

BPC® Go Operations & Maintenance Manual

Version 2.2 February 2022

The latest version of this manual can always be downloaded from:
<https://www.bioprocesscontrol.com/manuals>

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Produced in Sweden.

i. Safety Information

Before operating the BPC[®] Go (hereafter referred to as "the instrument", "the system", "the equipment" or "BPC[®] Go" interchangeably) from BPC Instruments AB (hereafter referred to as "BPC Instruments", "BPC", "Bioprocess Control" or "BPC Instruments AB" interchangeably), carefully read this operator manual for the instrument, any separate instructions for other equipment used together or in conjunction with the instrument as well as the safety instructions for any and all chemicals used in the process of utilising the instrument.

When performing experiments with the instrument, always use protective eyewear, gloves and lab coat. Always make sure there is adequate ventilation and take proper precautions when handling electrical devices near water or explosive gases. Make sure to tie back any hanging objects, such as hair and clothing, when working near rotating or otherwise moving parts.

Do not modify the instrument without the prior consent of the manufacturer. BPC Instruments AB do not assume responsibility for any errors due to equipment modification.

Do not clean or service the instrument while it is running.

Do not expose the instrument to mechanical vibrations or high frequency radio transmissions.

Never operate the instrument in a way it was not intended.

Never operate the instrument, nor let anyone else operate it, without proper training.

Never use the instrument outside or in environments with parameters outside of the instruments recommended range.

Never connect additional electrical equipment not supplied by BPC Instruments AB for the express purpose of using with the instrument. This is true even if the connections can mate.

Always back-up important data to an external device.

Always keep the instrument level and on a flat and stable surface. Failing to do so can, among other things, generate an erroneous gas reading.

Always make sure all safety guards are in place and working before operating the instrument.

Always make sure that all parts are functioning properly immediately after start-up.

Always keep the instrument clean.

Always make sure to have access to relevant chemicals before starting an experiment.

Always dispose of parts and chemicals according to applicable rules in the country of usage.

Periodic maintenance of the instrument and its various accessories is essential. Always make sure they are in working condition. If service or spare parts are required, please visit <https://webshop.bioprocesscontrol.com> or contact BPC Instruments AB directly or one of its representatives.

Always make sure that the gas outlet of the flow cell unit (FCU) is able to release pressure in the event of pressure build-up inside of the instrument. Do not obstruct or block it.

Always make sure that the instrument is registering reasonable amounts of gas before starting an experiment. This can be done by injecting air in the gas inlet using a syringe. This is especially true if dangerous gas is used. Do not depend on the gas registrations of the instrument as a safety procedure.

Always make sure to connect the power supply so that it is easy to remove from the mains power outlet and so it doesn't risk becoming damaged.

Always wait 60 seconds between powering the system on and off. This will allow for the operating system to shut down properly and for the capacitors to properly cycle.

Always use deionised water to minimise the risk of residue or rust forming on the inside of the flow cell unit.

ii. Limited Warranty

The product warranty provided with the instrument corresponds to the stipulations in Orgaline 2012, unless otherwise agreed upon with BPC Instruments AB ("BPC"). Furthermore, any removal of the outer enclosure of the base unit, without prior consent of BPC Instruments AB, is considered a breach of warranty. The flow cell unit(s) cannot be opened. Doing so is considered a breach of warranty and will render them completely unsuitable for usage. BPC Instruments AB ("BPC") reserves the right to correct any possible errors, mistakes, changes, updates, technical data or otherwise relevant information in this manual or any other documents, where applicable by law.

iii. Electrical Safety

Compliance is required with respect to voltage, frequency and current requirements indicated on relevant parts. Improper operation, damage to the equipment, fire or otherwise undesired effects might be caused by connecting to a different power source. There is no user-serviceable parts in the equipment, unless otherwise agreed upon with BPC Instruments AB ("BPC").

iv. Declaration of Conformity

Hereby, BPC Instruments AB ("BPC"), declares that this device is in compliance with the essential requirements and other relevant provisions of the following directives: . The full text of the EU declaration of conformity is available at the following address: <https://www.bioprocesscontrol.com/compliance>.



v. Technical Specification

Dimensions:	19 x 11.5 x 13 cm
Weight:	0.5 kg
Operating Environment:	Indoor 20 - 40 °C
Operating Humidity:	5 – 95 % non-condensing
Power Input	12 V DC / 1.0 A

Power Supply (Switching):	External AC / DC Adapter PSAC12R-120
Manufacturer:	Phiong Technology Co. Ltd.
	No. 568, Fusing 3rd Rd., Gueishan District, Taoyuan City, Taiwan
Power Input	AC 100-240 V AC 50-60 Hz 0.5 A 24-32 VA
Power Output:	12 V DC, 1.0 A

vi. Delivery Checks

As soon as taking delivery of the instrument and before putting it into service, inspect the package and make sure there is no damage. If there is any reason to believe that the instrument has not arrived in a suitable condition, inform the transport company and request that they document the issue appropriately, self-document using photographs and contact your seller for further information.

Read the operations manual in its complete form. This will assure that the instrument is used appropriately and will serve as a guide to identify any damage to the instrument or parts thereof.

The following parts should be included in your purchase. If this is not the case, please contact your seller in order to receive the missing parts.

- 1 Operators manual (this document)
- 1 Quick-guide
- 1 BPC[®] Go base unit (Art No 17-0001-01)
- 1 Flow cell unit (9 ml resolution) (Art No 12-0302-02)
- 1 Flow cell unit (2 ml resolution) (Art No 12-0302-01)
- 1 Power adapter main unit mk 3 (Art No 17-0002-01)
- 4 Check-valves (Art No 01-0404-02)

vii. Optional Equipment

The following equipment can be bought from BPC Instruments AB and its distributors. They are not required to perform experiments with the instrument, but they are fully compatible and, depending on the use case, can increase the effectiveness, abilities or functions of the instrument.

- Gas sampling port (Art No 05-0207-01)
- Tygon[®] Tubing 3.2 x 1.6 mm (Art No 01-0405-02)
- Tubing clamp 6 mm (Art No 01-0108-02)
- Syringe (Art No 12-0403-01)
- Network cable 1.0 m (Art No 01-0402-01)

For a complete listing of available systems and parts from BPC Instruments AB, for this instrument and others, please visit our online store at <https://webshop.bioprocesscontrol.com> or contact our sales team via email at sales@bpcinstruments.com and via phone at +46 (0)46 163950.

For assistance with usage of the system, or parts of it, please contact our support team via email at support@bpcinstruments.com and via phone at +46 (0)46 163950.

Please have the serial number of your instrument easily accessible as this will allow us to assist you in a quicker and more accurate fashion.

viii. Contact Information

BPC Instruments
Mobilvägen 10
223 62 Lund
Sweden

E-mail: info@bpcinstruments.com

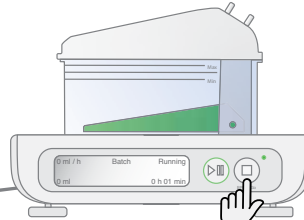
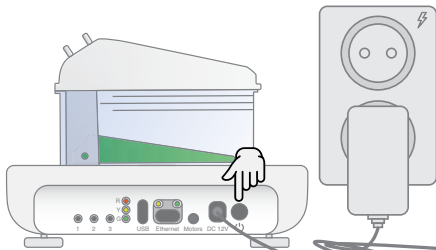
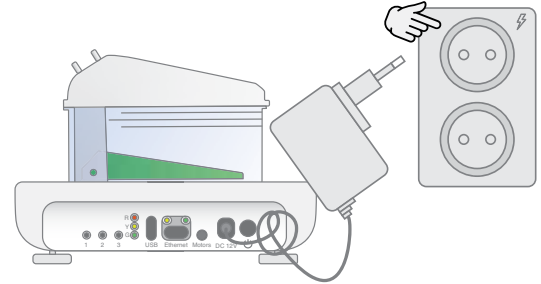
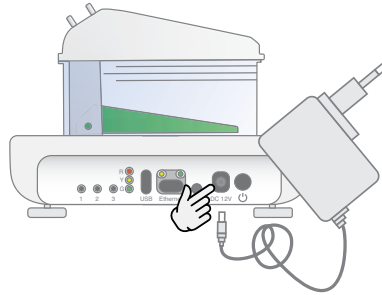
Phone: +46 (0)46 163950

