Clarity Controls

Agilent 1100

LC **ENG**

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1 Agilent 1100 Control Module 5
2 Requierements 6
3 Installation Procedure 7
3.1 Installing the GPIB interface in the PC 7
3.2 LAN card setting 9
3.3 Clarity configuration 11
3.3.1 Assign the control to Clarity Instrument 14
3.4 First start of Clarity after configuration 14
4 Using the Control Module 16
4.1 Method Setup – AS Control 16
4.2 Method Setup – LC Control 16
4.3 Method Setup - Acquisition 17
4.4 Method Setup - Thermostat 17
4.5 Data Acquisition 17
4.6 Device Monitor 19
5 Reference description 20
5.1 Agilent 1100 Configuration – Common 20
5.2 Add Module 21
5.3 Autosampler AS (G1313) and TAS (G1329) 22
5.3.1 Agilent 1100 Configuration –(T)AS 22
5.3.2 Method Setup – AS Control - Injection 22
5.3.3 Method Setup - AS Control - Program 24
5.3.4 Hardware Configuration - AS 26
5.4 DAD (G1315) 27
5.4.1 Agilent 1100 Configuration - DAD 27
5.4.2 Method Setup – Acquisition - Signal 28
5.4.3 Method Setup – Acquisition –DAD 30
5.4.4 Method Setup – Acquisition - Outputs 31
5.4.5 Method Setup – Acquisition –Time Table 32
5.4.6 Hardware Configuration - Main 33
5.4.7 Hardware Configuration - Info 34
5.5 FLD (G1321) 34
5.5.1 Agilent 1100 Configuration - FLD 34
5.5.2 Method Setup – Acquisition - FLD Parameters 35

5.5.3 Method Setup – Acquisition - Flashlamp 38
5.5.4 Method Setup – Acquisition - Outputs 39
5.5.5 Method Setup – Acquisition - Time Table 40
5.5.6 Hardware Configuration - Main 41
5.5.7 Hardware Configuration - Info 41
5.6 MWD (G1365) 42
5.6.1 Agilent 1100 Configuration - MWD 42
5.6.2 Method Setup – Acquisition - Signal 43
5.6.3 Method Setup – Acquisition - MWD 45
5.6.4 Method Setup – Acquisition - Outputs 46
5.6.5 Method Setup – Acquisition – Time Table 47
5.7 VWD (G1314) 48
5.7.1 Agilent 1100 Configuration - VWD 48
5.7.2 Method Setup – Acquisition - Signal 49
5.7.3 Method Setup – Acquisition - VWD 51
5.7.4 Method Setup – Acquisition - Outputs 52
5.7.5 Method Setup – Acquisition – Time Table 53
5.8 LC Pump (G1310, G1311, G1312) 53
5.8.1 Options 57
5.9 Column Compartment (G1316) 58
5.9.1 Agilent 1100 Configuration –AS 58
5.9.2 Method Setup – Thermostat – Temperature 58
5.9.3 Method Setup - Thermostat – Time Events 60
6 Connections 61
6.1 Wiring 61
6.2 Description of connectors: 61
6.2.1 LAN interface 61
6.2.2 GP-IB communication 62
6.3 Recommended GPIB addresses: 62
7 Troubleshooting 63
Commdrv.log utility 65

1 Agilent 1100 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)

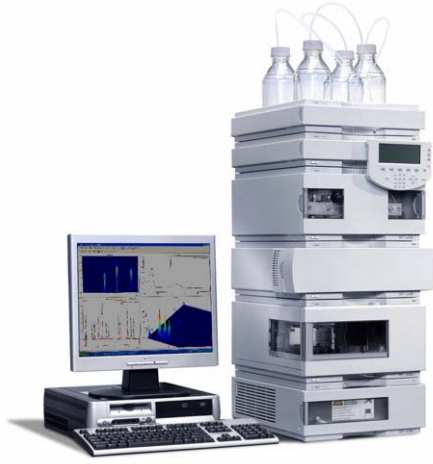


Fig. 1. Agilent 1100

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*

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**).

2 Requierements

- 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 (IAG11), GPIB cable (p/n GPIB) and free PCI slot in the PC.
  - or 82350A USB/GPIB interface card and free USB port in the PC.

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.*

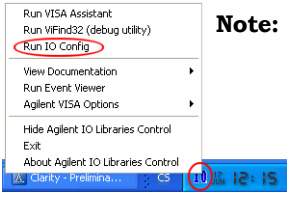
Note: *Cables are not part of **Clarity** Control Module. It is strongly recommended to order required cables together with the Control Module.*

3 Installation Procedure

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.*

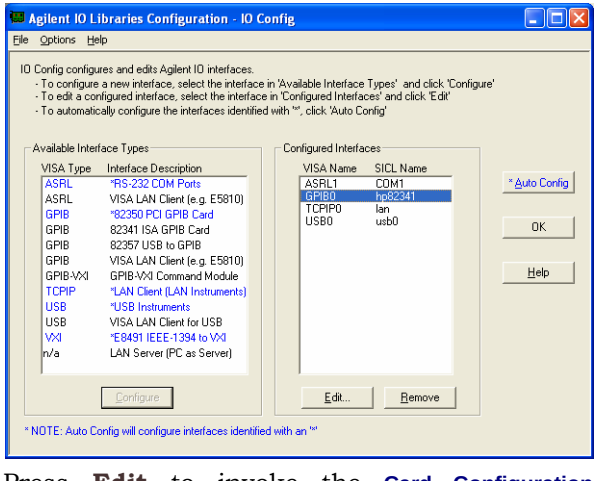
- Insert the **82350A PCI/GPIB** Interface in the PCI slot.
- Install the corresponding drivers (SICL and VISA) provided by the interface manufacturer.



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.

- In the **Agilent IO Libraries Configuration** dialog select your GPIB card.



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

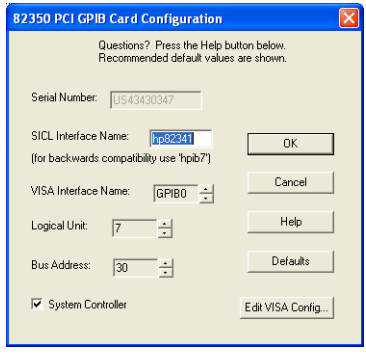


Fig. 2. 87350 PCI GPIB Card Configuration

- 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 Clarity **Agilent 1100 Configuration** dialog.

