Title: Siemens Blood Gas Analysers User Guide

Site/Area of application	Point of Care - Produced specifically for Ward Users
Index code	POCT-SOP-23 v1.2
Superseded documents	POCT-SOP-23 v1.1
Implementation date of this version	16/08/2024
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Reason for change

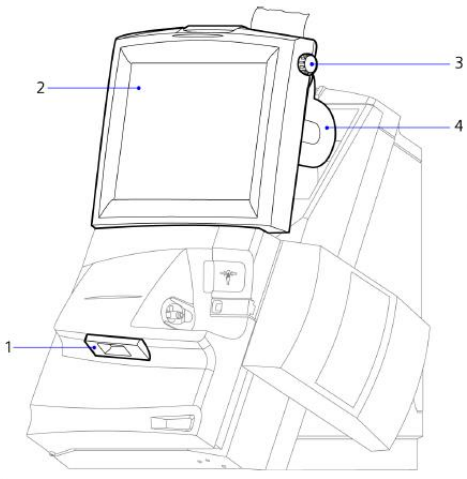
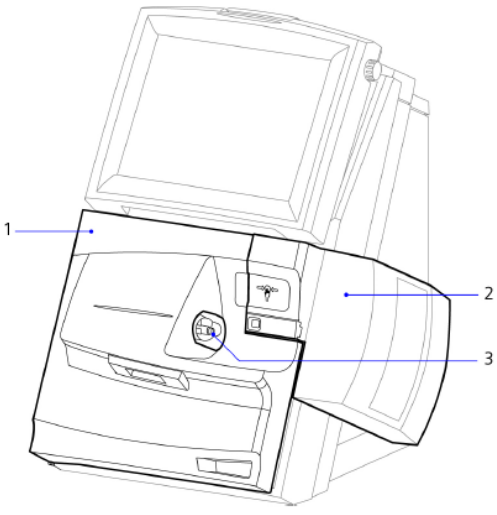
Minor formatting changes to make easier to read, including correct formatting of page numbers.

Impact on training needs and requirements for competency assessment

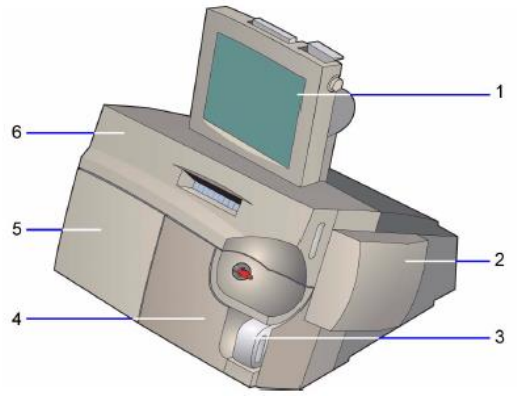
This is a new procedure Acknowledgment of notification is taken to be your confirmation that you will ensure you are familiar with and implement the processes described. A process of training and assessment of competency is required.

Keywords for search
Point of Care, Blood Gas, Siemens, RP500, RL1200, RapidPoint, RapidLab, BGA

Signature

Contact Details	Office hours: Mon-Sat 08:30-17:00 Call: 0113 39 22338 or 0113 20 64791 Email: leedsth-tr.pointofcare@nhs.net
Medico-Legal	**It is important to not share passwords and always use the correct patient ID** • It is a legal requirement and Trust policy for individual access not to be shared. • Creates an Information Governance audit trail • Enables test results to be recalled for specific users and patients • Protects staff and patients from device misuse Training updates are required every **TWO years** and untrained staff must **NOT** use the analyser. Patient ID must be entered each time a sample is analysed. Acceptable forms of ID are: **- PAS Number (preferable)** **- NHS number** - **A&E number** In case of an unknown patient, enter something as specific as possible e.g. 'unknownmalecrash' and contact POCT with the correct ID when known.
Analyser overview	**RAPIDPoint 500 and RAPIDPoint 500e Model**   1 Integrated barcode scanner 2 Touch screen 3 Paper-advance knob 4 Printer  1 Door 2 AutomaticQC cartridge 3 Sample port

