

# Clarity Controls

*Agilent 68xx*

GC

ENG

Code/Rev.: M041/24I  
Date: 26.7.2010

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To facilitate the orientation in the **Agilent 68xx** manual and **Clarity** chromatography station, different fonts are used throughout the manual. Meanings of these fonts are:

**Instrument** (blue text) marks the name of the window, to which the text refers.

*Open File* (italics) describes the commands and names of fields in **Clarity**, parameters that can be entered into them or a window or dialog name (when you already are in the topic describing the window).

WORK1 (capitals) indicates the name of the file and/or directory.

*ACTIVE* (capital italics) marks the state of the station or its part.

The bold text is sometimes also used for important parts of the text and the name of the **Clarity** station. Moreover, there are text sections written in format other than normal text. These sections are formatted as follows:

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**Note:** Notifies the reader of possibly interesting information.

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**Caution:** Warns the user of possibly dangerous or very important information.

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**█ Marks the problem statement or trouble question.**

**Description:** Presents any closer information on the problem, describes its causes etc.

**Solution:** Marks the response to the question, presents a procedure how to remove it.

# 1 Agilent 68xx GC Control Module

The **Agilent 68xx** GC driver can control Agilent **6890**, **6890N**, **6820** and **6850** GC chromatographs and the Agilent **7683** autosampler (including tray).

*Note:* **Agilent 7683** autosampler can be controlled only through **6890N**, **6820** and **6850** chromatographs.



*Fig 1: GC 6890 with autosampler*

## The direct control can be performed via

- COM (RS232)
- LAN - 6890N, 6820 and 6850 models only

## Data Acquisition can be performed via

- COM (RS232)- **Clarity** Digital Data Acquisition
- LAN - **Clarity** Digital Data Acquisition
- ANALOG - analog signal to A/D converter (eg. **INT7** or **U-PAD**).

## 2 Requirements

- **Clarity** Installation CD ROM with GC Control module (p/n A23).

### When using LAN communication

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*Note:* LAN communication is supported since **Clarity** 2.4.

- LAN card in the PC
- Cross LAN cable (p/n SK08).

### When using COM communication

- Free serial port in the PC (fast - 16550 UART).

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*Note:* Modern computers usually have only 1 (if any) serial (COM) port installed. To use more devices requiring the port, the **MultiCOM** adapter (p/n MC01) is available.

- Serial cross DB9F-DB9F cable (p/n SK01).

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*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 Agilent 68xx - Communication

- It is necessary to find out the communication parameters for the desired type of communication (LAN or COM). These parameters will then have to be set in the **Clarity GC Control** module.

**Note:** **Agilent 6850 GC** can also be purchased without the display unit for setting the communication parameters. It is then necessary to obtain the communication parameters from the Agilent service technician.

**Note:** When connecting the 6850 model it is necessary to observe following sequence of steps: 1) connect the cables, 2) then switch on the PC and then switch on the GC. This model detects the type of communication (COM or LAN) automatically.

- Connect the appropriate cables between the GC chromatograph and PC.

### Serial Connection

The **Agilent 68xx** chromatograph may be controlled by serial (RS232) communication. It uses standard serial cross cable DB9F-DB9F wiring described in the picture.

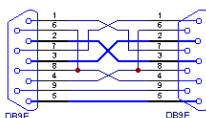


Fig 2: Serial cross cable DB9F - DB9F

**Note:** If serial communication cannot be established and all parameters of communication are correctly set (speed, parity, etc.), then we recommend to remeasure the cable according to the following scheme (especially pin connection 2 and 3).

### LAN connection

**Caution:** Do not use the **Agilent 68xx** DHCP server feature.

When using the LAN communication it is recommended to attach the GC chromatograph directly to the PC avoiding HUBs, Switches etc. Contact your local LAN administrator who can make the appropriate settings.

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**Caution:** **Cross LAN** cable is primarily used for the direct connection of the chromatograph and the PC. This cable can also be used for the connection of the device to the switch or network socket, but with older switches, the **straight LAN** cable might be necessary.

## 3.2 Installing the GC module in the PC

- Select and if necessary install a fast serial port in the PC.

**Caution:** In the following procedure the setup of HP 68xx with digital acquisition (without A/D converters) will be described.

- Install **Clarity** station, in the **HW Setup** dialog check the *Other* option during installation.

