

LMT Goniophotometer Software – Migration to a new OS/PC –



1 Introduction

This information is intended to support users of **LIMES 2000** or **SoLiT Automotive** in case

- an existing goniophotometer software shall be transferred to a new computer running WIN 7/10.¹
- the computer hard disk containing the goniophotometer software installation needs to be replaced.
- Microsoft Windows needs to be re-installed as a clean system.
- you have to migrate from Windows XP or Windows 7 to Windows 10, either to 32bit or 64bit version.

Throughout this document we are using the word “LMT Software” for both LIMES 2000 and SoLiT Automotive. A few steps of the procedure are necessary for **LIMES 2000** only, but not for **SoLiT Automotive**. They are always marked as “**LIMES 2000 only**”.

2 Hardware requirements

2.1 Performance characteristics

As of 2020, LMT recommends to configure new PCs based on below listed characteristics. Alternative hardware, for instance AMD instead of Intel processors, may be chosen, however, full compatibility has to be carefully checked.

The list below lists hardware requirements for bot **Limes 2000** and **SoLiT LabControl** (= hardware client of **SoLiT Automotive**), i.e. for all cases when an LMT goniophotometer will be connected to the PC.

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|---------------------------------|--|
| – Operating System | Microsoft Windows 7/10 with .Net framework 4.8 installed.
64-bit systems are strongly recommended, but as of 2023 32-bit systems are supported as well. |
| – Housing | Desktop PC or 19” frame for integration into a 19” cabinet |
| – Processor | ≥ 4 cores |
| – Clock rate | ≥ 2 GHz |
| – RAM | ≥ 8 GB (64 Bit, x64), 16 GB recommended
≥ 4 GB (32 Bit, x86), 8 GB recommended |
| – Disk capacity | ≥ 200 MB free disk space available (SSD recommended) |
| – Graphic device | DirectX 9 with WDDM 1.0 or higher |
| – Display | 1024 x768 minimum, full HD recommended |
| – No. of PCI slots | ≥ 4, depending on measurement hardware |
| – Measurement bus | National Instruments IEEE 488.2 controller interface board (PCI-GPIB) |
| – Network | ≥ 100 Mbit transfer rate |
| – 2 nd LAN interface | in case hardware with TCP/IP interface is used, e.g. power supplies etc. |
| – 3 rd LAN interface | in case a luminance camera is used, e.g. LMK from TechnoTeam |
| – COM and USB ports | as required by the individual hardware |

¹ WIN 11 is currently under test, but has not been officially released as of March 2023.

2.2 System settings

Energy options must be set in such a way that sleep mode is disabled! Otherwise, correct reading from the hardware cannot be guaranteed.

Monitor switch-off may be configured according to the user's preferences. LMT default setting is 45 minutes.

2.3 Peripheral devices

Mechanical dimensions of PC housing or required number of connections have to be considered when deciding about new computer hardware. Please care about sufficient slots for USB, serial and PCI or PCI-Express connections. Especially, in case of GPIB or DAQ boards, it should be assured that the corresponding board connectors do not interfere with the housing.

It is recommended to carefully check how many of each type are required with the old setup and how many might be required in future for other devices (software dongles, external memory devices, printer, CD-ROM, ...). License keys in USB version can be supplied on request. Old type LPT license keys cannot be used with parallel-port interface board, only if available on mainboard.

3 Software requirements

LIMES 2000 can be operated on Microsoft WIN XP/7/8/10 (WIN XP only up to version 18.1117.1038), but as of 2020 installation on WIN 10 is highly recommended.

SoLiT Automotive), can be installed on WIN 7/10. Preferable, 64-bit operating systems should be installed although LMT software still runs as well on 32-bit systems.

In order to avoid any problems during the installation and migration process, it is essential to have an up-to-date operating system including all service packs, updates and patches.

On all operating systems WIN XP/7/8/10 you have to log on as "Administrator" or with a user account having administrator rights to install the interface drivers and the LMT software.

SoLiT Automotive is installed in the standard folder programs. In order to avoid problems with Microsoft Virtual Store, **LIMES 2000** should be installed in C:\LMT, at least in a different location than the standard program files.

Installation of the GPIB interface drivers has to be done first and in a second step the LMT software including Sentinel driver (**LIMES 2000 only**) may be installed. Per default, both GPIB and Sentinel devices are using the same port numbers. Please refer to chapter 6.1. , i.e. "GPIB Interface board".

