Service functions of the IntelliVue G7m are accessed with the 866173 Service Software (VISIA2 tool) which is available on the IntelliVue Documentation DVD shipped with the host monitor.

Equipment Required

The following equipment is required for checking the gas analyzer. If applicable, part numbers are given in

Equipment	Philips part No. or other recommendation	Accuracy
IntelliVue G1/G5 PC cable	M1013-61005/451261005001	n/a
Flowmeter TSI	4535 641 78121	±3 ml/min or better
Digital Barometer/ Pressure Indicator	Recommended: DRUCK DPI 705, 2 bar, absolute	±2 mbar or better
Philips Watertrap	989803191081 (Pack of 12)	n/a
Sample Tubing	M1658A / 989803104671	n/a
Calibration Gas Reservoir Bag	M1659A / 989803104681	n/a
Calibration Gas	M1662A / 451261001391	n/a
Gas Exhaust Return Line or Exhaust Tubing	M1655B / 989803145671 or M1015-40001 / 453563227921	n/a
Leakage Test Kit	M1013-64002 / 451261014851	n/a

NOTE

If your PC/Laptop does not have an RS232 serial connector, you can use a USB-to-Serial adapter. To check the USB Serial Port Settings:

1 Go to **Control Panel** -> **System and Security** -> **Hardware and Sounds** -> **Device Manage**r and select the USB Serial Port (only available when a USB adapter is attached).
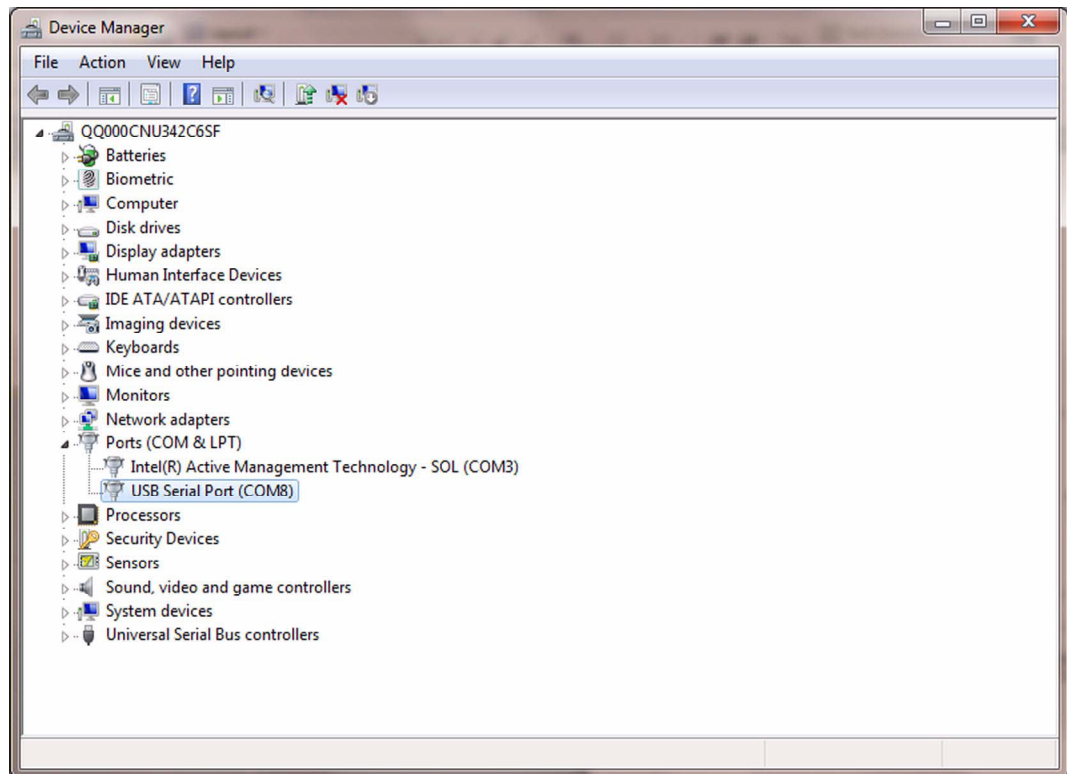
2 Right click on the USB Serial Port, click **Properties ,** select the Port Settings Tab and click **Advanced.**

