ABSELION™
PRECISION MADE PRACTICAL

PLATFORM MANUAL

User guide for installing, operating, and maintaining the Amperia™ system

AMPERIA™ PROTEIN QUANTIFICATION SYSTEM

PRODUCT CODE: PL-001-UK/EU/US

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1 Introduction

The **Amperia™ Protein Quantification System** is a benchtop instrument designed for rapid, automated protein analysis using **Redox Electrochemical Detection (RED)**. This manual provides essential information for the installation, operation, and maintenance of the instrument in a laboratory setting.

Amperia™ combines an integrated sensor readout mechanism, temperature-controlled agitation modules, and intuitive software to support a range of protein quantification workflows, including use with complex or unpurified samples.

This document outlines operational guidance and safety precautions and should be read in full before use. For best results, follow each step as described and keep this manual accessible during routine operation.

Note: Specifications and procedures described are subject to change without notice. Always refer to the latest version online or contact Abselion for updates.

2 Safety information

Read all safety instructions before operating the instrument. Failure to follow these guidelines may result in injury, equipment damage, or invalid results.

Warning Symbols

These symbols are used throughout the manual to highlight potential hazards:

	**WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.

	**CAUTION** Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

SAFETY WARNINGS AND CAUTIONS

	**WARNING** **Mechanical hazards** The Sensor Head moves automatically during operation and can cause serious injury if obstructed. • Keep the tambour door closed during operation. • Do not insert hands or fingers into the instrument while the Sensor Head is moving or immediately after issuing a movement command. • Never attempt to stop the Sensor Head or agitator manually.
	**WARNING** **Lifting hazard** The instrument weighs approximately 18–20 kg. Improper lifting may cause back injury or dropped equipment. • Use correct manual handling technique. • Always carry using the designated side handles. • Do not lift the unit by placing fingers underneath the base.
	**CAUTION** **Electrical safety** Improper use of the power supply may lead to damage or risk of electric shock. • Only use the supplied AC/DC power supply (model: TR9CI5000YL4BIMR6BF3). • Ensure all plugs are fully inserted and sockets are not loose. • Do not operate with a damaged power cord. • Disconnect by holding the plug, not pulling on the cable. • Do not move or service the instrument while it is powered on.
	**CAUTION** **Environmental use** The system is designed for standard laboratory environments. • Operate only between 15 - 30 °C and 40 - 70% RH. • Do not use outdoors or in areas with moisture, excessive dust, or extreme temperatures. • Do not operate at high altitude. • Do not disassemble or modify the instrument. • If unusual odours, smoke, or noise occur, disconnect power immediately and contact support.
	**CAUTION** **Foreign objects** Foreign materials can interfere with operation or damage the instrument. • Ensure no foreign objects are present inside the instrument before use. • Only operate with components correctly loaded and seated.
	**CAUTION** **Cleaning** Improper cleaning agents can cause equipment damage or skin irritation. • Clean with mild detergent or 70% isopropyl alcohol (IPA) only. • Do not use strong solvents, direct sprays, or submerge any part of the instrument. **Note:** If the instrument has been used in a **Category 3 (CAT3) laboratory**, contact support before moving it to a lower containment environment.