RAPIDLab 1200 Model (Delivery Suite ONLY)



1 User interface module
2 AutomaticQC module (optional)
3 Waste module
4 Reagent module
5 Wash module
6 Measurement and CO-ox modules

CONSUMABLES

- Blood syringes are delivered to low usage wards yearly and high usage wards on regular standing orders. If you need to place an additional order for blood gas syringes or capillary tubes, please email: leedsth-tr.procurementoffice-lgi@nhs.net

- Siemens RAPIDLyte Blood Gas Syringes Luer Lock (order code: 11561347)
- Siemens RAPIDLyte Blood Gas Syringes with Safety Needle (order code: 11561349)
- Siemens RAPIDLyte Multicap-S Plastic Capillaries (pot of 50 order code: 6440221, pot of 500 order code: 2043295)
- Siemens capillary caps (order code: 08685906)

- Sample ports (supplied by POCT Team)
- Printer paper rolls (supplied by POCT Team)

RAPIDLab 1200 ONLY

- Waste bottle (supplied by POCT)

Calibration

- 1 point every 30 mins (2:30 min), 2 point every 2nd hour (5:30 min) and full every 8th hour (8:00 min).
- The machine may calibrate up to 2 more times if a parameter fails.
- Calibrations will occur more frequently if the analyser detects an issue.
- **DO NOT CANCEL CALIBRATIONS** as parameters that have not passed a calibration will not be available.
- Failed parameters will be marked with a line or a cross. Samples can be analysed but results will not be produced for this parameter.

Quality Control (QC)

- 3 levels of Automatic QC, 2 levels analysed every 8 hours
- Failed QC is indicated by a QC droplet symbol in the parameter box.
- Samples can be analysed but results will not be produced for this parameter.

	EQA (External Quality Control) EQA is organised by an external organisation but the aim is to compare your department's performance with your peers nationally. Samples are received monthly and will be analysed by the POCT Team. Any issues picked up by this will be acted on to ensure analysers are giving the correct results.
Health and Safety	• Samples must be capped as soon as possible after collection. • Conform to Trust Infection Control policies at all times. • Gloves should be worn when handling blood samples. • Syringes and capillaries must be disposed of in a sharps bin.

Maintenance	• Cleanliness of the blood gas machine is the responsibility of the user and the ward.
	• Analyser should be cleaned using:
	  ○ Haz-Tab solution prepared within 24hrs
	  ○ Biohazard wipes (order code H9730)
	• **DO NOT USE** green clinell wipes or any other cleaning products on the blood gas analysers. Many cleaning products contain a component that damages the sodium sensor and produces incorrect patient results
	
	• Printer Paper- must be replaced when the red stripe appears on printouts. Ensure that the paper is in the correct way by scratching it before inserting it into the feeder- a grey line will appear. **DO NOT** discard the grey spindle inserted inside the paper roll, this holds the weight of the paper roll and prevents it from damaging the mechanism.
	
	RAPIDLab 1200 ONLY
	• New waste bottles are stored in the cupboard below the analyser.
	1. Remove the full waste bottle and secure the orange lid, dispose in a clinical waste bin.
	2. Insert a new waste bottle, ensuring the orange lid is located in the storage position and the waste container opening is inserted into the analyser first.