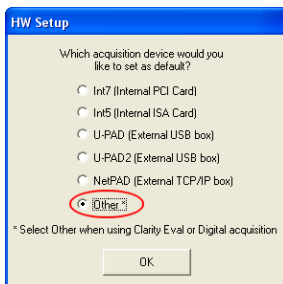
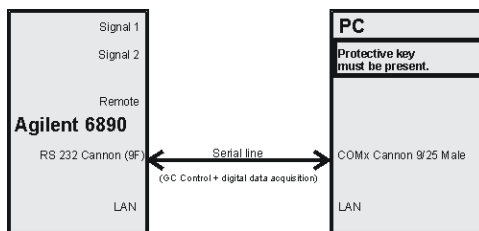


Fig 3: HW Setup

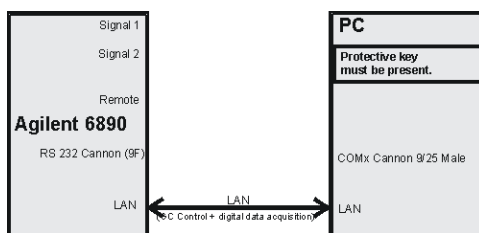
- Connect the GC chromatograph to the PC by serial cable (COM) or by LAN, turn the power GC on.

## 3.3 Connections

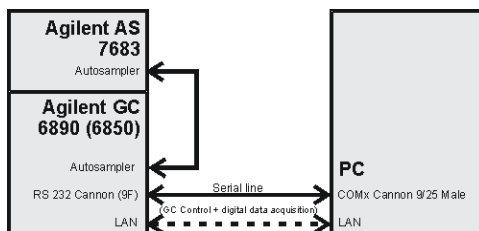
### 3.3.1 Wiring



AGILENT 6890 - RS232 with digital acquisition



AGILENT 6890 - LAN with digital acquisition



AGILENT 6890N (6850) - with AS 7683

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

### 3.3.2 Description of connectors:

#### Signal 1 (2)

- PS/2 connectors with output of both analog amplifiers (connected to detector).

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*Note:* Not necessary when using the digital acquisition.

### **Remote**

- 9 pins male Cannon connector dedicated to send start signal to **Clarity**.

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*Note:* Not necessary when using digital acquisition

### **RS232**


- 9 pins male Cannon connector for direct control and digital acquisition. It also may be labeled "Modem" on some 6890 models.

### **LAN**

- RJ45 connector

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*Note:* Consult the servis manual relevant to the GC type.

## 3 Clarity Configuration

- Invoke the **System Configuration** dialog accessible from the **Clarity** window using the *System - Configuration* command.
- Press the **Add**  button (See "System Configuration" on page 11) to invoke the **Available Control Modules** dialog.

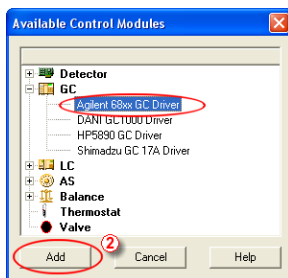



Fig 4: Available Control Modules

- Select the *Agilent 68xx GC Driver* and press the **Add**  button.
- The **Setup dialog** dialog will appear.

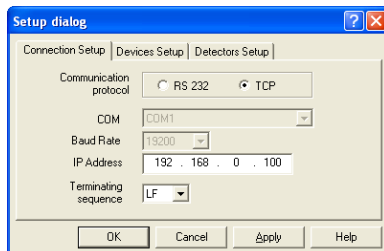


Fig 5: Connection Setup

- Select the *Communication Protocol*, which can be RS232 (COM) or LAN.
- For **RS232** : Set *COM* port and *Baud Rate* according to the setting in the chromatograph.
- For **LAN** : Set the *IP Address* according to the setting in the chromatograph.

The GC communication settings are accessible by the Options button from the GC keyboard, then scroll to the Communications section.

For RS 232 the settings should be set to 8 data bits, 2 stop bits, No handshake. Baud rate and terminating sequence must comply with the settings in **Clarity**.

For LAN communication settings, the Enable DHCP option should be OFF (it is not supported by **Clarity**).

For direct connection to PC use crossed LAN cable and manually set the IP address and Subnet mask in both PC and the GC.

Following settings example can be used (the IP address should differ in the last digit group) :

- In the PC

IP address: 192.168.0.1

Subnet mask: 255.255.255.0

- In the GC

IP address: 192.168.0.2

Subnet mask: 255.255.255.0

If your computer is connected into a local LAN, assign the GC a free IP address from the relevant IP range. Contact your LAN administrator for details.

**Note:** When you have the **6850** model without display and you do not know the *Baud Rate* it will most probably be *9600*. The Controller Module may be needed to determine or change the settings during installation; it is not needed for normal operation.

