Serstech 100 Indicator Demo Guide

SERSTECH

Chemical identification for a safer world

The Serstech 100 Indicator

- The Serstech 100 indicator is delivered in a Peli case that is:
  - Water proof
  - Crush proof
  - Dust proof

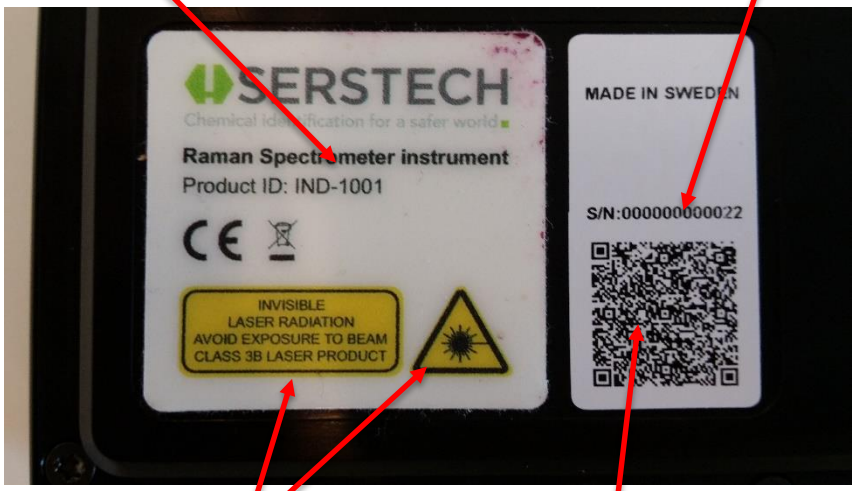
PELI™

The Serstech 100 Indicator and included accessories

Instrument and accessories

Label on the instrument’s front

Labels on the backside of the instrument



Serial number

Product ID

Laser safety information

QR code

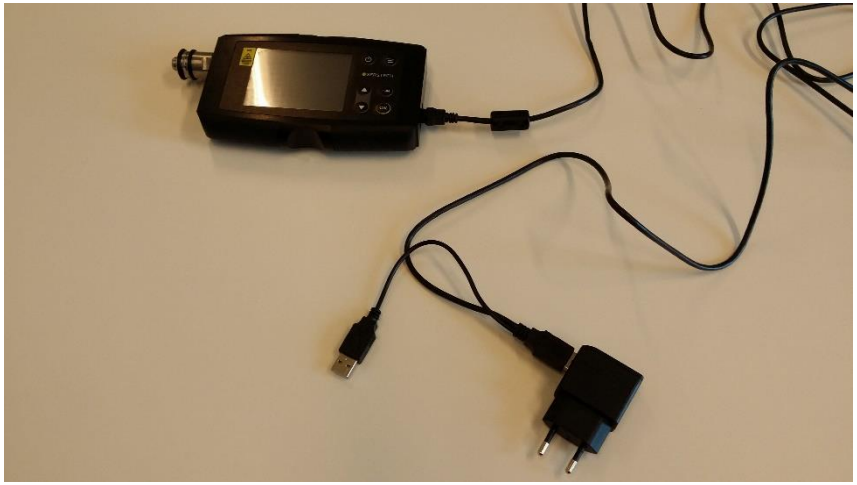
The function buttons

Recharging the Serstech 100 Indicator

- Use the USB cable, delivered with the instrument, to plug into the Serstech 100 USB port

Connect the USB to power source

- Connect the other end of the USB cable into an adapter that fits to you local wall socket. Even if the minimum required current is 0.5A, we strongly recommend 1A.



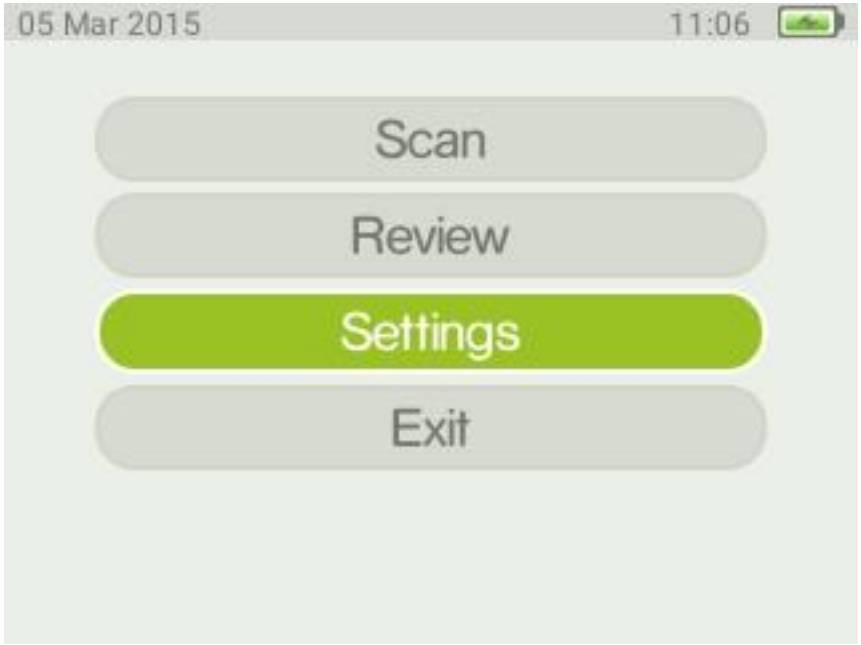
Calibration control

- The instrument performance should regularly be controlled using the function ”Calibrate”
- Calibration is performed using the lens cap, also known as the Calibration cap

Calibration cap/Lens cap

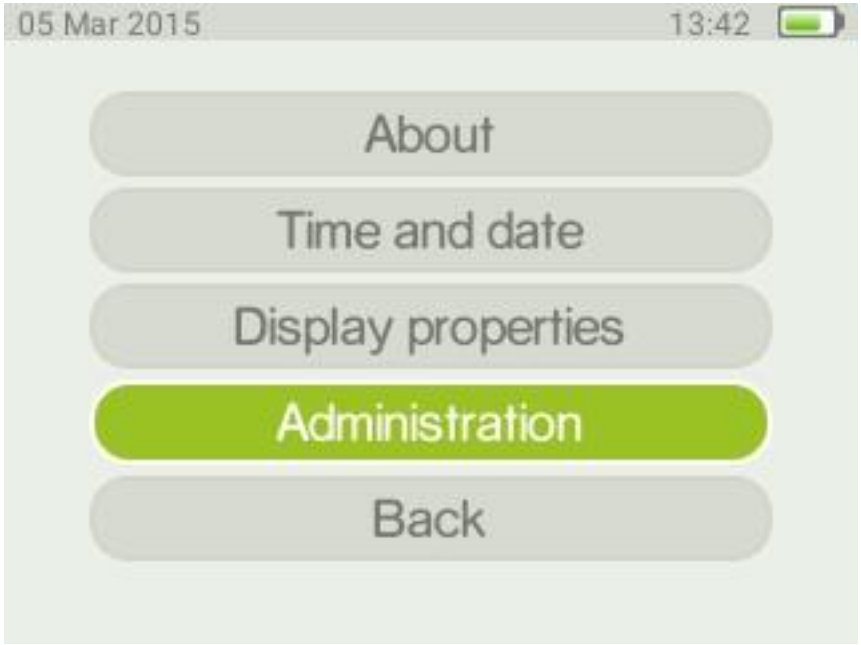
Calibration control

- From main menu select settings



Calibration control

- Select Administration

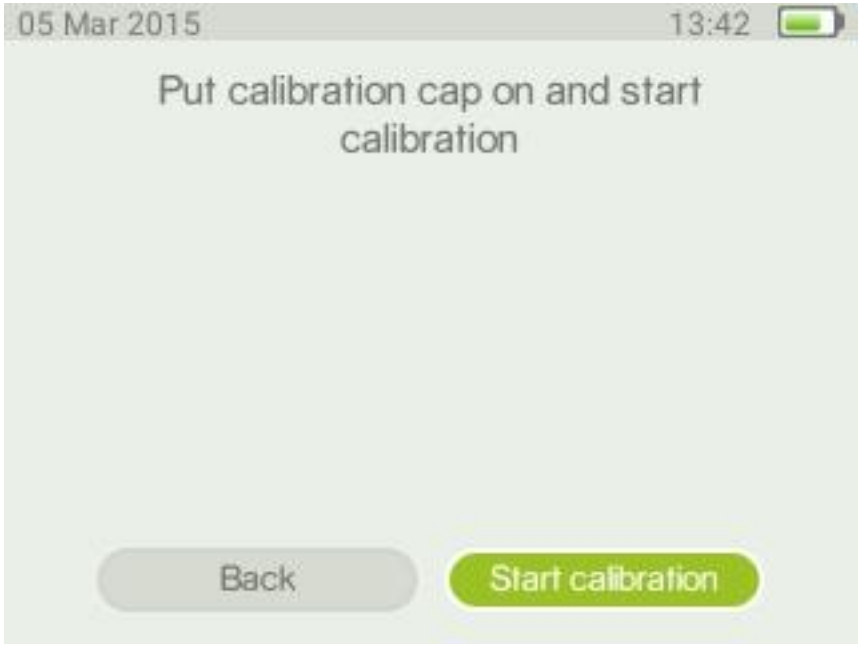


Calibration control

- Select Calibrate

Calibration control

- Put on lens cap



Calibration cap on

Calibration results

- **Calibration successful. Current calibration still valid.**
- No changes are inferred
- **Calibration successful. Recalibration performed.**
- The obtained values for the polystyrene spectrum is within the acceptance criterion. However, a better fit was obtained these new values was used to recalibrate instrument.
- **Processing failed.**
- No match to the polystyrene was obtained. Make sure that the lens cap, containing the polystyrene reference material is in position and repeat the calibration procedure. Recurrent failure indicates instrument error.

