Clarity (Lite)

2.4.4 vs 2.4.1

ENG

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1 General

- Version 2.4.4 supports unicode characters, this enabled the localization to Chinese and in future also to other languages and use any national characters in the chromatogram description.
- As Windows 98 are no longer supported by Microsoft, the Clarity version 2.4.4 cannot be installed under this operating system.
- The number of signals per chromatogram was increased from 4 to 12. The widgets for naming and color selection of signals had to be extended accordingly.
- Tables new function **Fill Down** will copy content of current cell to all cells bellow it. In Start Vial column in Sequence table it will automatically increment values.
- The Import Chromatogram dialog can now import multi-detector chromatograms from TXT format.
- The time axis in **Data Export** were exported with 3 decimal places precision only, now it is 5 decimal places to enable fast analysis in the future.
- The automation using commandline parameters was significantly empowered.
- The Demo data are no longer stored in default projects. There are DEMO1-4, EA_DEMO, PDA_DEMO and GPC_DEMO.
- Note: To open a demo project use the File Project command in the Instrument window to invoke the Projects dialog. The Open button will invoke the Open Project dialog, where it is possible to select one of the DEMO Projects.

1.1 System Configuration

System Configuration			
Setup Control Module	s		Number of Instruments
	Used	S/N	A& Instrument 1 1 to Instrument 2 1to Instrument 2 1to Instrument 4
As As Construction A Detector A Detector 1 A Detector 2 A Detector 3 A Detector 4 Built FR4D acquisition Driver A Detector 1 A Detector 1 A Detector 2 A Detector 2 A Detector 2 A Detector 2 A Detector 1 A Dete	Instrument 1	0-888	A Installatient & A Installation & A Insta
 ▲dd Remove A 	bout	Setup	3 Acquisition Card Number Start (Dig. Input) Int? A/D Card driver 1 Image: Card driver Ready (Dig. Output) Int? A/D Card driver Image: Card driver Image: Card driver IDK Cancel Help

Fig. 1. System Configuration

Instrument Type()

The instrument type selection was changed from radiobutons to listbox. Following new instrument types were added:

✓ Full version

• LC-PDA

the PDA related options are displayed in this instrument only

• CE - capillary electrophoresis

Setup Control Modules

Following new types of devices were added: 2

- MS
 - future use for mass spectrometry detectors
- Fraction Collector future use for fraction collectors
- Valves

future use for auxiliary devices controlable from the **Method Setup - Event Table** or multifunctional devices

Changed order and grouping

To accommodate new devices and to simplify the navigation, the available devices were regrouped and reordered.

Option "-- " (none) for the Start In and Ready Out. 3



Fig. 2. System Configuration

The option "--" (None) was enabled for the **Start In** and **Ready Out** fields in the **System Configuration** dialog for selected devices.

1.2 Single Analysis

Single Analysis	- (Default1)		×
Analysis			
Sample ID			
Sample			
Amount	0	ISTD Amount	0
Dilution	1	Inj. Volume [ml]	0
	🔽 Calibration Standard		Method
	Level: 1		
- Control	none 🔨		
Run		Abort	Snapshot
Chromatogram	File Name 6	2006 16_23_28)	
%e · %R	7		▶
🗐 Enable File	Overwrite 9 10	Counter 2	Data Recovery
	12 13 V	Cancel	Help

Fig. 3. Single Analysis

- New **Level** field enables to select recalibration level in the calibration file directly from **Single Analysis** dialog.
- The default filename template in the **Chromatogram Filename** field was changed to %e-%R (Name of the Instrument Date and time). This settings ensures that the filename willbe always unique.

1.3 Sequence

The default setting for new sequence was changed to *"ACTIVE"*.

It is possible to change the default by modifying the TEMPLATE.SEQ file in the COMMON subdirectory.

1.4 Method Setup

Event table

The **Event** table was moved from the Acquisition tab to its own Event Table 0 tab common for all detectors on the **Clarity Instrument**.

The digital inputs from devices configured on the Instrument can be used as an event source.