Website: <https://www.bpcinstruments.com>

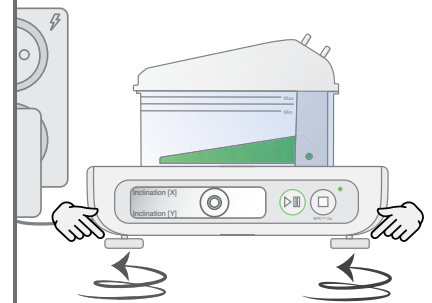
Webshop: <https://webshop.bpcinstruments.com>

Swedish organisation number: 556687-2460

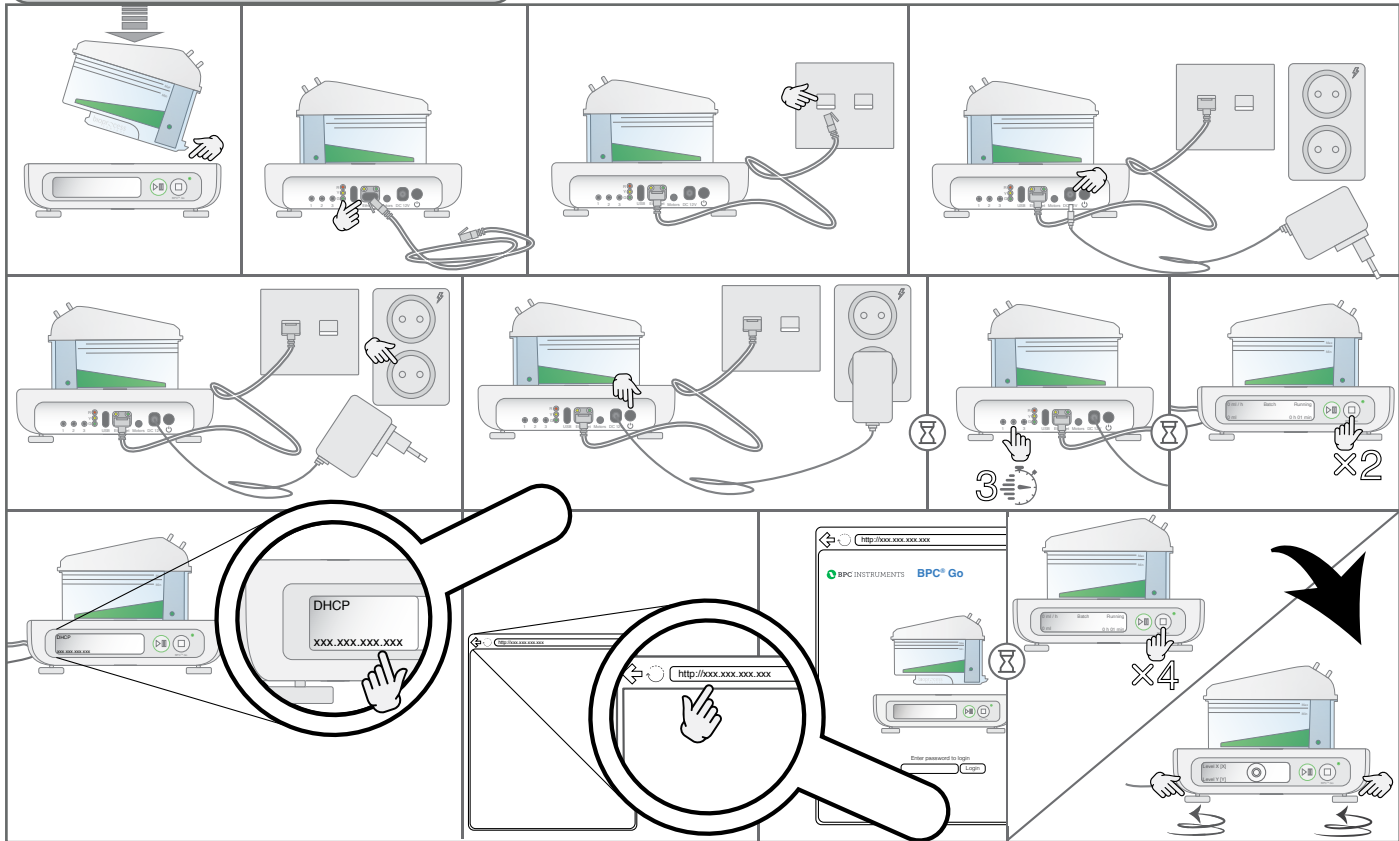
QUICK GUIDE: STAND-ALONE MODE



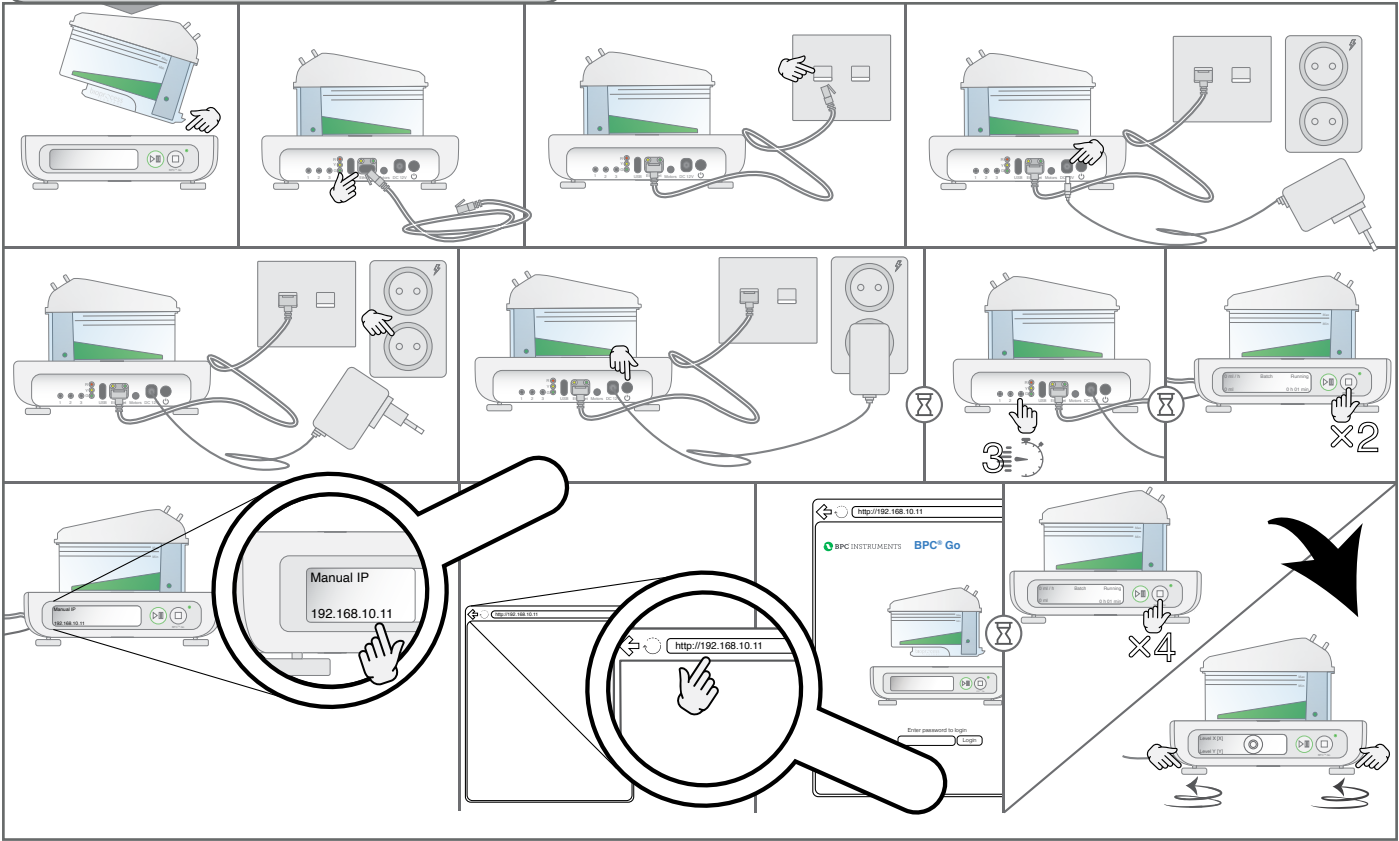
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QUICK GUIDE: DHCP NETWORK MODE



QUICK GUIDE: MANUAL IP NETWORK MODE



Chapter 1: Overview

The BPC® Go consists of two main parts; the BPC® Go base unit, which provides the analytical functionality of the instrument as well as a physical user interface through which the user can interact, and the flow cell unit, which provides the chamber for doing the actual physical measuring of the gas. Each of these units can be used interchangeably with any other unit (provided that calibration data is entered correctly), i.e., they are not tied to each other. However, one of each is required in order to be able to use the instrument as intended as each contain different functionalities required by the other part.

