DataApex
Clarity™
CHROMATOGRAPHY SOFTWARE

DURATEC DDT 3200

Clarity Control Module ENG

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

Phone: +420 251 013 400
Fax: +420 251 013 401
clarity@dataapex.com
www.dataapex.com

DataApex Ltd.
Petrzilkova 2583/13
158 00 Prague 5
The Czech Republic

Author: MP

Contents

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:

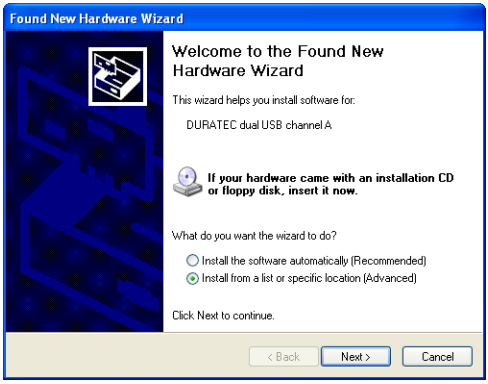


Fig 2: Found New Hardware dialog

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.

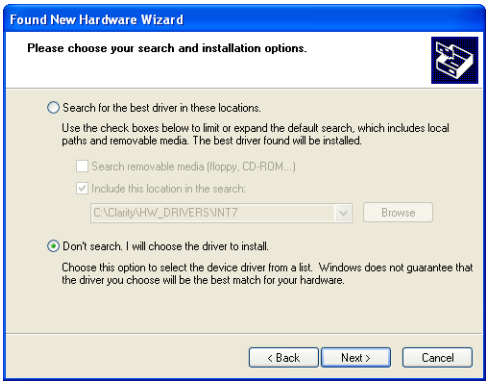


Fig 3: Choose options

Select the "*Dont search…*" option.

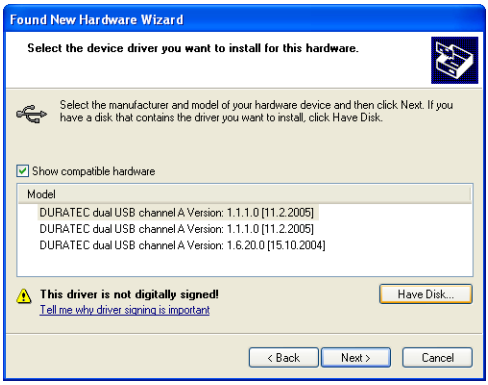


Fig 4: Select device driver

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

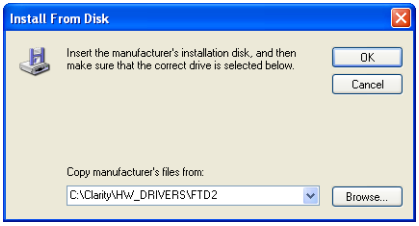


Fig 5: Install from disk

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

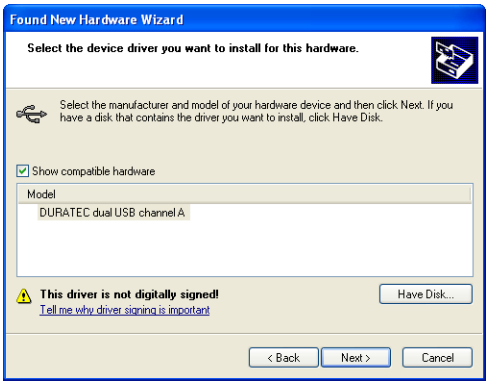


Fig 6: Select Device model

Select *Next* to continue the installation

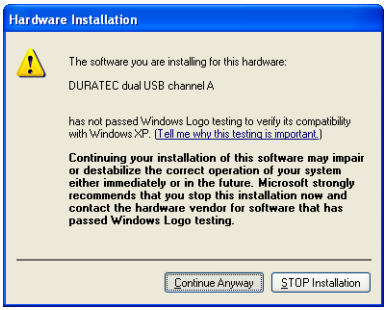


Fig 7: Microsoft Logo testing

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

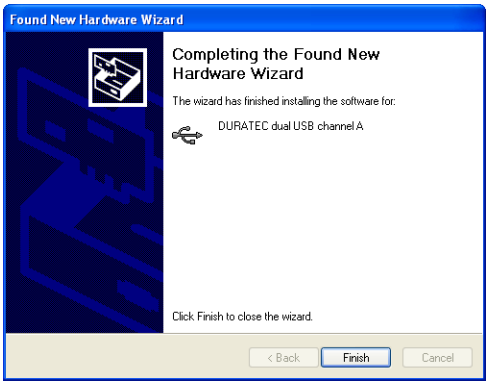


Fig 8: Complete Hardware Installation

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.

