DataApex
Clarity™
CHROMATOGRAPHY SOFTWARE

AGILENT 1100/1200

Clarity Control Module   ENG

Author: MP

Contents

To facilitate the orientation in the **Agilent 1100/1200** manual and **Clarity** chromatography station, different fonts are used throughout the manual. Meanings of these fonts are:

> *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.
>
> WORK1 (capitals) indicates the name of the file and/or directory.
>
> *ACTIVE* (capital italics) marks the state of the station or its part.
>
> [Chromatogram](#) (blue underlined) marks clickable links referring to related chapters.

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 Agilent 1100/1200 Control Module

The **Agilent 1100** driver can control Agilent **1100 series** and **1200 series** (in 1100 emulation mode) HPLC systems with:

- DAD*, MWD*, VWD, FLD and RID detectors
- Quarternary, Binary and Isocratic Pumps
- Column compartments
- Autosamplers (standard and thermostated)

Note: For the 1200 series compatibility, please refer the Agilent 1100/1200 Series Firmware Upgrade Guide.

We recommend to use **Agilent ICF** control module which supports complete list of **Agilent LC instruments** and is regularly updated to support latest firmwares of instruments. Refer to www.dataapex.com/icf.
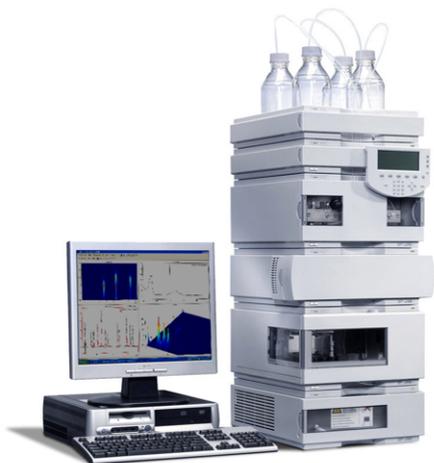
Fig. 1: Agilent 1100

The direct control can be performed via

- 82357A USB/GPIB Interface
- 82350A PCI/GPIB Interface
- LAN

Note: The **82355** and **82431 ISA/GPIB Interfaces** are not supported.

* From the **G1315** (DAD) and **G1365** (MWD) modules, only the -A and -B subtypes can be controlled using the **Clarity** 1100 driver. The -C and -D types use different protocol and cannot be downgraded to the 1100 operation mode.

Data Acquisition can be performed via

- GPIB - **Clarity** Digital Data Acquisition
- LAN - **Clarity** Digital Data Acquisition
- ANALOG - analog signal to A/D converter (e.g. **INT7** or **U-PAD**).

Note: GPIB communication is not supported since Windows 7.

2 Requirements

- **Clarity** Installation CD ROM with LC Control module (p/n A24).
- AS control module (p/n A26) when the autosampler is used.
- PDA Extension (p/n A29) when the DAD or FLD detector is used.
- Cross LAN cable (p/n SK08) and the LAN card in the PC for the newer **Agilent 1100** and all **Agilent 1200** systems. For older **Agilent 1100** systems, GPIB interface may be necessary. This consists of:
  - either 82357A PCI/GPIB interface card, GPIB cable and free PCI slot in the PC.
  - or 82350A USB/GPIB interface card and free USB port in the PC.

Note: The interface cards and GPIB cable are available from Agilent or 3rd parties only.

Caution: If you want to use the GPIB interface, install the **IOLib Suite** first. It can be found on the **Clarity** Installation CD in the directory HW_DRIVERS\AGILENT or download the newest version from the Agilent website.

Caution: GPIB communication interface is not supported since Windows 7.

Caution: It is only possible to control one **Agilent 1100** system via a single GPIB interface, for more systems more GPIB interface cards are necessary. No such restrictions apply for LAN communication.

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

Caution: Check your **Agilent 1100** for available communication options. In older systems, the LAN communication interface was optional and HP-IB standard. In recent new systems and in the 1200 series modules the HP-IB port is no more present.

Caution: Before you start **Clarity**, ensure there is not any other application or the **Agilent Handheld Controller** active and controlling the **Agilent 1100** instruments.

2.1 Compatible Agilent 1100/1200 Devices

Clarity is able to control **Agilent 1200** devices only if their firmware is compatible with **1100** series (firmware version series A.XX). Firmware versions A.06.0X used in currently delivered (as for 2008/2009) **Agilent 1200** devices were tested with **Clarity** successfully. The minimum recommended firmware version will be the **A.05.06-10** set.

Firmware change can be performed by **Agilent** service at delivery, the necessary tools and files are also available on the **Chemstation Installation CD** or can be downloaded from **Agilent** web pages. More info can be found in Agilent 1100/1200 Series Firmware Updates Manual Part Number 01100-90110 available on their web pages.

Tab. 1: The following Agilent 1100/1200 modules with the respective 1100 compatible firmware revision are supported by Clarity Agilent 1100 LC system driver:

Agilent Device	Type
G1310A	Isocratic Pump
G1311A	Quaternary Pump
G1312A	Binary Pump
G1313A	Autosampler
G1329A, G1330A, G1330B	Thermostatted Autosampler
G1314A, G1314B	Variable Wavelength Detector
G1365A, G1365B	Multiple Wavelength Detector
G1315A, G1315B	Diode Array Detector
G1321A	Fluorescence Detector
G1362A	Refractive Index Detector
G1316A, G1316B	Thermostatted Column Compartment

The DAD and MWD detector models **G1365C MWD SL**, **G1365D MWD** cannot go below firmware version B.01.01/B.01.04 and will not work in 1100 emulation mode and are not supported by the **Clarity Agilent 1100 HPLC System** driver.

3 Installation procedure

The installation procedures of the Agilent 1100 and 1200 modules are described in this section.

3.1 Installing the GPIB interface in the PC

Caution: If you are using the **82357A USB/GPIB** Interface, then leave out the first step and plug in the GPIB device after you have installed the drivers.

- Insert the **82350A PCI/GPIB** Interface in the PCI slot.
- Install the corresponding drivers (SICL and VISA) provided by the interface manufacturer.

Caution: In **Windows Vista** and **7**, run the installation as administrator (right-click on the installation executable file and select *Run as administrator*).

Note: The communication was tested on the GPIB driver library version M01.01. The IO libraries are also available on www.agilent.com/find/iolib.

- (Plug in the **82357A USB/GPIB** Interface).
- In the right part of the Windows taskbar click the *IO* icon.

Fig. 2: Popup menu of the IQ icon

- In the *Agilent IO Libraries Configuration* dialog select your GPIB card.
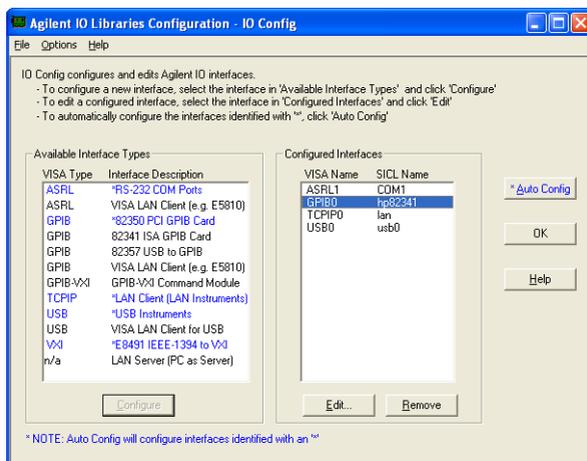
Fig. 3: Agilent IO Libraries Configuration - IO Config

- Press *Edit* to invoke the *Card Configuration* dialog.

Fig. 4: 87350 PCI GPIB Card Configuration

- Set the *SICL Interface Name*.

The *BUS Address* must be different from the address of any of the other components in the **Agilent 1100** configuration - recommended values are 21 or 30 (21 is offered as default).

Note: Should the setting be compatible with the **Chemstation** the *SICL Interface Name* must be "**HP82341**").

Write down the *SICL Interface Name* and *BUS Address* fields it will be necessary to set these values later also to the *Agilent 1100 Configuration* dialog.

- Connect the **Agilent 1100** to the PC by GPIB interface.

Caution: It is recommended to connect the **GPIB cable** between the **PC** and the **Agilent 1100** component with the largest amount of communication. This is usually the **DAD** detector. If it is not present in the set then any other detector (MVD, WVD, FLD, etc.)

- Turn the power on (both PC and **Agilent 1100**).
- Review the GPIB settings.

3.2 LAN card setting

- To operate properly in a network environment, the LAN Interface must be configured with valid TCP/IP network parameters. These parameters are:
  - IP address
  - Subnet Mask
  - Default Gateway
- There are several different Init modes for setting the IP address of the **Agilent 1100** system selectable by dip switch settings on the LAN communication board.

SW 4	SW 5	SW 6	Init Mode
OFF	OFF	OFF	Bootp
OFF	OFF	ON	Bootp & Store
OFF	ON	OFF	Using Stored
OFF	ON	ON	Using Default
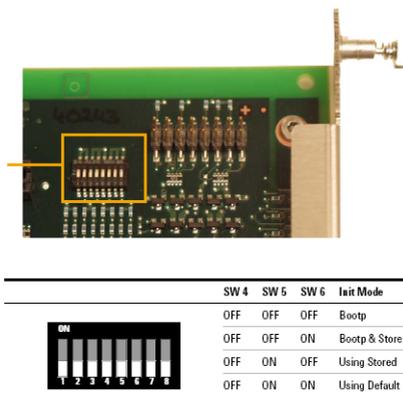
Fig. 5: LAN card DIP Switches

3.2.1 Default settings

- The factory set "*Using Default*" option (*SW5 ON* and *SW6 ON*) uses fixed IP address **192.168.254.11**. In case the 1100 is connected directly to PC, it is the recommended setting, please see the chapter **"Single PC & network connection"** on pg. **13**.
- For the LAN card in the PC use TCP/IP settings with a fixed IP address, for example:

IP address: 192.168.254.12
Subnet mask: 255.255.255.0

Note: The last IP address section should be different from the 1100 IP address.

- When connected to a network, the address above should be assigned to the 1100 system (contact your LAN administrator).

3.2.2 Stored Settings

- When this address could not be used due to network constraints, it can be changed from the default settings by following procedure:

- Use the *Run* command from the Windows *Start* menu. Run the CMD.EXE with following commands:

Note: It is necessary to have Telnet client enabled. The status of Telnet client can be modified in the *Windows*.
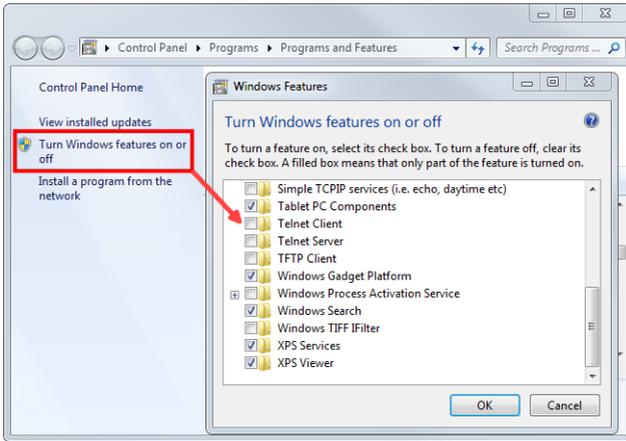
Fig. 6: Windows 7 - Telnet client
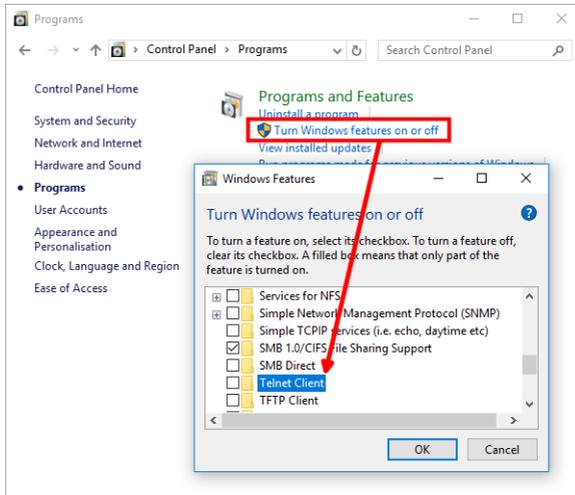
Fig. 7: Windows 10 - Telnet client

telnet 192.168.254.11 (default or stored address)

IP 192.168.254.12 (desired IP address)

Quit

- After this switch off the **Agilent 1100** and change the dip switch settings on the LAN card to "*Using Stored*" (*SW5 ON* and *SW6 OFF*).

. . . .

Note: The stored address can be also changed using the **Handheld Controller** (G1323A/B).

3.2.3 Bootp Settings

The **Chemstation** usually uses the **bootp server** to assign an IP address to the **Agilent 1100** instruments. The DIP switches on the LAN card are *SW5 OFF* and *SW6 ON* or *OFF* in such case. Set the appropriate IP address according to the bootp manager settings in **Agilent 1100** configuration too.

. . . .

Note: Detailed description of the possible LAN interface card settings can be found in the **Agilent G1369A LAN Interface User Manual** (Agilent P/N G1369-90000).

. . . .

Caution: In case you want to use J4100A JetDirect card (alternative to HP JetDirect Print Servers 600N/400N/500X/300X) we don't support it and don't guarantee the functionality.

3.3 Connections

3.3.1 Wiring

In case of complete system with autosampler, pump and detector only the HP-IB communication line is needed.

When using a system without autosampler or single modules (detectors, pumps) only, they need to be started using the Remote external event contact connector.

The connector is 9 pin Sub D Receptacle (Canon female) on the backside of the module, marked Remote. Use the Pin 1 to Pin 3 (Start) contacts to connect the injector. The pins 1 to 8 may be used to Stop the run alternatively.

Caution: Next to it is another connector of the same type marked RS232.

3.3.2 Description of connectors

LAN interface

The LAN interface board is installed usually in only one component of the **Agilent 1100** system. On others a cover plate is in its place.
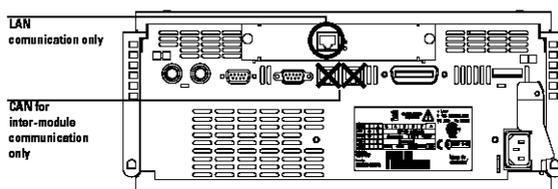
Fig. 8: Back side of the Agilent 1100 and the LAN connector

Caution: Be careful that you connect the LAN cable to the **LAN Interface** and NOT to one of the CAN connections. The CAN bus uses 12-Volt signals, and a misconnection to the CAN bus may destroy network equipment on the other end of the cable.

