

# Quick Guide

## A-LAS-CON1-ACP-Scope Software V2.00

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(PC software for Microsoft® Windows Vista, XP, 2000, NT)

**for control units of type A-LAS-CON1-ACP  
and sensor systems based thereon**

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## 1 Installing A-LAS-CON1-ACP-Scope

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1.



DVD-Laufwerk (F:)

Place the installation CD-ROM in your computer's CD/DVD drive. In our example we assume this is drive "F".

2.



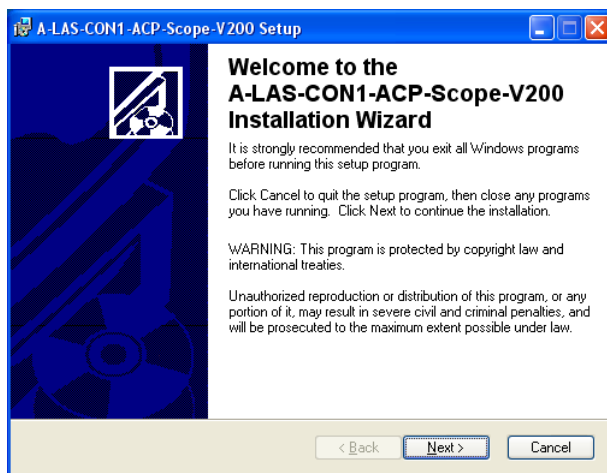
setup.exe  
MSI Installer Bootstrapper  
National Instruments

Start the Windows Explorer and in the folder tree of your CD-ROM drive navigate to the installation folder F:\Install\.

Then double-click on the SETUP.EXE symbol to start the installation.

As an alternative, software installation can also be started by clicking on **START / Run...** and then entering "F:\Install\setup.exe", which must be confirmed by clicking on the **OK** button.

3.

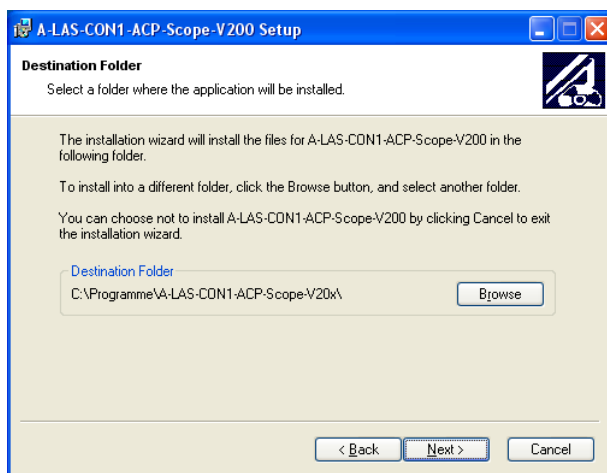


The installation program then displays a dialog box for A-LAS-CON1-ACP Scope installation.

This dialog box shows some general information about installation.

Click on the **NEXT** button to start the installation. **CANCEL** closes the program without performing installation.

4.

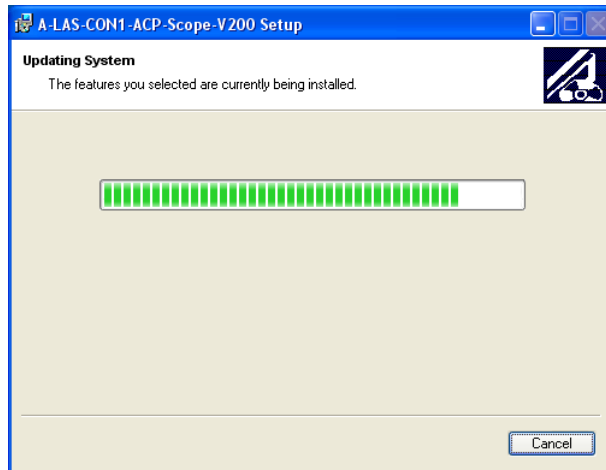


A dialog appears for selecting the folder where the application will be installed (destination folder).

You may accept the suggested folder with **NEXT**, or you may change the destination folder as desired by clicking on the **BROWSE** button.

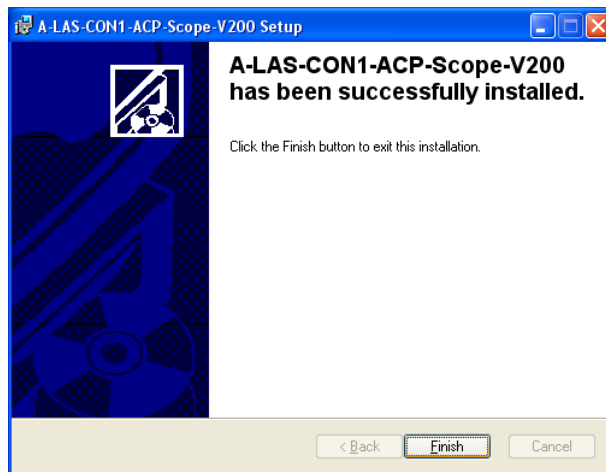
Click on the **NEXT** button to continue with the specified folder. **CANCEL** closes the program without performing installation.

