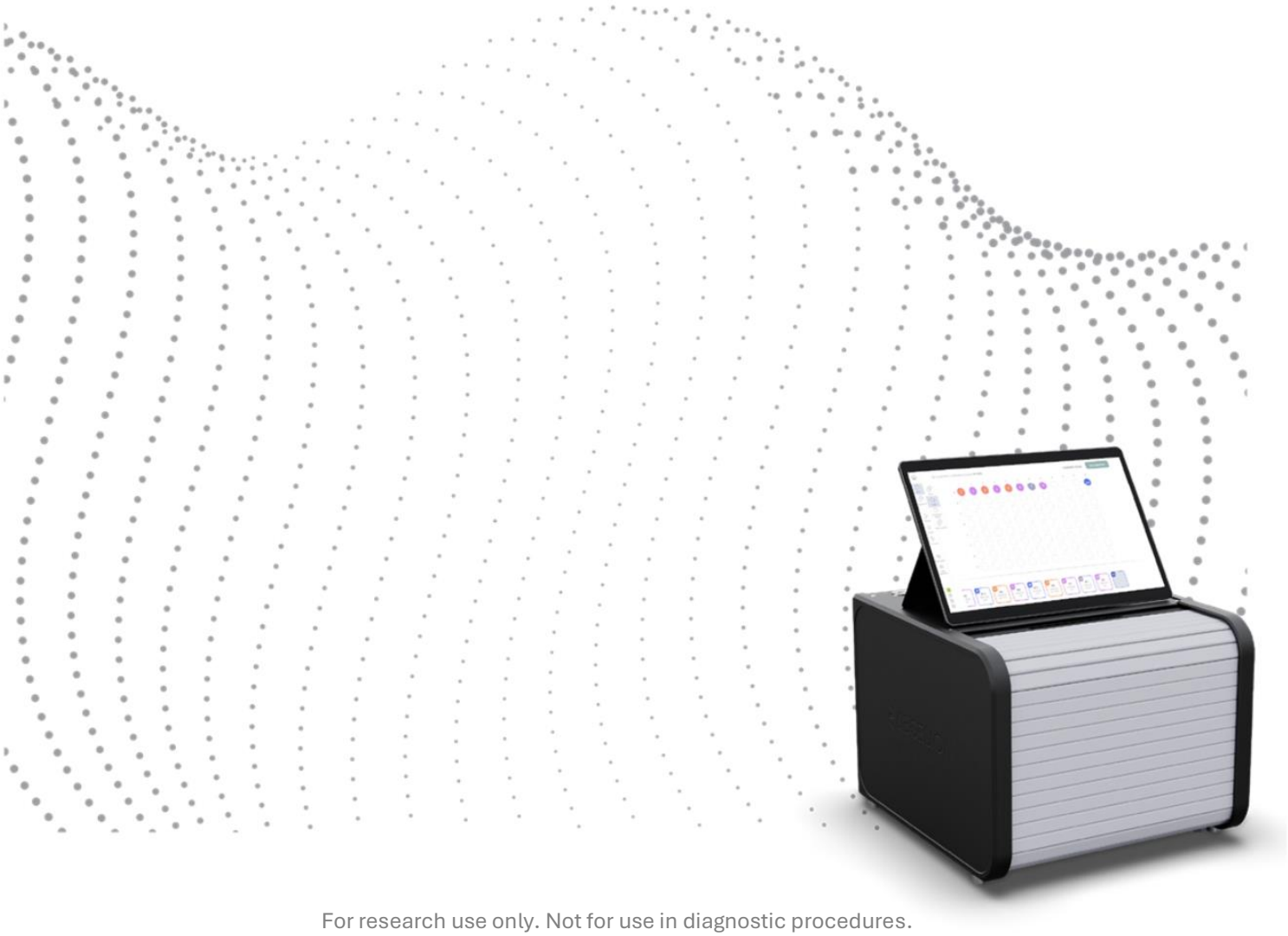
ABSELION™
PRECISION MADE PRACTICAL

SOFTWARE GUIDE

Software guide for experiment setup, assay execution, and result review with the Amperia™ system

VERSION 1.0
DATE OF ISSUE: 29 Aug. 2025



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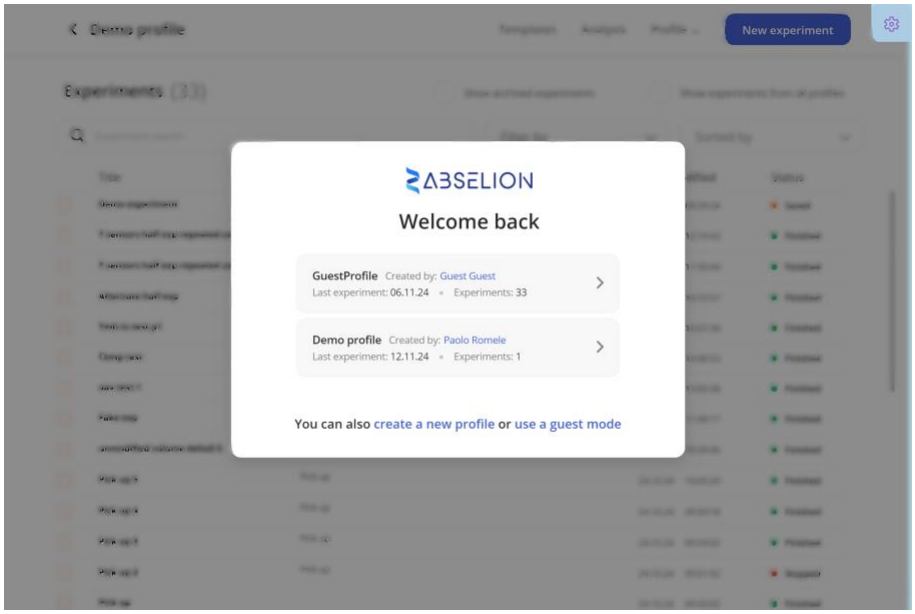
1 Introduction

This manual provides guidance on using the Amperia™ Software, which controls experiment setup, instrument operation, and data analysis through an intuitive touchscreen interface. It covers software functionality only; for hardware setup, sensor loading, or system maintenance, refer to the **Amperia™ User Manual**. Screenshots and figures throughout are representative examples and may differ slightly from actual layouts or results depending on system configuration and software version.

