

DURATEC DDT 3200

Clarity Control Module

ENG

Code/Rev.: M064/40E Date: 8/24/2020

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To facilitate the orientation in the **Duratec DDT 3200** 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 Duratec DDT 3200 Control Module

• The **Duratec DDT-3200 USB** control module can control and acquire data including online spectra from Duratec DDT-3200 USB PDA detector.



Fig 1: Duratec DDT-3200

Data Acquisition is performed via the USB A-B cable (supplied with the detector).

Two communication channels are used:

- A for instrument control commands
- B for spectral data acquisition

2 Requirements

- Clarity Installation CD ROM with LC Control module (p/n A24).
- If the PDA detector is to be used, the PDA Extension (p/n A29) is also necessary.
- Free USB port in the PC.
- USB A-B cable (p/n SK06).

Note: Cables are not part of **Clarity** Control Module. It is strongly recommended to order required cables together with the Control Module.

• DDT-3200 USB control module installation (the module can be purchased from the Duratec Company - see **www.duratec.com**)

3 Installation Procedure

3.1 Installing the DDT-3200 USB drivers

- Install Clarity software first.
- Restart the computer.
- Plug in the USB cable from detector and switch it On.
- The Found New Hardware dialog will appear:

Found New Hardware Wiz	ard Contract of Co
	Welcome to the Found New Hardware Wizard
	This wizard helps you install software for:
	DURATEC dual USB channel A
2 has	If your hardware came with an installation CD or floppy disk, insert it now.
	What do you want the wizard to do?
	 Install the software automatically (Recommended) Install from a list or specific location (Advanced)
	Click Next to continue.
	< Back Next > Cancel

Fig 2: Found New Hardware dialog

Since the "*Install the software automatically*" option may in some cases fail to install the correct drivers, we recommend following the manual procedure.

Use the "Install from a list or specific location (Advanced)" option.



Fig 3: Choose options

Select the "Dont search ... " option.



Fig 4: Select device driver

Use the "Have disk" button to open the "Install from disk" dialog.



Fig 5: Install from disk

Use the *Browse* button to locate the FTD2XX.SYS file in the **Clarity** installation subdirectory C:\CLARITY\HW_DRIVERS\FTD2.



Fig 6: Select Device model

Select Next to continue the installation



Fig 7: Microsoft Logo testing

Ignore the Microsoft Logo Testing warning, use the *Continue Anyway* button.



Fig 8: Complete Hardware Installation

Finish the installation.

Note: As there are two USB communication channels, this procedure should be repeated also for Channel B.

3.2 Installing the DDT-3200-USB Control module

Run the supplied DURATEC.EXE file.



Fig 9: Duratec DDT3200 setup

Select the directory, where **Clarity** is installed (C:\CLARITY\BIN by default).

Choose Destination Location				X
NEXT GENERATION equipment for chemical laboratories DoubApox Clarity**	Destination Directory [C:\Clarity		Space Required:	Browse
			Space Available:	1653512 K
		< <u>B</u> ack	Next >	Cancel

Fig 10: Duratec DDT3200 setup

Note: The DDT-3200-USB control module must match the **Clarity** version. When updating **Clarity**, you may need to obtain also corresponding version of the DDT-3200-USB control module from Duratec Company.

3.3 Clarity Configuration

- Invoke the System Configuration dialog accessible from the Clarity window using the System Configuration command.
- Press the Add button to invoke the Available Control Modules dialog.



Fig 11: Available Control Modules

• Select the *Duratec DDT-3200 USB from the Detectors group* and press the *Add* button.

DDT3200 Setup		? 🗵
Port A	DDT-3200 USB A (2005-054A)	•
Port B	DDT-3200 USB B (2005-054B)	
Detector 1	Detector 1	
Detector 2	Detector 2	
Detector 3	Detector 3	
Detector 4	Detector 4	
PDA Detector 1	PDADetector 1	
	Digital Input Names	Change
	Digital Output Names	Change
ОК	Cancel	Help

Fig 12: DDT3200 setup

Caution:	The detector must be connected, and switched ON with drivers installed
	during this step.

• You can eventually change detector and input/output names to be displayed within the instrument.

3.3.1 Assign the control to Clarity Instrument

- Switch to the desired **Clarity** *Instrument* x ① tab in the right part of the System Configuration dialog.
- Drag and drop the *Duratec DDT-3200* from the *Setup Control Modules* (2) in the left to the instrument on the right (or use the --> button (3) in the center).