Using the vial adapter

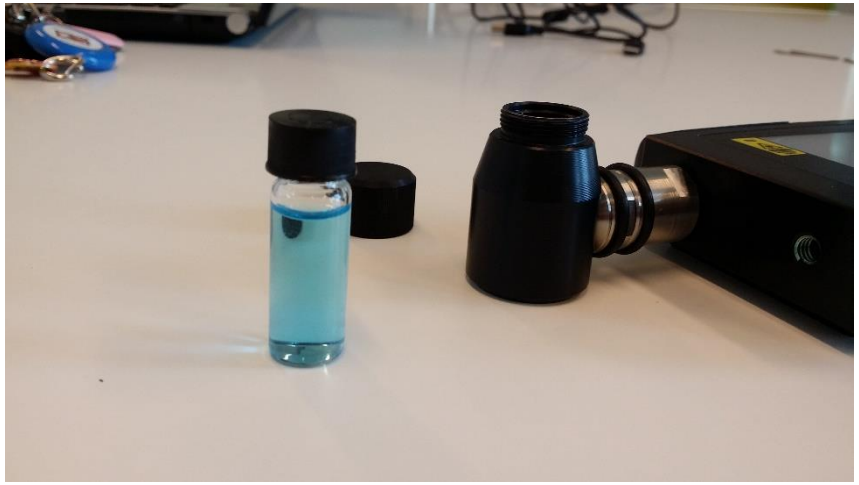
- The vial adapter should be used for analysis of liquid samples only.

Mounting the vial holder

- Place the vial holder on the protruding optics and press until it snaps into position.

Identifying an unknown sample

- Liquid sample present in vial



Load vial

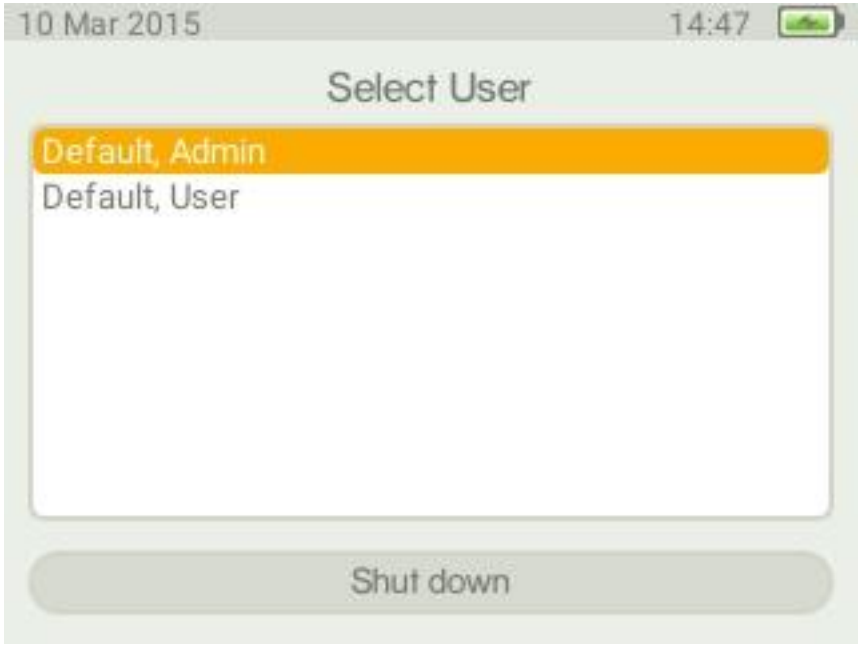
- Add your sample into a suitable vial (4 ml vial with 10 mm diameter)
- Place the vial in the vial holder

Start analysis

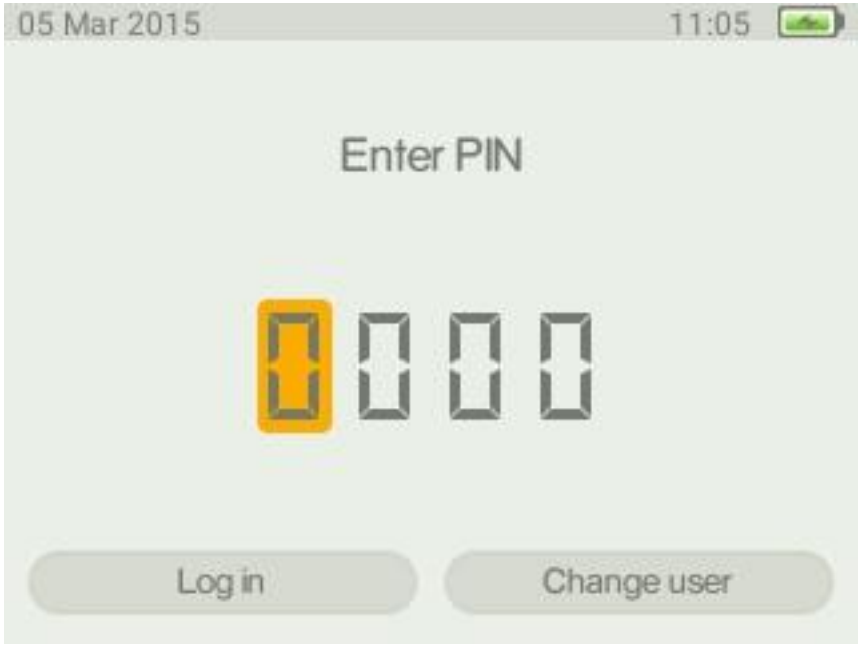
- Place the screw cap in position
- Start analysis

