JAS Gas Injection Control Unit

jas joint analytical systems

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Introduction

System Requirements

- Microsoft Windows XP with Service Pack 3 (SP3) installed
- Microsoft .NET Framework 2.0 or higher
- Intel Pentium 2,6 GHz Dual Core
- 2 GB RAM
- 2 GB of free hard drive space
- DVD-ROM drive

Compatibility

- The JAS GICU software is compatible with all Agilent GCs.
- All versions of the ChemStation are supported
- Methods and sequences can be saved independently of the ChemStation

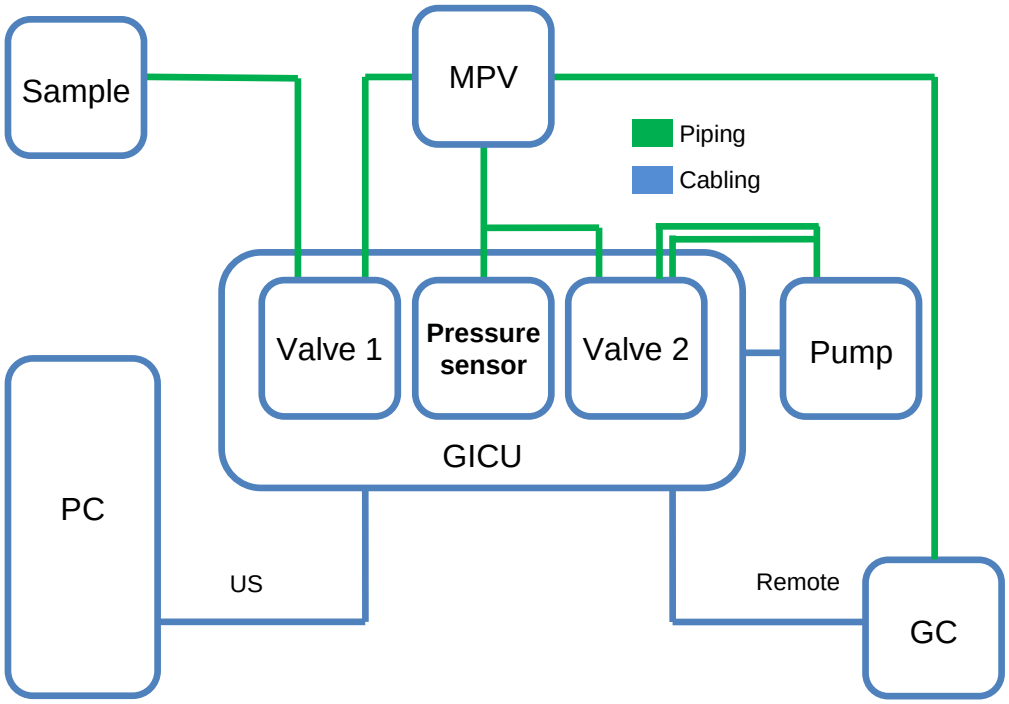
Specifications

- Loadable up to 2 bar absolute pressure
- The amount of approachable under pressure depends on the used pump
- Response time of the valves are 30ms

