



## Hands-on training for ALEXYS users

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## Introduction

This hands-on training is intended for end-users of ALEXYS® LC-ECD Analyzers, who want to get familiar with the CLARITY chromatography software, which is used for control, data-acquisition and data processing.

This hands-on document contains three cases:

- CASE 1: setting up method files and a sequence table
- CASE 2: process/reprocess and reporting of data
- CASE 3: how to set-up a system configuration from scratch (Advanced)

CASE 1 and 2 are recommended to get familiar with daily actions. This document is aimed to serve as a manual for ALEXYS users. All the steps are highlighted using a few example chromatograms, but are applicable to your own chromatograms as well.

## Necessities

### *Personal Computer*

- Windows NT based Operating System (Windows 7 Pro, 8, and 10)

### *Software*

- Clarity (version 8.4)
- Clarity analyzers from Antec (version 8-202010 or higher)

Both software packages can be freely downloaded from the Antec website.

### *Hardware*

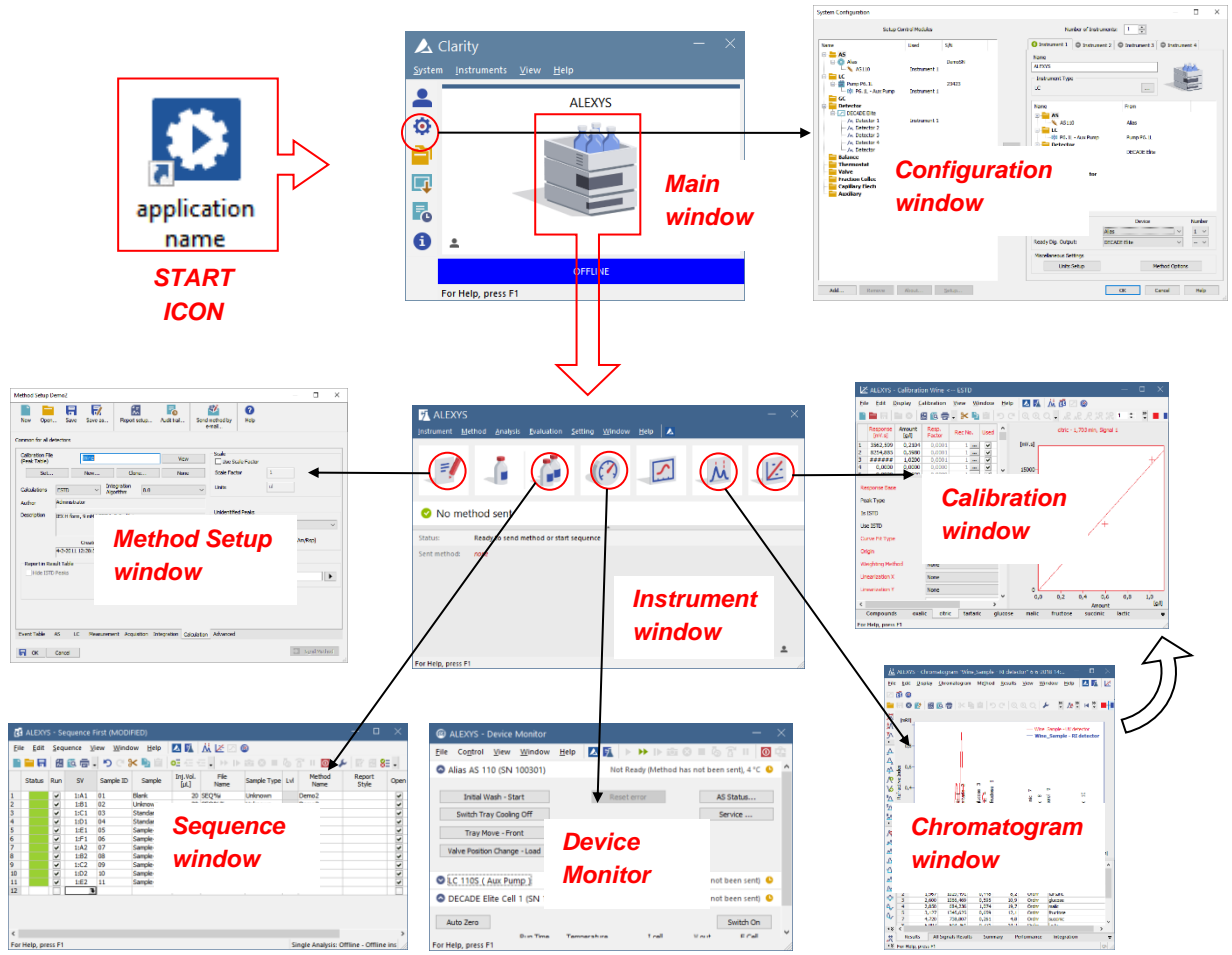
- A Clarity license dongle; one of either types:
  - o acquisition (p/n 195.0035, Clarity single instrument. incl LC, AS module)
  - o off-line (pn. 195.0C59)

## Preparations

1. To understand the *concept of Clarity* before starting the hands-on session, have a look at the presentation which is available on the Antec website:  
([www.antecscientific.com/support/software-recordings](http://www.antecscientific.com/support/software-recordings))
2. Install the Clarity software
3. Install the feature ' Always install' and 'Hands-on session' from the installation-program *Clarity analyzers from Antec\_8-20xx.exe*. This will copy the desktop shortcuts and example chromatograms to your computer .
4. You are now ready to start with CASE 1

# Overview chart of Clarity windows

As reference material, the schematics below shows the names of the different Clarity windows.



## CHAPTER 1

**CASE 1: setting up method files & a sample queue**

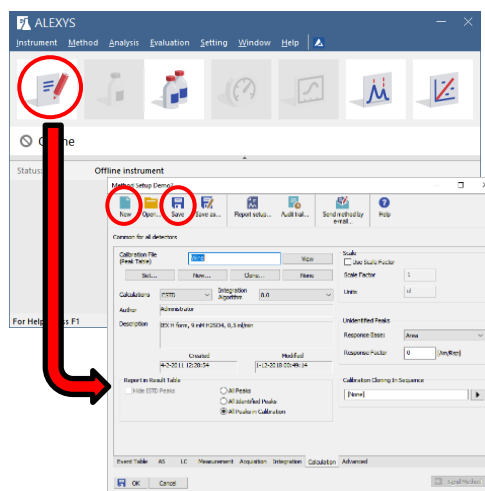
Purpose of this case study is to get familiar with setting up an instrument method and sample queue. The method and sample queue will be set to result in automated peak identification and quantification of various components in a group of samples.

**Step 1 Starting up Clarity software with a pre-defined desktop shortcut**

1. Start up the Clarity software program using the desktop short-cut '**CASE 1 and 2**'.  
*If this short-cut key is not present, install the set of preconfigured Clarity files using the installer, see previous page.*
2. Log-in on Project 'CASE 1' and click 'OK'

**Step 2 Creating a new method**

3. Open the Method Setup window using the icon in the Instrument Window.
4. Create a new method (New button).
5. Save the method with the name 'INJECTION'.

**Step 3 Setting the method parameters**

For this example, the LC-ECD settings that will be entered are for carbohydrate analysis using a 4-step Pulsed Amperometric Detection (PAD). For other applications, the parameters like flow rate and detector settings can be found in the method section of scientific papers or application notes as a starting point.

6. Doublecheck that the method that you are about to adjust is the one you just named 'INJECTION' (see the text displayed in the top rim of the Method Setup window).

**DECADE Elite detector settings**

7. In the Method Setup window, activate the tab 'Acquisition'.
8. Set the detector parameters to the 4-step PAD mode, including an autozero at the start of the run:

Main:

- Mode -> Pulse
- Pulse settings:

E1	0.1	[M]	t1	0.4	[s]		
E2	-2	[M]	t2	0.02	[s]		
E3	-0.6	[M]	t3	0.01	[s]	ts	200 [ms]
E4	-0.1	[M]	t4	0.07	[s]		
E5	0	[M]	t5	0	[s]		

*Output:*

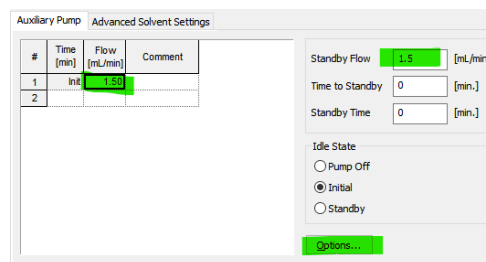
- Compensation: on
- Range: 2  $\mu$ A/V
- filter setting: off

*Time table:*

- at t=0.10 min program a Sensor auto-zero (Active).

