CA®-SMART

REF: 5310.1

CA®-SMART Version 3.0 with Webcam

(CA® Photo Support REF 5312.1 is technical precondition for this version)

REF: 5310.0

CA®-SMART Upgrade Version 3.0 without webcam

- for upgrading CA®-SMART Version 2,
(the existing webcam can be used).

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SCHEU Dental Technology

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System Requirements

Before starting the installation process, make sure your computer system meets the following requirements:

- Windows XP SP3 / Windows Vista / Windows 7 / Windows 8
- USB 2.0/ 3.0 port for the webcam
- Mouse with scroll wheel (recommended)
- Graphic card with OpenGL >= 2.0 and DirectX >= 9.0c driver support
- Monitor with at least 1024x768 resolution
- At least 500 MB free memory required for installation and sufficient memory for project data (appr. 40-160 MB for each project set-up)

We strongly recommend to save your patient data on a regular base (e.g. on an external hard disc).
Please make sure all available updates have been installed on your operation system as well as on the hardware drivers (graphic card, chip set etc.)

Hint: Please disable the power saving mode directly. In the case your PC is automatically set in the power saving mode (standby mode/sleep mode), we recommend to quit the software when leaving your working place, as otherwise waking up the program may lead to problems.
Some current notebooks come with two graphic cards which can be used alternately in order to maximize power saving. In this case make sure the CA®-SMART software is only used with the higher quality card. In case of questions contact your hardware supplier.

An internet connection and an installed email client are recommended for using the software.

CA®-SMART-Software (Scope of Delivery)

The software (REF: 5310.1) comes with:

- USB flash
  with the following files:
  SetupCA-SMART_Ver_3_X_X.exe
  SetupCA-SMART_Ver_3_X_X-1.bin
  SystemInfo.exe
  Calibration_XXXXX.zip

  All files have been duplicated as .md5 files in order to make sure all files have been completely and correctly copied on the USB flash.

- Factory-calibrated webcam with serial number
- Detailed manual

The Upgrade Software (REF: 5310.0) comes with:

- USB flash
  with the following files
  SetupCA-SMART_Ver_3_X_X.exe
  SetupCA-SMART_Ver_3_X_X-1.bin
  SystemInfo.exe

  All files have been duplicated as .md5 files in order to make sure all files have been completely and correctly copied on the USB flash.

- Detailed manual

Please use the factory-calibrated webcam with serial number and calibration_XXXXX.zip provided under your software version 2.0.

The CA® Photo Support (REF: 5312.1) is required for using all function of CA®-SMART version 3.0.

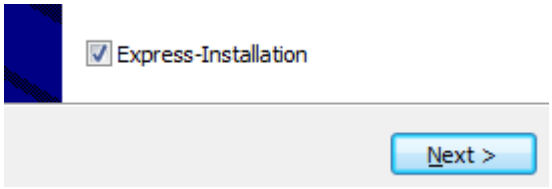
System Accuracy

The software has a physical resolution of 0,07 mm per pixel.

Hint: Before getting started:

The CA®-SMART 3.0 software is a single user version.

You can install the single user version using the express installation:



In case of disabling the express installation, you can proceed with a user-defined installation. This kind of installation offers you the possibility of choosing the installation paths for:

- **Program Directory (Program)**
- **Directory of Application Data (Program Settings)**
- **Directory of User Files (Projects)**

This enables the installation on a connected network drive.

Please note: CA®SMART 3.0 software is a single user version only requiring the use of a webcam.

<u>Case A)</u>
One existing working place with webcam – other users connected to the network should have the possibility to view the projects of this working place:

<u>->A1</u>
You'll install **all three installation paths into one shared directory.**
(e.g. F:\CA-SMART3). Directory authorisations reserved!

This enables starting the application file *„CASMART3.exe“* in the chosen directory by different users connected to the network.
➔ The complete software functions are only available on the working place the software has been installed.
➔ All other users can only start the software in the „Viewer mode“.

This kind of installation <u>does not</u> correspond to the Windows Guidelines.

->A2
We recommend the following kind of installation:

Please install the following **locally** on the working place PC with camera:

- **Program Directory (Program)**
- **Directory of Applicaton Data (Program-Settings)**

Please install

- **Directory of User Data (Projects)**

on a **network drive**. (Directory authorisations provided !).

Please proceed identically installing the software for all other users connected to the network.

Driver installation and calibration file are not required, as no camera is connected.
➔ On the working place PC all software functions are completely available.
➔ All other users will start the software in the „Viewer Mode“.

Case B)
If more than one working place PC with one camera each shall be connected to the network, please proceed as described under **A2** , but please note the following:

CA® SMART version 3.0 is a single user version only. This means that all data concerning projects, patients and doctors are generally administered in a shared file. Editing and deleting a file is only safe and guaranteed when only one system has access to the corresponding file.

The users are held responsible for this. We recommend installing only single-user working places.

Installation

Please only start the installation if you are familiar with the installation routines of Windows, otherwise please ask for professional support.

It is recommended to disable the virus scanning of your PC before installing the software and to activate it again after the software has been successfully installed.

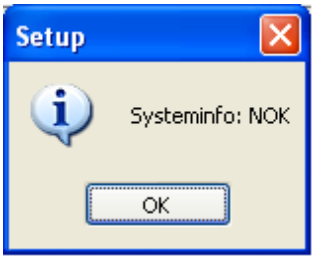
You must have administrator rights to install and run the software.

Before starting the installation, quit all other applications. Then connect the webcam to a USB port. Wait while Windows recognizes the new hardware.

Make sure to use only this USB port for this webcam.

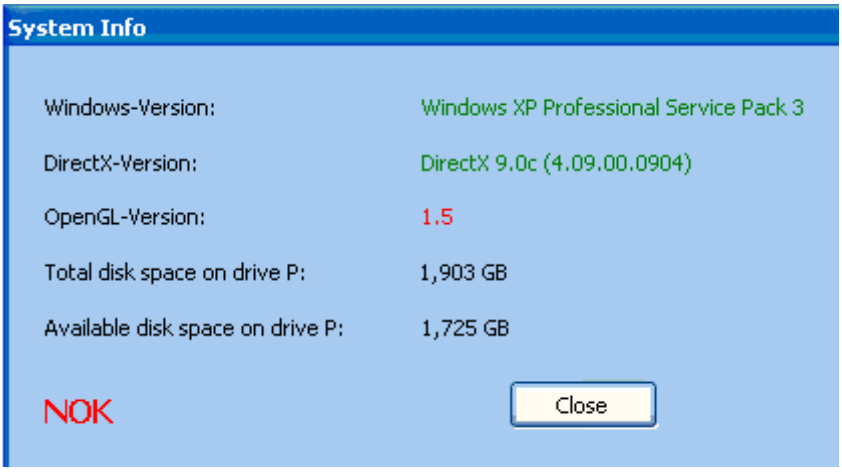
Please start the file „SetupCA-SMART_Ver_3_X_X.exe“ on your USB stick.

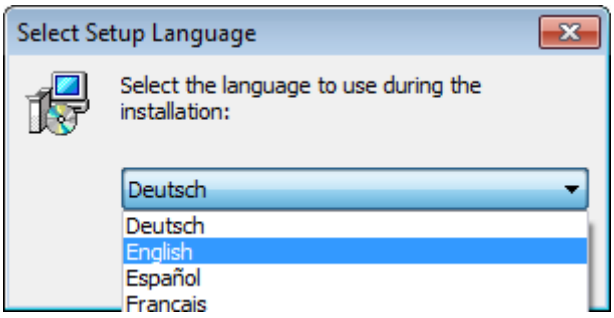
This file automatically starts the file „SystemInfo.exe“ and verifies whether all systems requirements are met.
In case these requirements are not met, the following warning will appear in a window:



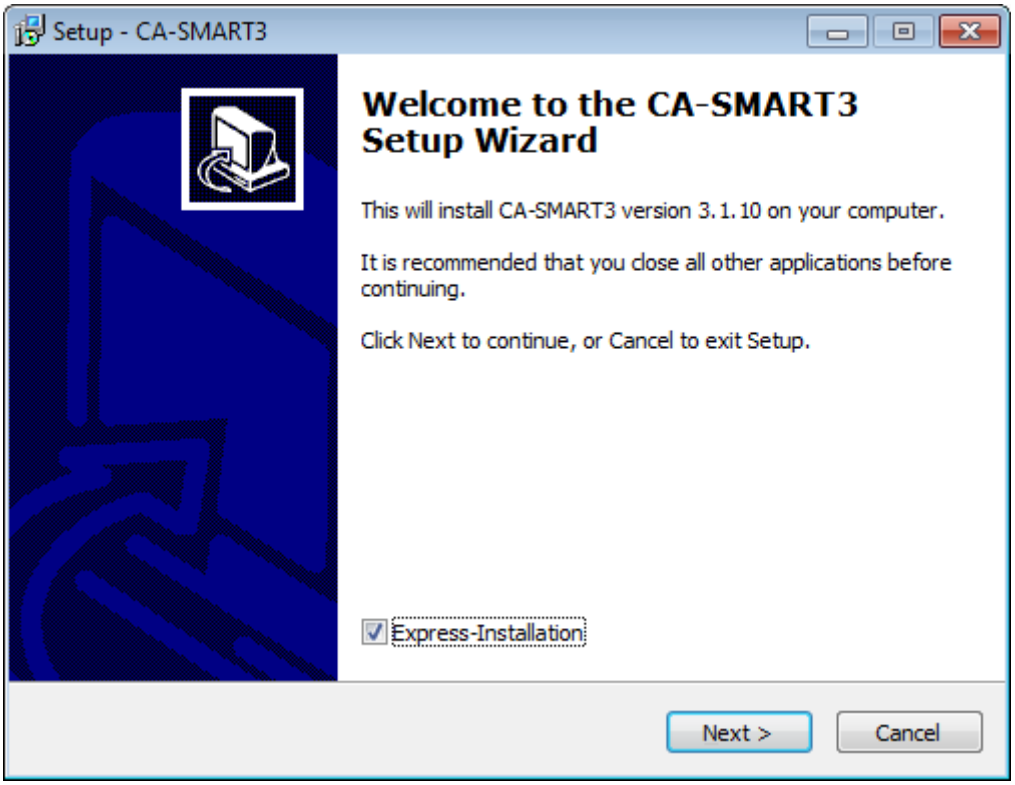
„NOK“ –> System requirements are not met.
(Depending on the system, this warning may appear only after entering the user information. It is possible to proceed with installing the software, but the software may not function properly or only restricted.)

In case the file „SystemInfo.exe“ is started directly from the USB stick, you'll receive a more detailed information:



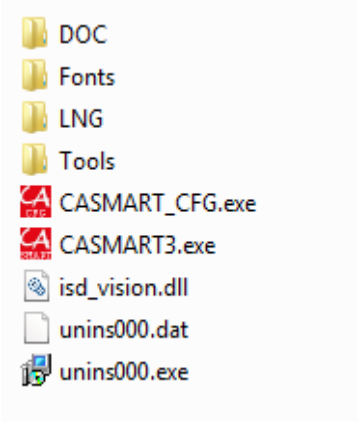


Select the installation language

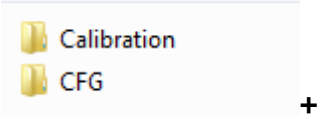


If you carry out the express installation, the software will be installed in the following directories (Windows 7 – 64 bit):

- Program directory (program):
C:\Program Files (x86)\CA-SMART3

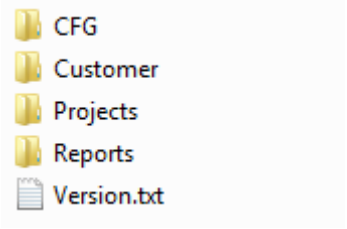


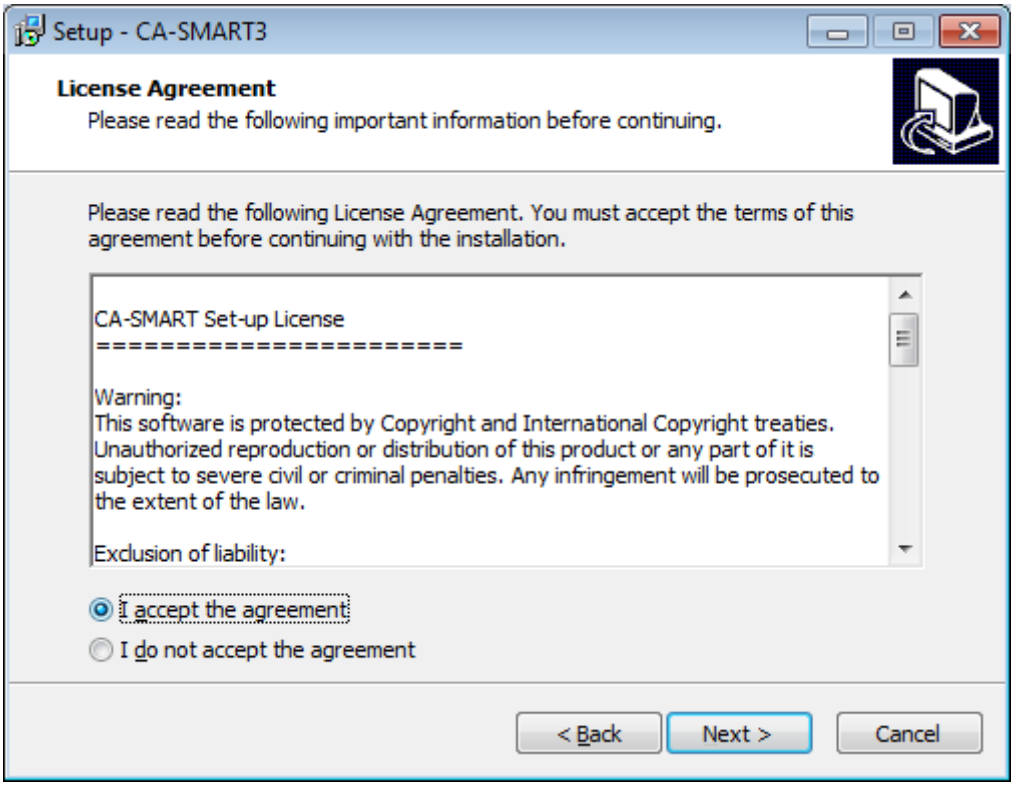
- Application files (program settings):
C:\ProgramData\CA-SMART3
(will only appear in the Windows-Explorer in case „Show hidden files ,folders and drivers“ is activated).



+ Key File

- User Files (Projects)
C:\Users\Public\Documents\CA-SMART3
(Shown in the Windows-Explorer as:
C:\User\Public\Public Documentation\CA-SMART3)





Please accept the Setup License Agreement.