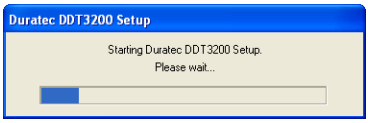


Fig 9: Duratec DDT3200 setup

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

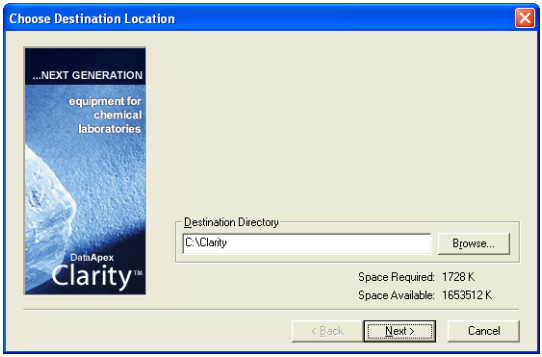


Fig 10: Duratec DDT3200 setup

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.

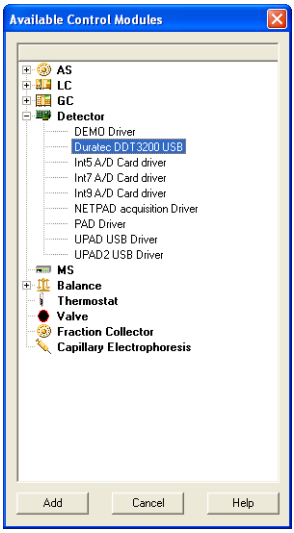


Fig 11: Available Control Modules

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

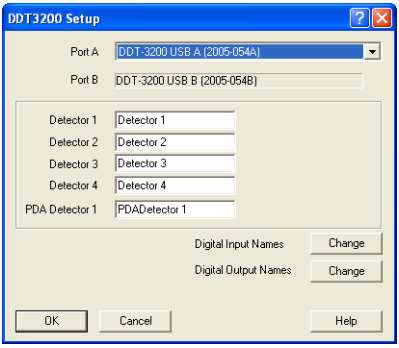


Fig 12: DDT3200 setup

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).

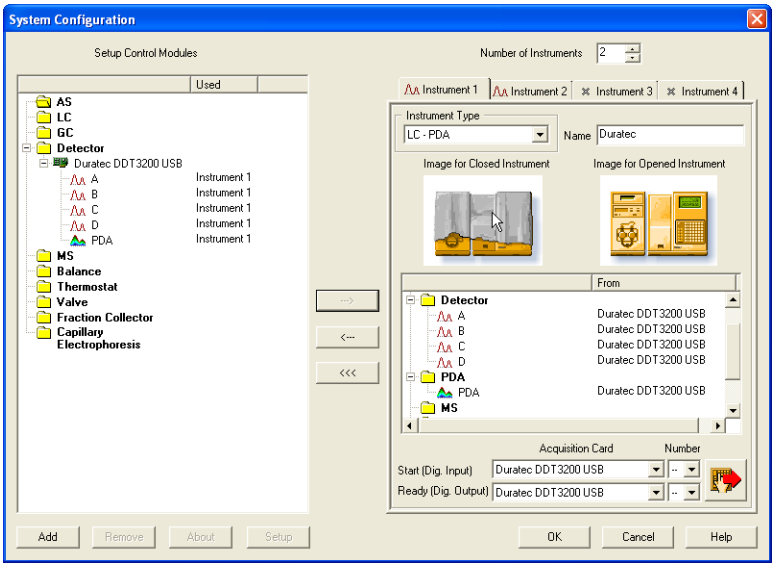


Fig 13: System Configuration

- 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.

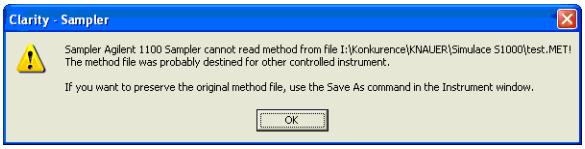


Fig 14: Cannot read method message box

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).