Log on

- Select user from the list

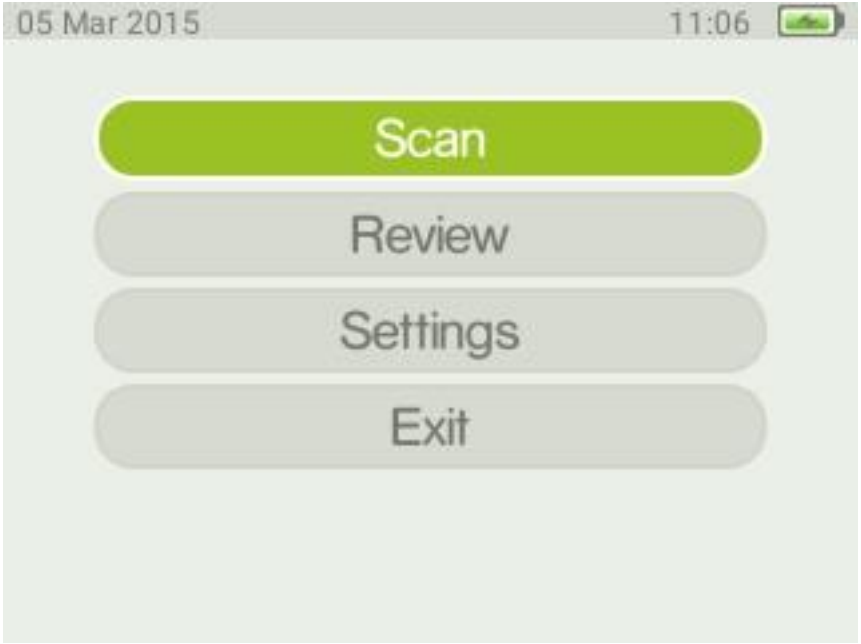


Enter pin



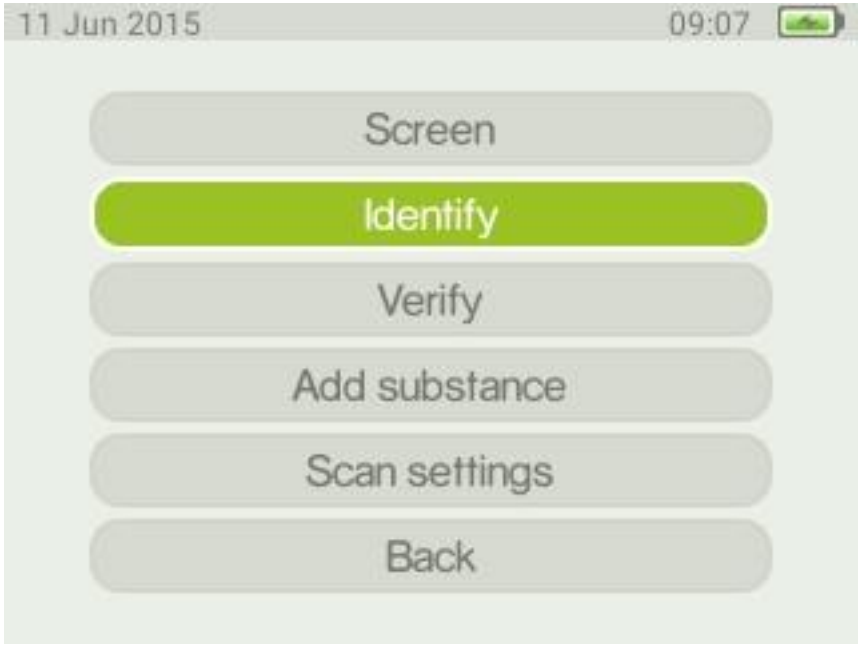
Main menu

- Select scan from the main menu



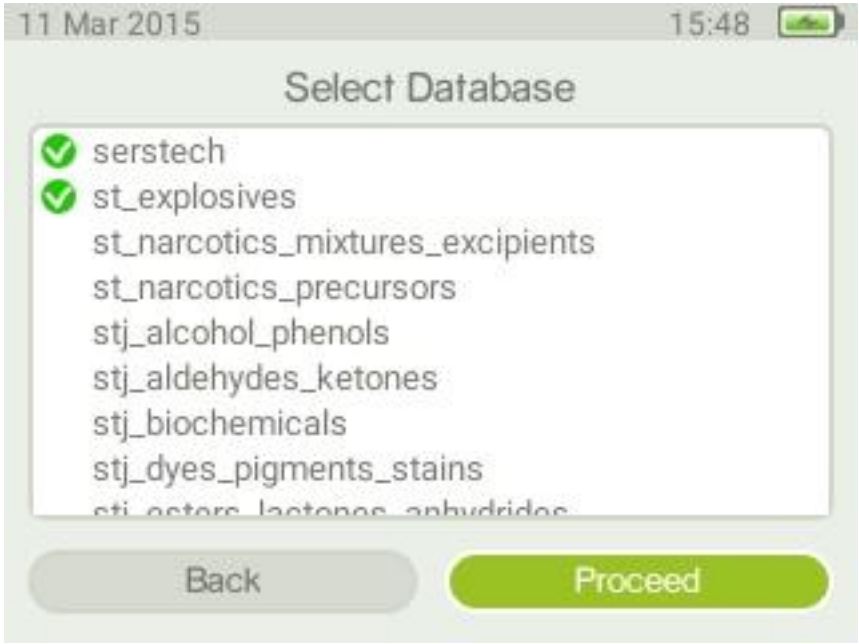
next step

- Select identify



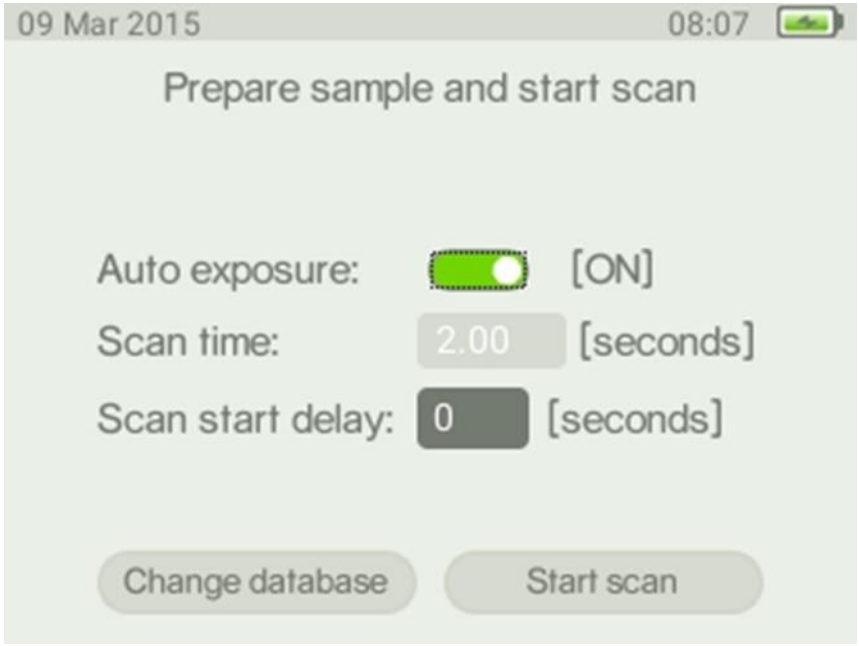
Select database

- Select databases to be used for the identification
- The demo data base named ”serstech” comes with the instrument. Additional data bases may be purchased.



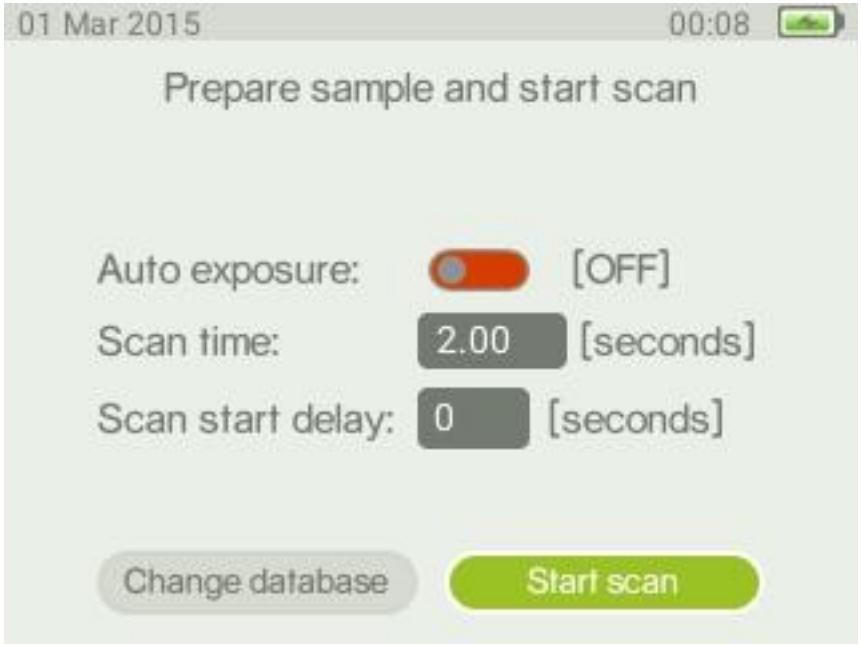
Scan window- Auto exposure

- To obtain the best spectral quality the Auto exposure should be used
- UseTab button to activate the Auto exposure Press the OK button to turn Auto exposure ON or OFF.
- When auto exposure is active the displayed scan time is not used



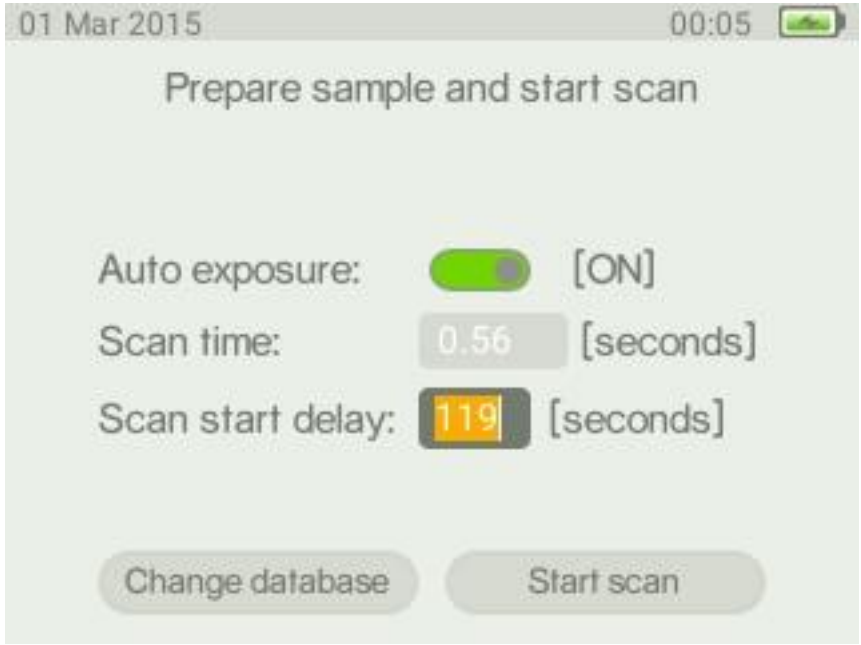
Scan window- Manual exposure

- Via Tab button turn auto exposure OFF
- The Scan time displayed will be used when Auto exposure is turned OFF
- Use Tab to nove to Scan time field and use arrow buttons with Tab button to set time