3 System Overview

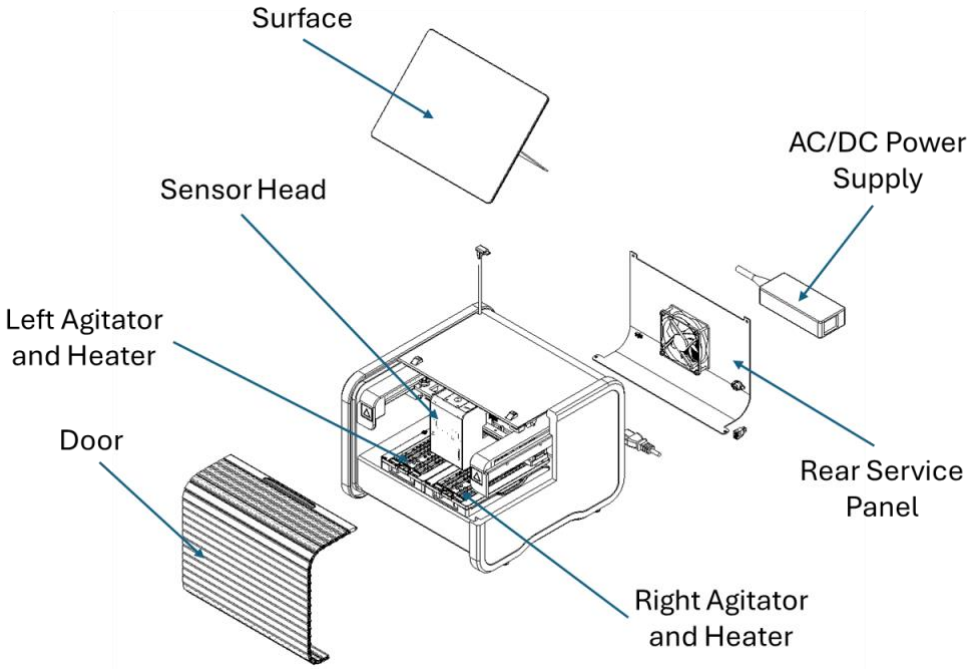
The Amperia™ system is a compact benchtop instrument for automated protein quantification using Redox Electrochemical Detection (RED). It combines precision automation, temperature-controlled agitation, and intuitive software in a single integrated platform.

Key components include:

- A motorised **Sensor Head** for automated sensor positioning and measurement
- Two **Agitator and Heater Modules**, each supporting one 96-well plate and a removable Sensor Rack
- A magnetically mounted **Microsoft Surface Pro** for system control and data output
- A **tambour door** to protect the internal mechanism and reduce dust and light ingress

The layout of these components is shown in **Figure 1**.

Figure 1. Overview of the Amperia™ system



Annotated view of key hardware features, including the Sensor Head, agitation modules, Surface mount, Sensor Rack locations, and tambour door.

The instrument is designed for routine use in general laboratory environments and supports a range of assay workflows, including those using unpurified or complex samples.

Note: This manual covers hardware setup and maintenance only. For guidance on running assays, using the software interface, and data handling, please refer to the separate **Amperia Software Guide** and relevant assay kit instructions.

4 Setup and Powering On

This section outlines how to position the system, connect power and interface components, and load the necessary consumables prior to running an assay.

4.1 INSTRUMENT PLACEMENT

Place the Amperia™ system on a clean, flat, and stable laboratory bench in a temperature-controlled environment (15 - 30 °C, 40 - 70% RH). Ensure sufficient space around the instrument for cable access and safe loading of consumables.

WARNING

The instrument weighs approximately 18 - 20 kg. Improper lifting may result in injury. Use correct manual handling technique and carry using the designated side handles. Do not lift by placing fingers underneath the base. Use a trolley or request assistance when moving the instrument over longer distances.

4.2 POWER AND INTERFACE CONNECTION

Follow the steps below to connect the instrument and control interface:

1. **Connect the power supply**
   - Insert the mains lead fully into the supplied AC/DC power supply.
   - Plug the instrument connector into the socket at the rear of the instrument.
     - The connector features a **sprung plastic sleeve**. Pull this back during insertion to ensure a proper connection.
     - The flat side of the plug should face upward.

CAUTION

Ensure the instrument plug is fully inserted and correctly aligned. Forcing the connector may damage the socket or internal pins.

Note: The mains power plug provided with the instrument will vary depending on the destination region (UK, EU, or US). Ensure the plug is compatible with your local socket before use.

2. **Mount the Microsoft Surface Pro**
   - Place the Surface Pro on top of the instrument using the magnetic bracket.
   - Connect the **USB-C cable** to the **lower USB-C port** on the Surface to enable data transfer and charging.
3. **Power on**
   - Connect the power supply to a mains socket and switch it on.
   - The Surface should display a charging icon, indicating successful power connection.

Note: Software operation and assay workflows are detailed in the **Amperia Software Guide** and relevant assay kit instructions.