5.



Installation is then performed automatically.

6.



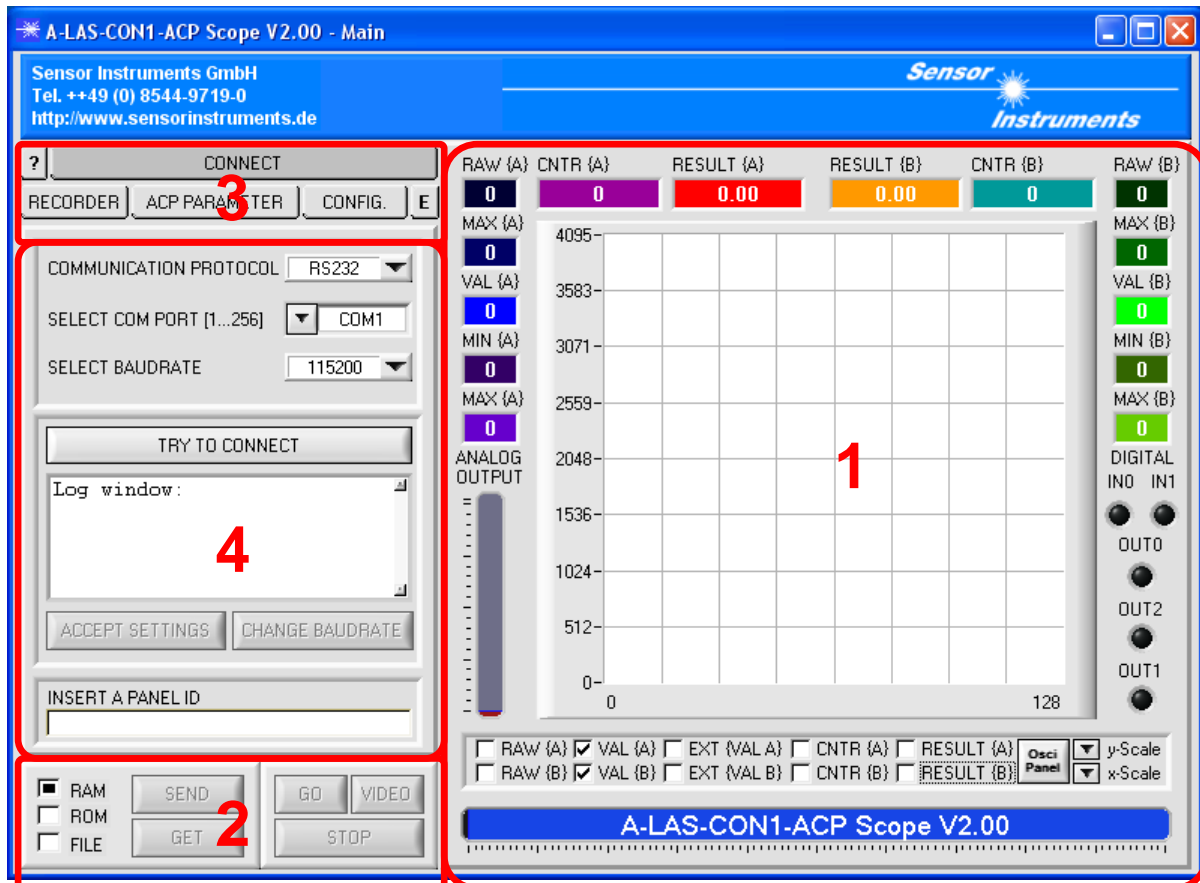
When installation is completed, a dialog box informs you about successful installation.

The A-LAS-CON-ACP Scope software can now be started by clicking on the respective icon in the newly created program group under:

**Start > All programs  
>A-LAS-CON1-Scope-V200**

## 2 Overview - A-LAS-CON1-ACP-Scope

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The user interface is divided into four sections: The right section (1) contains the numeric displays of the current A-LAS-CON1-ACP data and the scroll graph display that represents the characteristics of the signals. In oscillograph mode two displays for the individual channels are shown instead of the scroll graph. Section (2) permanently displays the buttons for controlling data exchange ("GO", "VIDEO" and "STOP") and the buttons for exchanging parameters with the control unit ("SEND" and "GET"). Individual parameters of the A-LAS-CON1-ACP can be accessed by way of several panels that are arranged centrally at the left side (4). The buttons (3) for selecting these panels and thus defining the current display are located at the top of the left side.

## 2: Data exchange



The software is not connected with the A-LAS-CON1-ACP.