System Configuration		
Setup Control Modules		Number of Instruments
Setup Control Modules	> 	Number of Instrument 2 x An Instrument 1 An Instrument 2 x Instrument 1 An Instrument 2 x Instrument 1 Name Duratec Instrument 7 Image for Opened Instrument Image for Opened Instrument Image for Opened Instrument
Add Remove About Setup]	Ready (Dig. Output) Duratec DDT3200 USB

Fig 13: System Configuration

- When needed, set the *Ready (Dig.output)* to be used by **Active Sequence** for synchronization with non-controlled samplers.
- The *Start (Dig. Input)* should be left to *None-*, the synchronization is done over the USB line.

Caution: The PDA module must be accompanied with at least one signal from the same detector.

3.4 First start of Clarity after configuration

At the first start **Clarity** may display a warning message that the stored Duratec DDT-3200 instrument method stored in **Clarity** does not match with the method in the device.



Fig 14: Cannot read method message box

This message is normal, when the method is first time used with new or modified configuration of the controlled instruments.

The message requesting confirmation of sending changed method to Duratec DDT-3200 instrument will appear (under default settings).

Duratec - Method Default1 🛛 🔀
The method has been changed - send to Instrument?
Yes No Help
Set current action as default and perform it without prompt in the future.
This setting can be changed in the System Configuration dialog.

Fig 15: Changed method dialog

• Click the *No* button not to send the default method parameters to the detector.

If you have some method already stored in the Duratec DDT-3200 device, it is possible to download it to **Clarity**.

• Open the respective Acquisition tab of the Method Setup dialog and download the method using the *From ..(device name)...* button.

Method Setup Default1	
Select Detector A 🔽 🔽 Enabled	
Detector Method	
Detector Instrument Wavelength program	
Signal	From Det
Wave length 200 [nm] Range 1000 💌	
Common	
Rate 10,00 V [Hz] Mode Sensitivity V	
Time [s] 4,00 💌	
	Det Status
Description Status	
Status Ready	
Event Table Measurement Acquisition PDA Integration PDA Method Calculation Advanced	
OK Cancel Apply Report	Help

Note:

It is necessary to download the wavelengths for all configured detectors separately using the *Select Detector* listbox in the upper part of the *Method Setup* dialog.

4 Using the control module

Depending on the selected component appropriate new tabs will appear in the Method Setup dialog. These are used for setting the corresponding parts of the **Duratec DDT-3200** instrument (device) method. The Acquisition and PDA tabs are used for the detector settings.

Event Table Measurement	Acquisition	PDA	Integration	PDA Method	Calculation	Advanced	
[OK		Cancel	Apply	Rep	ort	Help

Fig 16: Tabs of Method Setup dialog

4.1 Method Setup - Acquisition

Depending on the configured detectors new tabs will appear in the Method Setup - Acquisition dialog.

The Acquisition tabs contain:

The *From Det...* button loads the instrument method from the detector to the template method that is currently opened in the **Instrument window**.

The *Det Status* opens the Hardware Configuration dialog listing the available hardware features of current configuration.

The individual subtabs of the Method Setup - Acquisition dialog are described in the corresponding sections of chapters **6.1.2 - 6.1.4**.

4.2 Method Setup - PDA

This tab appears when the PDA detector is configured to instrument. It enables the settings for spectra acquisition conditions.

4.3 Data Acquisition

The Data Acquisiton window displays online signal from the detectors. It also provides access to analysis controlling commands such as *Start*, *Stop*, etc. For detailed description of the Data Acquisition window see the **Clarity** Reference Guide.

🔤 Agi	lent 1100 - Da	ta Acquisition				
<u>]]</u> –	Analysis Display	<u>View</u> <u>Window</u> <u>H</u> elp Always on Top ✓ Toolbars Customize Reset All	▲ 1 M K K	2 1 [min.]	Voltage range	10 [mV]
4- 2- 0- -2-		Grid Lines Fixed Axes Floating Axes • Context Axes Show Spectrum	-		DAD : D DAD : D DAD : D DAD : D	etector 2 etector 3
-4- 0		0,2	0,4 Tim	0,6 Ne	0,8	1,0 [min.]
Time: ??	? Voltage	[mV]:				

Fig 17: Data Acquisition

The graph can also display acquired spectra using the $\overset{\text{W}}{\overset{\text{View}}}$ - Show Spectrum command (active only during running acquisition).