The software supports both template-based and custom workflows, offering flexibility for a wide range of applications.

Upon launching the software, users are presented with a welcome screen displaying all available profiles (**Figure 1.1**). A profile acts as a container for experiments and can be organised by user, project, or workflow.

Figure 1.1 Welcome screen displaying profile options on startup.



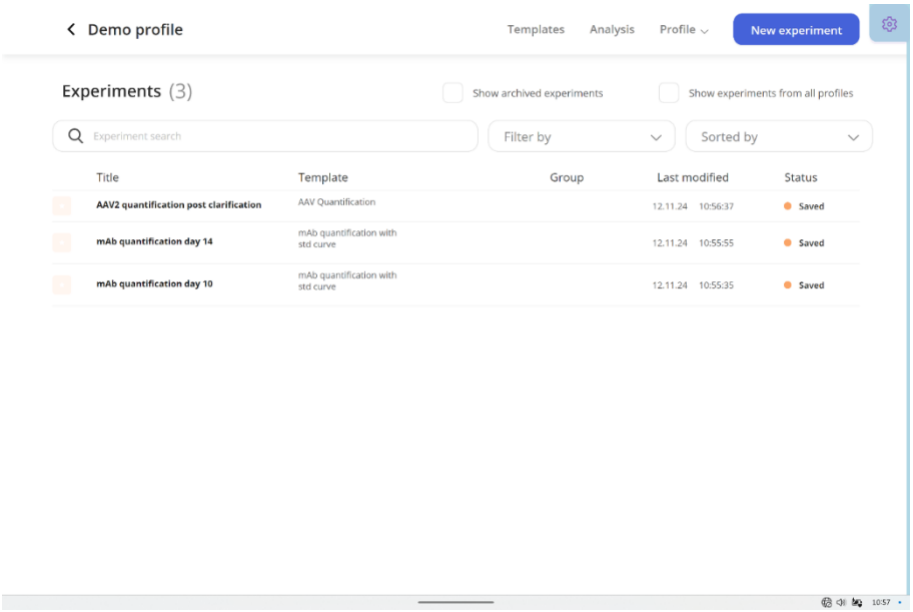
1.1 PROFILES AND EXPERIMENT OVERVIEW

After selecting a profile from the welcome screen, users are taken to the Experiment Overview screen (**Figure 1.2).** This interface lists all experiments associated with the selected profile, along with key details such as experiment name, creation date, status, and template origin.

Profiles help organise experiments by operator, project, or application. From the overview screen, users can:

- View experiment details
- Mark experiments as favourites using the star icon
- Duplicate or edit existing experiments
- Create a new experiment using a template or custom workflow

Figure 1.2. Experiment overview screen for a selected profile.



1.2 EXPERIMENT SETUP OPTIONS

There are two main ways to set up an experiment in Amperia: using a template or creating a custom workflow. Templates are ideal for routine or standardised assays, while the custom setup offers full control over parameters.

- **Template Experiments**
  Pre-defined templates provide a fast and reliable starting point for experiment setup. Templates can be reused or adapted to specific needs. Modifications made during setup do not alter the original template.
  *(See **Section 2** for more detailed instructions.)*

- **Custom Experiments**
  Users can define every aspect of the workflow, including plate layout, reagent types, sensor sequence, and timing. Custom experiments can also be saved as new templates for future use.
  *(See **Section 3** for more detailed instructions.)*

1.3 ANALYSIS OVERVIEW

Amperia includes built-in analysis functionality to support common quantification workflows. After an experiment is complete, users can generate standard curves, apply them to sample data, and visualise results directly on the touchscreen interface.

Analysis outputs can be displayed as plate layouts, bar charts, or line graphs. Results can be exported in multiple formats, including **.csv** (raw data), **.xlsx** (formatted tables), and **PDF** (summary views with charts and annotations).

*(See **Section 4** for more detailed instructions.)*

2 Running a Template Experiment

This section provides a step-by-step walkthrough for setting up and running an experiment using a pre-defined template. Templates are the quickest way to start standard experiments, with parameters that can be adjusted as needed without modifying the original template.