GP-IB communication

The HP-IB connector is a standard on the **Agilent 1100** series modules.
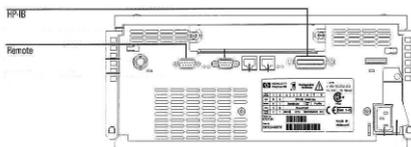
Fig. 9: Back side of the Agilent 1100 and the GP-IB

Tab. 2: General-purpose remote cable pin layout and colours:

PIN	HP 1100	Signal Name	Active (TTL)
1	White	Digital Ground	

PIN	HP 1100	Signal Name	Active (TTL)
2	Brown	Prepare run	Low
3	Gray	Start	Low
4	Blue	Shut donw	Low
5	Pink	Not Connected	
6	Yellow	Power on	High
7	Red	Ready	High
8	Green	Stop	Low
9	Black	Start request	Low

3.3.3 Recommended GPIB addresses

Tab. 3: Default GP-IB Addresses:

Device	Adress	Device	Adress
Autosampler	28	**Autosampler**	28
Pump	22	**RID**	29
FLD	23		
VWD	24	**Autosampler (HP 1050)**	18
Agilent 8453	25	**Pump (HP 1050)**	16
DAD/MWD	26	**VWD (HP 1050)**	10
Column Compartment	27	**DAD (HP 1050)**	17

For GP-IB board is recommended to use the **Address 21** (default) or **30**.

3.3.4 Single PC & network connection

A single PC equipped with LAN card can be used together with **Agilent 1100**. When using a **switch** or a **hub**, multiple **Agilent 1100** can be connected to one PC.

Settings

PC: LAN card, TCP/IP protocol.

Both PC and **Agilent 1100** should be configured on the same IP range.

. . . .

Caution: Crossed LAN cable is required (in case the **Agilent 1100** is connected to LAN card directly, without using the **switch**).

Tab. 4: Recommended IP settings:

	Agilent 1100	LAN card
IP	192.168.0.200	192.168.0.1
Port	80	- - -
Subnet Mask	255.255.255.0	255.255.255.0
Default Gateway	192.168.0.1	192.168.0.1
Accept From IP	0.0.0.0	- - -
Accept From Subnet Mask	0.0.0.0	- - -

Firewall

Ensure that the firewall does not block communication from the **Agilent 1100**.

Internet connection

Be aware that many Internet connections are provided using the LAN card. If this is the case a separate LAN card must be configured for each Internet and **Agilent 1100**.

3.4 Clarity Configuration

Caution: Before you start configuring the **Agilent 1100** in **Clarity**, ensure there is not any other application or the **Agilent Handheld Controller** active and controlling the instruments.
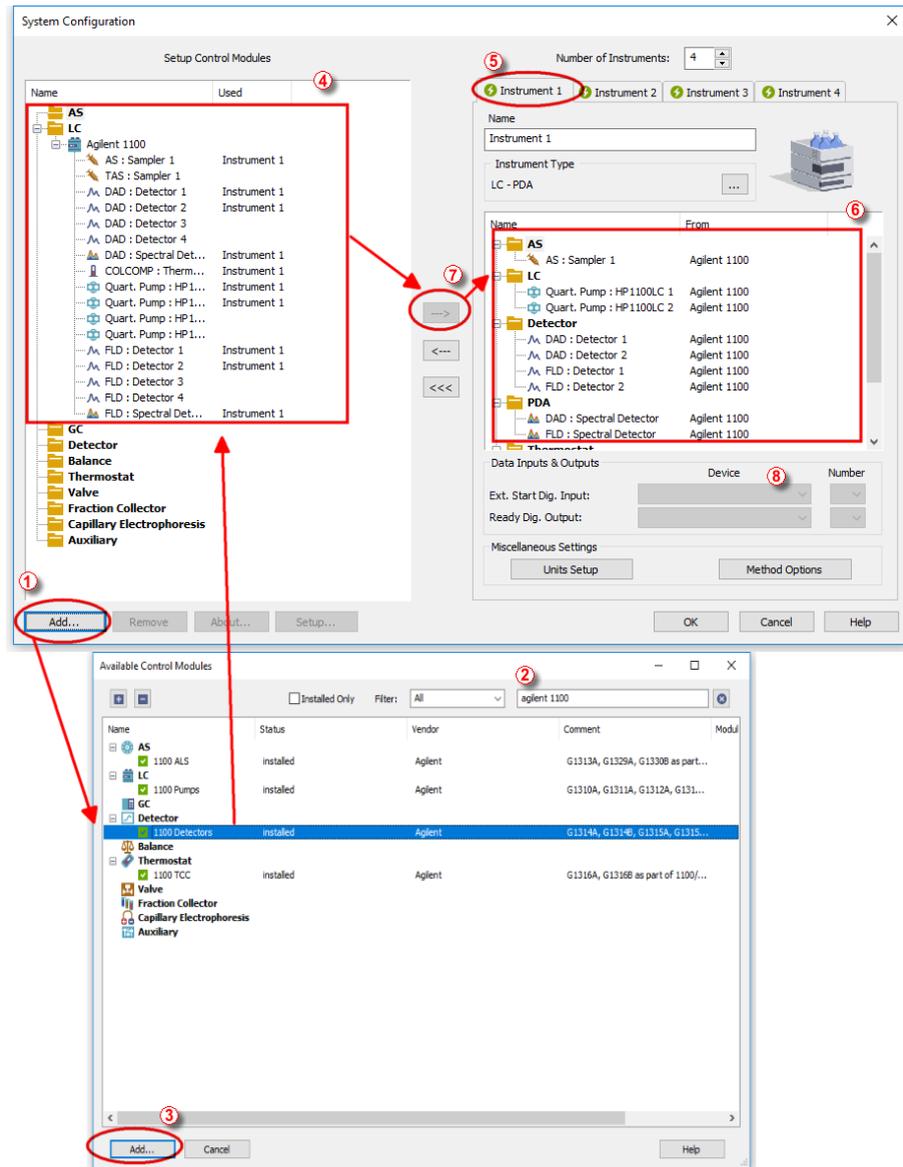
Fig. 10: How to add Agilent 1100

- • Start the **Clarity** station by clicking on the ⚊ icon on the desktop.
- • Invoke the *System Configuration* dialog accessible from the *Clarity* window using the *System - Configuration...* command.

- Press the *Add* button ① (see **Fig. 10** on pg. **15**.) to invoke the *Available Control Modules* dialog.
- You can specify the searching filter ② to simplify the finding of the driver.
- Select the **1100 Detectors** and press the *Add* ③ button.

The Agilent 1100 Setup dialog will appear.
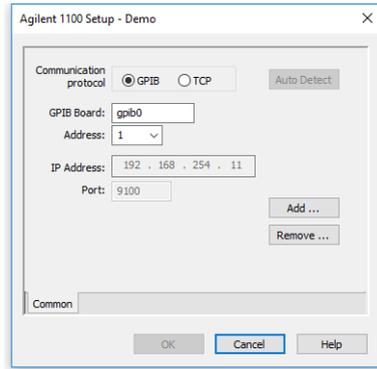
Fig. 11: Agilent 1100 Setup

If you have LAN skip to LAN communication section.

GPIB communication

- Set the GPIB *Board* name.

. . . .

Note: (Use the *SICL Name* set for the board in the Agilent IO Libraries configuration - IO Config window).

- Set the *Address* according to the BUS Address of the **Agilent 1100** component that is physically connected with the PC.

It is recommended to connect the component with largest amount of communication, which is usually DAD detector.
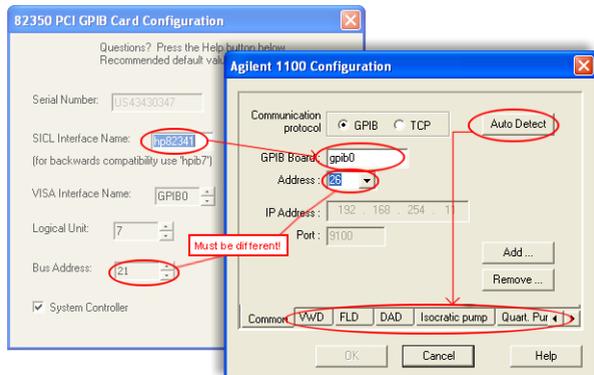

Fig. 12: GP-IB Configuration in the Agilent 1100

. . . .

Note: Default factory settings are listed in the chapter **"Recommended GPIB addresses"** on pg. **12**..

. . . .

Caution: The interface address set for the GPIB interface in Agilent IO Libraries configuration - IO Config window should be different from those used for the connected **Agilent 1100** components.

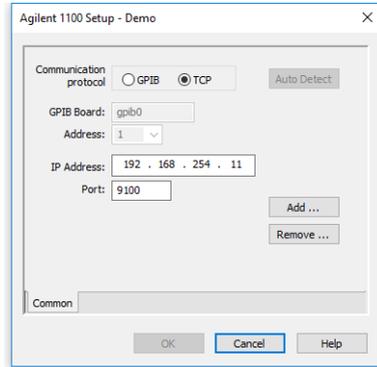Skip to the **Common procedures** section.

LAN communication

Fig. 13: LAN configuration in the Agilent 1100

- Set the **IP Address** of the **Agilent 1100** system.
- Set the *Port* address used (9100 by default).

Note: The Port address in the Agilent 1100 system can be changed using the Handheld Controller (G1323A/B).

Common procedures

Automatic Configuration

- Use the *Auto Detect* button.

Clarity will determine the **Agilent 1100** configuration automatically. Tabs of individual components of the **Agilent 1100** configuration will appear.

- Go to the individual tabs and set the desired parameters for each component (e.g. names of detectors, etc.)

Manual Configuration

Note: Manual configuration can be performed if the automatic configuration did not detect all components correctly or if you want to customize the configuration settings.

- Use the *Add* button to invoke the Add Module dialog and add the modules manually.
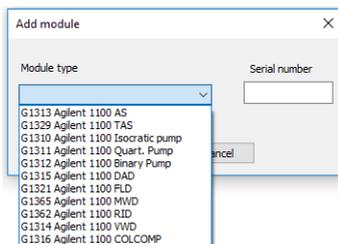
Fig. 14: Adding a controlled module of the Agilent 1100

- Select the desired module from the *Module Type* listbox and set the *Serial Number*.
- Click *OK*. A corresponding tab will appear in the *Agilent 1100 Setup* dialog.

Note: Repeat the above three steps to add all desired components.

- Go to the individual tabs and set the desired parameters for each component (e.g. names of detectors, etc.)
- Press the *OK* button.

Note: The Agilent 1100 Setup dialog is more closely described in the chapter **"Agilent 1100 Configuration - Common"** on pg. **21**.

- The Agilent 1100 item will appear in the *Setup Control Modules* list of the *System Configuration* dialog
- Drag and drop the desired **Agilent 1100**modules from the *Setup Control Modules* ④ list on the left side of the *System Configuration* dialog to the desired *Instrument* ⑤ tab on the right side ⑥ (or use the ⟶ button ⑦ to do so).

Caution: The spectral detector can be configured only if there is at least one detector signal from the same device configured on the **Clarity** Instrument.

3.5 First start of Clarity after configuration

At the first start **Clarity** may display a warning message that the stored **Agilent 1100** instrument method stored in **Clarity** does not match with the method in the device.
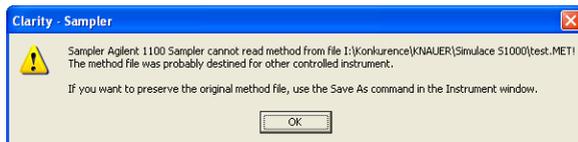

Fig. 15: Cannot read method message box

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 **Agilent 1100** instrument will appear (under default settings).
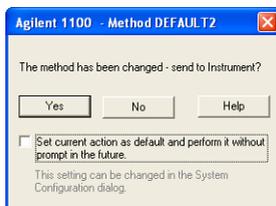

Fig. 16: Changed method dialog

- Click the *No* button.

If you have some methods already stored in the **Agilent 1100** device, it is possible to download them to **Clarity**.

- Open the respective tabs of the *Method Setup* dialog: *AS*, *Acquisition*, *Thermostat* and download the methods using the *From ..(device name)..* button.

. . . .

Note: It is currently <u>not possible</u> to download the **LC** method from the device to **Clarity**.

3 Using the 1100 control modules

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 **Agilent 1100** instrument (device) method.

| Event Table | AS | LC Gradient | LC | Measurement | Acquisition | Thermostat | Integration | PDA Method | Calculation | Advanced |

The *Method Setup* tabs contain:

The *From …* button (e.g. From AS, From DAD, etc.) that loads the instrument method from the corresponding device to the template method that is currently opened in the *Instrument* window.

The *To …* button (e.g. To AS, To DAD, etc.) that sends the sampler part of the template method opened in the *Instrument* window (and displayed in the individual tabs of *Method Setup* dialog) from **Clarity** to the corresponding device.

The *… Status* opens the *Hardware Configuration* dialog listing the available hardware features of current configuration and enabling manual control of selected functions.

....

Caution: If the module does not get the method file, for example after the *Instrument* window opening or method file change, the *Single Run* measurement will run with the old method loaded to the **Agilent 1100** control module.

3.6 Agilent 1100 Configuration - Common

This dialog sets the basic communication parameters of the GPIB interface. After the communication with the interface is properly established the *Auto Detect* button will automatically detect and connect all Agilent 1100 components.
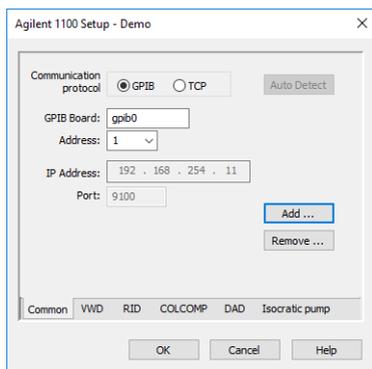

Fig. 17: Agilent 1100 Configuration - Common

It is also possible to add or remove components manually. However this is recommended only in specific cases and for advanced users.

Board
Sets the GPIB interface name. Use the *SICL Name* set for the board in the Agilent IO Libraries configuration - IO Config window.