4 Preparation

In advance of installing LMT software on a new PC or upgrading the operating system, a proper backup as described below should be done in order to prepare all data for easy setup of the new installation.

4.1 Backup

Make a backup of all your files from the **LIMES 2000** software. Per default all files are located in the folder "...\\LMT\\LIMES 2000\\Data". Current settings can be checked in \\Options\\Files and Folders. We recommend to make a copy of the complete folder to a safe place (network drive, CD, etc.).

Data of **SoLiT Automotive**), are hosted by the server. If the server module runs on a remote PC, usually backup should be done for the remote PC. If the server module is installed locally, the database folder should be part of a regular backup procedure.

4.2 Save registry settings (LIMES 2000 only)

If you want to have the same appearance and handling of the software on the new computer, you should perform the following steps in order to bring all software settings from one computer to the other.

The same procedure can be used if you want to transfer the settings for different Windows operators with own accounts.

1. Use the WINDOWS Start button and select “Execute”.
2. Type the name of the Registry Editor program “regedit” and click on “Open”.
3. Select the entry “\HKEY_CURRENT_USER\Software\VB and VBA Program Settings” and click on it with the right mouse button. Select the “Export” item from the pop-up menu.
4. Select a proper file name like “*Limes settings old PC*” and save the file. It will get the extension “.reg”.
5. Copy this file to a save place (network drive, CD, etc.).

5 Upgrade of operating system (OS)

After a proper backup has been done, a conversion of WIN 7 to WIN 10 may be performed. Experience shows, that in 99% of upgrade procedures the installed software packages are working properly after the conversion. In this case LMT software is ready to be used without any additional measures.

However, to cover the remaining 1%, it is necessary to perform the backup procedure as described in chapter 4. If the OS conversion fails, the user will have to set up the PC including the new OS from scratch, which means the backup procedure has been better done properly.

6 Installation

6.1 GPIB Interface board

In case the hardware like a goniophotometer or an integrating sphere is connected to the computer, the GPIB driver needs to be installed first. If the LMT software is used for evaluation only, this step may be skipped. The actual version of the NI-driver can always be downloaded from the National Instruments website

<https://www.ni.com/en-us/support/downloads/drivers/download.ni-488-2.html#329025>

Alternatively, the NI-Software may be installed from the CD as initially delivered. However, this may require an update later on which is why LMT recommends to install the latest update in the first place. The current version is 19.5.

1. Run the setup program and conduct a full installation.
2. Terminate the setup, remove the CD and shut down the computer.
3. Open the PC and install the interface board in an empty PCI, PCIe or USB slot. Please take care that the interface cable connector can be easily plugged later to the socket of the interface board without any interference or stress induced by the PC housing.

4. Close the PC and power it up again.
5. In the Device Manager you will find the driver for National Instruments.

LIMES 2000 only:

There is a problem that National Instruments is using ports which are required as well for the driver of the Sentinel license key. Therefore, a port modification has to be implemented into the WINDOWS registry settings. If this port modification is not done at this point in time, later on the driver for the Sentinel license will not be properly installed.

6. Download the appropriate registry change from <https://www.lmt.de/latest/Drivers/Sentinel/DongleNotFound-Problem/>
 - LogosPortsFix_Win7x64.reg is to be used for WIN 7/8/10 64bit
 - LogosPortsFix_Win7x86.reg is to be used for WIN 7/8/10 32bit or WIN XP
7. Execute the port modification by double-click on the selected file.
You will be asked whether these settings should be installed into your current registry.
Please confirm.
The settings will be copied into your actual registry. You will get a message of the success.
In case of doubt, you can check with TCPview (MS Sysinternals) that NI is using port 7000.
8. In order to avoid any sleep mode effects, turn OFF all relevant settings with regard to energy saving within the power options of your operating system.

6.2 Installation of LIMES 2000

A LIMES 2000 installation (new PC or disk) should follow the steps as listed below. It is recommended to download a Universal Limes-Setup-file with the latest release and drivers from www.lmt.de/latest.

Currently (as of 2021), the latest available Universal-Limes-Setup is 18.1105.1038.