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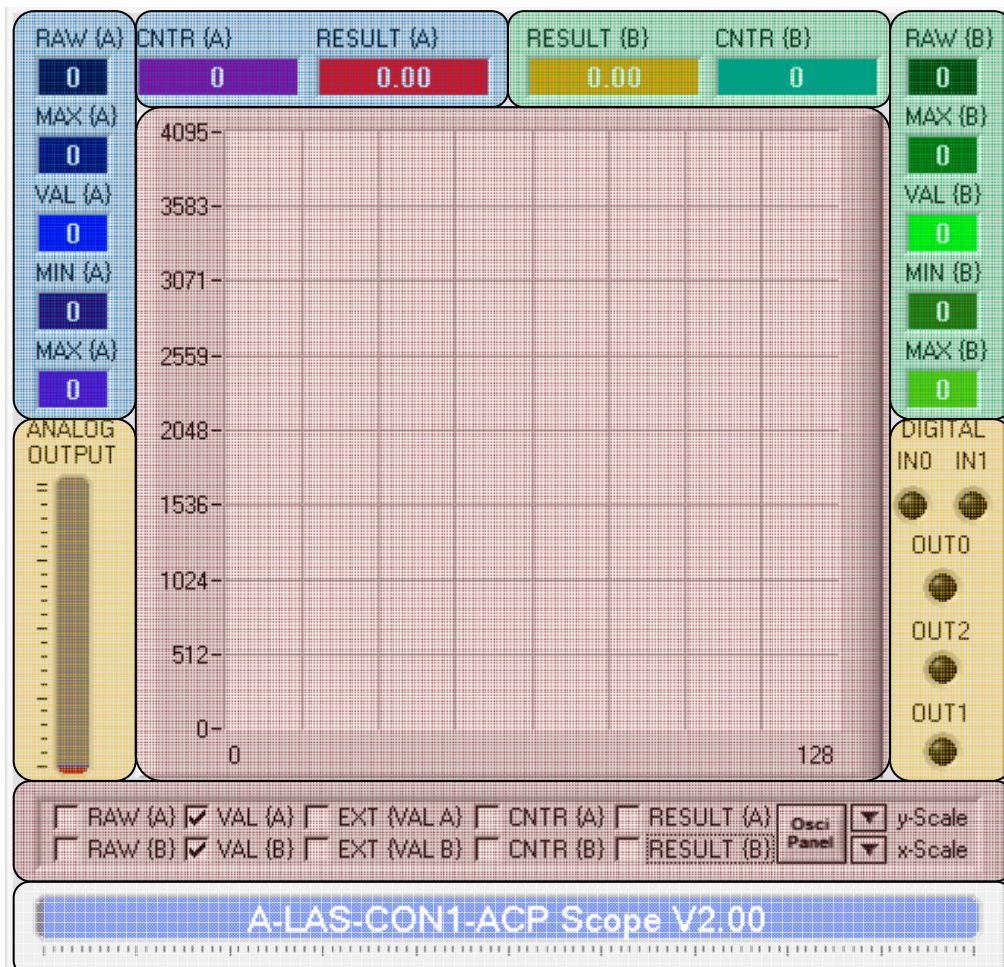


The software is in "GO" mode: Data are cyclically requested from the control unit and displayed.



The software is in "VIDEO" mode: Data are cyclically requested as in "GO" mode. When recording is finished and available, the respective data are then read out and displayed.

## 1: Numeric / graphic displays

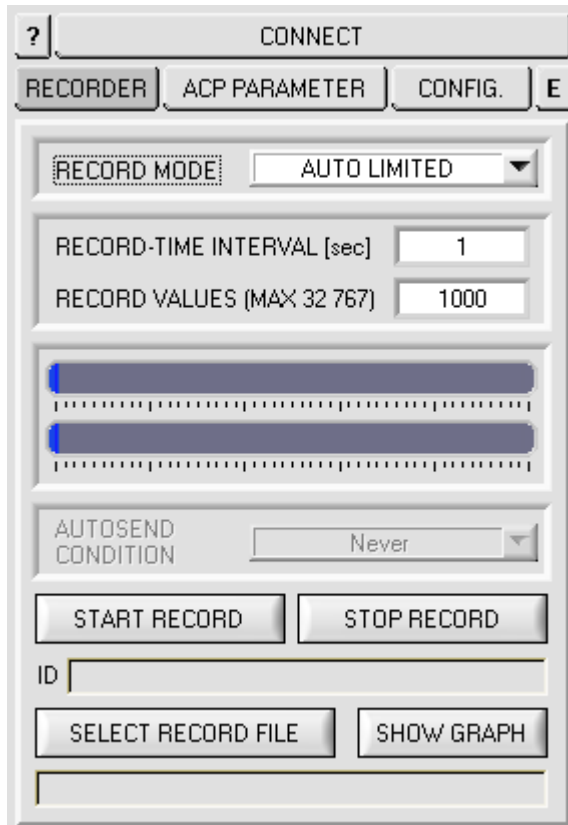


Blue background	Numerical values of channel A
Green background	Numerical values of channel B
Yellow background	Status displays of the digital inputs and outputs and of the analog output
Red background	Graphic displays of measurement values