"LAN card setting" on page 8 to learn how to correctly set this field.

Address

- Sets the BUS Address for the **Agilent 1100** component that is connected to the GPIB cable.

. . . .
Note: Default factory settings are listed in the chapter **"Recommended GPIB addresses"** on pg. **12**.

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The interface address set for the GPIB interface in Agilent IO Libraries configuration - IO Config window should be different from those used for the connected **Agilent 1100** components.

"LAN card setting" on page 8 to learn how to correctly set this field.

Auto Detect
Automatically detects current configuration of the **Agilent 1100** set.

Add / Remove
Invokes the Add Module / Remove Module dialog described in following chapter.

3.7 Add Module

Adds tabs corresponding to the specific configuration of the **Agilent 1100** set to the Agilent 1100 Configuration dialog.

Fig. 18: Add Module

Module Type
Select the desired module type to add a corresponding tab to the Agilent 1100 Configuration dialog.

Serial Number
States the serial number that can be found on a label on the device.

3.8 Autosampler AS (G1313) and TAS (G1329)

3.8.1 Agilent 1100 Configuration
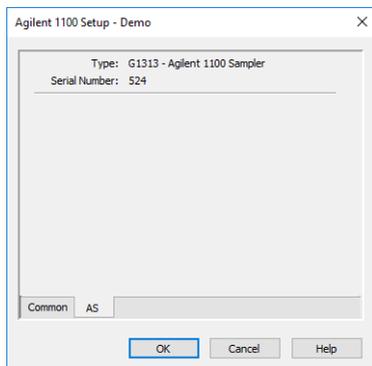

Fig. 19: Agilent 1100 Configuration - TAS

Type
Type of **Agilent 1100** component indicated by name and code number.

Serial Number
Serial number must correspond to the serial number imprinted on a label on the device.

3.8.2 Method Setup - AS - Injection

The *Injection* tab specifies the basic autosampler settings.

Standard Injection
Injection will be performed without wash or program.

Injection with Needle Wash
Before each injection the needle will be washed in the vial specified in the *Wash Vial* field.

Wash Vial
Sets the number of the vial to be used for needle washing in the *Injection with Needle Wash* mode.

Injection Program
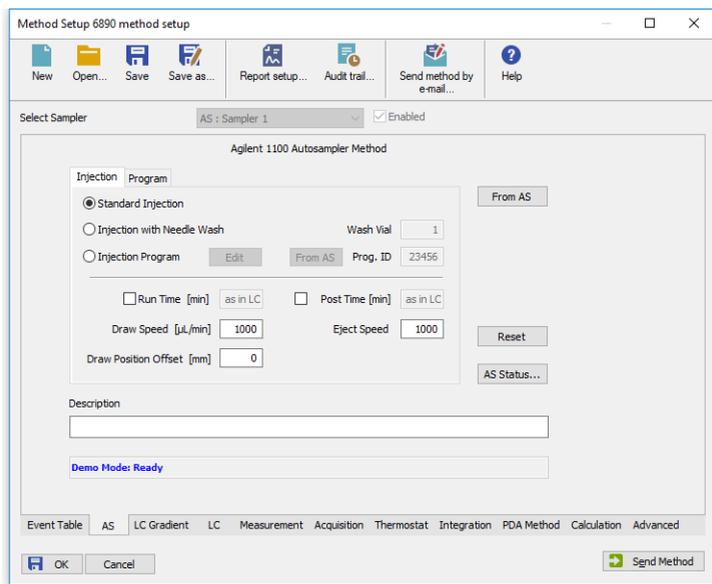Applies injection program specified in the Program tab.

Fig. 20: Method Setup - AS Control - Injection

Click *Edit* to switch to the Program tab.

From AS will load injection program with the specified *Prog.ID* from the autosampler.

Run Time [min]

Run time of the analysis. Data acquisition will be finished after the specified time unless a shorter time is specified in another module.

Post Time [min]

The system will stay in running state for the specified time after the analysis is finished

Draw Speed [µl/min]

Sets speed for drawing sample in micro litres per second. This parameter determines how fast the metering device moves to draw up sample.

Eject Speed [µl/min]

Sets speed for ejecting sample in micro litres per second. This parameter determines how fast the metering device moves to eject sample.

Draw Position Offset [mm]

Needle draw/eject position offset.

Defines the offset of the needle from the default draw position in a vial.

0 means default draw position, negative values move needle closer to the bottom of the vial.

3.8.3 Method Setup - AS - Program

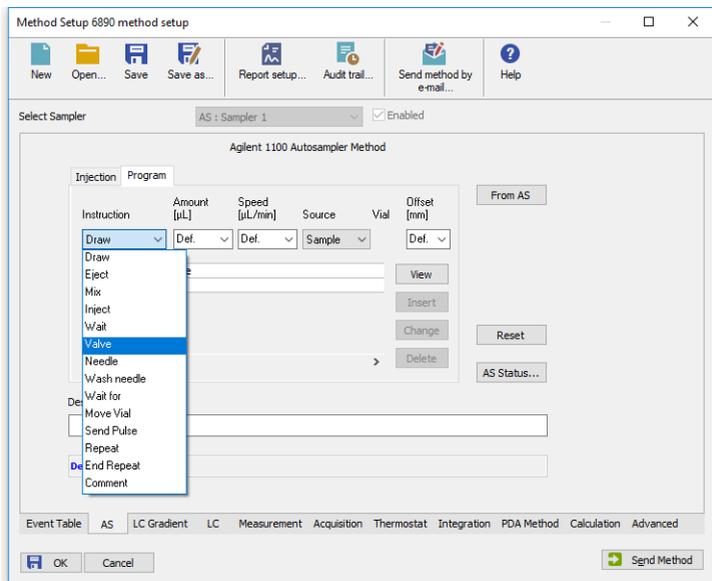The *Program* tab is used to display and modify injection program of the autosampler.

Fig. 21: Method Setup - AS Control - Program

Working with the **Injection program** is simple:

Compose the command in the line above the table. Use the *Insert* button to add it to the table and the *Change* and *Delete* buttons to modify the program table

Instruction
Displays a list of available operations.

See the **Agilent 1100** User manual for detailed description.

Amount [µl]
Specifies the volume used in operation

Speed [µl/min]
Sets speed for drawing/ejecting in micro litres per second. This parameter determines how fast the metering device moves during the selected operation.

Source
Displays a list of options

Vial
Specifies used vial number (where appropriate)

Offset [mm]
Defines the offset of the needle from the default draw position in a vial.

0 means default draw position, negative values move needle closer to the bottom of the vial.

View

Copies the content of the selected line to the fields above the table.

Insert

Inserts a line bellow the active line containing the instruction defined in the fields above the table.

. . . .

Caution: The button is active only when the *Injection Program* is selected on the Injection tab.

Change

Replaces current line with the instruction specified in the fields above the table.

. . . .

Caution: The button is active only when the *Injection Program* is selected on the Injection tab.

Delete

Deletes selected line.

. . . .

Caution: The button is active only when the *Injection Program* is selected on the Injection tab.

3.8.4 Hardware Configuration

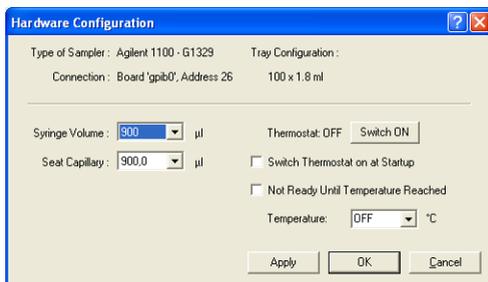This dialog is invoked by pressing the *AS Status* button in the Method Setup - AS dialog.

Fig. 22: Hardware Configuration

In the top section the *Type of Sampler*, *Connection* and *Tray Configuration* are displayed.

Syringe Volume

Selects the volume of the syringe in *µl*.

Seat Capillary

Selects the volume of the seat capillary in *µl*.

Following items are displayed only for the **thermostated sampler (TAS)**

Thermostat

Displays the actual status, the button allows for manual switching it **ON/OFF**

Switch thermostat on at Startup
The thermostat will be set **ON** during the initialization.

Not Ready until Temperature Reached
The autosampler will be "Not Ready" until the set temperature +/-2 C is reached.

Temperature
Setting of the desired temperature.

3.8.5 Device Monitor

The *Device Monitor* window can be invoked by the *Monitor - Device Monitor* command from the **Instrument** window or using the Device Monitor 🌀 icon.
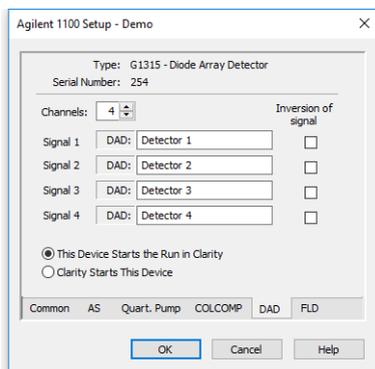

Fig. 23: Device Monitor of Agilent 1100 AS

3.9 DAD (G1315)

3.9.1 Agilent 1100 Configuration

Fig. 24: Agilent 1100 Configuration - DAD

Type
Type of **Agilent 1100** component indicated by name and code number.

Serial Number
Serial number must correspond to the serial number imprinted on a label on the device.

Channels
Number of independent data channels.

Signal n
Sets the names of individual signals (detectors).

Inversion of Signal

Inverts the polarity of the respective signal.

This Device Starts the Run in Clarity / Clarity Starts This Device

This radiobutton enables to start the analysis run from the **Clarity**. With *This Device Starts the Run in Clarity* checked, the device is started prior to **Clarity** by its front button or autosampler connected to this device and passes the start to **Clarity**. When *Clarity Starts This Device* is checked, **Clarity** is started prior to this device by separately wired autosampler, Start button in Single Run or different device and then starts this device.

Note: The *This Device Starts the Run in Clarity* option is checked by default.

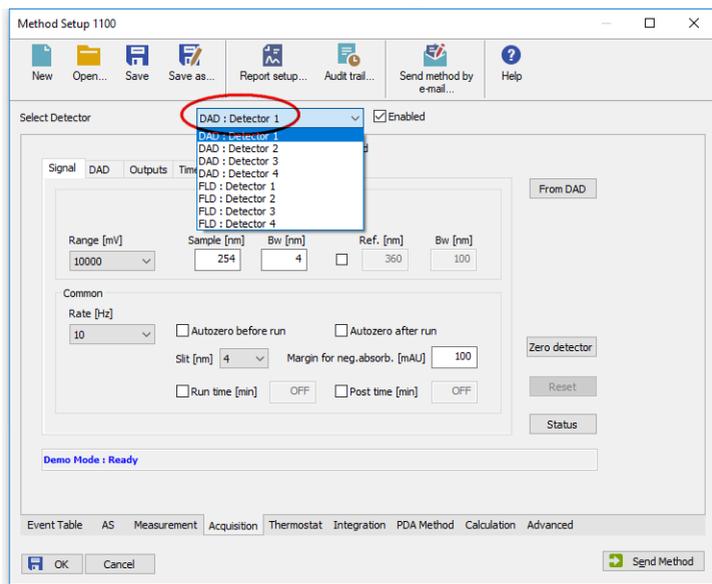## 3.9.2 Method Setup - Acquisition - Signal

Fig. 25: Method Setup - Acquisition - Signal

Note: The digital detectors distinguish Start and Stop events so it is not necessary to specify the (Start-Start, Start-Restart, etc. options like with the A/D converters.

Range [mV]

Sets the signal range of the detector.

Sample [nm]

Sets the centre of the wavelength of the detector.

Bw [nm]

Sets the bandwidth for the (sample) wavelength in nm.

Valid Values: *2 .. 400* nm

Use reference (unlabeled checkbox)
Use the reference wavelength (to compensate for lamp fluctuations)

Ref. [nm]
Sets the center of the reference wavelength in nm.
Valid Values: *0*, *190* .. *950* nm

Bw [nm]
Sets the bandwidth for the reference wavelength in nm; must be 0, if reference is switched off
($190 <= Ref. - Bw / 2 <= 950$)
Valid Values: *0.2* .. *400* nm

Common

Rate [Hz]
Selects the data acquisition rate for the stored signals.

Autozero Before Run
Resets the detector to zero at the beginning of the analysis

Autozero After Run
Resets the detector to zero after finishing the analysis.

Slit [nm]
Defines the width of the built-in microslit in its open-position.
The instrument performs a zero automatically, whenever the *Slit* parameter has been changed.

Margin for neg. absorb [mAU]
Maximal negative value of absorbance that will be still taken into account.

Run Time [min]
Run time of the analysis. Data acquisition will be finished after the specified time unless a shorter time is specified in another module.

Post Time [min]
The system will stay in running state for the specified time after the analysis is finished
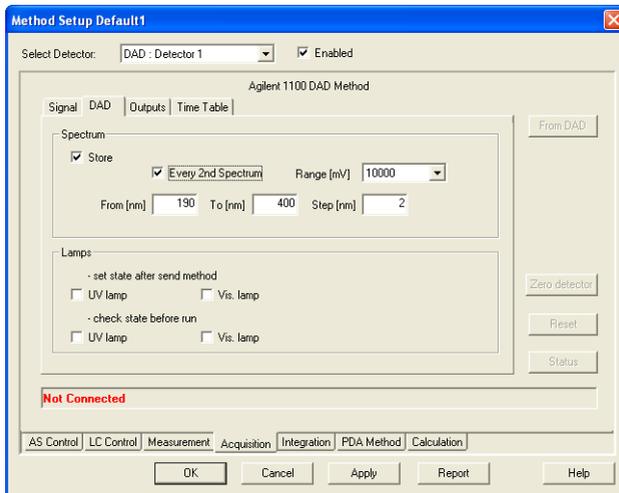
3.9.3 Method Setup - Acquisition

Fig. 26: Method Setup - Acquisition - DAD

Spectrum

Store

Spectral data will be acquired and stored in the chromatogram.

Every 2nd Spectrum

Leaves out every second spectrum to reduce the data throughput.

Range [mV]

Sets the signal range for spectra.

From (x) To (xx) Step (xxx)

Sets the wavelength range and stepwidth for spectra. The stepwidth defines the distance [in nm] between two adjacent data points.