.
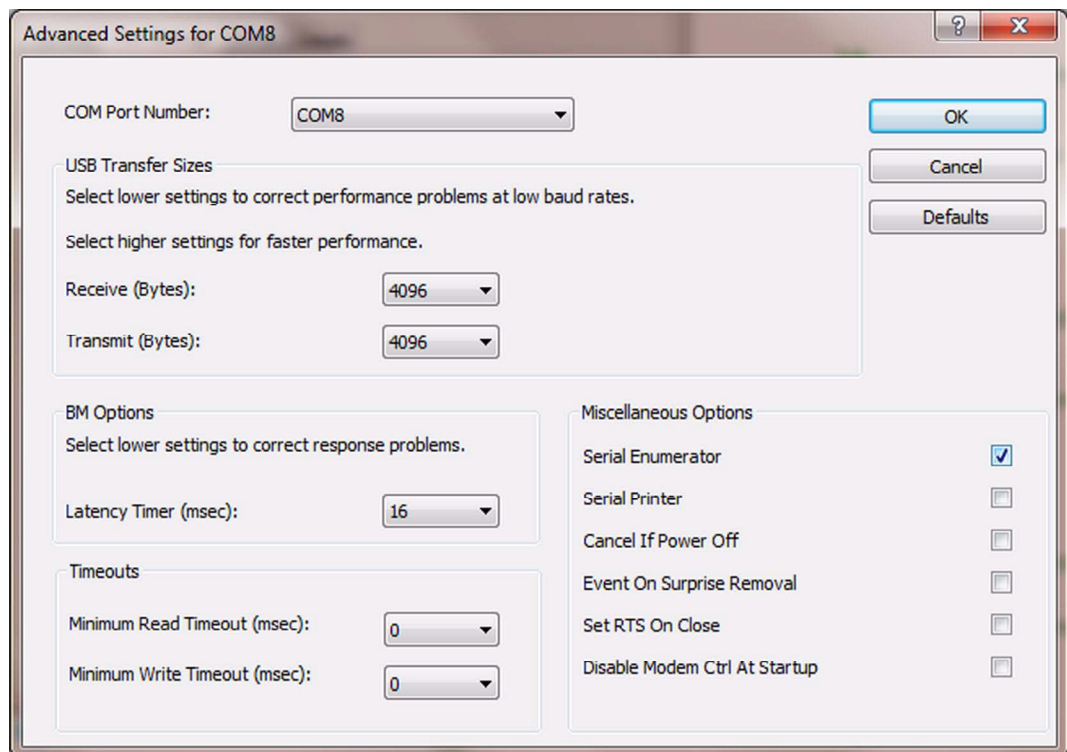
Annual Checks

Perform the following procedure once a year

1 Connect a PC/Laptop running the Service Software (VISIA2 tool) to the instrument. Make sure that zero mode is switched to Auto - see "Zero Calibration".

2 Check that there are no reported errors.

3 Perform the following checks:

  a. Visual Check

  b. Gas Accuracy Check

  c. Leak Check

  d. Flow Rate Check

  e. Pressure Sensor Test

Connecting the Gas Analyzer to a PC/Laptop

To set up a computer as a service host for the gas analyzer, a serial connection must be established with the PC cable (451261005001). Connect the RJ45 connector of the cable to the appropriate receptacle on the side of the gas analyzer, and then connect the D-SUB9 connector of the cable to the serial port of your computer.

Go into service mode on the IntelliVue monitor and then start the VISIA2 software on your computer.

RJ45 connection on side of gas analyzer

NOTE

- After each use of the VISIA2 tool, the host monitor must be switched off and back on again before being used for patient monitoring.