Measurement Range

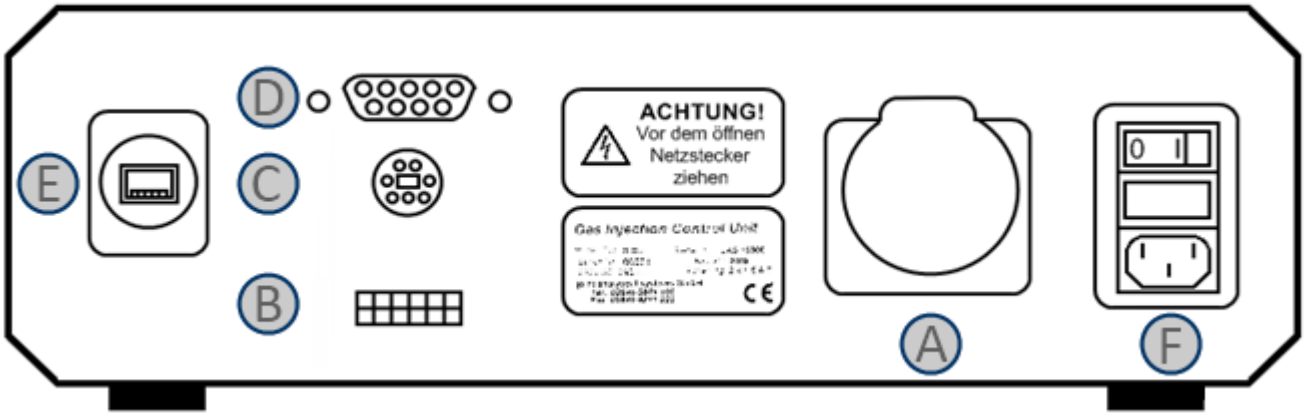
From 250 mbar up to 1700 mbar

Schematic of GICU



Hardware Installation

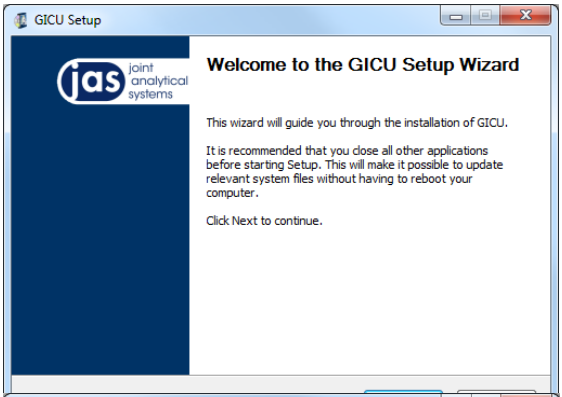
1. First connect the pumps AC power plug to the connector (A) on the back of the GICU base unit.
2. Connect the pressure sensor with the socket (C) and secure the plug with the bayonet fitting.
3. Now connect the valve controller to port (B).
4. Plug the GCs remote cable to the serial port (D) and tighten the screws.
5. Now plug the USB cable into the appropriate socket (E).
6. Finally, connect the power cord into the connector (F) and the circuit (WARNING: Only operate at 220V)



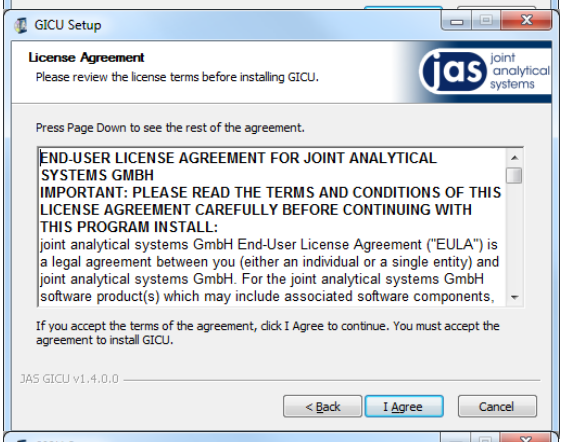
Hinweis:
The output of the pump can be specified in the order according to customer wishes. By default, a 1/8 inch noise attenuation is used.

Software Installation

Stating the Installation
Run the setup and start the installation process by pressing „Next“.

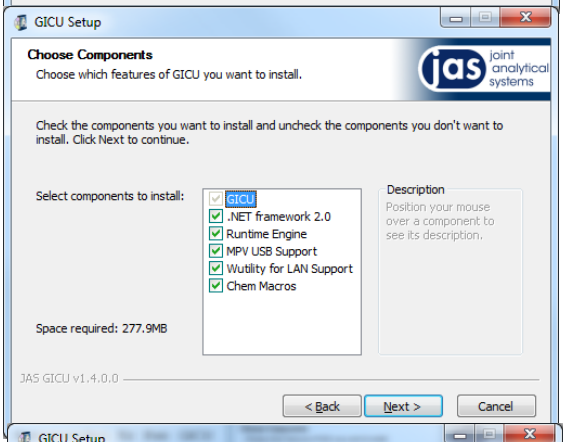


Terms of Use
Read carefully the Terms of GICU software on the next page and confirm by clicking "I Agree“.

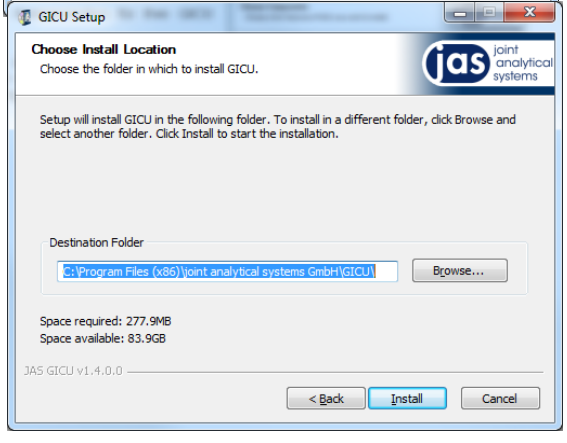


Component Selection
Select the components you need for your GICU installation.

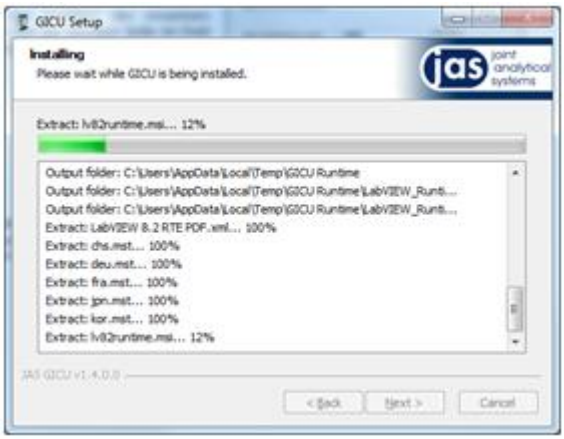
A more detailed description of the function of the individual components can be found on the right side on the field "Description". Notice that the descriptions will only appear after selecting a component.