If network access is not available, LIMES 2000 can be always installed from the CD as initially delivered. Once this is done, updates can be installed by simply replacing the files *Limes.exe* and *LimesControl.exe* manually within the \LMT\LIMES 2000 folder.

1. Make sure that no license key is connected to the computer before you start the setup.
2. If you install Limes version 16.607.806 or higher, an additional software package called LMTAutomationObjects (LMTAO) is required and should be installed first.
Microsoft .NET Framework 4 must be installed in order to enable the installation of LMTAO.
WIN XP operating systems which are not up-to-date may report an error when executing the MSI installer. Please download in this case *WindowsXP-KB942288-v3-x86.exe* from the Microsoft homepage or from the LIMES 2000 download folder and install it.
3. After double-click on the LIMES 2000 setup-file, select “Full installation”.
In order to avoid problems with MS virtual store under Windows 7/8/10 you should install LIMES 2000 in C:\LMT\LIMES 2000 and avoid to use the standard installation path suggested by the operating system (e.g. C:\Program Files\LMT\LIMES 2000).
4. If the LIMES 2000 setup is not progressing, there may be a conflict with the network settings. In this case you have to disconnect any network (LAN, WLAN), reboot the PC and start the setup again. During or after the setup process you may be again requested to re-boot the PC.
5. Subsequent to the LIMES 2000 installation process, the license key driver from Sentinel will be installed.

Do not start LIMES 2000 at this point in time but follow the steps outlined below!

6. If the installation has been performed using the LIMES 2000 setup CD containing an older software version, please download the current version from the LMT homepage www.lmt.de/latest.
As outlined in chapter 6.2, newer versions of LIMES 2000 are not installed via an installer kit, but by simply replacing the files *Limes.exe* and *LimesControl.exe* manually within the \LMT\LIMES 2000 folder.
7. Use the WINDOWS Explorer and select the folder “..\LMT\LIMES 2000”. Re-name the folder “\LMT\LIMES 2000\Data” to something different, e.g. “\LMT\LIMES 2000\DataNew”.
8. Copy the folder “\LMT\LIMES 2000\Data” of your backup files to the same location of the new PC.
9. Make sure, that the latest hardware description contained in your backup data, e.g. the files *Limesxyyyz.ini* und *Limesxyyyz.udb*, are located within the folder “\LMT\LIMES 2000\Data”.
10. Copy the latest text file, e.g. the *Items.mdb* for screen and printed text into the folder \LMT\LIMES 2000\Data. This file may be downloaded as well from the Limes Download folder.

6.3 Registry settings (LIMES 2000 only)

Registry settings may be restored if a backup was done as described in item 4.2, however, they have to be adapted to the new operating system.

1. Open your registry settings file (“Limes settings old PC.reg”) with any text editor, for instance *Notepad++*. If necessary, use “Find and Replace” to change the path names from the old computer (probably C:\Program Files\LMT\...) to the ones of the new computer (probably C:\LMT\...).
2. Select a proper file name like “Limes settings new PC.reg” and copy the file onto the new PC.
3. Double-click on it.
You will be asked whether these settings shall be installed into your current registry.
Please confirm.
The settings will be copied into your actual registry and you will get a message in case of success.

6.4 Driver for Sentinel License Key (LIMES 2000 only)

After the Limes 2000 setup the Sentinel license key driver has been installed. The steps below describe how to make sure that the latest update has been installed.

1. In case your Limes 2000 installation was done via a CD, please check the driver version.
As of 2020 the latest version is 7.6.5.
2. If the driver version is the latest one, you can continue with item 6.6.
3. If the driver version is not the latest one, it must be replaced.
Uninstall the Sentinel driver via “Programs and Features” in the control panel.
4. Shut down the computer, disconnect the license key and re-start the computer.
5. Remove all Sentinel registry settings.
 - Run SSDcleanup-64 for Windows 7/10 64bit
 - Run SSDcleanup for Windows 7/10 32bit or Windows XP
6. Install the Sentinel driver 7.6.5 (allow changes on firewall settings)
7. Connect again the license key.
The settings will be copied into your actual registry and you will get a message in case of success.

6.5 Installation of SoLiT Automotive

Follow chapter 4.1 of the *SoLiT Automotive* manual.

6.6 Windows settings

Some Windows settings might be different on the new operating system, depending on the language. Especially the decimal point or decimal comma setting could influence the data format when the light distribution is exported into external file formats like IES, Eulumdat, etc.