	Meth	hod Setu	p Default	1						E
	Cor	mmon for a	I detectors							
			1	Input					Output	
		Name	Туре	Source	Input	Value	Units	Output Type	Output	Parameter
	1	Signal	Input >	Detector 1		20,000	m∨	Int7 A/D Card drive	2	Pulse
	2	DI1	Dig. Inp	Int7 A/D Card driver	1	Down		Run Program	C:\Clarit	VV248
	3	DI2	Dig. Inp	Int7 A/D Card driver	2	Down		Command	Abort	
Abort 💦	4	Switch	Time >			2,000	min	Int7 A/D Card drive	3	Pulse
Stop	5									
Repeat injec		C	Ð							
Skip vial	E	vent Table	Measurer	ment Acquisition Integ	ration	Calculation	n Adv	anced		
Shutdown				ОК	Cance		App	y Report		Help

Fig. 4. Method Setup – Event Table

Event names can be set in the table. 2

In addition to the digital outputs and external programs the acquisition and sequence control commands (**Stop**, **Abort**, **Previous**, **Next**, **Shutdown**) can also be used as an event output. (These commands are functional only in selected control modules).

✓ Full version

External start options

Method Setup E	thanol in blood		×
Common for all de	ectors		
Method Descrip	tion		
DEMO Example	- GC - Autosampler - Ethanol in blood	🔽 Enable Autostop	
Column	db 624-30m-3.0u-0,32 id	Run Time:	
Mobile Phase	hydrogen	4 [min.]	
Flow Rate	50 cm/min	1. Const	
Pressure	5.57 psi		
Detection	FID	External Start/Stop	
Temperature	Ramped to 225		
		Start Only	
Note	short linear velocity 50 cm/seccolumn initial 45 deg	C Start - Restart	
		C Start - Stop	
		⊙Up _F	
		C Down 🔁	
Event Table M	easurement Acquisition Integration Calculation Advanced		-
	OK Cancel Apply	Report Help	

Fig. 5. Method Setup - Measurement

Subtraction chromatogram

The **External Start** ① options were moved from the Acquisition tab to the Measurement tab that is common for all detectors.

Method Setu	ip Ethanol in blood (MODIFIED)
	Subtraction Chromatogram Pers01 Matching No Change
	Column Calculations Unretained Time 1.2 Column Length 30000 [mm] C Statistical Moments From Wridth at 5033
Event Table	e) Measurement Acquisition Integration Calculation Advanced

Fig. 6. Method Setup - Advanced

The **Subtraction Chromatogram** function and **Performance Calculation** parameters were moved from the Measurement to Advanced tab ①.

Gradient table in LC control

The composition is displayed by 0,1% (used to be 1%).

1.5 Data Acquisition

The limits for signal display were increased on voltage axis from 10^4 to 10^9 .

Note: The larger scale is now used by digital detectors of Agilent 5890 and 68xx.

1.6 Chromatogram

New features enable to highlight peaks in chromatogram based on their selection ① in **Result** table or by color defined in the **Calibration** table ②.



Fig. 7. Chromatogram Peak Coloring

The calibration table in the Calibration – Compounds window now contains the **Peak** Color column ①. The background of corresponding peaks in the chromatogram will be filled with the color specified in this column.

Ľ	My G	C - Calibration 250x8	hr1 < ES	TD (MOD	IFIED)							X
E	e <u>E</u> d	it <u>D</u> isplay <u>⊂</u> alibration <u>V</u> iev	<u>W</u> indow <u>i</u>	Help 📐		8 🖬 🛛	<u>~</u>					
ļ) 🍝	🖬 🖾 🗙 🛛 😂 🗟	∌ ∐ %	B	K5 (2)	0,0,0		🐄 🔶 4	1	Auto	matic	R
			Calibratio	n Summary	Table (EST	D - 250x8hr	1 - Signal 2)					^
	Used	d Compound Name	Reten.Time	Left Window	Right Window	Peak Type	Peak Color	LOD	LOQ	RB	Resp. Factor	
1	7	oxalic	4,561	0,100	0,100	Ordnr		0,000	0,000	A	0,0000	
2	V	citric	5,203	0,100	0,100	Ordnr	\$	0,000	0,000	A	0,0000	
3	2	tartaric	5,423	0,100	0,100	Ordnr		0,000	0,000	A	0,0000	
4	V	glucose	6,053	0,100	0,100	Ordnr		0,000	0,000	A	0,0000	
5	v	malic	6,303	0,100	0,100	Ordnr		0,000	0,000	A	0,0000	
۰ ۲		fructore	6 577	0.100	0 100	Ordor		0.000	0.000	٥	0.0000	>
For I	∢ ► Help, p	Compounds (oxalic ress F1	λ citric λ	tartaric)	glucose)	malic) fr	uctose) si	iccinic ∕I	actic } gh	/cerol /	∖acetic) hromatogra	meth

Fig. 8. Calibration peak coloring

The **Graph Properties – Graph** dialog provides a possibility to switch the colouring possibilities on and off easily. The Peak Area Coloring section contains Set by Calibration checkbox for enabling the colors defined in the calibration and the Peak(s) Selected in the Result Table for enabling the highlighting of the peaks that are currently selected by left mouse click on the row number.