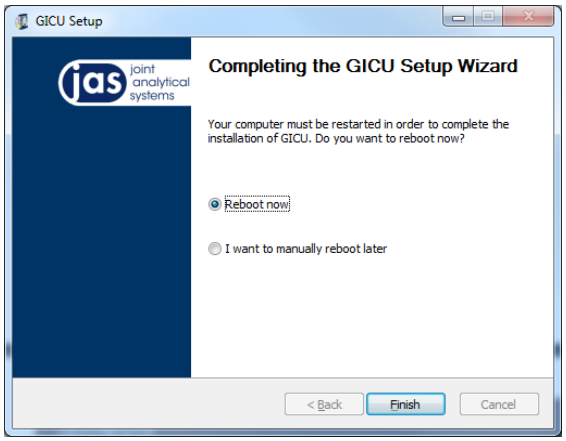
Installation Path
Click on the "Browse ..." button to adjust the pre-selected installation path. This opens a folder selection window where you can select the desired path. Then click on "Install" to begin the installation.



Installation
Finally, the installation of the software is running. This may take a few minutes. The time varies with the selected components.



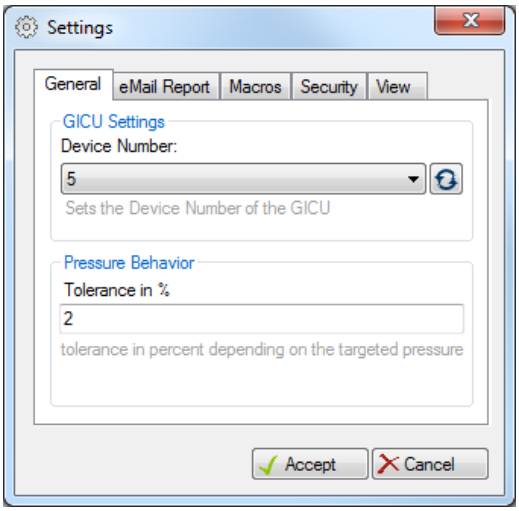
Restart
To complete the installation restart your computer. This is necessary to make sure all components are functional.



First Start

The first time the GICU software gets started you will get a message that indicates that a connection can be made to the GICU.

Next the Settings menu will open. Please select a GICU from the "Device Number" list and confirm with "Accept". If the Settings menu appears with a warning that no devices were found, please check the USB connection between the PC and the GICU.

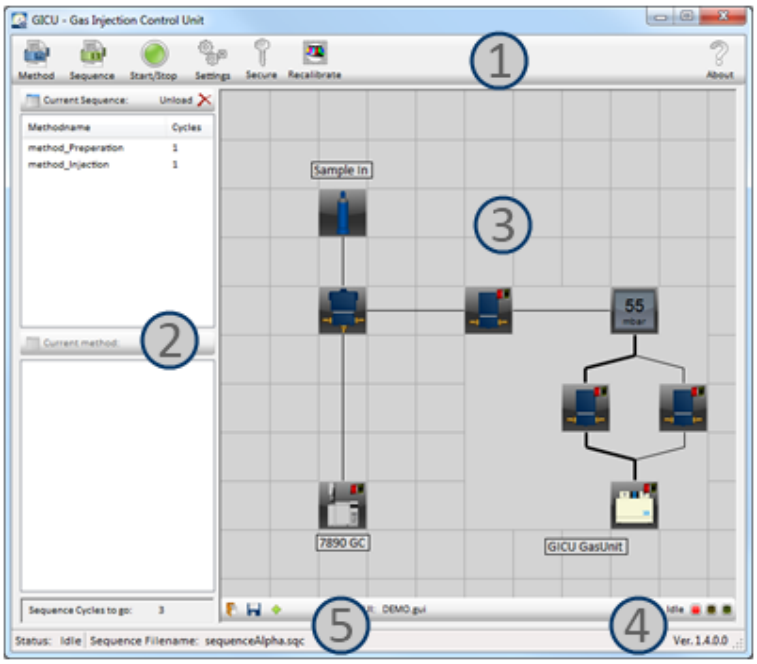


User Interface

After launching the software you will see the user interface with the recently loaded element view.

1. Toolbar
2. Progress bar
3. Element area

At the bottom in the status bar, you will also find information about the version number (4) and the filename of the loaded sequence (5).