Valid Values:

From - 190 .. 950: lower wavelength limit [nm]

To - 190 .. 950: upper wavelength limit [nm]

Step - 1 .. 100: stepwidth [nm]

Lamps

Set state after send method

Checkboxes *UV Lamp* - *Vis Lamp* will switch the respective lamp ON after sending the method in case it is OFF.

Check state before run

Configure, if UV light source (*UV Lamp*) or visible light source (*Vis Lamp*) is required. Determines whether a method requires the selected lamp or not. The

module becomes *NOT READY* state if the respective lamp is switched off.
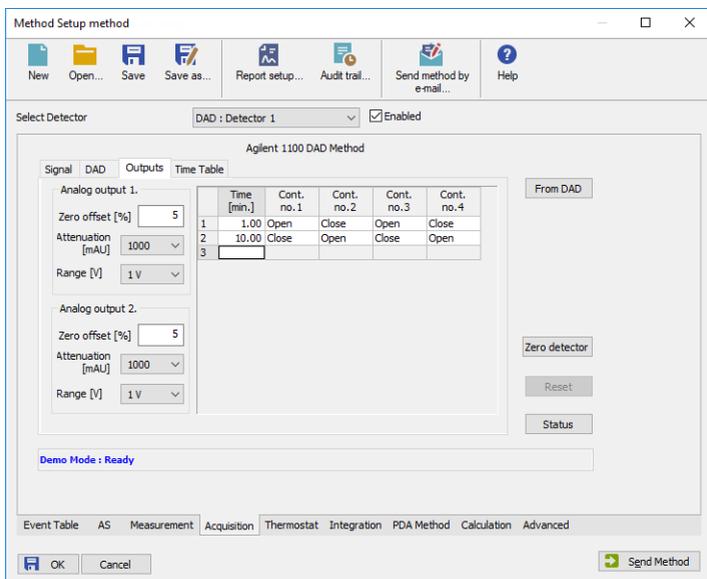
3.9.4 Method Setup - Acquisition - Outputs

Fig. 27: Method Setup - Acquisition - Outputs

Analog Output (x.)

Zero Offset [%]

Sets the zero offset voltage for *Analog Output 1 (2)* to a percentage of the full scale voltage.

Attenuation [mAU]

Selects analog output attenuation

The DAD offers two analog outputs: *Signal A* at *Analog Output 1* and *Signal B* at *Analog Output 2*.

The attenuation can be changed in power of 2 steps between *2000 mAU* and *0.98 mAU*.

Range [V]

Sets the output signal Range to 1 V or 0.1 V.

Table

The Output relays on detector are optional feature of certain **Agilent 1100** configuration.

If it is present in your configuration, then the table will enable to set the timetable of events to trigger these outputs.
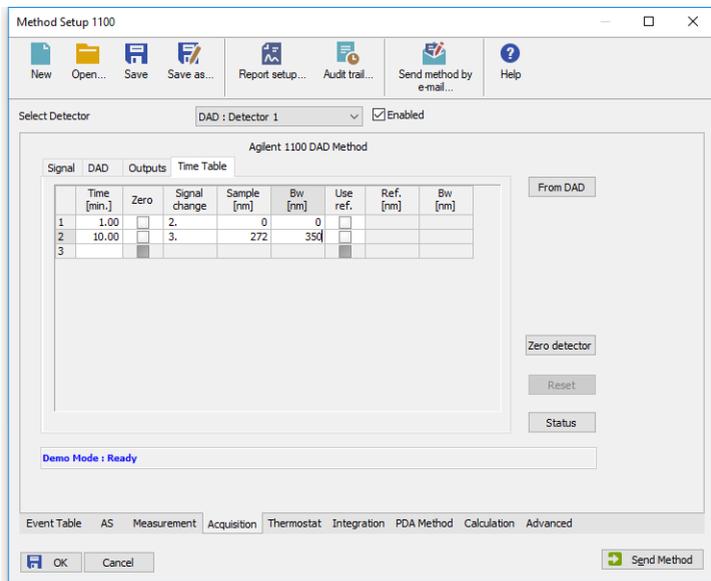
3.9.5 Method Setup - Acquisition - Time Table

Fig. 28: Method Setup - Acquisition - Time Table

Time [min.]
 Sets a time for the desired change. Zero time is not a permitted value.

Prep.
 Autozero will be performed when checked

Signal Change
 Select the signal (1-4) to set a new wavelength

Sample [nm]
 Set the sample wavelength

Bw [nm]
 Set the Sample bandwidth

Use ref.
 Reference wavelength will be used when checked

Ref. [nm]
 Set the reference wavelength

Bw [nm]
 Set the Reference bandwidth
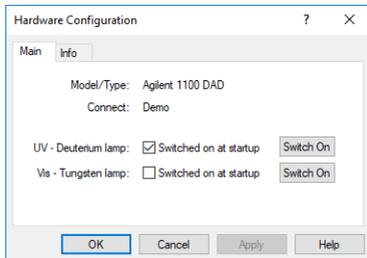
3.9.6 Hardware Configuration - Main

Fig. 29: Hardware Configuration - Main

UV - Deuterium lamp
Deuterium lamp configuration determines whether the Deuterium lamp will be switched on during **Agilent 1100** startup or not. The button enables to turn the lamp ON or OFF manually.

VIS - Tungsten lamp
Tungsten lamp configuration determines whether the Tungsten lamp will be switched on during **Agilent 1100** startup or not. The button enables to turn the lamp ON or OFF manually.

3.9.7 Hardware Configuration - Info
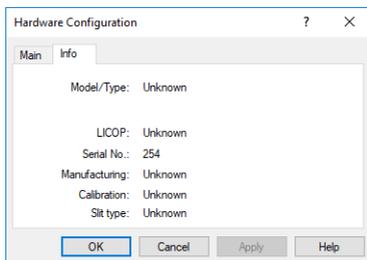Displays the configuration of the DAD detector.

Fig. 30: Hardware Configuration - Info

3.9.8 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.**
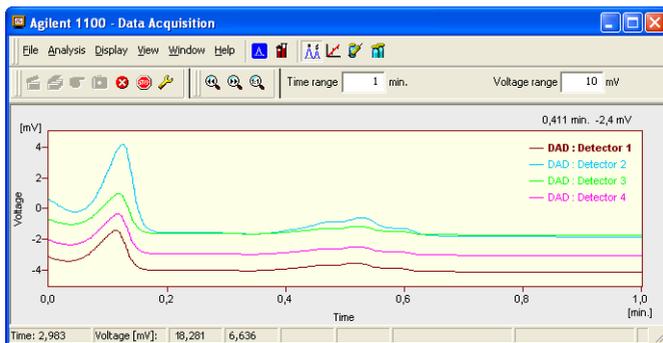

Fig. 31: Data Acquisiton

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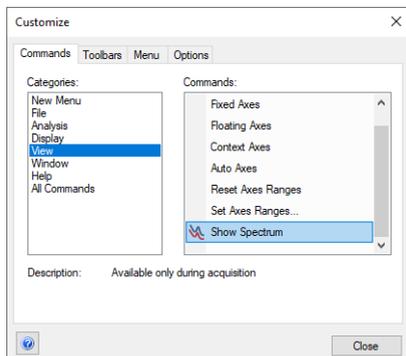

Fig. 32: Customize

It is also possible to add 📊 *Show Spectrum* icon to the toolbar for fast setting of the spectral mode (as well as ⁰✚ *Set Zero* and ⁰✚ *Reset Zero*).

To do this use the *View - Toolbars - Customize* command. The *Show Spectrum* icon can be found on the *Customize - Commands* dialog in the Analysis set of commands.

3.9.9 Device Monitor

The *Device Monitor* window can be invoked by the *Monitor - Device Monitor* command from the *Instrument* window or using the Device Monitor 🔵 icon. It allows to perform the *Zero Detector* action and switch the lamps on/off.
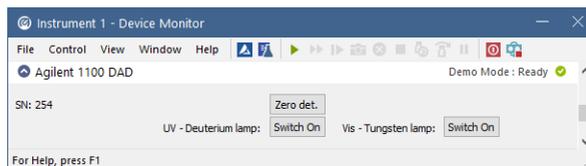

Fig. 33: Device Monitor of Agilent 1100 DAD

It is possible to control the detector operation during the analysis in the *Device Monitor* window.

Zero Detector
Sets the response of the detector to *0*.

Switch On (Off)
Turns the UV - Deuterium lamp or Vis - Tungsten lamp on/off.

3.10 FLD (G1321)
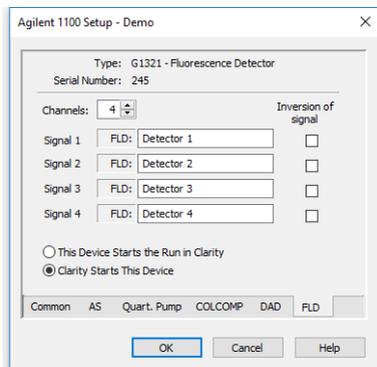
3.10.1 Agilent 1100 Configuration

Fig. 34: Agilent 1100 Configuration - FLD

Type
Type of **Agilent 1100** component indicated by name and code number.

Serial Number
Serial number must correspond to the serial number imprinted on a label on the device.

Channels
Number of independent data channels.

Signal n
Sets the names of individual signals (detectors).

Inversion of Signal
Inverts the polarity of the respective signal.

This Device Starts the Run in Clarity / Clarity Starts This Device
This radiobutton enables to start the analysis run from the **Clarity**. With *This Device Starts the Run in Clarity* checked, the device is started prior to **Clarity** by its front button or autosampler connected to this device and passes the start to **Clarity**. When *Clarity Starts This Device* is checked, **Clarity** is started prior to this device by separately wired autosampler, Start button in Single Run or different device and then starts this device.

Note: The *This Device Starts the Run in Clarity* option is checked by default.

3.10.2 Method Setup - Acquisition - FLD Parameters
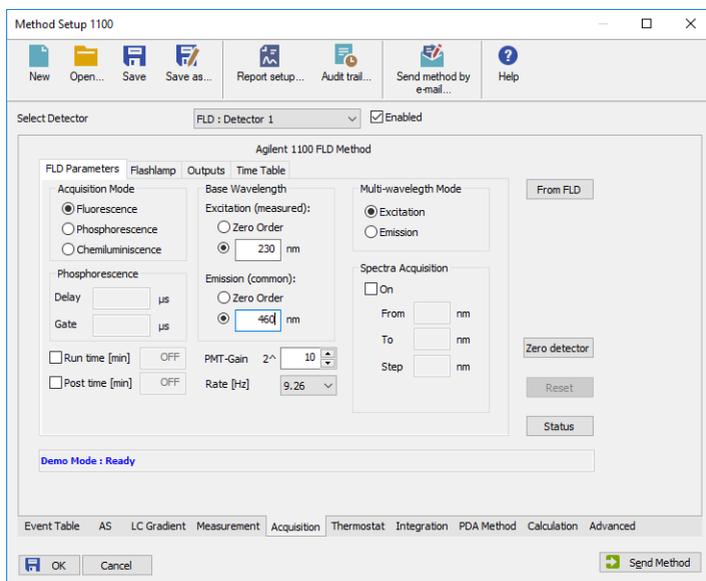
Sets the basic parameters of the FLD detector.

Fig. 35: Method Setup - Acquisition - FLD Parameters

Acquisition Mode
Selects among *Fluorescence*, *Phosphorescens* or *Chemoluminiscence* acquisition modes.

Phosphorescence
Sets the parameters of the Phosphorescence acquisition mode.

> **Delay [µs]**
> Determines the time between flash and Start_of_Integration.

> **Gate [µs]**
> Determines the time between Start of Integration and End of Integration.

Caution: If flash frequency is 370 Hz (the *Economy Mode* on the Flashlamp tab is checked) and *Delay + Gate* fields sum is greater than **4.5** msec then the flash frequency will automatically be reduced to 74 Hz!

Note: The digital detectors distinguish Start and Stop events so it is not necessary to specify the (Start-Start, Start-Restart, etc. options like with the A/D converters.

Base WaveLength
Sets the base wavelength of the Excitation and Emission for the selected detector.

Excitation (Detector1)
Sets excitation base wavelength for detector (channel) - 1, 2, 3 or 4.

Possible options are *Zero Order* or specifying a wavelength value (default is 460 nm)

Emission

Sets Emission base wavelength of the selected detector (channel) - 1, 2, 3 or 4.

Possible options are *Zero Order* or specifying a wavelength value (default is 460 nm)

PMT-Gain

Sets the sensitiveness (PMT-gain) of the photomultiplier.

Rate [Hz]

Sets the data output rate of the detector to the workstation.

The data rate cannot be changed during RUN mode of the detector.

Multi-wavelength Mode

Defines the Multi-Wavelength-Mode of the detector.

Note: **Clarity** Control module does not enable to switch the *Multi-wavelength Mode* OFF.

Switching between different multi- wavelength modes lasts from 20 up to 50 seconds, the module becomes NOT READY in-between.

> **Excitation**
>
> Multi excitation wavelength and excitation spectrum. Emission will be constant - EX_{1-4}/EM_1.

> **Emission**
>
> Multi emission wavelength and emission spectrum. Excitation will be constant - EX_1/EM_{1-4}.

Spectra Acquisition

Set parameters for acquisition of excitation/emission spectra (depending on the setting of the *Multi-wavelength Mode*).

If the *On* checkbox is not checked the spectra will not be acquired.

If it is *On*, the *From*, *To* and *Step* fields can be filled in to specify the spectrum to be acquired.

Note: A **Spectral Detector** must be configured on the **Clarity Instrument**. "Clarity Configuration" on page 14 example ④), otherwise this section will be disabled.
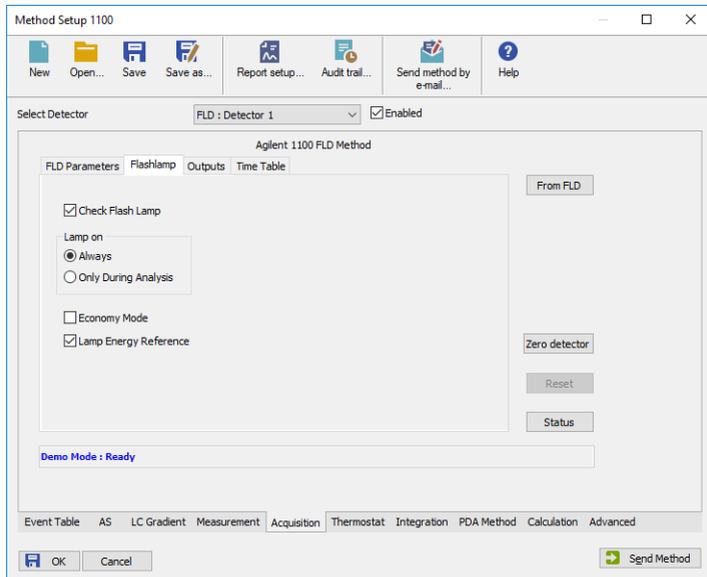
3.10.3 Method Setup - Acquisition - Flashlamp

Fig. 36: Method Setup - Acquisition - Flashlamp

Check Flash Lamp
Determines whether a method requires the flashlamp or not.
The module will get in *NOT READY* state if the flashlamp is switched off while this parameter is checked.