- The Parameter and Pato/PIA tabs in the VISIA2 tool are not used.

When the VISIA2 tool starts up, the connection should be established automatically, if not, push the button.

In order to keep the gas analyzer running, make sure the Pump Flow Level is set to **High** and Operating Status to **Operating** (default setting after startup of gas analyzer).

Zero Calibration

The IntelliVue G7m requires a periodic zero calibration. Whenever this is due, the instrument sends a zero request command to the host monitor. The Philips patient monitor automatically initiates a zero calibration whenever it receives such a request from the gas analyzer - if you want the VISIA2 tool to do the same, you have to switch the zero mode from Manual to Auto.

Zero requests occur 30 minutes after power on. In a steady state, a normal zero is performed not more than every 24 hours.

Zero Calibration Test

Test Procedure:

• Press the **Zero all Necessary** button.

Expected Result:all fields in the **Accuracy** column of the Gas Values table are green and read **Iso.**

If this test fails, check the water trap and sample tubing for occlusions, perform a Leak Check and a Flow Rate Check and rerun the Zero Calibration Test. If it fails again, the gas analyzer needs to be replaced.

If a Zero Calibration fails in Monitoring Mode, check the monitor's altitude setting.

Leak Check

This test ensures the integrity of the pneumatics system, which has a big impact on the quality of the measured values. Make sure that the leak check is passed before checking

NOTE

Always use a new water trap and new sample tubing to perform a leak check.

Equipment Required

- M1655B Gas Exhaust Return Line or
- M1015-40001 Exhaust Tubing to measure the flow at the gas analyzer outlet
- 453564178121 Flowmeter TSI
- Watertrap - 989803191081 (pack of 12)
- M1658A Sample Tubing
- M1013-64002 Leakage Test Kit
- Digital Pressure Indicator

Leak Check Procedure

1 Set pump flow to off

2 Ensure that the valve setting is set to patient (default setting after startup of gas analyzer)

3 Connect digital pressure indicator and the leakage test kit. See Instructions for Use supplied with the leakage test kit for details (M1013-9302B).

4 Follow the leakage test kit IfU to apply low pressure and wait until you have a pressure of 200 mbar below ambient.

5 Wait until the low pressure has stabilized.

Expected result:

After 1 minute, check the pressure. The pressure should not increase more than 80 mbar in 1 minute for the test to pass.

If this test fails, make sure that there are no leaks in the setup and rerun the test. If it still fails, the gas analyzer has an internal leakage and needs to be replaced.

Pressure Sensor Test

- Trigger a zero procedure (all necessary parameters) via the service host, watch its progress and wait until it is finished (zero successful).
- Measure ambient pressure with independent digital barometer.
- Compare the ambient pressure measured with the digital barometer with the ambient pressure measured by IntelliVue G7m as shown by the VISIA2 tool.
- Expected result: The deviation between the two measured values is < 10 mbar.

Test	Expected test results
Pressure Sensor Test	Deviation between the two measured values is < 10 mbar

WARNING

For this check, always measure the gas analyzer flow rate at the sample gas inlet. Measuring at the outlet may

Test Procedure:

- Connect sample line to the watertrap
- Connect a flowmeter to the sample line

NOTE

During warm up or zero the flow rate may be higher than 200 ml/min. Please wait until the flow stabilizes.

In case the pump flow is out of the specified limits (e.g. 225 ml/min), it needs to be adjusted following the procedure described in the section "Flow Rate Adjustment". A pump flow of e.g. 215 ml/min is **not** out of range and does not require a Flow Rate Adjustment.