Toolbar

On the toolbar you can easily perform basic functions. From left to right you have the following functions available:

- Method — Open the Method editor
- Sequence — Open the Sequence editor
- Start/Stop — Start/Stop the loaded Sequence
- Settings — Open the Settings menu
- Secure — Lock the GICU software
- Recalibrate — Calibrate the pressure sensor
- About — Version information

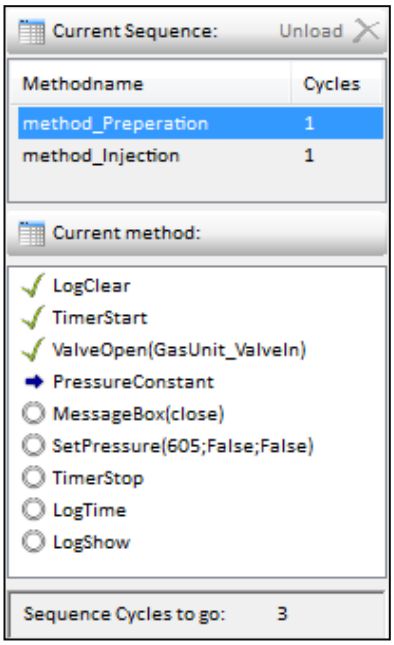
Progress Bar

The progress bar is an important component of the user interface. It is divided into a display for the progress of the sequence, in the upper region and a display for the progress of the method, in the lower region.

In the sequence region the currently running method is highlighted. On the left you see the method name and on the right the number of loops for this method. In order to remove a sequence click the "Unload" button.

While passing though the various methods, the method steps were shown in the lower display. The currently processed step is marked with an arrow.

At the bottom of the progress bar you will find the number of cycles, the sequence will be ongoing.



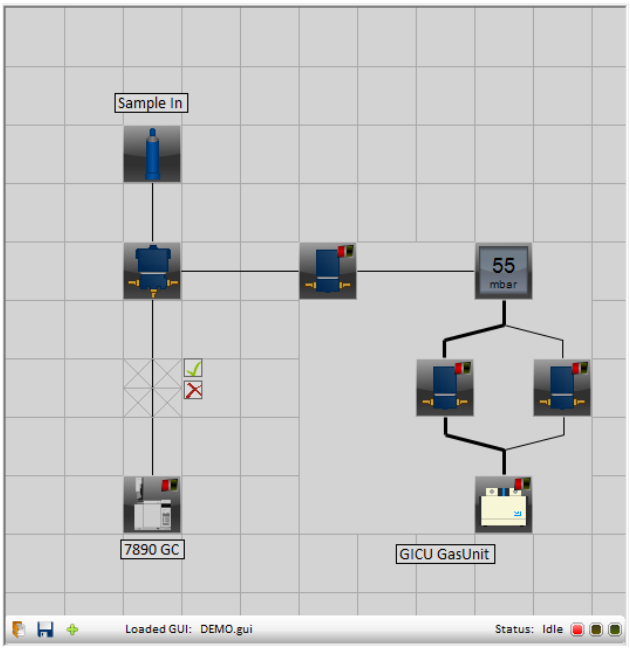
Element Area

Within the Element Area all components of the GICU systems and their status were shown.

User-modifiable elements are provided with an on/off indicator. Green means on (or in open valves), red means off (or closed).

All other elements are merely illustrative of the structure or the display of the current gas pressure.

By double clicking you can open the connection tool for the appropriate grid boxes and lines on or off.



Toolbar

The toolbar contains the following tools:

- Save element area
- Load an saved element area
- Add a new element to the current area

In addition, you will see the currently loaded GUI and the status of GICU

The different status colors stand for:

Red	- Idle	(Waiting state)
Yellow	- Preparing	(GICU is matching the pressure)
Green	- Run	(GC is running).

Connection Tool

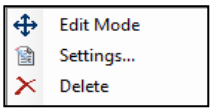
You can open the connection tool by double clicking on one of the grid boxes. It can displayed horizontal, vertical and diagonal lines. By clicking on the greyed out corresponding line, it gets activated. On another click it gets deactivated.

Using the two buttons on the right side you can accept the changes by clicking the green mark or reject by clicking on the red X.

Move the connection tool during operating with a double click on another field and all changes will applied automatically.

Context Menu

Each control in the element area has a context menu that can be opened by right-clicking. In this menu, the edit mode can be activated for this element, the settings menu can be opened or the item can be deleted.



The edit mode is indicated by a green border around the object. As long as this mode is active, the position and the size of the element can be changed.

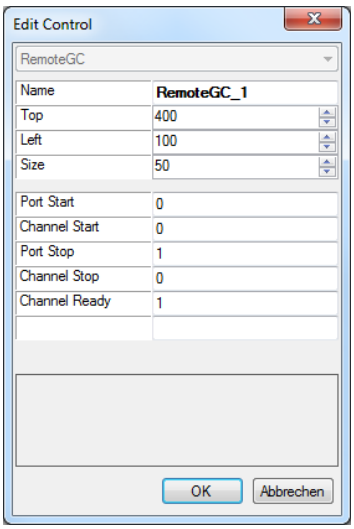
When deleting, the item is displayed with a red border and a dialog appears to confirm the operation.