- Go to the **Devices** tab

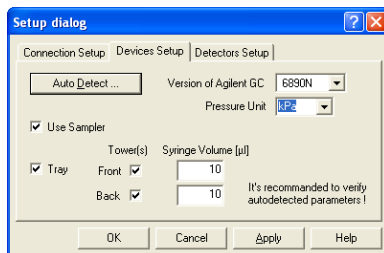


Fig 6: Devices Setup

- Use the *Autodetect* button to read in instrument configuration and check the communication.
- Control the detected parameters against the GC parameters.
- When the Agilent 7683 Autosampler controlled through the GC is present (6890N, 6820, 6850), check the *Use Sampler* checkbox and select present towers (*Front* and/or *Back*).
- Go to the **Detectors Setup** tab

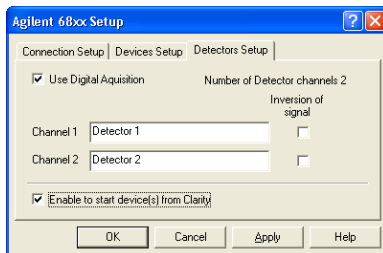


Fig 7: Detectors Setup

- Check the *Digital Acquisition* checkbox and fill in the names of your detectors.
- Check the *Enable start from Clarity* checkbox in case the run is not started by the 6890 itself (for example when a sampling valve is used and is activated within the method). When using a sampler or starting by the **Start** button on GC or remote contact on GC, the checkbox must not be checked.
- Press the *OK* button.

The *Agilent 68xx GC Driver* item ③ will appear in the *Setup Control Modules* list in the left part of *System Configuration* dialog.

- Switch to the desired *Instrument X* tab ④ in the right part of the *System Configuration* dialog.

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*Note:* The *Instrument Type* ⑤ must be set to *GC*.

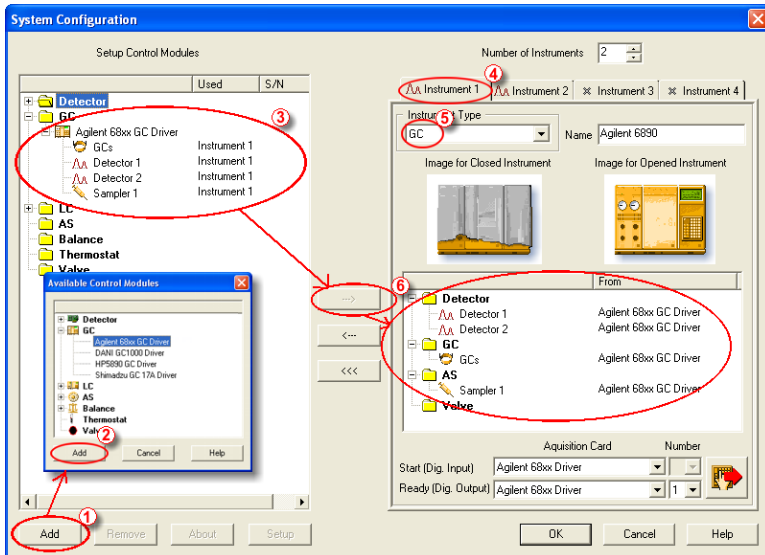


Fig 8: System Configuration

- Drag the *Agilent 68xx GC Driver* from the *Setup Control Modules* in the left to the instrument on the right or use the  $\rightarrow$  button ⑥.

*Note:* Drag only one detector to the **Instrument** tab if you do not wish to acquire both signals simultaneously.

## 4 Using the Control Module

New tab **GC Control** appears in the **Method Setup** dialog, enabling the setting of the GC control method.

If the **7683** sampler is configured there will appear also **AS Control** tab for setting the autosampler method.

**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 68xx** control module.

### 4.1 Method Setup - GC

- Use the *From GC* button to download current method parameters from **Agilent 68xx** (and save it under suitable name). You can use this procedure to copy the parameters of your methods already stored in the GC memory to **Clarity**.
- Use the *Send Method* button to upload the **Clarity** method GC parameters to **Agilent 68xx**.
- Use the *GC Status* button to see the current GC configuration (inlets, detectors etc.).