Chapter 1.1 BPC® Go Base Unit

The BPC® Go base unit is where all the physical user interface actions and cable connections take place. While considerations and precautions have been taken during the production of the equipment, it is important to remember that this part of the unit is not waterproof, nor can it be submerged in liquid or have excessive liquid enter into it. Please use with caution to prolong the life of your instrument.

Button	Action
1	Reset password (Factory reset if held during power on)
2	Set IP address according to DHCP server
3	Set IP address to 192.168.0.1

LED	Description
	Instrument has booted properly
	Flow cell opening detected
	Error detected

Adjustable feet for making sure the instrument is level.

Three LEDs used for indicating the state of the instrument.

Three function buttons for controlling settings not related to gas detection. The button should be held for about three seconds for the action to register.

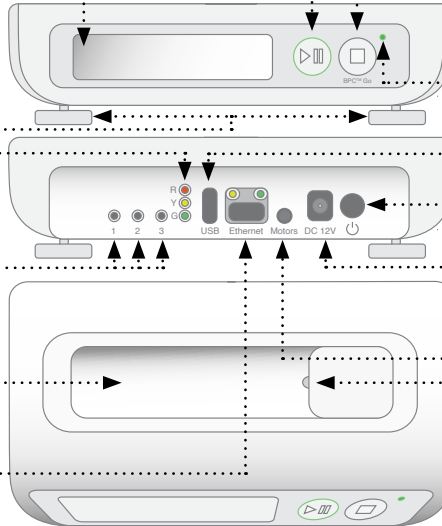
Mounting fixture for the flow cell unit.

Ethernet port for connecting Ethernet CAT cable to the instrument. Required to access the web UI.

The front OLED screen will display various information intended for the operator. If the provided web UI is not used, this is the only available interface for transferring information to the operator from the instrument.

The stop button is used to stop the instrument flow detection, clear data and change sub-screen.

The play/pause button is used for starting and pausing the instrument gas detection.



USB port used for upgrading the system.

The power LED indicates if the instrument is powered on or not.

On/off button for instrument.

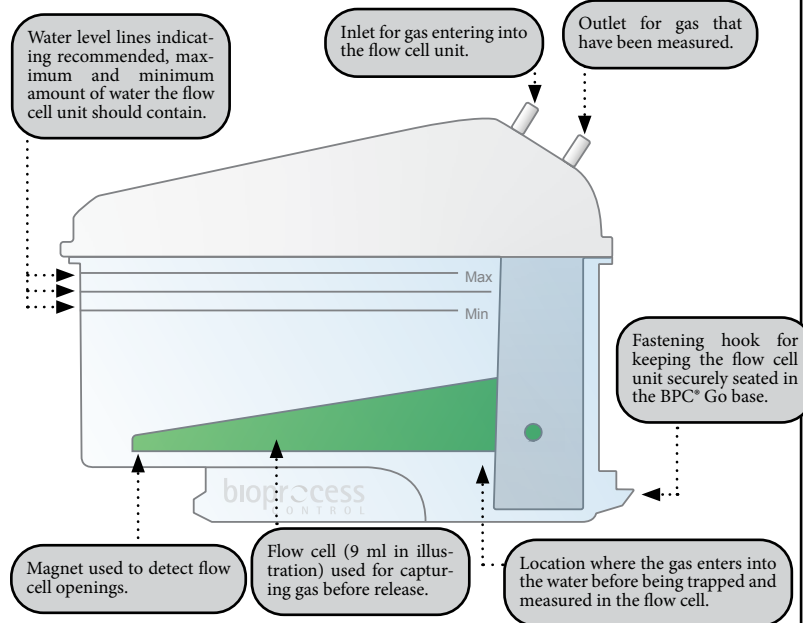
Port for connecting the main unit power adapter.

The flow cell LED, in its default configuration, indicates that the instrument has registered an opening. It does this by flashing at the moment of detection.

Port for connecting external motor controller (Art No 01-0109-01) via a motor controller signal cable mk 3 (art no 17-0003-01).

Chapter 1.2 Flow Cell Unit

The flow cell unit is where the gas enters into the BPC® Go in order for it to be measured, using the volumetric method. Depending on which flow cell unit is being used, the resolution is either approximately 2 or 9 ml. Please keep in mind that each version has different upper and lower bounds for gas flow. For the 2 ml flow cell unit, the applicable range is 0.2 to 1,500 ml per hour and for the 9 ml flow cell unit, it is 1 to 6,000 ml per hour.






IMPORTANT: The flow cell unit (FCU) can NOT be opened. Any attempt to do so will risk damaging it and ruining the gas tightness. Also, always remember to use the appropriate calibration cell volume (configurable in the web UI) associated with each FCU.

Chapter 1.3 On-Board Buttons

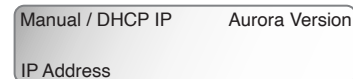
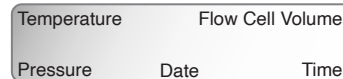
While using the web user interface is the recommended way to operate the BPC® Go, the most important functions can also be accessed through physical buttons located on the right-hand side of the front panel. Actions taken with these buttons will be reflected both on the built-in display and in the web user interface.



When the display is in sleep-mode (turned off), pressing any of the two buttons   will turn the display on and display the default sub-screen. On this screen, current flow speed, accumulated volume and time since start of the experiment can be read. Furthermore, the screen will display whether the system is in continuous or batch mode as well as if the system is in pause or play mode (or if the flow cell is detached).

Briefly pressing the stop button  while the screen is on will cycle between the available sub-screens. The second of these will display the current temperature and pressure, the calibrated flow cell volume the instrument has been configured to use, current system date, and current system time.


The third sub-screen will display whether the instrument uses a manually assigned IP or an automatic IP assigned by a DHCP server as





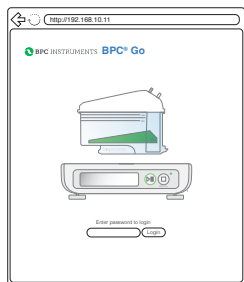
well as what IP address is currently in use and the version of the instrument's Aurora software.



The fourth of these will display the alignment indicator. It is very important that the instrument is completely level while in use. The BPC® Go base has four feet that can be individually adjusted to achieve this.




Briefly pressing the play/pause button  while the display is turned on will switch the instrument between the two play/pause states. While in the play state, all openings will be registered and is the default state the instrument should be in while an experiment is running. In the pause state, no openings will be registered until the state is changed to play.

While in the pause state, holding down the stop button  for two seconds will bring up the “Stop experiment” menu. If no further input is received for five seconds, the display will revert to its previous menu. Pressing the stop button  before this time limit places the instrument in stop mode and clears all old data. In order to start a new experiment, the play/pause button needs to be pressed.



Chapter 1.4 Web UI

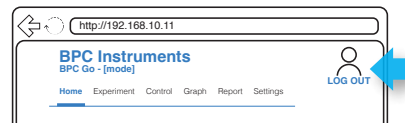
When the BPC® Go instrument is connected to a network, the web user interface can be accessed by entering the correct IP address into a web

browser. In order to find out which IP address is assigned to an instrument, press either the play/pause button  or the stop button  if the screen is in sleep-mode. With the screen on, press the stop button  twice to cycle to the network information sub-screen.

Once the IP address has been entered into a web browser, the user interface will load. When asked to enter a password, the factory default one is *bpc*. Enter the password and click on the login button.