With the "Settings" menu item you have access to the following settings:

There are four standard settings for each object:.

- Name – For a individual name
- Top – Indicates the distance between the top border and the object
- Left – Indicates the distance between the left border and the object
- Size – Size and height of the object

In the lower section you will maybe find individual settings, mostly Port and Channel settings.



Adding a New Element

Open the Create dialog by clicking on the third button in the toolbar (green plus symbol), located on the lower border.

Pick your new element from the selection box on top and add a name into the "Name" field. You can also use the standard name for this element.

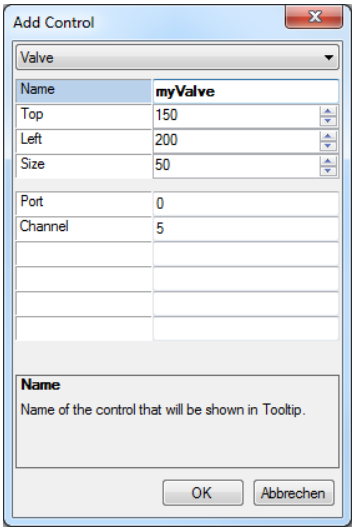
You can also add the distance to the top and left border by adding values to the "Top" and "Left" fields. Same on the "Size" and "Height" field. All four settings can be changed later via the edit mode.

Depending on the chosen type of object you might have to fill out specific settings. A short description for each setting is located on the lower section.

A standard element view can be found at the installation path. Easily open the "Standard.gui" or, If you use your GICU with a MPV use the "StandardWithMPV.gui".

Using the toolbar on the element area you can save and load your GUI. All GICU GUI-files are using the ".gui" file ending.

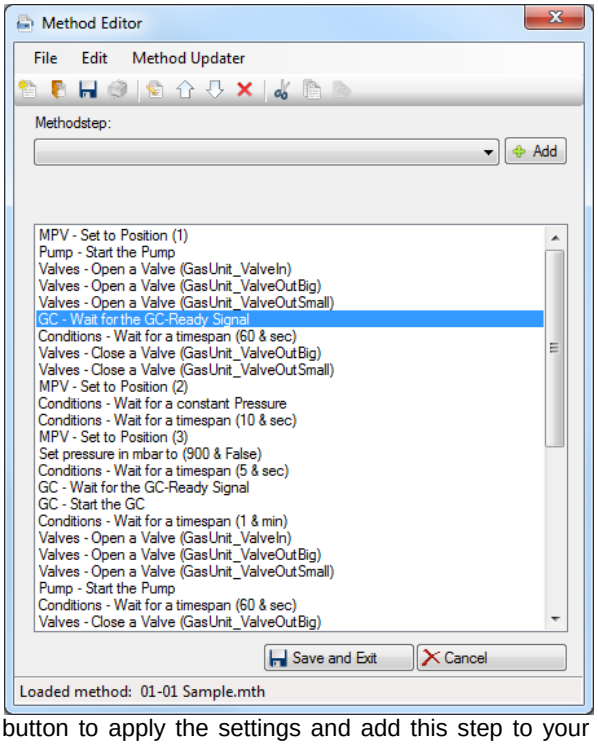
Notice:
A list of all elements can be found in the appendix.



Method Editor

General Information

The method editor is for creating and editing procedures that are later stored at sequences. Here you can use some basic commands to operate your system. The editor is divided into three sections:



Toolbar

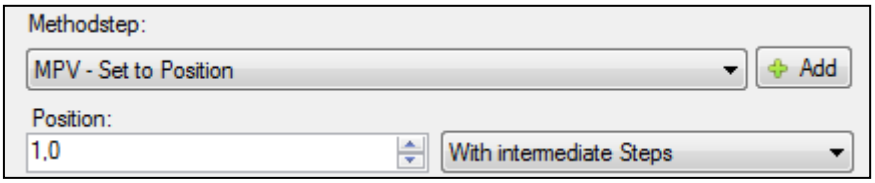
Using the "file" menu, you can save, load and print methods.

In the "edit" menu, you can edit the individual steps and change their positions. You have also the ability to copy, cut and paste them.

With the method updater you can update methods that were created before version 1.4.4.0. Is step is necessary if you want to run older methods on the latest software version.

Method Steps

To add a new method step choose a command from the "method step" list. Some commands may require some additional parameters, which can be given below the list. Click on the "Add" button to apply the settings and add this step to your method.



The available commands may vary depending on which elements were added to the element area. To obtain additional information about a step, move your mouse over the list. A tooltip box will appear shortly.

Notice:
A list of all available steps can be found in the appendix.

Buttons

If editing an already existing method, simply click on "Save and Exit" to apply your changes and close the method editor.
By clicking on the "Cancel" button the method editor quits.