Scan window- Scan delay

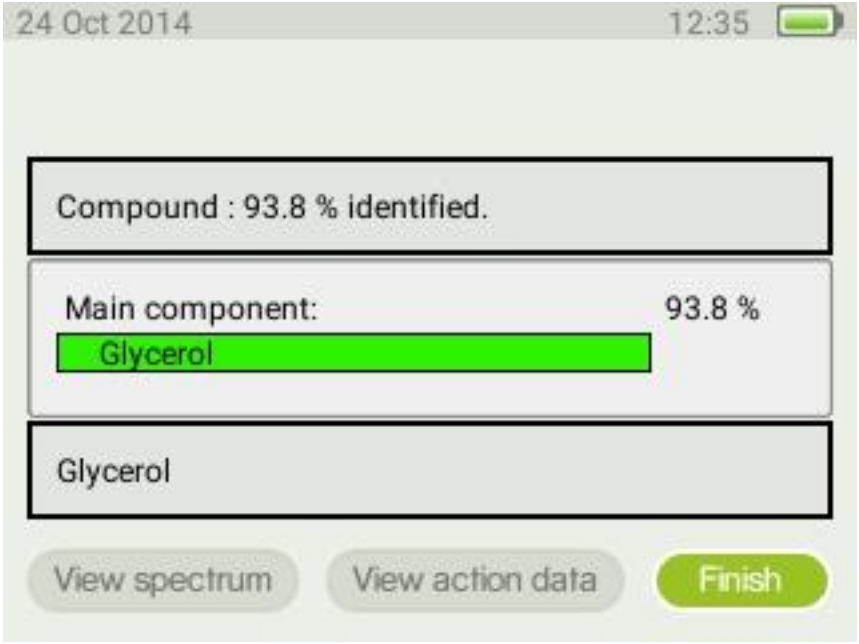
- Scan delay delays the analysis and thus the activation of the anlysing laser
- This functions shall be used whenver there is any risk that the substance analysed may react violently with the laser light i.e. exploding.
- The Scan delay can be set for 0-999 seconds



One component identified

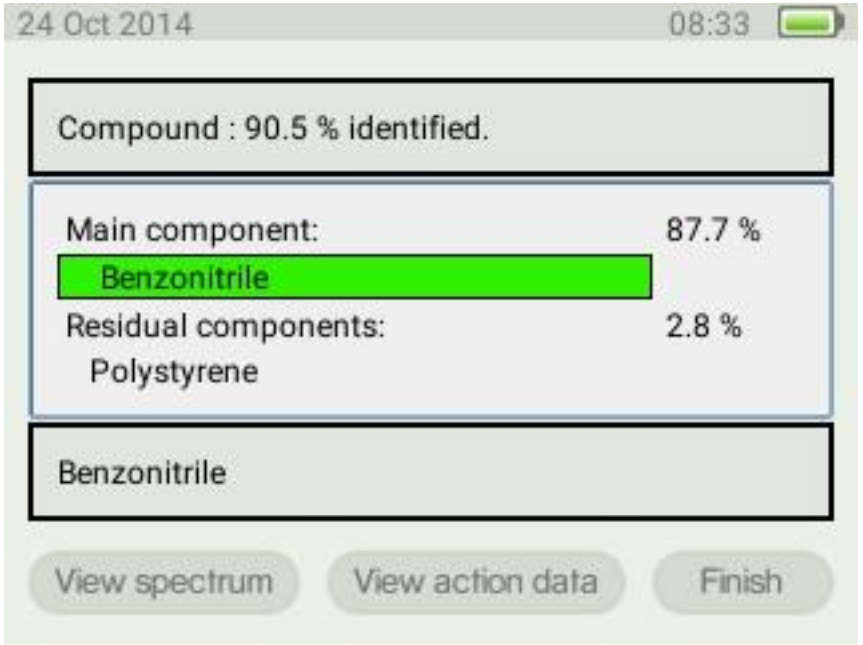
- Compound 93.8 % identified means that the correlation factor between the the analysed sample and the spectrum in the data base is 93.8 %

- Here only one component is identified



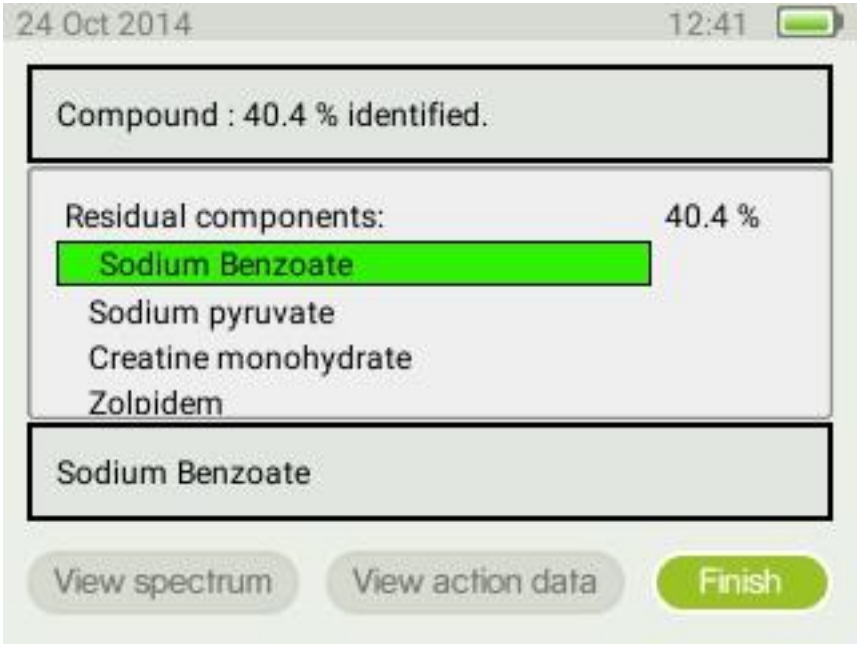
One main component and residuals identified

- In this example the sample spectrum can be explained to 90.5 % by the spectral information in the data base used (compound 87.7 %).
- The main component is Benzonitrile (spectral contribution from the data base spectrum of acetone to the sample spectrum is 87,7 %).
- There is still spectral information of the sample spectrum that is explained by the data base that is not benzonitrile. This is referred to as Residual components.
- Under Residual component(s) the substance(s) whose spectra contribute to the Compound identified are listed. The exmaple above has one residual component (Polystyrene).
- The substances listed under Residual component may be part of the sample analysed.



Only residual identified

- The sample is identified to have 40.4 % correlation to the data base spectrum. None of the individual components spectral contribtion is high enough to be a main component
- The information could only be used to support identification via any other information obtained from the sample e.g. odor, color, liqiud/solid.



No match

- When the obtained spectrum from the sample does not have any match in the data base

Too low signal to noise

- When the signal to noise ratio is too low for a Raman spectrum to be obtained

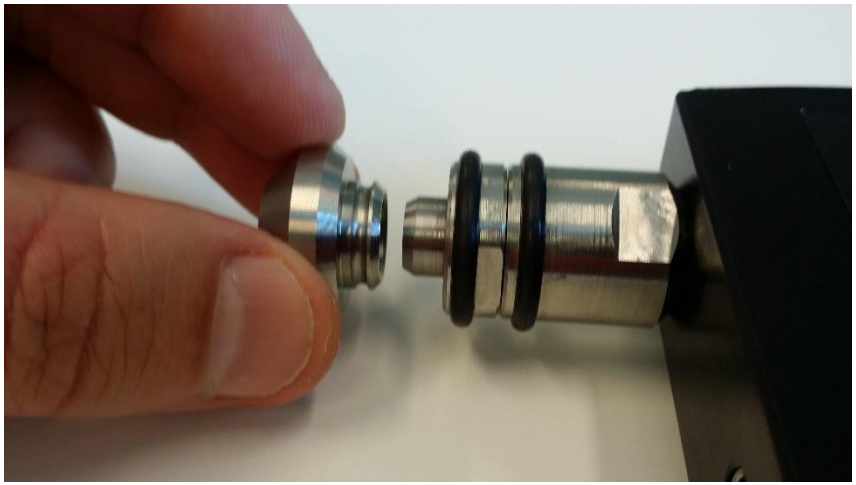
Using the point and shoot adapter

- If necessary remove the vial holder.
- Locate the point and shoot adapter

Point and shoot adapter

Mounting the point and shoot adapter

- Place the point and shoot adapter on the protruding optics and press until it snaps in position.



Adapter mounted

- Note, the Serstech 100 Indicator analyses light in the visible range, thus care must be taken so that no light sources are directed towards the opening of the optics

Samples

- Powder and pellets are preferably analysed through a plastic bag

Powder analysis

- Make sure that the sample is gathered in an amount that can fit against the point and shoot adapter

Press the bag against the adapter

- Press the plastic bag against the point and shoot adapter
- Make sure that the sample is present in the area where the analysing beam is emitted from the adapter
- Keep the sample pressed against the adapter until the red diode, indicating laser activity, is turned off

Analysis with point and shoot adapter

- Keep the sample pressed against the point and shoot adapter during the analysis (as long as the red laser warning diode is lit)