CA-SMART Setup Lizenz

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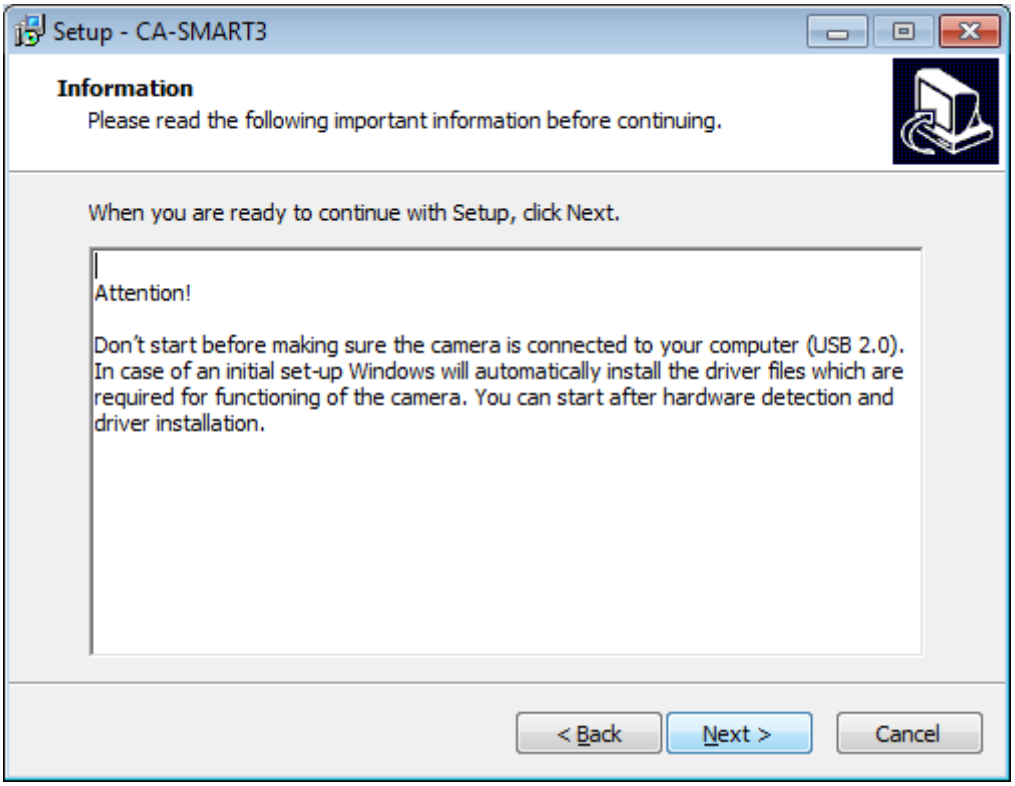
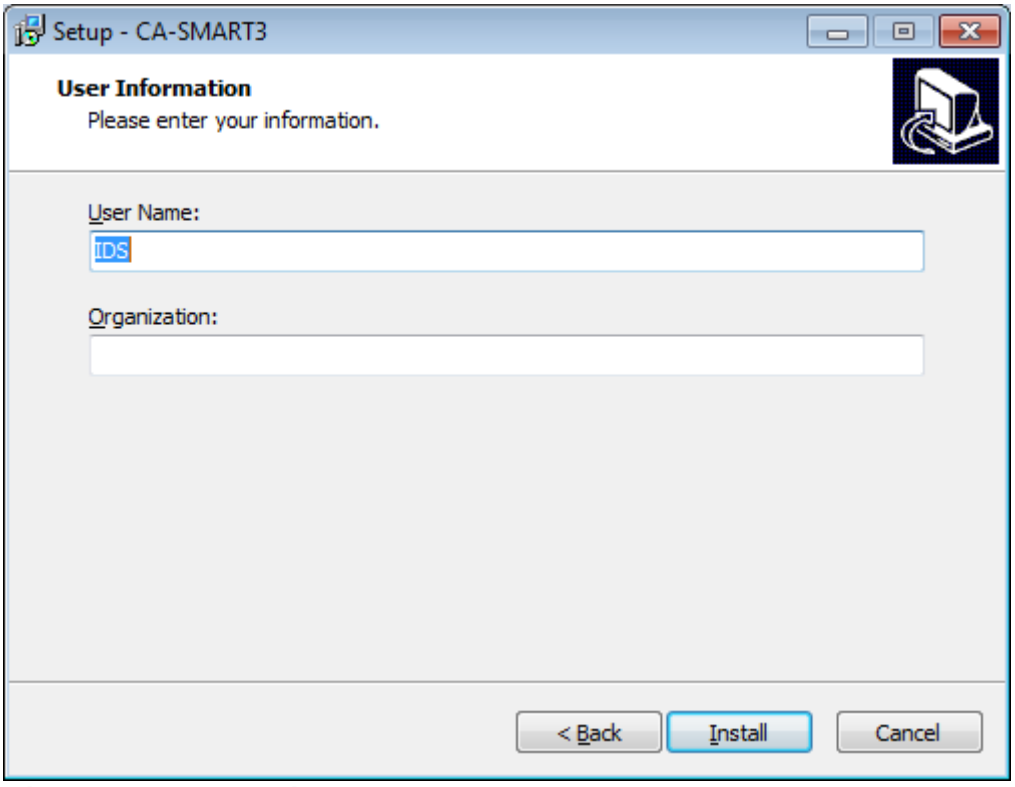
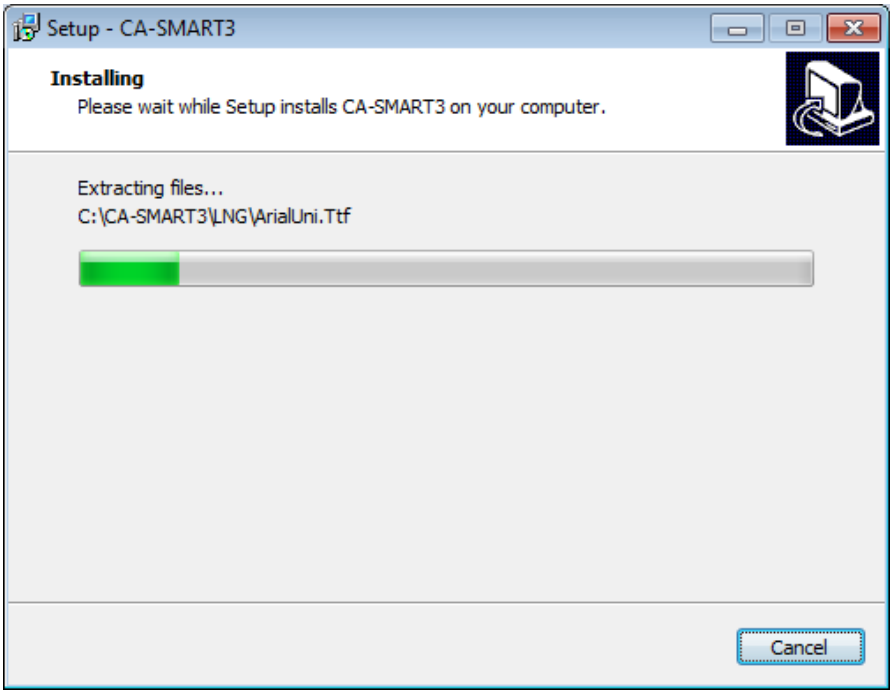
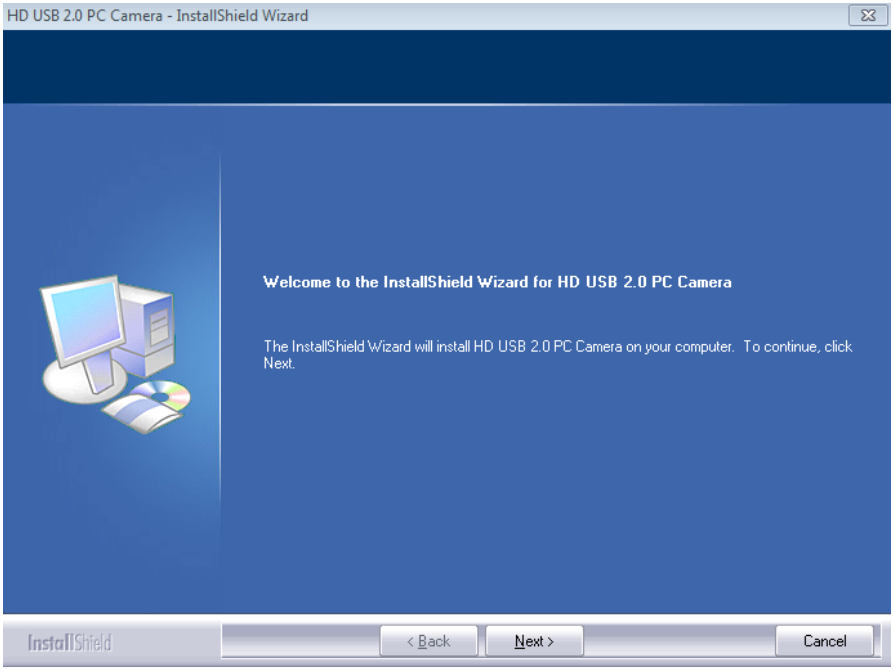
SCHEU-DENTAL