4.3 LOADING CONSUMABLES

This section describes how to load and remove well plates, Sensor Racks, and electrochemical sensors. The sensors are supplied as **strips**, each containing **four individual probes**, and must be manually loaded into the Sensor Rack before use. Always ensure the instrument is idle and the Sensor Head is stationary before inserting or removing any components.

4.3.1 LOADING AND REMOVING WELL PLATES

Well plates are placed onto the agitation module using the handle mechanism. Each module supports one 96-well plate.

Refer to **Figure 2** for the plate loading and removal mechanism.

WARNING

Ensure the instrument is not running and no movement commands have been issued. Keep hands clear of the Sensor Rack and Sensor Head during and immediately after movement.

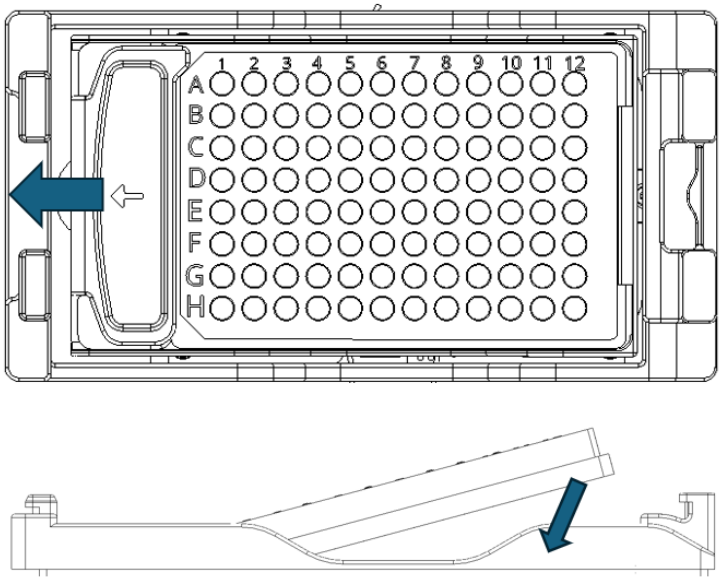
To insert a well plate:

1. Use the software interface to **clear the Sensor Head** from the target position (left or right position).
2. Gently pull the handle on the agitation module to raise the front tab.
3. Insert the 96-well plate with **well A1 positioned front-left**.
4. Release the handle to lower the locking tab.

To remove a well plate:

1. Pull the handle to raise the front tab.
2. Lift out the plate from the rack.

Figure 2. Loading and removing a 96-well plate



The handle mechanism allows secure placement and removal of standard-format plates. A1 should be positioned front-left when loading.

4.3.2 LOADING AND REMOVING SENSOR RACKS

Each Agitator Module accommodates one removable Sensor Rack, which holds the electrochemical sensors in defined positions beneath the Sensor Head.

Refer to **Figure 3** for the Sensor Rack removal and insertion process.

⚠	**WARNING** Ensure the instrument is not running and the Sensor Head is stationary before reaching into the instrument. Do not attempt to access the Sensor Rack while the Sensor Head is in motion.

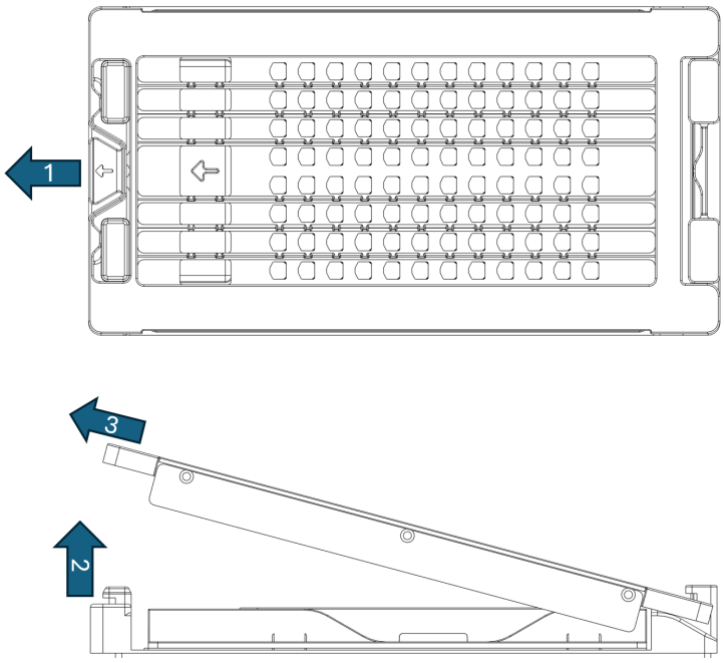
To remove a Sensor Rack:

1. Use the software interface to move the Sensor Head away from the active agitator position (left or right).
2. Pull the **front tab** on the Sensor Rack upwards to release it.
3. Lift the rack vertically and remove it from the module.