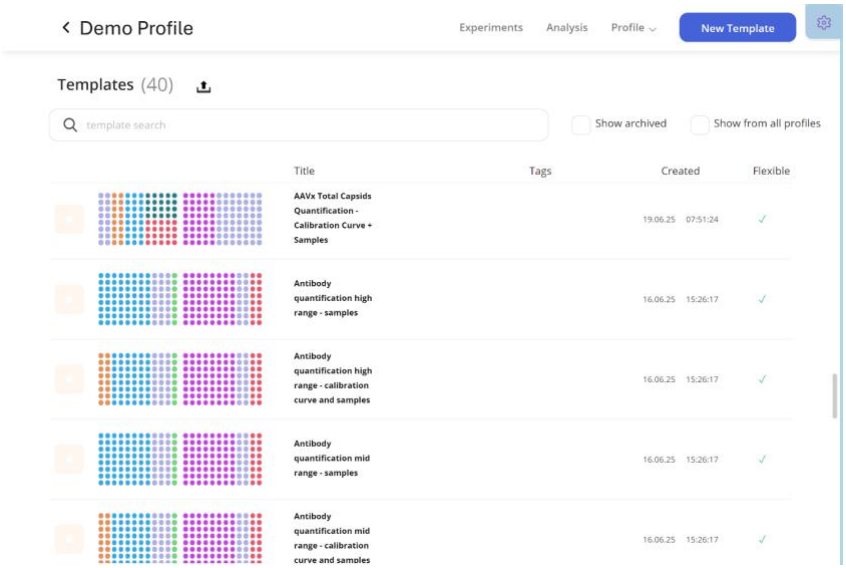
Step 1: Select a Template

Navigate to the **Templates** view to browse available experiment templates (**Figure 2.1**). These serve as starting points for commonly used workflows and can be modified **without** changing the original template.

Note:

- Templates are pre-installed and aligned to assay types such as AAV and antibody quantification, etc. Refer to the relevant assay kit documentation for further guidance.
- This guide uses the **AAV quantification template** as an example. For guidance on other assay types, refer to the relevant assay kit documentation.

Figure 2.1. Template selection view showing available experiment templates.

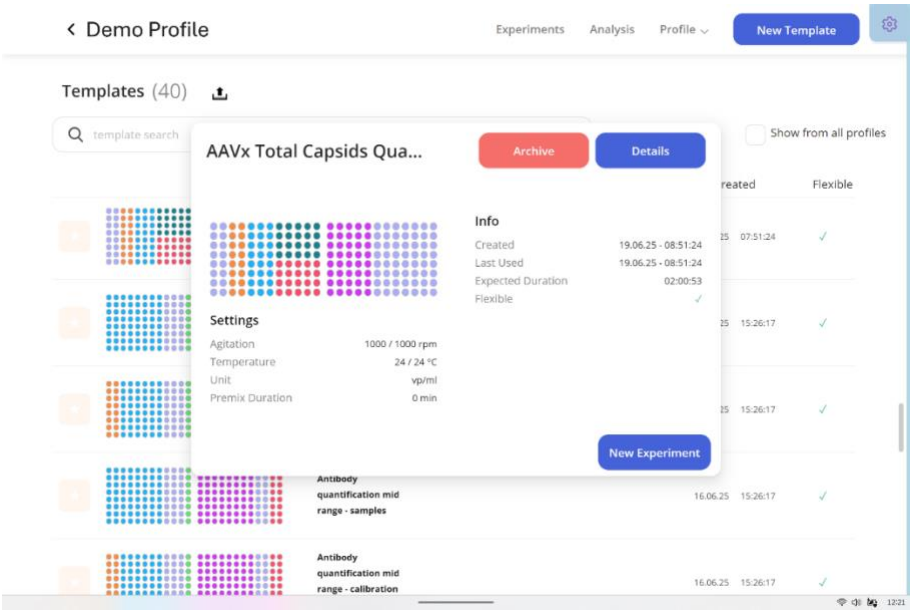


Step 2: Review Template Details

Select a template to view its associated parameters and layout. The template details screen displays information such as default plate configuration, reagent types, and the measurement sequence.

To proceed, tap **New Experiment** to begin setting up a run based on the selected template **(Figure 2.2).**

Figure 2.2. Template details view with option to start a new experiment.

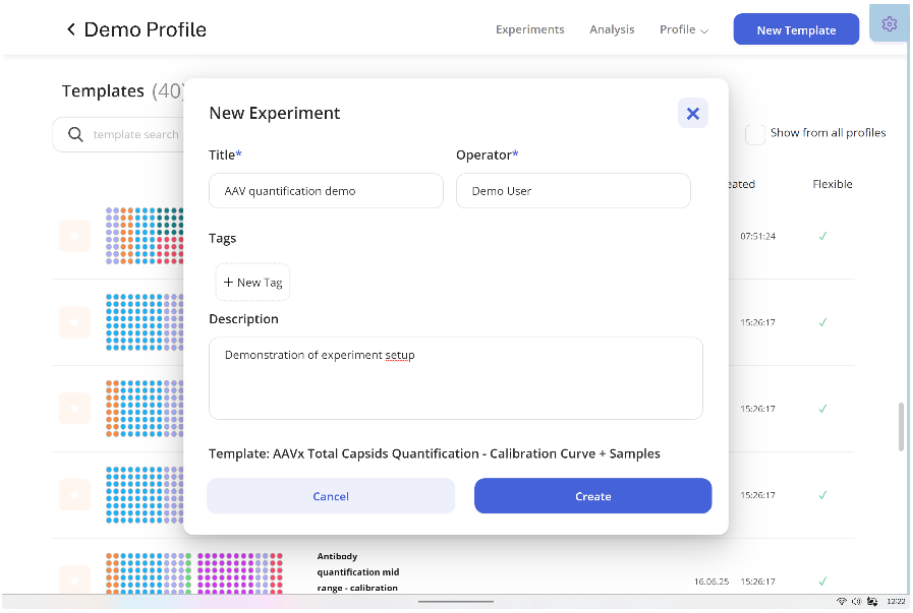


Step 3: Define Experiment Details

Enter the required details for the new experiment. Each experiment must have a **title** (which must be unique) and an **operator name**. An optional description can also be added to summarise the purpose or context of the run (**Figure 2.3**).