Fig. 9. Graph Properties – peak coloring

Result table VFull version



Option to calculate **Total** ① for **User Columns**. **Start Time** and **End Time** columns available in the **Result** table (hidden by default)

Summary table

ÅÅ	My G	C - Chrom	atogra	m FM1_25	11 13.1	0.2006 1	5:43:17 F	Recent (Lin	iked Calib	oration)				
Ē	le <u>E</u> di	it <u>D</u> isplay	⊆hromat	ogram <u>M</u> eth	od <u>R</u> esult:	s <u>S</u> ST ⊻iev	v <u>W</u> indow	Help 📐	11	😇 🖉 f	Ĩ			
]]e	<u>s</u> 🗐	× 🛛	🍯 👌	🍜 🕹 🕻	· ۵ 🕯	• ~ (®		🔎 🔎	<u> </u>	-	= -		⊕⊠.	<u>k</u> 🗉
.199	-				6	D	Sur	mmary Table			2			
*^								1,2	dichloretha	n		Benzen		
775				Sample ID	Volume	Peak Time	Length	Reten. Time	Area	Amount	Reten. Time	Area	Amount	Reter
-	3				volumo	r con rime	congun	[min]	[mV.s]	[ug/ul]	[min]	[m∀.s]	[ug/ul]	[rr
Δ		FM1_2110	Signal 1	FM1_2110	0,500	2,580	75000	7,616	657,710	0,110	8,223	1609,003	0,073	
Δ		FM1_2112	Signal 1	FM1_2112	0,501	0,000	50	7,620	665,400	0,111	8,227	1658,019	0,075	
		FM1_2211	Signal 1	FM1_2211	0,500	2,580	75000	7,602	609,015	0,102	8,207	1484,932	0,067	
40		FM1_2510	Signal 1	FM1_2510	0,500	2,580	75000	7,626	582,068	0,097	8,233	1413,838	0,064	
R		FM1_2511	Signal 1	FM1_2511	0,500	2,580	75000	7,622	685,391	0,114	8,229	1666,923	0,075	
1		<												>
¥		Results	Sumn	nary / Integ	ration)	Measureme	nt Condition:	s)∖SSTR	(esults					
Å		For Help, pr	ess F1										Overl	ay //

Fig. 10. Chromatogram - Summary

Chromatogram specific columns (Common \bigcirc) can be displayed in the **Summary** table together with the summary columns \bigcirc .

✓ Full version **Measurement conditions** My GC - Chromatogram C:\clarity_2.4.2\Duratec\Data\Duratec - 26.6.2006 13_59_10 - 1 26.6.2006 13:59:... 🔳 🗖 🗙 Eile Edit Display Chromatogram Method Results SST View Window Help 🔼 👖 🟒 🕎 🌮 🎢 当 🖬 🗙 🎯 🗿 🕹 🙏 🖻 🖄 🗠 🖉 🔍 역 역 🥥 🔑 🔽 🚺 💋 🖉 🦧 🎟 Chromatogram Audit Trail (C:\clarity_2.4.2\Duratec\Data\Duratec - 26.6.200... .* Measurement Condition 솼 Eile Edit View Help Description 🍅 💁 🍰 🌽 Column Δ Mobile Phase Time Type Analyst Det Description 4 26.6.2006 13:59:11 26.6.2006 13:59:11 26.6.2006 13:55:08 1 26.6.2006 13:55:08 1 26.6.2006 13:59:11 DataApex 1 Save File C:\clarity_2.4.2\Duratec\Data\Duratec - 26.... Elow Rate 4 Acquired DataAnex -Duratec DDT3200 1 Vis - Tungsten lamp : On Pressure DataApex -K DataApex -Duratec DDT3200 1 UV - Deuterium lamp : Off Detection V ŝΔ Temperature or Help, press F1 ۶۸ Note Set... None Chromatogram T × Audit Trail (Acquisition Messages) Show Matching No Change • Δ Δ Instrument ∕ Event Table λ1λ2λ3λ4/ Δ Results & Summary & Integration Measurement Conditions SST Results / Overlay or Help, press F1

Fig. 11. Chromatogram – Measurement Conditions

The overview of acquisition messages \bigcirc and a button linkinkg to the audit trail \bigcirc is added.