### 3+4: Parameter and configuration panels

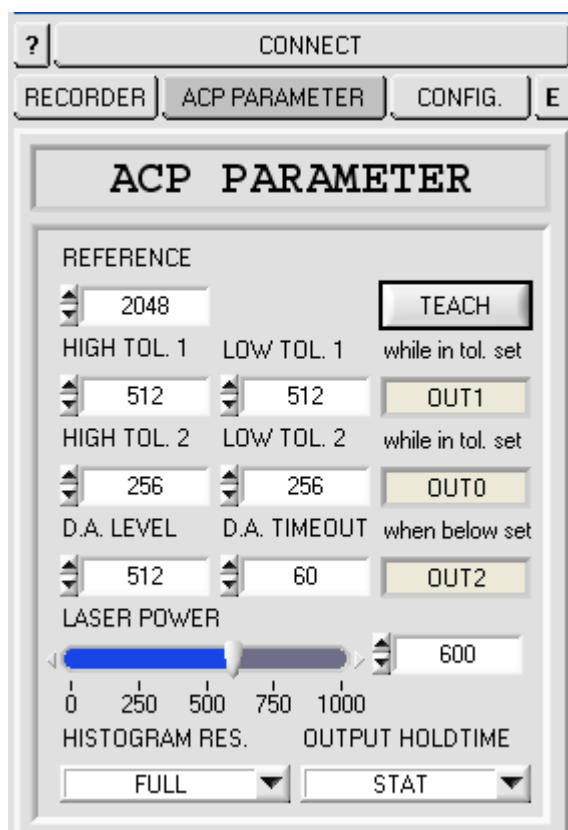
The **CONNECT** panel is used for setting the connection parameters for communication between the PC and the A-LAS-CON1-ACP control unit. The type of connection can be selected in the **COMMUNICATION PROTOCOL** selection field. The available options are RS232 and TCP/IP. RS232 must be used for real serial interfaces (COM1, COM2) and for virtual COM ports that are generated by RS232-to-USB converters. The port number is defined in the **SELECT COM PORT** input field, where the port number must be entered by means of the keyboard. If, for example, a virtual COM port exists at COM17, this must be entered as "17", "com17" or "COM17". The eight COM ports that were entered last are saved in a history and can be selected from this history by clicking on the dropdown field. **SELECT BAUDRATE** is used to determine the transmission rate (bits per second). For this rate five settings are available between 9600 baud and 115200 baud. Once the connection parameters have been set, click on **TRY TO CONNECT** to try to establish a connection. If connection is successfully established, click on **ACCEPT SETTINGS** to synchronise the PC and the control unit. At this time the baudrate can be adapted by clicking on **CHANGE BAUDRATE**. To do this, select the desired baudrate from the dropdown list, and then click on the button. Finally, the connection entity can be given an identifying name in the **INSERT A PANEL ID** text field.

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The **RECORDER** panel is used to control the recording of current measurement data in a text file on the local computer. For this purpose the connection with the control unit must have been established and a valid target file must have been selected. This target file can be selected by clicking on the **SELECT RECORD FILE** button. **RECORD MODE** allows you to select one of four recording modes. **AUTO LIMITED** saves a specified number of values (**RECORD VALUES**) in a specified time interval (**RECORD TIME INTERVAL**). With **AUTO UNLIMITED** recording continues without limit until recording is stopped or the maximum number of values is reached. **MANUAL RECORDING** adds the current value from the running measurement to the file every time a button is pressed (**CAPTURE DATA FRAME**). Finally, **AUTO TRIGGERED** records a data frame when a previously specified event occurs.

When the recording mode has been selected and the respective parameters have been set (time, values), recording can be started by clicking on the **START RECORD** button. The software at the same time is set to "GO" mode. Recording is stopped when the specified number of values (or the maximum number of values) is reached. A running recording process can be stopped at any time by clicking on the **STOP RECORD** button. When recording is restarted all the counters will be reset.



Necessary settings for A-LAS-CON1-ACP operation can be made in the **ACP PARAMETER** panel. These settings include the **REFERENCE** value that represents the setpoint value of the quantity to be measured. This value and also the tolerance values are entered in ADC digits, which can be converted into mm with the factor (APERTURE LENGTH / 4096). The **TEACH** button copies the last measurement value as setpoint value to the parameter set. Two asymmetric tolerance bands are available around the reference value, one of which is linked with **OUT1** (emergency stop), and one with **OUT0** (warning signal). The permissible measurement value deviations are entered under **HIGH TOL** and **LOW TOL** in ADC digits. Digital output **OUT2** is a status or dirt accumulation output. The output is activated if for a certain time in seconds (**D.A. TIMEOUT**) the recorded analog value remains below an adjustable threshold (**D.A. LEVEL**). When the threshold is exceeded the output and the timeout time are reset. **LASER POWER** is used to determine the intensity of the sensor's transmitter. This parameter should be set such that when the laser beam is free (!) the RAW value lies in a range between 3000 and 3600 digits. **OUTPUT HOLDDTIME** defines the time for which the digital outputs at least are "ON". This helps to prevent too short pulses for the PLC. Finally, **HISTOGRAM RES.** defines the resolution of histogram recording. 512 "bins" are available altogether. With **FULL** setting, 8 values are combined per bin. With **HALF** 4, with **QUARTER** 2, and with **FINE** only 1 value is counted per bin.