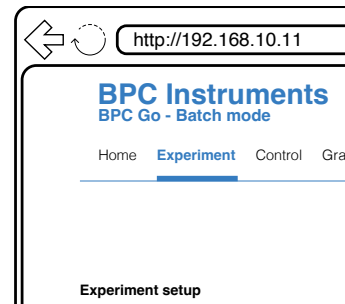
Chapter 1.4.1 Home



The Aurora web UI is modelled around six different tabs that provide access to different functions of the instrument. The first one, labeled *Home*, is the default page to be presented after a user logs in. From here, all the other tabs can be accessed, an image of the current instrument type can be seen (in this case, a BPC® Go) and the user can log out to prevent unauthorised access. Furthermore, the current mode in use (*batch* or *continuous*) is displayed for easy access. As there are some differences in the web UI depending on which mode is selected, this document will highlight those differences as they occur throughout the interface.

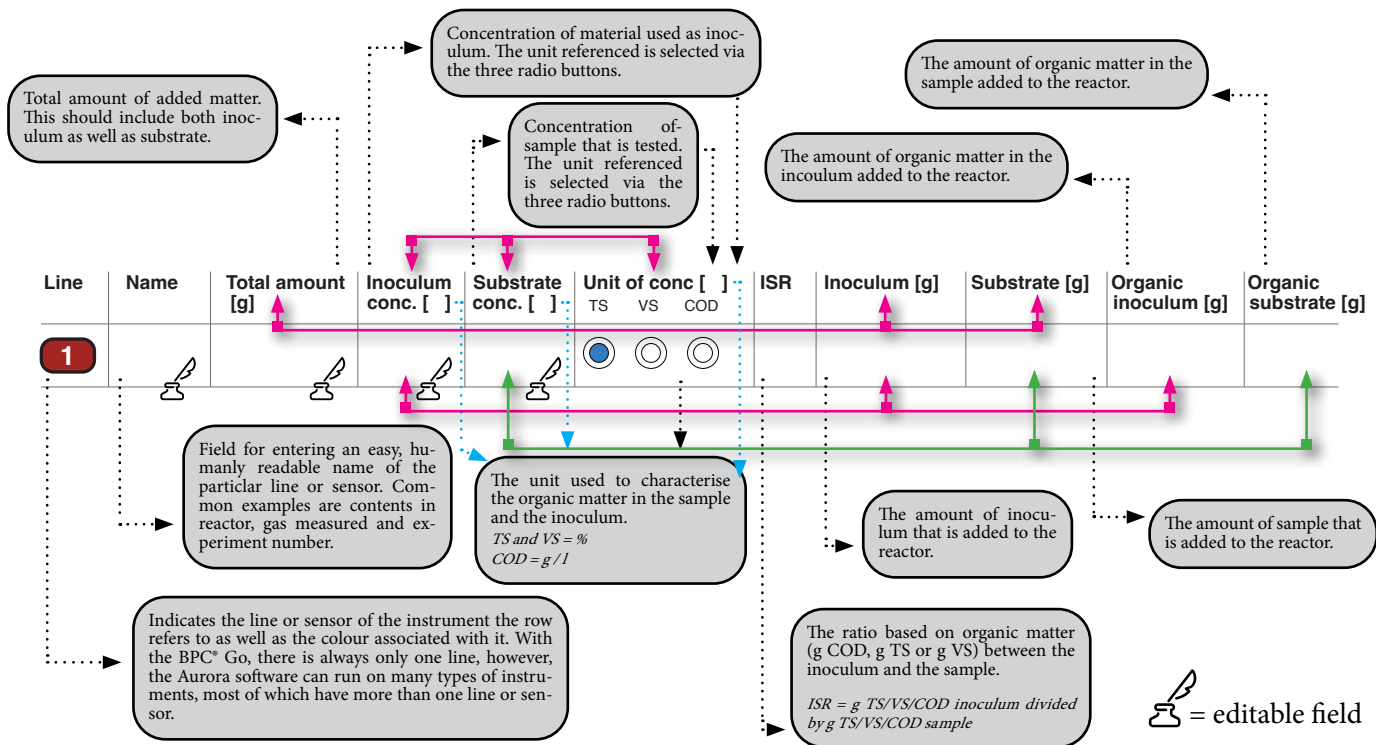


Chapter 1.4.2 Experiment

Note: The experiment tab is only available when the system is in *batch* mode. It is replaced by the feeding tab when the *continuous* mode is active. In order to change mode, see the chapter in this document describing the settings tab.



Please keep in mind, the information entered into the experiment fields are only used as a guide for the operator and for the report generation. None of the calculations that the instrument performs are dependent on these values and they can safely be left blank. In order to edit a field, left click on it with the mouse pointer or press   on the keyboard until a suitable field is selected. As data is added, the calculated fields will be populated and thus making experiment setup easier.

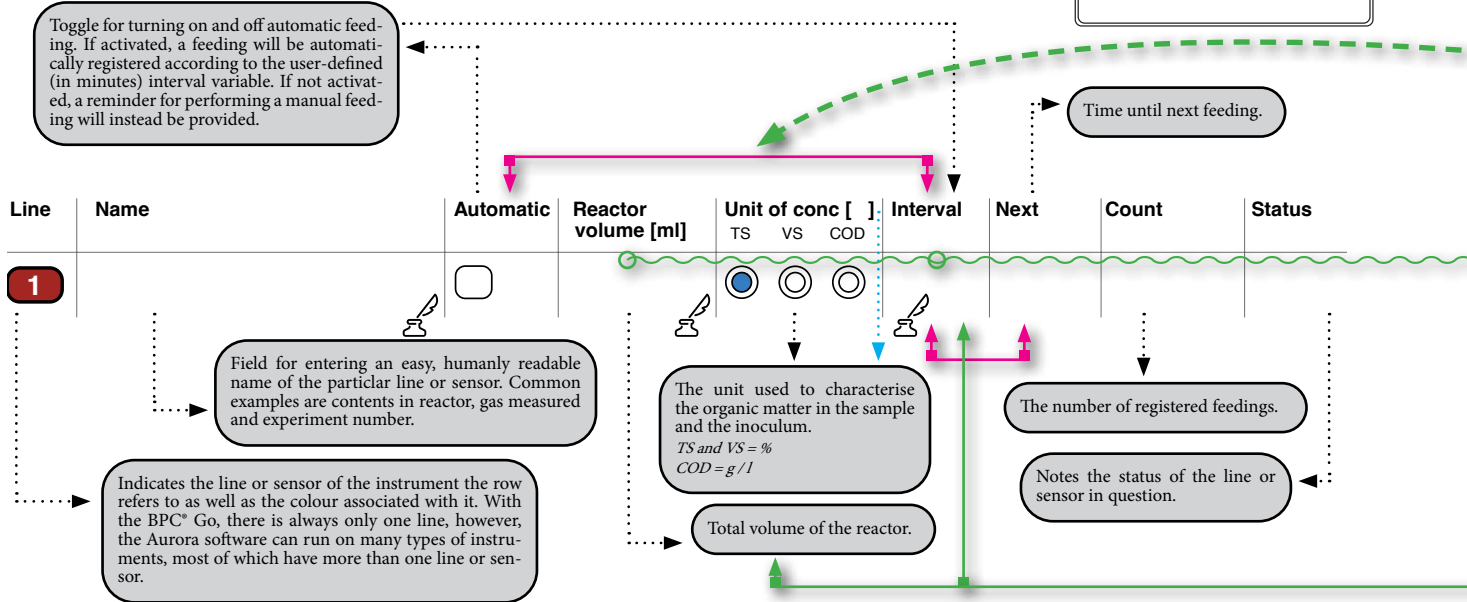
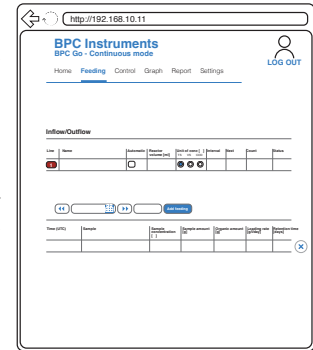



In order to print out a hard copy of the data stored in the experiment matrix, press the [Print experiment guidelines](#) and follow the steps native to the operating system being used. This can be helpful for physically preparing the experiment as well as to store for later reference. Please note, there is also the possibility to manually enter the amount of organic inoculum and substrate by selecting the “manual” radio button near the top of the page.