To insert a Sensor Rack:

1. Align the Sensor Rack with the guides on the agitation module.
2. Lower it vertically into position until fully seated.

Figure 3. Removing and inserting the Sensor Rack



The Sensor Rack is lifted using the front tab and seated vertically into the agitation module. The Sensor Head must be cleared before accessing.

4.3.3 LOADING AND REMOVING SENSORS

Sensor strips are manually inserted into the Sensor Rack prior to running an assay. Each strip contains four electrochemical probes and is designed for single-use. The Sensor Rack includes designated slots for these strips, including four positions located outside the 96-well plate footprint, used for sensor pickup and calibration.

Refer to **Figure 4** for correct sensor orientation and loading positions.

⚠	**WARNING** Ensure the instrument is not running and the Sensor Head is stationary before inserting or adjusting any sensors. Always use the software interface to clear the Sensor Head from the working area.

To load sensor strips:

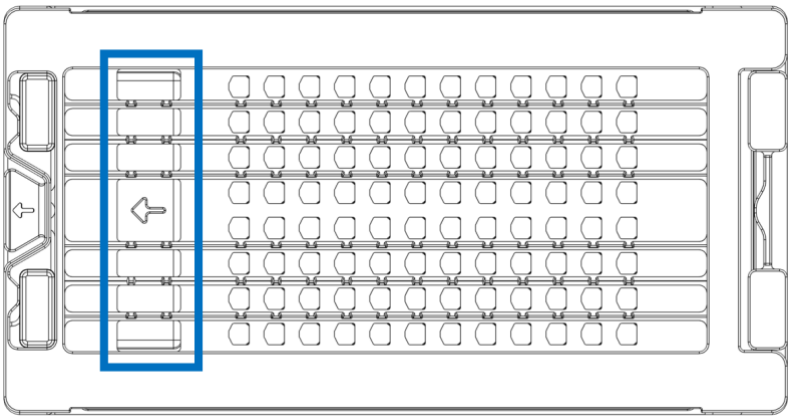
1. Use the software interface to move the Sensor Head away from the agitator position.
2. Insert each sensor strip into the Sensor Rack slot with correct orientation:
    - **Gold electrode facing front**
    - **Silver electrode facing rear**
3. Press gently to seat the sensor fully into the slot.

Note: Sensor strips are intentionally asymmetrical. Incorrect orientation may cause damage during pickup.

To remove sensors:

1. Use the software interface to clear the Sensor Head.
2. Gently lift each sensor vertically from its slot using gloved fingers or blunt forceps.
3. Dispose of sensors according to your laboratory waste guidelines or the instructions provided in the relevant assay kit.

Figure 4. Manual loading of electrochemical sensor strips into the Sensor Rack



Strips must be oriented with the gold electrodes facing forward. Misaligned strips may break during Sensor Head pickup.

4.4 CLEANING AND DECOMMISSIONING

Routine cleaning of the Amperia™ system should be carried out using mild, laboratory-grade cleaning agents. Avoid the use of strong solvents or direct liquid application that could damage internal components or leave residues in fluid traps.

⚠	**CAUTION** Only use mild detergent or 70% isopropyl alcohol (IPA) to clean the instrument. Stronger cleaning agents may remain in inaccessible areas and cause skin irritation or equipment damage.

- Use a soft cloth lightly moistened with approved cleaning solution to wipe external surfaces.
- Avoid spraying liquids directly onto the instrument.
- Do not allow cleaning fluid to enter vents, connectors, or internal components.

Note: While the instrument includes chemically resistant surfaces, it is not designed for aggressive or high-volume liquid cleaning.