? CONNECT

RECORDER ACP PARAMETER CONFIG. E

### ACP CONFIGURATION

USE SCALING

☐ On  
☐ Off

SELECT SCALEFACTOR

NONE

SCALE [mm per 4095 digits] CORR. FACTOR [%]

1.000 100.000

GET NORM FACTORS

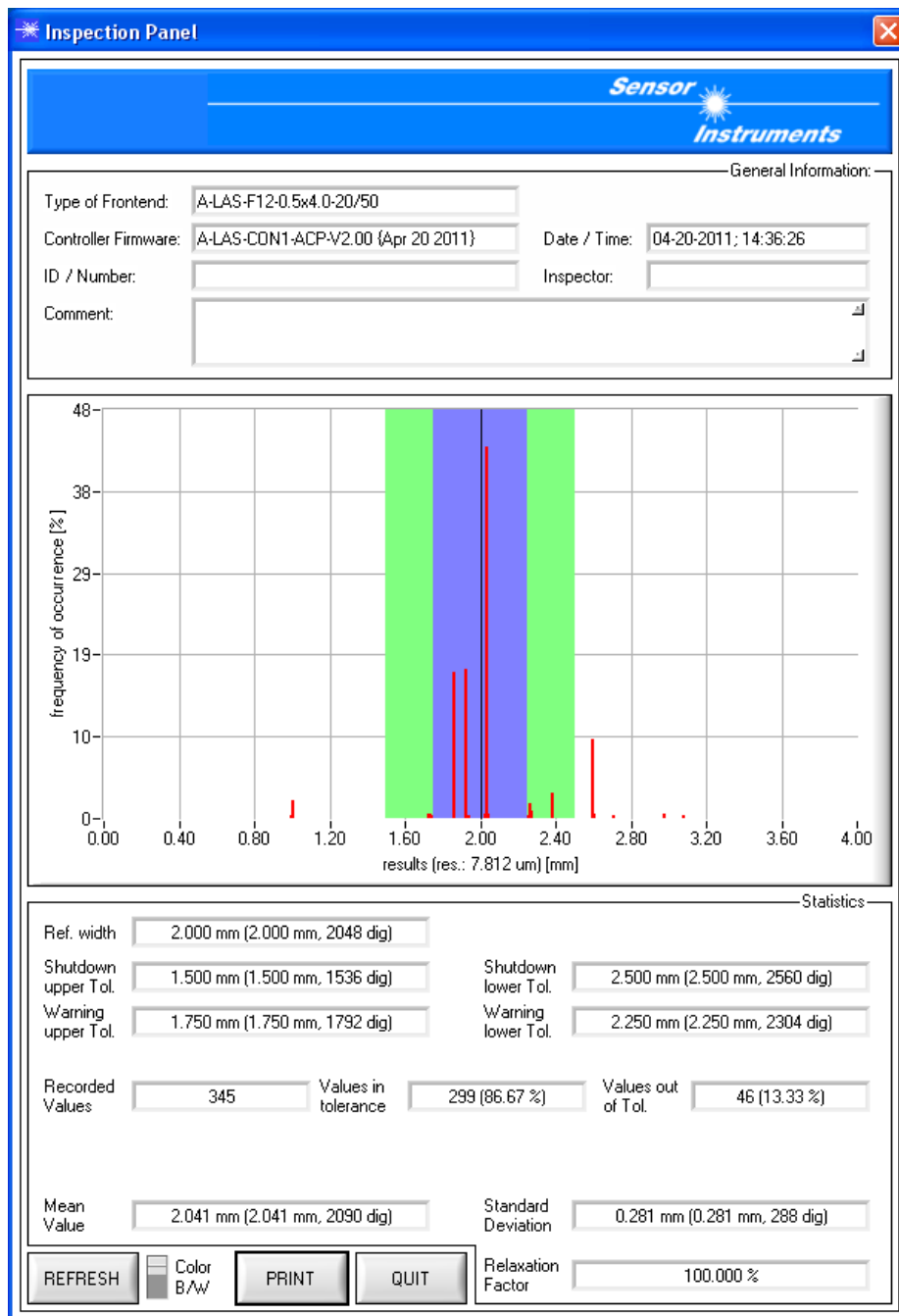
RESET INTERNAL BUFFERS

PRINT REPORT

LOCK SOFTWARE

The statistical evaluation of measurement values is an integral part of the ACP software. For this purpose the determined measurement values are counted in a histogram. Every measurement value is considered in this recording process. Recording continues until one of the counter readings reaches the value of  $2^{31}-1$ . After this, recording is frozen. These data can be accessed by way of the **CONFIG.** panel. With the **RESET INTERNAL BUFFERS** button the measurement value counters (bins) and other internal buffers and values are reset or set to zero. This button can be used to prepare the memory when a new batch starts. With a click on **PRINT REPORT** at any time, most appropriately at the end of a batch, the measurement value counters are read, processed, and displayed in a printable statistics view (see: **Inspection Panel**). If the aperture value of the sensor frontend is known, the measurement values can be scaled in mm. For this purpose scaling can be turned on and off with **USE SCALING**. The **SELECT SCALE FACTOR** dropdown list contains various sensors of different sizes. When **MANUAL** is selected, a user-specified length value can be entered. The **CORR. FACTOR** parameter is a correction value that is used for all measurement values, mean value, and standard deviation. The **LOCK SOFTWARE** button can be used to lock the access to the PC software with a password, which means that only **GO** and **STOP** will be available.

## Inspection Panel



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The **Inspection Panel** represents the measurement values recorded during the operating time of the A-LAS-CON1-ACP. At the centre the frequency of measurement value occurrence (ordinate) is represented in relation to the measurement values (abscissa) in a bar diagram. The area within the emergency stop limits is shown in green (bright grey in b/w mode), the area within the warning signal limits is shown in blue. **Ref. width** represents the setpoint value (first value: after use of the correction factor, in brackets: without correction factor and without scaling) The fields **Shutdown upper Tol.