Clarity (Lite)

7.0 vs 6.0

ENG

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Sections of the manual connected only to the **Clarity Full** version are marked with the Full version icon.

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To facilitate the orientation in the **7.0 vs 6.0** manual and **Clarity** chromatography station, different fonts are used throughout the manual. Meanings of these fonts are:

Instrument (blue text) marks the name of the window to which the text refers.

Open File (italics) describes the commands and names of fields in **Clarity**, parameters that can be entered into them or a window or dialog name (when you already are in the topic describing the window).

WORK1 (capitals) indicates the name of the file and/or directory.

ACTIVE (capital italics) marks the state of the station or its part.

The bold text is sometimes also used for important parts of the text and the name of the **Clarity** station. Moreover, some sections are written in format other than normal text. These sections are formatted as follows:

Note:	Notifies the reader of relevant information.
Caution:	Warns the user of possibly dangerous or very important information.

Marks the problem statement or trouble question.

Description: Presents more detailed information on the problem, describes its causes, etc.

Solution: Marks the response to the question, presents a procedure how to remove it.

1 Preamble

This document will guide you through the news and improvements in the **Clarity** Chromatography Station version **7.0**. The most interesting features implemented between version **6.0** and **7.0** include:

- Changed installation structure for easier orientation and backup management.
- **Clarity** updates available from the main window.
- **Windows 10** compatibility.
- New features in the **Chromatogram** window, such as *All Signals Results* tab.
- New **7.0 Experimental** Integration Algorithm.
- New global units setup.
- Indication of control modules in development state.
- Enhancements in fraction collectors.
- Various **Clarity** improvements and bug fixes.
- New and updated control modules.

2 Clarity

2.1 Updating Clarity

Clarity stations updated to version 6.2 or higher, that are connected to the Internet will automatically (unless the function is turned off) check for software updates. If a newer version is available to download, it will be offered in the main Clarity window - see **Fig 1** on pg **2**.

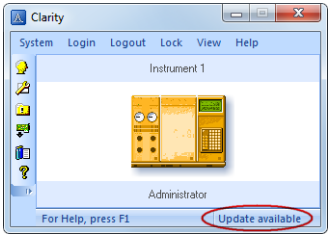


Fig 1: Update available in the main Clarity window

In case of Clarity Lite, it will be displayed in the main window - see **Fig 2** on pg **2**.

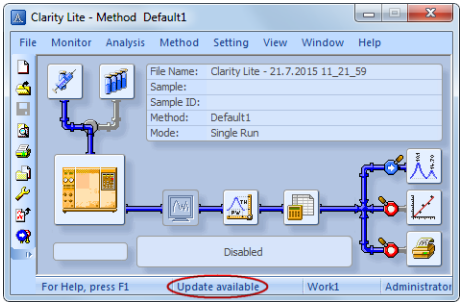


Fig 2: Update available in theClarity Lite window

Clicking on the *Update available* command triggers the Check for Updates dialog for direct download of the new version.

2.2 Changed installation structure

Clarity version **7.0** underwent major changes regarding installation structure. The default Clarity installation now contains 3 separate directories.
Reason for this change was to offer you a more clear and understandable structure.

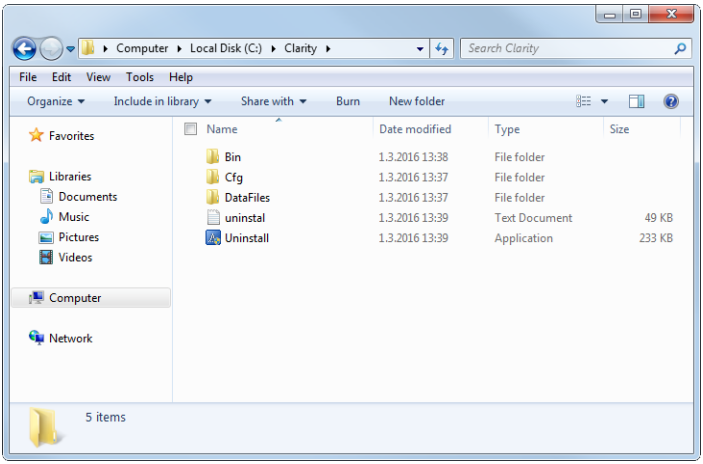


Fig 3: Default Installation structure

- **Bin** - contains binary files such as *.DLL libraries and *.CHM files necessary for correct functionality. You should never need to access it and change anything manually. During an update files in this directory will be replaced.
- **Cfg** - contains configuration files such as *.DSK, *.PSW, *.SNO and other configuration and debug files. Once contacted by our support, they will ask for files which are located here. Unless specified, files located here are preserved during an update.
- **DataFiles** - contains your projects with methods, calibrations and measured chromatograms. Files in this directory are preserved during an update (apart from the Demo files which will be erased).

As you can see, everything is now sorted and conveniently stored in corresponding directories. Backup of your chromatograms and configuration files is much easier since they are stored in just 2 directories.
New installation wizard will take care of everything.

2.3 Software Compatibility

Since version **6.2** Clarity had been thoroughly tested with official release of **Windows 10** and there were no issues regarding incompatibility found.

2.4 Units Setup Full version

Units setup had been unified and the only place regarding units setup is newly in the *System Configuration*.