Analysis of large solid samples

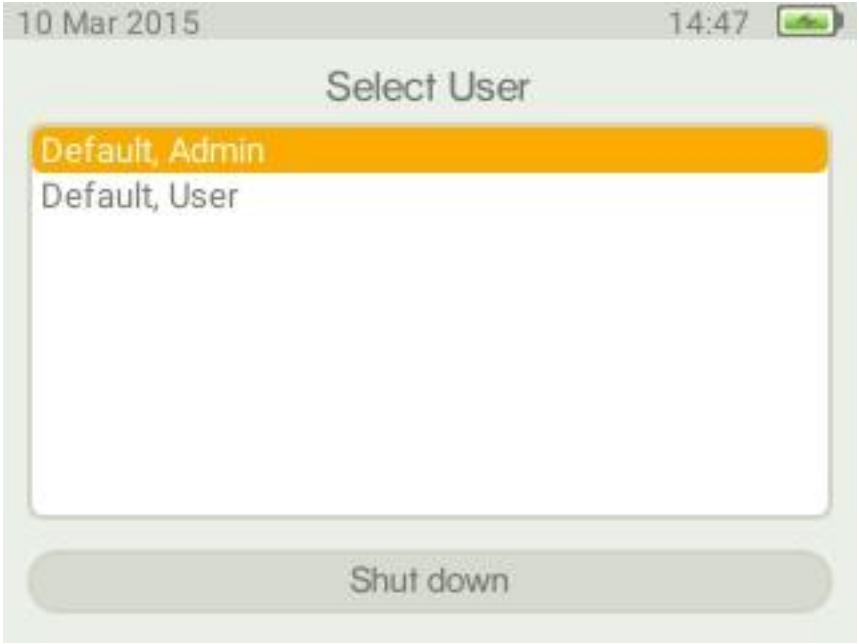
- Press the instrument optics with the point and shoot adapter to the surface of the sample