	**WARNING** If the instrument has been used in a Category 3 (CAT3) laboratory, contact Abselion support before moving, decommissioning, or servicing the unit. Biosafety procedures may apply.

4.5 STORAGE AND TRANSPORT

The Amperia™ system should be stored and transported with care to prevent mechanical or electrical damage. **Recommended storage conditions:**

- Temperature: 15 - 40 °C
- Relative humidity: 40 - 70% RH
- Dust-free, dry, and vibration-free environment

	**CAUTION** Do not store or transport the instrument with consumables, sensor strips, or well plates loaded. These items must be removed and stored separately according to their specific requirements.
	**WARNING** Ensure the instrument is disconnected from mains power and all cables are detached before moving or packing. Improper handling may result in injury or internal damage.

- Carry the instrument using the designated handles only.
- Avoid placing pressure on the tambour door.
- If shipping, ensure the Sensor Head is secured and the unit is properly cushioned.

Note: For international shipment or long-term storage, contact Abselion for guidance and optional transit locking tools if required.

4.6 TROUBLESHOOTING

The table below lists common issues that may occur during setup or operation, along with suggested corrective actions. If problems persist or are not listed, please contact Abselion.

Issue	Possible Cause	Suggested Action
Surface Pro does not power on or charge	Power supply not connected properly	Check mains power and ensure all connectors are fully inserted
Surface Pro connected, but no communication	Incorrect USB-C port or software issue	Ensure USB-C is connected to the lower port; Try power cycling the Surface
Instrument does not start up	Power not switched on or plug loose	Confirm AC/DC adapter is connected and switched on
Sensor Head does not move	Software not communicating with hardware	Power cycle the instrument and restart the software
Sensor Head error during sensor pickup	Sensor strip inserted incorrectly or damaged	Remove and reinsert strip; check orientation (gold electrodes front, silver contacts rear)
Agitator not heating or agitating	Module not recognized by system	Check sensor rack and plate placement; power cycle instrument and restart software
Unusual noise or vibration	Foreign object or internal obstruction	Power down system, inspect internal components, and remove debris
System freezes or becomes unresponsive	Software or hardware communication issue	Restart Surface and software; ensure all connections are secure

Note: For issues not resolved using the steps above, contact Abselion via the details provided at the end of this manual or visit: www.abselion.com

5 Technical Specifications

The following specifications outline the typical performance and physical characteristics of the Amperia™ Protein Quantification System. Values are based on internal validation and may vary slightly depending on assay format and environmental conditions.

5.1 PERFORMANCE SPECIFICATIONS

Parameter	Description	Value
Agitation speed	Adjustable mixing range	500 - 1000 rpm
Run time	Typical throughput	60 samples in 60 minutes*
Setup time	Average preparation time	~ 20 minutes*
Temperature control	Actively heated and cooled	15 - 40 °C**
Detection method	Redox Electrochemical Detection (RED)	–
Sensitivity	Assay-dependent (e.g. IgG quantification)	1 ng/mL or 10 pM*

* Based on internal testing using representative assays.
** Cooling is to 15 °C or 5 °C below ambient, whichever is higher.

5.2 INSTRUMENT SPECIFICATIONS

Parameter	Description	Value
Rated voltage	External input	24 V DC
Current draw	Typical	5 A
Power	Maximum consumption	120 W
Weight	Unpacked system	18 kg
Dimensions (L × W × H)	External	354 × 332 × 257 mm
IP rating	Ingress protection	IP20
Over-voltage category	Internal circuit rating	I
Insulation class	Electrical isolation	Class I
Operating conditions	Ambient environment	15 - 30 °C, 40 - 70% RH
Storage conditions	Unpowered storage	15 - 40 °C, 40 - 70% RH
Pollution degree	Environmental classification	1

Appendix A: Regulatory and Compliance Information

CE Mark Declaration

The Amperia™ Protein Quantification System complies with relevant EU harmonisation legislation. The CE mark affixed to the instrument signifies conformity with applicable health, safety, and environmental protection directives.