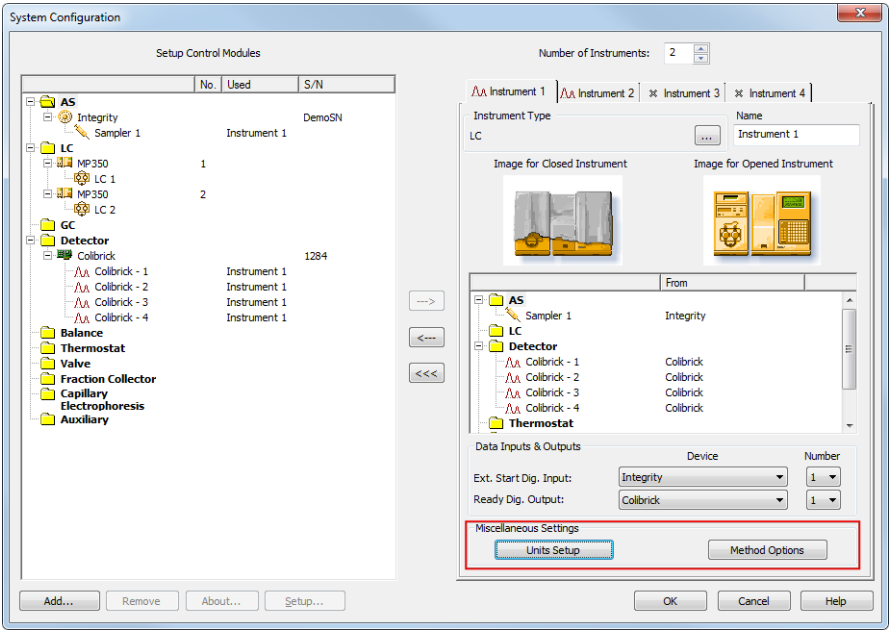


Fig 4: System Configuration - *Miscellaneous Settings*

The right side has been slightly changed in order to be more clear and understandable. *Miscellaneous Settings* groups units setup and method sending options that used to be under one button.

Units as well as method options are set for each instrument individually just as before. Set units affect primarily Chromatogram window - both graph and *Result table* are presented in the same units.

In general places that display or calculate with units will have units set according to the corresponding instrument.

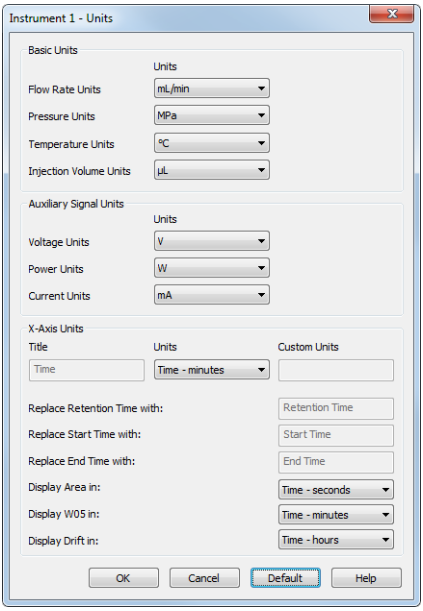


Fig 5: Units Setup *dialog - Instrument 1*

Several new units have been implemented:

- *Injection Volume Units*
- *Voltage units* - for auxiliary signals
- *Power units* - for auxiliary signals
- *Current units* - for auxiliary signals

Possibility to change the default *X-Axis* units (Time) to custom units. This options enables to replace *Retention Time*, *Start Time* and *End Time* with user defined value. The possibility to change *X-Axis* units has been allowed only to some extensions - for the rest it has been disabled and default units are used.

2.5 User Accounts

Option *Start Acquisition* has been implemented in the User Accounts. This option allows to set the right for users to start acquisition.

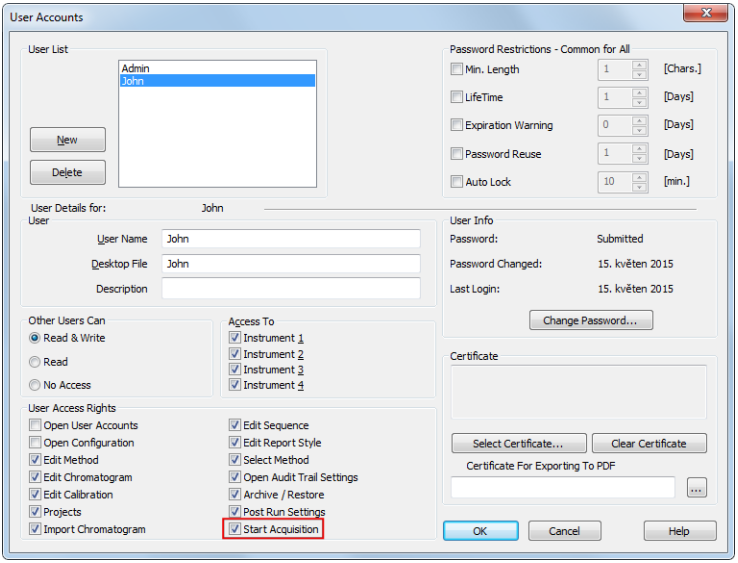


Fig 6: User Accounts *- new option Start Acquisition.*

2.6 Development version of control module

In case Clarity detects a control module that is under development and is being used on an Instrument, it will display a yellow stripe in the Instrument window with the following text: *Development version of control modules:* + *name*.
Development version of control module means that it is still under development and have not yet passed DataApex quality assessment tests. Once it will be tested and approved, it will be released and the yellow stripe will disappear. This serves as a protection for Clarity, since the possible malfunction may not me caused by Clarity itself but the control module which could be developed by a third party.