**P6.1L pump**

9. In the Method Setup window, activate the tab 'LC'.
10. Configure the pump to run at 1.5 mL/min, to stay at that flow rate when ready, and program the safety stop (Pmin) in case the bottle would run dry by mistake:
  - Initial flow rate: 1.5 mL/min
  - Stand by flow rate: 1.5 mL/min
  - 'Options':
    - Min Pressure: 3 bar
    - Max pressure: 200 bar.



**AS 110 autosampler**

11. In the Method Setup window, activate the tab 'AS'.
12. Configure the sub-tabs to match the hardware installed in the autosampler, and use a full loop injection method:

*Injection:*

- Injection method: Full loop.

*Wash:*

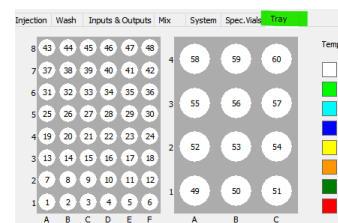
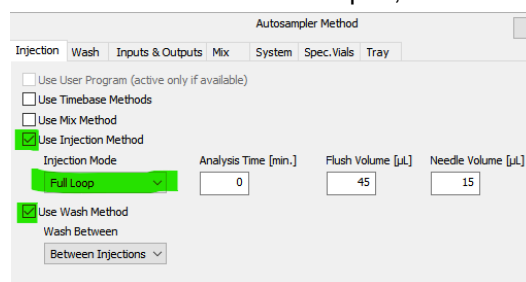
- 2 cycles

*System:*

- Syringe volume: 500  $\mu$ L
- Sample loop volume: 20  $\mu$ L
- use headspace pressure

*Spec. Vials:*

- 48-vials tray on left position, and tray with 12 vials on right position
- The tab 'Tray' shows the vial numbering of the selected tray outline

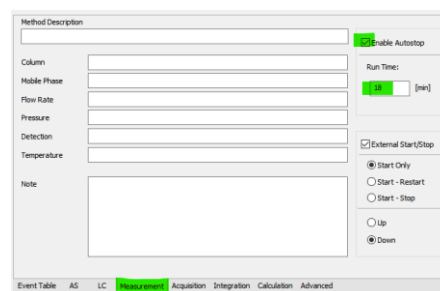


**Measurement settings**

13. In the Method Setup window, activate the tab 'Measurement'.
14. Configure the run time of the analysis:
  - Enable Autostop
  - Run time: 18 minutes.

*Tip:*

In principle, the rest of the fields in the left side of this tab can be used to fill in all relevant method parameters that would be beneficial for reference purpose (column type, mobile phase composition, etc.). This information will then be stored with each chromatogram.

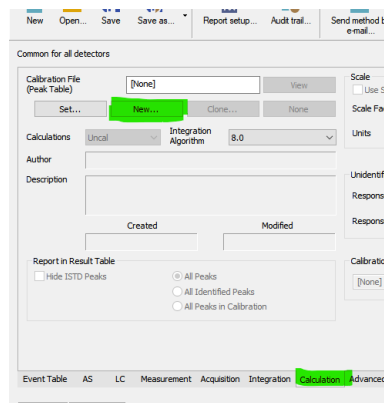


### Calculation settings

15. In the Method Setup window, activate the tab 'Calculation'.
16. Configure the link to the calibration file:
  - Click the 'New' button
  - Name the new Calibration file 'Carbs\_yymmdd', where yymmdd is today's date format.

**Tip:**

We advise to rename calibration files every day using the 'Clone' button. This is a very handy short-cut key that opens, clears, saves, and sets the new file all with one click.



17. Close the Method Setup window with the OK/Safe button

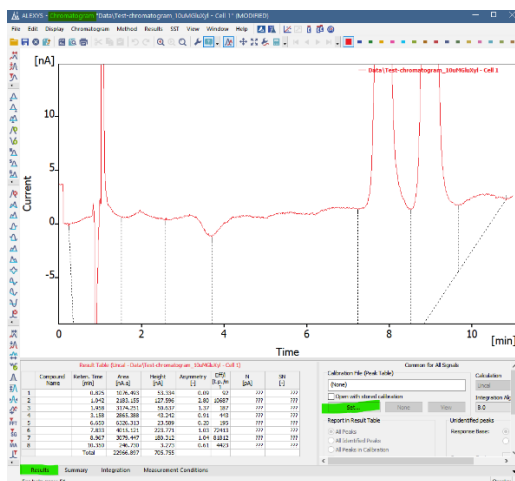
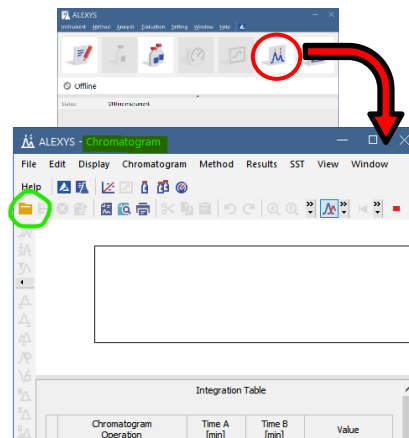
All the hardware method settings are now programmed.  
 In principle, the method is now ready to be used to run a test injection and optimize the peak recognition integration parameters on the basis of the resulting chromatogram.

## Step 4 Optimizing the peak recognition

The calibration file 'Carbs\_yymmdd' that was just made is still empty (it does not contain any parameters), and also the integration parameters for peak recognition are not optimized yet for the method. This needs to be optimized on the basis of a test injection.

A test chromatogram is available for training purpose:

18. Open the 'Chromatogram Window'.
19. Open the Data folder with the yellow folder icon or through the menu ('File/Open chromatogram') and select the test chromatogram.
20. Activate the Results tab, and manually link the calibration file 'Carbs\_yymmdd' using the button 'Set'.



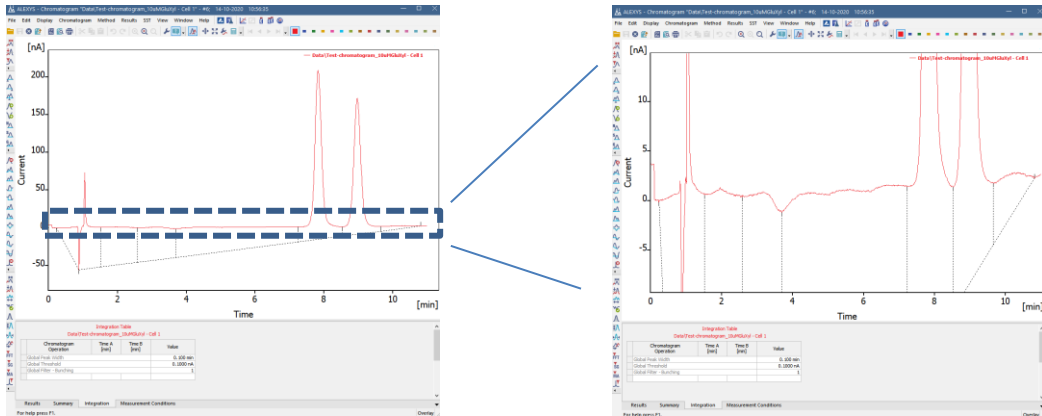


**Optimizing general integration parameters**




The test chromatogram will be used to develop a set of optimized integration parameters, which can then be used in the analysis method to be standard applied to each newly measured chromatogram:

*Note: do not use the buttons that apply to single peaks when developing a general integration table, as the list of parameters should work on any new chromatogram, not only this one.*

21. Zoom in on the baseline of the whole chromatogram (click/pull a box in the shape of the example below) to clearly see where the start and end marks will be set.