CE

WEEE Compliance

This product is subject to the Waste Electrical and Electronic Equipment (**WEEE**) Directive. As a producer and distributor of electronic equipment, Abselion offers free take-back and responsible disposal of this instrument at end of life.

To arrange collection or obtain further guidance, please contact Abselion using the details provided on the back cover or at www.abselion.com.

For Research Use Only. Not for use in diagnostic procedures.

MANUFACTURER DETAILS

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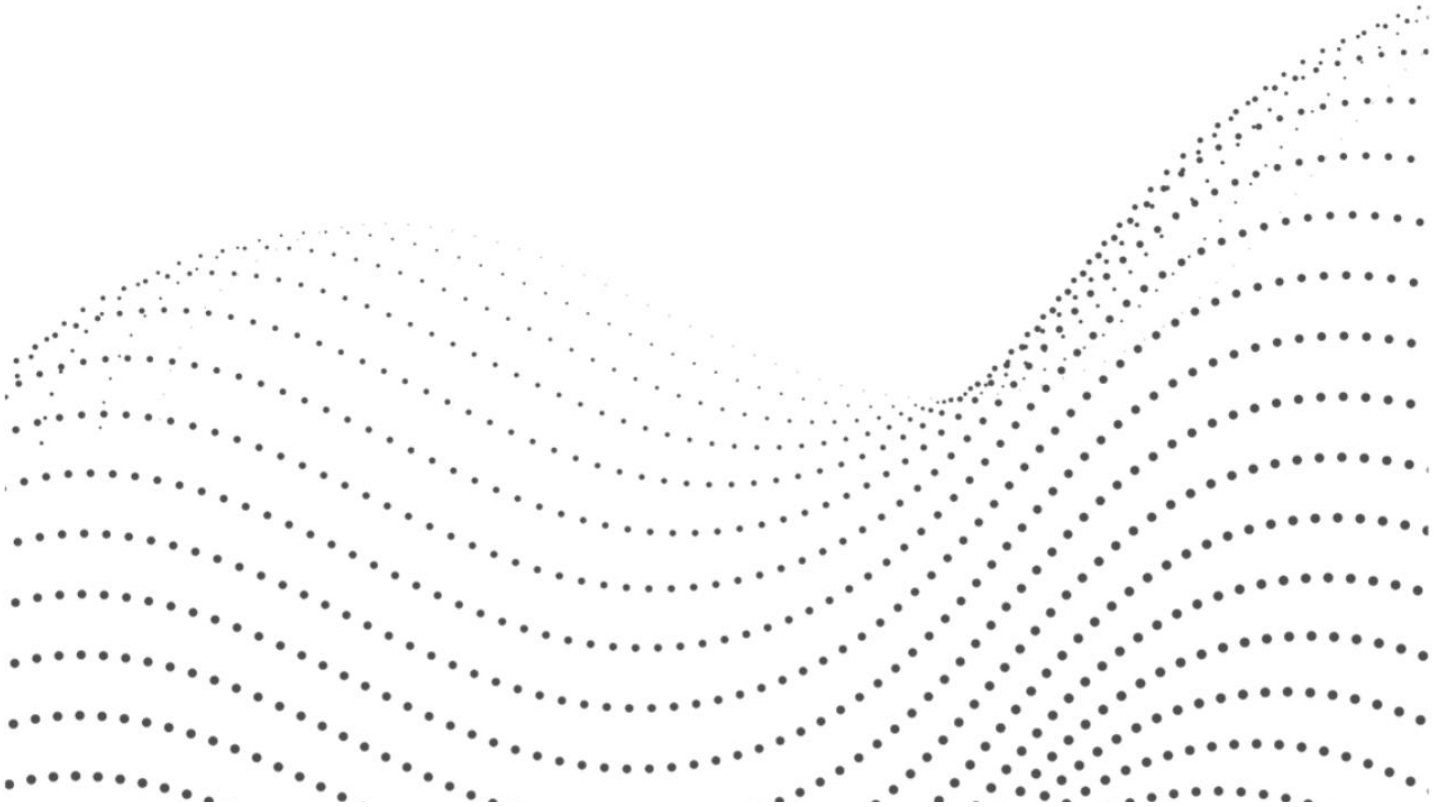

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