Software

Sequence Editor

General Information

The sequence editor allows you to create and edit sequences. Here methods get summarized for later processing. The sequence editor is divided into three sections, too.

Toolbar

In the "file" menu you can load, store and print sequences

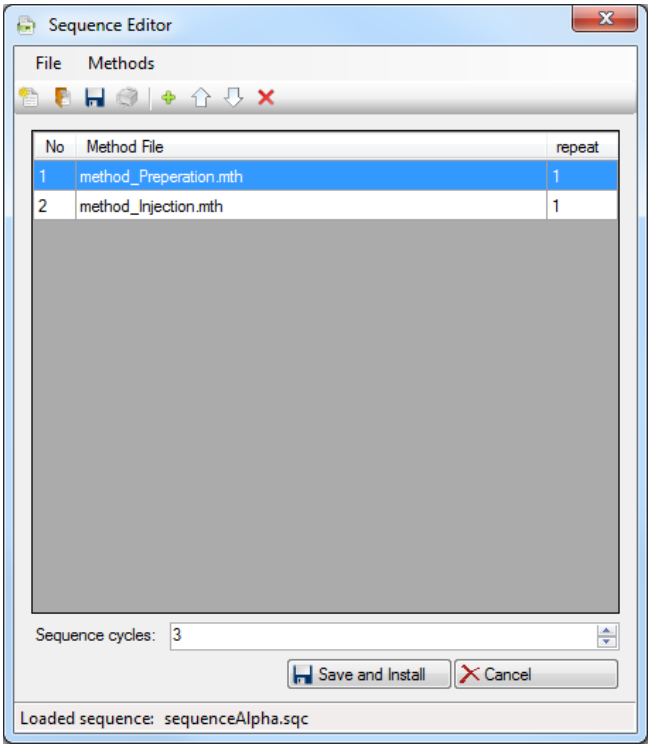
With the "methods" menu you can add and remove methods and change their position in the sequence.

List of Methods

Click on the "Add" button (green plus symbol) to open the selection dialog. Here you can see all available methods. Select the method you would like to add and load it by clicking on the "Load" button or double click the method itself.

To set repetitions you can change the amount in the "Repeat" column.

If you wish to cycle the hole sequence change the number at the bottom.



Buttons

If editing an already existing sequence, simply click on "Save and Install" to apply your changes and close the sequence editor. After closing, the sequence will be loaded automatically.

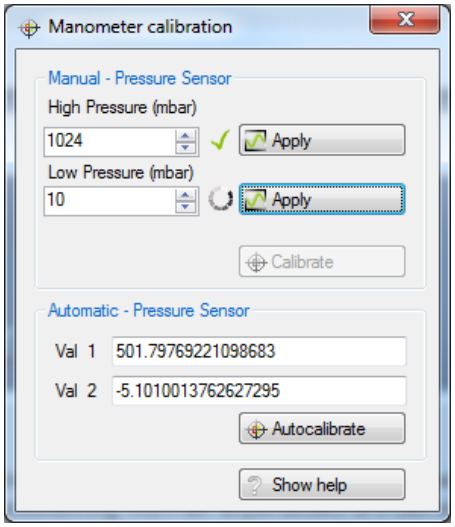
by clicking on the "Cancel" button the sequence editor quits. A confirmation prompt may be displayed when changes has been made to previously loaded sequences.

Notice:
Since the GICU has no direct connection to the GC ChemStation, you have to start GC methods parallel or called by the macro from the ChemStation out of the GICU.

Manual Calibration

In the unlikely event that the calibration data has been lost, a coarse calibration can be made. Proceed as follows:

- Make sure that no gas is connected at the sample-in and the entrance is not locked.
- Open the inlet valve and wait a few minutes until you have an atmospheric pressure in the system.
- Open the calibration menu on the toolbar.
- Enter the current atmospheric pressure into the text box under "High Pressure"
- Click on "Apply" next to that box.
- Close the inlet valve and open both valves to the pump.
- Start the pump.
- Wait at least five minutes until it reaches the minimum pressure.
- Next click on the bottom "Apply" next to the "Low Pressure (mbar)".
- Enter the minimum pressure which can be reached by your pump according to the specifications. Enter this value into the lower text box.
- Finally, click on "Calibrate".



Notice:
This calibration is only for emergency cases! You have still to recalibrate your pressure sensor as soon as possible.

Automatic Calibration

Together with your GICU you should also received data for calibration. With these you can repair faulty calibrations and recalibrate the pressure sensor. You will find the calibration data on a sticker on the bottom of the pneumatic unit of your GICU.