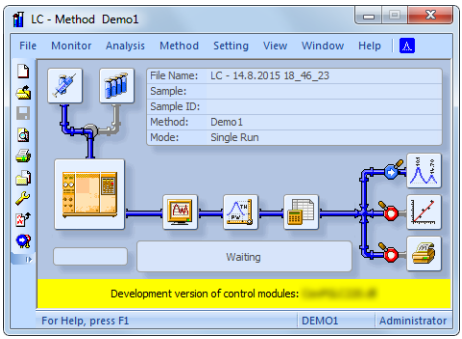


Fig 7: Instrument *window - Development version of control modules*

2.6.1 Unauthorized control module

All control modules used for controlling devices such as LC's, GC's and so on, must be tested and approved by DataApex because they are integral part of Clarity installation and cannot be installed in any other way.
In case Clarity detects an unauthorized control module, it will display a yellow stripe in the Instrument window with the following text: *Unauthorized control modules:* + *name*. In this case DataApex is not liable for a correct functionality of the control module.

2.7 Starting autosampler in Single Analysis Full version

New function enabling injection using an autosampler has been implemented in the Single Analysis window. Easily perform single injection using an automsampler without the need of setting a new row in the sequence table.

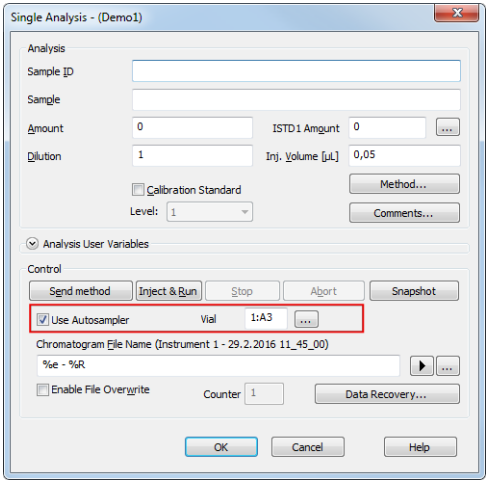


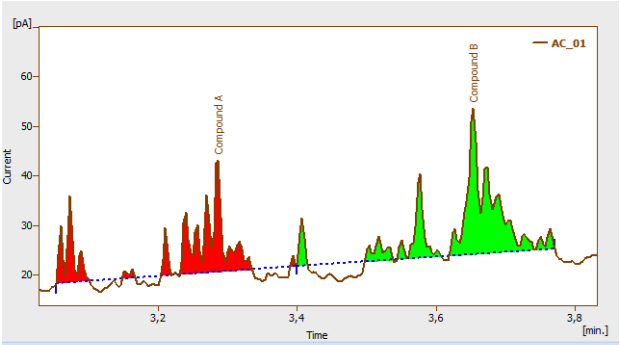
Fig 8: Single Analysis - *Use Autosampler*

Use Autosampler option is visible only when the autosampler is configured on the given instrument.
Upon pressing the *Inject & Run* button, a single injection will be carried out and data acquisition started.

2.8 Chromatogram

2.8.1 Baseline - Allow Crossing

Newly implemented option *Baseline - Allow Crossing - To Start/End* allows for easier modification of baseline. As a peak area will be considered all parts of signal line above baseline inside the selected time interval. See **Fig 9** on pg **10**.

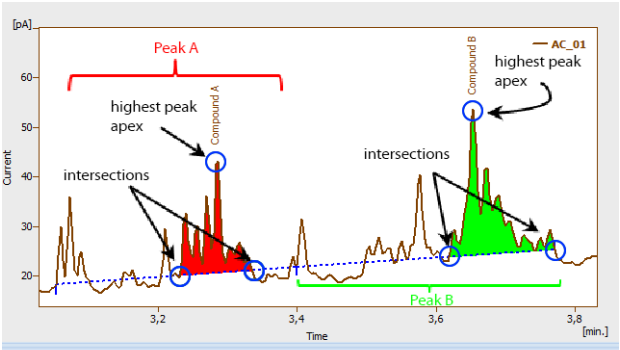


Integration Table (AC_01)

Chromatogram Operation	Grp.	Time A [min]	Time B [min]	Value
Global Peak Width				0,100 min
Global Threshold				0,1000 pA
Global Filter - Bunching				4
Baseline - Lock		0,000	10,650	
Baseline - Allow Crossing		0,000	0,000	To Start/End
Peak - Add positive		3,054	3,400	
Peak - Add positive		3,400	3,770	

Fig 9: Result of Baseline Allow Crossing with value To Start/End

Compared to the command *Baseline - To First Cross*, which is covered in **Fig 10** on pg **11**., as peak area will be considered only the part of the highest peak, bordered by first intersection of the signal line and the baseline to the right and left next to the highest peak apex.



Integration Table (AC_01)

Chromatogram Operation	Grp.	Time A [min]	Time B [min]	Value
Global Peak Width				0,100 min
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Global Filter - Bunching				4
Baseline - Lock		0,000	10,650	
Baseline - Allow Crossing		0,000	0,000	To First Cross
Peak - Add positive		3,054	3,400	
Peak - Add positive		3,400	3,770	

Fig 10: Result of Baseline Allow Crossing with value To First Cross

2.8.2 Result Table

- Column *Amount [%]* had been renamed to *Amount% [%]* to distinguish between Amount (Units) and Amount (%) columns in user column calculations.
- Support for other *ISTD*s had been added to list of *Variables* available for user calculations.