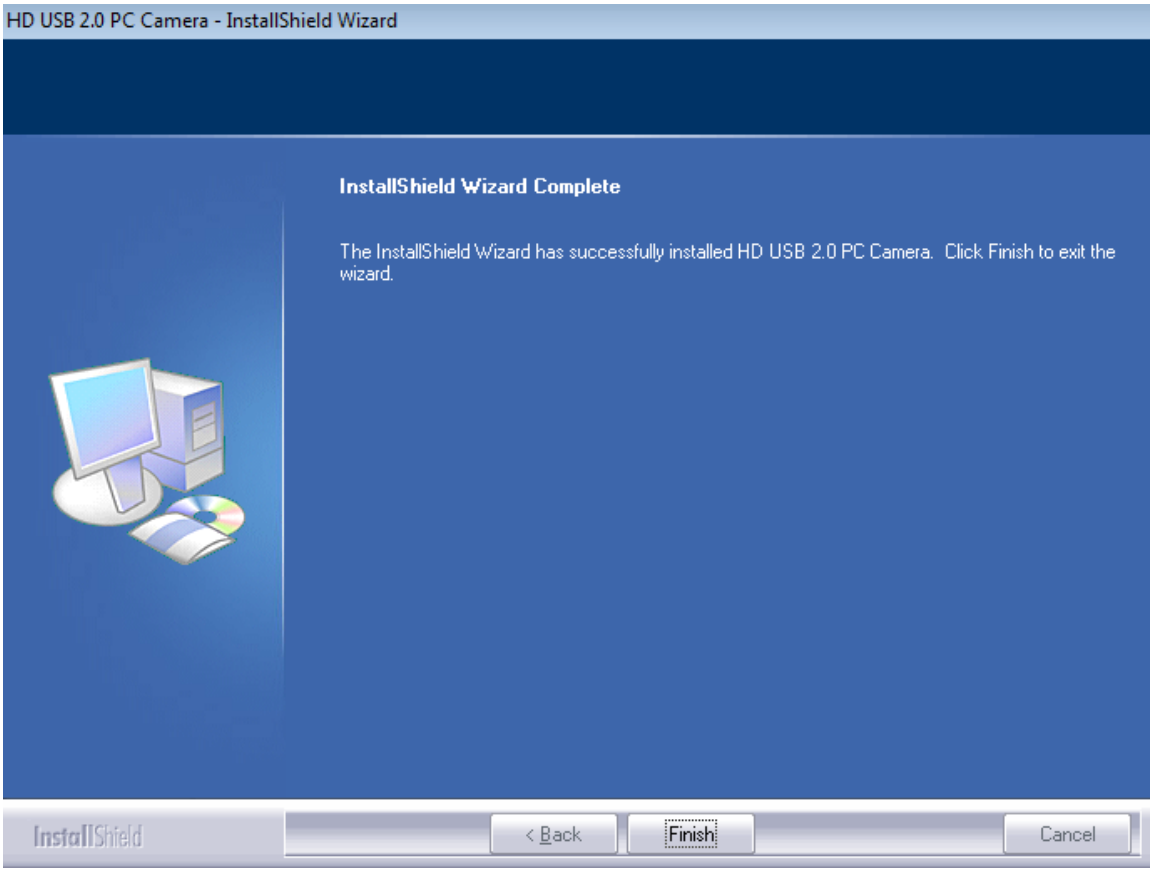


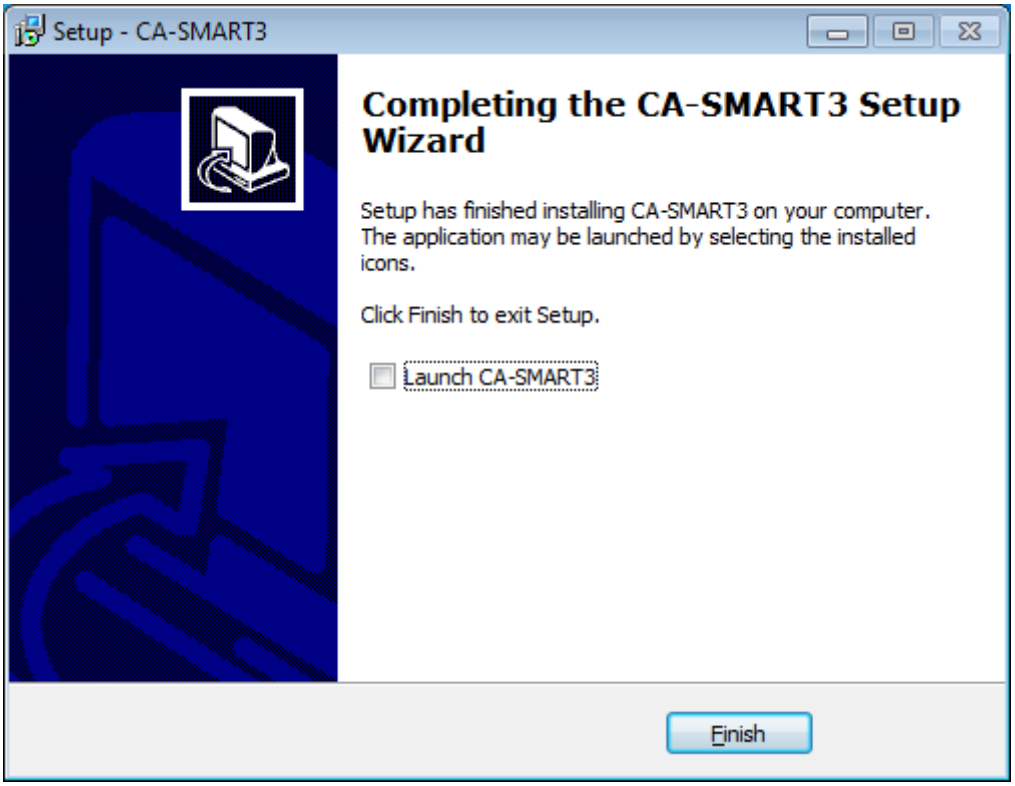
Please enter your data



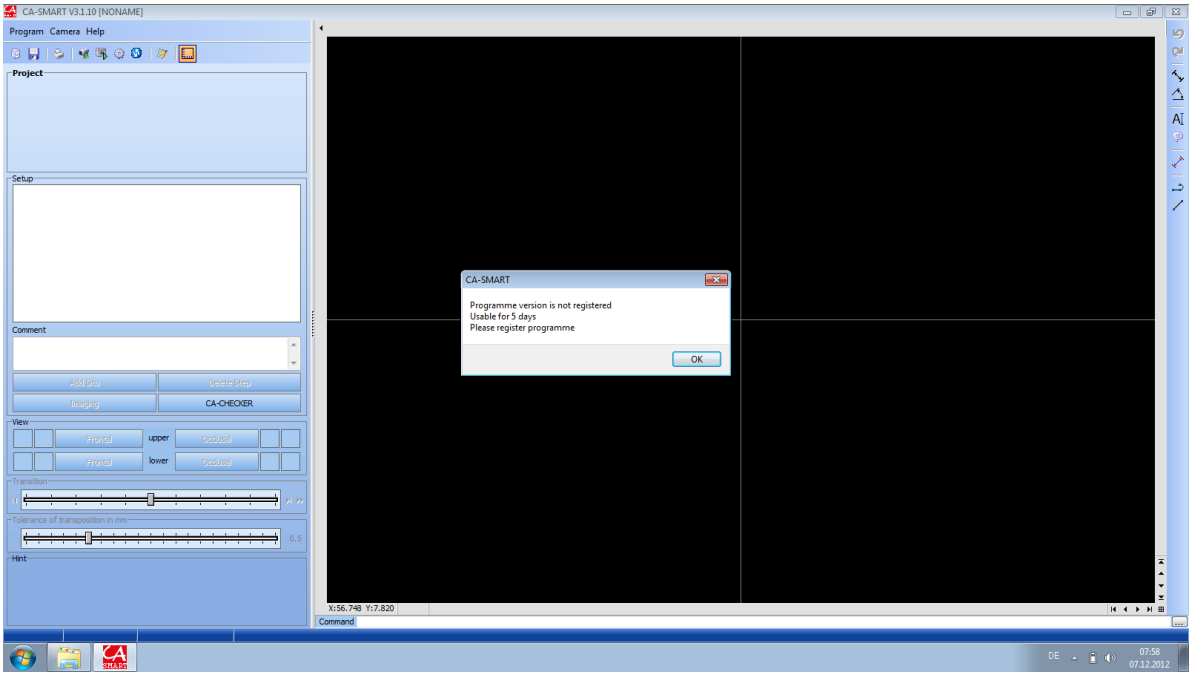


Please select „Install“



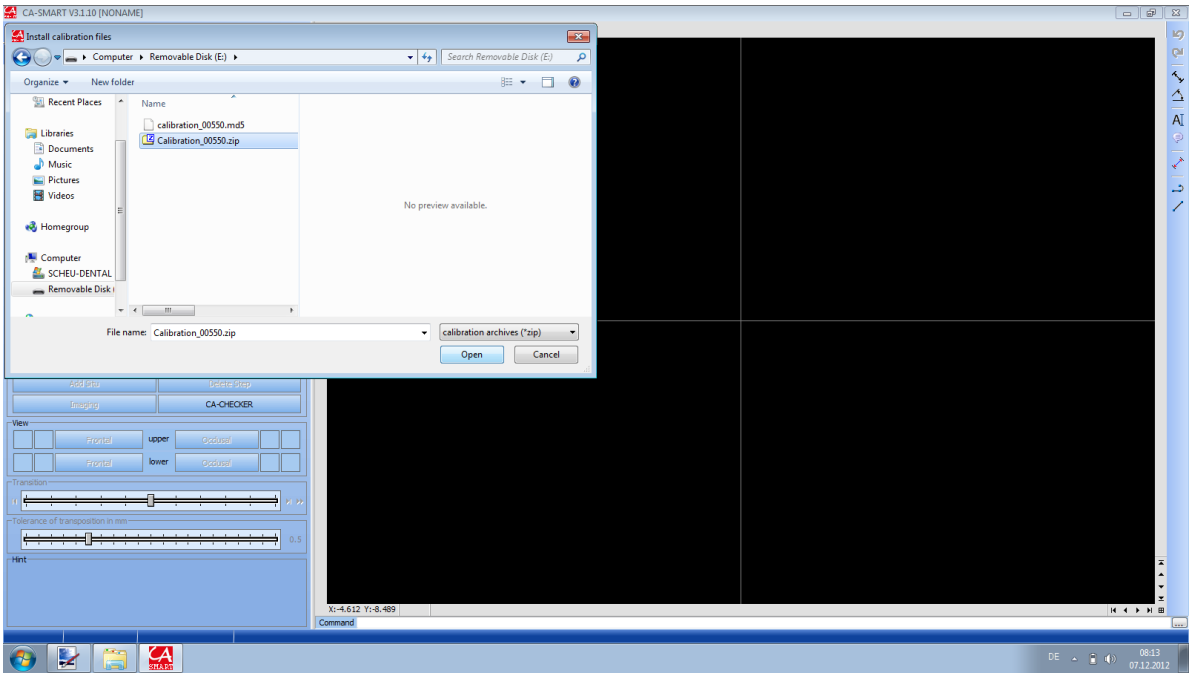


Select here „Launch CA-SMART3“ or start program later from your desktop.



After starting the program, you'll be informed this is an unregistered program version. You'll have the possibility to use all software features for a trial period of 5 days, under the precondition a webcam is connected. You can continue working on projects you already created after the software has been activated.

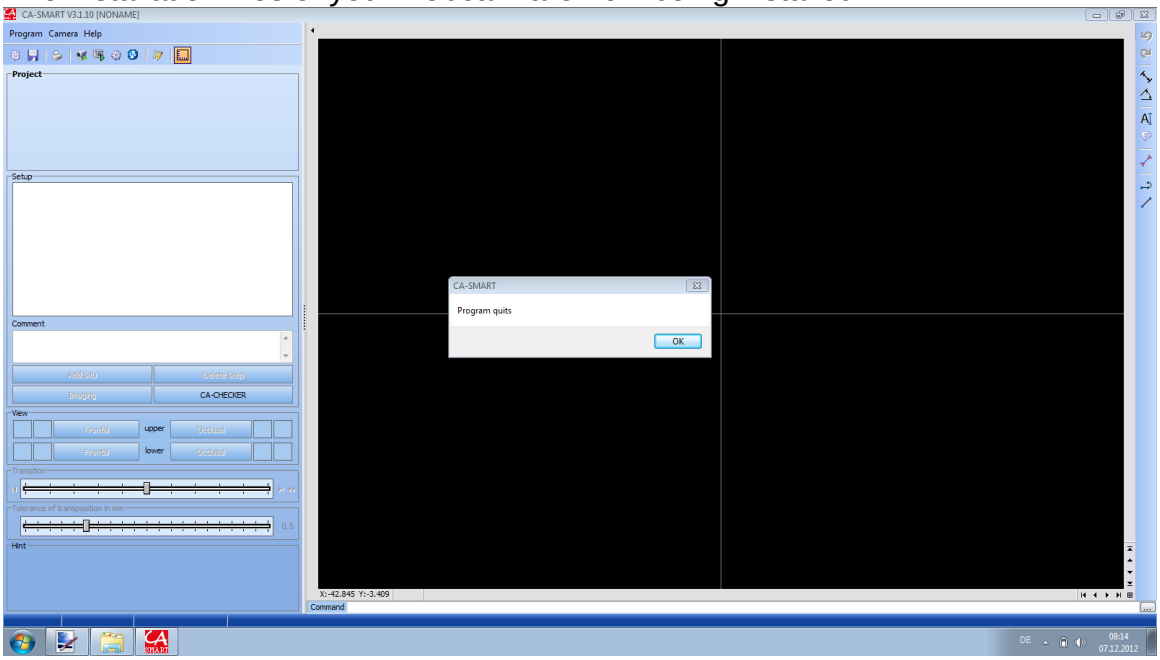
Installing Calibration Files



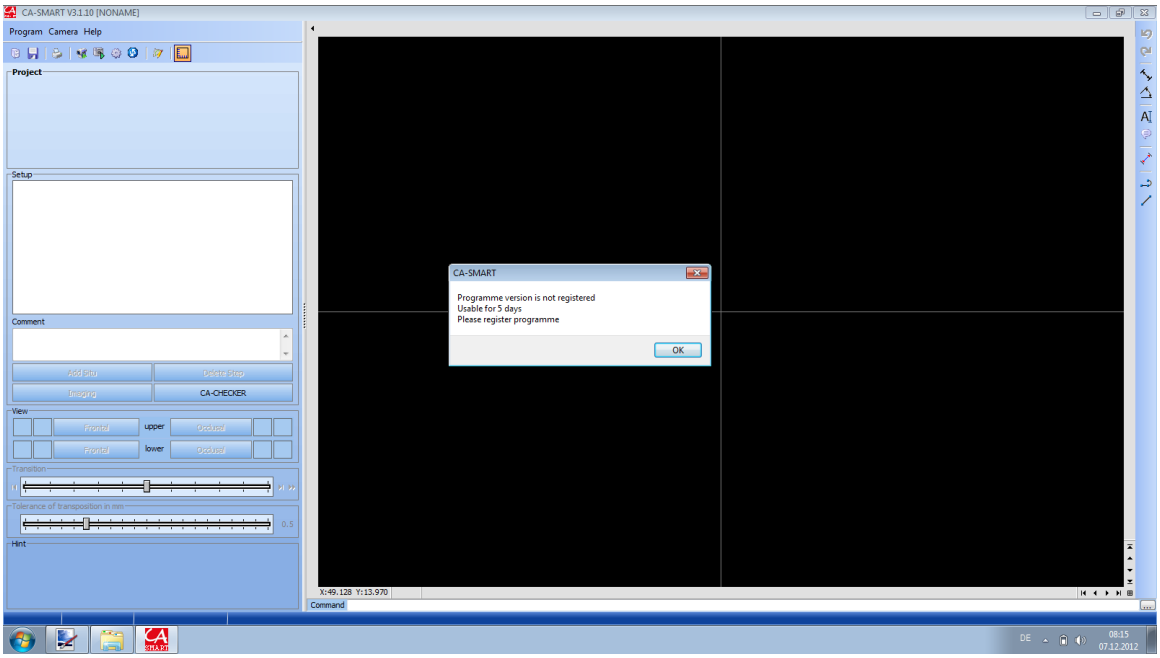
Connect the camera to the PC where the software (version with all features) will run. A window „Installing Calibration Files" will appear. Please select your installation USB flash shown as removable medium.

Hint:
If you installed the Upgrade, please use the camera calibration files from your CA® – SMART 2.X Setup USB flash.

Now select the file *„Calibration_Kamera-Nr.zip“* by double click or by highlighting and opening.
The installation files of your webcam are now being installed.

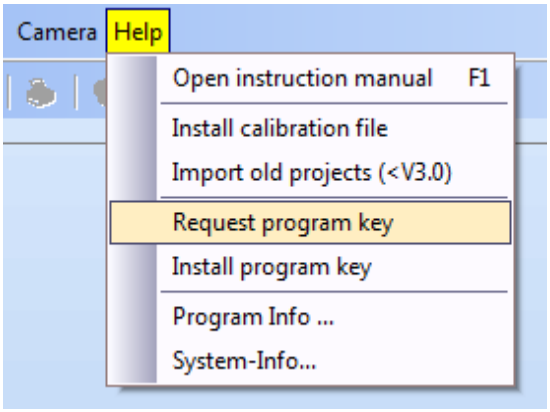


Please quit the program and restart.

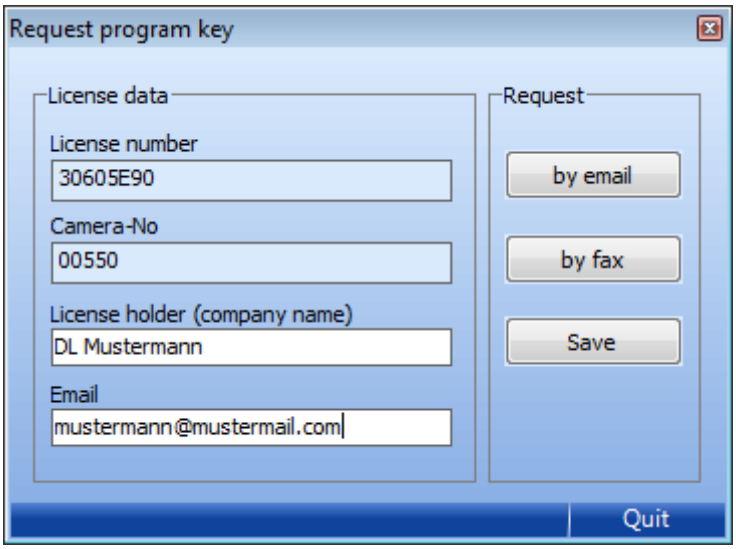


When restarting, you'll receive once again the warning that this is an unregistered program version and that you can use all program features from now on for a trial period of 5 days.

Requesting the program key

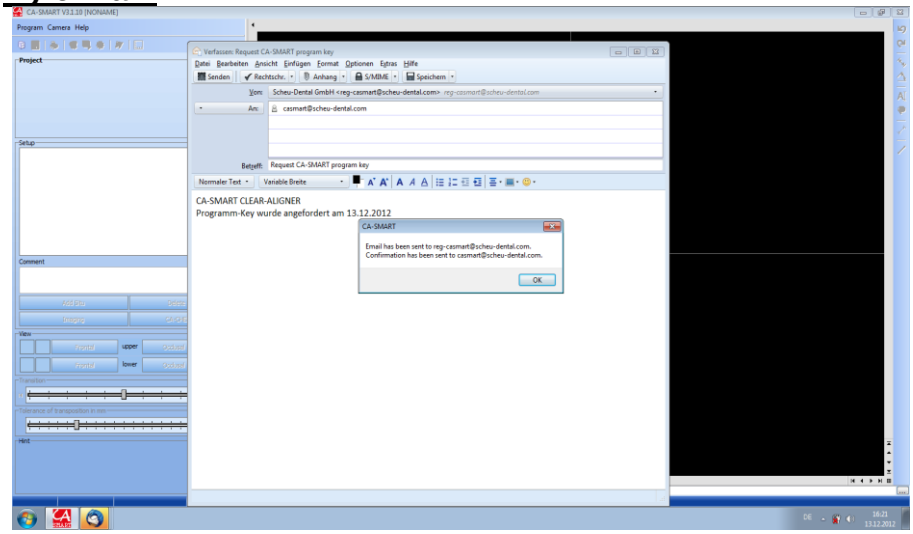


Select in the toolbar -> “Help“ -> „Requesting program key”



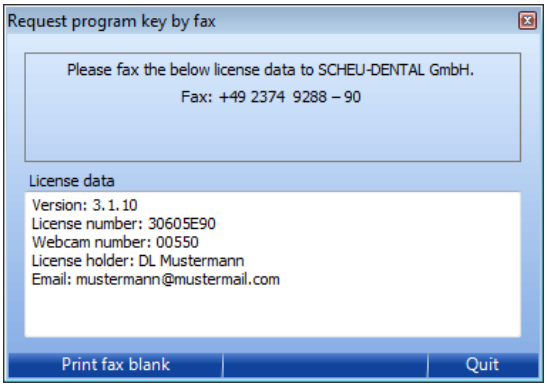
Please enter your licenser data (company name and e-mail address) in the window that will open.

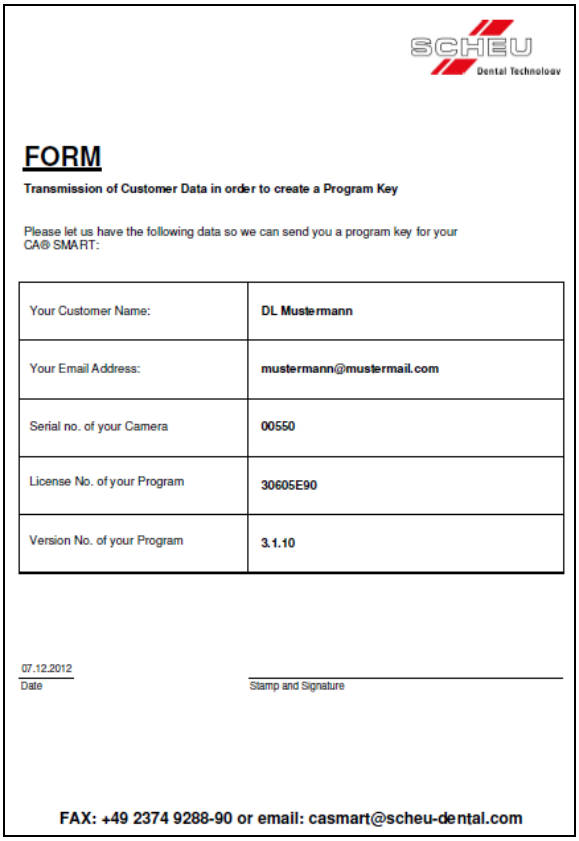
<u>You can request the key :</u>
<u>By e-mail:</u>



It is understood an e-mail client has to be installed on your PC. Please confirm having sent out the e-mail to: reg-casmart@scheu-dental.com.
You'll receive an automatic reply with the date of your request to your e-mail address.

By fax





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FORM

Transmission of Customer Data in order to create a Program Key

Please let us have the following data so we can send you a program key for your CA® SMART:

Your Customer Name:	**DL Mustermann**
Your Email Address:	**mustermann@mustermail.com**
Serial no. of your Camera	**00550**
License No. of your Program	**30605E90**
Version No. of your Program	**3.1.10**

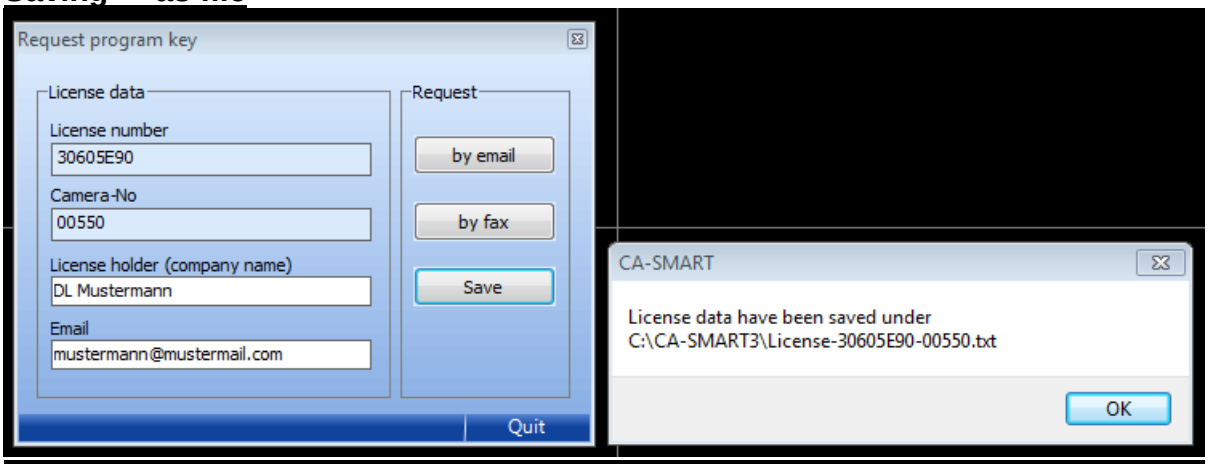
07.12.2012
Date

Stamp and Signature

FAX: +49 2374 9288-90 or email: casmart@scheu-dental.com

Print fax form and fax it to us.