To perform a calibration, proceed as follows:

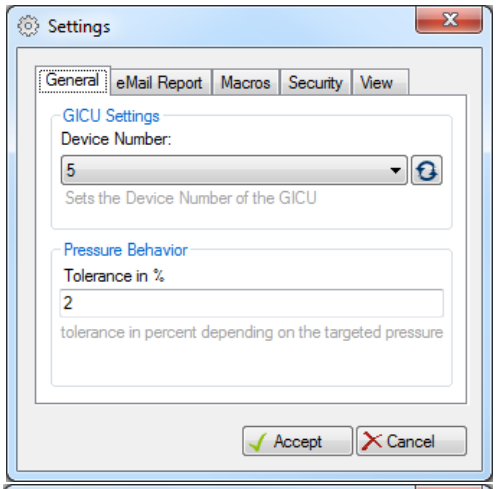
- Enter the first calibration value into the "Val 1" field.
- Enter the second calibration value into the "Val 2" field.
- When finished, click "Save and Exit".

Notice:
Additional help can be displayed by clicking the "Show help" button.

General Information

Using the GICU Settings menu you can select the GICU device number. If the Settings menu appears with a warning that no devices were found, please check the USB connection between the PC and the GICU.

In the "Pressure Behavior" section you can change the tolerance for your pressures. The default value is 2% tolerance.



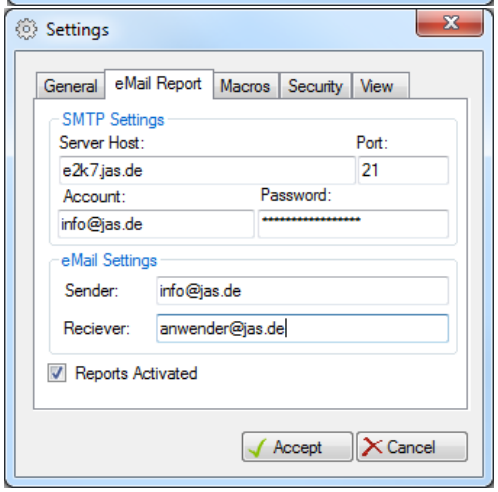
E-Mail Report

A bug report can be sent via e-mail when no GC-ready signal can be received (usually due to an error on the GC).

To enable the reporting check the box for "Reports Activated".

Then you have to enter your authentication data into the "SMTP Settings" field.

To specify sender and recipient addresses, enter this information into the "Email Settings" field

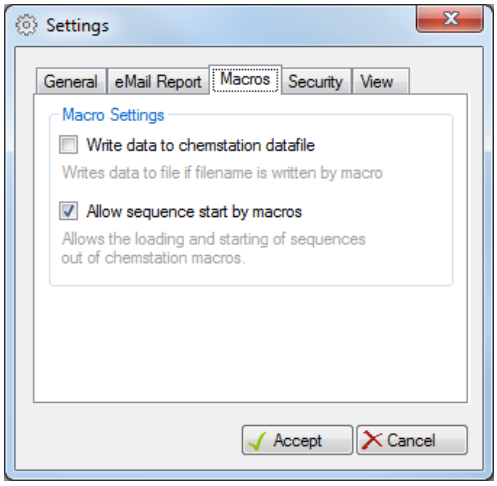


Macros

If the ChemStation macros have been installed, you can now change their settings here.

„Write data to chemstation datafile“ allows you to add the a method step with that you are able to write the pressure and MPV position into the chemstation.ini.

„Allow sequence start by macros“ allows you to match the start out of ChemStation macros.



Security

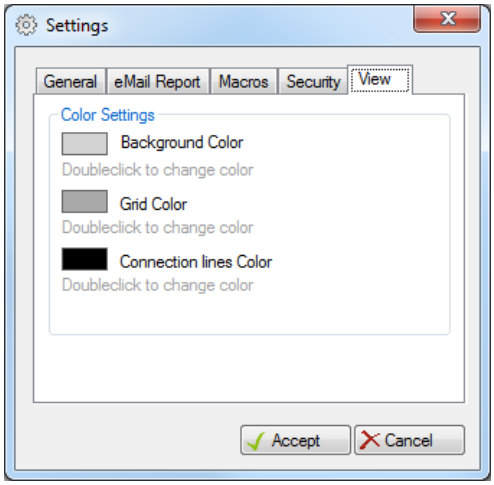
To protect your GICO software against unwanted changes, you can lock certain functions with a password.

To set a password, enter your new password into the "New Password" field and the "Repeat New Password" field.

If you already set a password you will have to authorize the change by entering the old password as well.

Click on "Accept" to save your new password.

View



Use the "View" tab to adjust the display properties of the grid.

By double clicking on the colored boxes you can set the colors for the background, the grid lines and the connection lines.