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

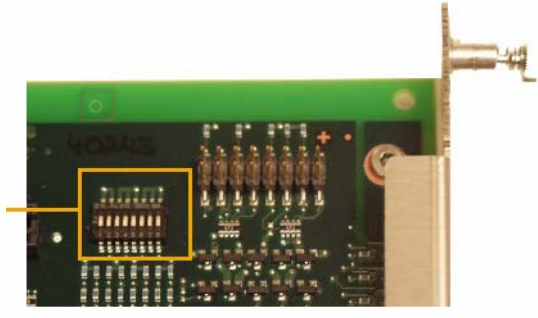
Caution! *It is recommended to connect the **GPIB cable** between the **PC** and the Agilent 1100 component with the largest amount of communication. This is usually the **DAD** detector. If it is not present in the set then any other detector (MVD, WVD, FLD, etc.)*

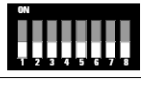
- Turn the power on (both PC and Agilent 1100).
- Review the GPIB settings.

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. 3. LAN card DIP Switches

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.
- 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

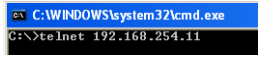
Note: *(the last IP address section should be different from the 1100 IP address)*

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

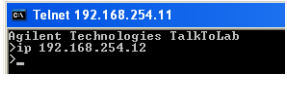
Stored Settings

- 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:

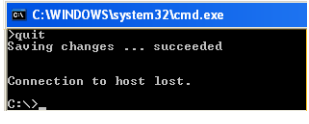
  telnet 192.168.254.11 (default or stored adress)



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)*

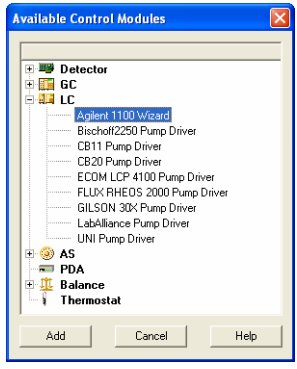
Bootp Settings

The **Chemstation** usualy uses the **bootp server** to assign an IP adress 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 Clarity 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).*

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.



- Select the **Agilent 1100 Wizard** and press the **Add** button.
- The **Agilent 1100 Configuration** dialog will appear.

If you have LAN skip to **LAN communication** section.

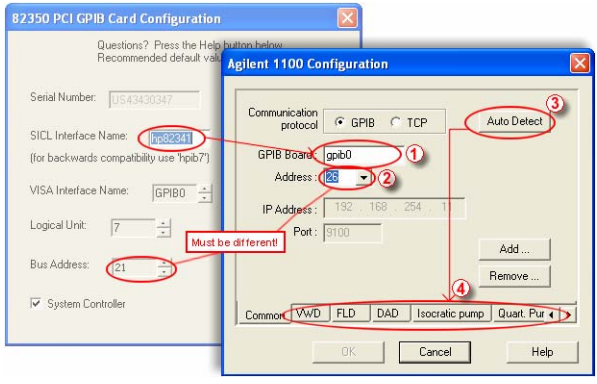
GPIB communication

- Set the GPIB **Board** name ①

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

- Set the **Address** ② 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.

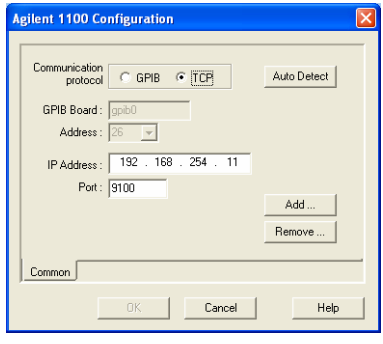


Note: *Default factory settings are listed in chapter **6.3** - **Recommended GPIB addresses:** on pg. **62***

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 procedure...**

LAN communication



- 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 procedure for both GPIB and LAN

- Use the **Auto Detect** ③ button.

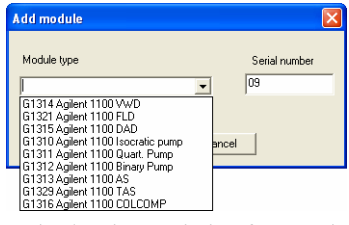
  Clarity will determine the Agilent 1100 configuration automatically. Tabs of individual components ④ of the Agilent 1100 configuration will appear.
- Go to the individual tabs and set the desired parameters for each component (e.g. names of detectors, etc.)

Skip directly to the 3.3.1 - Assign the control to Clarity Instrument.

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.



- 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 Configuration** 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.

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 **Agilent 1100** from the **Setup Control Modules** ② in the left to the instrument on the right (or use the --> button ③ in the centre).

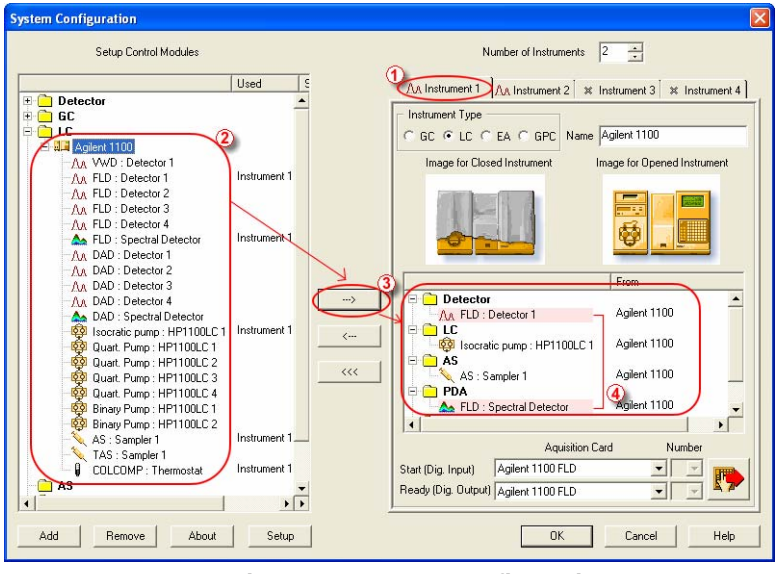


Fig. 4. System Configuration

Caution! *Even if signals from DAD and FLD detectors can be acquired simultaneously (up to maximum of four) on one instrument, only one spectral detector can be configured.*

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 (see the example ④).*

3.4 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.

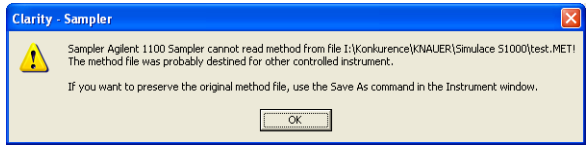


Fig. 5. Cannot read method message box

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).

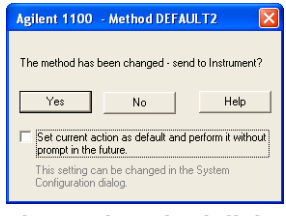


Fig. 6. Changed method dialog

- 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 Control**, **Acquisition**, **Thermostat** and download the methods using the **From ..(device name)..** button.

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

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

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.

4.1 Method Setup – AS Control

The **Method Setup – AS Control** dialog sets the parameters of the sampler method.

Detailed description of the **AS Control** dialog can be found in chapter **5.3** - **Autosampler AS (G1313) and TAS (G1329)** on pg. **22**.