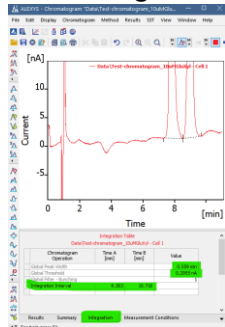
22. Activate the tab 'Integration' and use the buttons displayed on the left side of the Chromatogram Window to improve the peak integration:

- Make an 'integration interval' with the  button that includes the two peaks and about 1 min baseline left and right from the peaks.
- Adjust 'Global threshold' (second upper button) 
- Adjust 'Global Peak width' (first upper button) 

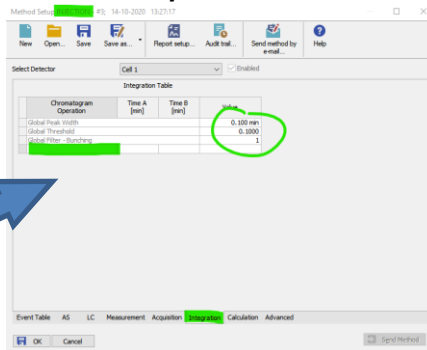
*It may be informative to type a few different values in the fields of Global peak width and Global threshold and see how the peak start and end positioning marks responds.*

23. When the integration settings are satisfactory, manually type the values that were obtained with the test chromatogram into the table in the integration tab of the method 'INJECTION'.

**Chromatogram window**



**Method Setup window**

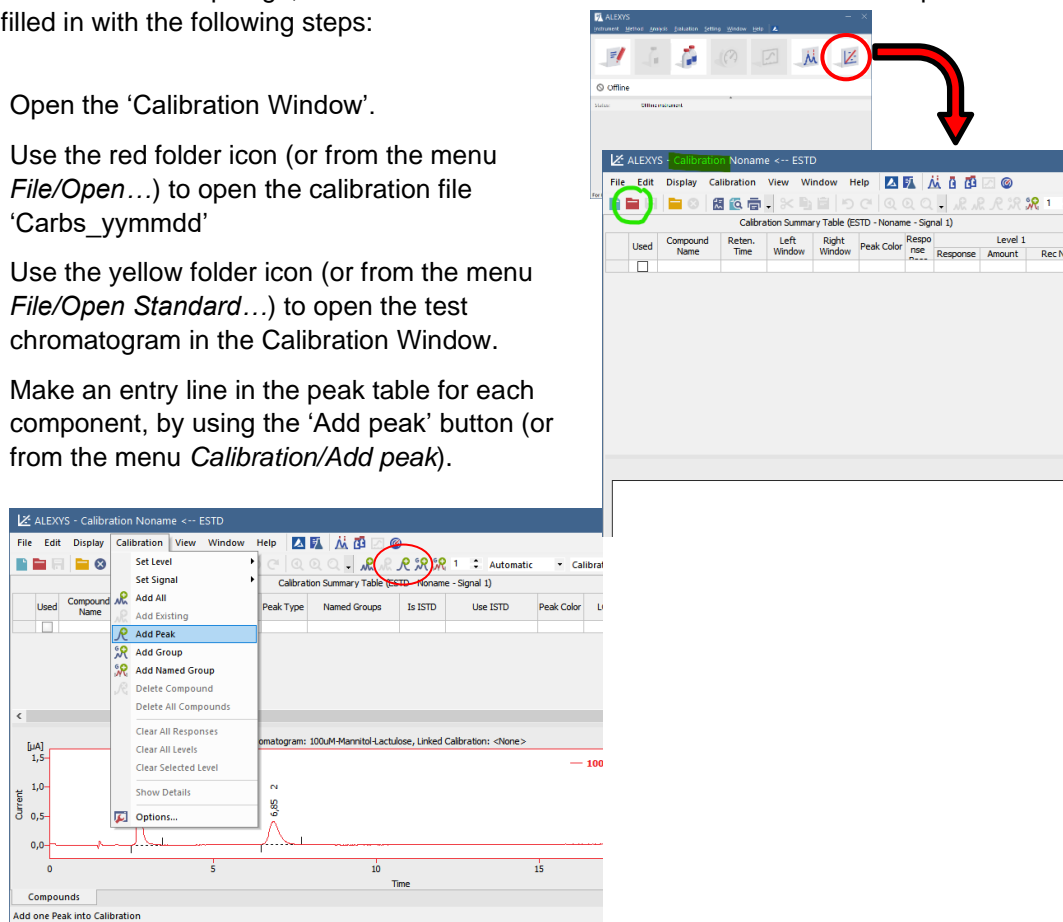


24. Close the Method Setup window with the OK/save button.

### Optimizing peak identification

The file with the method settings does not contain the information for peak names; it only contains a [link](#) to a calibration file, which does contain the table for peak names. The link was already created a few steps ago, but the calibration file still needs to have the correct peak names filled in with the following steps:

25. Open the 'Calibration Window'.
26. Use the red folder icon (or from the menu *File/Open...*) to open the calibration file 'Carbs\_yymmdd'
27. Use the yellow folder icon (or from the menu *File/Open Standard...*) to open the test chromatogram in the Calibration Window.
28. Make an entry line in the peak table for each component, by using the 'Add peak' button (or from the menu *Calibration/Add peak*).



29. Rename the automatically generated peak names (in column 'Compound Name'). The peaks can be renamed to Glu and Xyl (glucose and xylose) for the test chromatogram.
30. Set a (light) color for the peaks: this will be helpful later during evaluation of recorded chromatograms.

### Step 5 Setting up the calibration levels

Each peak entered in the peak table of the calibration file now has its own tab that can hold the calibration plot. To have the software automatically calculate amounts, the parameters need to be set correctly:

31. In the calibration window activate the 'Calibration options' through the menu (Calibration/Options), and check/adjust the following parameters:

#### Calibration options:

- Units of Compound:  $\mu\text{M}$
- Calibration: Automatic
- Mode: Recalibrate
- Recalibration: Replace

#### Defaults:

- Curve fit type: Linear

- Origin: Ignore origin

32. Click the button 'Set all now for current signal'

33. Open one of the components tabs, and fill in the concentration values that will be used for calibration:

- Level 1: 1 µM
- Level 2: 2 µM
- Level 3: 5 µM
- Level 4: 10 µM

For the other component, the same concentrations are used for calibration. *The values can thus be copy-pasted from one tab to the other.*

34. Save and close the updated calibration file.

	Response [nA.s]	Amount [µM]	Resp. Factor	Rec No.	Used
1	#####	1,00	0,0001	1	...
2	0,0000	2,00	0,0000	0	...
3	0,0000	5,00	0,0000	0	...
4	0,0000	10,00	0,0000	0	...
5	0,0000	0,00	0,0000	0	...
6	0,0000	0,00	0,0000	0	...
7	0,0000	0,00	0,0000	0	...
8	0,0000	0,00	0,0000	0	...
9	0,0000	0,00	0,0000	0	...
10	0,0000	0,00	0,0000	0	...

## Step 6 Preparing a sample queue

To run samples using an autosampler, a sequence file is necessary that identifies each injection:

35. Open the 'Sequence Window'

Status	Run	Method Name	SV	Sample ID	Inj. Vol. [µL]	Sample Type	Lvl	File Name
1	<input checked="" type="checkbox"/>	Noname	1:A1		1	Standard		%y%m%o-%H%M_%q_vial%v
2	<input type="checkbox"/>							

*Additional explanation for some column headers:*

- SV:** sample vial. The numbered position in the autosampler vial tray
- Sample type:** select 'Unknown' for samples, 'Standard' for the various calibrators, 'Bypass' for measurement of the baseline (no injection), and 'Blank' for the blank standard.
- Lvl:** level. This is the line number in the table containing the calibrator concentrations (see the calibrator file).

### **Tips for working with the sequence table:**

#### File Name generator:

The code in this field makes unique **file names** for each new chromatogram (and can be adjusted in necessary).

*When the mouse pointer is hovered over this cell, the projected chromatogram file name will show.*

#### Filling tables:

Use the key combination **[Ctrl]+F** to fill all the underlying cells with the same info as the selected cell. Use 'Fill series' from the context menu to fill a column with incrementing numbers.

36. Insert the following parameters to prepare for 8 analyses:
- In the field 'Method name' select the method 'INJECTION.
  - Injection volume: 20 uL
  - Add enough rows by clicking on the empty 'Run' box at the bottom of the list.
  - The first line should only be used for stabilizing and evaluation of the baseline without an injection.
  - Program the analysis of the 4 calibrators from vial positions B1-4 of the left tray. The level value (Lvl=1-4) identifies the various concentrations.
  - Vial positions A1-3 of the left tray contain 3 samples: a, b and c.