Lamp On
Sets the flashlamp off or on in different modes.
Always - Lamp will be always on.
Only During Analysis - Lamp will be ON only during analysis

Caution: The Lamp must be switched ON after the detector is switched on if the Only During Analysis option is active.

Economy Mode
Sets the Flashlamp Economy mode.

Tab. 5: Flash frequency according to mode:

	Multi wavelength mode
standard mode	flash frequency: 74.074 Hz flash energy: high
economy mode	flash frequency: 74.074 Hz flash energy: low

Lamp Energy Reference
Defines whether the lamp energy signal is used as reference for the fluorescence signal or not. The lamp energy signal is measured with the reference diode.
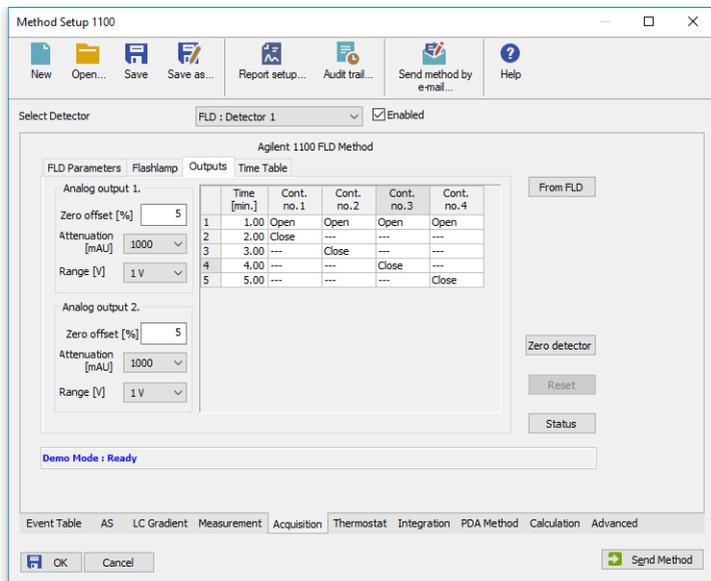
3.10.4 Method Setup - Acquisition - Outputs

Fig. 37: Method Setup - Acquisition - Outputs

Analog Output (X.)

Zero Offset [%]

Sets the zero offset voltage for *Analog Output 1 (2)* to a percentage of the full scale voltage.

Attenuation [mAU]

Selects analog output attenuation

The :Agilent 1100 - FLD offers two analog outputs: signal A at analog output 1 and signal B at analog output 2.

The attenuation can be changed in power of 2 between *1600 LU* and *0.2 LU*.

Range [V]

Sets the output signal Range to 1 V or to 0,1V

Table

The Output relays on detector are optional feature of certain **Agilent 1100** configuration.

If it is present in your configuration, then the table will enable to set the timetable of events to trigger these outputs.
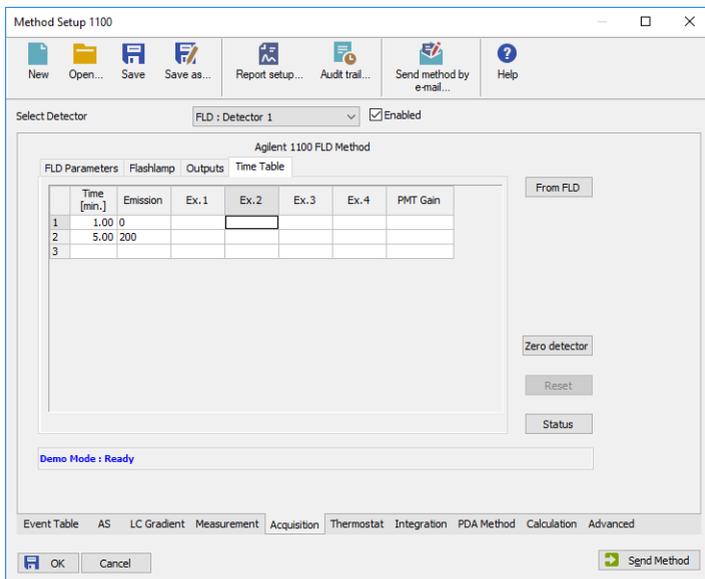
3.10.5 Method Setup - Acquisition - Time Table

Fig. 38: Method Setup - Acquisition - Time Table

Time
 Sets a time for the desired change. Zero time is not a permitted value.

Emission/Excitation
 Sets the Emission/Excitation wavelength (according to the multiwavelength mode selected

Ex. n/Em. n
 Sets the respective wavelengths according to the multiwavelength mode selected.

PMT Gain
 Sets the PMT Gain

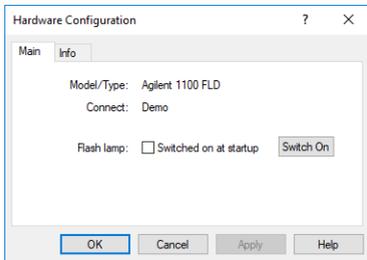## 3.10.6 Hardware Configuration - Main

Fig. 39: Hardware Configuration - Main

Flash lamp
Determines whether the flash lamp will be automatically switched on during **Agilent 1100** startup or not. The button enables to set the lamp ON or OFF manually.

3.10.7 Hardware Configuration - Info
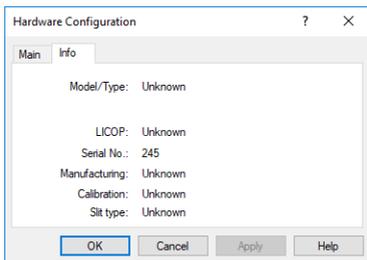
Displays the configuration of the FLD detector.

Fig. 40: Hardware Configuration - Info

3.10.8 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.**
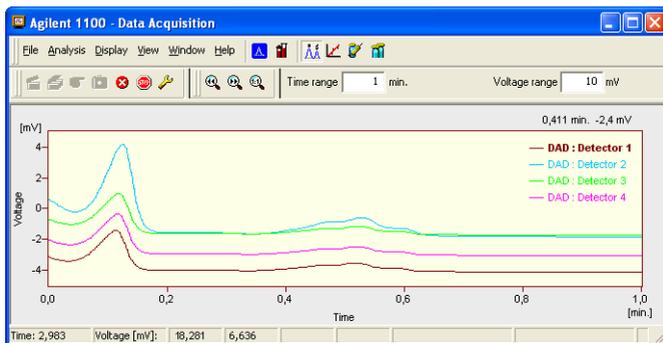

Fig. 41: Data Acquisiton

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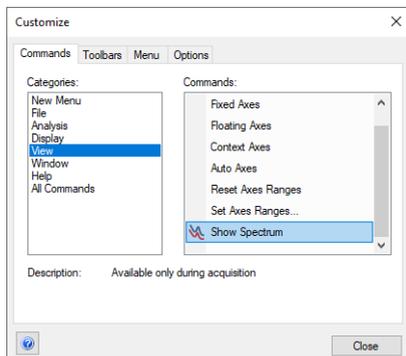

Fig. 42: Customize

It is also possible to add ▟▙ *Show Spectrum* icon to the toolbar for fast setting of the spectral mode (as well as ⁰⤒ *Set Zero* and ⁰⤒ *Reset Zero*).

To do this use the *View - Toolbars - Customize* command. The *Show Spectrum* icon can be found on the *Customize - Commands* dialog in the Analysis set of commands.

3.10.9 Device Monitor

The *Device Monitor* window can be invoked by the *Monitor - Device Monitor* command from the *Instrument* window or using the Device Monitor 🌀 icon. It allows to perform the *Zero Detector* action and switch the lamp on/off.
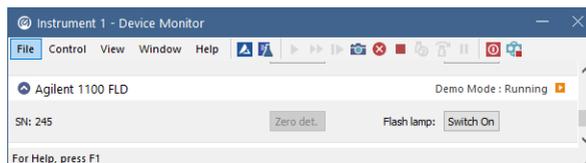

Fig. 43: Device Monitor of Agilent 1100 FLD

It is possible to control the detector operation during the analysis in the *Device Monitor* window.

Zero Detector
Sets the response of the detector to *0*.

Switch On (Off)
Turns the Flash lamp on/off.

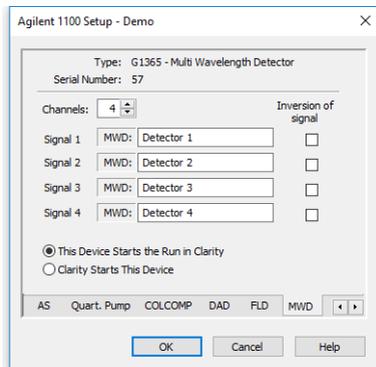## 3.11 MWD (G1365)

3.11.1 Agilent 1100 Configuration

Fig. 44: Agilent 1100 Configuration - MWD

Type
Type of **Agilent 1100** component indicated by name and code number.

Serial Number
Serial number must correspond to the serial number imprinted on a label on the device.

Channels
Number of independent data channels.

Signal n
Sets the names of individual signals (detectors).

Inversion of Signal
Inverts the polarity of the respective signal.

This Device Starts the Run in Clarity / Clarity Starts This Device
This radiobutton enables to start the analysis run from the **Clarity**. With *This Device Starts the Run in Clarity* checked, the device is started prior to **Clarity** by its front button or autosampler connected to this device and passes the start to **Clarity**. When *Clarity Starts This Device* is checked, **Clarity** is started prior to this device by separately wired autosampler, Start button in Single Run or different device and then starts this device.

Note: The *This Device Starts the Run in Clarity* option is checked by default.
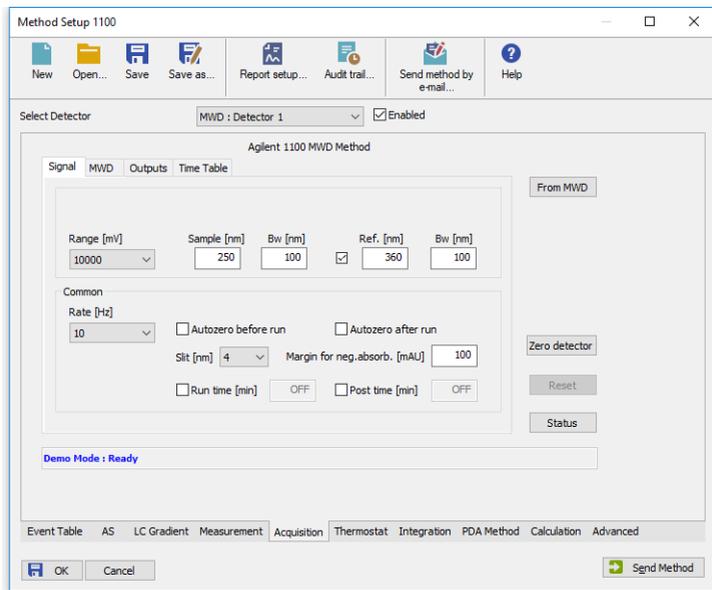
3.11.2 Method Setup - Acquisition - Signal

Fig. 45: Method Setup - Acquisition - Signal

Note: The digital detectors distinguish Start and Stop events so it is not necessary to specify the (Start-Start, Start-Restart, etc. options like with the A/D converters.

Range [mV]
Sets the signal range of the detector.

Sample [nm]
Sets the centre of the wavelength of the detector.

Bw [nm]
Sets the bandwidth for the (sample) wavelength in nm.
Valid Values: 2 .. 400

Use reference (unlabeled checkbox)
Use the reference wavelength (to compensate for lamp fluctuations)

Ref. [nm]
Sets the center of the reference wavelength in nm.
Valid Values: 0, 190 .. 950

Bw [nm]
Sets the bandwidth for the reference wavelength in nm; must be 0, if reference is switched off
$(190 <= Ref. - Bw / 2 <= 950)$
Valid Values: 0.2 .. 400

Common

Rate [Hz]
Selects the data acquisition rate for the stored signals.

Autozero Before Run
Resets the detector to zero at the beginning of the analysis.

Autozero After Run
Resets the detector to zero after finishing the analysis.

Slit [nm]
Defines the width of the built-in microslit in its open-position.

The instrument performs a zero automatically, whenever the *Slit* parameter has been changed.

Margin for neg. absorb [mAU]
Maximal negative value of absorbance that will be still taken into account.

Run Time [min]
Run time of the analysis. Data acquisition will be finished after the specified time unless a shorter time is specified in another module.