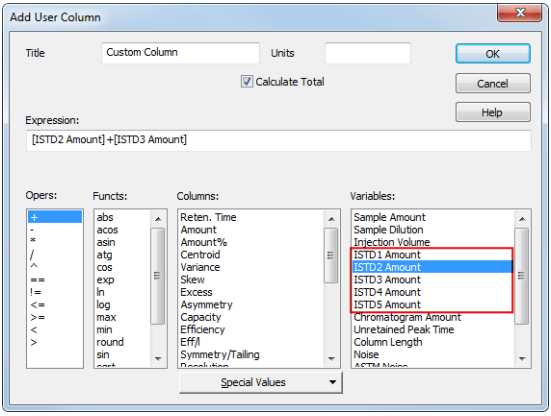

Fig 11: Add User Column dialog - ISTD1...ISTD5

2.9 All Signals Results tab

New tab All Signals Results had been implemented.

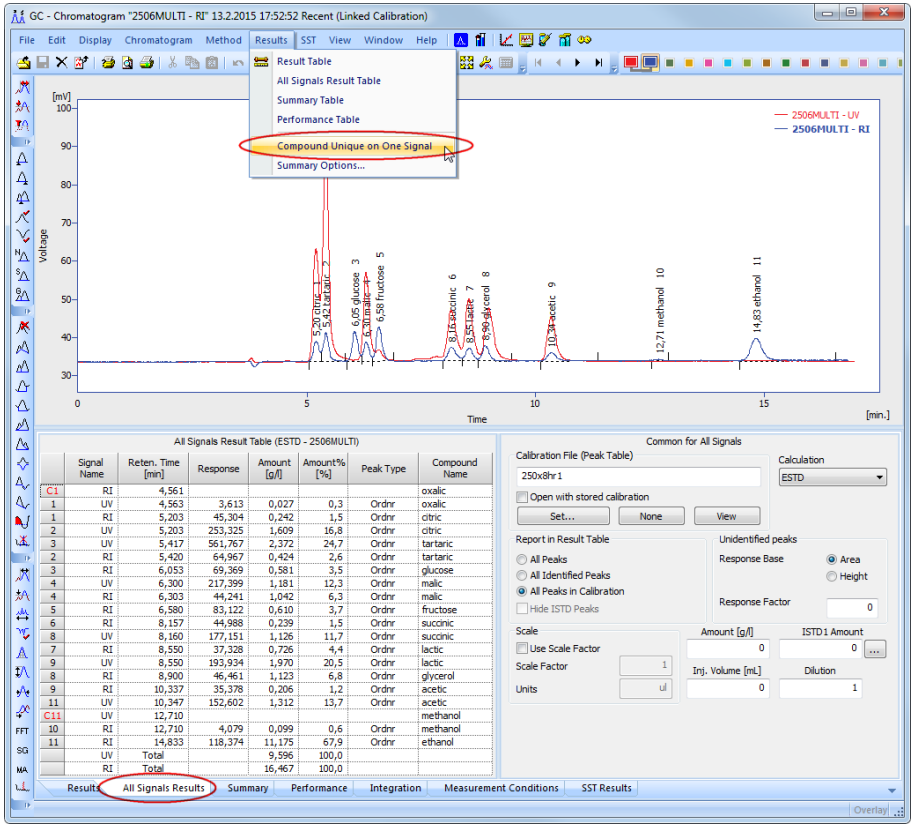

Fig 12: Chromatogram - All Signals Results tab

The tab displays *All Signals Result Table* with results for all signals in chromatogram in one convenient table.
In the menu *Results*, there is a new option - *Compound Unique on One Signal*. The purpose of this option is to limit compound to be specific for one signal. In such case the *Total* row will be calculated from all signals. In case the same compound is on more than one signal, the *Total* rows will be displayed for the individual signals. When a compound is calibrated on more signals and the option is selected, header of the *All Signals Result Table* will display a warning.
User Columns are not supported in *All Signals Result Table*.

2.10 Integration Algorithm

Clarity version **7.0** introduces one updated and one brand new integration algorithm (IA):

- *7.0*
- *7.0 Experimental*

IA noted by *7.0* is still the primary one used by default but it has been updated by new *Tangent Area Ratio* and *Tangent Slope Ratio* functions.

IA noted by *7.0 Experimental* is released for the first time and has been developed as a future successor of the *7.0*. Please note that the new integration algorithm is *experimental and still under development* therefore issues may still arise. Main enhancements and efforts have been put into:

- detecting baseline
- detecting so-called "stumps" which are caused when the top of the peak is cut off
- new way of detecting peaks with the help of normalization of the signal - peaks that are askew are now detected much better
- once a peak does not fulfill integration criteria it is automatically hidden in order not to alter course of the baseline
- searching of buffer zones (area at the foot of a peak) and clusters (area of consecutive peaks with the same polarity)

IA 7.0 Experimental automatically hides peaks that are found but do not meet criteria in the integration table. Image below shows a chromatogram with a multiple number of hidden peaks. Hidden peak ⓑ is not connected by baseline at the bottom of the peak. If you decide that specific peak should not be a hidden, go to menu *Chromatogram* - *Peak* option - click *Show* ⓐ and mark the start and end of the interval in which the peak should be revealed.