4.2 Method Setup – LC Control

Depending on the configured LC Pumps the **Method Setup – LC Control** tab will appear in the **Method Setup** dialog. This tab sets the parameters of the LC pumps method (gradient).

Following pumps are available for Agilent 1100: **Isocratic** (G1310) **Binary** (G1311) **Quaternary** (G1312).

See the chapter **5.8 - LC Pump (G1310, G1311, G1312)** on pg. **53**.

4.3 Method Setup - Acquisition

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

The individual variants of the Acquisition dialogs are described in the corresponding sections of chapters **5.4 - 5.7**.

4.4 Method Setup - Thermostat

The **Thermostat** tab is available only when the **Column Compartment** is installed.

See the chapter **5.9 - Column Compartment (G1316)** on pg. **58**

4.5 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**.

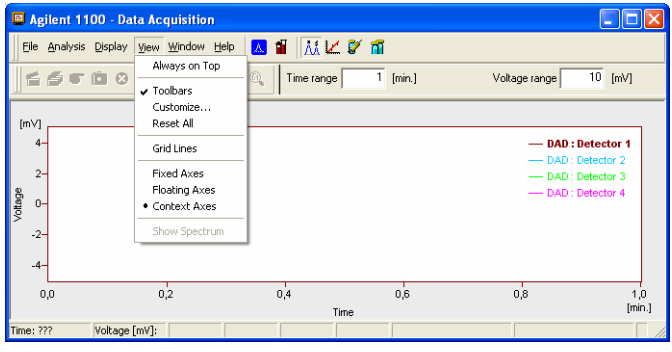


Fig. 7. Data Acquisiton

The graph can also display acquired spectra using the **View – Show Spectrum**

command (active only during running acquisition).

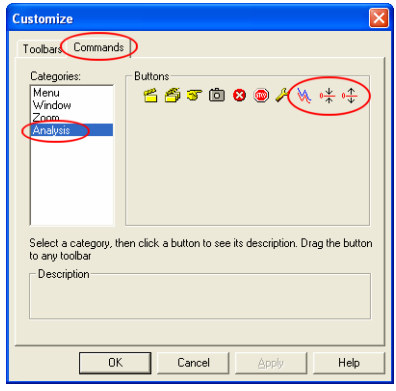


Fig. 8. Customize

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

4.6 Device Monitor

The pump status window can be invoked using the **Monitor – Device Monitor** command from the **Instrument** window or using the **Device Monitor** icon from the **Instrument** window.

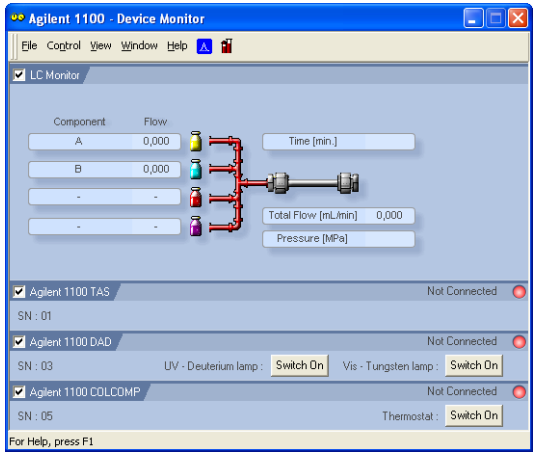


Fig. 9. Device Monitor

This window provides actual condition readings from the pumps.

The pump can be stopped from this dialog by using the **Control - Stop** command or by the icon. This will stop the running data acquisition, as well as the pump flow. The flow will be resumed by using the **Apply** or **OK** buttons in the **Method Setup** dialog.

The individual solvent flow can be displayed either in flow units or as a percentage of total flow by checking the **View - Component flow in %** command.

5 Reference description

This chapter provides detailed description of the individual controls for each dialog of the **Agilent 1100 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.*

5.1 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.

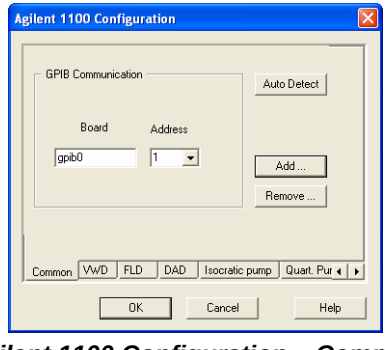


Fig. 10. Agilent 1100 Configuration – Common

It is also possible 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.

See the **3.2** on pg. **9** 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 chapter* ***6.3*** *-* ***Recommended GPIB addresses:*** *on pg.* ***62***

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.

See the **3.2** on pg. **9** 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.

5.2 Add Module

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

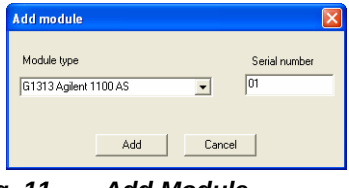


Fig. 11. Add Module

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.

5.3 Autosampler AS (G1313) and TAS (G1329)

5.3.1 Agilent 1100 Configuration –(T)AS

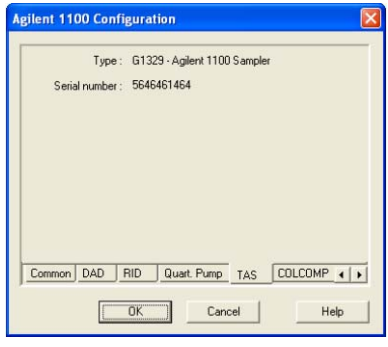


Fig. 12. Agilent 1100 Configuration - TAS

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.

5.3.2 Method Setup – AS Control - 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.

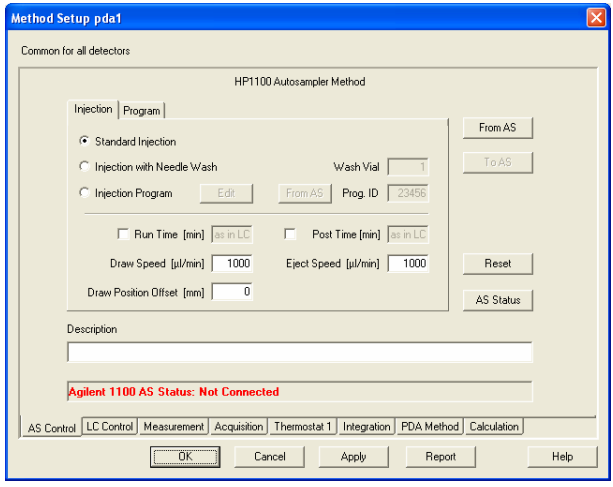


Fig. 13. Method Setup – AS Control – Injection

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.