	Status	Run	Method Name	SV	Sample ID	Inj. Vol. [µL]	Sample Type	Lvl	File Name
1		<input checked="" type="checkbox"/>	INJECTION	1:A1	Baseline	20	Bypass		%y%m%-H%M_%q_vial%2v
2		<input checked="" type="checkbox"/>	INJECTION	1:B1	Cal-1uM	20	Standard	1	%y%m%-H%M_%q_vial%2v
3		<input checked="" type="checkbox"/>	INJECTION	1:B2	Cal-2uM	20	Standard	2	%y%m%-H%M_%q_vial%2v
4		<input checked="" type="checkbox"/>	INJECTION	1:B3	Cal-5uM	20	Standard	3	%y%m%-H%M_%q_vial%2v
5		<input checked="" type="checkbox"/>	INJECTION	1:B4	Cal-10uM	20	Standard	4	%y%m%-H%M_%q_vial%2v
6		<input checked="" type="checkbox"/>	INJECTION	1:A1	a	20	Unknown		%y%m%-H%M_%q_vial%2v
7		<input checked="" type="checkbox"/>	INJECTION	1:A2	b	20	Unknown		%y%m%-H%M_%q_vial%2v
8		<input checked="" type="checkbox"/>	INJECTION	1:A3	c	20	Unknown		%y%m%-H%M_%q_vial%2v
9		<input type="checkbox"/>							

37. Save the sequence table under the name 'Hands-on\_yymmdd' (using today's date tag).

38. The sequence is now in theory ready to run (from the menu *Sequence/Run* or using the icon).

If there was hardware connected to the computer, this sequence would result in analysis of the samples and standards, and automatically processed chromatograms. In this hands-on session, the option to run it is grayed out, as there is no hardware connected to the computer.

CHAPTER 2

# CASE 2: reprocessing data

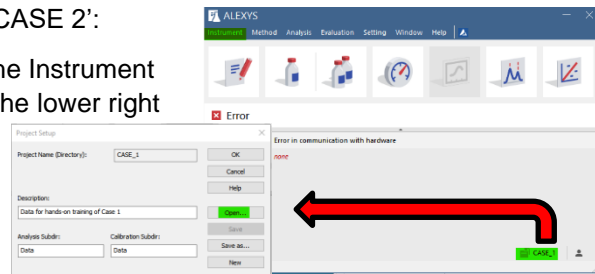
This case deals with reprocessing Clarity chromatograms batch-wise, which can be used in case post-run parameters (integration, calibration) were not ideal in the applied method.

A set of example calibrator and sample chromatograms to work with in Case 2 are available in the Project folder 'CASE 2'.

## Step 1 Changing to a different Project

Change to the preconfigured Clarity project 'CASE 2':

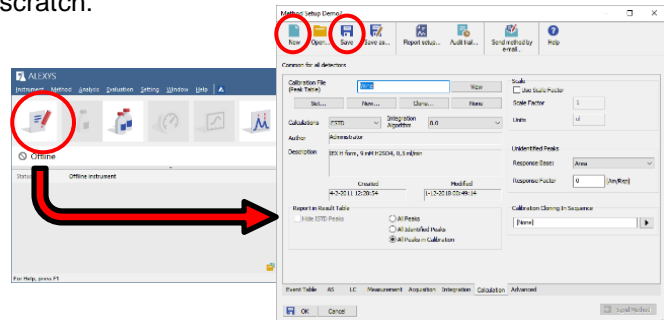
1. Open the Project Setup window (in the Instrument window click on the project name in the lower right corner).
2. Then open Project 'CASE 2'.



## Step 2 Create a dedicated reprocessing method

Any method can be adjusted and reused to reprocess chromatograms, but for this training we will prepare a dedicated method from scratch:

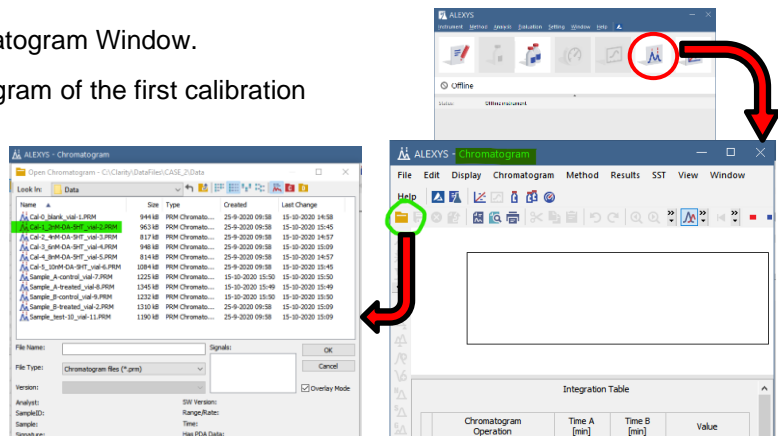
3. Open the Method Setup window (using the icon in the Instrument Window).
4. Create a new method (New button).
5. Save the method with the name 'REPROCESS'.



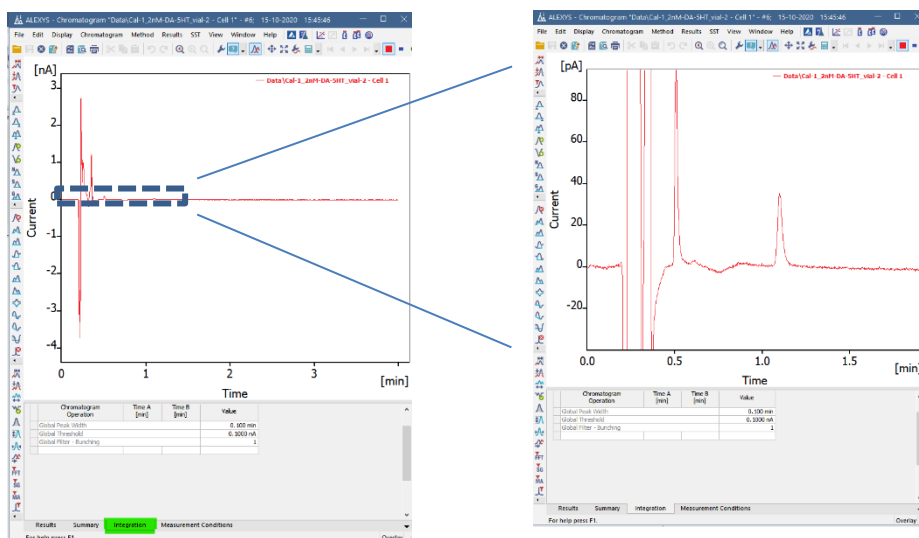
## Step 3 Obtain an optimized set of integration parameters

One of the chromatograms can be used as a template to develop the optimized set of integration parameters for the reprocessing method.

6. Activate the Chromatogram Window.
7. Open the chromatogram of the first calibration standard (Cal-1).



- Zoom in on the relevant part of the chromatogram that contains the two peaks (click-draw a box around it).

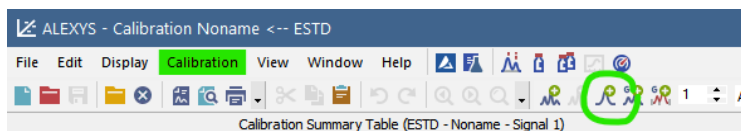
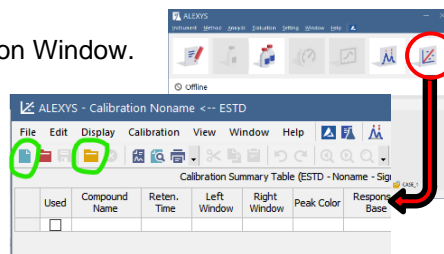


- In the Chromatogram window, activate the Integration tab.
- Create an integration table that correctly integrates the two relevant peaks:
  - dopamine (DA) at about 0.5 min
  - serotonin (5-HT) at about 1.1 min
  - Adjust these integration parameters (use the buttons on the side of the chromatogram window):
    - Global peak width
    - Global threshold
    - Integration interval
  - Instead of using the buttons, values can also be typed directly into the table to see what happens. In case of difficulties finding a good set of parameters, use the values given at the end of this section on page **Error! Bookmark not defined.**
- Type the optimized values into the integration table of the method 'REPROCESS'.
- Save the changes to the method 'REPROCESS'.