Saving -> as file



This file will be saved in the indicated directory, can be transferred to a flash drive and can be sent to reg-casmart@scheu-dental.com or casmart@scheu-dental.com by another PC.

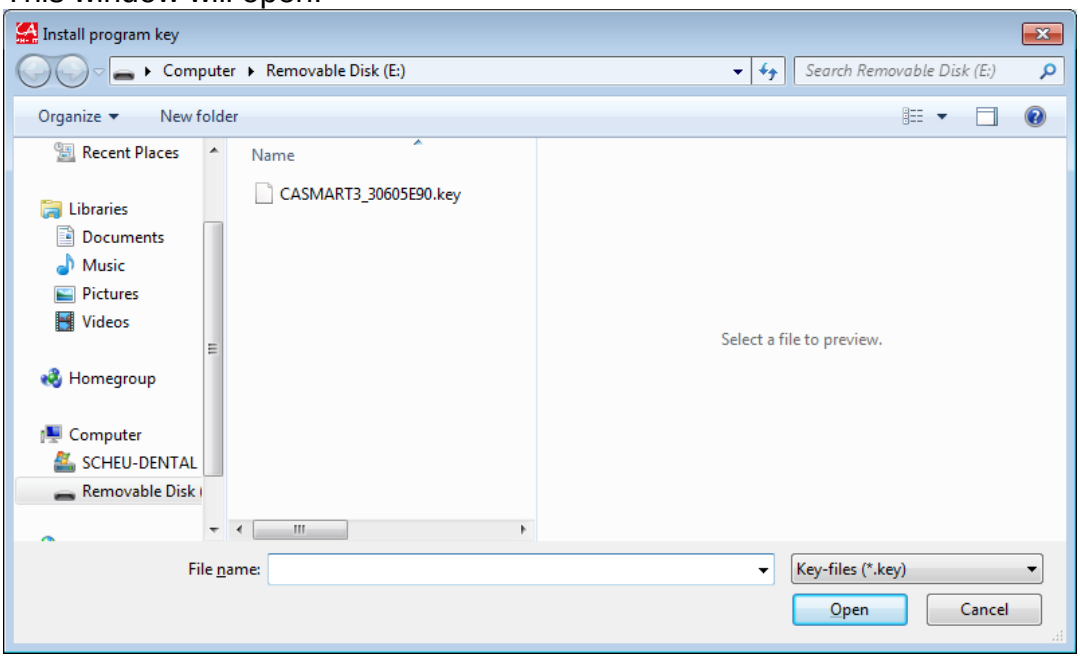
We'll then generate the program key as a file named „*CASMART3_Lizenz-Nr.key*".

Please keep in mind that generating the key file is done manually at SCHEU-DENTAL and may require some time. You can be rest assured we'll send it to you as soon as possible.

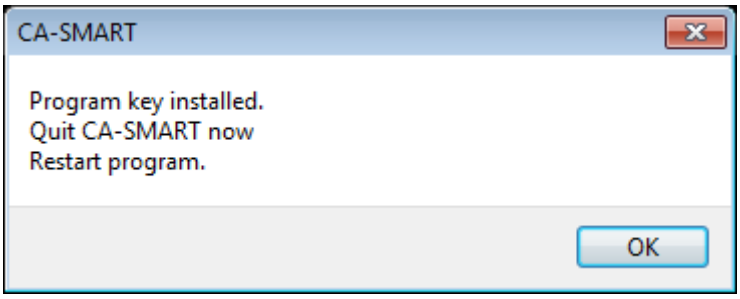
After having received the key file by flash drive or e-mail please import it in the software.

Installing the program key

Open the toolbar -> Help -> “Installing program key“.
This window will open:



Please select the corresponding directory and double click the file “*CASMART_Lizenz-Nr.key“* or highlight and open.
The program key is now being installed.
The window will open:



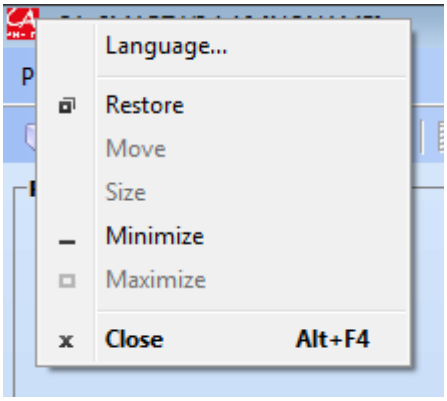
Your registration data will appear in the program info window after the license key has been successfully imported (-> Help -> Program-Info):

You can quit this window by clicking somewhere into it or Esc.

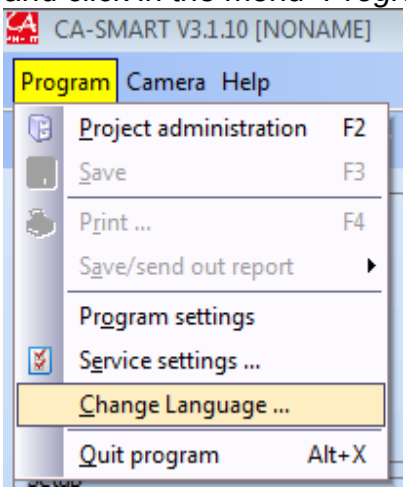
Language Selection

You already selected a language during the installation procedure. However, you can change to another language at any time.

Select the small CA®-SMART Icon on the left and then "*language…"*



and click in the menu "*Program"* „*Change language…"*



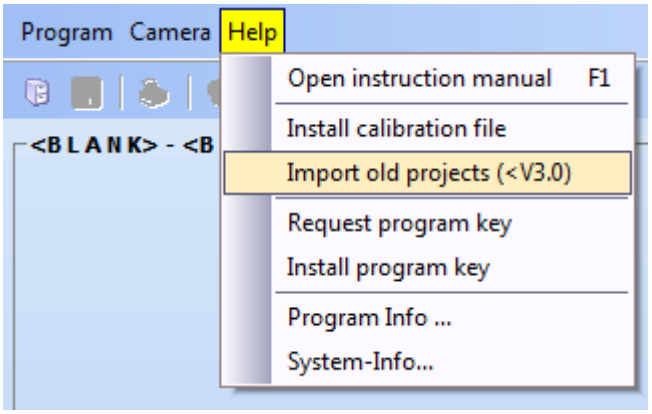
and select the desired language.

After quitting the program, the selected language will be saved.

Importing projects created under CA®-SMART 2.0

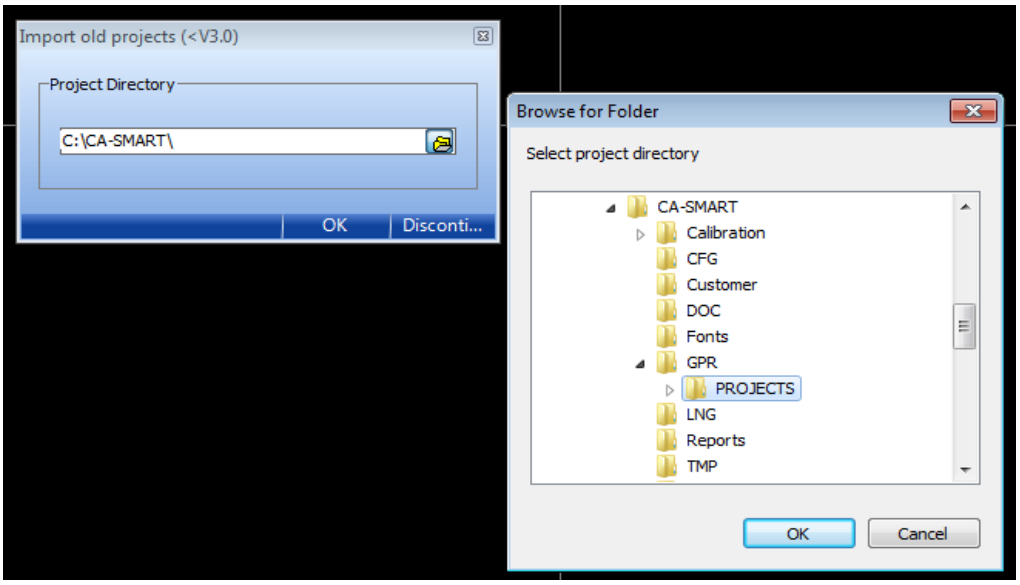
You have the possibility to import old projects created under CA®-SMART 2.0. It is possible to import all projects completely or only single projects.

Please select in the toolbar -> „Help“ -> „Import old projects (<V3.0)“



The window „Import (<V3.0) old projects“ will open showing a standard path.

Select the icon „Select path“ .
Define the storage location of your old projects in the new window:
X:\....\CA-SMART\GPR\PROJECTS
or select only one single project:
X:\....\CA-SMART\GPR\PROJECTS\Mustermann



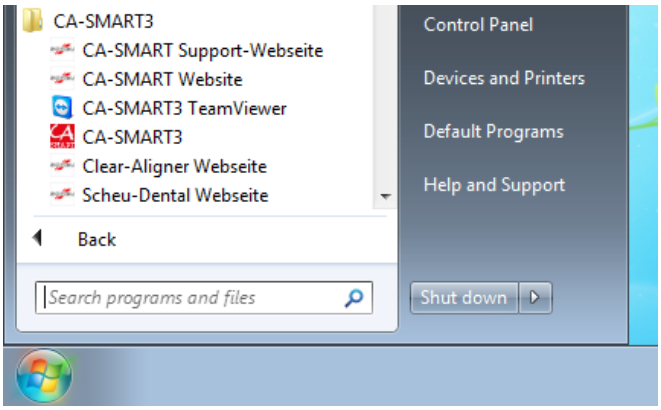
Hint:
In version 2.0 only the occlusal view was available. Thus, you could take only one model picture for each project. Therefore, all projects will be imported in the “occlusal view upper jaw”!

Both software versions run still in parallel.
It is not absolutely required to import old projects. Please keep in mind that in the old software version two projects had to be administered for a patient with one Set-up each in upper and lower jaw. Thus, these projects would have to be imported separately one by one, distinguishing the projects and patients by “Mr. Joe Public Upper Jaw” and “Mr. Joe Public Lower Jaw”.
For convenience we recommend to keep and finish old projects under version 2.0.

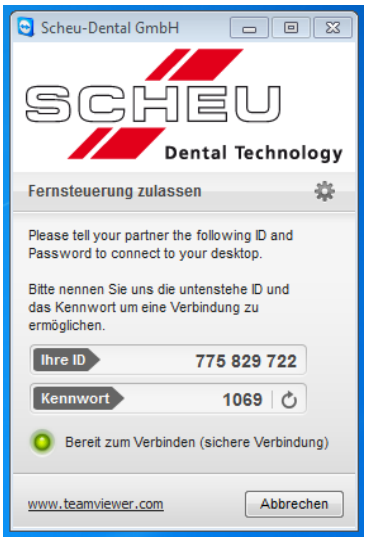
External Support / Providing Access to your PC via Internet

If you need external support, SCHEU-DENTAL can provide direct access to your system to verify your software via TeamViewer.

Please make sure your PC has internet access.
Please navigate to the Windows Start button -> All programs -> CA-SMART3



and start the TeamViewer.



Please let us have your ID and your pass word by phone.
We can provide access to your PC under your surveillance. For any information on security please visit www.teamviewer.com

Direct access is provided for one session. It is not possible to have repeated access to your PC.

We reserve the right to invoice you for remedying of any fault which is not due to a software error.

CA®-SMART Version 3.0

Step by Step – Instruction
Documentation of a Set-Up in the software

This Step by Step Instruction doesn't contain all software functions.

You'll find the description of all functions under -> „Help" -> „Open Instruction Manual".

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SCHEU Dental Technology

Working models

Please use white plaster models. Plaster of different colors may have an effect on the automatic generation of the dotted area.

Please use red or blue color for any marking on the model:

Red – is automatically recognized as „dotted area“.

Blue- won’t be recognized as „dotted area“.

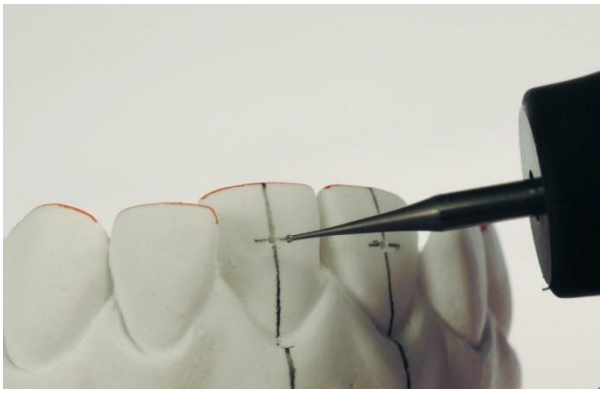
Hint:

Black markings and shadows may be recognized as „red” and thus a „dotted area“ may be generated. You can use the tool “Edit dotted area” for any manual modification.

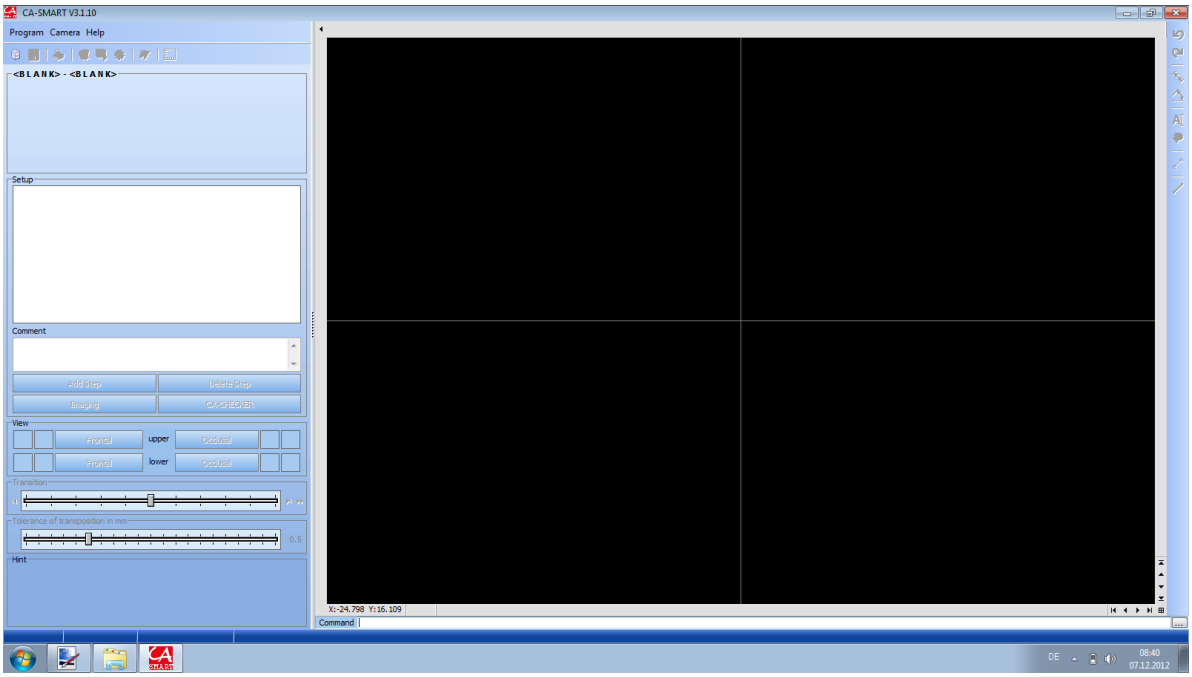
CA® CHECKER – Requirements:

CA® Ball shaped bur (0,5 mm Ø , max. 5.000 U/min), (included in delivery scope).