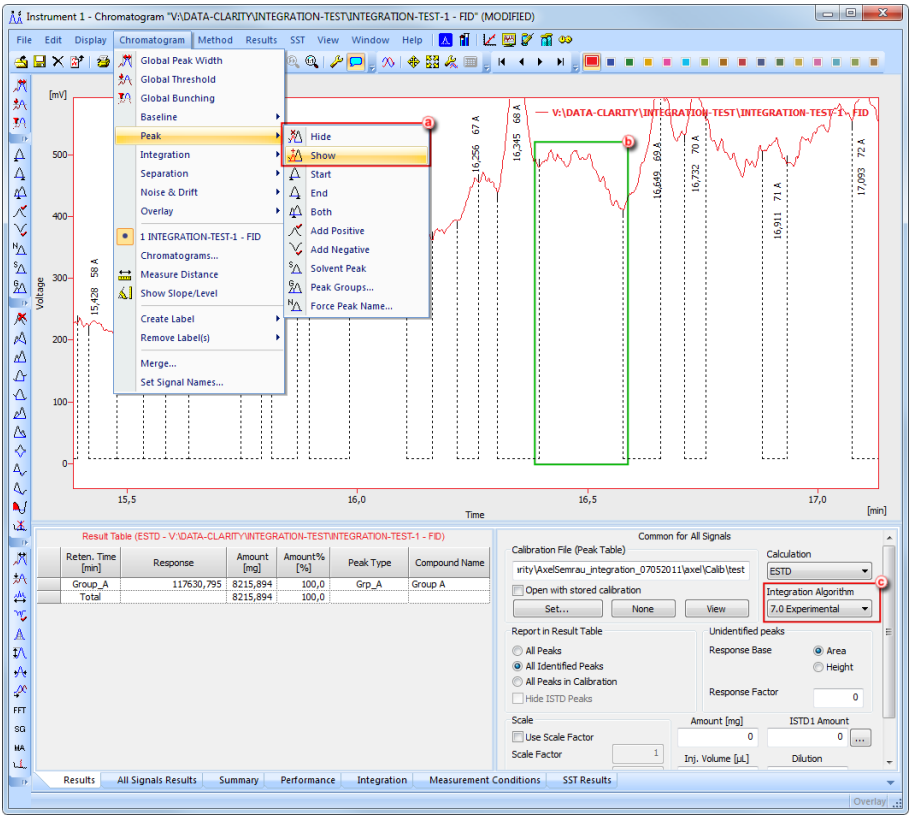

Fig 13: Chromatogram - *IA 7.0 Experimental*

IA is accessible from the Method Setup - Calculation tab where it can be chosen which IA will be used during processing of the chromatogram. In the Chromatogram window on the *Results* tab in the section *Common for All Signals* you can choose which IA ⓒ to use and is the best place to fiddle around it and see what is detected better in the new *7.0 Experimental* IA.
Try it out and tell us what you think.

2.11 Show Slope/Level function

New function *Show Slope/Level* accessible from the menu *Chromatogram* displays values of the signal and signal derivation (slope) for purposes of filling the *Fraction Table*. Upon invoking the command, slide with the cursor to the point of interest - bubble displays values for *Time*, *Slope* and *Level* for the active signal.

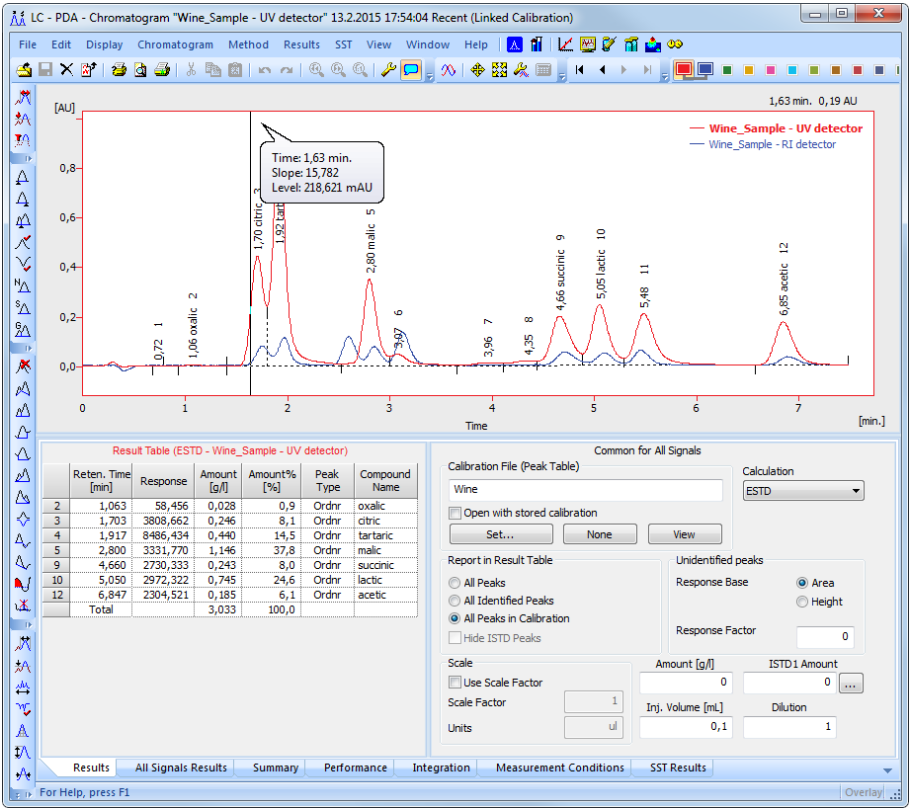

Fig 14: Chromatogram *window - Show Slope/Level*

2.12 User Variables

User variables allow to set custom variables which can be then used in the *User Columns* calculations. It's the best way to introduce a new variable for specific calculations.
There are three places where user variables can be found:

- *Single Analysis*

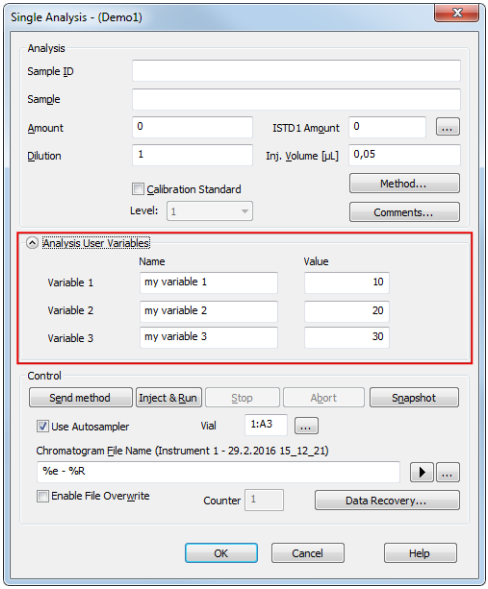

Fig 15: Single Analysis *- Analysis User Variables*

- *Method Setup - Advanced* tab

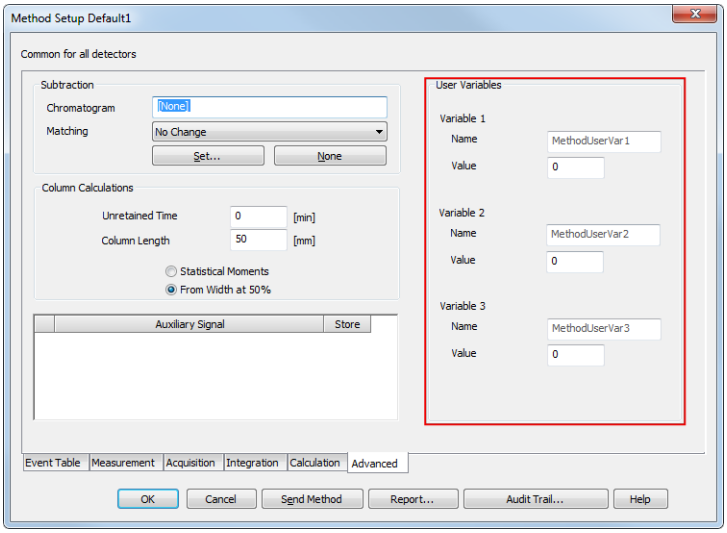

Fig 16: Method Setup - *Advanced tab*

- Sequence - use *Setup Columns* to reveal

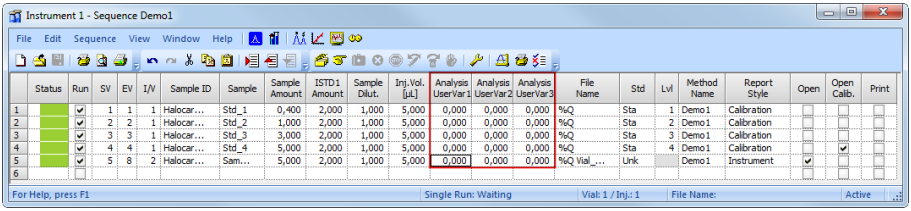

Fig 17: Sequence

User variables are then copied to the measured chromatogram and can be used for further calculations.

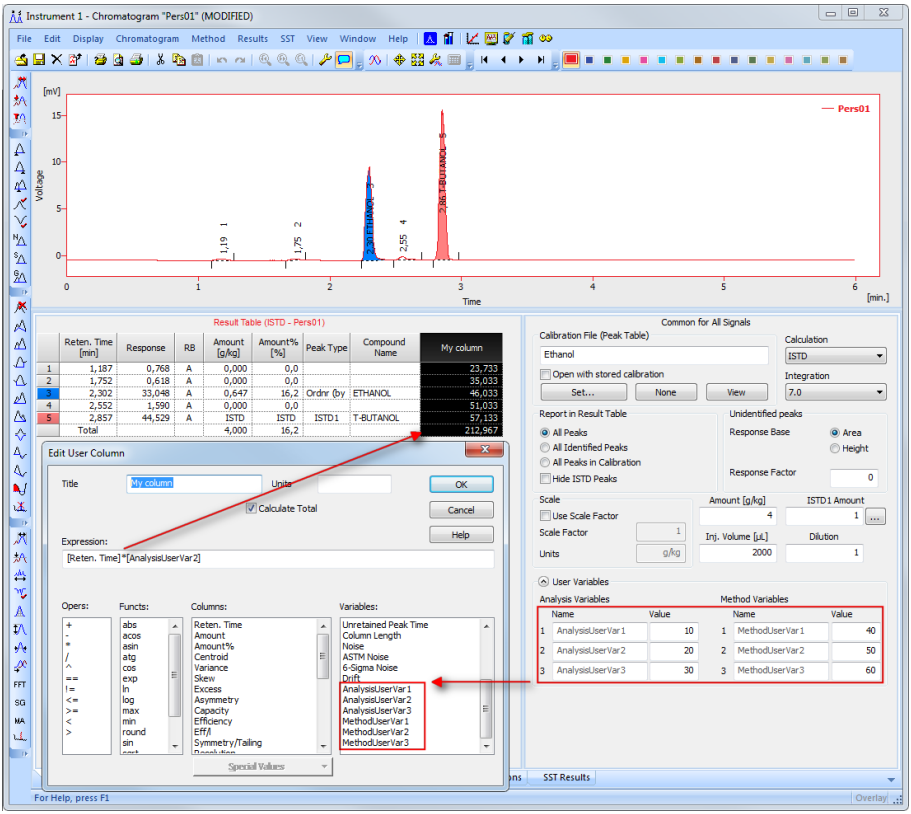

Fig 18: Chromatogram - *Results tab*

2.13 Enhancements in Fraction Collectors

Fraction collectors had undergone a major update. First of all each row of the *Fraction Table* can be set for a different signal thus allowing a large number of different conditions based on different detector signals.
Second of all there had been added support for collecting fractions based on new signal conditions - combinations of *Level* and *Slope* may now be set in order to collect fractions (indicated by blue rectangle in the **Fig 19** on pg **20**.).
Fraction Table now displays *Signal Condition* command with expanded support for following signal conditions (indicated by red rectangle in the **Fig 19** on pg **20**.):