## Step 4 Create a calibration file and define peak names

A calibration file contains the table with names that will be assigned to peaks depending on their retention time. To create the peak names table, perform the following steps:

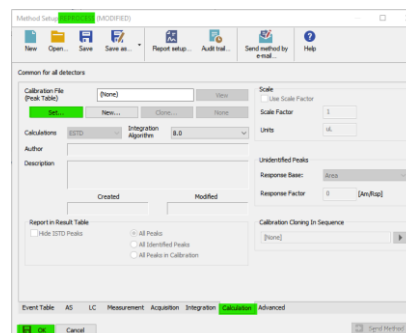
- From the Instrument Window, open the Calibration Window.
- Click the blue 'New' button.
- Click the yellow folder icon 'Open standard' (or through the menu 'File/Open standard'), and select the calibrator chromatogram that was just integrated (Cal-1).
- Make an entry line in the peak table for each relevant peak by using the 'Add peak' button for every peak (or through the menu *Calibration/Add peak*).



- a. Rename the default given peak names in the column 'Compound Name' to the real peak names.
    - dopamine (DA) at about 0.5 min
    - serotonin (5-HT) at about 1.1 min
  - b. A light color can be assigned to each peak. This will then be applied to every chromatogram linked to this calibration file and this helps to visually evaluate peak integration.
17. Save the changes to the Calibration file and name it 'Peaks\_YYMMDD', where YYMMDD is today's date format.

## Step 5 Linking a calibration file to the reprocessing method

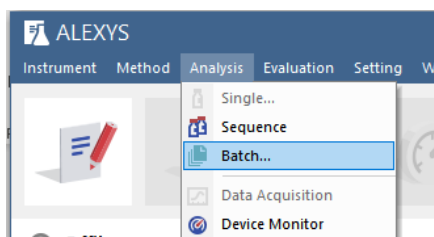
18. Go back to the Instrument Window and open the Method Setup window for the method REPROCESS.
19. Activate the tab 'Calculation'.
20. Use the 'Set' button and select the calibration file 'Peaks\_YYMMDD'.
21. Click OK/save to close this window.



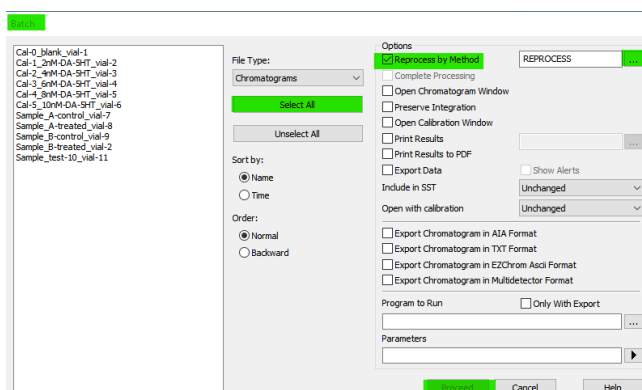
## Step 6 Batch-wise reprocessing of chromatograms

In principle, the chromatogram with the optimized integration table could now be 'Set model' through the Chromatogram Window menu (*Method/Set model*), and the other chromatograms can receive the integration table one by one from the model through 'Copy from model'. Connecting the chromatogram to a specific calibration file can also be done manually for each single chromatogram one by one. However, with many chromatograms to be reprocessed this way it is a lot of unnecessary work, as these modifications can also be done batch-wise by applying the optimized settings from the method 'REPROCESS'. This is how-to:

22. In the Instrument window, open the batch processing window from the menu (*Analysis/Batch...*).



23. Select all the chromatograms that have to be processed.
24. Check the box 'Reprocess by Method' and select the method 'REPROCESS'.
25. Click the "Proceed" button to reprocess all the selected chromatograms.

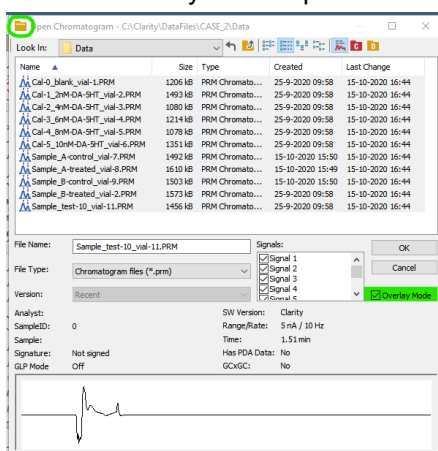


## Step 7 Visually inspect and correct all reprocessed chromatograms

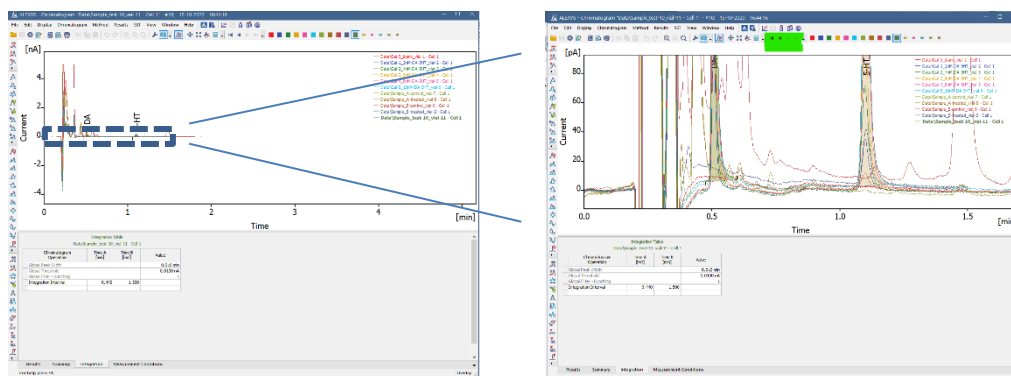
Every peak in each chromatogram has to be visually inspected for proper integration after reprocessing. Manual adjustment of the peak end and start markers can then also be applied. If too many peaks need adjustment, then it may be more beneficial to further optimize the integration parameters and Batch-reprocess the chromatograms again. We suggest to start with a general quick evaluation in overlay mode, followed by adjustment of individual chromatograms.


### Quick visual evaluation of all chromatograms in overlay mode

26. Open the Chromatogram window.
27. Close all displayed chromatograms (though the menu apply *File/Close all*).
28. Open the chromatogram selection panel (yellow folder icon).
29. Activate the 'Overlay mode' option.



30. Select all the chromatograms and open them
31. Drag a selection box in the relevant part of the chromatogram to zoom in. The goal is to see the assigned end and start position of the peaks. The light peak coloring helps to make the active chromatogram stand out from the overlay.



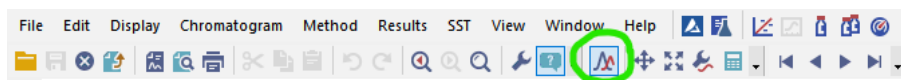
32. Use the triangular buttons from the horizontal button bar  to cycle through all chromatograms and get an impression if the integration needs much adjustment. The active chromatogram will be highlighted with bold font in the legend.



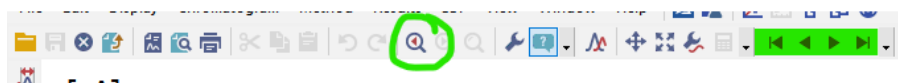
### Manual fine-tuning of individual peak integration

Usually, the overlay of all chromatograms contains too many lines to comfortably work on individual chromatograms, so here is how to work efficiently through a list of chromatograms in single display.

33. Close the Overlay view mode with the icon (or through the menu *File/Overlay Mode*)..



34. Note that the active chromatogram will be the one that stayed in display. If you want to start with a different chromatogram, open it with the yellow folder icon.
35. The display will also jump back to full view each time when opening a different chromatogram. To easily jump back to the previous setting of zoom-in, use the magnifier-glass icon with the back arrow inside.



36. The triangle icons can be used to display the next or previous chromatogram in the data folder.
37. The vertical button bar contains a set of icons that are helpful to make adjustments where necessary.

These are the most commonly used icons for manual integration adjustment:

		Change the start and end position marker of the peak
		Add a new peak. Use this in case a signal was too small to be recognized
		Use this icon to remove the integration from a part of the baseline.
		These icons change the way that the baseline below the peak is drawn.

When activated, a helpful text box will appear

*Tip:* Hold the [Ctrl] key while activating an icon to make repeated use of it when necessary. The [Esc] button releases the hold.

38. Inspect each chromatogram. When in doubt if a peak in a sample is of interest, combine it with a standard in overlay mode.

## Step 8 Build the calibration plot

After having batch reprocessed the chromatograms, each is linked to the calibration file *Peaks\_yymmdd*. This file needs to be updated with the information of the calibrator standards to have the software calculate the component amounts in the samples.