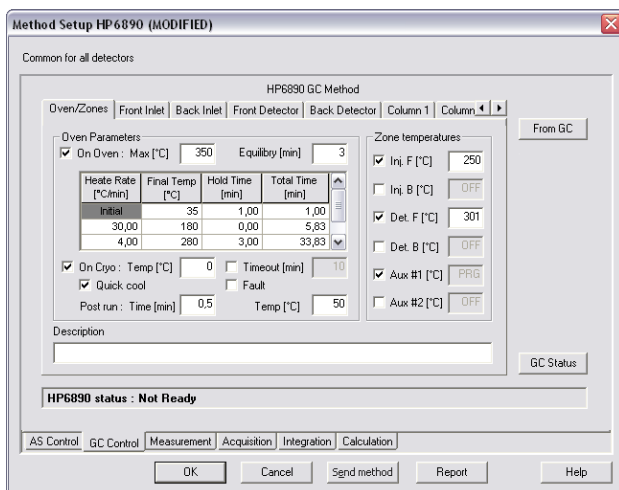


Fig 9: Method Setup - GC - Oven/Zones

**Note:** In DEMO mode it enables selecting them)

- Use the upper tabs in the **Method Setup - GC Control** dialog to set or modify the GC control parameters.

**Caution:** The appearance of the individual dialogs depends on actual configuration of the **Agilent 68xx** chromatograph. Individual options (e.g. its availability) may also depend on the settings of other options across the tabs. For example setting in one tab can disable another option in another tab.

- On the **Signals** tab, it is possible to determine the source for the output Signals.

The Signal 1 or 2 will be then sent to the **Clarity** chromatography station either through analog output to Detector 1 or 2 of **INT7/U-PAD A/D** converter or using the digital output to the Detector 1 or 2 of the **Clarity Digital Acquisition**. These detectors can be configured in the **System Configuration** dialog (in the chapter "**Clarity Configuration**" on pg 11.).

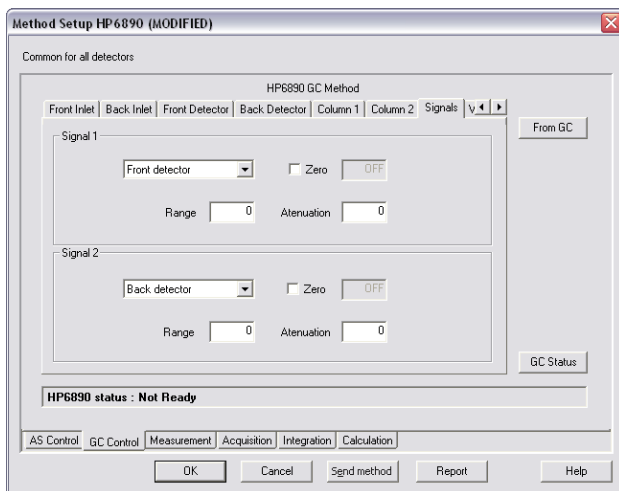


Fig 10: Method Setup - GC Control - Signals

## 4.2 Method Setup - Acquisition

- In the **Method Setup - Acquisition** dialog, check the *External Start/Stop* checkbox and select the voltage range to be acquired. Signals exceeding this value will be cut.

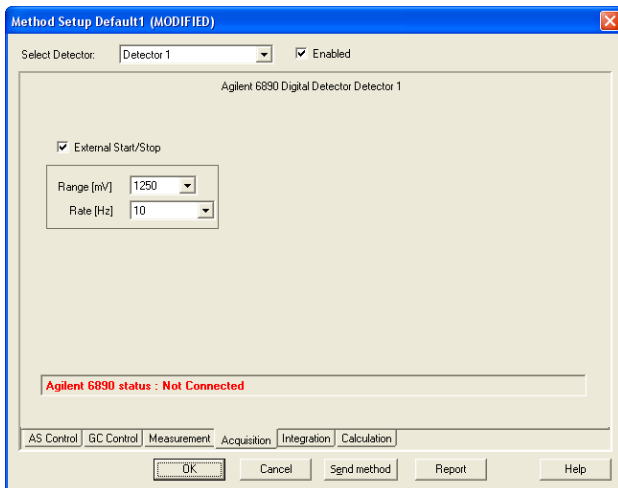


Fig 11: Method Setup - Acquisition

**Caution:** When using another sample rate (*Rate*) then the default (10 Hz) in **Single Run** analyses it is necessary to send the method to the device manually before starting the acquisition (using the *Send Method* button in the **Method Setup** dialog). The GC "forgets" the setting every time it gets into sleep mode or when switched off.

### 4.3 Method Setup - AS

- In the **Method Setup - AS Control** dialog, set the parameters of the sampler method.

