlated colour temper-

ature but will only show the intensity of the Y channel while the corresponding X and Z values will be set to zero.

In evaluation of colour coordinates or correlated colour temperature the missing values will be displayed or printed with a "-". Those points are also not plotted into the CIE 1931 or CIE 1976 colour chart.

Integrating Sphere

Colour charts have been added for displaying data recorded with a colorimeter (both C1210 and C3300) in an integrating sphere. Correction of data due to calibration via software as well as an optional attenuator at the colorimeter is properly taken care of.

CSV data export recorded with a colorimeter in a sphere from now on contains beside X, Y, Z as well x, y and T_{cp}. This was implemented to allow for convenience of easy data evaluation outside Limes 2000.

Flash measurement

In test programs using the SF105 as measurement device, only the unit cd will be available from now on. The unit lx will not be visible any more for SF105.

In order to differentiate luminous intensity from the effective intensity evaluated by the SF 105 software, in test reports the symbol J [cd] will be shown. In case the flash energy is used, the unit of J is [cd·s].

Reflex measurement

During movement of the Retro 2000 sensor the buttons *Go* and *Init* will be disabled. Similar, in the corresponding dialogue of reflex measurements the buttons Go, *Init* and the text field for entering the rotation angle ε will be disabled if the checkbox *use rotation* is not activated.

Power supplies

- A new AC power source SE AS 2000 (with I-mode for in-period current regulation) has been added to the available power supplies in Limes. The interface command type is SCPI again.
- The Chroma 6430 AC power supply has been added to the list of available power supplies; however, the maximum current is limited to 16A in order to avoid blowing the slow fuse in the connection unit.
- Starting of lamps sometimes failed in applications when users measured discharge lamps with a Chroma 64xx power source in *Auto Range* mode. However, the lamp would start if the range is changed manually to 300V.
  Therefore, from now on the range will be set by the software before the output relay is

switched on. The range decision will be done depending on the given voltage for power ramp up. Once the voltage is ramped down and the output relay is switched off, the range mode will be set back to *Auto range*.

- Implementation of Jäger DC one channel power supply has been improved with regard to the time needed for ramping to a certain value. The major parameter was enhancing the waiting time to 20 ms in order to get a correct reading even if the PC is busy with other tasks.
  The command strings for value reading or setting do not need to be entered manually, but are available as default after choosing Jäger power supply in electrical options.
- The Jäger 6 channel power supply has been added to the available power supplies in Limes 2000.
- Switching of voltage for measurement of turn indicators in flashing mode works with all Jäger devices.

Power measurement

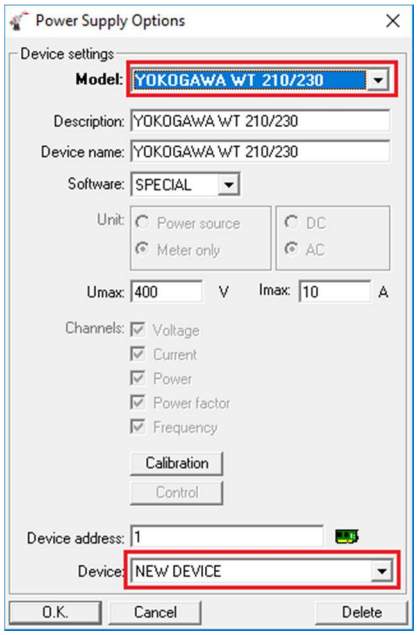
Yokogawa WT 310/330 has been added to the list of available power meters. Therefore, from this revision on it is not necessary to change the interface setting of the WT310 to WT200. In addition, the first channel will be read by default even in case there is more than one channel available.

For AC devices capable of measuring frequency values this information is now available within Limes 2000. In goniometer data of lighting applications the value will be saved within in the electrical table while for stabilization the frequency is part of the flux time table. For sphere applications it is added to the electrical data record.

In order to make the frequency measurement available, the electrical device has to be updated within the electrical instruments options (see picture on the right hand side).

This process is quite complex and should be done only by the advanced user. A separate application note is available which explains how to change the setting step by step.

Correspondingly, in the power supply dialogues of both Limes 2000 and LimesControl there will be one more entry which displays the measured frequency.



Within the electrical protocol and in the temperature protocol the corresponding plane will be displayed in the header, e.g. for a C-plane scan the C-angles are used to identify the individual plane.

Frequency and temperature measurements have been added as well for C-plane scans using GO- V and GO-R instruments.

Miscellaneous

- In situations when Limes 2000 is working with a corrupt data base, it is not possible to add fields to table *TestData* of a test database. An error message was introduced informing the user that it is necessary to use a new Limes 2000 database.
- From now on intensity values equal to zero will be shown in the intensity and illuminance table as 0 instead of "-".
- In up/down or down/up measurements with GODS for determination of direct/indirect flux it was not possible to use colour point or point measurements with Gamma Angles defined by the user. From now on the user is able to change the Gamma angle also for this type of measurement commands.
- GO-H 800 with a resolution of 0.05° was sometimes running into the horizontal end switch if the user had moved it manually beyond ±90° and switched back to software control. This cannot be completely avoided, however, now the safe area for manual operation is extended to ±170°.
- In situation when one axis is running into the end switch, for all GO-H types the other axis will be stopped immediately.
- Programs containing both point and grid measurements sometimes showed empty lines in case a certain evaluation was not available for point data. A similar behaviour occurred for CRI and spectral evaluation. The bug was fixed.
- Point measurements with C3300 are done by averaging of multiple readings. In some situations the first readings may not be valid if the instrument is still tuning in. Therefore, the first two readings will be neglected before the averaging starts.
- Logging of hardware errors has been improved and is saved into a file named *Recover.log*.
- The update rate of the progress bar in LimesControl is now calculated based on the scanning speed. The progress bar has been disabled for GO-R goniometers to avoid conflicts due to the high scanning rates.
- The evaluation of AFS did not work if distributions had been saved as ASCII files. This bug was fixed.
- Displaying of large data in multiple tables is accelerated because the corresponding message window will only pop-up once.
- Colorimeter measurements with unit lx were only corrected to test screen distance if the correction to test screen was activated. Otherwise the illuminance value was given at the physical distance of the colorimeter. This was changed such that test screen distance is used even if there is no correction to screen geometry.
- The text box coming up during the *Pause* command will show the next command. Formerly, the preceding command text was always displayed. The *Pause* command after the last measurement was suppressed since it is redundant.