**Enter the standard concentrations and units in the calibration file**

39. Activate the Calibration window and open the calibration file *Peaks\_yymmdd*.

40. Open the 'Calibration/Options' from the menu and check the following settings

Tab *Calibration options*:

- Compound Units: nM
- Mode: Recalibrate
- Recalibration: Replace

Tab *Defaults*:

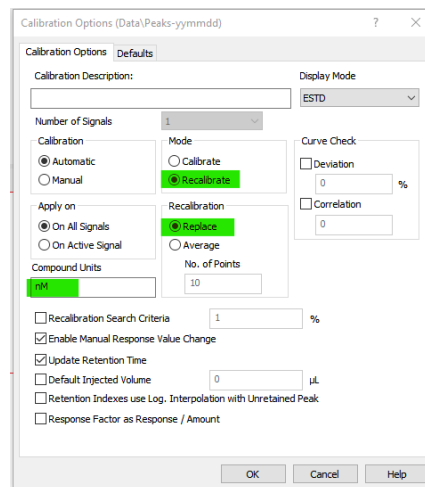
- Response base: Area
- Curve fit type: Linear

41. Activate the tab of each component, and fill the table with the different concentrations (Amount) of the various calibrator standards.

Note: the table row numbers are the 'Levels' of the calibrators.

**Tip:** Once typed, the list can be copy-pasted to the other component tabs (unless they were prepared with different concentration of course).

The calibration file is now ready to receive the data points from the calibrators.

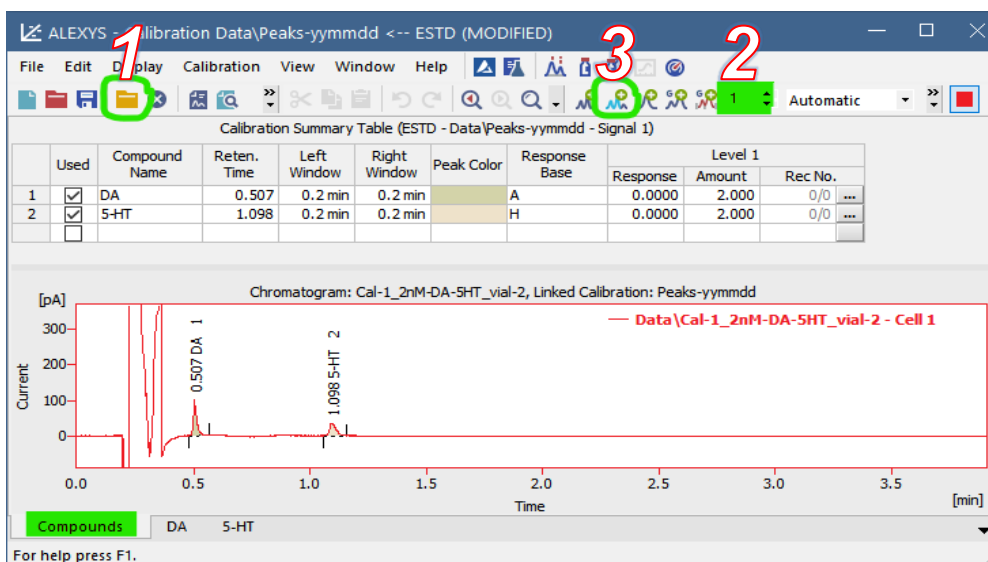


	Response [nA.s]	Amount [nM]	Resp. Factor	Rec No.	Used
1	0.0000	2.0	0.0000	0/0	<input type="checkbox"/>
2	0.0000	4.0	0.0000	0/0	<input type="checkbox"/>
3	0.0000	6.0	0.0000	0/0	<input type="checkbox"/>
4	0.0000	8.0	0.0000	0/0	<input type="checkbox"/>
5	0.0000	10.0	0.0000	0/0	<input type="checkbox"/>
6	0.0000	0.0	0.0000	0/0	<input type="checkbox"/>
7	0.0000	0.0	0.0000	0/0	<input type="checkbox"/>
8	0.0000	0.0	0.0000	0/0	<input type="checkbox"/>
9	0.0000	0.0	0.0000	0/0	<input type="checkbox"/>

**Entering the calibrator data into the calibration plot**

42. Activate the 'Compounds-tab in the Calibration Window

43. Entering the calibrator data in the calibration plot is a 3-step process:



- 1) Open a calibration chromatogram in the Calibration window (use the yellow folder icon, or through the menu: *File/open Standard*)
  - 2) Set the level number associated with the opened standard (use the number icon, or through the menu: *Calibration/set level*)
  - 3) Upload the responses into the calibration plot (use the 'Add Existing' icon or through the menu *Calibration/Add Existing*)
44. Repeat this procedure for each calibration level
  45. Check the resulting calibration plot for each component tab.

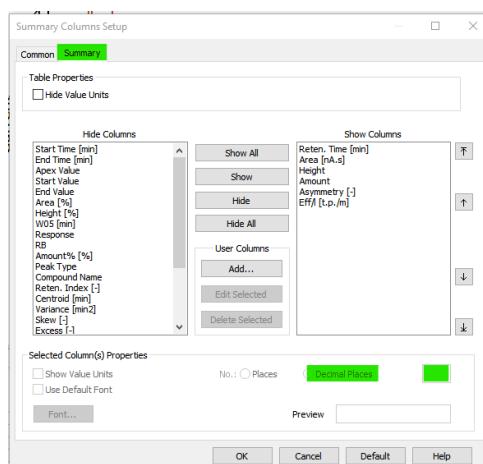
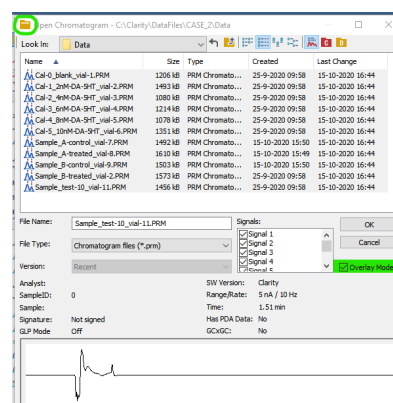
After adding the data from all 5 calibrator chromatograms, the calibration curve of the component DA should show a correlation coefficient of at least 0.999 when using the training set. Check/correct the integration and upload the adjusted data if it is any lower.

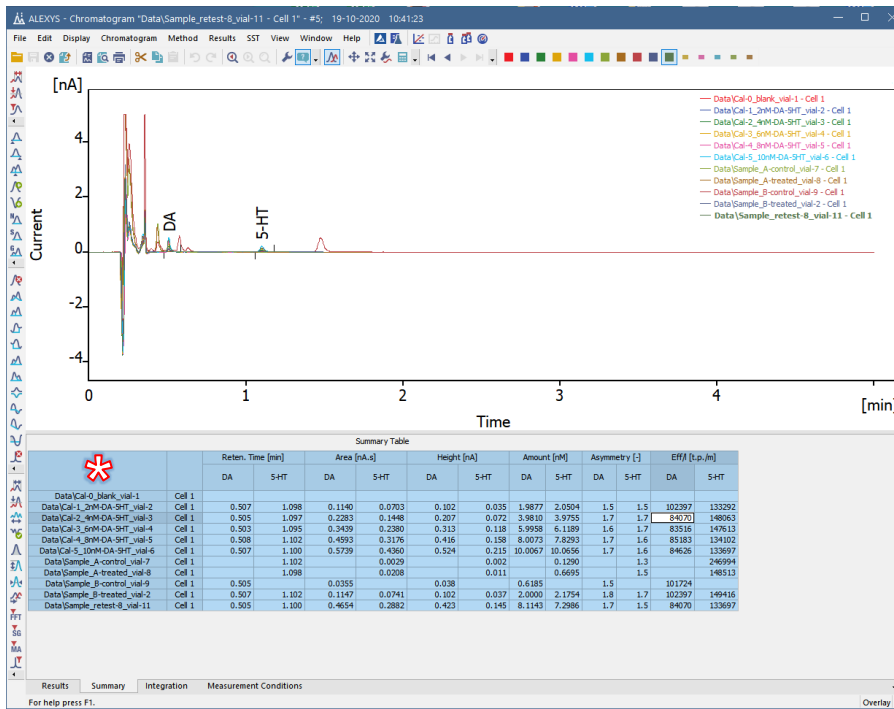
For 5-HT an outlier may be recognizable. For practice purpose, doublecheck the chromatogram that gave this data point (open in chromatogram window), try out some different curve fit types and see how unchecking some data points affects the plot of 5-HT.