Post Time [min]
The system will stay in running state for the specified time after the analysis is finished
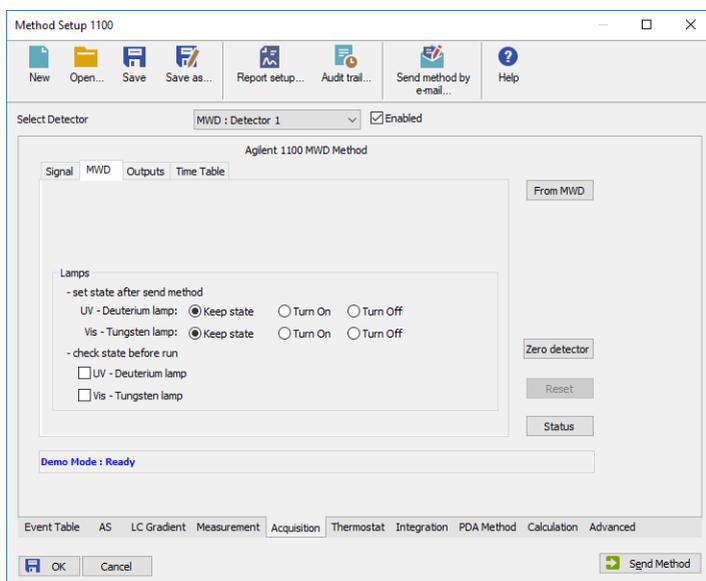
3.11.3 Method Setup - Acquisition - MWD

Fig. 46: Method Setup - Acquisition - MWD

Lamps

Set state after send method
Checkboxes *UV Lamp - Vis Lamp will set the respective lamp ON after sending the method in case it is OFF.*

Check state before run
Configure, if UV light source (*UV Lamp*) or visible light source (*Vis Lamp*)is required

Determines whether a method requires the selected lamp or not. The module becomes *NOT READY* state if the respective lamp is switched off
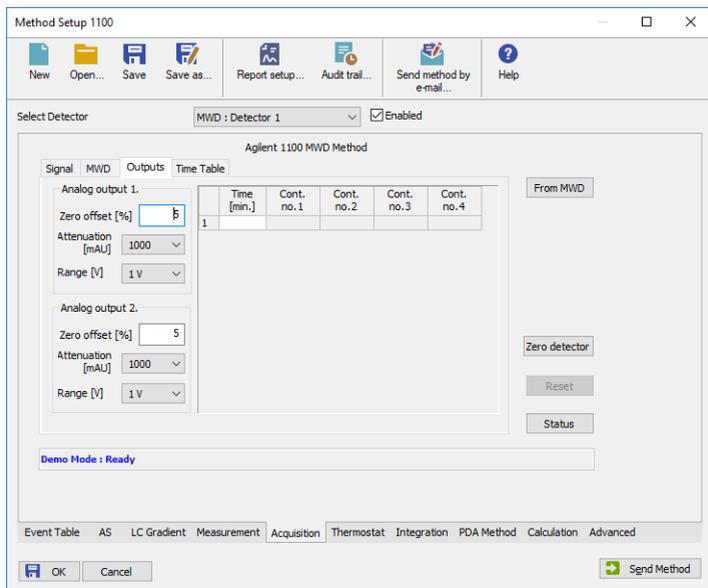
3.11.4 Method Setup - Acquisition - Outputs

Fig. 47: Method Setup - Acquisition - Outputs

Analog Output (X.)

Zero Offset [%]
Sets the zero offset voltage for *Analog Output 1 (2)* to a percentage of the full-scale voltage.

Attenuation [mAU]
Selects analog output attenuation

The DAD offers two analog outputs: signal A at analog output 1 and signal B at analog output 2.

The attenuation can be changed in power of 2 steps between 2000 mAU and 0.98 mAU.

Range [V]
Sets the output signal Range to 1 V or 0.1 V.

Table

The Output relays on detector are optional feature of certain **Agilent 1100** configuration.

If it is present in your configuration, then the table will enable to set the timetable of events to trigger these outputs.

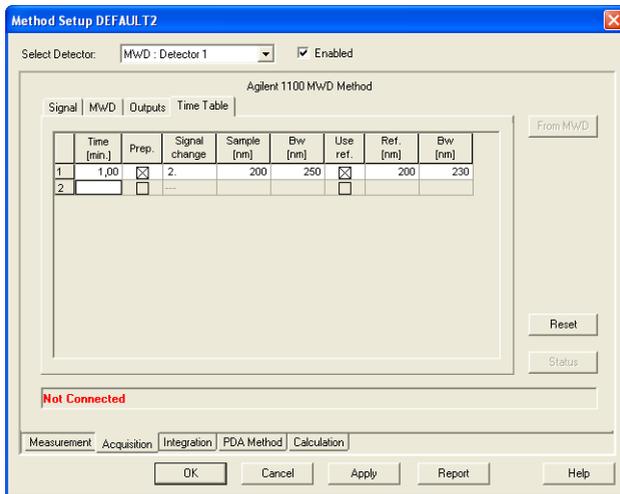## 3.11.5 Method Setup - Acquisition - Time Table

Fig. 48: Method Setup - Acquisition - Time Table

Time [min.]
Sets a time for the desired change. Zero time is not a permitted value.

Prep.
Autozero will be performed when checked

Signal Change
Select the signal (1-4) to set a new wavelength

Sample [nm]
Set the sample wavelength

Bw [nm]
Set the Sample bandwidth

Use ref.
Reference wavelength will be used when checked

Ref. [nm]
Set the reference wavelength

Bw [nm]
  Set the Reference bandwidth

3.11.6 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.**
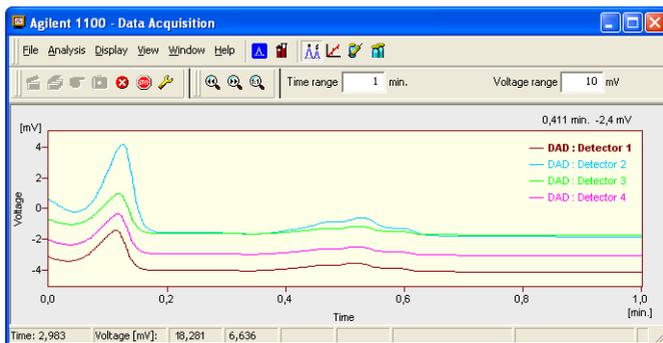

Fig. 49: Data Acquisiton

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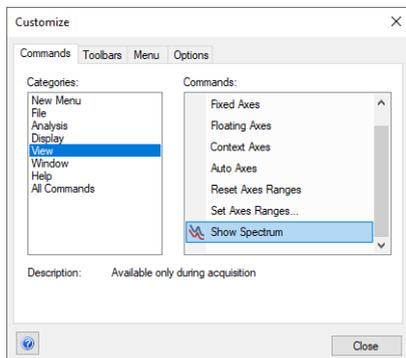

Fig. 50: Customize

It is also possible to add 📊*Show Spectrum* icon to the toolbar for fast setting of the spectral mode (as well as ⁰✚ *Set Zero* and ⁰✚ *Reset Zero*).

To do this use the *View - Toolbars - Customize* command. The *Show Spectrum* icon can be found on the *Customize - Commands* dialog in the Analysis set of commands.

3.11.7 Device Monitor

The *Device Monitor* window can be invoked by the *Monitor - Device Monitor* command from the *Instrument* window or using the Device Monitor 🔴 icon. It allows to perform the *Zero Detector* action and switch the lamps on/off.
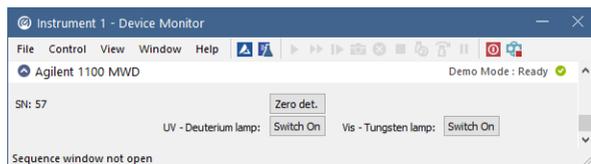

Fig. 51: Device Monitor of Agilent 1100 MWD

It is possible to control the detector operation during the analysis in the *Device Monitor* window.

Zero Detector
Sets the response of the detector to *0*.

Switch On (Off)
Turns the UV - Deuterium lamp or Vis - Tungsten lamp on/off.

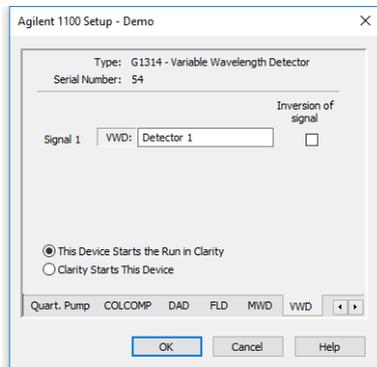# 3.12 VWD (G1314)

3.12.1 Agilent 1100 Configuration

Fig. 52: Agilent 1100 Configuration - VWD

Type
Type of **Agilent 1100** component indicated by name and code number.

Serial Number
Serial number must correspond to the serial number imprinted on a label on the device.

Channels
Number of independent data channels.

Signal (n)
Sets the names of individual signals (detectors).

Inversion of Signal
Inverts the polarity of the respective signal.

This Device Starts the Run in Clarity / Clarity Starts This Device
This radiobutton enables to start the analysis run from the **Clarity**. With *This Device Starts the Run in Clarity* checked, the device is started prior to **Clarity** by its front button or autosampler connected to this device and passes the start to **Clarity**. When *Clarity Starts This Device* is checked, **Clarity** is started prior to this device by separately wired autosampler, Start button in Single Run or different device and then starts this device.

Note: The *This Device Starts the Run in Clarity* option is checked by default.

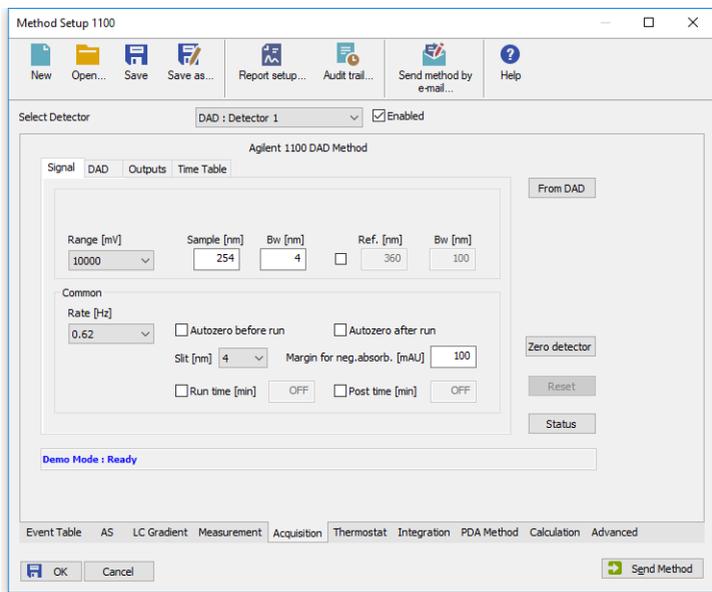## 3.12.2 Method Setup - Acquisition - Signal

Fig. 53: Method Setup - Acquisition - Signal

Note: The digital detectors distinguish Start and Stop events so it is not necessary to specify the (Start-Start, Start-Restart, etc. options like with the A/D converters.

Range [mV]
Sets the signal range of the detector.

Sample [nm]
Sets the signal wavelength of the detector.

Common

Rate [Hz]
Selects the data acquisition rate for the stored signals.

Autozero Before Run
Resets the detector to zero at the beginning of the analysis

Autozero After Run
Resets the detector to zero after finishing the analysis.

Margin for neg. absorb. [mAU]
Maximal negative value of absorbance that will be still taken into account.

Run Time [min]
Run time of the analysis. Data acquisition will be finished after the specified time unless a shorter time is specified in another module.

Post Time [min]
The system will stay in running state for the specified time after the analysis is finished
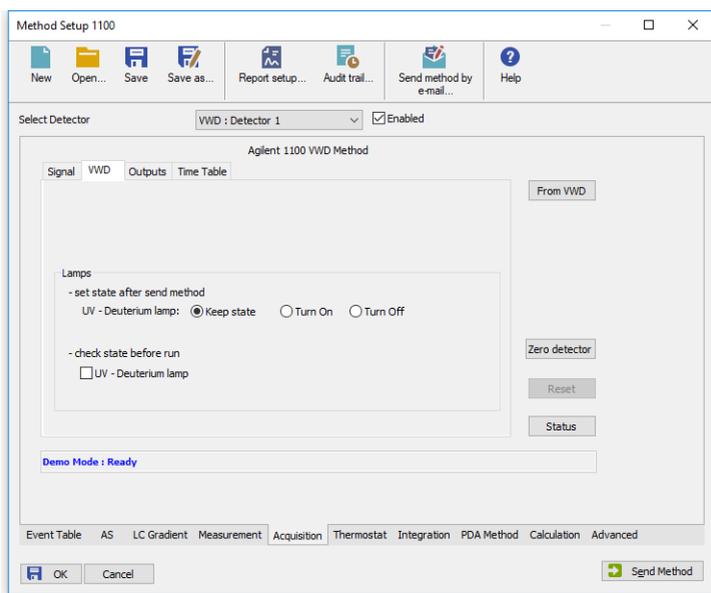
3.12.3 Method Setup - Acquisition - VWD

Fig. 54: Method Setup - Acquisition - VWD

Lamps

Set state after send method
Checkboxes *UV Lamp - Vis Lamp* will set the respective lamp ON after sending the method in case it is OFF.

Check state before run

Configure, if UV light source (*UV Lamp*) or visible light source (*Vis Lamp*)is required.

Determines whether a method requires the selected lamp or not. The module becomes *NOT READY* state if the respective lamp is switched off.

3.12.4 Method Setup - Acquisition - Outputs
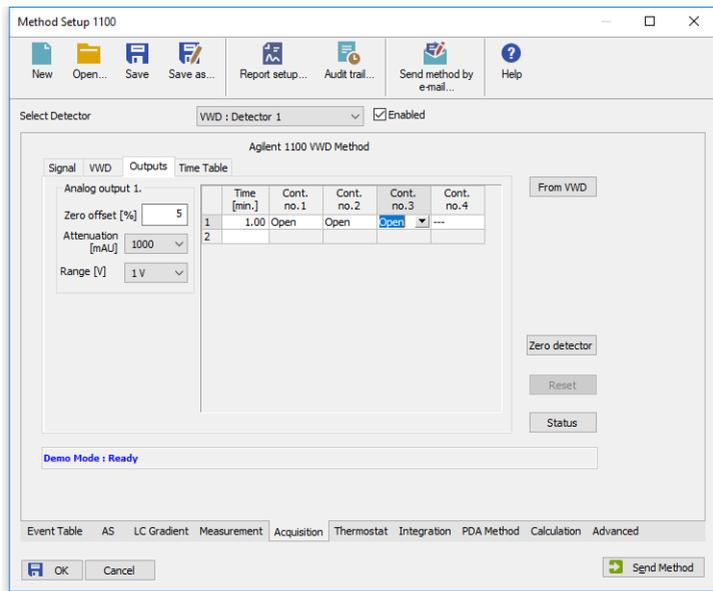
Fig. 55: Method Setup - Acquisition - Outputs

Time [min.]

Sets a time for the desired change. Zero time is not a permitted value.

Cont. no. 1 - 4

Sets the desired state of the Output to be set at the specified time.