Verifying a caffeine sample

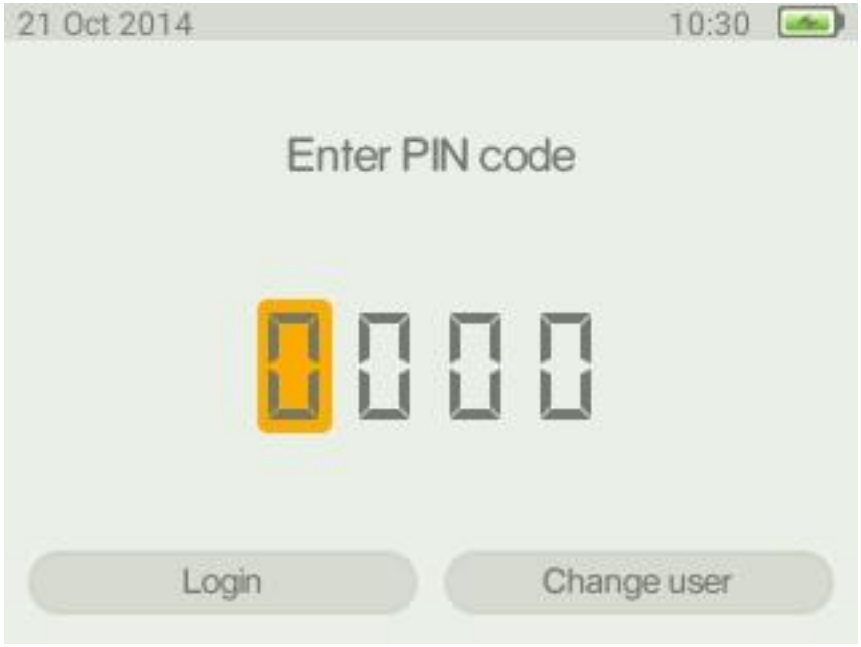
- Start instrument via Power on/off

Log on

- Select user from the list

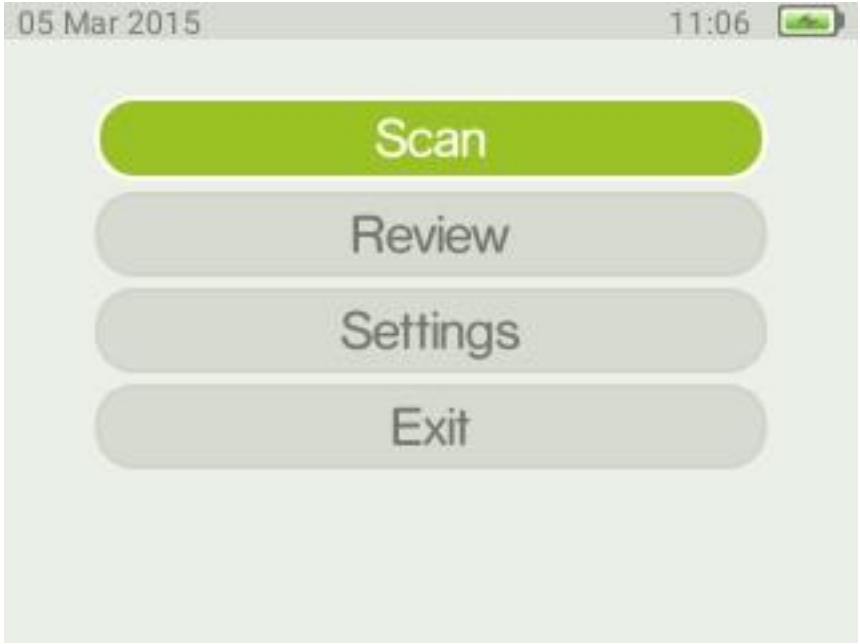


Enter pin



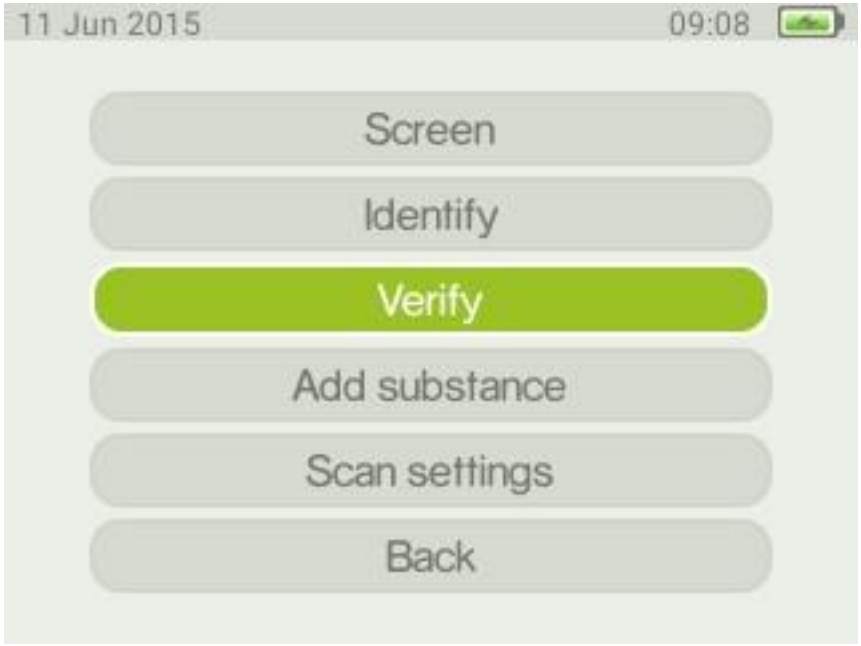
Main menu

- Select scan from the main menu



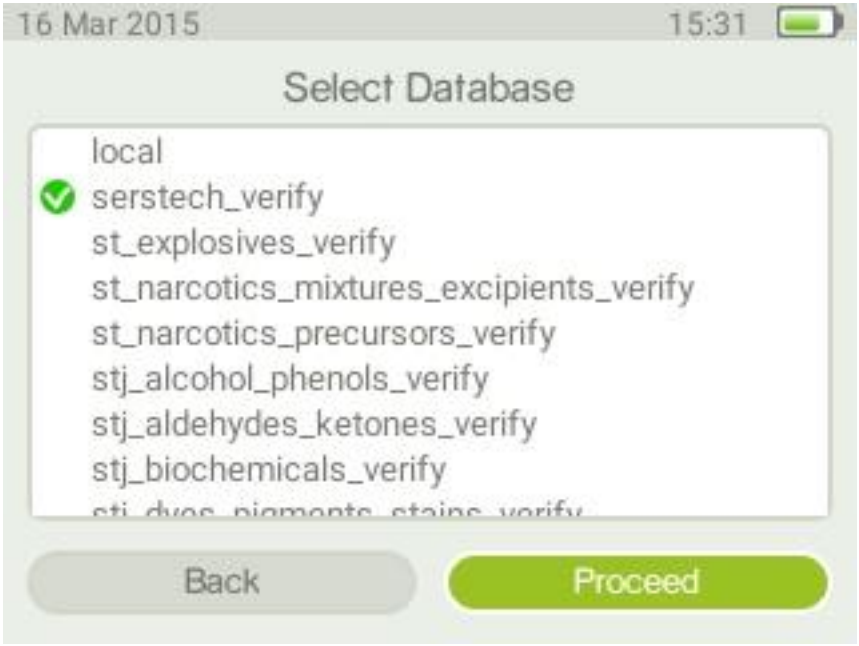
Next step

- Select Verify



Select database

- Select the appropriate database

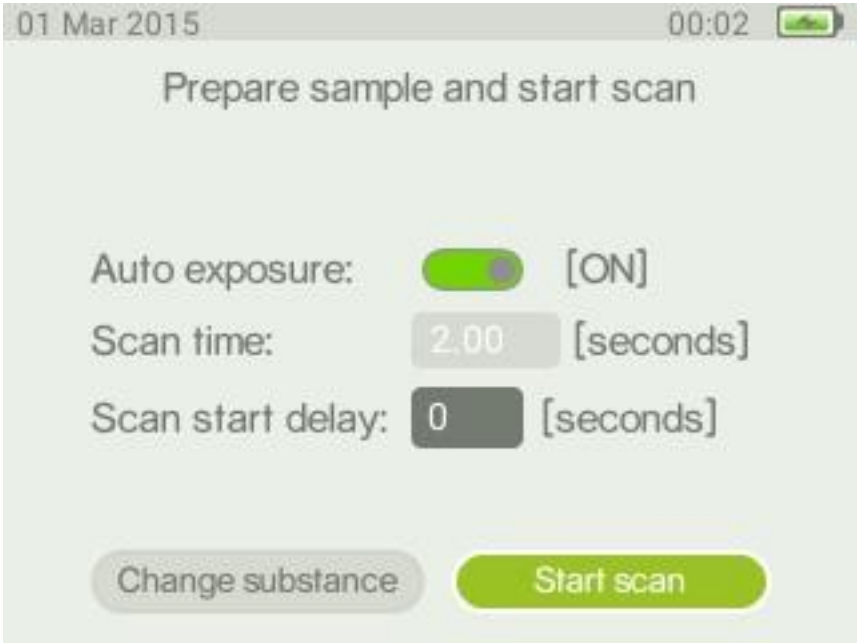


Select substance

- Select Caffeine from the list

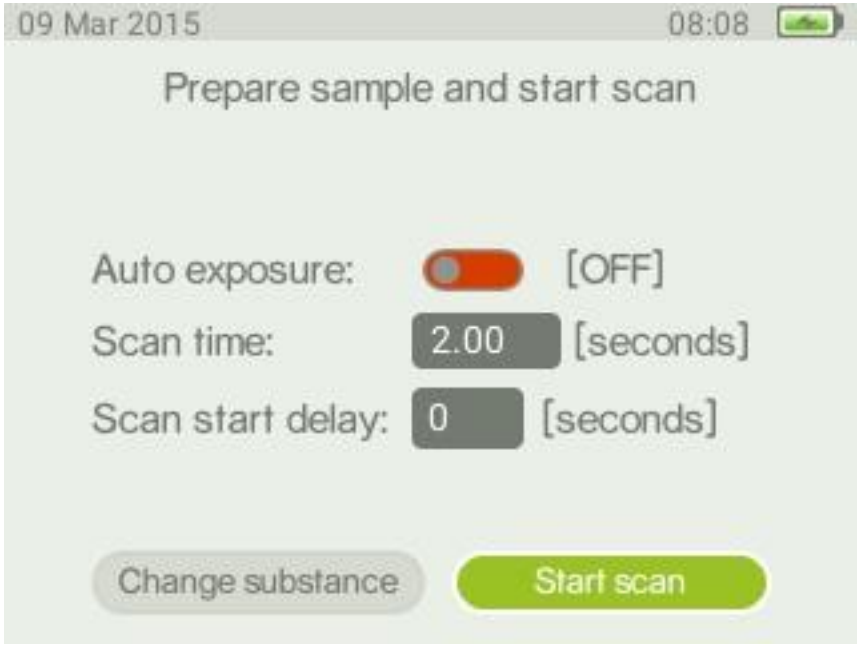
Scan window- Auto exposure

- To obtain the best spectral quality the Auto exposure should be used
- UseTab button to activate the Auto exposure Press the OK button to turn Auto exposure ON or OFF.
- When auto exposure is active the displayed scan time is not used



Scan window- Manual exposure

- Via Tab button turn auto exposure OFF
- The Scan time displayed will be used when Auto exposure is turned OFF
- Use Tab to nove to Scan time field and use arrow buttons with Tab button to set time



Result: Pass

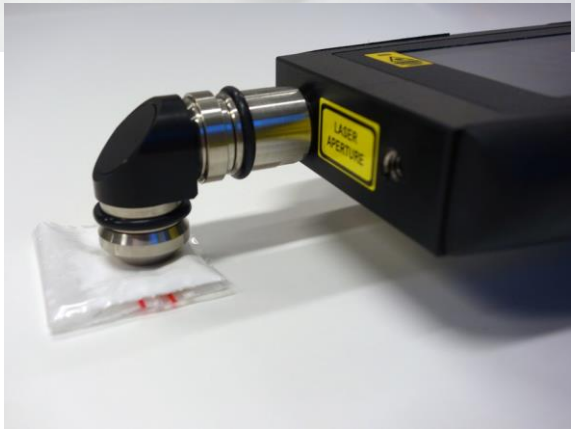
- If the spectrum of the sample matches the spectrum of caffeine in the data base the result will be Pass

Result: Fail