Once complete, tap **Create** to proceed.

Figure 2.3. Experiment setup screen for entering title, operator, and description.



Step 4: Confirm Experiment Setup

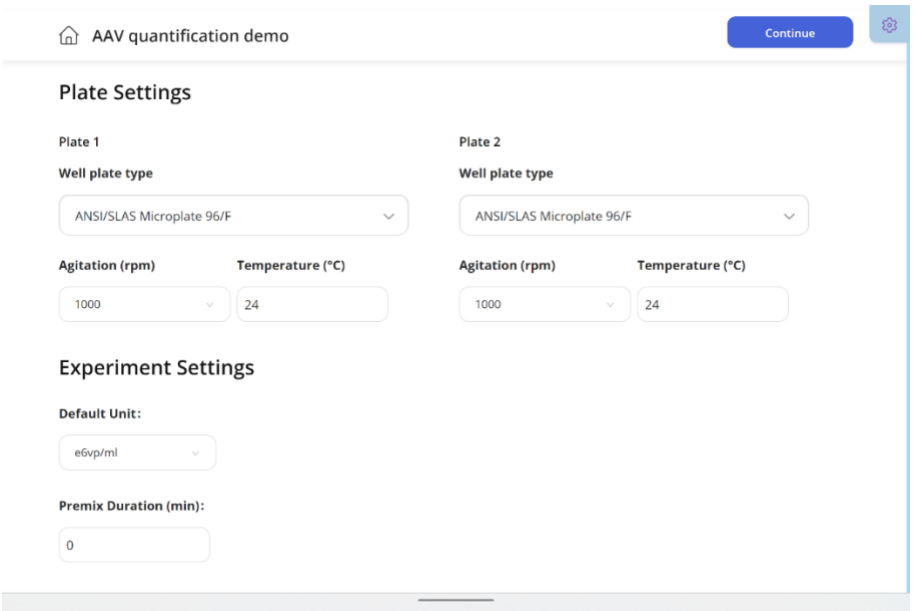
After creating the experiment, a summary screen appears showing the configured details. If no changes are needed, tap **Start Experiment** to proceed directly to the run **(Figure 2.4a**).

To adjust parameters such as temperature or agitation speed, tap **Timeline,** then **Sequence**, and select the settings icon to access experiment settings (**Figure 2.4b**). Once setup is complete, tap **Continue** to proceed to the next step.

Note: Agitation speed and temperature can be set independently for each plate.

Figure 2.4a. Summary screen showing experiment setup with option to start the run.

Figure 2.4b Experiment settings screen for adjusting temperature and agitation.



Step 5: Review Plate Layout

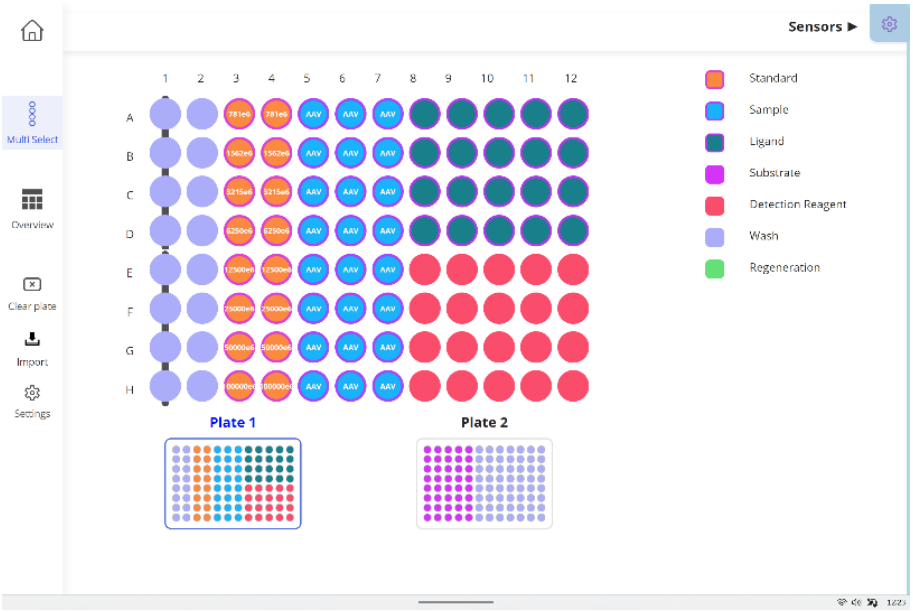
The plate view displays the layout of the well plate for the experiment. The numbers shown in the wells represent default concentrations for calibrators, based on the selected template.

Units (vp/mL or µg/mL) are pre-set by the template according to the assay type.

To edit a well, tap its position on the plate. Activate **Multi Select** to edit groups of four wells simultaneously or deactivate it to select individual wells (**Figure 2.5**).

Once the layout is complete, select **Sensors** to continue.

Figure 2.5. Plate layout view showing editable well fields.



Step 6: Define Sensor Positions

The sensor view is used to assign starting positions for the sensor strips required in the experiment. Each sensor strip contains four probes, and the number of strips depends on the assay.