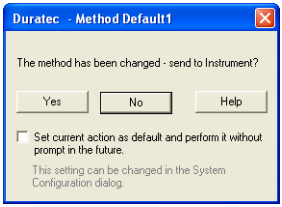
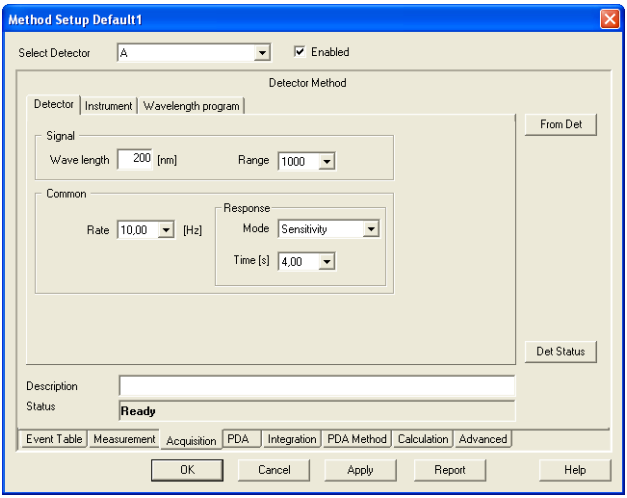


Fig 15: Changed method dialog

- 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.



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.

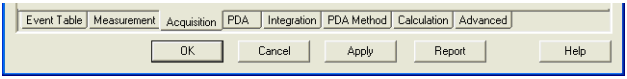


Fig 16: Tabs of Method Setup dialog

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.

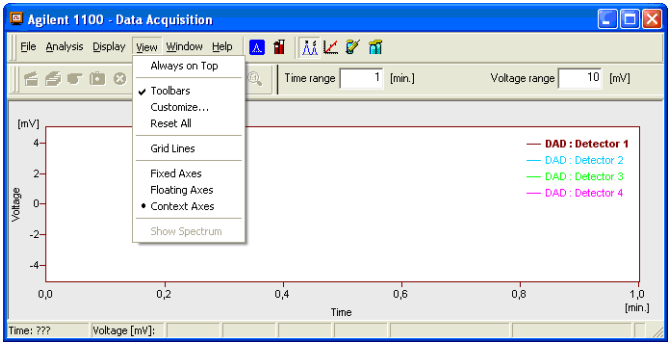


Fig 17: Data Acquisition

The graph can also display acquired spectra using the *View - Show Spectrum* command (active only during running acquisition).

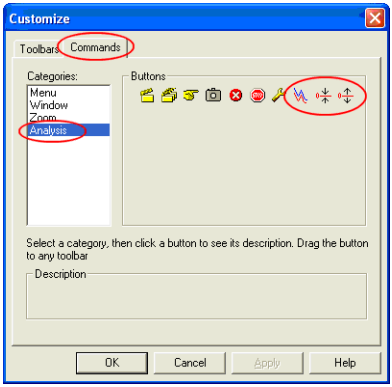


Fig 18: Graph Properties

It is also possible to add *Show Spectrum* icon to the toolbar for fast setting of the spectral mode (as well as *Set Zero* and *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.

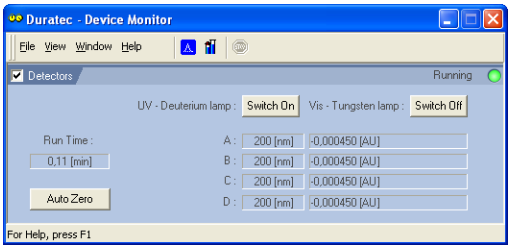


Fig 19: Device monitor

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**.

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

6.1 Duratec DDT-3200 Configuration - DAD

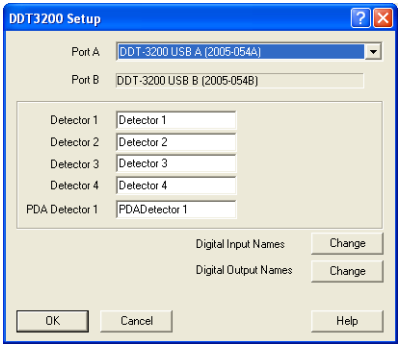


Fig 20: Duratec DDT-3200 Configuration - DAD

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.