Performance Table VFull version

			Colum	n Performance	e Table (From 5	0% - Pers01)		
	Reten. Time [min]	17/05 [min]	Asymmetry [-]	Capacity [-]	Efficiency [th.pl]	Eff/l [t.p./m]	Resolution [-]	Compound Name
1	1,188	0,092	0,633	-0,01	931	31	-	
2	1,750	0,087	0,605	0,46	2259	75	3,716	
3	2,302	0,055	0,828	0,92	9702	323	4,595	ETHANOL
4	2,553	0,055	2,069	1,13	11940	398	2,700	
5	2,857	0,047	0,958	1,38	20759	692	3,521	T-BUTANOL
Re	sults 👌 Summa	y Perfor	mance / Inte	gration)	feasurement Ci	onditions)	SST Results	1

Fig. 12. Chromatogram - Performance

Possibility to display names for identified compounds in the **Compund Name** column (1) also in the Column Performance table (used to be possible only in the Result table).

Open Chromatogram

The **Open Chromatogram fom Sequence** command now enables to select between stored or linked Calibration and the number of opened signals.

1.7 Calibration

- The signal specific columns in the global calibration table are displayed in the color of the active signal. For a single signal calibration, the columns are not anymore distinguished by color, because it was confusing.
- Option to use **Unretained Peak Time** in **Retention (Kovacs) Indexes** calculation

1.8 Export

The **Export Data** dialog was enhanced by the following new features:

Export Content Result table In fixed format Summay table Column Moments Caculation Parameters Chromatogram Chromatogram Chromatogram Header Table Headers	Chromatogram C All Data C Displayed Data M XAvia Time Step: D min. C Append 4 Character Encoding:	Text Format
File Name Export		[Hesuit table only]

- Automated export of the **Summary** table ① in the **Export Content** group.
- Option to export the **Result** table as on screen (WYSIWYG) can be set by unchecking the **In fixed format** checkbox **2**
- Option to set field delimiters ③ and UNICODE (UTF-8) ④ character set for text exports.
- Possibility to export 3D data from PDA window.

1.9 Audit Trail VEul Version

For selected devices additional instrument events (sending of method, lamp status) and errors (missing data, pump error) are recorded in the Audit Trail.

2 Control modules

2.1 Device Monitor window

P HPLC-DAD -	Device Moni	tor					
<u>Fi</u> le LC Co <u>n</u> trol	<u>V</u> iew <u>W</u> indow	/ <u>H</u> elp 🔼 1	1				
LC Monitor							
Compone	nt Flow						
A	0,000	🗋 🎽 🔫	Time	[min.]			
в	0,000	ີ 🏅 关		100			
		الم الم	₩ _				
		_ _ }	Total Flov	v (mL/min)	0,000		
		_ 🗎 🛏 4		ro IMDol	0.57		
			Pressu				
			Pressu	re (ivira)	0,01		
			Pressu	ie (wird)	0,01		
Sampler 1			Pressu	Loadi	ng configu	ation, please	e wait
Sampler 1			Pressu	Loadii	ng configu	ation, please	e wait Readj
Sampler 1 Detectors		euterium lamn	Switch On	Loadii Vis - Tungs	ng configur	ation, please	e wait Ready
Sampler 1	UV∙D	euterium lamp	Switch On	Loadi Vis - Tungsl	ng configur	ation, pleas	e wait Readj
Sampler 1 Detectors Run Time :	UV∙D	leuterium lamp Detector 1	Pressu Switch On 200 (nm)	Loadii Vis - Tungsl	ng configu en lamp : AU]	ation, pleas	e wait. Readj
Sampler 1 Detectors Run Time :	UV - D	leuterium lamp Detector 1 Detector 2	Pressu Switch On 200 [nm] 200 [nm]	Loadii Vis - Tungsl -0,001110 [-0,001110]	en lamp : AU]	sation, please	e wait. Readj
Sampler 1 Detectors Run Time :	UV · D	reuterium lamp Detector 1 Detector 2 Detector 3	Switch On 200 [nm] 200 [nm]	Loadii Vis - Tungsl -0,001110 [-0,001110]	en lamp : AU] AU]	ation, please	e wait Ready
Sampler 1 Detectors Run Time :	UV · D	Peuterium lamp Detector 1 Detector 2 Detector 3 Detector 4	Switch On 200 [nm] 200 [nm] 200 [nm]	Vis - Tungsl -0.001110 [-0.001110] -0.001110 [-0.001110]	en lamp : AU] AU] AU]	ation, pleas	e wait. Ready
Sampler 1 Detectors Run Time :	UV - D	Petterium lamp Detector 1 Detector 2 Detector 3 Detector 4	Switch On 200 [nm] 200 [nm] 200 [nm]	Vis - Tungsl -0.001110 [-0.001110] -0.001110] -0.001110] -0.001110]	en lamp : AU] AU] AU]	switch Off	Ready
Sampler 1 Detectors Run Time :	UV - D	Peuterium lamp Detector 1 Detector 2 Detector 3 Detector 4	Pressu Switch On 200 [nm] 200 [nm] 200 [nm]	Loadii Vis - Tungsl -0.001110 [-0.001110] -0.001110 [-0.001110]	en lamp : AU] AU] AU] AU]	Switch Off	e wait Ready