Pre-Analytical	**Before analysing a sample, you must always:** • **Avoid infusion sites and clear lines-** Glucose, potassium and sodium can all be affected by the presence of a contaminating fluid. Clear all lines thoroughly and be aware of infusion sites. • **Expel Air-** The presence of air in the syringe will affect the pO2 result. Cap the sample immediately after collection and expel all air through the filter cap. • **Mix-** Samples must be collected into heparinised blood gas syringes or capillaries to prevent clotting. To ensure the heparin is distributed throughout the sample, invert sample at least 20 times and roll between your palms immediately. If the sample is not mixed prior to analysis, the red cells can settle and cause the Hb result to be greatly affected. • **Prevent Haemolysis -** Small amounts of haemolysis can raise potassium results significantly. If blood is drawn under force or through a very small needle bore, the red blood cells may haemolyse (break) and release their contents. Small amounts of haemolysis can falsely elevate the potassium level significantly. • **Analyse within 10 minutes** - all parameters are affected by delayed analysis due to cell metabolism; test within 10 mins of collection. A whole blood sample is living tissue; the white blood cells will continue to use O_2 and produce CO_2, glucose will be utilised and lactate will be created as a by-product.

	Be aware that: • **Antimicrobial compounds** - such as silver sulfadiazine and chlorhexidine, significantly affect sodium results and may affect subsequent sample analyses. These components can be contained in cleaning products. • **Patients on Vitamin B12 (Hydroxocobalamin)** - may have lower than expected values for carboxyhemoglobin (fCOHb) and methemoglobin (fMetHb).
Sample Preparation	• Positively identify patient by confirming full name and DOB prior to sample collection. • You must use a heparinised syringe or heparinised capillary to collect the sample. • Label sample or kidney bowl with patient addressograph. **Syringes** • Syringes are pre-set to 1.5mL. Adjust fill line to the desired volume with minimum sample size of 1mL in a syringe. • **NOTE:** When using the syringe with attached needle **DO NOT** push syringe to expel air prior to sample collection. This will expel the heparin and increase chances of clotting. When performing an arterial stab, place the syringe at a 45 degree angle and allow the syringe to auto-fill. • Expel air into the filter cap, mix immediately after collection by inverting the syringe at least 20 times and roll between your palms and again prior to analysis. **Capillaries** • Minimum sample size ¾ of a 175µl capillary • Capillary samples must be free of air bubbles and be one continuous line of blood. • Capillary samples should be capped and rolled between the fingers. Mix the sample immediately after collection and again prior to analysis. • Analyse the sample within **10 minutes** of collection. **DO NOT** discard the sample until results have been printed and you are satisfied. You may re-analyse a sample as long as it is within 10 minutes of collection.

Sample Analysis

- Ensure the machine says '**Ready**' in the top left corner, then login by scanning the barcode on your Trust ID badge.

1. Select the relevant sample type
   - Arterial
   - Capillary
   - Venous
   - Mixed Venous

- Ensure sample is mixed well prior to analysis. If using a syringe, expel the first couple of drops into a sharps bin.

2. Insert the sample into the sample port. For capillary samples, insert the opposite end to that used for collection.

3. Select **Start/Analyse**.

- When prompted, remove the sample and press the arrow to continue. If using a syringe, expel the air and recap the sample until you receive the results.

4. When prompted, scan patient ID barcode. Ensure the details are correct and press the arrow to continue.

- The analyser will display the results and print a copy automatically. Press the arrow button to logout.

- The analyser will run a wash cycle after every patient sample.

- Dispose of the sampling device in a clinical waste bin.

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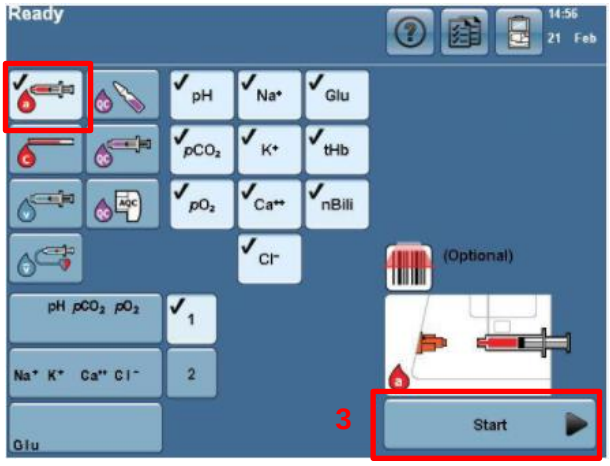

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Analysing Microsamples (RAPIDLab 1200 ONLY)

If you are analysing a sample on the RapidLab 1200 blood gas analyser and have less than 90µL of blood, you can still analyse your sample using the Microsample option.