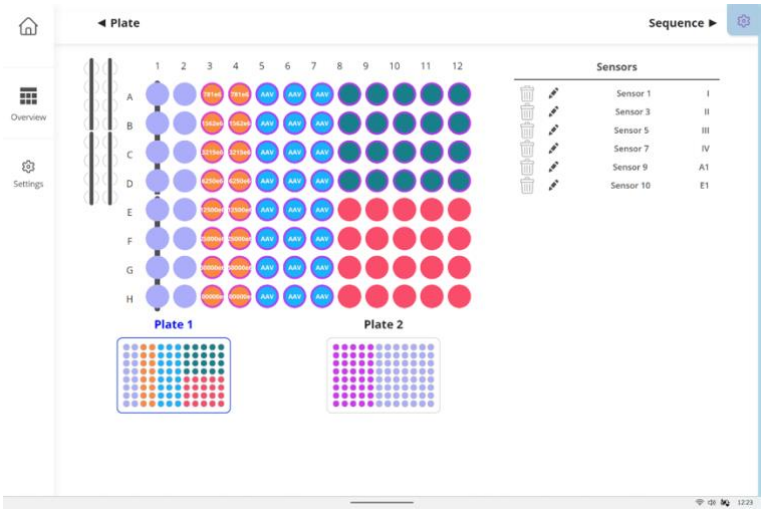
Sensor strips can be added by tapping on the wells chosen as starting positions. Assigned strips appear in the list on the right-hand side of the screen.

The assay setup for each run uses two plates: **Plate 1** (left position) and **Plate 2** (right position). Use the buttons at the bottom of the screen to switch between them (**Figure 2.6**).

Note: Recommended sensor positions are provided in the relevant assay kit documentation. For instructions on how to physically load or remove sensor strips, refer to the **Amperia™ User Manual**.

Once all sensor strips are assigned, select **Sequence** to continue.

Figure 2.6. Sensor view showing assigned starting positions and plate navigation.

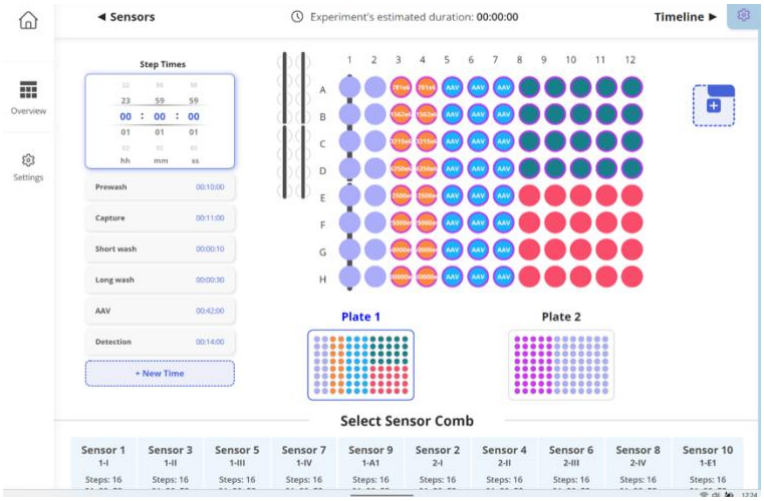


Step 7: Review Sequence Setup

The sequence view defines the order and timing of each step in the experiment, indicating which wells each sensor strip visits and for how long (**Figure 2.7**).

For template-based experiments, a default sequence is typically provided. If no changes are required, select **Timeline** to continue.

Figure 2.7. Sequence view showing time-based steps assigned to sensor strips.

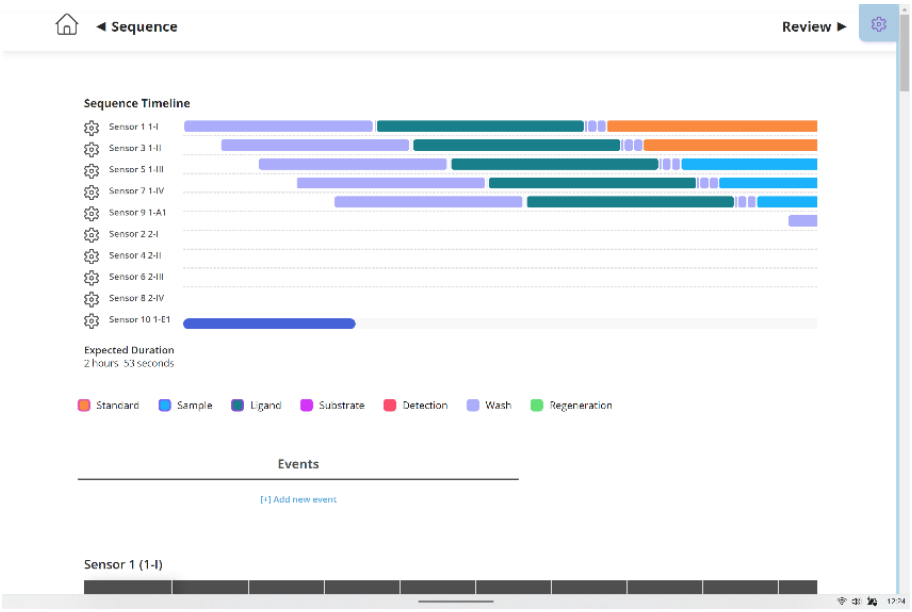


Step 8: Review Timeline View

The timeline view provides a visual overview of the sequence for each sensor strip, including the timing and order of movements (**Figure 2.8**).

For template experiments, the timeline is typically pre-configured. If no changes are needed, select **Review** to continue.

Figure 2.8. Timeline view showing pre-configured sensor sequence.



Step 9: Review and Start Experiment

The review page (**Figure 2.9a**) summarises all settings for the experiment, including plate layout, sensor positions, and sequence.

If everything is correct, tap **Start Experiment**. A confirmation pop-up will appear showing the total number of steps and overall timing (**Figure 2.9b**). Tap **Start** in the pop-up to begin the run.