3.12.5 Method Setup - Acquisition - Time Table

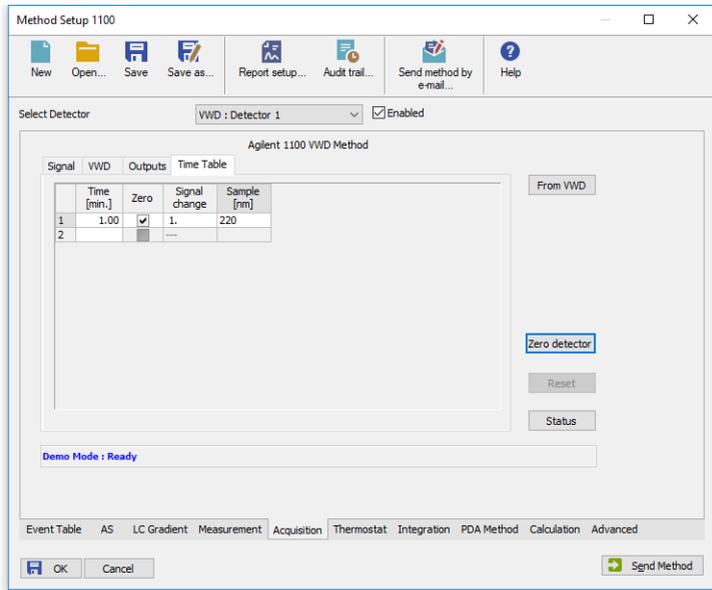
Fig. 56: Method Setup - Acquisition - Time Table

Time [min.]
  Sets a time for the desired change. Zero time is not a permitted value.

Prep.
  Autozero will be performed when checked

Signal Change
  Select the signal (1-4) to set a new wavelength

Sample [nm]
  Set the sample wavelength

3.12.6 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.**
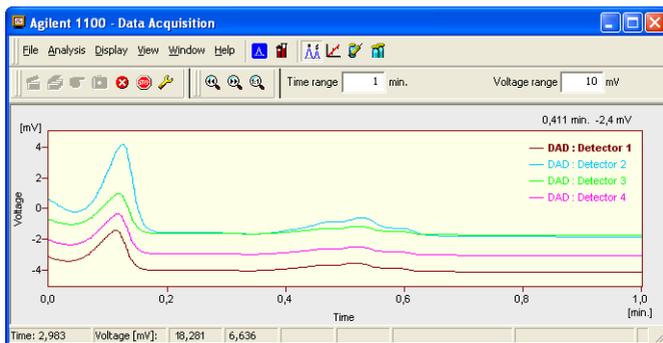
Fig. 57: Data Acquisiton

The graph can also display acquired spectra using the 📊 *View - Show Spectrum* command (active only during running acquisition).
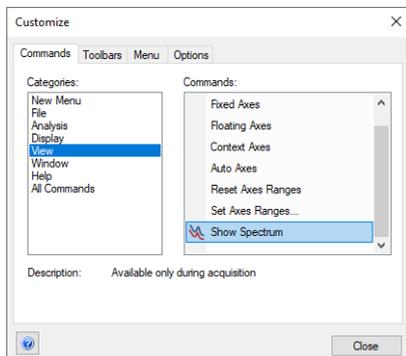
Fig. 58: Customize

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 - Toolbars - Customize* command. The *Show Spectrum* icon can be found on the *Customize - Commands* dialog in the Analysis set of commands.

3.12.7 Device Monitor

The *Device Monitor* window can be invoked by the *Monitor - Device Monitor* command from the *Instrument* window or using the Device Monitor ⊘ icon. It allows to perform the *Zero Detector* action and switch the lamp on/off.

Fig. 59: Device Monitor of Agilent 1100 VWD

It is possible to control the detector operation during the analysis in the *Device Monitor* window.

Zero Detector
Sets the response of the detector to *0*.

Switch On (Off)
Turns the UV - Deuterium lamp on/off.

3.13 LC Gradient (G1310, G1311, G1312)

Setting of the LC pumps. Following pumps are available: **Isocratic** (G1310) **Binary** (G1311) **Quaternary** (G1312).

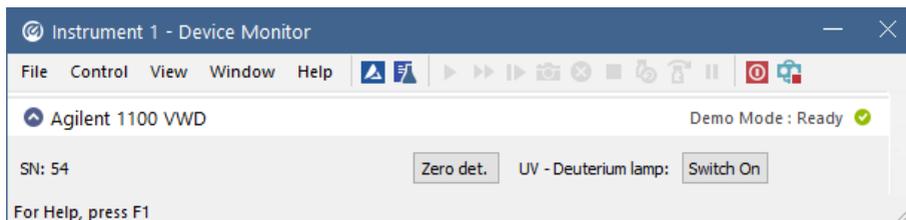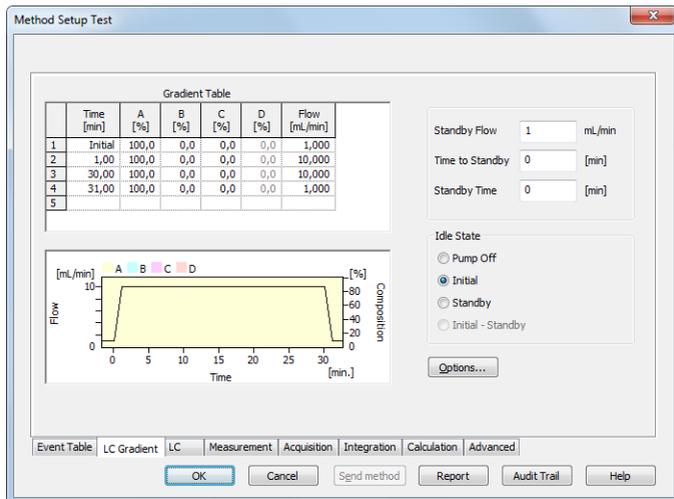The *Method Setup - LC Gradient* dialog sets the parameters of the LC pumps method (gradient).

Fig. 60: Method Setup - LC Gradient

Caution: Pump is working properly when flow is set 0-10 ml for pressure max. 200 bar and 0-5 ml for pressure max 400 bar. Other values are ignored without any warning.

Caution: When pump is configured on the system, the data acquisition time is governed by the last entry in the *Gradient Table*. Even when running isocraticaly, you must define at least two lines, the last with the desired analysis time.

Caution: When stopping pump from the *LC Monitor*, the pump may go to Error state (Status LED on the pump is in red). The sending of method using the *Send Method* button from the *Single Analysis* dialog or *OK* or *Apply* button from the *Method Setup* dialog will clear this state.

Graph

The graph depicts the percentage of components as a function of time together with the overall flowrate. Data are taken over from the **Gradient Table**. Changes effected in this table are immediately reflected in the graph. Assignment of colors to individual components is shown in the header. The assignment is fixed and individual components are displayed in the graph from bottom to top.

The flowrate is displayed in black.

The graph has two vertical axes: the axis on the left refers to the mixing ratio, that on the right to the overall flowrate.

Gradient Table

A table for setting the composition of the mobile phase and the overall flowrate as a function of time. Operation is analogous to that of spreadsheets (Excel, Quatro Pro, …). Upon clicking a cell by the left mouse button that cell is highlighted by dots and ready to receive values. A cell that fails to highlight is not available for editing.

Time [min.]

The entered value represents the time at which the ratio of flowrates and the overall flowrate correspond to the values entered in the corresponding row. (These values vary continuously from one time to the next in a manner ensuring that the conditions specified in the next row are satisfied).

XXX1 (..4) [%]

Represents the percentage of a component. The designation **XXX1-4** is in fact replaced by the name of the component (items **Solvent 1 - 4** in the **Gradient Options** Dialog box). Should you enter a component value such that the sum of all values exceeds 100 %, the percentage in the last column is automatically adjusted; if the percentage of the last compound is already zero, the value of the currently entered component is adjusted instead. The flowrate of a compound is calculated by multiplying the overall flowrate (indicated in the **Flow** column) by the corresponding percentage divided by 100.

Flow [ml/min]

Indicates the overall flowrate through the column. The entered value applies to the time specified in the corresponding row.

Caution: If the **flowrate** set for the given pump in the **Gradient Table** (calculated from percentage and total flow) will exceed the maximum flowrate for the set pump head, the change will not be accepted and may invoke a communication error.

Parameters

Standby Flow

Indicates the overall flowrate through the column in the STANDBY state reached after the last row of the table has been performed and the Time to Standby has passed. The time period during which the flowrate is so maintained is defined by item Standby Time. (The ratio of individual components in the respective STANDBY and IDLE states is given by the first row of the Table (the Initial row).

Time to Standby [min]

Indicates the time during which the flowrate varies continuously between the last values entered in the table and the value defined by Standby Flow. This time is included in the analysis time (the CONTROL state).

Standby Time [min]

The time during which the flowrate is maintained at Standby Flow. This time is included in the analysis time (CONTROL state).

Idle State

An item specifying the overall flowrate through the column outside the instrument method. The following states are possible:

Pump Off

The flowrates of all components are zero.

Initial

The flowrate is defined by the first row of the gradient table (the Initial row).

Standby

The flowrate is the same as in the STANDBY mode and, accordingly, corresponds to the value entered in Standby Flow.

The IDLE state enters into effect each time an instrument is opened, at the end or after abortion of an analysis by the **Abort** command, and is maintained also when the **Clarity** program is shut down.

The mixing ratio of individual components in both the IDLE and STANDBY states is given by the first row of the **Gradient Table** (the **Initial row**).

Initial - Standby

This function is not supported by the **Agilent 1100**.

3.13.1 Options

By invoking the *Options* button in the Method Setup - LC dialog, the *Gradient Options* dialog will appear.

Fig. 61: Gradient Options

In this dialog, the *Flow Rate* and *Pressure* units can be selected, the pressure limits set and *Solvents* can be enabled and named. *Max. Pressure for Set Flow* sets the maximum pressure to be used in the *Set Flow* dialog.

Caution: Do not disable the solvents for binary or quaternary pumps and always use all of them, even if you are running isocratically. Only the data for enabled solvents are sent to the pump and if the pump remembers non zero percentage for not used solvent from previous method, it will not accept the new values since the total would exceed 100%.

3.13.2 Method Setup - LC

A tab serving for setting of the program for Seal Wash Pump (if there is one installed).
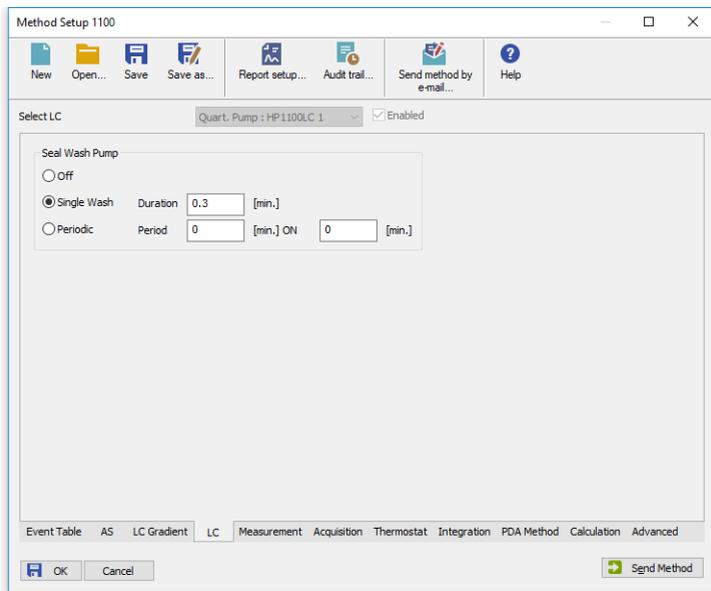

Fig. 62: Method Setup - LC

Seal Wash Pump

Sets the behavior of the Seal Wash Pump. The pump may be either *Off*, perform a *Single Wash* on each run with the *Duration* specified in minutes, or perform *Periodic* washes which last for amount of time set in *ON* field and have the amount of time between the washes as specified in *Period* field.

3.13.3 Device Monitor

The pump status dialog can be invoked by the *Monitor - Device Monitor* command from the *Instrument* window or using the Device Monitor 🔴 icon. It displays the actual flows of particular solvents, as well as the total flow, the total pressure and the analysis time.
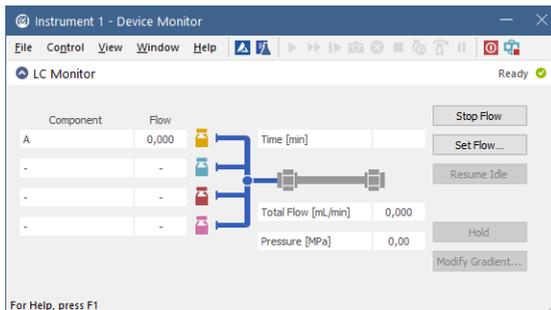

Fig. 63: LC monitor

Stop Flow

The pumps can be stopped from this window using the *Stop Flow* button. This action will stop the pump only, the analysis run will continue and must be stopped or aborted from the Data Acquisition window or *Single Analysis* dialog.

Set Flow...

Sets the desired total flow and solvent ratios in the opened *Set Flow* dialog.*Max. Pressure* allows to set a different pressure than set in the "Options" on page 61 of a given method.
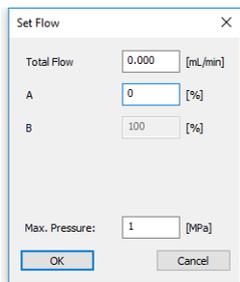

Fig. 64: Set Flow

The number of solvents and their names displayed in the Set Flow dialog correspond to the solvent number and names set in theGradient Options dialog. The last available solvent field is always grayed and is automatically counted as a rest of the percentage of the other solvents.

Resume Idle

Returns the pumps to *IDLE* state as defined in the appropriate field on the LC Gradient tab of the *Method Setup* dialog.

Hold / Resume

Clicking on the *Hold* button will keep the current gradient conditions until *Resume* is clicked.

Modify Gradient...

Opens the LC Control Manual Flow dialog allowing to set custom flow and mobile phase composition, disregarding the **Gradient Table** set in the method. The command is only available during the analysis run.