You can perform a microsample either by selecting this from the main analysis screen before selecting the 'analyse' button or by allowing the analyser to prompt you that the sample volume is insufficient and allowing you the option to perform a microsample.

1. Select the button for the patient sample type (arterial, venous, capillary, mixed venous) and then press **Microsample.**

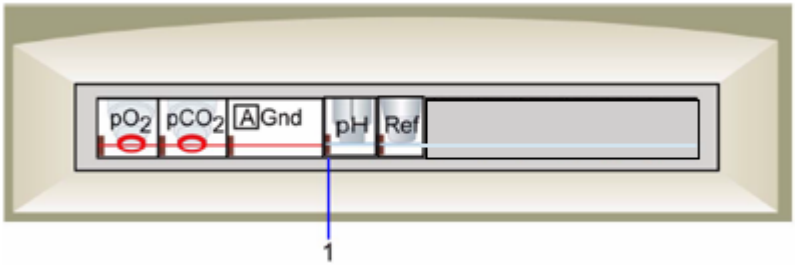
2. Insert the sample into the sample port and press **Analyse**.
   Note: If microsample was not selected before analyse, the analyser will detect an insufficient sample and prompt the user to select microsample or cancel.* ***Select Microsample**.*

3. When prompted remove the sample and press the arrow to **Continue**.

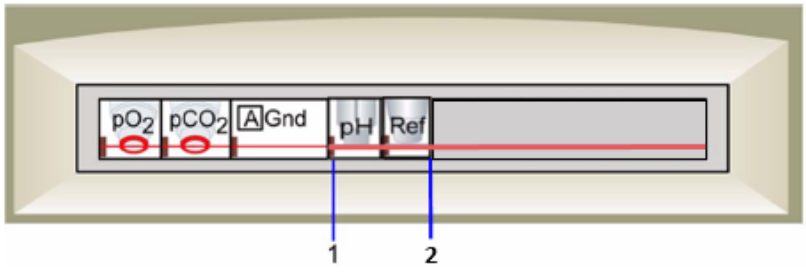
4. To start the sample moving through the sample path, press **Advance Sample.**

5. Watch the sample move into the sample path. For the first part of the analysis there must be continuous sample from the very left of the pO2 electrode to just beyond **position 1**, as shown below and press **Stop sample** once the sample reaches this point**.**

6. Select **Analyse.** Wait whilst the system analyses pO2 and pCO2. After the system finishes the analysis it moves the sample to the remaining sensors.



7. Watch the sample move through the sample path and inspect the sample path for bubbles or gaps.
   - Ensure that the trailing edge of the sample remains in contact with the **Gnd sensor**
   - Ensure that the leading edge of the sample fills the **Ref sensor**, just beyond **position 2**.



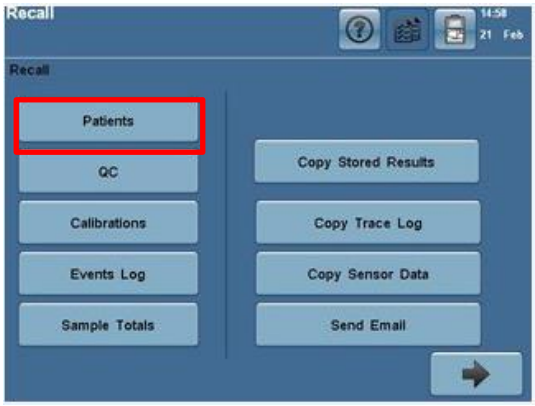
8. If bubbles or gaps are present, select **Cancel**. If no bubbles or gaps are present select **Analyse.**
9. When prompted, enter the patient ID (see above for acceptable ID).