5.3.3 Method Setup - AS Control - Program

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

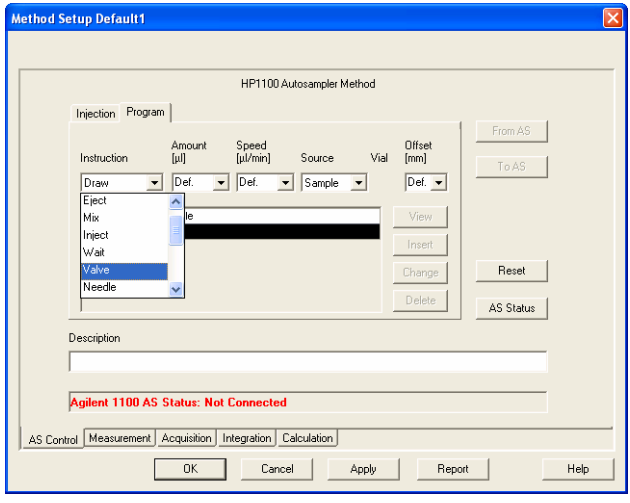


Fig. 14. Method Setup – AS Control – Program

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.*

5.3.4 Hardware Configuration - AS

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

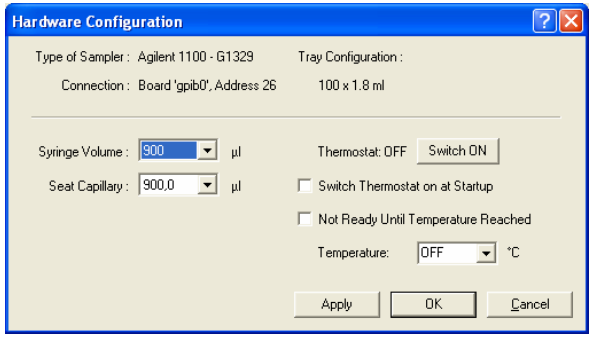


Fig. 15. Hardware Configuration

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.

5.4 DAD (G1315)

5.4.1 Agilent 1100 Configuration - DAD

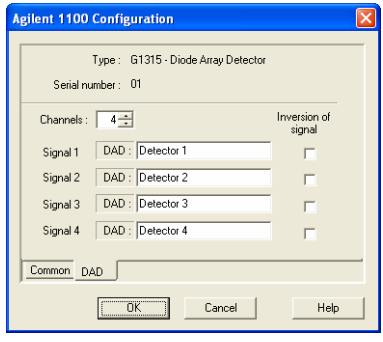


Fig. 16. Agilent 1100 Configuration - DAD

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.

5.4.2 Method Setup – Acquisition - Signal

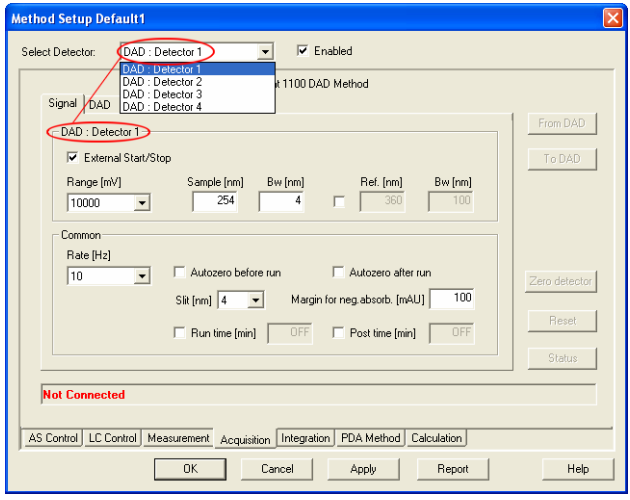


Fig. 17. Method Setup – Acquisition - Signal

Detector 1

External Start/Stop

Enables control through the use of an external event.

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

5.4.3 Method Setup – Acquisition –DAD

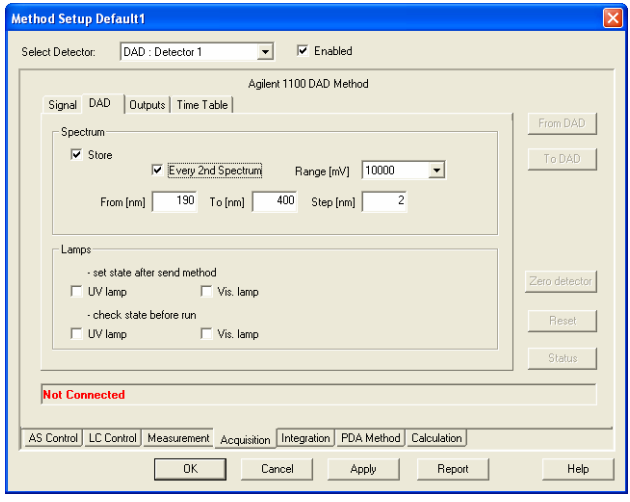


Fig. 18. Method Setup – Acquisition - DAD

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 xxx 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 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

5.4.4 Method Setup – Acquisition - Outputs

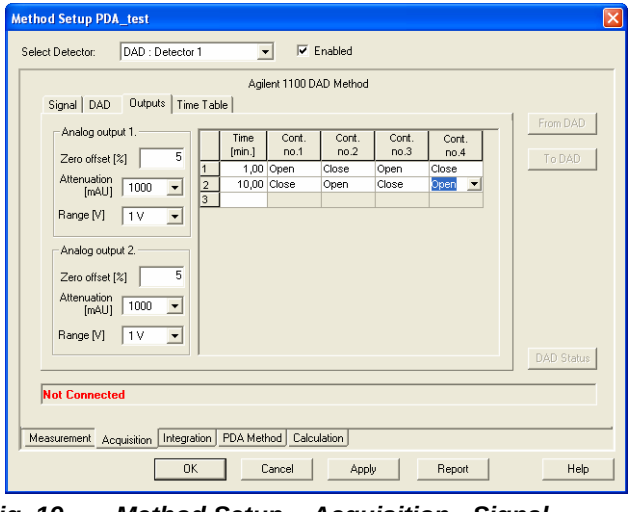


Fig. 19. Method Setup – Acquisition - Signal

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.

5.4.5 Method Setup – Acquisition –Time Table

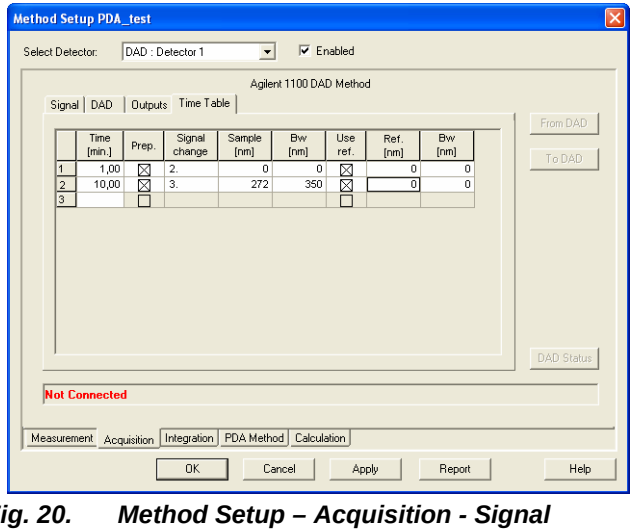


Fig. 20. Method Setup – Acquisition - Signal

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

5.4.6 Hardware Configuration - Main

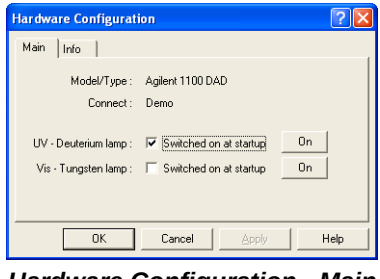


Fig. 21. Hardware Configuration - Main

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.