Test	Expected test results
Flow Rate Check	Sampling rate is 200 ±20 ml/min

CAUTION

For this adjustment, always measure the gas analyzer flow rate at the gas sample inlet. Measuring at the outlet may lead to incorrect flow re

In case the gas analyzer flow rate is outside the tolerance limits, it can be adjusted according to the following procedure:

1   Make sure you measure the flow at the gas analyzer's inlet.

2   Select **High** in the Pump Flow Settings section of the Gas Module screen in the VISIA2 tool.

3   Connect the flowmeter to the sample line.

4   Click the **Adjust** button in the Pump Flow section.
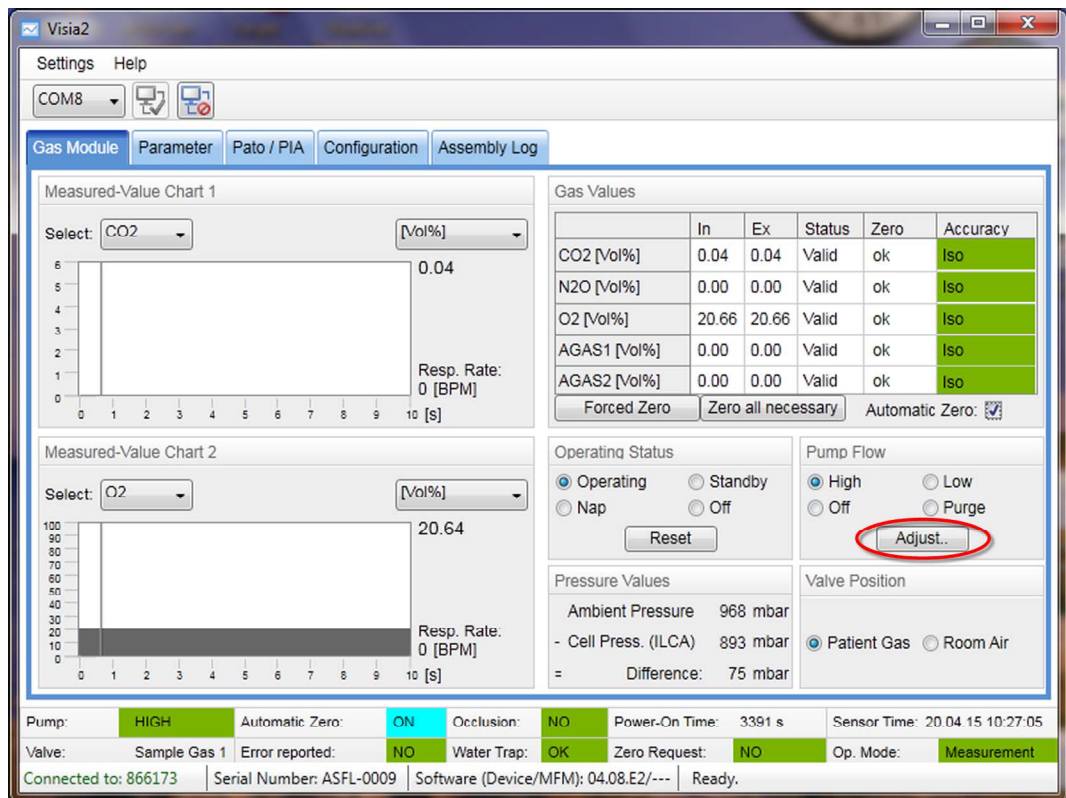
5   Now use the ↑ and ↓ buttons to decrease or increase the flow to 200 ml/min or until it is inside the tolerance limits.
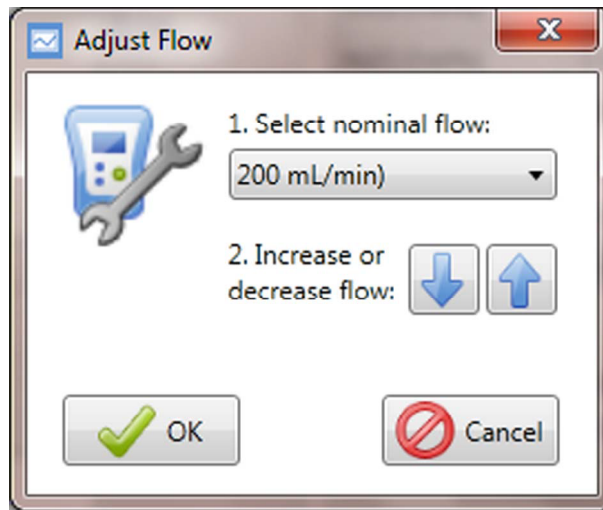