**, **Shutdown lower Tol.**, **Warning upper Tol.** and **Warning lower Tol.** show the corresponding limits in the same format. The values of the arithmetic mean value (**Mean Value**) and of the standard deviation (**Standard Deviation**) are calculated from the histogram record and displayed. Other display fields show the correction factor (**Relaxation Factor**), the total number of recorded values (**Recorded Values**), and the percentage of measurement values within (**Values in tolerance**) and without the limits defined by the emergency stop limits (**Values out of Tol.**).

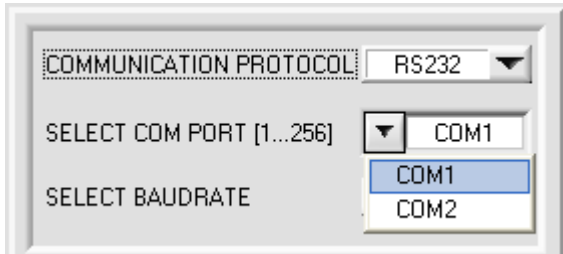
The upper section contains three display fields that show the selected sensor (**Type of Frontend**), the firmware version and the control unit (**Controller Firmware**), and the date and time of report generation (**Date / Time**). Three additional fields can be used to enter the batch number (**ID / Number**), the abbreviation or name of the person preparing the report (**Inspector**), and any desired text comment for the report (**Comment**) before printing.

For a black-and-white view of the panel (b/w printer) the display can be toggled between **Color** and **B/W**. In this case the panel needs to be created and filled anew, which can be done by clicking on the **REFRESH** button. Once the panel view has been completely refreshed, it can be printed by clicking on the **PRINT** button. If a report should be saved on the local hard disk, we recommend to use a corresponding PDF printer driver to create a PDF file. The main window cannot be accessed as long as the Inspection Panel is active. Click on the **QUIT** button or on the "Close" icon at the right side in the title bar of the window to close the Inspection Panel.

### 3 Measuring with A-LAS-CON1-ACP and A-LAS-CON1-ACP-Scope

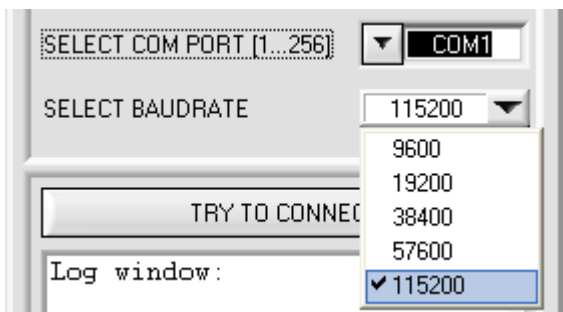
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#### 3.1 Establishing the connection and exchanging parameters

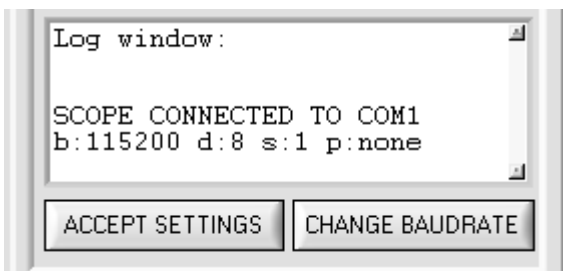
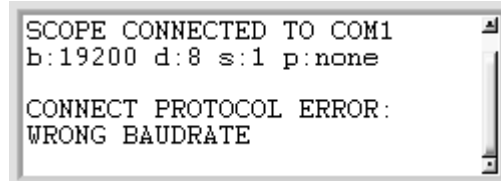


Select the COM port through which the A-LAS-CON1-ACP is connected to the PC. A virtual COM port that is assigned by the Windows® operating system can be determined by means of the Device Manager.