Customize
Toolbars Commands
Categories: Menu Window Zocco.
Select a category, then click a button to see its description. Drag the button to any toolbar Description
OK Cancel Apply Help

Fig 18: Graph Properties

It is also possible to add Show Spectrum icon to the toolbar for fast setting of the spectral mode (as well as ${}^{0}\frac{4}{7}$ Set Zero and ${}^{0}\frac{4}{7}$ Reset Zero). To do this use the View - Customize command. The Show Spectrum icon can be found on the Customize - Commands dialog in the Analysis set of commands.

5 Device Monitor

The **Device Monitor** window shows the actual state of the controlled instruments and allows for manual *CONTROL* of specific functions.

Puratec - Device		0			
Detectors				Running	(
	UV - Deuterium lamp :	Switch On	Vis - Tungsten lamp :	Switch Off	
Run Time :	A:	200 [nm]	-0,000450 [AU]		
0,11 [min]	В:	200 [nm]	-0,000450 [AU]		
	С:	200 [nm]	-0,000450 [AU]		
Auto Zero	D :	200 [nm]	-0,000450 [AU]		
or Help, press F1					

Fig 19: Device monitor

The lamps can be turned *ON* or *OFF* using the appropriate buttons and *AutoZero* can be performed.

6 Reference description

This chapter provides detailed description of the individual controls for each dialog of the **Duratec DDT-3200 Control module**.

6.1 Duratec DDT-3200 Configuration - DAD

DDT3200 Setup	2
Port A	DDT-3200 USB A (2005-054A)
Port B	DDT-3200 USB B (2005-054B)
Detector 1 Detector 2 Detector 3 Detector 4 PDA Detector 1	Detector 1 Detector 2 Detector 3 Detector 4 PDADetector 1
	Digital Input Names Change Digital Output Names Change
ОК	Cancel Help

Fig 20: Duratec DDT-3200 Configuration - DAD

Port A

Communication channel A selection.

Port B

Communication channel B description.

Detector n

Sets the names of individual signals (detectors).

PDA Detector

Sets the name of the PDA detector

Digital Input names

Allows to change the digital input names to be used in the Method Setup - Event Table dialog.

Digital Ouput names

Allows to change the digital output names to be used in the Method Setup - Event Table dialog.

The Digital Inputs and Outputs can be utilized in the Method Setup - Event Table . Here it is possible to specify actions triggered by various parameters (analysis time, signal level, Digital inputs, etc.).

For detailed description refer to the Clarity Reference manual.

Note: This detailed description is easily accessible in the online help system; just press the **F1** button while being in the respective dialog.

6.2 Method Setup - Acquisition - Detector

Method Setup Default1	
Select Detector A 🔽 🔽 Enabled	
Detector Method	
Detector Instrument Wavelength program	From Det
Signal Wave length 200 [nm] Range 1000 -	Prom D et
Common	
Response Rate 10.00 V [Hz] Mode Sensitivity V	
Time (\$) 4,00 💌	
	Det Status
Description	
Status Ready	
Event Table Measurement Acquisition PDA Integration PDA Method Calculation Advanced	
OK Cancel Apply Report	Help

Fig 21: Method Setup - Acquisition - Detector

Signal

These settings are individual for each signal selected in the *Select Detector* listbox.

Wavelength [nm]

Sets the wavelength for the selected signal.

Range [mV]

Sets the signal range of the detector.

Common

Note: Common parameters are common for all signals.

Rate [Hz]

Selects the data acquisition rate for the stored signals.

Response

Mode

Selects the spectral resolution mode - sensitivity or resolution.

Time [s]

Defines the detector time constant applied to the signals. Available values are 4, 2, 1, 0.5 or 0.25 sec.

6.3 Method Setup - Acquisition - Instrument

Method Setup Default1	
Select Detector A 🔽 🔽 Enabled	
Detector Method	
Detector Instrument Wavelength program	
Start ext signal Internet Sign	From Det
Tungsten @ Keep state C Turn On C Turn Off	
	Det Status
Description	
Status Ready	
Event Table Measurement Acquisition PDA Integration PDA Method Calculation Advanced	
OK Cancel Apply Report	Help

Fig 22: Method Setup - Acquisition - Instrument

Start external signal

Select the Digital input used to start data acquisition.

Autozero external signal

Select the Digital input used to activate the Autozero

Analog output

Range

Sets the range for analog output signals

Baseline offset

Sets the baseline offset for analog output signals

Valve

Mode

Sets the operation mode for the optional valve

Level [%]

Sets the threshold for opening the valve as percentage of the set analog signal range.

Delay [s]

Sets the delay for switching the valve in sec.

Lamps

Keep state

The state of the lamp will not be changed, when method is loaded. Default setting .

Turn On

Configure, if the lamp should be turned on, when the method is sent to detector.