The 'Unknown' samples will now automatically have the concentrations of their components calculated on the basis of the linked calibration plot.

## Step 9 The data summary table

46. Open the Chromatogram window.
47. Close any displayed chromatograms (though the menu apply *File/Close all*).
48. Open the chromatogram selection panel (yellow folder icon).
49. Activate the 'Overlay mode' option.
50. Select all the chromatograms and open them
51. Activate the Summary tab
52. Check that the parameters that have to be reported are in the table, and that their number of digits is relevant/enough (hint: look at the *Amount* data). Adjust if necessary (through the menu open '*Edit/Setup Columns*', tab 'Summary')





In principle, the data in the Summary table can now be selected (click in the table's left upper corner at \*) copy-pasted to another program like Excel or Word for further handling.

Now that the data has been reprocessed, have a look and see **what does the data show?**

Did the treatment have an effect?

Calibrator 4 seems to contain an outlier, and the standard mix was therefore reanalyzed. Was it an instrument hiccup or more likely to be a pipetting error?

What is wrong with the chromatograms of Sample B?

Have a look at the chromatogram name and the vial-number code in the name. This example shows why we recommend to have the vial number in the chromatogram name.

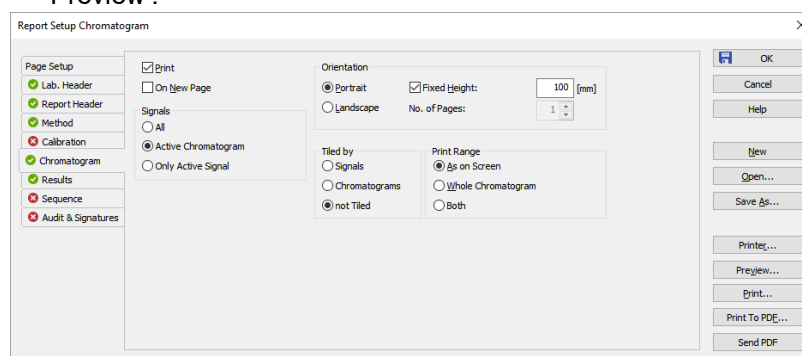
## Step 10 Creating a report in Clarity

Alternatively, the data and chromatograms can also be printed in a customizable format using a report template.

53. In the Chromatogram Window, open the report setup window (*File/Report set-up*)
54. Open the template 'ALEXYS-chromatogram'
55. Click 'Save as' and rename the file 'CHROM-AND-CAL' before adjusting.

56. Adjust the parameters:

- As an exercise, adjust the template to print each chromatogram with the calibration plot that was used for its calculation.
- Every change to the template can be checked directly with the button 'Preview'.



57. The individual chromatogram reports can now in theory be printed.

#### Box 1

The set of integration parameters for the batch reprocessing set were as follows:

Chromatogram Operation	Time A [min]	Time B [min]	Value
Global Peak Width			0.010 min
Global Threshold			0.0100 nA
Global Filter - Bunching			1
Integration Interval	0.440	1.500	

These values leave room for some manual tweaking of the sample chromatograms to get familiar with the additional single peak integration adjustment buttons.

## CHAPTER 3

## CASE 3 Setting up a system configuration from scratch

This case deals with setting up a Clarity system configuration from scratch. The analyzer that is set up as an example will be intended for isocratic LC-ECD measurements. Of course, the principle shown here holds for different configurations as well.

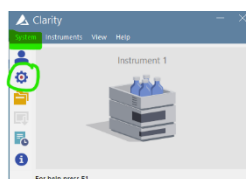
To be able to control all HPLC system components (pump, autosampler and a detector) a so called 'Instrument' has to be defined. This is a three step process:

- a. Activate the correct hardware drivers in the Clarity Configuration window.
- b. Combine the drivers to define an 'Instrument'.
- c. Define the start trigger.

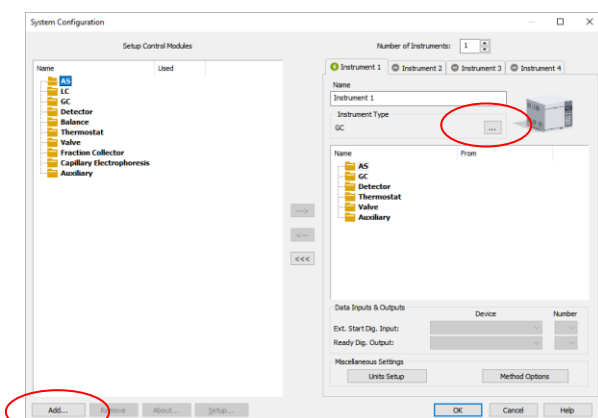
### Step 1 Open the Clarity Configuration window

For training purpose, a dedicated 'empty' configuration file can be used. This can be activated as follow:

1. If Clarity was open, close it down completely.
2. Start up the Clarity with the short-cut key 'CASE3', which should be present on the desktop. The Main window opens.
3. Open the Configuration window from the Main window using the icon (or though the menu *System/Configuration*).

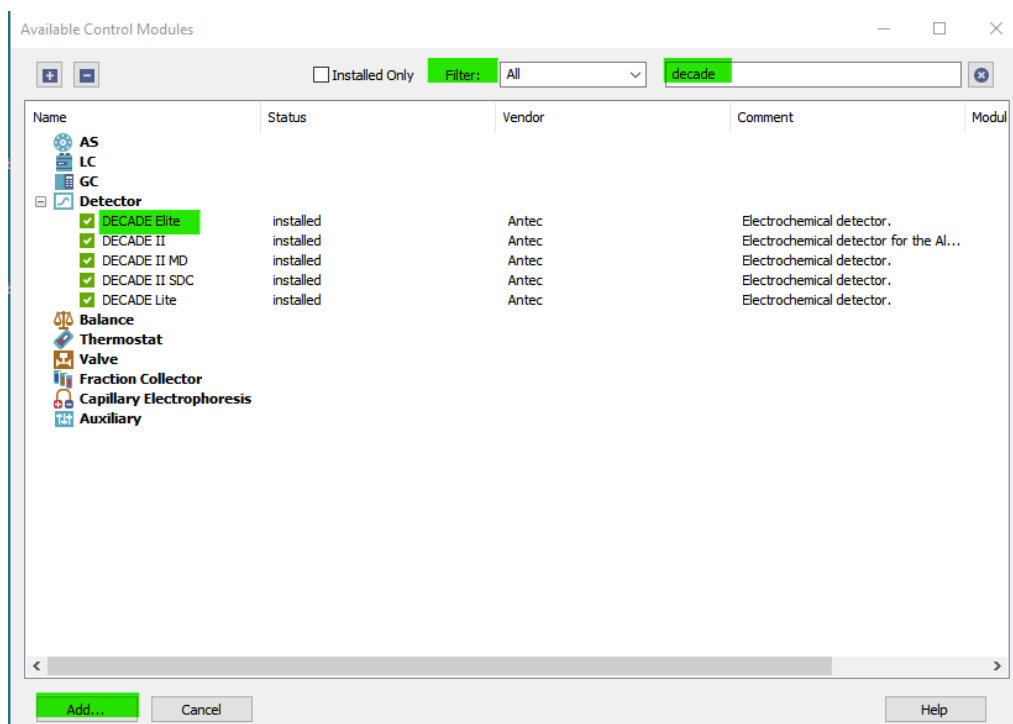


### Step 2 Setting up the Control modules of an LC system



4. Change the Instrument type to 'LC'
5. Click the 'Add' button in the lower left corner. A new window will open that lists all the available drivers for Clarity software.

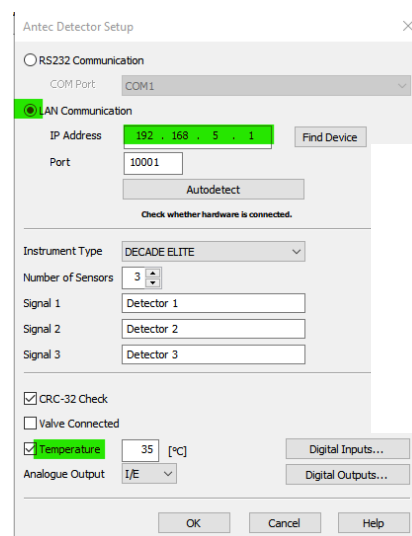
**Tip:** use the filter option to find the relevant drivers.