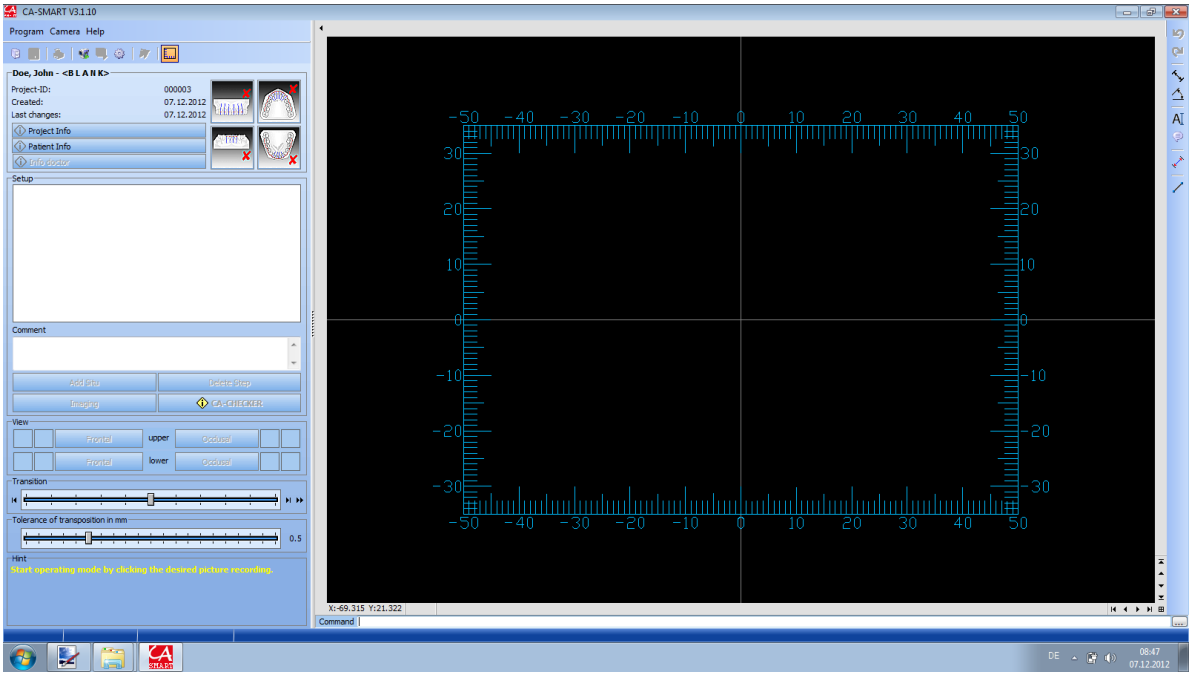
It is used for precise spot drilling the facial axis marking (F-A point) on the situation model.



Screen Views

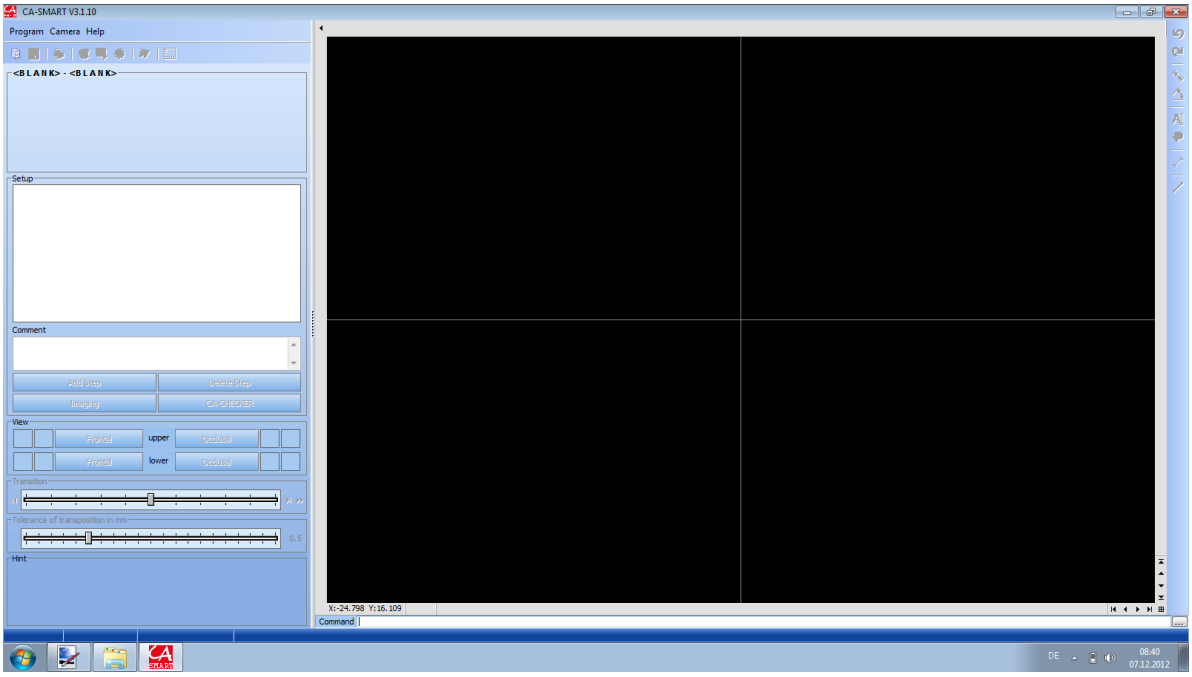


Screen view after starting the program



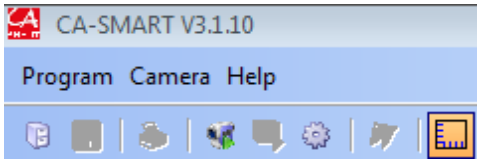
Screen view of project

Softwarestart

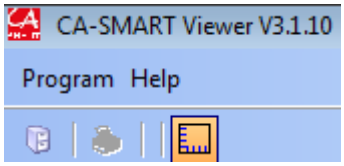


Screen view after starting the program

Toolbar



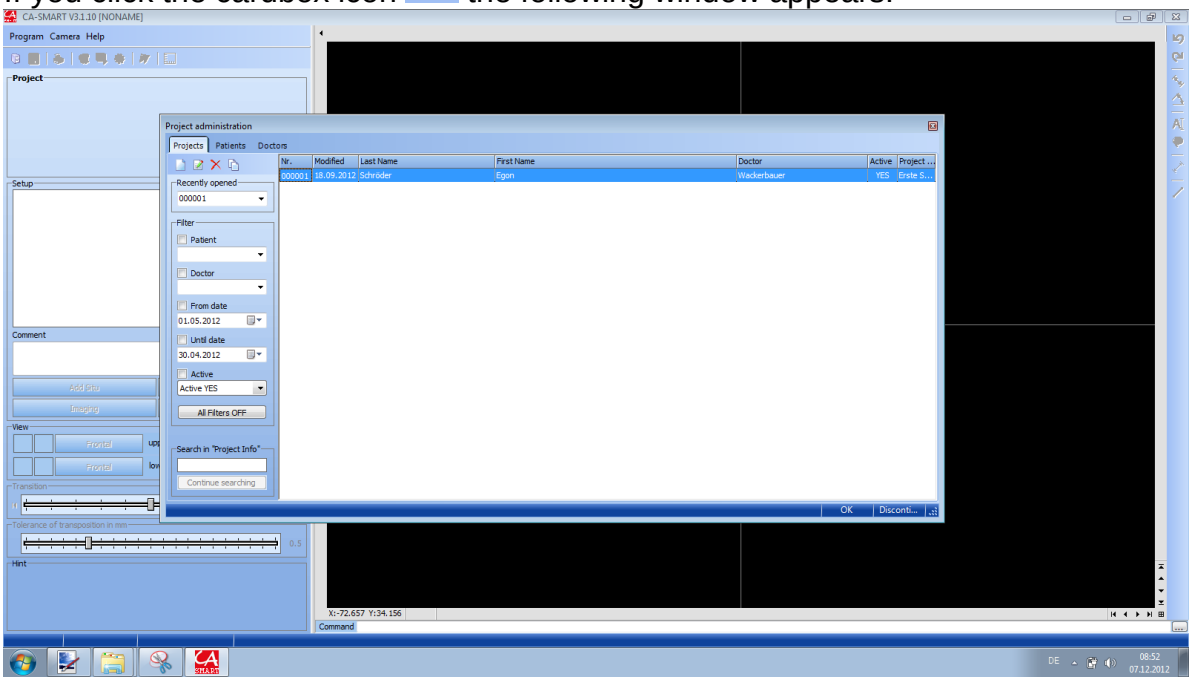
1 2 3 4 5 6 7 8 Full version



1 3 8 Viewer
(without camera/camera driver)

1	Project administration (F2)
2	Save patient (F3)
3	Print current view (F4)
4	Camera image ON/OFF
5	Save camera image
6	Camera adjustments
7	Edit area of points
8	Ruler ON/OFF

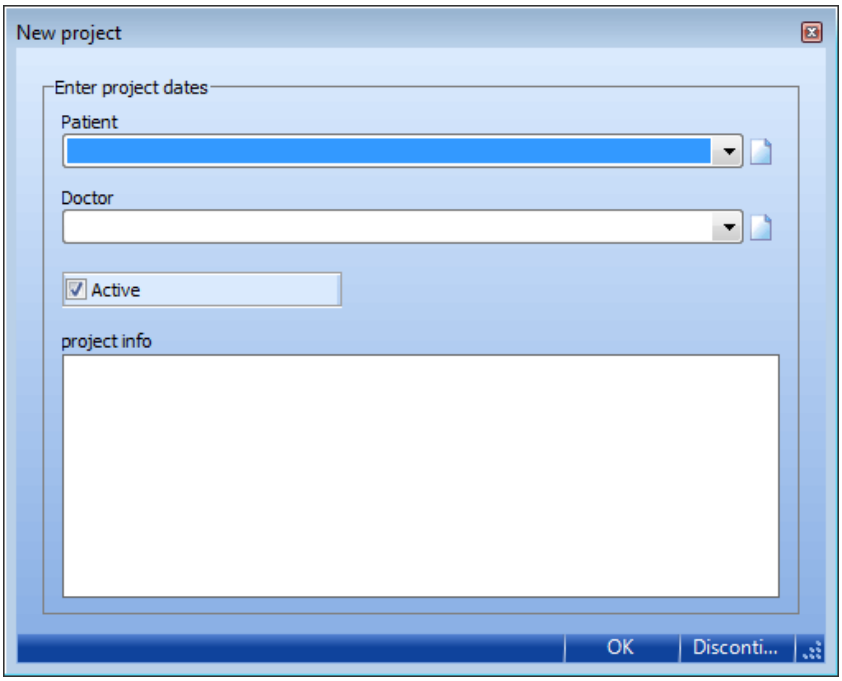
If you click the cardbox icon the following window appears:



Here you'll have the possibility to open existing projects and to edit new ones.

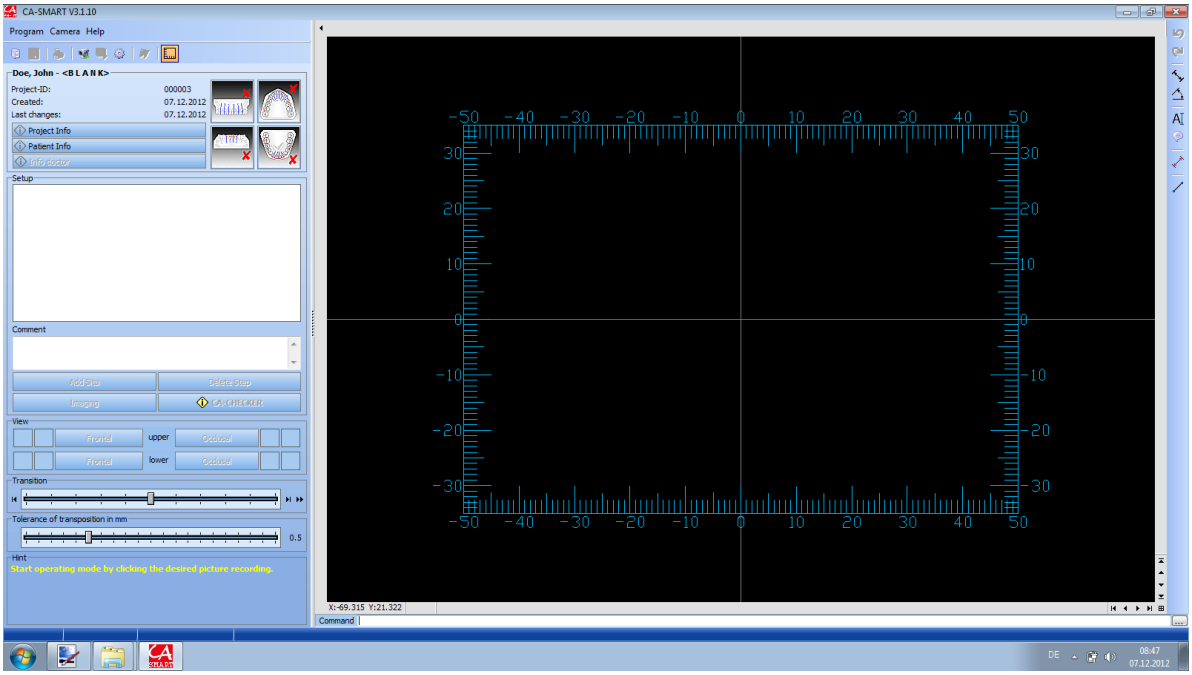
Editing a New Project

Select the „blank page“ icon in the project administration in order to edit a new project. The following window appears:



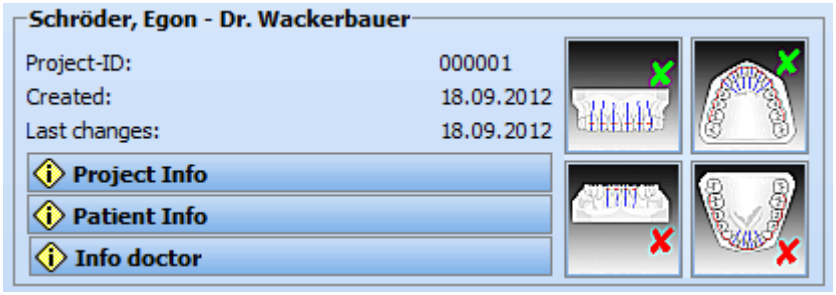
Here you can either select a patient or doctor from existing data records or edit a new one.

Moreover, you'll have the option to enter additional information in the array „project information". This text will be transferred later on in the printed documentation and can be modified at any time while working on this project.
After having edited the project, you can start working on it by a double click or by confirming with "OK".



Working on a Project

Various kinds of views are available for every project, which can be activated by clicking the view icons on the right beside the project data.



Doing so, these kinds of views are generally activated.

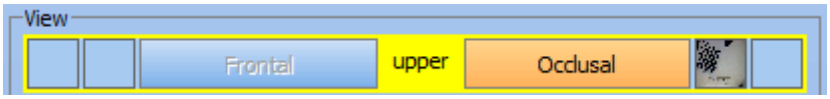
Here you'll have the possibility to modify information concerning project/patient or doctor.

Hint:
The i-icon informs you about the following:

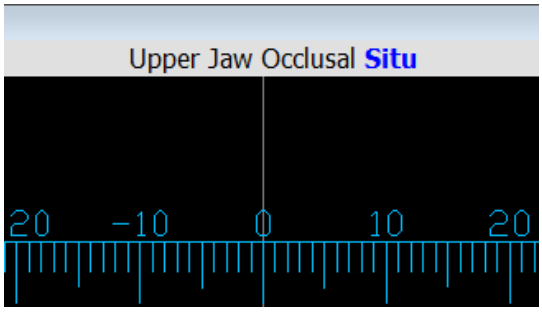
In the example:
Additional information has been added to the project.
No information has been added to the patient yet.
No doctor has been added to the project yet.

The printed documentation PDF will only contain the project information, any information on patent or doctor will be shown only in the program.

After having activated the various kinds of views you can select in the window „View" the corresponding button:



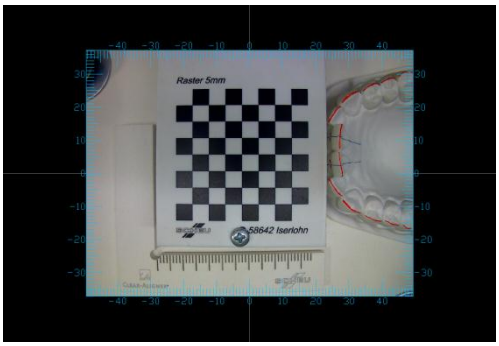
The activated button turns into orange. The corresponding kind of view is indicated as well on top of the black working area.