5.4.7 Hardware Configuration - Info

Displays the configuration of the DAD detector.

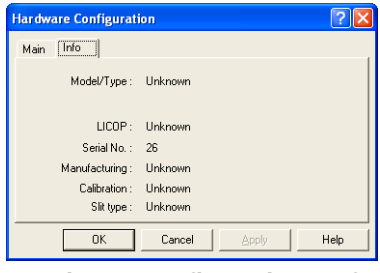


Fig. 22. Hardware Configuration - Info

5.5 FLD (G1321)

5.5.1 Agilent 1100 Configuration - FLD

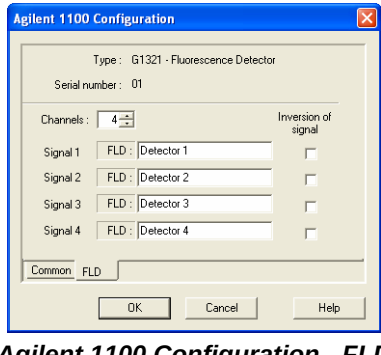


Fig. 23. Agilent 1100 Configuration - FLD

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.

5.5.2 Method Setup – Acquisition - FLD Parameters

Sets the basic parameters of the FLD detector.

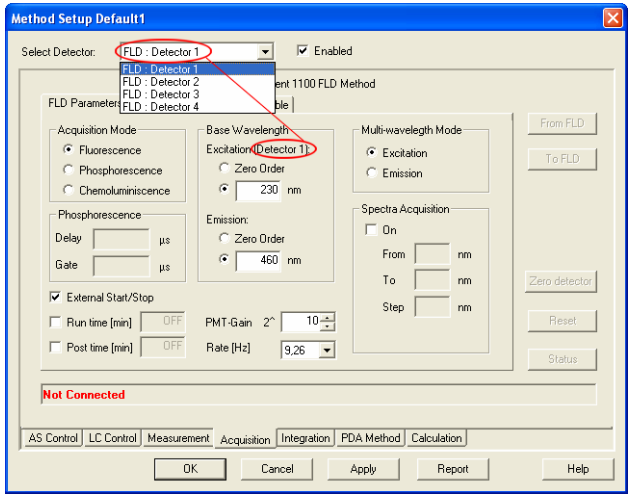


Fig. 24. Method Setup – Acquisition - FLD Parameters

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!*

External Start/Stop

Enables control through the use of an external event.

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** (see pg. 14 example ④), otherwise this section will be disabled.*

5.5.3 Method Setup – Acquisition - Flashlamp

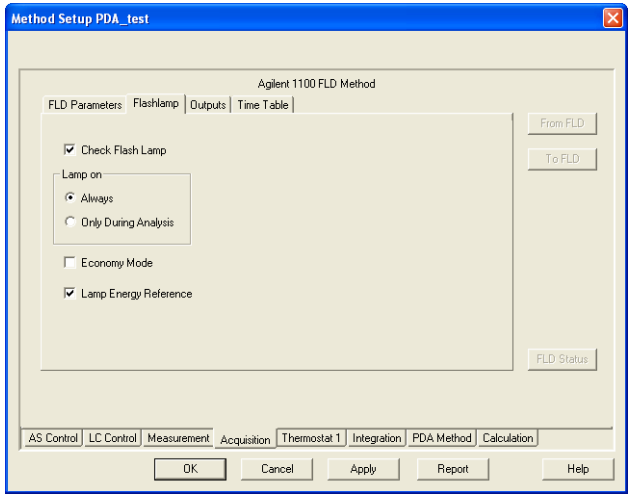


Fig. 25. Method Setup – Acquisition - Flashlamp

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.

	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 reference diode.

5.5.4 Method Setup – Acquisition - Outputs

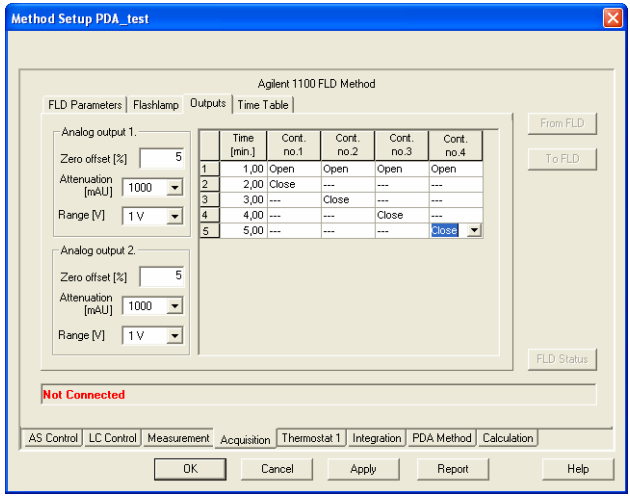


Fig. 26. Method Setup – Acquisition - Outputs

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 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 1600LU and 0.2LU.

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.

5.5.5 Method Setup – Acquisition - Time Table

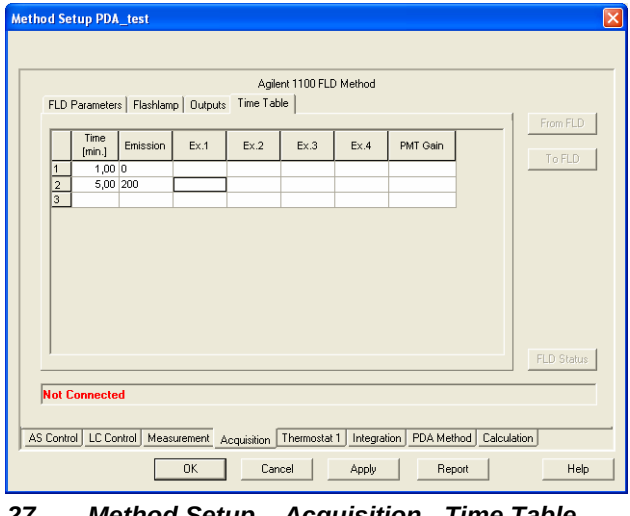


Fig. 27. Method Setup – Acquisition - Time Table

Time

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

5.5.6 Hardware Configuration - Main

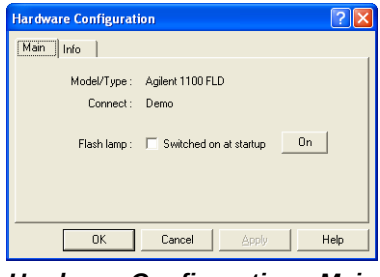


Fig. 28. Hardware Configuration - Main

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.