3.13.3.1 LC Control Manual Flow

The *LC Control Manual Flow* dialog accessible through using the *Manual Flow…* button from Device Monitor window allows the user to set a custom mobile phase composition and flow while the analysis is running. It resembles the Method Setup - LC Gradient tab in functionality.
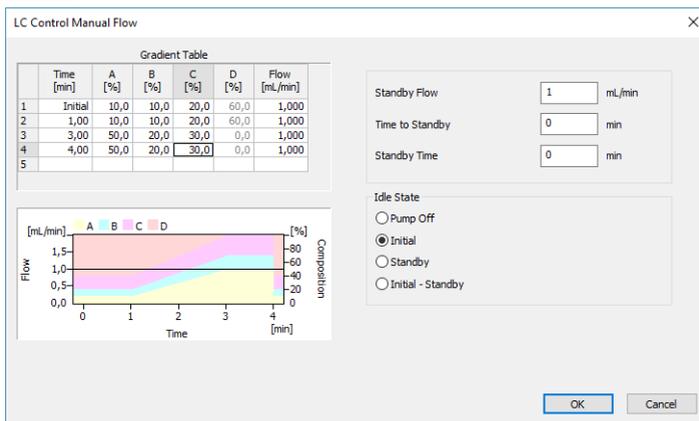
Fig. 65: LC Control Manual Flow dialog

The *LC Control Manual Flow* dialog is only available during the analysis run. When it is invoked and the *OK* button is pressed, the original **Gradient Table** from the acquisition method is discarded and replaced by the **Gradient Table** from the *LC Control Manual Flow* dialog. Any such operation is recorded in the audit trail of the measured chromatogram.

Caution: After the analysis run which used manual flow changes ends, the original method is automatically sent to all controlled devices to make sure **Clarity** station returns to the original method.

3.13.4 Agilent 1100 Setup
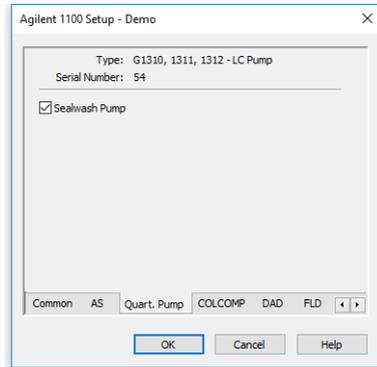
Fig. 66: Agilent 1100 Setup - Pump

Type
 Type of **Agilent 1100** component indicated by name and code number.

Serial Number
 Serial number must correspond to the serial number imprinted on a label on the device.

Sealwash Pump
 Sets the presence of the Seal Wash Pump.

3.14 Column Compartment (G1316)

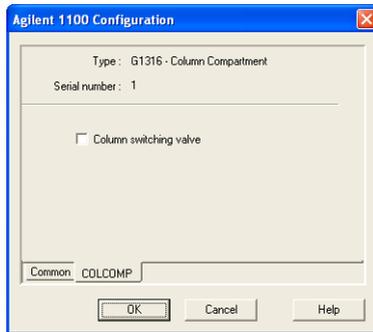## 3.14.1 Agilent 1100 Configuration

Fig. 67: Agilent 1100 Configuration - COLCOMP

Type
  Type of **Agilent 1100** component indicated by name and code number.

Serial Number
  Serial number must correspond to the serial number imprinted on a label on the device.

Column switching valve
  Select if the column switching valve is present in the configuration

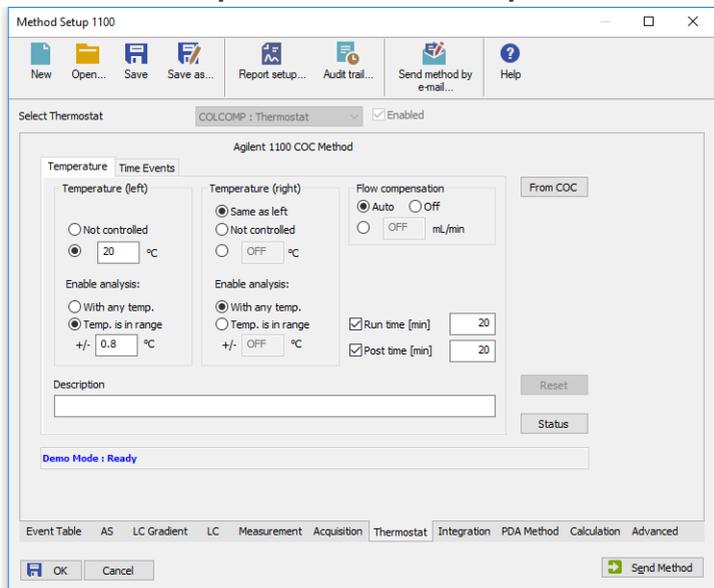## 3.14.2 Method Setup - Thermostat - Temperature

Fig. 68: Method Setup - Thermostat - Temperature

The *Temperature* tab specifies the left and right temperature settings.

Temperature (left)

Not Controlled x specific temperature

Enable Analysis

With Any Temp, *Temp. is in Range*, *+/-*

Sets the temperature control mode. When a temperature range is set, the module will be *READY* only after the temperature reaches the preset limits.

Flow Compensation

Auto x *Off* x specific flow

Note: The column can be switched during the analysis using the timed event ("Method Setup - Thermostat - Time Events" on the next page).

Caution: Note names of columns in Clarity (Column 1, Column 2) differ from names of columns displayed on thermostat controller display. Column 1 in Clarity actually stands for column located on position 2 in the thermostat and vice-versa for column 2 in Clarity and column in position 1 in the thermostat.

Run Time [min]

Run time of the analysis. Data acquisition will be finished after the specified time unless a shorter time is specified in another module.

Post Time [min]
The system will stay in running state for the specified time after the analysis is finished

3.14.3 Method Setup - Thermostat - Time Events

The *Time Events* tab is used to display and modify a table with time program of temperatures.

Fig. 69: Method Setup - Thermostat - Time Events
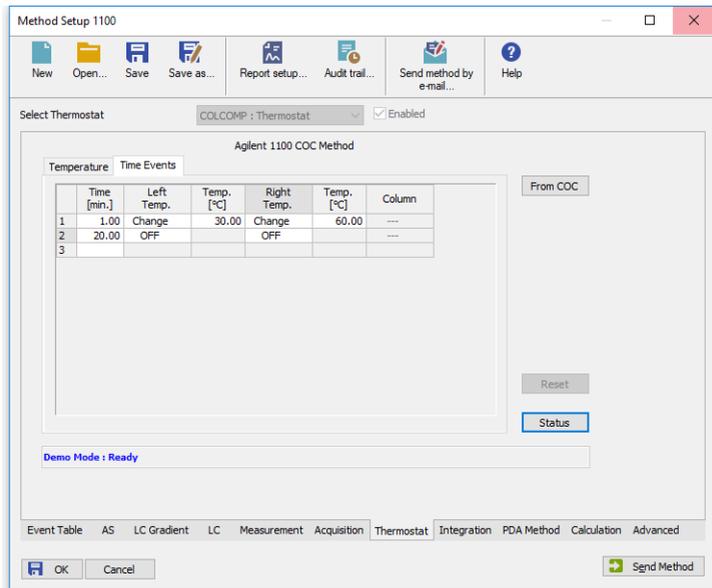
Time [min.]
Sets time when at least one of the temperatures in the table should be changed.

Left Temp.
Switches the Left temperature control Off or On.

Temp. [°C]
Sets the right temperature value.

Right Temp.
Switches the Right temperature control Off or On.

Temp. [°C]
Sets the left temperature value.

Column
Switches the column selection valve position.

....

Caution: Note names of columns in Clarity (Column 1, Column 2) differ from names of columns displayed on thermostat controller display. Column 1 in Clarity actually stands for column located on position 2 in the thermostat and vice-versa for column 2 in Clarity and column in position 1 in the thermostat.

3.14.4 Device Monitor

The *Device Monitor* window can be invoked by the *Monitor - Device Monitor* command from the **Instrument** window or using the Device Monitor 🔵 icon. Thermostat *Device Monitor* serves for monitoring the actual thermostat temperature and allows to switch the thermostat on and off.
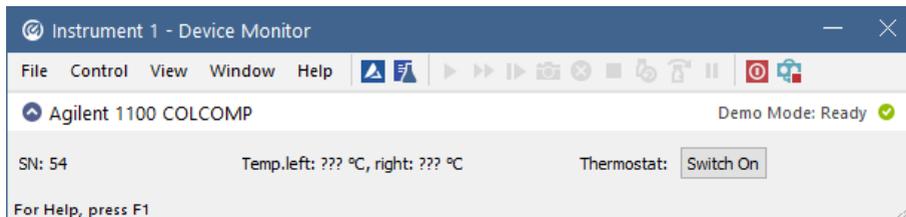

Fig. 70: Device Monitor of Agilent 1100 COLCOMP

Switch On (Off)
Turns the thermostat on and off.

Temperature
Current temperature retrieved from the thermostat.

4 Troubleshooting

Problem 1 - Communication problem

The communication cable must be connected to the module with most extensive communication. When DAD detector is present, it should be used for communication. Otherwise first other detectors and only last the other modules should be used.

Problem 2 - Error dialog or communication problem with GPIB

Ensure you have corrected installed the **IOLib Suite**. If found, remove the SICL32.DLL file from the **Clarity** installation directory which is no longer used in Clarity from version 2.8 (C:\CLARITY by default). Then reinstall the **IOLib Suite** which it can be found on the **Clarity** Installation CD in the directory HW_ DRIVERS\AGILENT or download the newest version from the Agilent website.

Communication problems may be caused by GP-IB Address conflict on the GP-IB bus. Each Module including the GP-IB board must have unique address. The Addressees can be changed for the individual modules by the DIPswitch settings on their backside.

Default settings are listed in the chapter **"Recommended GPIB addresses"** on pg. **12**.

Also notice that GPIB communication interface is not supported since Windows 7.

Problem 3 - Error in communication with the HP-IB card

This may be caused by the running **IOLib** drivers. Remove automatic start of IOLib drivers by deleting the corresponding item from the *Start - All Programs - Startup* menu (example from English Windows XP).

Problem 4 - Aborting Activity

Occasionally some **Agilent 1100** module may get to the "*ABORTING ACTIVITY*" state (referred in the status line of the *Method Setup* - control tabs). The red diode is indicating Error status on the module. Usually it is necessary to:

- Close **Clarity** Software
- Switch off all the **Agilent 1100** modules
- Wait for few seconds
- Switch on the **Agilent 1100** modules
- Start **Clarity** after the modules have been initialized.

Problem 5 - Not Connected

Occasionally some or all **Agilent 1100** modules may get to the "*NOT CONNECTED*" state (referred in the status line of the *Method Setup - xxControl* tabs). This may be caused by some error in the communication.

Usually it is necessary to:

- Close the **Clarity** Software
- Switch off all the **Agilent 1100** modules
- Wait for few seconds

- Switch on the **Agilent 1100** modules
- Start **Clarity** after the modules have been initialized.

Problem 6 - Not ready problem

When autosampler is not injecting, some module may be "*NOT READY*". (Yellow diode is lighted on this module).

Check that the required lamps in detectors and the thermostat has been turned ON.

When the autosampler detects even temporary *NOT READY* state of some module, it will wait for 1 minute and then it will retry the injection.

Problem 7 - Analysis stop problem

When LC pump is configured on the system, the Analysis time is governed by the length of the gradient defined by the last line in the gradient table.

The table should always contain at least two lines, even when running isocratically.

When only one line is set and the Run time is not specified in other modules, the **Agilent 1100** may be in *RUNNIG STATE* (green diodes on) even after the analysis time in **Clarity** has elapsed. The system can be in such case stopped by the *Stop* command/icon from the *LC Monitor* window. The initial conditions will be resumed after using the *Resume Initial* conditions command or sending the method.

Problem 8 - Agilent 1100 Module Error

Occasionally some **Agilent 1100** module may get to the "*ERROR*" state (referred in the status line of the *Method Setup - xxControl* tabs). The red diode is indicating Error status on the module. A message box describing the error may appear in **Clarity**.

Most common causes will be missing vial in the autosampler, exceeded pressure limits on the pump, or leak detected by the solvent sensors on some module.

First it is necessary to remedy the cause, after sending the method from **Clarity** the operation can be usually resumed.

Otherwise it may be necessary to restart the system.

Problem 9 - Clarity stays in the Waiting state after Agilent 1100 stopped the analysis

When the analysis is stopped from the device equipped with autosampler (unknown reason of the stop) **Clarity** waits two minutes and then tries to re-run the sequence, this is repeated five times and then the analysis is stopped in **Clarity**.

Problem 10 - AS unknown error while encountering thermostat leak

In this situation, the state of the thermostat and detectors cannot be reset by sending the method nor by shutdown.

It is necessary to switch the thermostat and/or detector off using the button on the device and then turn it on again.

Problem 11 - Buffer Overflow message

When the *Buffer Overflow* dialog appears, the communication speed with the **1100 DAD** is probably very slow. Try to change the data acquisition *Rate [Hz]* in Method Setup - Acquisition - Signal tab or the signal and wave length range in the Method Setup - Acquisition - DAD tab to lower values.

Commdrv.log utility

When the cause of problems could not be discovered easily, the recording of communication between **Clarity** and the 1100 modules can significantly help the DataApex support to discover the cause.

It is possible to record the communication between **Clarity** and the **Agilent 1100** system. The recording can be enabled by amending the file COMMDRV.INI in the **Clarity** installation directory (located in C:\CLARITY\CFG by default). The file can be edited in any text editor (e.g. **Notepad**).

Find an area of the COMMDRV.INI file appropriate to the 1100 connection you use (GPIB or LAN) and change the paragraph so it looks as follows:

for GP-IB

[GPIB0,26]

echo=on

textmode=on

filename=CommDrvGPIB.txt

reset=on

or for LAN communication

[TCP_IP 192.168.254.11:9100]

echo=on

textmode=on

filename=CommDrvTCP.txt

reset=on

First rows of each paragraph should correspond to the settings of your **Agilent 1100** system and appropriate values can be found in the *System Configuration* dialog.

Note: The communication from several COM ports /other sources may be recorded at once. It is only necessary to set each paragraph so.

The particular parametres in each paragraph mean:

Echo

On - communication will be recorded.

Off (default) - communication will not be recorded.

Textmode

While set to *On* ensures that the communication will be recorded in the text format. If set to *Off*, the output may be in binary format (if the device supports it).

Filename

The name of the file where the communication should be stored. If the path is not specified, the file will be stored in the same folder as the COMMDRV.INI file.

The created log file can be viewed in any text editor.

Reset

On - will erase the log each time the station is restarted. In case the record is needed, it must be renamed, copied or moved before the **Clarity** is started again.

Off - the log will not be reset, it can increase substantially after some time)

Note: This record is very helpful for troubleshooting the communication between **Clarity** and any device.