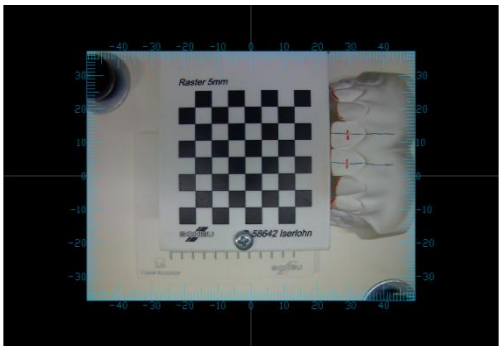


Setting the Stops of the Photo Support

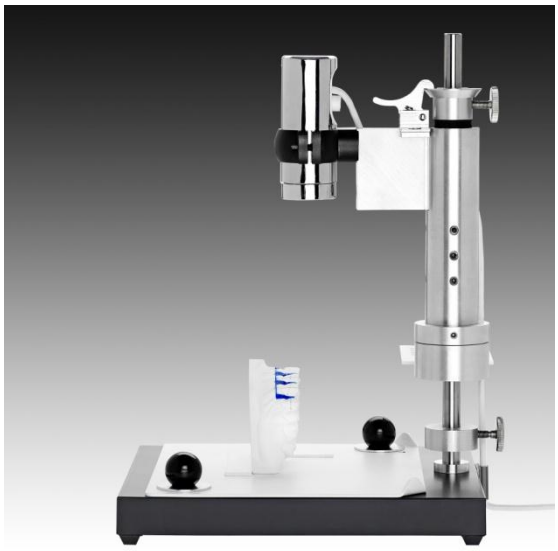
Now please proceed with setting the stops of the photo support for occlusal and frontal picture taking of the model you are working on:

Make sure the measurement level, i.e. the upper printed surface of the scaling disc, is congruent with the incisal edge of an incisor you want to move. In case you want to move several teeth, you have to define different heights for the lower (occlusal) and the upper (frontal) stops.





Occlusal



Frontal

The model heights may be different. Therefore we recommend to work on and to terminate the Set-up documentation for your current model at first, i.e. the documentation of upper and lower jaw models should be done separately one after the other.

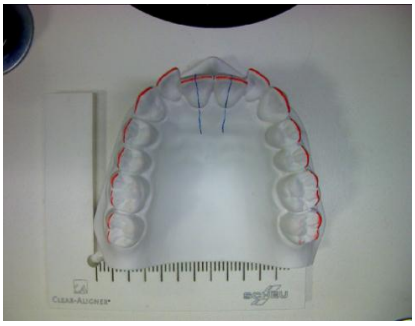
Starting Taking the Situ Picture

By clicking the button “Starting taking the picture”, the live-fed image will be activated automatically. The color of the icon “Camera picture ON/OFF” changes to orange:

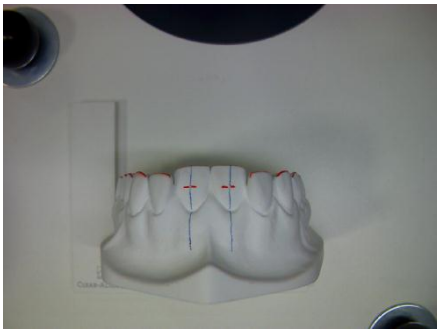
Place your model on the stop plate in accordance with the stop angle and loosen the black ball nuts. Now the stop plate on the grey base plate can be moved, so that you can move the model centrally into the picture before fixing the plate again.

A central position of the model in the picture will be the ideal precondition for a successful documentation.

However, please keep in mind there is only one stop position available for both kinds of view (occlusal and frontal).



occlusal

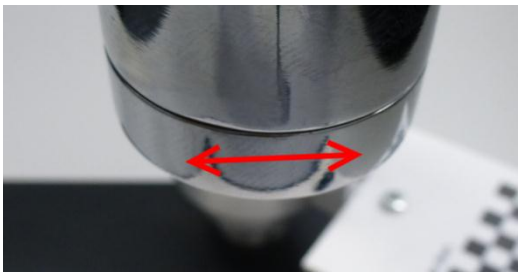


frontal

Please make sure the teeth you want to move are visible in the picture section, as this is the precondition for measurement.

Please make sure not to move the stop plate after fixation. This position will be the basic position for overlapping the set-up picture by the situ picture later on.

Now please proceed with adjusting the camera lens before taking the first picture of this model under the live-fed image:



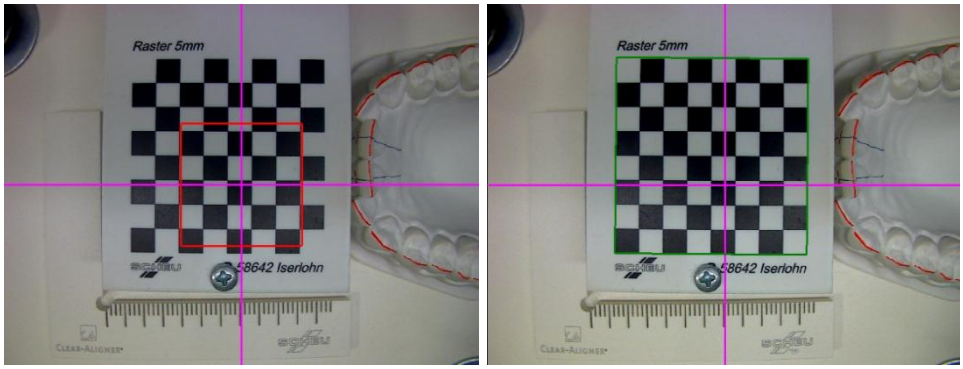
Scaling yes / no

Please note scaling has to be done <u>for each Set-up case before taking the first situ picture</u>, no matter, whether the first situ picture will be occlusal or frontal.

Please move the scaling disc under the camera before clicking the button. *“Scaling -> yes“* . Please take care of the following:

- The chess board pattern has to be completely visible in the picture, a straight alignment is not necessary.
- Make sure the scaling disc is clean (no impurities, no scratches on the black chess board)

Advantage:
Scaling will be done quicker, you won’t have to wait:



The automatic scaling mode is activated which is shown by a red squad. Faster systems will skip this indication. After the chess board pattern has been recognised, the squad will get larger until it has reached the size of the chess board pattern and changes to green. An acoustic signal will indicate that scaling is completed.

Hint:
The accuracy of all future measurements will depend on precisely adjusting the camera lens to the measurement level.

Make sure not to change the picture sharpness for any further pictures during this set-up, because this may lead to false measurement results!

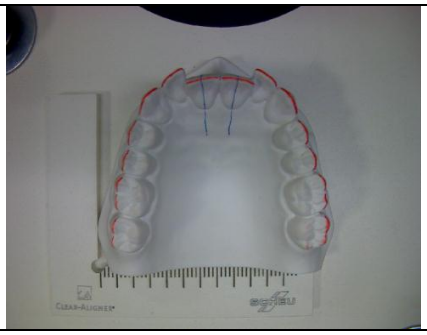
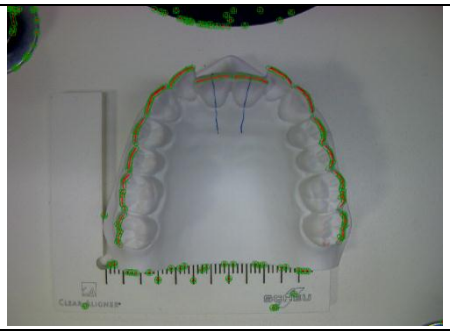
The scaling disc is fixed to the camera. Therefore scaling is not necessary for the second situ picture taking and you can click “Scaling -> no”. As already mentioned before, please don’t modify the camera settings (picture sharpness etc.). Moreover, please note that you should not do any separate scaling for another kind of view!

Saving the Situ Picture

Now the button „save picture“ is activated. Please move the scaling disc back to its original position and place the model under the camera - in accordance with the angle stop. The right position of the model is very important, because this will be the basic position for taking the set-up picture as well.
Please make sure to use only trimmed models in order to guarantee a secure position. As an option, you can use the following model holder: REF 5360.1 CA® model holder for photo support.

Press the button *“Save picture“*

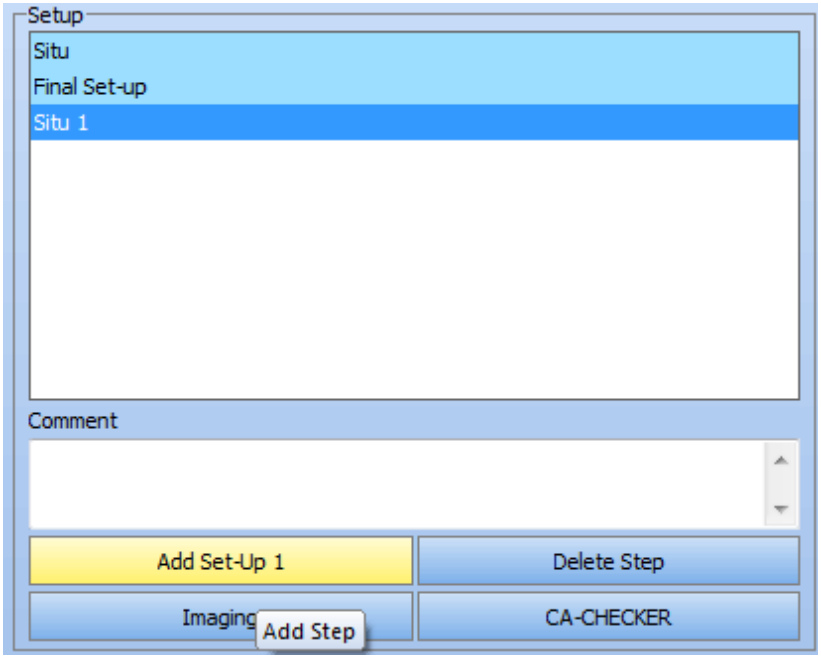
The working picture shows different illustrations:

	
Situ picture without dotted area	Situ 1 to Situ n with dotted area

The working situ picture shows no dotted area, because here the final (diagnostic) set-up is realised and no tolerances for the transpositions have to be considered. The working picture situ 1 to situ, however, shows the dotted area, because in the single set-up steps the tolerances for the transpositions have to be considered.

Please make sure to save both situ pictures (occlusal and frontal).

Adding Further Steps



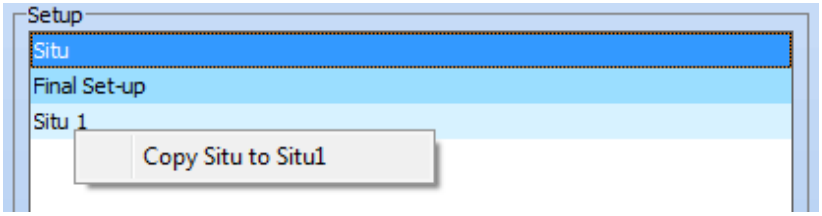
You can add further steps at any time (exception: picture taking mode).
After the first activation of the different kind of views, only the step situ is shown.
Then an additional button „Add final set-up“ will show.
Further steps Situ 1 / Set-Up 1 / Situ 2 / Set-Up 2 / … can be added.

Up to 49 further situ/set-up picture pairs can be taken and compared until the end of the corresponding treatment. Click the button “situ n” resp. “set-up n” for adding further steps, “n” stands for any further step.

Hint:
If you don’t want to proceed with a final set-up, begin taking the first picture in „situ 1“. Thus, the arrays for “situ” and “final set-up” will remain blank.

“Copying Situ to Situ 1“

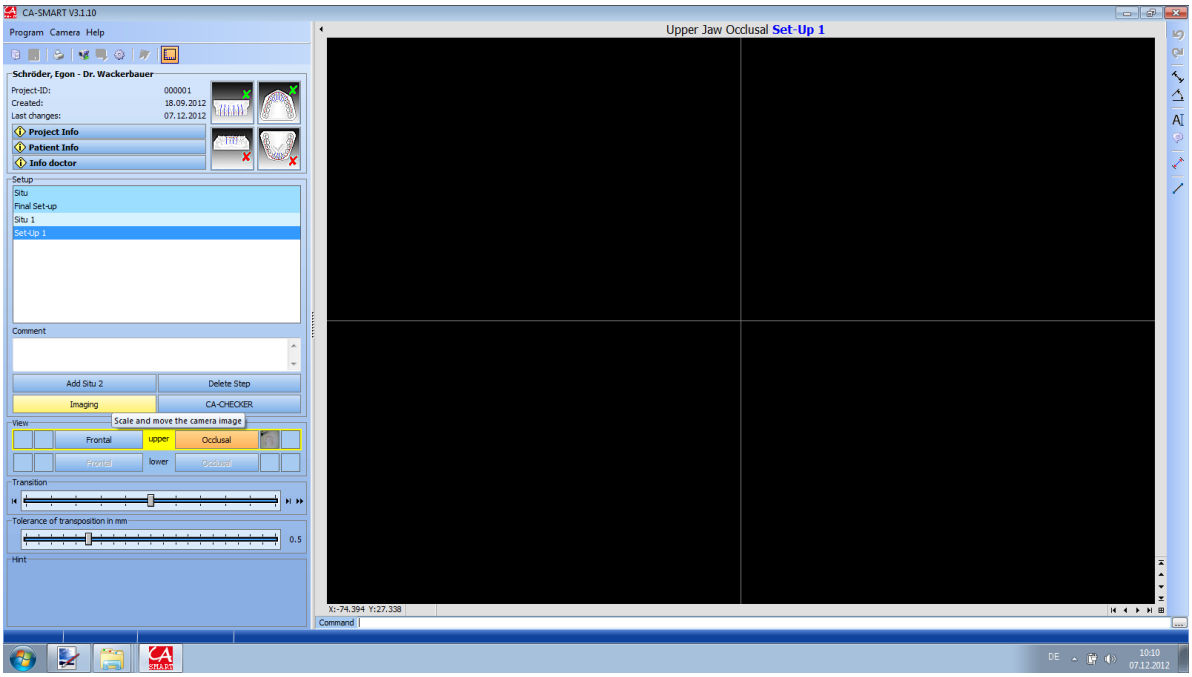
This function enables copying the taken situ picture into the step situ 1. This is useful if you want to proceed for the first situ model with a diagnostic (final) set-up and the first Set-Up -> „Set-Up 1”.
For using this function, click the list of set-up (right mouse button) and select the „copying situ to situ 1“.



This function is only possible, if the steps „Situ“, „Final Set-up“ and „Situ 1“ are shown in the set-up window.

After having saved the situ view pictures, you have the possibility to document the torque and angulation values of the teeth you want to move using the CA® CHECKER (please refer to the chapter CA® CHECKER). If this is not required, you can now prepare a silicone matrix and proceed with the segmentation of the teeth you want to move on your model. The basic model situation is reconstructed using the silicone matrix and set-up wax.