5.5.7 Hardware Configuration - Info

Displays the configuration of the FLD detector.

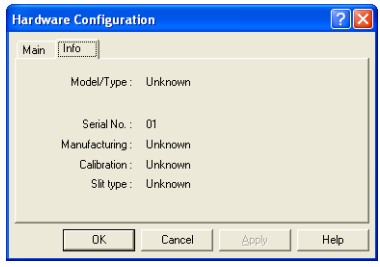


Fig. 29. Hardware Configuration - Info

5.6 MWD (G1365)

5.6.1 Agilent 1100 Configuration - MWD

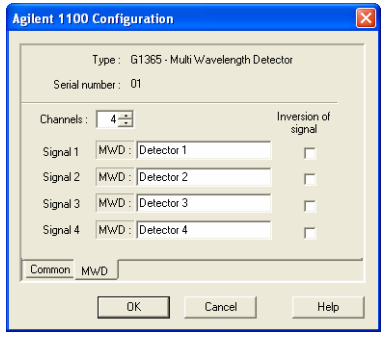


Fig. 30. Agilent 1100 Configuration - MWD

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.

5.6.2 Method Setup – Acquisition - Signal

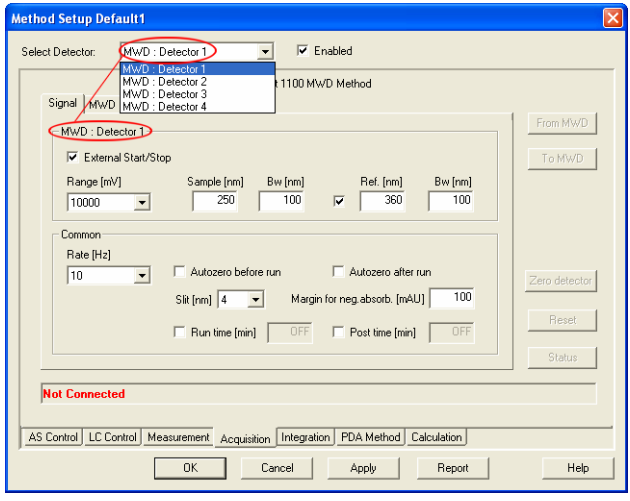


Fig. 31. Method Setup – Acquisition - Signal

Detector 1

External Start/Stop

Enables control through the use of an external event.

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

5.6.3 Method Setup – Acquisition - MWD

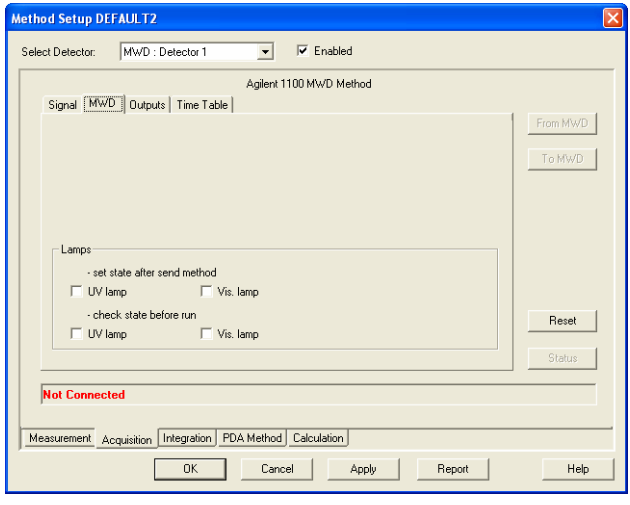


Fig. 32. Method Setup – Acquisition - MWD

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

5.6.4 Method Setup – Acquisition - Outputs

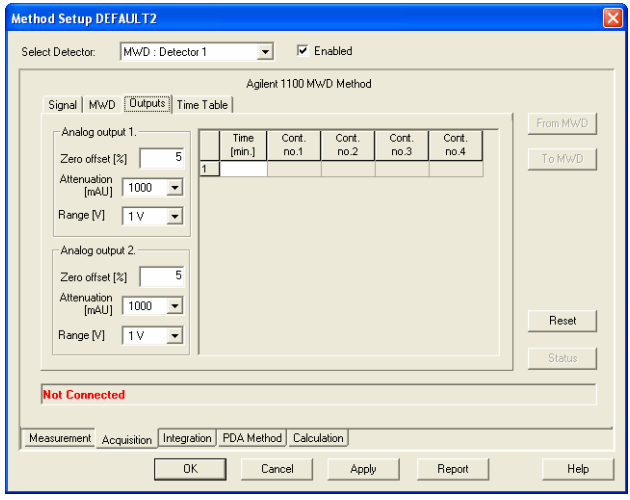


Fig. 33. Method Setup – Acquisition - Outputs

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.

5.6.5 Method Setup – Acquisition – Time Table

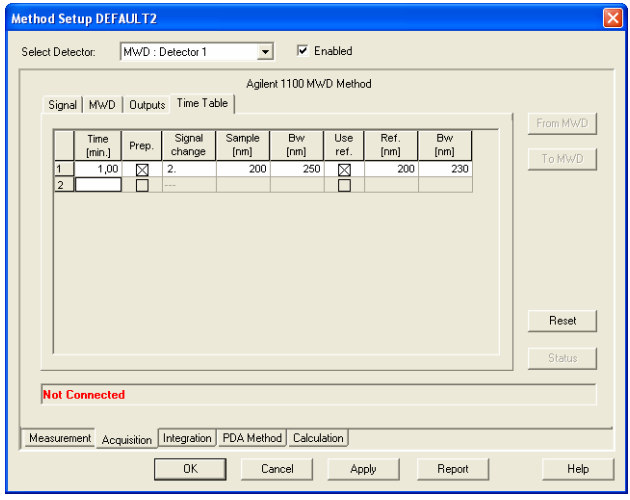


Fig. 34. Method Setup – Acquisition – Time Table

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

5.7 VWD (G1314)

5.7.1 Agilent 1100 Configuration - VWD

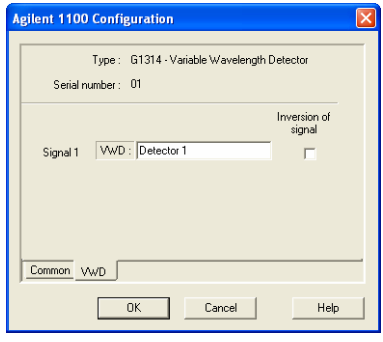


Fig. 35. Agilent 1100 Configuration - VWD

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.