6.2 Method Setup - Acquisition - Detector

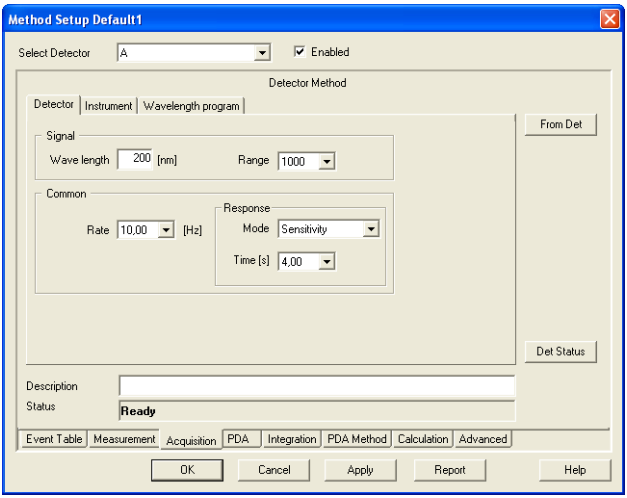


Fig 21: Method Setup - Acquisition - Detector

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

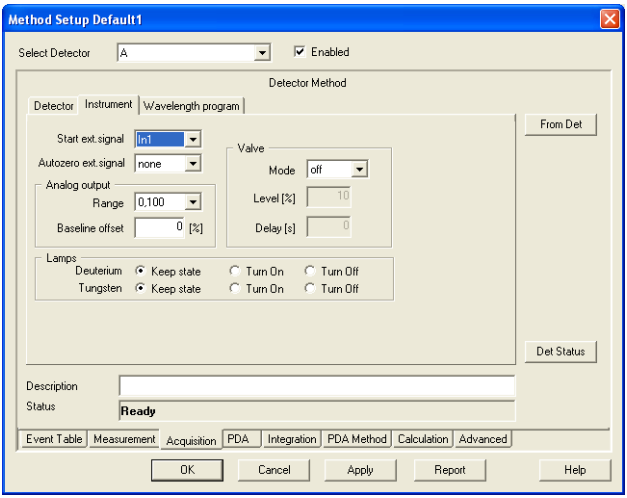


Fig 22: Method Setup - Acquisition - Instrument

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

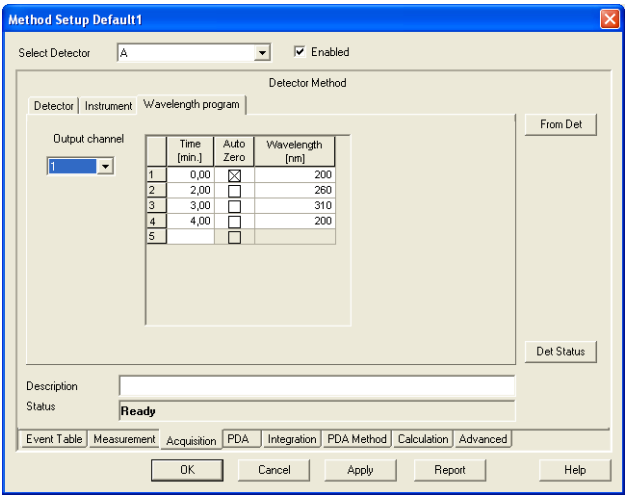


Fig 23: Method Setup - Acquisition - Wavelength program

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

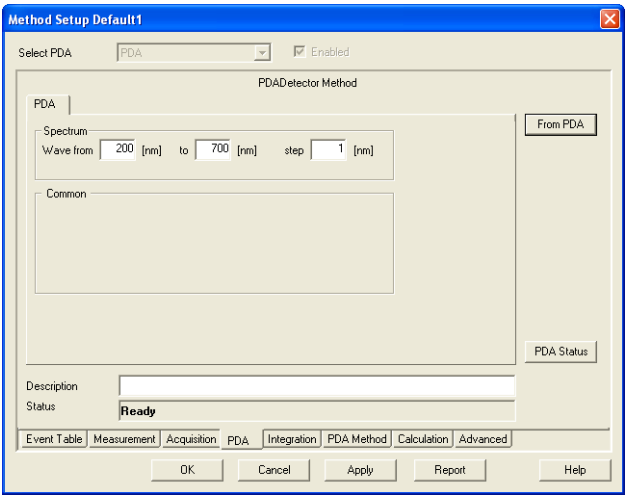


Fig 24: Method Setup - PDA

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.

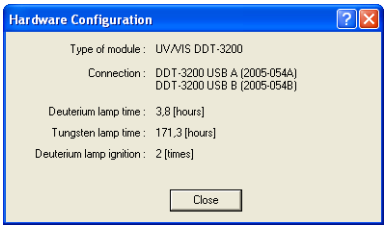


Fig 25: Hardware Configuration

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 (1V FS)	10	22
Channel 3 (1V FS)	11	23
Channel 2 (1V FS)	12	24
Channel 1 (1V FS)	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.