Figure 2.9a. Review screen summarising experiment setup.

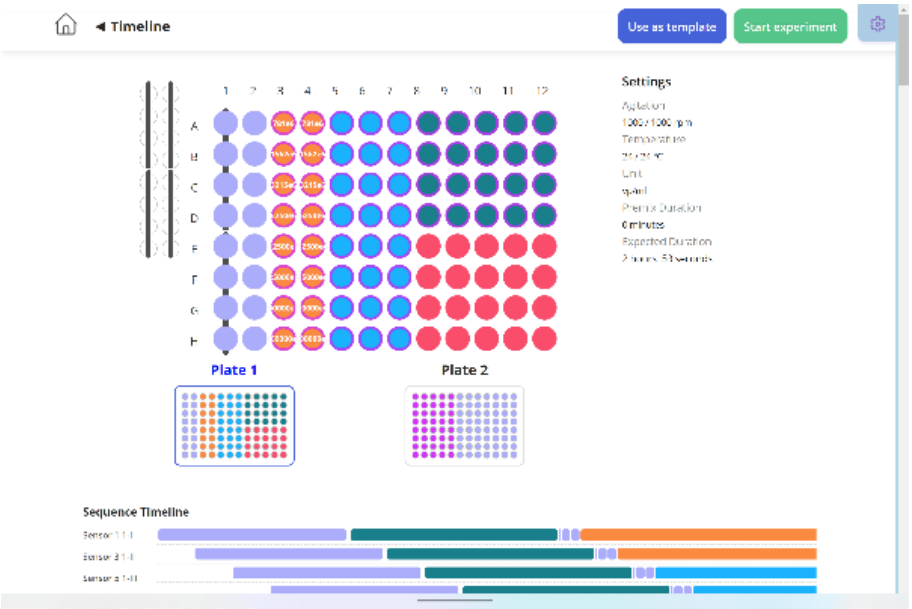
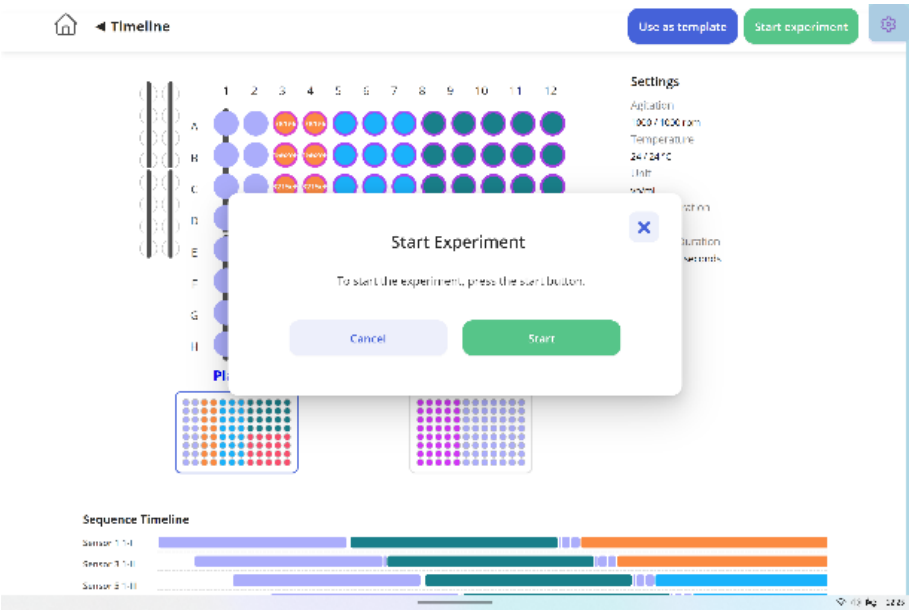


Figure 2.9b. Pop-up confirmation with final start button.



Step 10: Load Plate and Sensor Strips

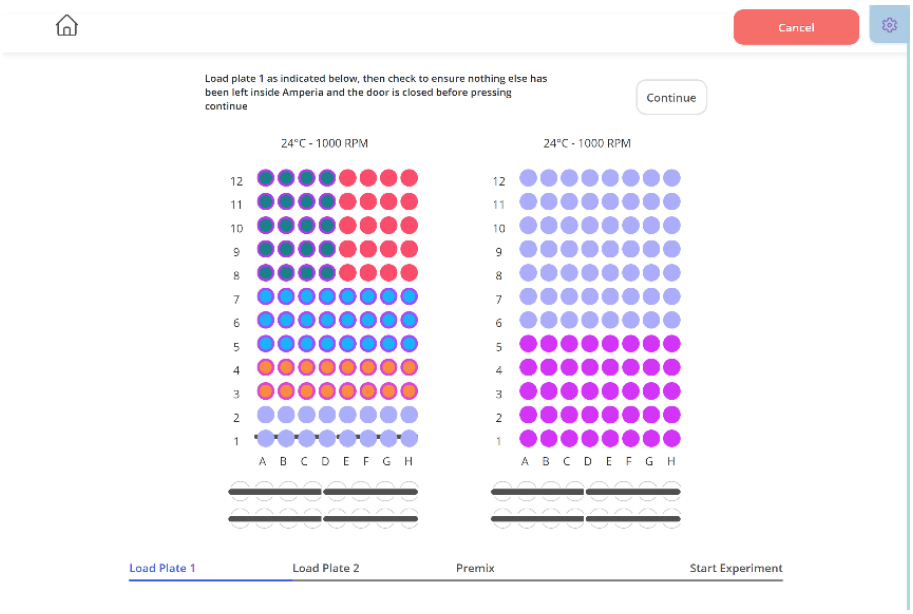
At this stage, the software prompts the user to load the well plates and insert the sensor strips (**Figure 2.10**).