5.7.2 Method Setup – Acquisition - Signal

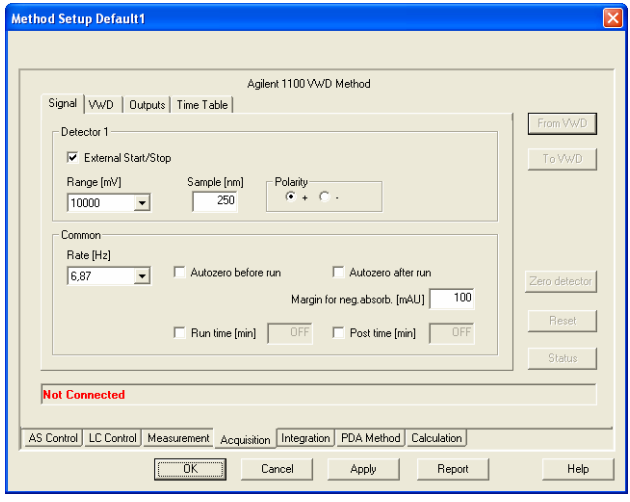


Fig. 36. Method Setup – Acquisition - Signal

Detector 1

External Start/Stop

Enables control through the use of an external event.

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.

Polarity

Sets the polarity of data handling for the detector. For positive polarity (+) the detector output positive data if detecting higher absorbance compared to the value during balance. With negative polarity (-) the detector output positive data if detecting lower

absorbance compared to the value during balance.

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

5.7.3 Method Setup – Acquisition - VWD

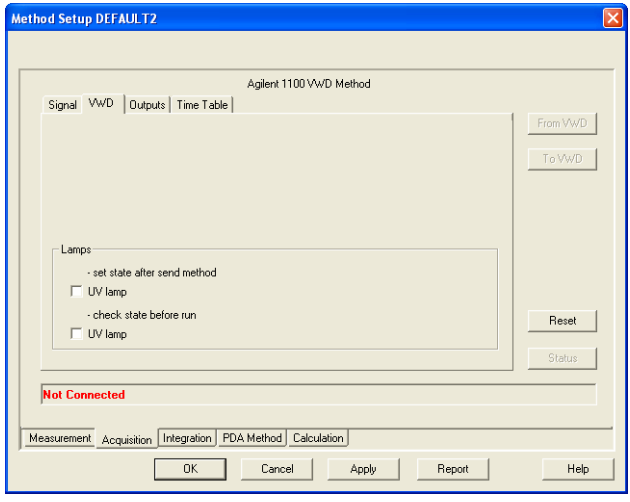


Fig. 37. Method Setup – Acquisition - VWD

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

5.7.4 Method Setup – Acquisition - Outputs

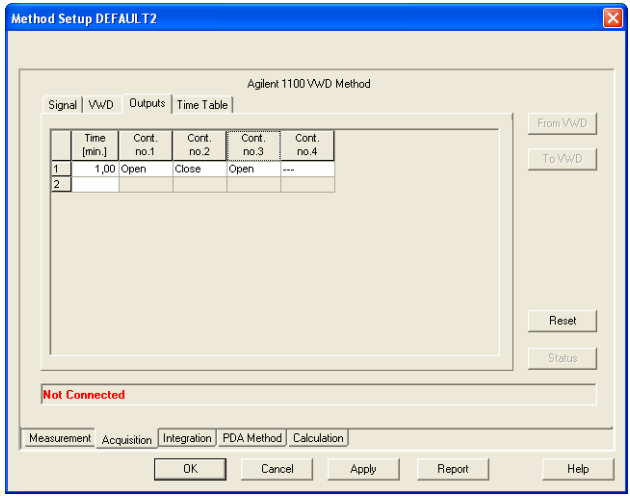


Fig. 38. Method Setup – Acquisition - Outputs

Time [min.]

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

Cont. no. 1 - 4

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

5.7.5 Method Setup – Acquisition – Time Table

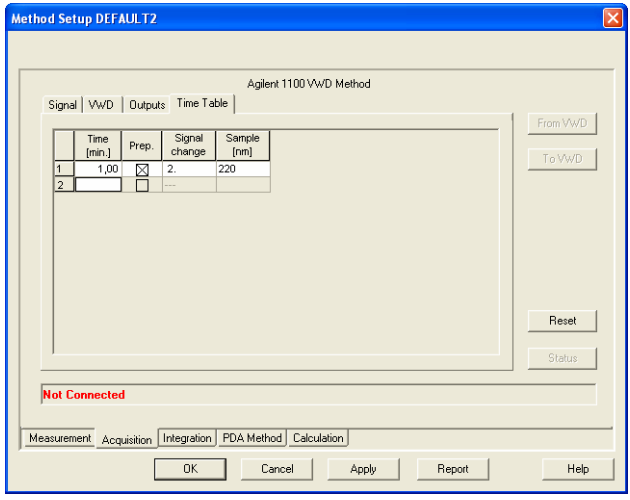


Fig. 39. Method Setup – Acquisition – Time Table

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

5.8 LC Pump (G1310, G1311, G1312)

Setting of the LC pumps. Following pumps are available: **Isocratic** (G1310) **Binary** (G1311) **Quaternary** (G1312).
See the chapter **4.4** - Method Setup - Thermostat on pg. **17**.

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

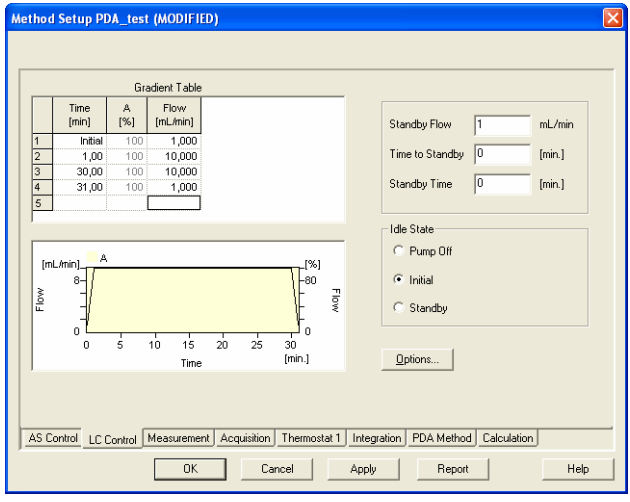


Fig. 40. Method Setup – LC Control

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).

5.8.1 Options

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

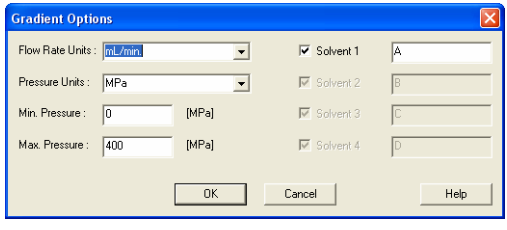


Fig. 41. Gradient Options

In this dialog, the **Flow Rate** and **Pressure** units can be selected, the pressure limits set and **Solvents** can be enabled and named.