### DECADE Elite detector

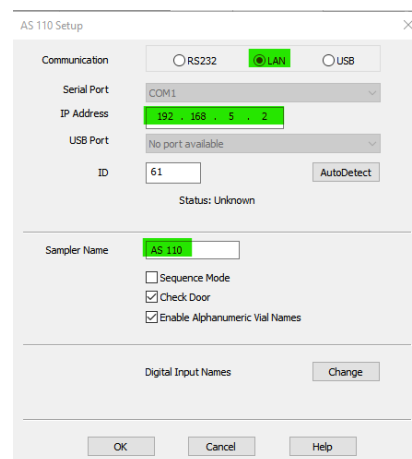
6. Select and 'Add' the detector 'DECADE Elite'
7. Set the communication protocol to LAN.
8. The default IP address of a detector is 192.168.5.1.
9. Set the oven temperature (to for example 35 °C).
10. Close the Detector set-up windows by clicking the OK button.

Now the DECADE Elite is added to the left side of the configuration window.



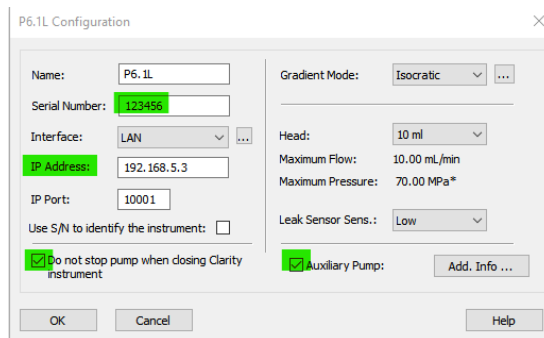
### AS 110 autosampler

1. Select and 'Add' the autosampler 'AS 110'
2. Set the communication protocol to LAN.
3. The default IP address of an autosampler is 192.168.5.2.
4. Change the sampler name to AS 110
5. Click 'OK' to close the window



**P6.1L pump**

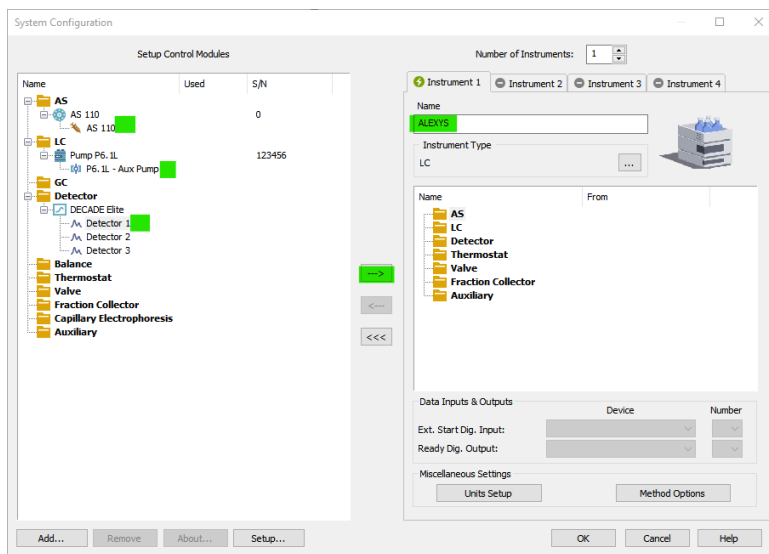
6. Select and 'Add' the pump P6.1L
7. Set the communication protocol to LAN.
8. The default IP address of a pump is 192.168.5.3.
9. Type a sham serial number (123456).
10. Check the 'Auxiliary pump' check box and the "Do not stop pump when closing Clarity" check box.
11. Click 'OK' to close the window



**Step 3 Defining the Instrument**

Define an instrument by transferring the required control modules to 'Instrument 1':

12. Change the instrument name to 'ALEXYS'
13. Transfer all three relevant control modules to the right side of the System configuration window by drag-drop or by selecting them and using the → button in the middle of the window.



**Step 4 Define the start trigger**

14. Check/set the 'Ext. Start Dig. Input' to AS 110, nr 1 (inject trigger from the autosampler).

This will trigger the Clarity software to start recording the signal after an injection

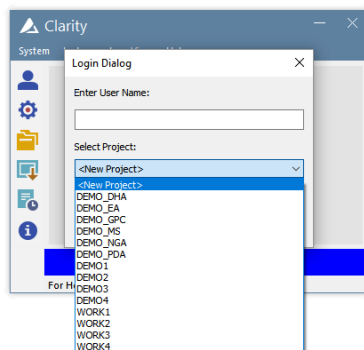
15. Click OK to store the new configuration settings, and return to the Clarity main Window.



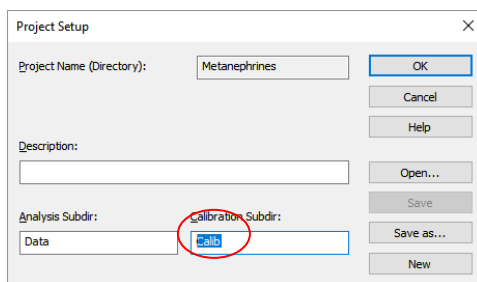
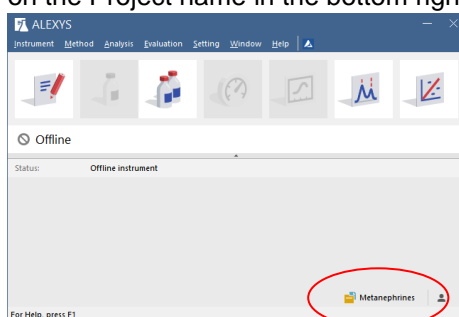
## Step 5 Creating a Project folder for storage of Data and Methods

The Clarity software uses so-called Project folders to keep data, calibration files and methods organized together. To make a new Project:

16. Log in to the 'Instrument' that was just created.



17. In the Login Dialog, select '<New project>' and give it a name (e.g. Metanephrines)  
*Ignore the error messages during log in in case there are no LC system components physically connected to the PC.*
18. In the instrument window, open the Project set-up menu (Instrument/Project, or click on the Project name in the bottom right corner).

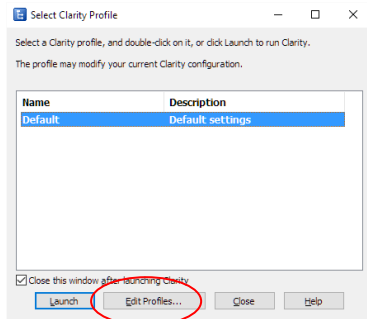


19. Note that the folder structure organizes calibration and data chromatograms in two different folders by default.
20. Change the Calibration Subdir from 'Calib' to 'Data'. This will result in calibration chromatograms and normal chromatograms to be stored in the same folder. This makes it possible to make overlays directly of standards and samples.
21. Close the 'Project Setup' window with the OK button.

## Step 6 Making short-cut desktop keys to start Clarity

22. Open the program 'Launch Manager' from the Start menu (this program is installed as part of the Clarity package).

23. Choose 'Edit Profiles'

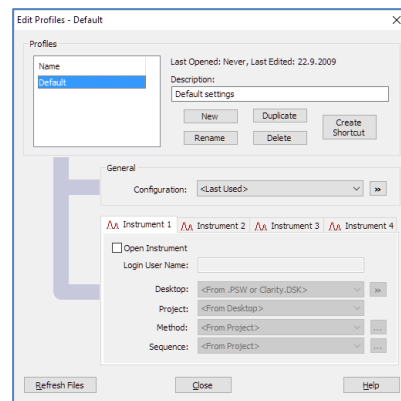


24. Choose to make a 'New' description and name it 'TEST\_Hands-on'

25. Select a Configuration file, check the box 'Open Instrument', select a desktop file (Hands\_on\_training.dsk), and select the newly made Project folder.

26. Create a shortcut on the desktop for this combination of settings.

27. After closing the Launch Manager, Clarity can be restarted using the new shortcut.



The next step would be to set up the method files and run samples: this is dealt with in Case 1.

For more supporting information on Clarity we refer to the website of Antec and DataApex:  
[www.DataApex.com](http://www.DataApex.com)  
[www.AntecScientific.com](http://www.AntecScientific.com)