6   Press the **OK** button to store the new flow rate setting.

7   Switch the **Pump Flow Level** to **Off** and then **High** again and check the flow in the flowmeter and in the **Adjust Flow** window in the VISIA2 tool. Check the flow again in normal Monitoring Mode.

If the flow rate cannot be brought inside the tolerance limits, the gas analyzer

NOTE

Once a new flow rate has been saved, the old ones are overwritten.

Gas Accuracy Check

The gas analyzer should run for at least six minutes until the Accuracy column in the Gas Values table of the VISIA2 tool is green and reads **Iso** for each value before continuing with the following procedures. This is to allow the module to reach ISO accuracy.

Before performing Gas Accuracy Check, you must first:

- pass the Leak Check,
- pass a Zero Calibration,
- ensure that there is enough gas in the check gas bottle,
- check tubing assembly and reservoir bags for leaks or damage.

The procedure to check the gas accuracy is as follows:

1   Set the Measured-Value Chart 1 to **CO2** (make sure the unit is set to Vol%) and the Measured-Value Chart 2 to **AGAS1.**

2   After the calibration gas from the gas bottle is applied (see next steps), make sure **DESFLURANE** is detected.
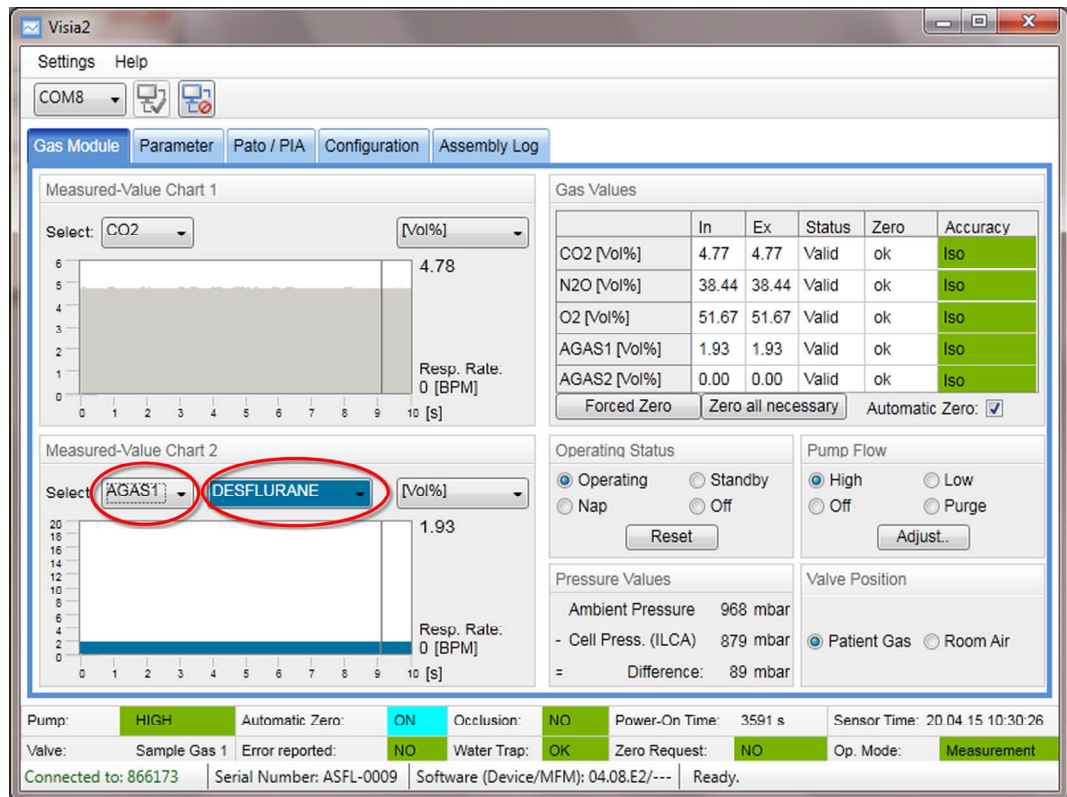
3   Make sure the pump is off, then connect the calibration gas bottle, the reservoir bag and the sample line as shown below.
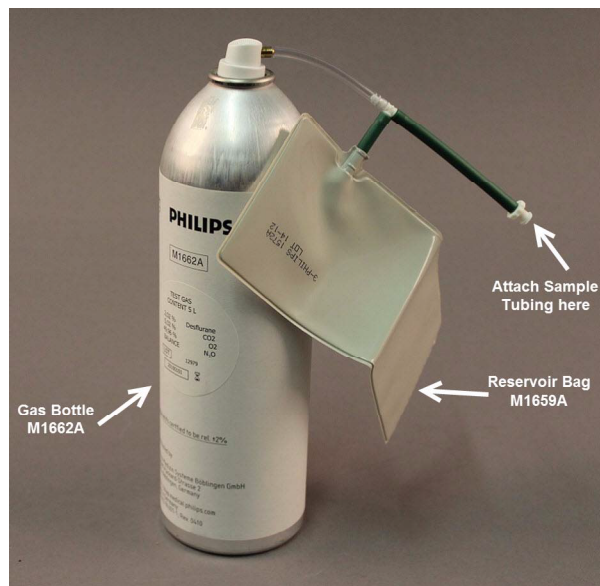
4   Switch on the pump. Wait until the reservoir bag is empty. Wait for another 10 seconds to let the gas analyzer completely evacuate the reservoir bag. The INOP Occlusion may be issued but will disappear again as soon as the gas flow is restored.