Caution! *Do not disable the solvents for binary or quaternary pumps, 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%.*

5.9 Column Compartment (G1316)

5.9.1 Agilent 1100 Configuration –AS

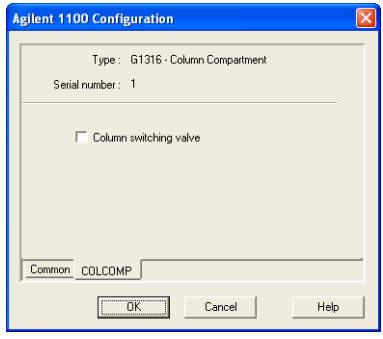


Fig. 42. Agilent 1100 Configuration - COLCOMP

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

5.9.2 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.

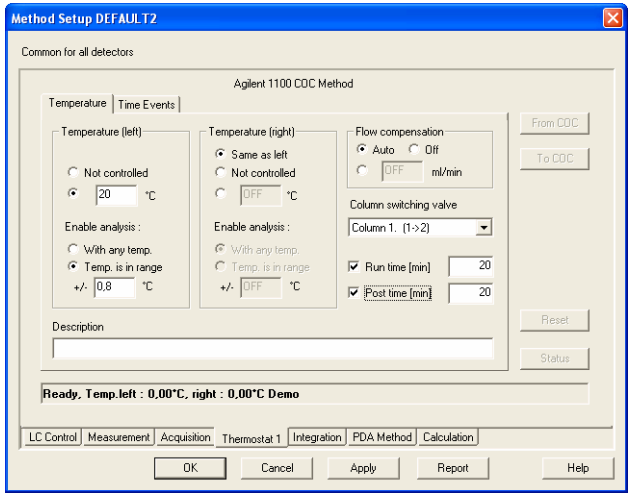


Fig. 43. Method Setup – Thermostat – Temperature

Flow Compensation

Auto x **Off** x specific flow

Column switching valve

Sets the column to be used in the current method.

Note: *The column can be switched during the analysis using the timed event (see pg. **59**).*

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

5.9.3 Method Setup - Thermostat – Time Events

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

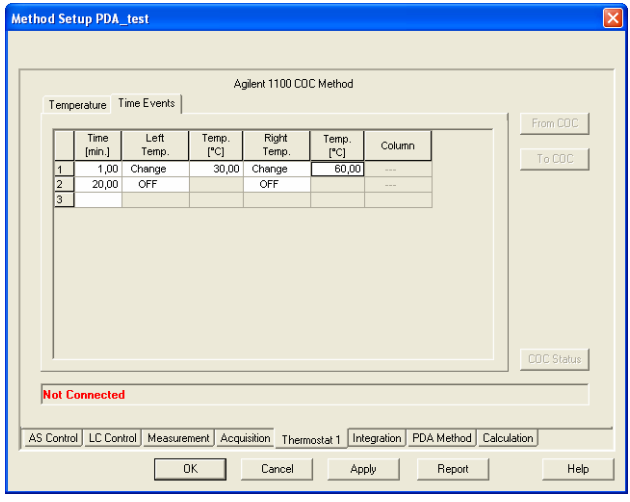


Fig. 44. Method Setup – Thermostat – Time Events

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.

6 Connections

6.1 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.

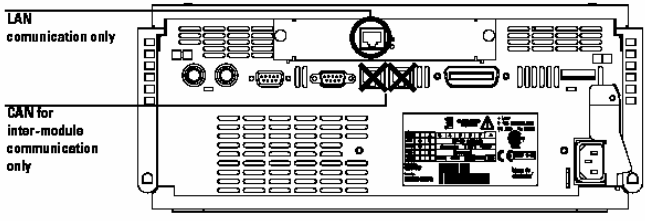
The connector is 9 pin Sub D Receptacle (Canon female) on the backside of the module, marked Remote. Use the Pin 1 to Pin 3 (Start) contacts to connect the injector. The pins 1 to 8 may be used to Stop the run alternatively.

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

6.2 Description of connectors:

6.2.1 LAN interface

The LAN interface board is installed usualy in only one component of the Agilent 1100 system. On others a cover plate is in its place.



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.*

6.2.2 GP-IB communication

The HP-IB connector is a standard on the Agilent 1100 series modules.

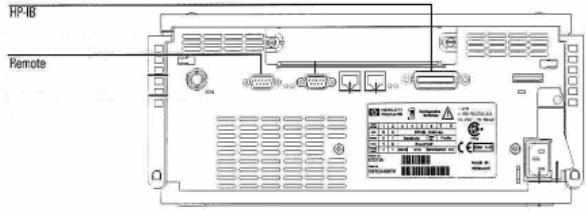


Fig. 45. Back side of Agilent 1100 components

General-purpose remote cable pin layout and colours:

Pin	HP 1100	Signal Name	Active (TTL)
1	White	Digital ground	
2	Brown	Prepare run	Low
3	Gray	Start	Low
4	Blue	Shut down	Low
5	Pink	Not connected	
6	Yellow	Power on	High
7	Red	Ready	High
8	Green	Stop	Low
9	Black	Start request	Low

6.3 Recommended GPIB addresses:

Default Addresses:

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**.

7 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 - Communication problem

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 **6.3** - Recommended GPIB addresses: on pg. **62**.

Problem 3 – 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 4 – 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 5 - 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 6 - 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 7 – 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 8 - Clarity stays in the Waiting state after Agilent 1100 stopped the analysis

When the analysis is stopped from the device equipped with autosampler (unkown 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.

Commdrv.log utility

When the cause 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. The file can be edited in any text editor (e.g. **Notepad**).

```
[COM1]
Echo=Off
textmode=on
filename=CommDrv1.log
reset=off
```

For GP-IB communication replace the port specification ([COM1]) by the GP-IB board SICL name and address, as used in the Agilent 1100 Configuration (for example [GPIB0,26])

For LAN comunication replace the port specification ([COM1]) by the device IP address and Port as used in the Agilent 1100 configuration (for example [192.168.254.11:9100]).

Note: *Separate entries can be specified for each Com port or device.*

Folloving parameters should be set also:

Echo

On - communication will be recorded.

Off (default) - will not record any communication.

Textmode

Filename

The file where the communication record should be stored. If the path is not specified, the file will be stored in the same folder like 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)

The typical example settings may be

for GP-IB

```
[GPIB0,26]
Echo=On
```

```
textmode=on
filename=CommDrv_1100.log
reset=on
```

or for LAN communication

```
[192.168.254.11:9100]
Echo=On
textmode=on
filename=CommDrv_1100.log
reset=on
```

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