- If the spectrum of the sample does not match that of the spectrum of caffeine in the data base the result will be Fail

Analysis using 90^{o} adapter

- With the 90^{o} adapter the sample can be analysed by simply placing the Indicator on top of the sample with the optics facing the sample.
- The 90^{o} adapter is made for analysis of solid samples

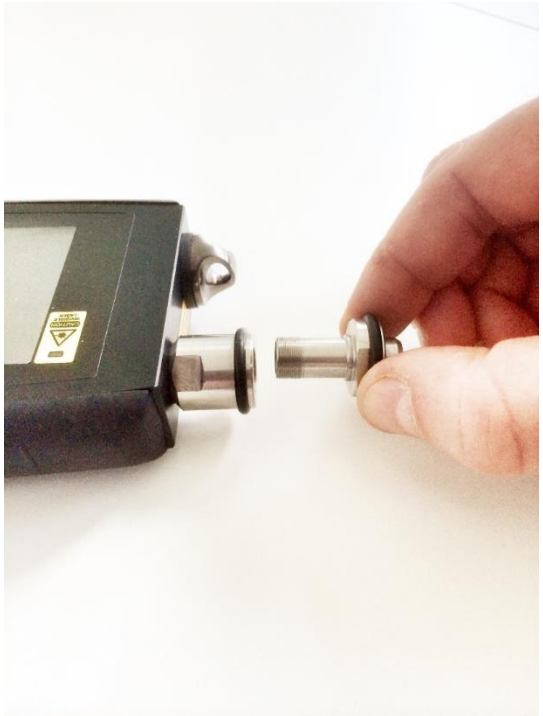


Changing to 90º adapter

- Make sure the Serstech 100 Indicator is turned off
- Use the tools to loosen the optics - place one tool at the flattened area (of the optics) close to the Indicator body and the other tool at the flattened area between the black O-rings

Removal of current optics

- Unscrew the optics and pull it out
- This removes the lens that focuses the light at a small spot on the sample



Laser safety

- Without the focusing lens any laser light leaving the system will travel very far with a beam of highly concentrated light.
- As a an extra safety precaution a curtain drops to prevent any laser light from being emitted – if the instrument is accidently started in this state.

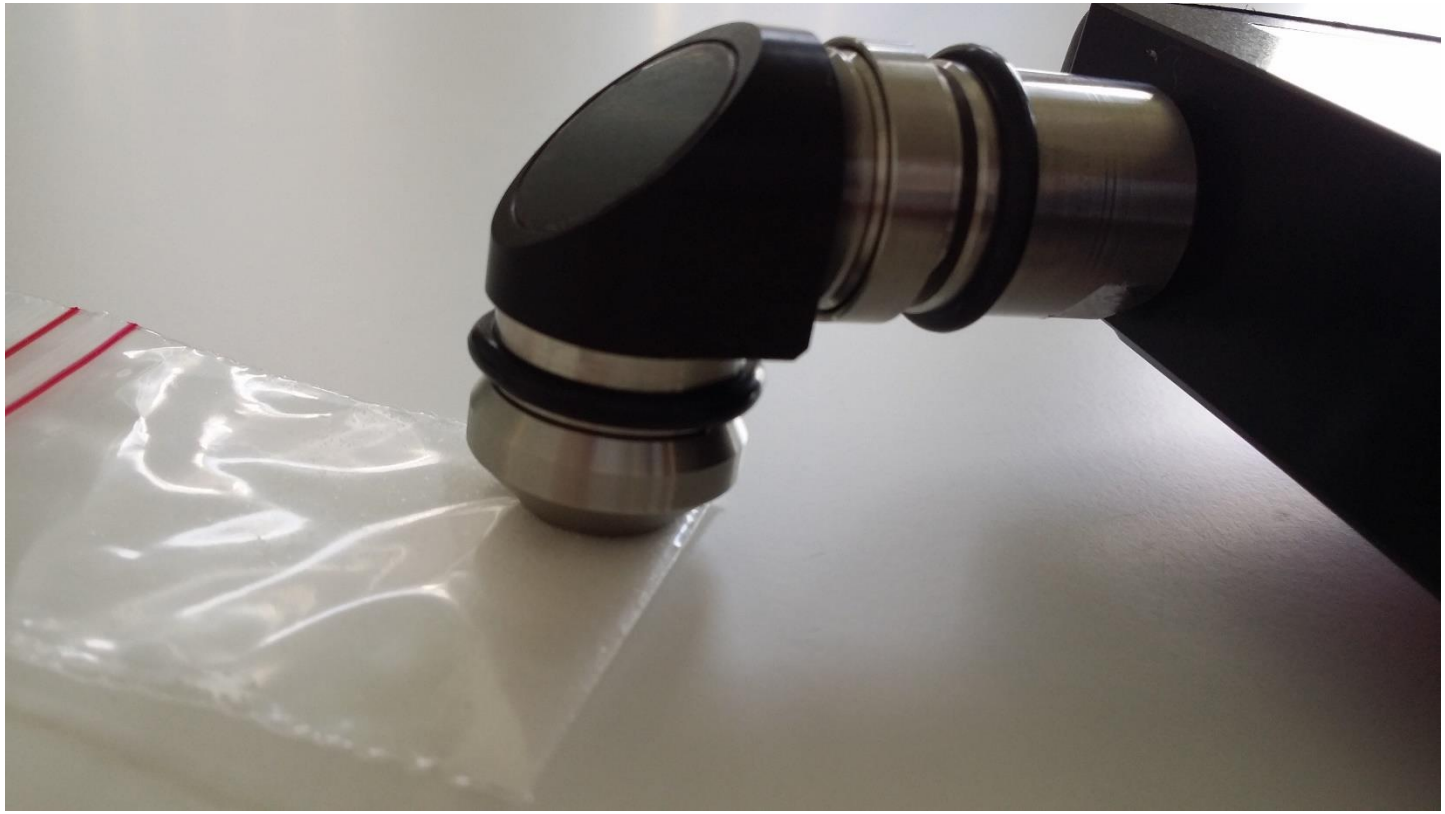
Fitting 90^{o}degree adapter

- Place the 90^{o}degree adapter in position and use your fingers to screw the optics onto the Indicator. Be gentle.