Starting Taking Picture of Diagnostic (Final) Set-up / Set-up



By clicking the button „starting picture taking“ the live-fed image is automatically activated and the icon changes to orange

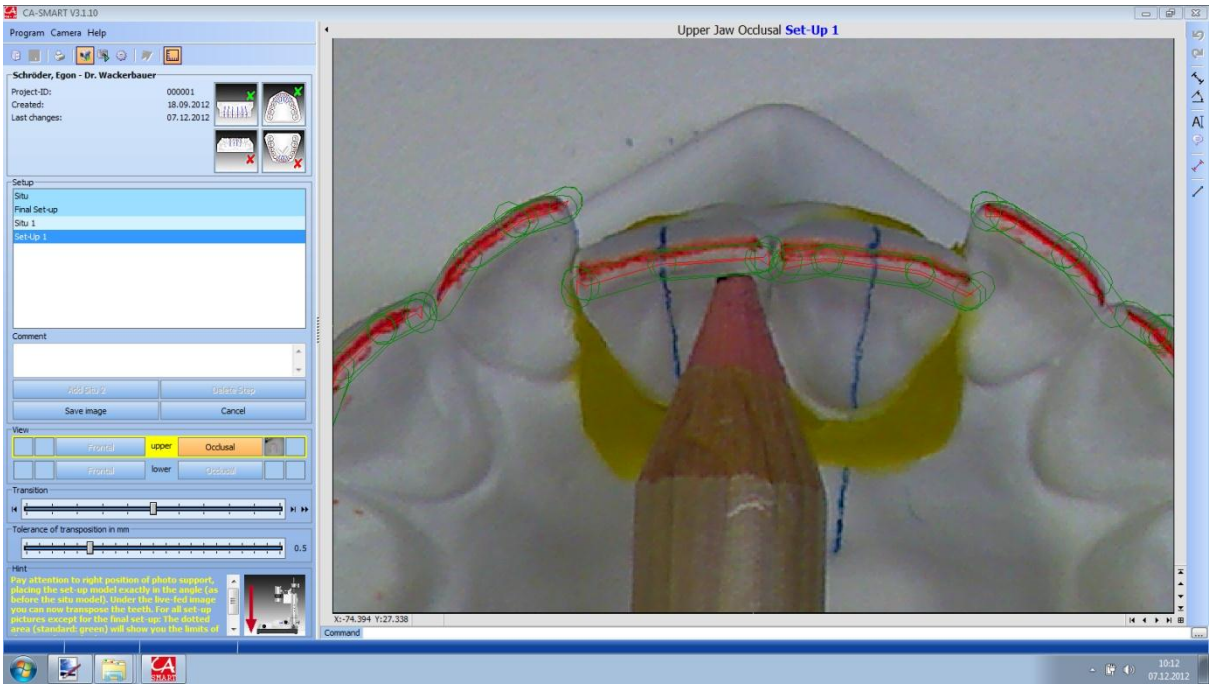
“Camera picture ON/OFF“

Place the model on the plate in accordance with the stop angle.

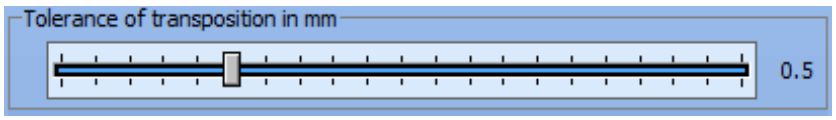
In the live-fed image under the camera, you can now proceed with moving the teeth within the tolerances you have preset and which are illustrated by the green dotted area.

Hint: Zooming in /out /moving the screen view

By pressing the scroll wheel of your mouse (-> a hand will be visible), you can move the picture as you like. By turning the scroll wheel, zooming in and out of the screen view is possible.

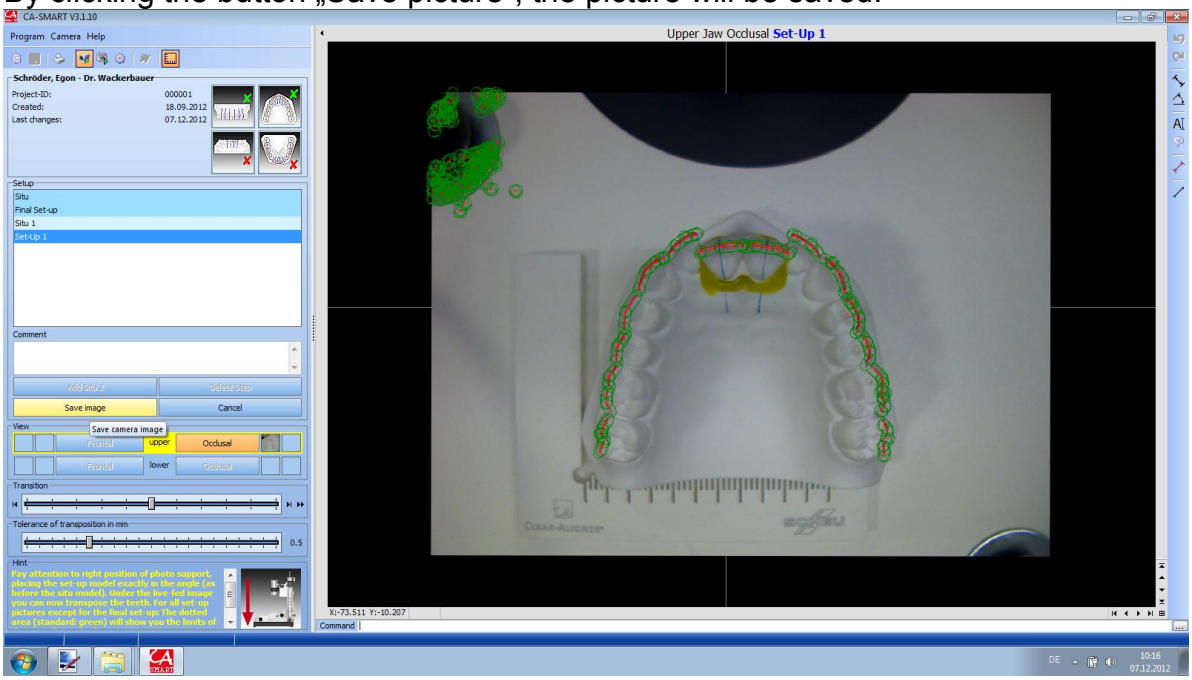


In case you wish to change the preset tolerances of the transposition, you can do so using the ruler:

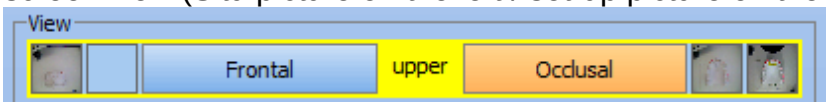


Saving the Set-up Picture

By clicking the button „Save picture“, the picture will be saved.



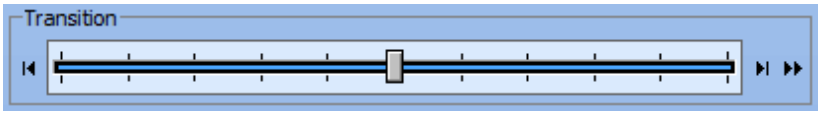
After having saved the set-up picture, both minimised pictures are visible in the screen view (Situ picture on the left / set-up picture on the right).



The working picture is shown in the overlapping mode (50/50).
(Cross fade controller is in central position).

Cross Fading

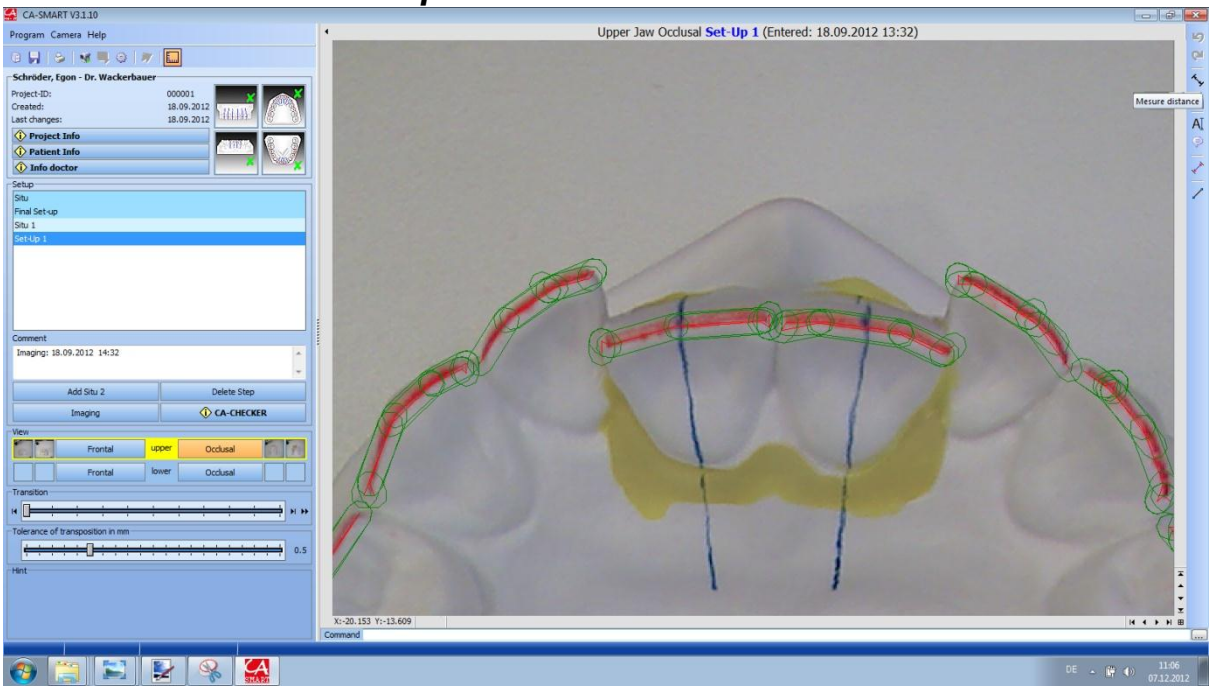
This function is only available in the set-up view!



Using this function you can view separately the situ or set-up pictures, you can cross fade manually or run an automatic cross fading:
By clicking the left arrow (or using the function key F5) the Situ picture will be shown, by clicking the right arrow (or F7) the set-up picture will be shown. You can drag the controller using the left mouse button in order to adjust cross fading as desired. By clicking the right mouse button (or F6) you'll receive a 50/50 view.

By clicking the double arrow you can start automatic cross fading.

Measurement of a set-up movement



The tool bar is in the upper right corner.

Tools for the Set-up Documentation

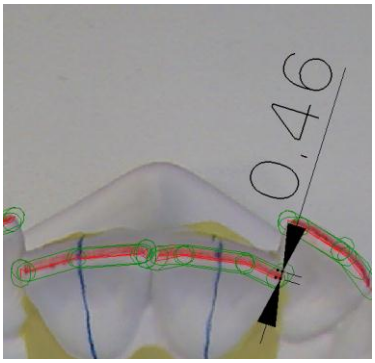
Tools

	Undo last action	Ctrl+U
	Redo	Ctrl+R
	Measure distance	
	Measure angle	
	Insert text	
	Insert info-text	
	Measure distance/angle	
Only possible when the icon „Edit area of points“ is activated:		
	Draw poly line	
	Draw line	

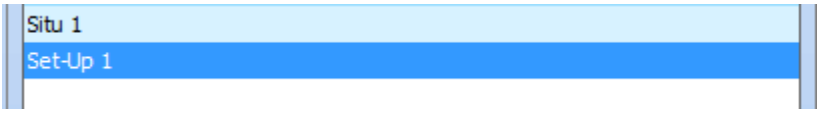
Viewing the picture on the screen

Using the arrow buttons you can move the picture in the screen view. You can center the picture by clicking the icon ⊞ .

For this set-up we will measure the distance:



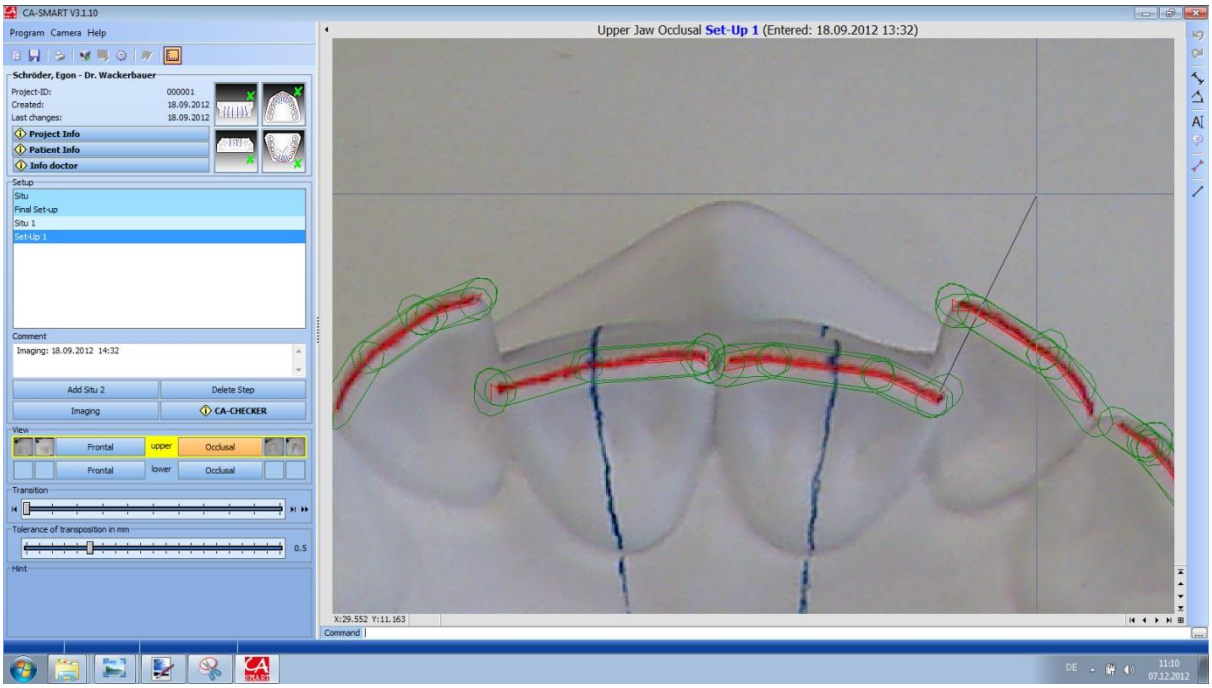
<u>The measurement should only be done in the active set-up view.</u>



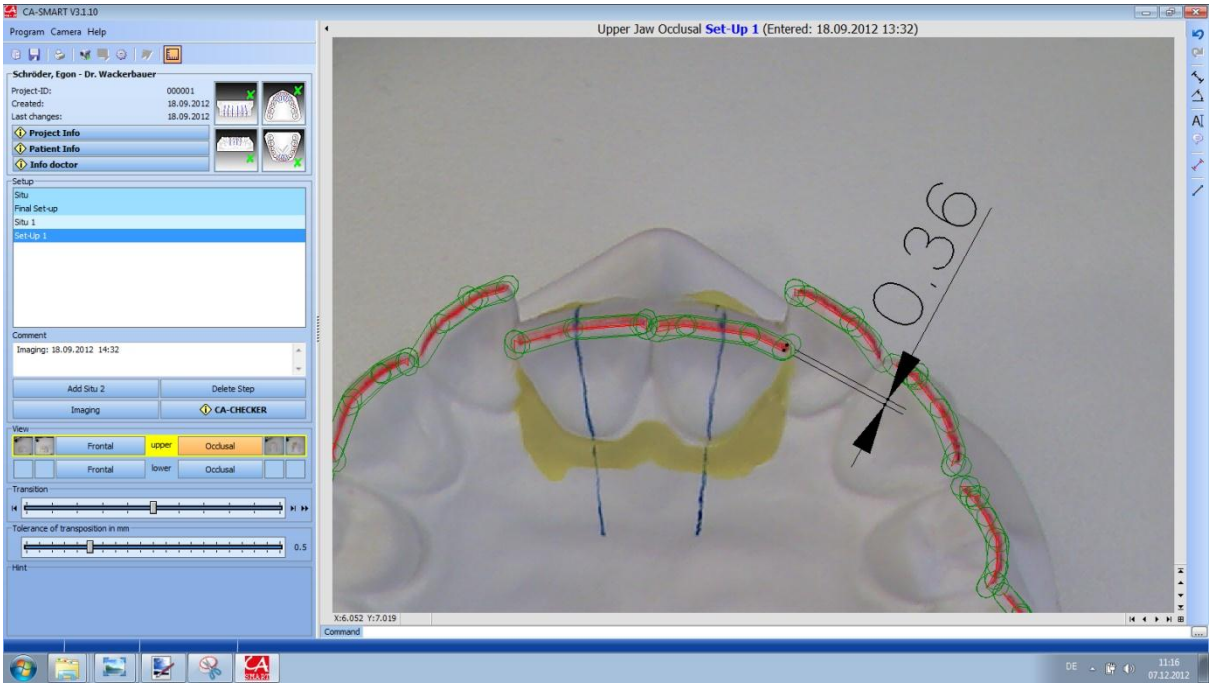
It is possible, too, to effect a measurement in an active situ view, but these measurements won't be transferred into the printed documentation.

In order to facilitate the measurement, you can zoom in or out or move the picture at any time as required (See above). Select the required tool by clicking and proceed with measuring using the cross hair.