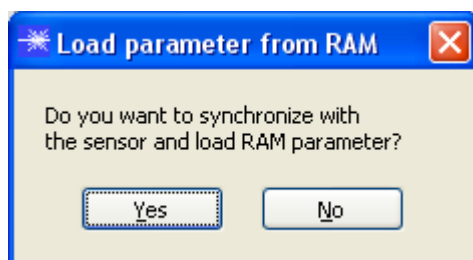
**START > Settings > Control Panel > System (tab: Hardware > Device Manager)**



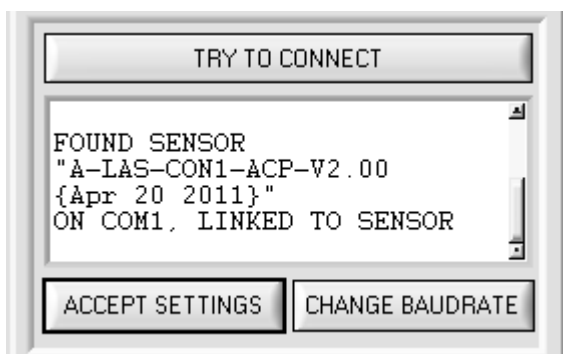
Select the baudrate that should be used. An error message will be displayed if the baudrate does not match the baudrate used at the control unit:



Click on **TRY TO CONNECT**. If the selected COM port exists, is available, and communication through the COM port shows an existing A-LAS-CON1-ACP, continue with **ACCEPT SETTINGS**.



After **ACCEPT SETTINGS** you will be prompted to fill the parameters of the PC software with those of the control unit. Normally this synchronisation should be performed, except if the parameters of the PC software have already been specified and should not be overwritten.



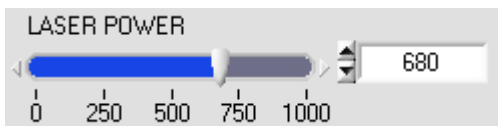
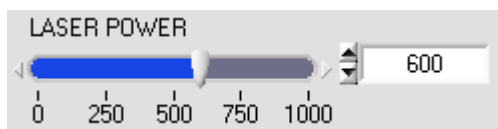
The final message shows the version string of the control unit in the LOG window.



When parameters have been set in the PC software they must be sent to the control unit. Click on the **SEND** button to do this. This process transfers all the parameters. Click on the **GET** button to read parameters from the control unit to the PC software. The buttons will be disabled during the sending process. When the process is finished the buttons will be enabled again.

Three memory types can be selected: **RAM** is the volatile memory of the A-LAS-CON1-ACP that will lose its contents when power is turned off. **ROM** is the non-volatile memory of the A-LAS-CON1-ACP that will not lose its contents when power is turned off. However, the ROM memory cannot be rewritten without limitation. **FILE** means a file on the local hard disk. This item can be used to locally store parameters sets of the A-LAS-CON1-ACP or to restore them from files.

### 3.2 Configuring parameters and setting the scaling function



RAW {A}  
**2882**

The first step that must be performed always is to set the laser power. For this purpose check the RAW value with the specified setting and with free laser beam.

A value between 3000 and 3600 is ideal. In this range the laser power is sufficient to guarantee stable measurement without risking overloading of the receiver. Use an iterative process to increase the power until the RAW value assumes the desired value.

RAW {A}  
**3490**

RAW {A}  
**3489**  
MAX {A}  
**2860**

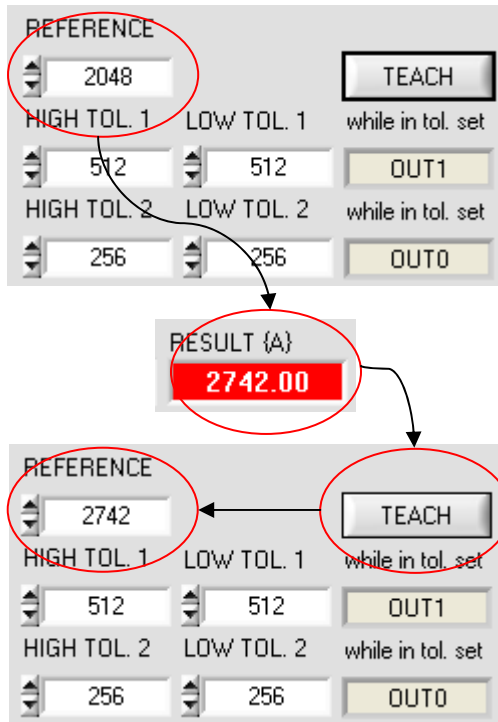
GET NORM  
FACTORS

RAW {A}  
**3488**  
MAX {A}  
**3490**

Scaling should be set as the second step. Scaling means that the analog values that are provided by the sensor are scaled to a fixed value range by applying a factor.