✓ Full version

- **Device Monitor** window (used to be **LC Monitor**) was amended to accommodate monitors from multiple devices.
- Functional buttons (Autozero, Lamp On/Off, etc.) are available in selected monitors.

2.2 New control modules added Veul version

- LC Control: module for **Knauer Smartline** system - preliminary versions, to be released autumn 2006
- LC Control: module for direct control of **Shimadzu LC10-AD VP**.
- AS Control: module for **CTC LC PAL** autosampler (also for **GC PAL** and selected OEM versions)
- AS Control: module for direct control of **Shimadzu AOC 20i** autosampler for GC.
- AS Control: module for **HTA HT300** extended to control also **HT300LV**

- DET Control: PDA detector **Duratec DDT 3200 DAD** (available from Duratec company only)
- DET Control: module for direct control of **Ecom Topaz**, **Sapphire** and **LCD2073A** detectors.

2.3 LC Agilent 1100 series modifications

- LAN communication added
- Common system monitor in the Device Monitor window.

2.4 UNI pump control

New fields were added for comments and for setting the time between commands.

The communication parameters (baud rate etc.) are stored in the profile.

The UNI pump driver profiles were reorganized in the UTILS subdirectory grouped by the manufacturers.

2.5 LC Control States

The display and handling of LC gradients was unified in Clarity:

- Gradient is always displayed including the Standby and Idle states
- Isocratic mode can be set by the following steps:
 - Setting the initial conditions in the first row of gradient table
 - Setting the **Standby Flow** same as **Initial Flow**.
 - Setting the Idle state to Initial.

The sum of the **Time to Standby** and **Standby Time** then represents the duration of the gradient for eventual **Control Time**. The flow will not be changed, it is not necessary to set any time.

3 Extensions

✓ Full version

3.1 SST

The **Amount%** column was added to the avaliable parameters.

3.2 CE - Capillary Electrophoresis

New Clarity Extension for capillary Electrophoresis includes:

- Optional CE Clarity Instrument type
- CE specific terminology
- Time corrected area can be used as a base for quantitation.
- Peak identification can be optionally based on **Peak Start/Peak End**.

Note:

Detailed information about the CE Extension can be found in separate manual (Part No. M062)

4 Compatibility Issues

Most of the files should be backward compatible; however some hidden bugs may still appear.

Caution! It is recommended to backup your files as well as Clarity configuration files before upgrade.

- Files using UNICODE characters may not be interpreted correctly in the previous Clarity versions. Also, the Chinese characters in some fields may not display correctly on non Chinese Windows.
- The methods that utilize the **Event table** will not be backward compatible.

When transferring methods with event tables from older versions, the **Source** and **Output** columns may not be filled correctly, it is necessary to check and eventually correct such methods.

• A bug present in version 2.4.1 prevents correct conversion of the **Pulse** output in **Event table** (it will be converted to *HIGH*).

For remedy, the method should be first saved using the latest Clarity 2.4.1 version (2.4.1.93 and later) and only then opened in Clarity 2.4.4.