- *Start L+S End L+S*
- *Start L+S End L or S*
- *Start L or S End L+S*
- *Start L or S End L or S*

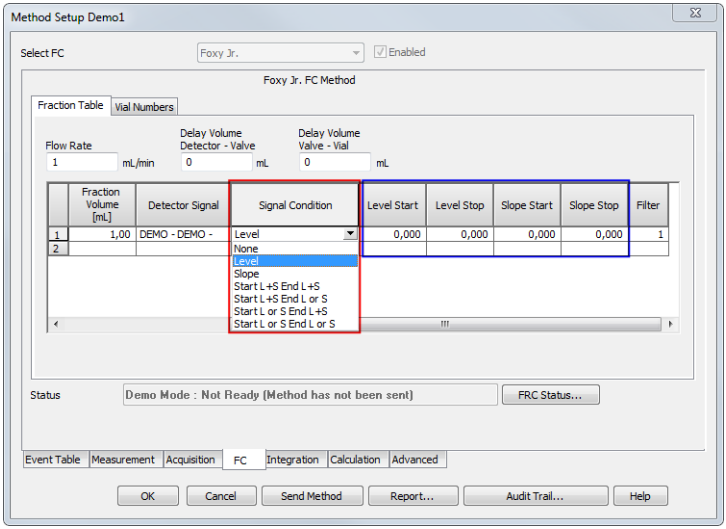

Fig 19: Fraction Table - Signal conditions

For more information about fraction collection, see respective manual of the fraction collector or invoke *Help* using the *F1* key.
Newly the collected fractions indicated in the chromatogram are not red but had been changed to orange. A check for overlapping intervals has been implemented.
Bear in mind that the improved behavior and fixed bugs may result in the necessity of making amendments in existing scripts and methods. If you are unsure, consult it with our support team at support@dataapex.com.

2.14 User Guide in main Clarity help

User Guide which could have previously be found only on the internet is now also located in the **Clarity** main help.
This is to bring our users a more convenient way to search for standard operation procedures and steps of how to achieve most common goals.