10. The machine will show the results when analysed and print a copy automatically. Press the arrow button to finish. The analyser will run a wash cycle after every patient sample.

	• Dispose of the sampling device in a clinical waste bin.
Results	• Result printout must be checked for error flags detailed at base of printout. Flagged results may not be reliable. • Results should be reported according to ward/departmental procedures ensuring correct patient identification. • In the case of an unexpected or abnormal result, the sample can be analysed again if still within 10 minutes of collection. Ensure the sample is mixed and contains no air bubbles, repeat the sample on the same analyser and a comparison analyser and contact POCT. If outside this time frame, repeat using a fresh sample. A sample should also be sent to the lab for confirmation. • **Hb results** should **NOT** be used for the basis of a blood transfusion. Any result below the transfusion cut off must be confirmed by a laboratory Hb result. • Please note that the calcium result given by the blood gas machine is an ionised calcium and therefore the reference range differs from the lab calcium result. **INTERPRETING COMMON RESULTS SYMBOLS** ↑ The result is above the patient range. ↓ The result is below the patient range. -----↑ The result is above the reporting range. -----↓ The result is below the reporting range. -----? The system has an atypical response when measuring this parameter and cannot report the result. Analyze the sample again, if possible.

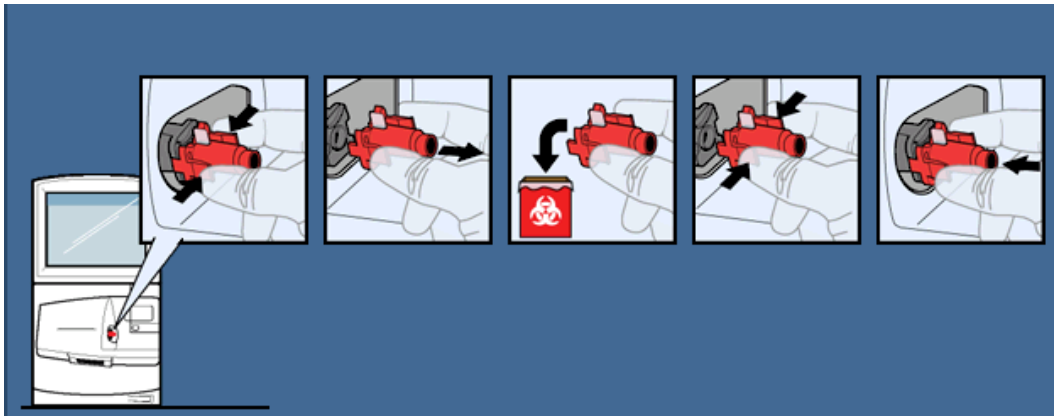
Result Recall

- Log into the analyser and select the 'tick sheet' icon in the top right corner 
- Select 'Patients'
- The analyser will display the last 250 patient results.
- Select 'Search' to search for a specific patient ID.
- Select 'Results' to display the results
- Another copy of the results can be produced by pressing the print icon.
- Log out by selecting the arrow until at the home screen.



Troubleshooting and Incident Reporting

- Sample port - this **MUST** be replaced when the machine prompts you to do so. The machine has detected a clot and/or an insufficient sample and is unable to analyse the sample. **DO NOT** attempt to re-run the sample. Ensure that the port is clipped in at both sides; wiggle it to ensure it is fitted securely.



- If the machine displays an error message, please use your nearest alternative analyser and contact POCT. Outside of POCT working hours, follow the Out of Hours Procedure poster behind the analyser.
- Further information, including Standard Operating Procedures can be found at Leeds TH Pathology website.
- When reporting clinical incidents on DATIX, select incidents involving Trust equipment and select 'in-vitro Medical Devices' from the drop down list.