Appendix

Table of Elements

Basic Elements

Name	Symbol	Description	Method step
AUX		Used to illustrate, the displayed number is modifiable	
Gas Bottle		Used to illustrate	
Gas Mouse		Used to illustrate	
Remote GC		This element takes the remote control of the GC. The user is able to start and stop the GC.	• start GC • wait GC Ready • wait GC Stop
Pump		The pump can be started and stopped by the user.	• pump start • pump stop
Reactor		Used to illustrate	
Secure Valve		Used to illustrate	
Valve		The valve can assume two states: open and closed. It can be controlled by the user.	• valve open • valve close
Gauge		The gauge displays the current pressure in the system. It is also part of the gas unit.	• Wait constant pressure

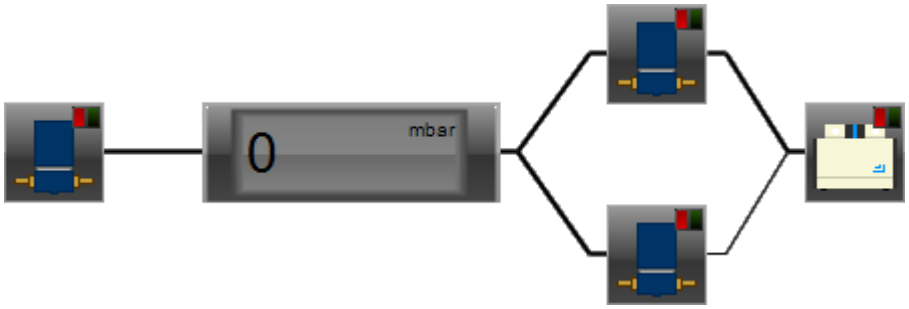
Table of Elements

Special Elements

Gas Unit

The gas unit is the heart of GICU. It includes all important elements to adjust the pressure. After inserting the gas unit to your element are you will have access to the following special commands:

- Set Pressure to
- Set Pressure higher or equal to
- Set Pressure lower or equal to
- Flush



MPV (Multi-position valve)

The MPV element controls a MPV via Ethernet or serial port. The user can click on each port to change the MPVs position state. With the MPV you have access to this commands:

- Set MPV position
- Set MPV to next position
- Set MPV to previous position

the MPV can be controlled either via a serial interface or via Ethernet. For a serial control, enter the settings dialog of the element and enter the MPVs Com Port number into the "Com Port" field. If you wish to control the MPV via Ethernet, enter the IP address into the "IP" field.

Appendix

Table of Method Steps

Table of Available Commands

Method step name	Description
Chemstation.ini – Write current pressure	Writes the currently measured pressure in the ChemStation.ini so that it can be written in the data file.
Chemstation.ini – Write MPV Position	Writes the position of MPVs in the ChemStation.ini.
Conditions – Wait for a constant Pressure	The method is malted until a constant pressure within the tolerance is present.
Conditions – Wait for a timespan	The method is stopped for a specified period of time. As the units are available milliseconds (ms), seconds (sec) and minutes (min)
Flush the GICU	Flushes the GICU. First it opens the inlet valve until the specified pressure is reached. Then the inlet valve closes and the opens the outlet valve. Next the pump starts until the under pressure is achieved.
GC – Start the GC	Starts the GC via the remote cable (takes no consideration for GC-Ready).
GC – Wait for the GC-Ready Signal	The method is halted until the GC sends a ready signal. Wait longer than eight minutes and an error message will come up and abort the method.
GC – Wait for the GC-Stop Signal	The method is halted until the GC sends a stop signal. This is done after the end of a run or by manual stopping.
Logfile – Clear the Logfile	Clears the log file.
Logfile – Show the logfile	Displays the log file in a separate window. The method is stopped until the window is closed again.
Logfile – Write the current pressure	Writes the current pressure in the log file.
Logfile – Write time duration	Writes the measured time interval of the timer.
MPV – Move to next Position	Driving the MPV to the next position.
MPV – Move to Previous Position	Driving the MPV a position back.
MPV – Set to Position	Driving the MPV at the specified position. If the MPV has increment step, these can be used by using x.5 steps.
Pump – Start the Pump	Starts the pump.
Pump – Stop the Pump	Stops the pump.
Set pressure in mbar higher or equal to	Open the inlet valve and wait until the pressure reaches or exceeds the target pressure.
Set pressure in mbar lower or equal to	Opens the outlet valves, starts the pump and waits until the target pressure is reached.
Set pressure in mbar to	Set the target pressure within the tolerance. The initial pressure must be higher than the target pressure. By activating the "Keep pump on" function this prevents the pump is swithed off during adjustment. "Use Sample-in" serves for adminitting if the target pressure is reached.

Appendix

Table of Method Steps

Table of Available Commands

Show a message	Displays a message. Method will be halted until message box was closed
Timer – Start the timer	Starts a timer.
Timer – Stop the timer	Stops the timer and saves the value.
Valve – Close a Valve	Closes the chosen valve
Valve – Open a Valve	Opens the chosen valve

Appendix

Port Assignment

Port assignment of the default GICU

Function	Port	Channel
Outlet valve (tight capillary)	0	4
Outlet valve (wide capillary)	0	5
Pump	0	6
GC Start Signal	0	7
GC Stop Signal	1	0
Inlet valve	1	2
Pressure sensor	0	-
GC Ready Signal	1	-

Information

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