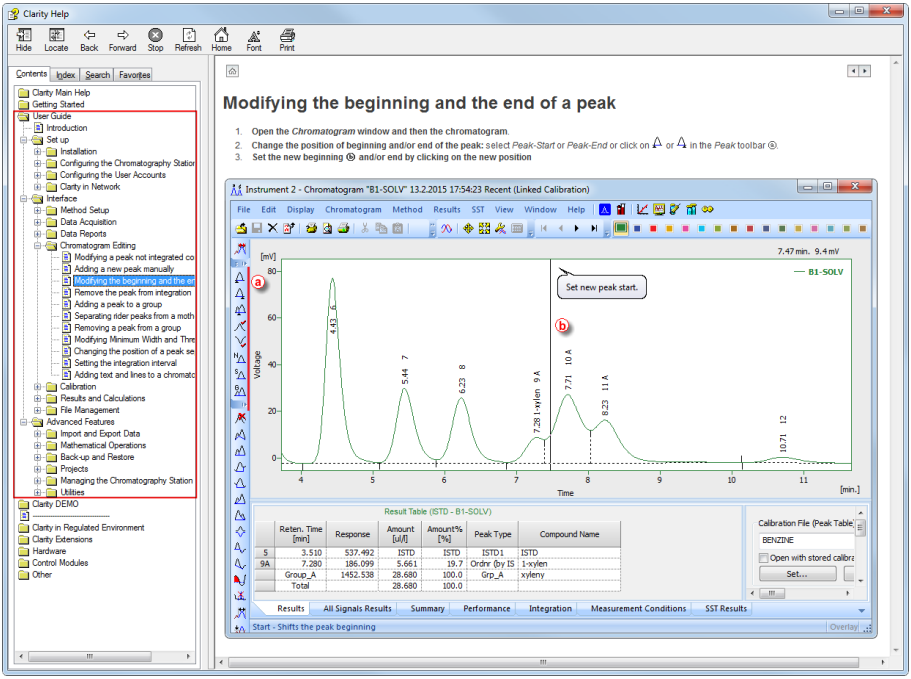

Fig 20: Help - *User Guide*

2.15 Various changes in Clarity

- *Event Table - Hold/Resume* options are now available in the *Event Table* as *Outputs*. Therefore based on the settings, *Event Table* may now trigger *Hold/Resume* commands for selected pump models.
- Batch dialog now supports reprocess of chromatograms in subfolders.
- Reports:
    - Report setup now supports printing of formulas used in the User columns.
    - Fixed page header for override printer settings regarding page orientation which was not functional.
    - Print to PDF now supports landscape printing.
- Due to compatibility issues Clarity does not allow to create folders starting or ending with a space anymore.
- PDA window - isoplot view - at opening the window, the cursor is automatically centered in the view (regardless of previous position at closing).
- GPC window - printing of calibration curve graph is now independent of the settings in the Chromatogram window.
- In the Device Monitor, LC Gradient, Purge dialogue - new field *Max Pressure* to limit the current maximum pressure was implemented. It is pre-filled with value of 1 *[MPa]*.
- Method Setup - for new methods, the *External Start* option default setting was changed from "*Start/Restart*" to "*Start Only*".
- "Enable start from Clarity" checkbox has been changed in some control modules to a more self-explanatory radio buttons with tooltips.
- Checkbox in Sequence Options has been changed to a list-box where it is much clearer what option, either Active or Passive, is selected.
- Improved error messages for invalid file names.
- IQ report and systeminfo.txt now reports all devices in configuration (in previous versions only detectors).
- OQ_Validation and LaunchManager utilities have been localized. Switch Clarity to desired language and aforementioned utilities will be automatically localized.
- Various known bugs have been fixed. See *What's new* in the About dialog of your **Clarity**.

3 New and updated control modules Full version

This section contains new and updated control modules introduced to Clarity.

3.1 Advion

Updated:

- Advion Expresion CMS - API updated to version 3.0.35.1.

3.2 Agilent

Updated:

- Control of the GC 7890 as well as AS is now implemented using the ICF libraries.

Note: Please note that control of the GC 7890 using ICF libraries is still under development and issues may arise.

- Agilent ICF libraries - updated to version A.02.03 DU2.

3.3 Antec

Updated:

- Antec Decade Elite detector control module is now in the Released state.
- New command *Cell Off/On* in Device Monitor for Antec Decade II and Decade Elite. Detector is not providing any data when cell is off.

3.4 Dani

Updated:

- Dani Master updated drivers: GC to 1.5.12.0 version, DHS to 1.0.9.0 version and SHS to 1.0.11.0 version.

3.5 DataApex

New:

- New control module Zebrick D/A, D/F converter for LC pump control is now in Development state.

Updated:

- GCxGC modulator is now in the Released state.

3.6 Ecom

New:

- New control module ECDA2000 version 0.8.0.0 is now in Development state.

Updated:

- Ecom updated drivers: ECD2000 to version 2.2.0.0, ECO2000 to version 2.0.0.0, ECP2000 to version 2.1.0.0, Flash06DAD to version 1.6.0.0 and Flash12DAD to version 2.1.0.0.

3.7 Ellutia

Updated:

- Ellutia series 200 GC driver updated to version 1.0.2.4.

3.8 Elysia

New:

- Elysia POMO Radiodetector control module is now in the Testing state.
- Elysia GabiStar control module is now in the Testing state.

3.9 Hitachi

Updated:

- Hitachi LaChrom Elite autosampler - new wash dialog button in the Device Monitor.
- Hitachi LaChrom Elite drivers are now working also on 64 bit systems.

Note: However, please note that the drivers were successfully tested only on Windows XP SP3 - on higher operating systems the *Autodetect* and opening of the instrument may take excessive time making the control module unusable.

3.10 HTA

Updated:

- HT2x00H autosampler - support for two injectors and DIN synchronization option implemented.
- HT4000L autosampler control module is now in the Released state

- HT2000H and HT2100H autosamplers support higher oven and syringe temperatures (firmware at least 1.12 or higher).

3.11 Knauer

New:

- New control module Kanuer Azura RID 2.1L refractive index detector.

Updated:

- PLATINblue Autosampler AS-1, UV Detector MW-1, Azura PDA Detector DAD2.1L, Azura UV Detector MWD2.1L control modules are now in the Released state.
- Knauer control modules updated to version 6.0.0.5021.

3.12 Microsaic

New:

- Microsaic 4000 MiD mass spectrometric detector - control module is now in the Testing state.

3.13 Rigol

New:

- Rigol L-3250 PDA detector control module is now in the Testing state.

3.14 Sedere

Updated:

- Sedere Sedex LC and FP detectors - new commands for standby mode implemented.

3.15 Shimadzu

Updated:

- Shimadzu SIL-20ACHT autosampler control module has been released.
- Shimadzu GC 2010/2014 - support for flow setting for dual inlet in dual mode.

3.16 Spark

New:

- Spark Integrity autosampler - control module is in Testing state.

Updated:

- Spark Alias - LAN communication changed from UDP to TCP. Note the used mode, communication mode needs to be changed by the Alias Service Manager.
- Spark Alias - default Scale factor for syringe speed changed from 1 (slowest) to 10 (fastest).

3.17 Other control modules

New:

- Column Usage Monitor - an auxiliary utility in UNI-RUBY script to monitor column's lifespan.

Updated:

- Alltesta Analyzer is now in the Testing state.
- Almsco - BenchTOF MS detector is now in the Relased State.
- ERC - RefractoMax 520 control module by UNI-RUBY script is now in Released state.
- FTDI USB driver updated to version 2.10.0.
- GL Sciences LC 800 HPLC system - 64 bit drivers added.
- Gow Mac Series 816 GC control module is now in the Released state.
- Ingos AAA50 driver updated to version 1.0.3.0.
- Kontron 525 pump control module is now in the Testing state.
- Recipe HT4000 thermostat control module is now in the Released state.
- Rheodyne MXII and Titan series valves support new operation modes.
- SSI Next Generation Pumps control module by UNI-RUBY script is now in the Testing state.
- Schambeck S 6300 autosampler control module is now in the Released state.
- Sykam S1130 pump driver updated to version 1.0.12.0.