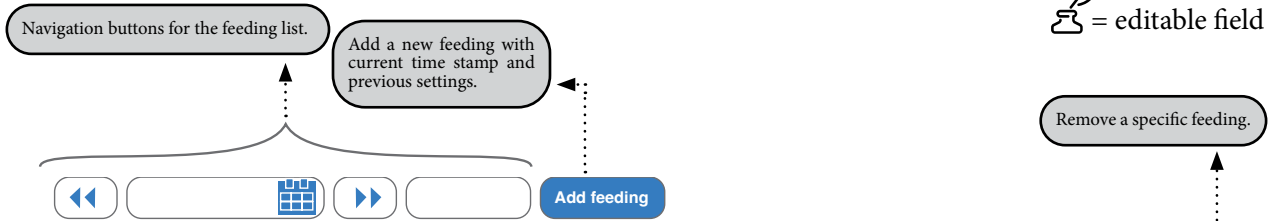
Chapter 1.4.3 Feeding

Note: The feeding tab is only available when the system is in *continuous* mode. It is replaced by the experiment tab when the *batch* mode is active. In order to change mode, see the chapter in this document describing the settings tab.

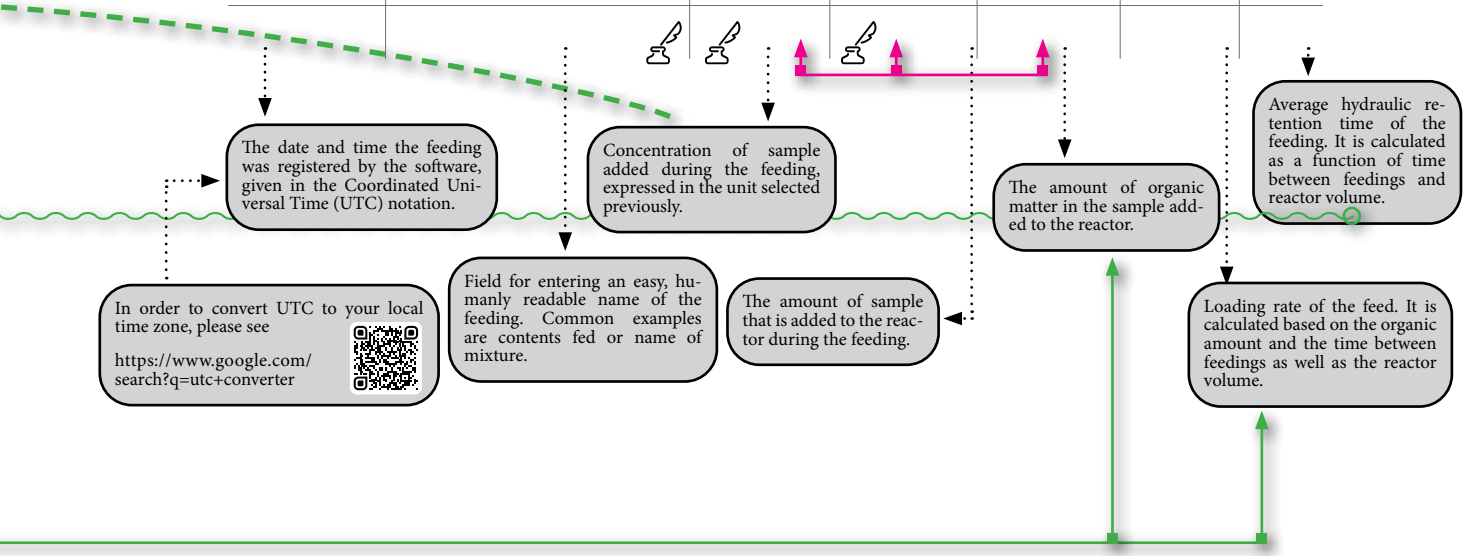
The feeding tab provides the settings that facilitate the reactor feeding data entry and calculations. It can be used in two different ways: manual and automatic. The manual setting requires the operator to manually set the time and date for each individual feeding while the automatic setting uses a user-definable timer (minimum 5 minutes between each feeding) to automatically register each feeding as they occur. Unless intervened by the user, each manual or automatic feeding will have the same sample settings as the previous one.

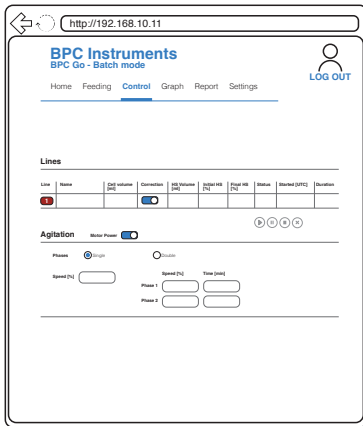


 = editable field



Time (UTC)	Sample	Sample concentration []	Sample amount [g]	Organic amount [g]	Loading rate [g/l/day]	Retention time [days]
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Chapter 1.4.4 Control

The control tab is where direct interaction with the flow cell unit and the motor(s) are conducted. All changes here will have a direct effect on ongoing and future experiments and can not be undone as such. They can be changed back to their previous settings but any events that have taken place during the changes will be permanent.

Note: Some options are only available in batch mode.

Chapter 1.4.4.1 Lines

Lines

Line	Name	Cell volume [ml]	Correction	HS Volume [ml]	Initial HS [%]	Final HS [%]	Status	Started [UTC]	Duration
1			<input checked="" type="checkbox"/>						

Time elapsed since the experiment was started (by pressing the play button).

Field for entering an easy, humanly readable name of the particular line or sensor. Common examples are contents in reactor, gas measured and experiment number.

The date and time the experiment was started (by pressing the play button), given in the Coordinated Universal Time (UTC) notation.

Mathematical compensation of the measured gas volume is necessary if the gas compounds are separated by selective absorption before measurement and the removable gas content in the reactor headspace is expected to be different at the start (i.e., flushing gas or air) and the end (i.e., generated gas) of the test.

The volume of gas corresponding to one opening of the flow cell. This value is provided with the calibration certificate provided with the flow cell unit (FCU). This value is specific to the FCU it comes with and needs to be edited if another cell is used.

Volume of headspace inside the reactor at the start of the test.

Notes the status of the line or sensor in question.

Expected percentage of removable gas in the reactor headspace at the end of the experiment.

Percentage of removable gas in the reactor headspace at the beginning of the experiment (i.e., flush gas or air).

Example: CO₂ and H₂S can be removed/absorbed when NaOH solution is used as absorbing agent.

Example: If a mixture of CH₄ and CO₂ is produced and a flush gas with a different composition is used (i.e., 100% N₂ or 100% CO₂), and CO₂ is removed before measurement, this function should be activated. If CO₂ is not removed and both CH₄ and CO₂ are measured, this function should be deactivated.

In order to convert UTC to your local time zone, please see





<https://www.google.com/search?q=utc-converter>



 = editable field

Chapter 1.4.4.2 Control Panel

Located at the bottom right of the *lines* section is the control panel for the flow cell unit. These work as follows:

-  Start data registration. In order to be able to press this button, the *status* needs to be *ready*
-  Pause data registration. In order to be able to press this button, the *status* needs to be *running*
-  Stop data registration. In order to be able to press this button, the *status* needs to be *paused*
-  *Clear* all data registrations. In order to be able to press this button, the *status* needs to be *stopped*

Examples:

If the instrument is currently registering data (status = running), in order to start a new experiment, the following buttons need to be pressed, in order: pause, stop, clear.

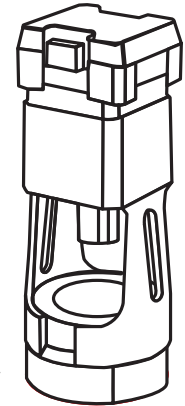
If the last experiment has been ended (status = stopped), no button can be pressed to put the instrument in play mode. A new experiment need to be started by pressing the following buttons, in order: clear, play.

If the instrument is currently registering data and the user wants to temporarily prevent registration and then start it after a while, the following buttons need to be pressed, in order: pause, (perform desired action), play.