The screenshot shows a dialog box titled "Method Setup DEFAULT3 (MODIFIED)" with a close button in the top right corner. The main content area is titled "HP6890 Sampler Method" and contains a "Front Tower" tab. The parameters are organized as follows:

Pre Wash Solvent A	Pre Wash Solvent B	Pre Injection Delay [min]	<input type="checkbox"/> Slow Plunger
2	2	1	

Sample Washes	Pumps	Viscosity [s]	<input type="checkbox"/> Sample Skim [mm]
2	6	0	10

Post Wash Solvent A	Post Wash Solvent B	Post Injection Delay [min]
3	3	0

Below the parameter fields is a "Description" text area and an "AS Status" button. The status text reads "HP6890 status : Ready". At the bottom of the dialog, there is a navigation bar with tabs for "AS Control", "GC Control", "Measurement", "Acquisition", "Integration", and "Calculation". Below the navigation bar are buttons for "OK", "Cancel", "Send method", "Report", and "Help".

Fig 12: Method Setup - AS - Front Tower

The *From AS* button loads the sampler method from the sampler. *Send Method* button sends the sampler method from **Clarity** to the autosampler.

## 4.4 Hardware Configuration

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

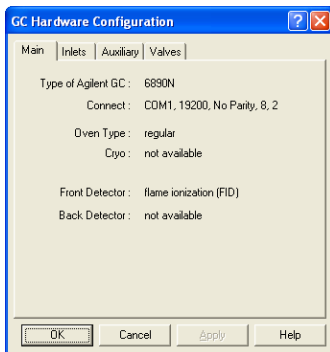


Fig 13: Hardware Configuration

## 4.5 Digital Outputs

The **Host Ready Control** dialog defines the initial state of **Agilent 68xx** digital output, used for synchronisation with autosamplers or other external devices.

It is accessible using the *System - Digital Outputs* command from the **Clarity** window.

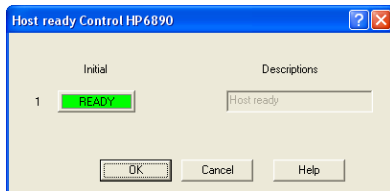


Fig 14: Host Ready Control

When multiple devices are configured on **Clarity**, select the **Agilent 68xx** driver from the list.

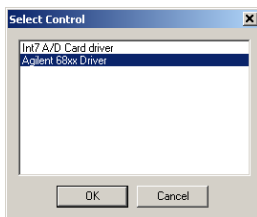


Fig 15: Select control window

The default settings (Ready) are necessary for operation without autosampler, otherwise the GC will be still in *HOST NOT READY* state.

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**Caution:** For Active Sequence, it must be changed to *NOT READY* state.

The Active Sequence changes the digital output state level when the command for injection is sent out and again back, when the injection is performed. If it was initially *READY*, it would have been changed to *NOT READY* and the sampler would be prevented from injection by the *HOST NOT READY* state.

# 5 Troubleshooting

## Host not Ready message

- Check the *Initial State* of the digital outputs of the [Host Ready Control Agilent 68xx](#). For manual injection, the state should be *READY*, while for active sequence with autosampler it must be *NOT READY*.

This dialog can be invoked by the *System - Digital Outputs* command from the main **Clarity** window.

## Buffer Overflow message

- Communication speed (Baud rate on serial line) is probably too low, so the 6890 internal buffer is getting overflow. Try to increase it (recommended value is 57700 Baud). This must be done both in **Clarity** System Configuration and on the GC, GC must be restarted for the change to take effect. In such a case please consider that some data will be probably missing in the resulting chromatogram, so it will be wise to repeat particular sample analysis.

## Error while starting the sequence

- The **Active Sequence** should be started from **Clarity**.

If it is started from both **Clarity** and the **GC Keyboard** simultaneously an error message will be issued.

## Agilent 68xx LAN connection

When connecting the 68xx to a PC using the LAN cable do not use the **Agilent 68xx** feature when it can work as a DHCP server. Check the IP address settings and type of cable used.

## 5.1 Commdrv.log utility

It is possible to record the communication between **Clarity** and the device. To activate the recording and specify a file for storing the communication set the COMx key(s) with following parameters in the COMMDRV.INI file located in the **Clarity** installation folder:

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

---

**Note:** The file can be edited by any text editor (Notepad).

---

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

**[COM1]**

Specifies the communication line used. Following options can be used [COMn] where the n is number of RS232 port in the PC used for communication.

[TCP\_IP xxx.xxx.xxx.xxx:yyyy] where the x correspond to the IP address and y to the port (9100 by default) used for the LAN communication.

**Echo**

*Off* (default) - will not record any communication.

**Filename**

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

Not received or unrecognized replies will be recorded as "*Timeout on Com line*"

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

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

**Reset**

*On* - will erase the log each time the station is restarted (otherwise the log can increase substantially after some time)