Open the instrument door and load **Plate 1 (left position)**. Place the corresponding sensor rack over the plate and insert the sensor strips.

Select **Continue**, then load **Plate 2 (right position)** with its sensor rack and strips.

Once both plates are loaded, close the door and tap **Start**. The experiment will begin once the set temperature is reached.

Figure 2.10. Loading plates and sensor strips before experiment start.

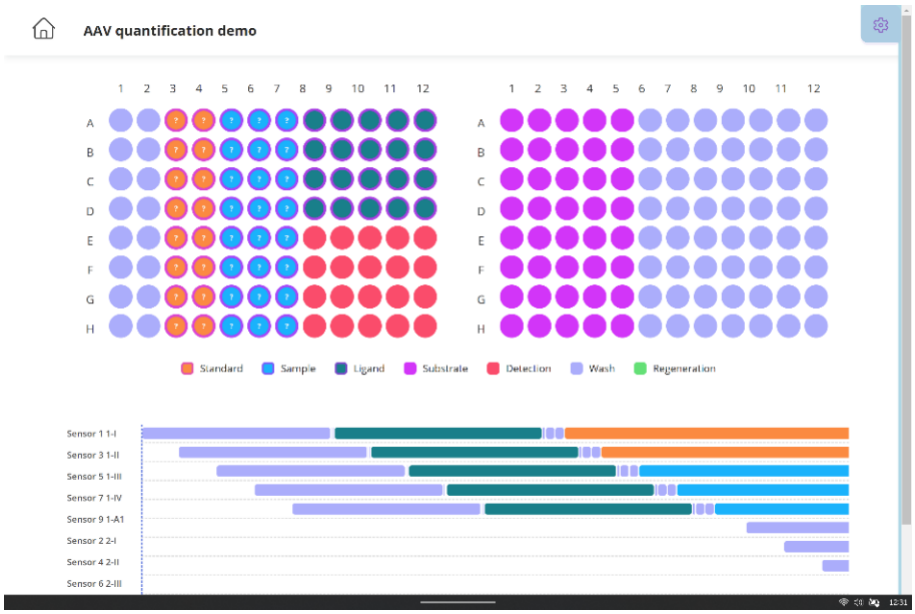


Step 11: Experiment in Progress

Once the experiment begins, the screen displays the current step and a countdown showing the time remaining. The overall experiment status is also visible at the bottom of the screen (**Figure 2.11**).

The experiment can be stopped at any time by tapping the red **Stop** button on the right-hand side.

Figure 2.11. Experiment progress view with current step and timing indicators.



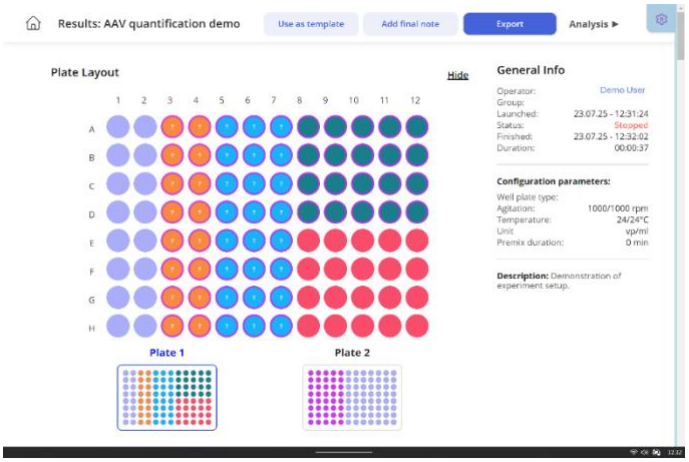
Step 12: View and Export Results

After the experiment completes, the results view is displayed. This includes the measured signal values shown in the plate layout (**Figure 2.12**).

If the experiment included calibrators, data can be analysed directly within the software using the built-in tools (See **Section 4 Data Analysis**).

To export the signal values, tap **Export**.

Figure 2.12. Results view showing measured signals in the plate layout.



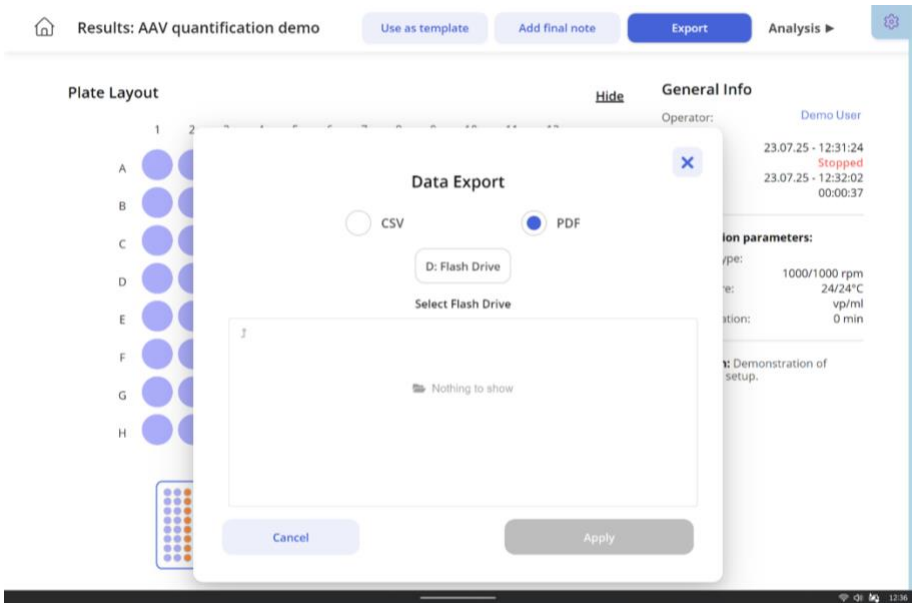
Step 13 – Choose Export Format

After selecting **Export**, choose the preferred file format (**Figure 2.13**). Results can be exported as:

- **.csv** – raw data as numerical values
- **PDF** – results summary with visual charts

Insert a USB stick into the port on the side of the touchscreen. Once detected, select the USB drive, then tap **Apply** to complete the export.