Chapter 1.4.4.3 Agitation (hardware)

While not provided by default, the BPC® Go can power and control standard motors from BPC Instruments. These can be sourced separately either from, depending on shipping location, BPC Instrument's official distributors or directly from BPC Instrument. For more information, please see the following URLs:

<https://webshop.bpcinstruments.com/produkt/39/43/50/brushless-dc-motor>
<https://webshop.bpcinstruments.com/produkt/33/37/44/motor-controller-standard>
<https://webshop.bpcinstruments.com/produkt/42/46/53/brushless-dc-motor-cable-1500-mm>
<https://webshop.bpcinstruments.com/produkt/155/178/232/motor-controller-signal-cable-mk-3>



Chapter 1.4.4.4 Agitation (software)

Located at the bottom of the control tab, the agitation settings are located. In order to be able to control motors, the setting labeled “motor power” needs to be activated. If no motors are to be controlled, it is recommended that this setting is deactivated.

Phases Single Double

Speed [%]

	Speed [%]	Time [min]
Phase 1	<input type="text"/>	<input type="text"/>
Phase 2	<input type="text"/>	<input type="text"/>

Motor Power


By selecting *single* phase, it is possible to set a constant speed, in percentage, for the connected motor to run at. If *double* phase instead is selected, two different speeds can be selected

and the motor will oscillate between the two. For example, if phase 1 is set to 100% and time is set to 10 minutes and phase 2 is set to 0% and time is set to 5 minutes, this means that the motor will run at full speed for 10 minutes and then stand still for 5, after which the cycle will repeat. Please note that the two speeds can be anything between 0-100 and so there is no requirement for full speed or complete stop.

Chapter 1.4.5 Graph

The graph tab behaves differently depending on if the instrument is in *batch* or *continuous* mode. Make sure that the correct mode is selected for the purpose of the experiment being performed.





Chapter 1.4.5.1 Graph (batch mode)

 Placing the mouse pointer over the icon representing the flow cell unit and briefly hovering will present an additional information box with the name of the line, the status of the line and when the last opening of the line occurred. Located in the left hand corner of this icon is also a graphical representation of the line status, providing an easy way to make sure it is set correctly. If the line is stopped, the icon will have a grayish hue to indicate unavailability.

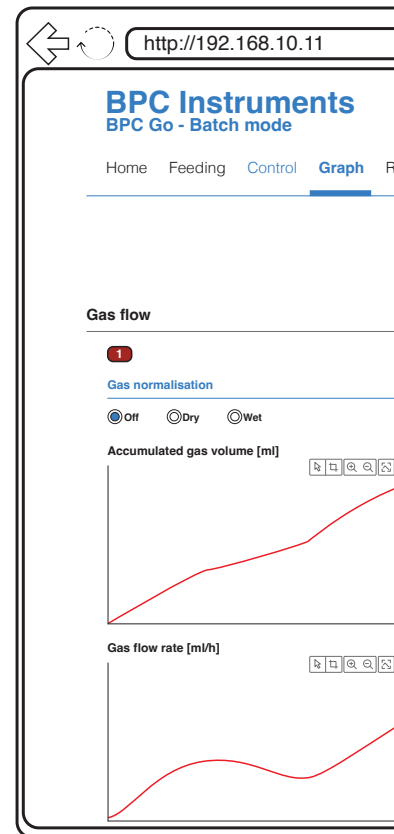
The radio buttons for gas normalisation affect the calculations made in the following way:

Off	Dry	Wet
No adjustments to normalise the gas is made. The presented gas volume and flow rate is the same as the physically measured one.	The gas volume and flow rate is adjusted to standardised conditions (0 °C and 1 atmosphere) with the help of the instrument's internal sensors. It is assumed that the gas is dry and no compensation for water content is made.	The gas volume and flow rate is adjusted to standardised conditions (0 °C and 1 atmosphere) with the help of the instrument's internal sensors. It is assumed that the gas is saturated with water and the volume this water corresponds to is subtracted from the gas volume.

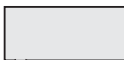
The navigation row present in the graphs have the following effects on the view of the data:

			
By holding down the left mouse button and, at the same time, moving the mouse pointer, it is possible to move the viewport of the graph.	By holding down the left mouse button and, at the same time, drawing a rectangle, a specific area can be made to fill the entire viewport	Pressing the magnifying glass with the plus sign will make the viewport zoom in. Pressing the magnifying glass with the minus sign will make the viewport zoom out.	Pressing the square will make all the available data fit in the viewport.

Note: The graph requires at least two data points (i.e., flow cell openings) in order to display information. To simulate an opening during testing, briefly remove the FCU and place it right back; wait for about 20 seconds and then repeat the action one more time. If everything is working correctly, an LED should light up under the FCU each time an opening is simulated and after two simulated openings, a line should appear in each graph.



Chapter 1.4.5.2 Graph (continuous mode)



Placing the mouse pointer over the icon representing the flow cell unit and briefly hovering will present an additional information box with the name of the line, the status of the line and when the last opening of the line occurred. Located in the left hand corner of this icon is also a graphical representation of the line status, providing an easy way to make sure it is set correctly. If the line is stopped, the icon will have a grayish hue to indicate unavailability.

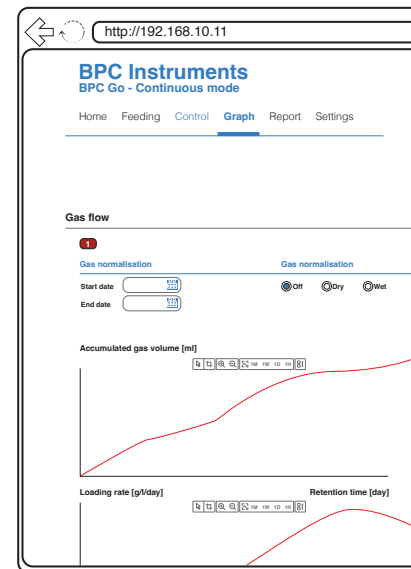
Under the time frame heading, there are two separate fields for manually entering the start and end time and date that should be displayed in the graphs. It is also possible to press the icon shaped as a calendar (and, in the next step, a clock) to use a visual interface.

The radio buttons for gas normalisation affect the calculations made in the following way:

Off	Dry	Wet
No adjustments to normalise the gas is made. The presented gas volume and flow rate is the same as the physically measured one.	The gas volume and flow rate is adjusted to standardised conditions (0 °C and 1 atmosphere) with the help of the instrument's internal sensors. It is assumed that the gas is dry and no compensation for water content is made.	The gas volume and flow rate is adjusted to standardised conditions (0 °C and 1 atmosphere) with the help of the instrument's internal sensors. It is assumed that the gas is saturated with water and the volume this water corresponds to is subtracted from the gas volume.

The navigation row present in the graphs have the following effects on the view of the data:

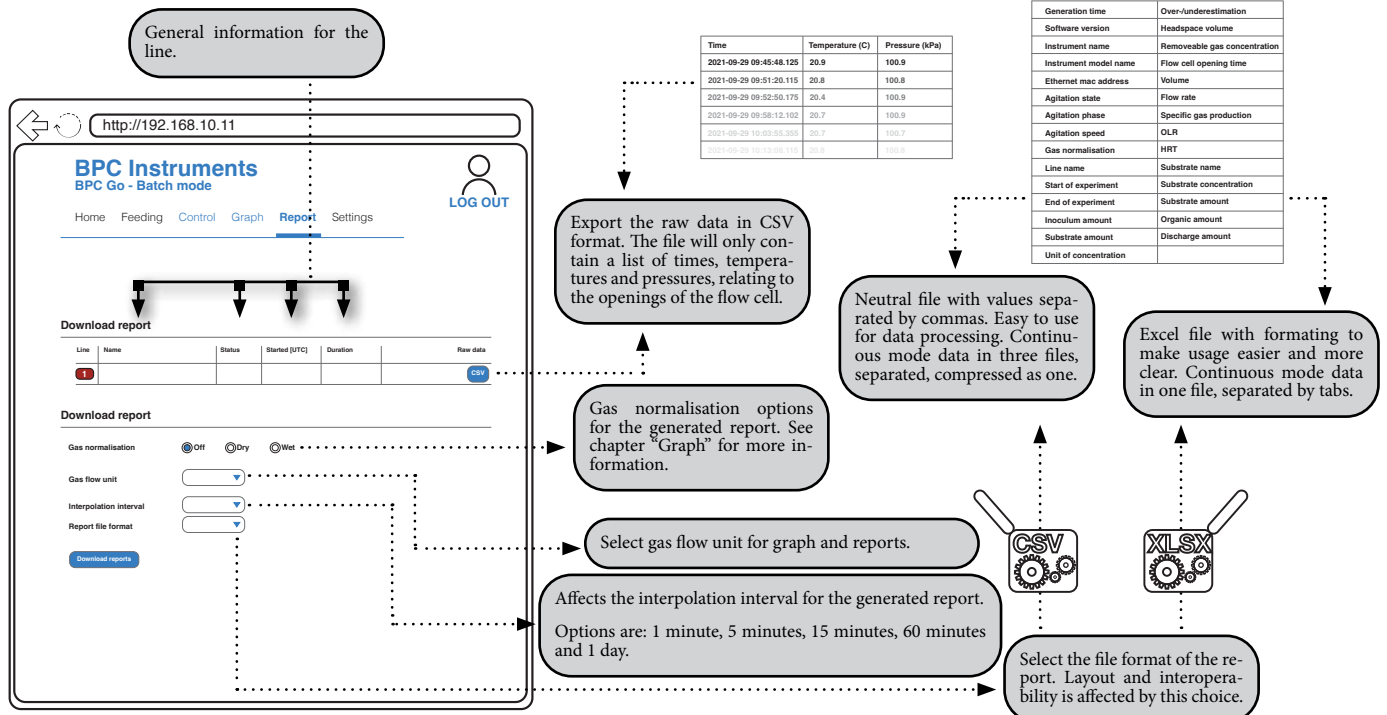
				1M 1W 1D 1H	
By holding down the left mouse button and, at the same time, moving the mouse pointer, it is possible to move the viewport of the graph.	By holding down the left mouse button and, at the same time, drawing a rectangle, a specific area can be made to fill the entire viewport	Pressing the magnifying glass with the plus sign will make the viewport zoom in. Pressing the magnifying glass with the minus sign will make the viewport zoom out.	Pressing the square will make all the available data fit in the viewport.	Pressing one of the above buttons will resize the graphs in order to fit the data from a corresponding time frame; 1 month, 1 week, 1 day or 1 hour.	Pressing the vertical arrow will keep the horizontal scale of the graphs intact but will expand the vertical scale to display all available data in that range.



Note: Just as the *batch mode* graphs, the continuous mode displays the gas flow rate in one graph area. The second graph area is displaying loading rate (in grams per litre per day) as well as retention time (in days). These latter measurements are related to the information entered into the feeding tab and is not related to the physical openings of the flow cell, nor do they affect the calculations of the gas flow rate.

Chapter 1.4.6 Report (batch and continuous mode)



All export of data from the BPC® Go instrument is done through the report tab in the web user interface. Depending on if the instrument is set to batch or continuous mode, the options will behave slightly differently. The core functionality, however, will remain the same. Two file formats are available for export: *CSV* and *XLSX*. The comma separated values (CSV) file format is a plain text format without any formatting and is completely platform and software neutral. XLSX (Excel Open XML) supports formatting and is supported by a vast number of software. If your choice of software does not support, or has issues with, XLSX, please use CSV. Note: When downloading a CSV report in continuous mode, a compressed (ZIP) file of the accumulated files will be generated; compatible with all standard compression software.



Chapter 1.4.7 Settings

The settings tab is home to a host of settings for the instrument. It also contains valuable information regarding versions, licenses, a logfile and so forth. Sometimes, a blue triangle with a white exclamation mark will appear next to the settings tab in the Aurora Web UI. This symbol indicates that there is information in the logfile that needs to be reviewed or that one of the settings needs to be adjusted. If it is a setting that is in question, that particular setting will also display the same symbol; if it is the logfile, pressing the clear log button (after reviewing and potentially saving the information) will remove the warning.



System information	Software licenses	Time settings	Instrument level calibration	Temperature calibration	Pressure calibration
Instruments hardware and software versions as well as serial number. Please have this information ready if you are contacting customer support. It will make sure that any issues can be resolved as quickly as possible.	Licenses for open source projects utilised in the instrument. For more information, please visit https://bpcinstruments.com/bpc-go-oss-licenses/ 	Having a correct internal time in the instrument is very important as it is used for a multitude of calculations. Make sure to always have the correct time set before an experiment is started, after a prolonged power outage or if the instrument has not been connected to power for an extended time.	Calibrate the horizontal level of the instrument. A true horizontal level is important for accurate measurements. Pressing the button will present a visual representation of the instrument level to help guide adjustment of instrument feet.	Current temperature detected by the instrument. If deviating from actual ambient temperature, calibration can be performed by the user. Before re-calibrating an instrument, make sure that it has had time to reach ambient temperature.	Used for adjusting measured gas to standard conditions. Current pressure detected by the instrument. If deviating from actual ambient pressure, calibration can be performed by the user. Used for adjusting measured gas to standard conditions.
Instrument name	Experiment type	Change system password	System power	System reset	System software update
Customisable name for the instrument to allow for easier identification. This name will be displayed at the login screen and in the top of the Aurora Web UI.	Type of experiment. Either batch or continuous. In batch mode, accumulated gas and gas flow rate are presented as graphs and an experiment setup page is available. In continuous mode, gas flow rate and process parameters are presented as graphs and a feeding page is available.	Set a new password for logging in to the instrument.	Safest and best way for restarting the system. If possible, always use this option instead of physically removing and reapplying power to the instrument.	A complete reset of the instrument to its default state. Please note that all data and settings are deleted during this reset.	Update the software of the instrument. Only ever use software files provided directly by BPC Instruments. For more information, please see https://bpcinstruments.com/bpc-go-software-downloads/ 

Network settings	Hostname	System warning log
<p>Displays IP and Mac address for the instrument. Also allows for configuring the built-in network adapter using either DHCP or manual configuration.</p> <p>Please note: using DHCP requires having a DHCP server available on the network . After being assigned an automatic IP address, use the display on the instrument to ascertain what address has been assigned.Do this by pressing the stop button next to the display three times.</p>	<p>Customisable network name for the instrument. This is used for identifying the system on a network and should not be confused with the setting called "Instrument name".</p> <p>This setting allows for accessing the unit through a name instead of an IP address.</p> <p>Example: IP is 192.168.10.11 and hostname is bpcgo - this means that, in the web browser, the unit can be accessed by typing either http://192.168.10.11 or http://bpcgo.local</p>	<p>Contains a list of events registered by the instrument which might be useful when trying to resolve an issue. Please have this information ready when contacting support</p>

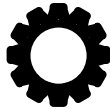
Chapter 2: Computer Network Configuration

If the instrument is directly connected to a computer (and not through any additional network equipment), it is important to configure the local network settings correctly. If this is not done, it might lead to problems and, possibly, an inability to access the instrument before proper steps are taken. The exact steps to take differ from operating system to operating system but they all remain fairly similar. Below are two of the most common operating system setups outlined: Microsoft Windows 10 and Apple Mac OS 11.x.

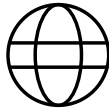
Chapter 2.1 Windows 10



Press the Windows icon in the bottom left corner in order to bring up the Windows Start Menu.



Press the gear icon to open up the settings windows.



In the settings window, press the globe icon to open up the network & internet settings.



Press "Change adapter options"



Located the suitable network adapter icon, right click and select "properties".



Select "Internet Protocol Version 4(TCP/IPv4)" and click the button labeled "Properties".

In the properties window, select the radio button labeled "Use the following IP address" and enter the information listed to the right. Once confirmed to be correct, press the "OK" button.

Note: The IP assigned here is different from the IP assigned to the instrument. The instrument IP ends with 11 and the computer IP ends with 10. To access the instrument in a web browser, make sure to enter the instrument IP in the location bar.

Use the following IP address:

IP address:

192.168.10.10

Subnet mask:

255.255.255.0

Default gateway:

Chapter 2.2 Apple Mac OS 11.x



Press the Apple icon in the top left corner in order to bring up the Apple menu and then select "System Preferences".