At first, you should adjust the situ picture in cross fading by clicking the button or F5. Then select a prominent point of the tooth which has been moved and set the first measurement point by clicking the left mouse button.

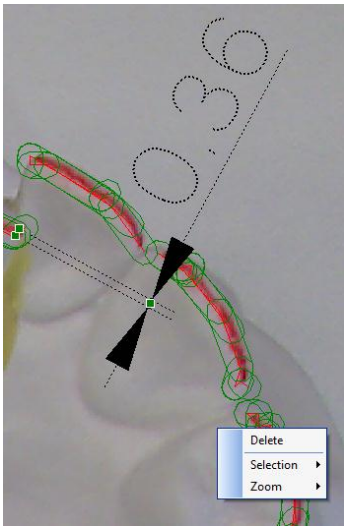


Now proceed with adjusting the set-up picture in cross fading by clicking the button or the function key F7. Set the second measurement point precisely at the chosen prominent point of the tooth that has been moved. Position now the illustration of the measurement by clicking once again the left mouse button. The illustration of the measurement is at first shown as a dotted line and can then be fixed on another position in the window by a further click.



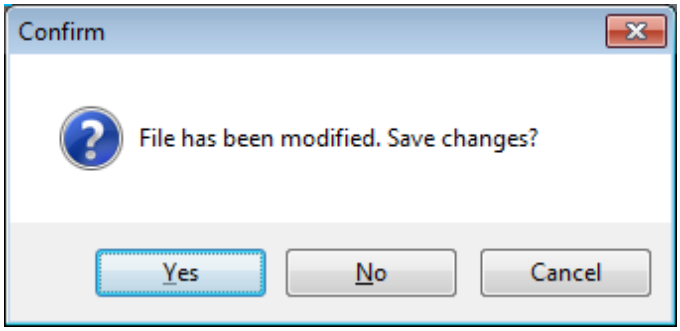
You have the possibility to change the dimensioning at any time.

- Click the dimensioning using the left mouse button and mark it (the illustration shows again a dotted line). By clicking an anchor point it will change to red and will be linked to the mouse, so that you can move and reset the point.
- Click the right mouse button: A menu will open where you'll have the possibility to delete the dimensioning.



In order to save the project after dimensioning click the icon .

When quitting the program, confirm by entering „Yes“ for saving the modifications.



Using the CA® CHECKER

A program module for the use of the CA®-CHECKER is integrated in this software. The CA® CHECKER enables measurement of torque and angulation values before and after set-up. Thus, you can directly insert the values as measured by the CA®-CHECKER in your projects and use them for your documentation.

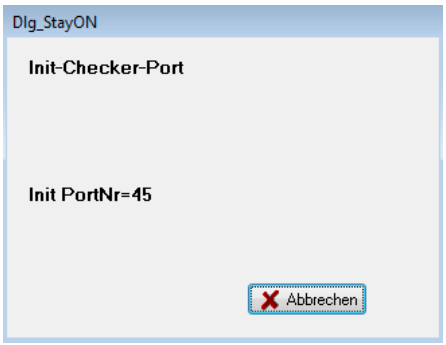
The instruction manual and software you received with your CA®-CHECKER is no longer required.

Hint:
Before using the **CA® CHECKER,** a precise alignment of it´s base plate made of granite by means of the attached level is compulsory. For any measurement using the CA®-CHECKER, the models on the model support have to be aligned in the same way; this refers to the measurement on the situation model as well as later on the same model with effected set-up.

Please note the CA®-CHECKER has to be activated in the “program settings” before use (please refer to the chapter “program settings”).

After activation you can use the button CA®-CHECKER

under the condition you have connected the hand piece of the CA® CHECKER to the USB port of your PC. If the checker is not connected, your PC will search for the hand piece and the following window appears:



In case this window appears while you want to take measurements, please quit the process immediately. After this, CA® CHECKER window will appear and you'll have to quit the system completely.

Now please connect the hand piece to your PC, wait while your system recognizes the hardware and restart the CA® SMART software.

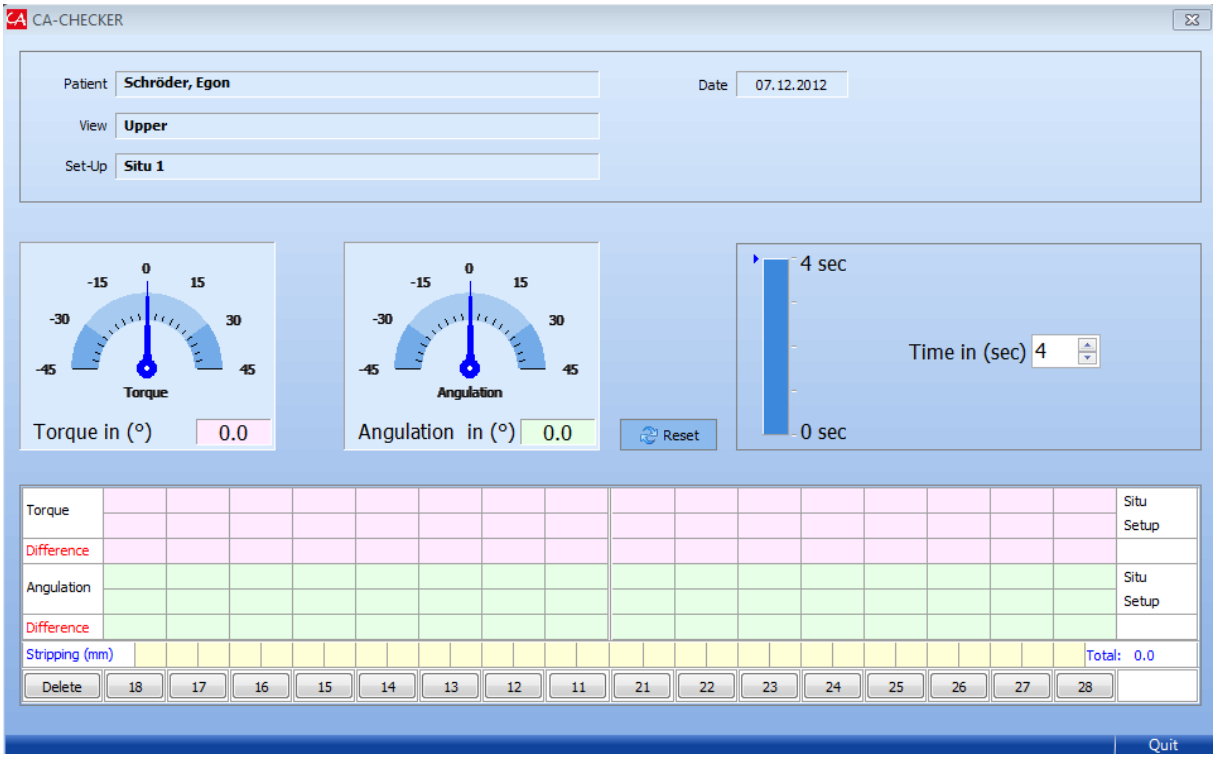
In case the CA®-CHECKER is correctly connected, the following window will appear

When using the device for the first time, please set the times for the determination of the measurement values. The time runs from the activation of the corresponding tooth until the insertion of the values in the chart. An acoustic signal will indicate the measurement values have been saved. The preset value will be saved when quitting the window.

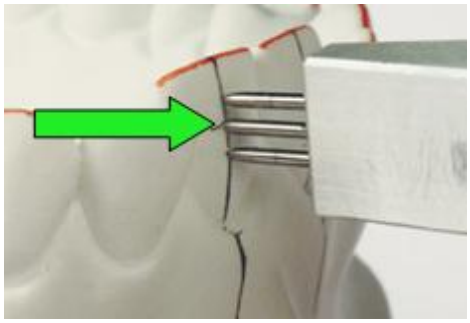
Please reset the precision measurement head once before measuring all set-up values.

Make sure not to change the position of the granite base plate during the complete measurement process of the set-up values.

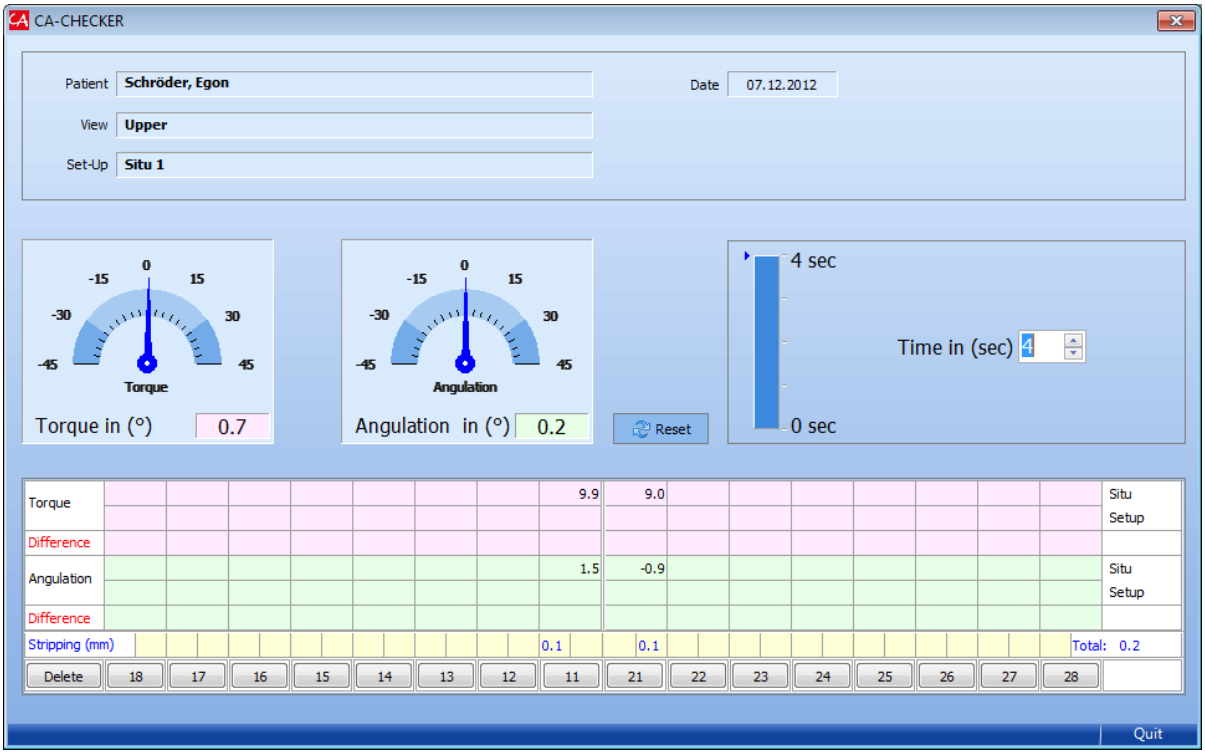
The measurement values of the situation model for the teeth you intend to move have to be fixed always in the same order:



Activate now the tooth for which you want to fix the measurement values.

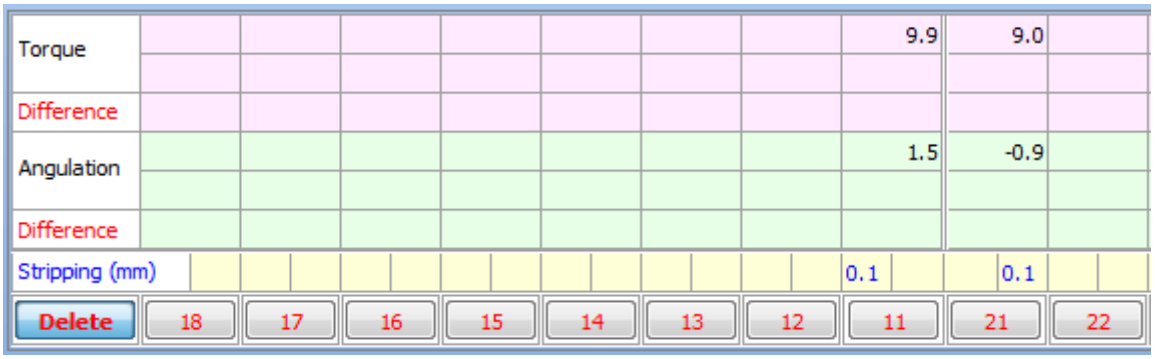


Place the precision measurement head to the tooth and wait while an acoustic signal indicates the measurement values have been transferred.



The transferred values and preset stripping values are shown in the chart. The preset stripping values are shown in the right array “Total”.
You can modify values if necessary.

- You can select the tooth you like to measure once again and the entered values will be overwritten.
- If you entered a wrong tooth, you can click the „delete“ button. The complete line of tooth buttons will turn to red and a singular deletion of all values in the selected tooth column is possible.

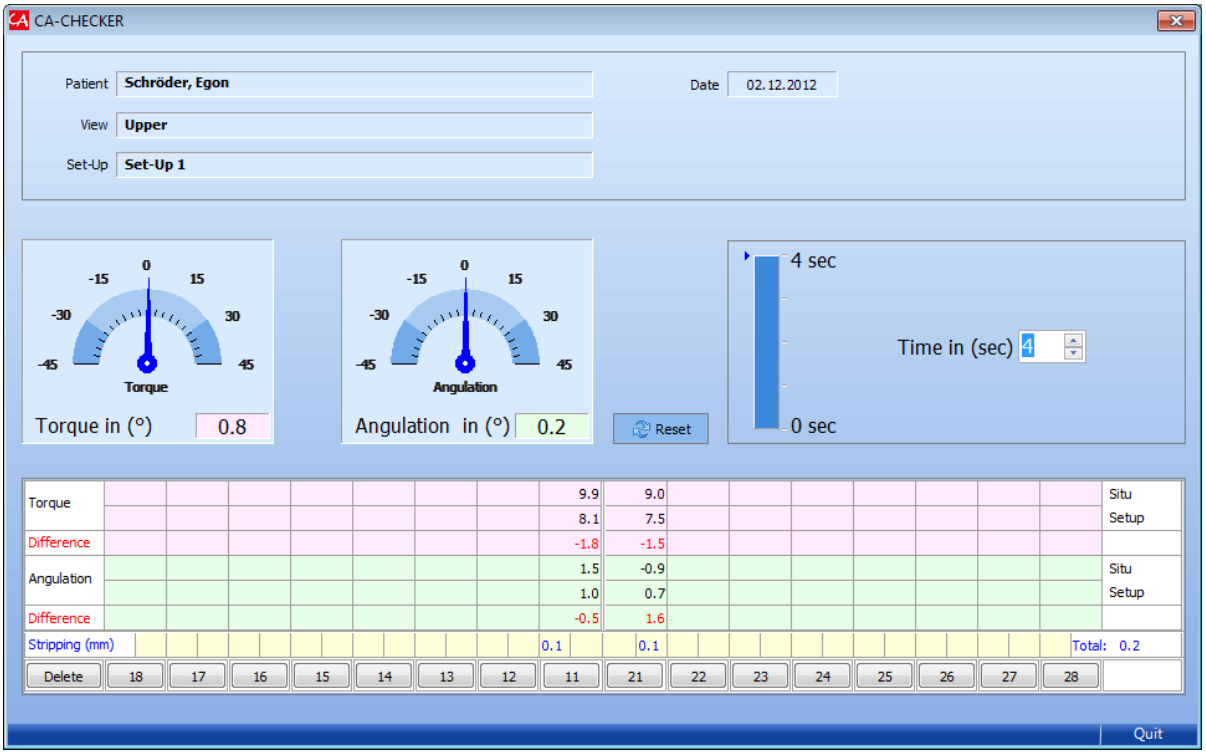


- If you wish to modify preset stripping values, you can re-enter or overwrite these values.

After quitting the CA® CHECKER window, an icon on the screen view signalizes measurement values have been entered, however only in the corresponding kind of view.

If you click now to the set-up view, no icon will be shown, as these values have not been inserted yet and have to be entered still.

Before you can determine the measurement values for the set-up model, the set-up step has to be documented in the CA® SMART software. After transposition of the teeth and corresponding documentation of the distance measurements in the CA® SMART software, you can proceed with measuring:



Final Comment

This instruction manual is not meant to replace the participation in our courses on CA® technology.
We strongly recommend all users to participate in these courses, as only doing so they will fully comprehend all interrelations between the various sequences of this software in practice.

For any further information please visit our website:

www.scheu-dental.com

➔ Courses: CA® CLEAR-ALIGNER workshop for Doctors and Technicians

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