1. For Windows 10 you can change the relevant settings in the chapter “Time & Language”.
2. Select “Language” and then “Administrative language settings”.
3. Click in the tab “Formats” on “Additional settings...”.
4. Here you can change the “Decimal symbol” and the presentation of “Digit grouping”.
5. Do not forget to disable sleep mode!
6. Maybe a Windows restart is necessary.

6.7 Installation of peripheral device drivers

Depending on the actual goniophotometer or integrating sphere in-use, different types of driver software might be required. Due to the huge variety of chip sets used by different suppliers in the past, this chapter can only give some general information.

- In case your goniometer is using USB-serial adapters, for instance for the Computer Controlled Table of GO-H systems, Tele-Control or L1000 luminance spot meter, you have to install the related driver of the USB2Serial cable supplier. Common suppliers of the corresponding chip-sets are FTDI and Prolific. For each of them there are different drivers for different operating systems.
- Some of the old USB2Serial adapters (e.g. PL2303HXA and PL2303X EOL chip versions) are not any longer supported by Windows 10. In this case the corresponding conversion cables must be replaced by new ones (e.g. PL2303HXD (HX Rev D) or PL2303TA chip for the examples mentioned above). Good experience has been made with conversion cables using chip sets from FTDI.
- If the PC is equipped with an internal PCIe serial board, a Manhattan driver could be the right one.

Unfortunately, Microsoft Windows does not easily provide a detailed hardware information. If you have the opportunity to boot the PC with a LINUX system, relevant hardware information can be extracted much easier.

7 Launching LMT Software

7.1 Connect hardware

If not yet done, make sure, that all hardware connections are properly done. This includes all serial ports, USB-to-serial connections (potentially based on a range extender) and last but not least the GPIB-bus from the control rack.

GPIB functionality and device availability may be checked using the National Instruments Measurement & Automation Explorer App, i.e. NI MAX.

Since the GPIB-cable is quite rigid and may exert force onto the GPIB controller board, respectively, on the PCI-slot in the PC main-board, LMT recommends to install a stress relieve for the IEEE cable, for instance using wire straps. Under no circumstances any stress applied to the cable should be passed onto the controller board, but should be absorbed by the stress relieve.

7.2 Starting LIMES 2000 for the first time after installation (LIMES 2000 only)

Now you can start the LIMES software the first time and do the final adjustments.

1. Once the LIMES 2000 screen comes up for the first time, make sure that hardware is enabled. This can be done for instance via the menu item *Options → enable hardware*
2. Make sure via *Options → files and folders* that the hardware description, e.g. the files *Limes xxyzz.ini* und *Limes xxyzz.udb*, are properly referenced.
3. Although the old registry settings have been imported, after the start of Limes2000 you may have to change two parameters via the menu item *Options → Program → Connection*
 - If you stay with “UDP connection” you have to click on the arrow at the “Remote computer name” to have the same name as the “Local computer name”.
 - In order to avoid problems with the UDP protocol, especially under Windows 7, LMT recommends switching to “Connection via file transfer”.
4. Some settings like screen resolution may be different on the new system. LIMES 2000 will detect the change and propose a new resolution which should be adopted.
5. Please check all settings in *Options → Hardware* and *Options → Files and Folders* in order to see whether they still reflect your existing hardware and software setup.
Especially after installation of USB2Serial driver software, Microsoft Windows may assign COM port numbers which do not reflect the hardware settings in LIMES 2000. Make sure, that the settings used in *Options → Hardware* are matching the parameters in the device manager.

Occasionally, the number assignment of such COM ports generated by USB2Serial adapters may be changed (e.g. usually increased) by Microsoft Windows which in turn means that the COM port numbers will not match the Limes hardware settings any longer. This may happen after installation of a new USB device (mouse, keyboard etc.) or when a USB cable is moved to a different slot.

If Microsoft Windows has changed COM port numbers, this change has to be undone within the device manager. Do not update the Limes hardware settings. Otherwise, such events will eventually lead to high port numbers beyond 16, while LIMES 2000 is only able to support COM port numbers up to a maximum of 16.

7.3 Starting SoLiT *Automotive* for the first time after installation

Follow chapter 4.3 of the *SoLiT Automotive* manual.

You are now ready to start working with your LMT goniophotometer Software. Have fun!