In non-scaled operation the measurement value depends on the laser power and on the degree of dirt accumulation at the optical unit. In scaled mode this dependency does not exist. The basis of scaling is to determine the factor that is to be applied, which is based on the non-scaled value that occurs when the light beam is free.

The calculation or determination of this factor can be started by clicking on the **GET NORM FACTORS** button. Depending on the parameterisation, re-calculation also can be triggered through an external input.



The third step is to determine the reference and the tolerances, as well as general parameters. If reference and tolerances should be entered as absolute values, they must be calculated as follows:

$$\text{value[digits]} = (\text{value[mm]} * 4096) / \text{aperture length[mm]}$$

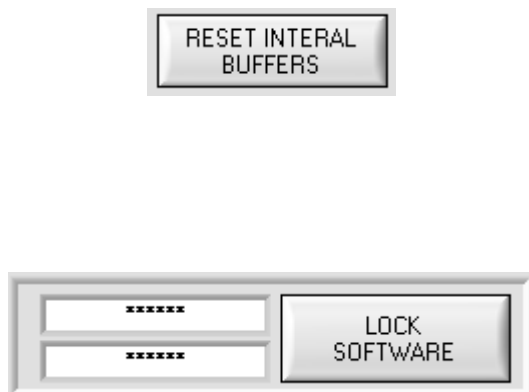
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As an alternative it is also possible to perform a measurement and to then adopt the value as reference by clicking on the **TEACH** button.

PLEASE NOTE: The parameters must be sent to the control unit, either to the volatile or non-volatile memory of the A-LAS-CON1-ACP.

PLEASE NOTE: The scaling setting will be LOST when power is turned off! Scaling must be performed anew after every power loss! The parameters (which relate to a fixed value range) can be kept.

### 3.3 Starting and stopping measurement



The A-LAS-CON1-ACP already is active after parameterisation, i.e. the outputs already switch according to the configured tolerance values. If measurement values also should be evaluated statistically, the measurement value buffer must be reset at the start of the measurement. This can be done by clicking on the **RESET INTERNAL BUFFERS** button. After this, the PC software can be closed. The A-LAS-CON1-ACP then continues to operate independently.

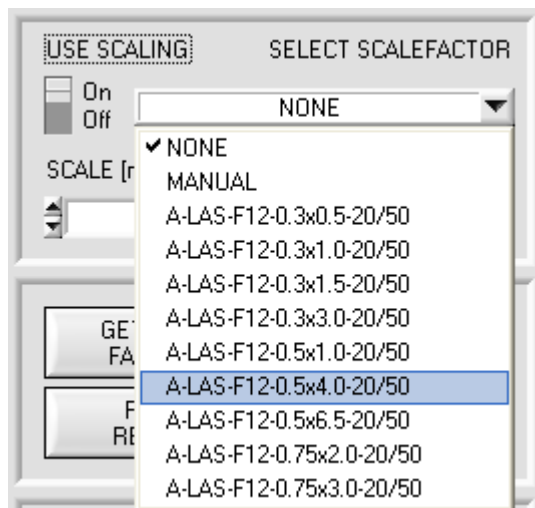
If the software remains active during the measurement (e.g. for observing the trend of measurement values at the PC, or for recording data), access to the software can still be limited. For this purpose the software can be locked by clicking on the **LOCK SOFTWARE** button and entering a password twice (two fields). In locked state the software only can be started (**GO**) and stopped (**STOP**).



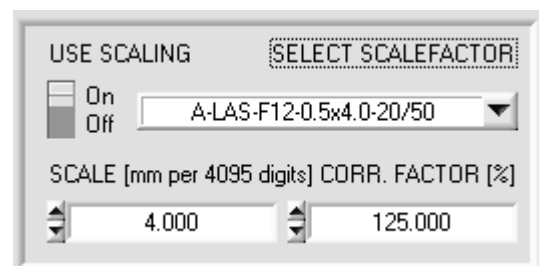
To unlock the software again, enter the password and click on the **UNLOCK SOFTWARE** button.

*PLEASE NOTE: The software can be closed at any time. When the software is restarted it will no longer be locked. However, it is NOT possible to reconstruct the password! A possible software manipulation can thus be traced back.*

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If after the end of the measurement the measured values should be statistically evaluated, click on the **PRINT REPORT** button (in **STOP** mode). Prior to this the correct sensor should be selected and the correction factor should be set.



**PRINT REPORT** opens the report view that is partially filled automatically and partially must be filled in by the person preparing the report.



Color output is set as standard. For b/w printing select **B/W** and click on the **REFRESH** button. Click on the **PRINT** button to initiate the panel print-out.

### 3.4 Wiring of A-LAS-CON1-ACP

Wiring Diagramm

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