5   Now fill the reservoir bag with gas.

CAUTION

Do not pressurize the reservoir bag.

Do not attempt the check process if there are any visible leaks in the bag or tubing.

Prevent the bag from emptying before

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6   Set the pump flow level to **High.**

7   Wait until the gas concentration reaches a stable plateau.

8   Verify that the values measured by the gas analyzer are within the specified limits for Check Gas No. M1662A.

Gas Type	Allowed Tolerance
Anesthetic Agent	± 0.5 vol%
CO_2	± 0.7 vol%
N_2O	± 6.2 vol%
O_2	± 3 vol%

Disposal of Empty Gas Cylinder

1   Empty cylinder completely by pushing in the pin of the valve.

2

CAUTION

Be careful to assure that the cylinder is comp

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3   Write "Empty" on the cylinder and place it with your scrap metal or, if you do not collect scrap metal for recycling, dispose of the cylinder .

Vuelink Performance Test

This test checks the performance of the Vuelink modules.

Tools required: none / external device (i.e. ventilator) and the required Vuelink cable

1   Plug the VueLink module into the Philips patient monitor.

2   Switch to Configuration Mode of your monitor.

3   Depending on your external device, configure the VueLink module as described in the Philips M1032 VueLink Module Handbook "Configuring the VueLink Module (CMS or V24/26)" on page 13 or "Configuring the VueLink Module (IntelliVue Patient Monitor)" on page 45. (Ensure that you have stored the configuration settings before continuing.)

4   Change the operating mode of the monitor to Monitoring Mode.

5   Press the Setup key on the front of the VueLink module.

6   Press the Setup VueLink pop-up key, if setup menu is not already shown.

7   In the Setup VueLink menu select Device, and then select the required Device driver.

8   Select Confirm to store the selection and wait for the message "Switched to new device"

9   Connect the module by plugging one end of the cable connector into the VueLink Module, and the other end into the connector of the external device. Make sure that you use the correct cable option for that device.