In the preferences window, press the globe icon to open up the network settings.



Locate the suitable network adapter icon and click on it. The icon might look a bit different depending on the computer setup.

In the "Configure IPv4" dropdown menu, select "Manually" and enter the information below. Once confirmed to be correct, press the "Apply" button.

Note: The IP assigned here is different from the IP assigned to the instrument. The instrument IP ends with 11 and the computer IP ends with 10. To access the instrument in a web browser, make sure to enter the instrument IP in the location bar.

Configure IPv4:

Manually

IP address:

192.168.10.10

Subnet mask:

255.255.255.0

Router:

Chapter 2.3 Network Quick Guide

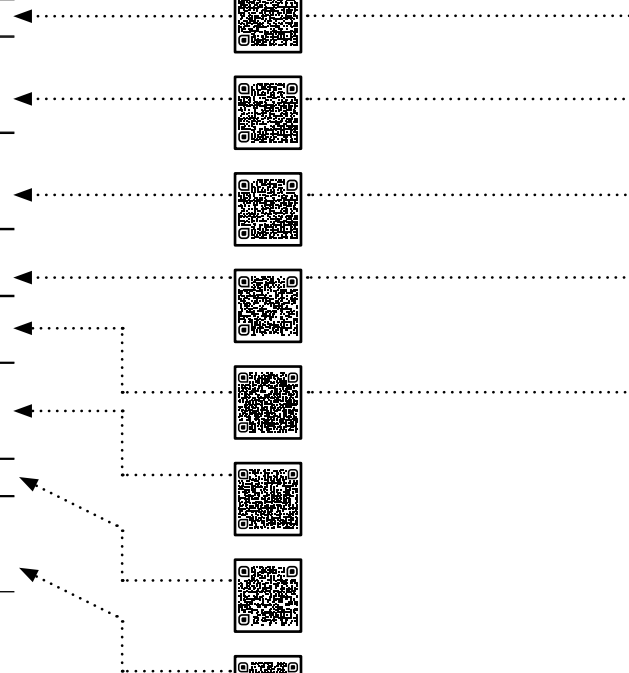
	Instrument	Computer
IP Address	192.168.10.11	192.168.10.10
Subnet mask	255.255.255.0	255.255.255.0
Gateway / Router	Leave empty	Leave empty

Chapter 3:Spare Parts

Below is a non-exhaustive list of parts available for the BPC® Go. For a complete list of all parts (and technical specifications) for sale from BPC Instruments, please visit the webshop at <https://webshop.bpcinstruments.com/shop/bpc-go/>



Name	Article Number	Description
BPC® Go Base	17-0001-01	Main unit of the instrument.
Flow Cell Unit, 9 ml	12-0302-02	Single flow cell unit (FCU). Measurement resolution: approximately 9 ml.
Flow Cell Unit, 2 ml	12-0302-01	Single flow cell unit (FCU). Measurement resolution: approximately 2 ml.
Check Valve	01-0404-02	Check valve used to prevent reverse flow of gas or liquid.
Main Unit Pow- er Adapter MK 3	17-0002-01	Power adapter used for all Gen 3 BPC Instruments main units.
Embedded Server Kit MK 3 Go	17-0101-01	IO-board and embedded server pre-mounted in a metal holder for easy replacement.
Sensor Board Go	17-0102-01	Detects flow cell openings.
Motor Controller Signal Cable MK3	17-0003-01	Communication cable used between Gen 3 main units and motor controllers.
BPC® Go	17-0000-01	Complete BPC® Go system.



Chapter 4: Additional Equipment

There are two ports on the BPC® Go that allow for connecting of external equipment provided by BPC Instruments (for the express purpose). This allows for the extension of the functionality of the instrument

Chapter 4.1 Motor and stirrer for bottle

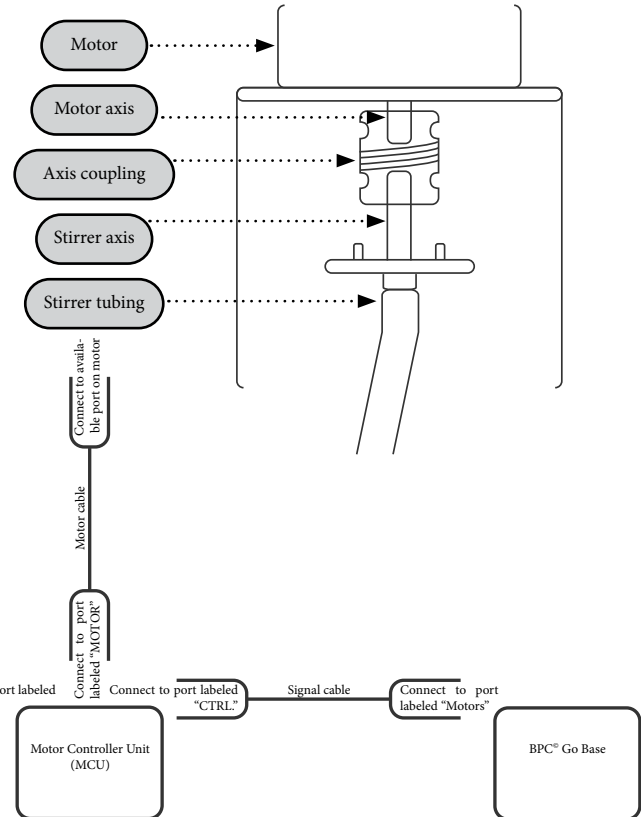
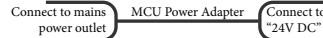
For mixing of a bottle with a standard GL 45 port, BPC provides equipment for this purpose. Please note that choice of stirrer depends on the size of the bottle but all other components remain the same. The speed of the mixing is adjusted in the Aurora Web UI in the control tab, under the agitation heading.

Components required:

- Motor Controller Signal Cable MK 3 (ART NO 17-0003-01)
- Motor Controller, Standard (ART NO 01-0109-01)
- Motor Controller Power Adapter (ART NO 01-0110-01)
- Brushless DC Motor Cable 1500 mm (ART NO 01-0104-02)
- Brushless DC Motor (ART NO 01-0102-02)
- Axis Coupling for Brushless DC Motor (ART NO 01-0112-01)
- Stirrer GL 45 (suitable size)

First, make sure that the power button on the motor controller is set to off. Failing to do so when connecting or disconnecting motors might damage the equipment.

Note: It is very important that the motor axis and the stirrer axis meet in the middle of the axis coupling (but without touching). If the stirrer axis puts downward tension on the stirrer tubing, it might, over time, drill a hole through the bottom of the stirrer and compromise the air seal of the setup.



Chapter 5: Maintenance

In order for the BPC® Go to perform properly and to maximise the life-span of the instrument and its constituent parts, it is important to clean and maintain it in a proper way. To clean the base unit, wipe it with a damp piece of cloth and, if required, a gentle form of detergent. The unit is not water proof and should not be exposed to liquid.

The flow cell units can not be opened and are considered consumables. Attempting to open them will irrevocably destroy the gas tightness of them. While still possible to use for some types of experiments, they can not be guaranteed to work as expected. Once they are dirty and the residue can't be removed by injecting deionized water into them using a syringe, it is recommended that they are replaced. More flow cell units can easily be ordered directly from BPC Instruments.



If an stirring solution from BPC Instruments is being used, the motor and motor controller unit should be cleaned the same way as the BPC® Go base. The stirrers, while also considered consumables, can be autoclaved. Their life-span will depend heavily on care being taken when mounting them and on what medium they are used to stir. More stirrers can easily be ordered directly from BPC Instruments.



In order to further maximise the life-span and performance of the BPC® Go, remember to send it in for service at suitable intervals and to contact BPC Instruments if there are any indication that the instrument is not working. Service intervals heavily depend on the usage and usage patterns of the individual instruments but common intervals range from one to three years. During service, the internal electronics of the instrument will be exchanged and, if a new compatible hardware version is available, upgraded to the latest version. Any other damage or issues will be resolved as seen suitable during the service examination. There are no additional charges for additional repair or replacement steps during the service. Please contact us via phone or email to receive a quotation for your unit.