Turn Off

Configure, if the lamp should be turned off, when the method is sent to detector.

6.4 Method Setup - Acquisition - Wavelength program

Method Setup Default1	
Select Detector A 🔽 🔽 Enabled	
Detector Method Detector Instrument Wavelength program	
Dutput channel Time Auto Wavelength 1 0.00 2 200 2 2.00 280 3 3.00 310 4 4.00 200	From Det
Description	Det Status
Status Ready	
Event Table Measurement Acquisition PDA Integration PDA Method Calculation Advanced OK Cancel Apply Report	Help

Fig 23: Method Setup - Acquisition - Wavelength program

Note: This tab is common for all detectors

Output Channel

Selects to which analog output channel will be sent the signal according to the wavelength program. The signal will be also stored as a signal for the **Clarity** detector corresponding to selected output channel.

Table

The wavelength program for selected output signal can be set in this table. For individual times, the desired wavelength and autozero can be set.

Zero Time line must always be set.

Caution: After the wavelength program the initial conditions will be restored only after the method has been sent to the detector. In Sequence mode, this is done automatically before each injection. In Single Analysis mode, this must be done manually (using the *Send Method* button). It is recommended to restore the initial conditions at the last line in this table to prevent problems.

6.5 Method Setup - PDA

Method Setup Default1	X
Select PDA 💌 🔽 Enabled	
PDADetector Method	
PDA	
Spectrum Wave from 200 [nm] to 700 [nm] step 1 [nm]	From PDA
Common	
	PDA Status
Description	- DA Status
Status Ready	
Event Table Measurement Acquisition PDA Integration PDA Method Calculation Advanced	1
OK Cancel Apply Report	Help

Fig 24: Method Setup - PDA

Spectrum

Wave from [nm]

Set starting value for spectral data range.

to [nm]

Set end value for spectral data range

step [nm]

Set step value for spectral data

Note: Those settings are not stored in the detector, the From PDA button will not change the actual values.

Note: The spectra are collected always at 10 Hz rate

6.6 Hardware Configuration

This dialog displays the detector information.



Fig 25: Hardware Configuration

7 Connections

7.1 Wiring

For synchronization and analog data output serves the 25 pin Canon connector on the back side.

Four digital inputs and four digital outputs are available besides the four analog output channels. The digital inputs are configurable in the Method Setup - Acquisition - Instrument dialog *Start Ext. Signal* field, the digital outputs can be activated from the Method Setup - Event Table dialog. The detector must be started using the Remote external event contact connector or the Start button on the detector.

Caution: The detector run could not be started from **Clarity**.

Note: Cables are not part of **Clarity** Control Module. It is strongly recommended to order required cables (p/n SK) together with the Control Module.

7.2 Description of connectors:

25-pin D-Sub connector receptacle (Canon female) Signal-Name Plus Minus Out 1 1 14 Out 2 2 15 Out 3 3 16 Out 4 4 17 In 1 5 18 In 2 6 19 In 3 7 20 In 4 8 20 Aux 5V (100mA max) 9 21 Channel 4 (1VFS) 10 22 Channel 3 (1VFS) 11 23 Channel 2 (1VFS) 12 24 Channel 1 (1VFS) 13 25

8 Troubleshooting

When the cause could not be discovered easily, the recording of communication between **Clarity** and the detector can significantly help the **DataApex** support to discover the cause.

8.1 Troubleshooting communication

The recording can be enabled by adding or amending the COMMDRV.INI file in the **Clarity** installation directory (C:\CLARITY\CFG by default). The file can be edited in any text editor (e.g. **Notepad**). Following lines should be added

[FTD2XX 2005-054A] echo=on textmode=on filename=CommDrvDuratecA_%D.txt reset=off

[FTD2XX 2005-054B] echo=on textmode=on filename=CommDrvDuratecB_%D.txt reset=off

Note: %*D* (or %*d*) in the filename parameter means that the log will be created separately for each day. The *reset=off* parameter disables deleting the content of the log each time the station is started during the same day.

The created LOG files will significantly help in diagnosis of unrecognized errors and problems in communication.

Please note that the log for Channel B (spectral data) grows rapidly and after short time it may slow down the communication or block it completely. Use it only temporarily, when data problems are encountered. The Channel A recording the communication related to instrument control is considerably smaller, however it is not recommended to leave it on for prolonged periods too.

8.2 Problem with acquiring spectra

• If the detector suddenly stops acquisition spectra.

This is most probably because of using USB HUB. Connect the USB cable from the detector directly into the PC.