Tighten the optics

- Use the tools to tighten it with modest force
- The 90^{o}degree adapter is now ready to be used

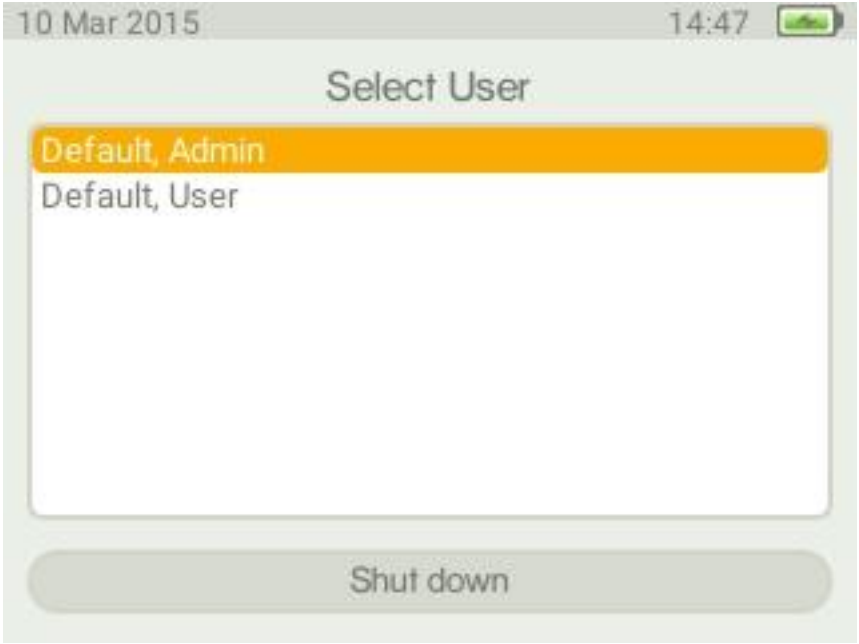
Proceed with analysis



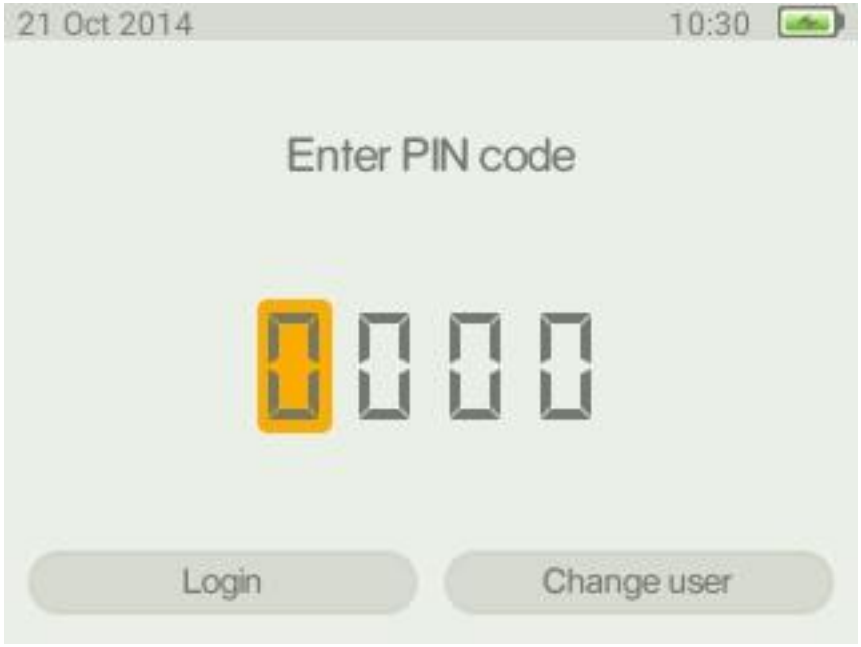
Screen list of restricted chemicals

Log on

- Select user from the list

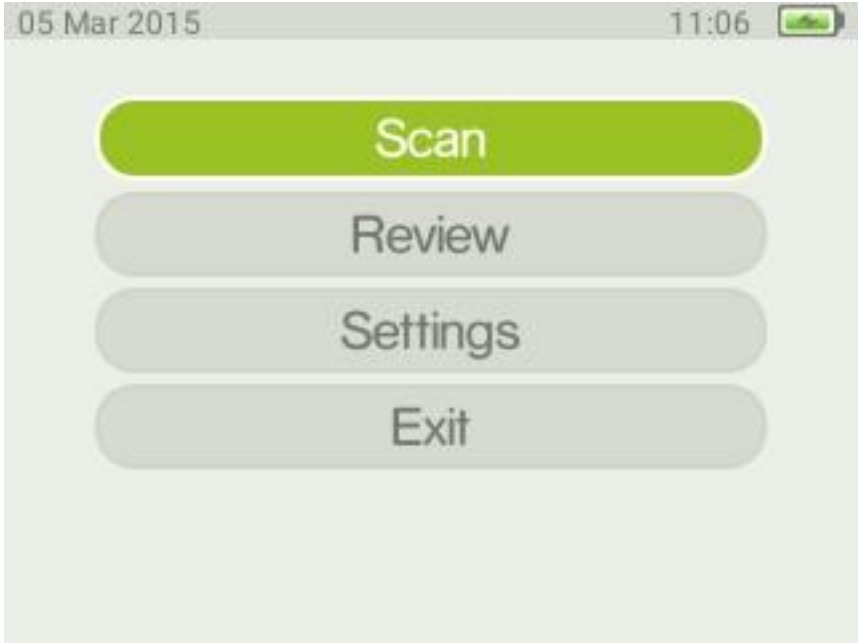


Enter pin



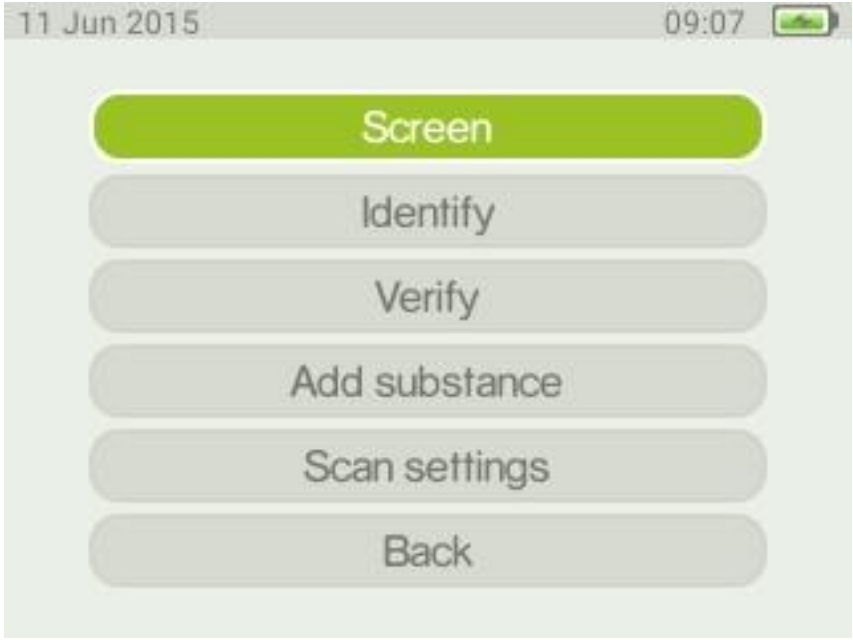
Main menu

- Select scan from the main menu



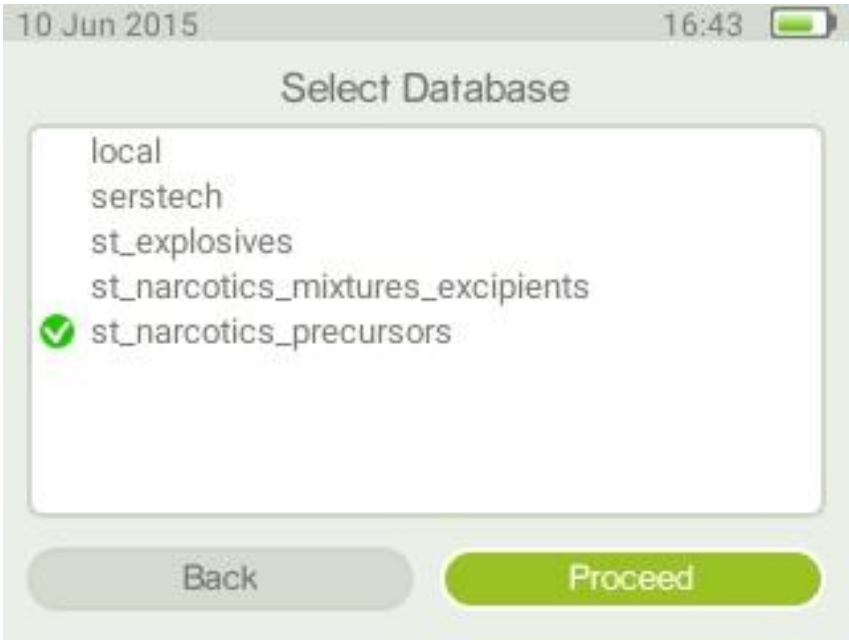
Next Step

- Select Screen



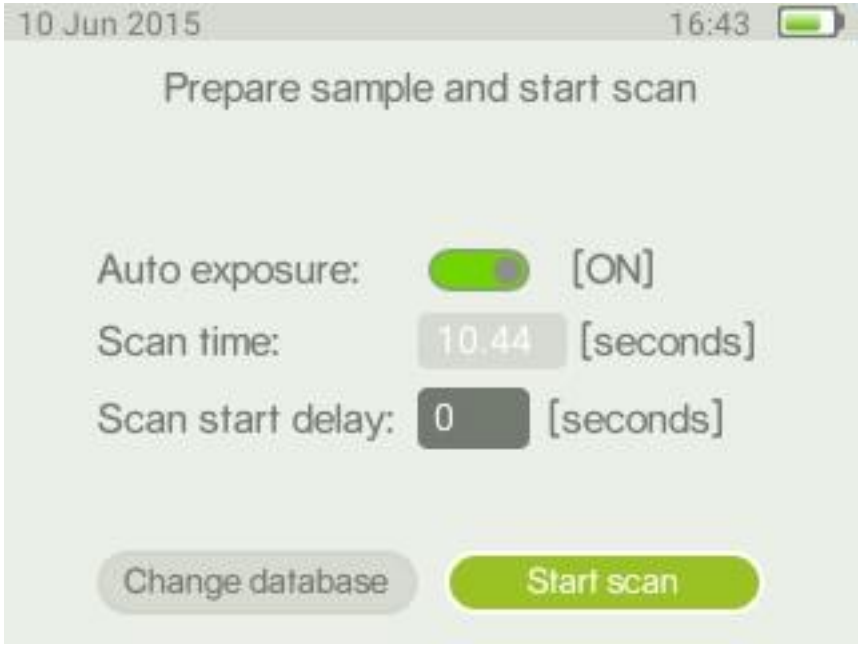
Select database

- The demo database named ”serstech” comes with the instrument. Additional databases may be purchased.
- You can also add substances and create your own personalised database



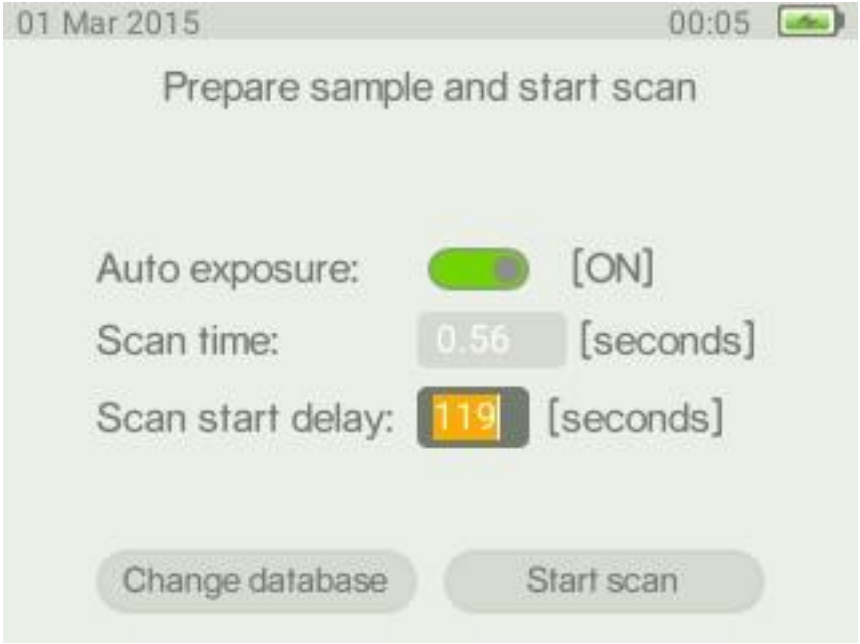
Scan window- Auto exposure

- Use the recommended Auto exposure to obtain the best spectral quality

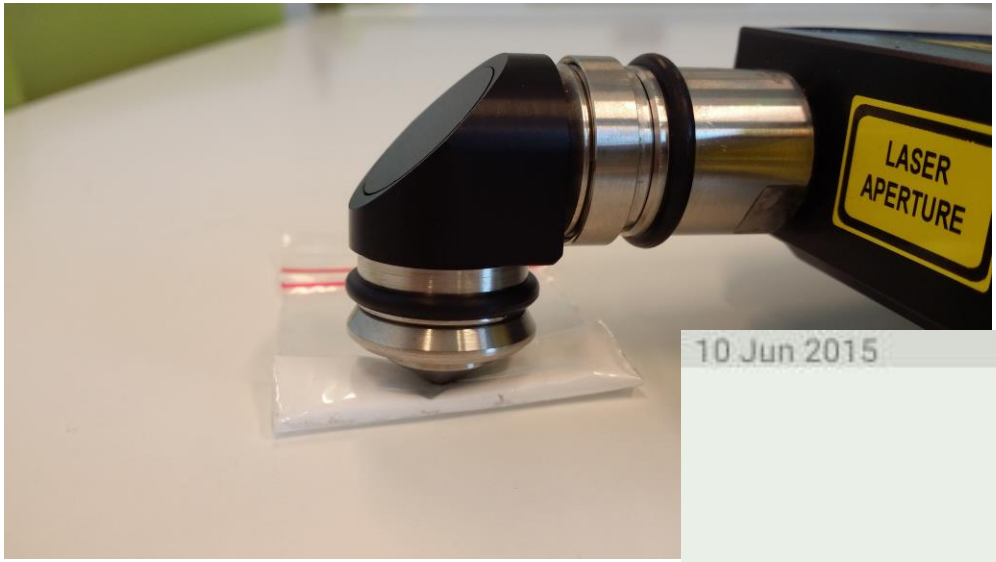


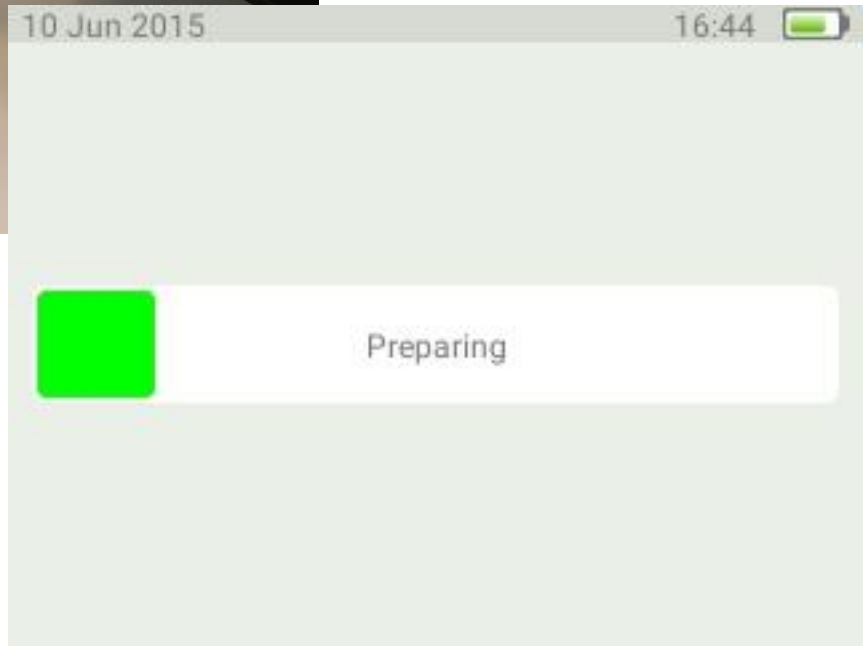
Scan window- Scan delay

- This functions shall be used whenver there is any risk that the substance analysed may react violently with the laser light i.e. exploding.
- The Scan delay can be set for 0-999 seconds



Proceed with analysis





Result

- The operator will be alerted with a red screen when the scanned sample is found in the selected library with restricted chemicals

Result

- The operator will be alerted with a grey screen if the sample does not match any spectra in the selected library
- If the spectral quality is too low, the operator will be alerted with a message “inconclusive result” it is recommended to repeat the scan.