Figure 2.13. Export menu showing file format options and USB selection.



3 Running a Custom Experiment

Custom experiments allow users to define all parameters from scratch, including plate layout, sensor assignment, and sequence. This section highlights only the steps that differ from the template workflow.

Note: For most applications, especially when using Amperia™ assay kits, we recommend starting with a template. The custom setup is intended for advanced or specialised workflows that fall outside standard kit configurations.

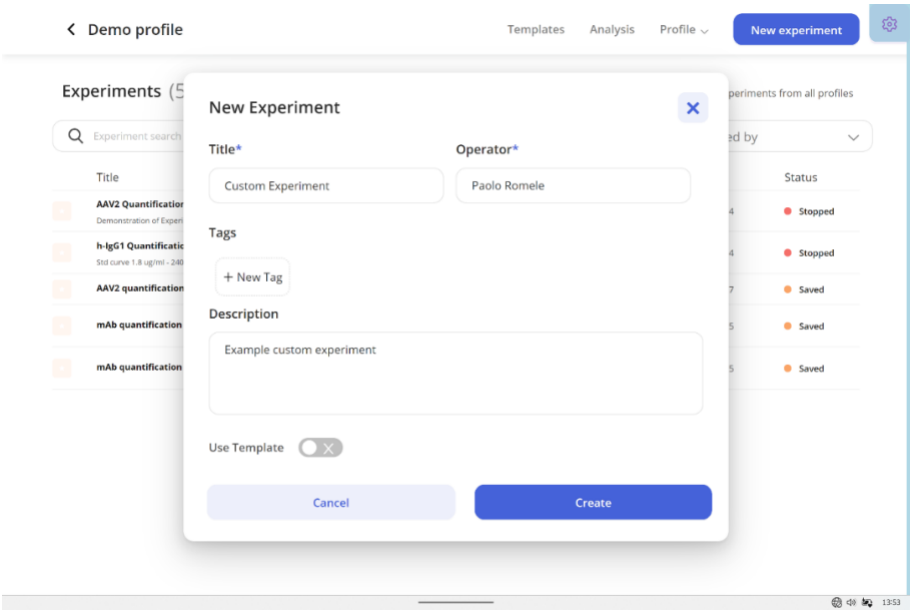
Step 1: Start a Custom Experiment

From the experiment overview screen, tap **New Experiment**. Enter a **title**, **operator name**, and an optional **description** (**Figure 3.1**).

To create a fully custom experiment, deactivate the “Use Template” toggle before proceeding.

Tap Create to continue.

Figure 3.1. Starting a new experiment without using a template.



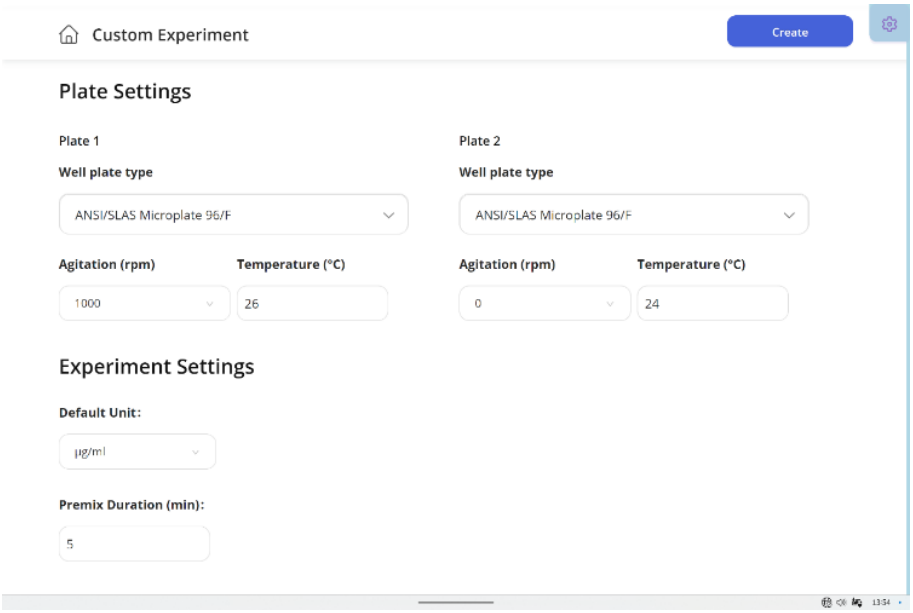
Step 2 – Define Experiment Settings

In the settings view, define key parameters for each plate (**Figure 3.2**), including:

- Plate type
- Agitation speed
- Temperature
- Default units (e.g., µg/mL or vp/mL)
- Premix duration (if required)

Plate type, Agitation speed and **temperature** can be configured independently for each plate.

Figure 3.2. Experiment settings screen for defining plate parameters.

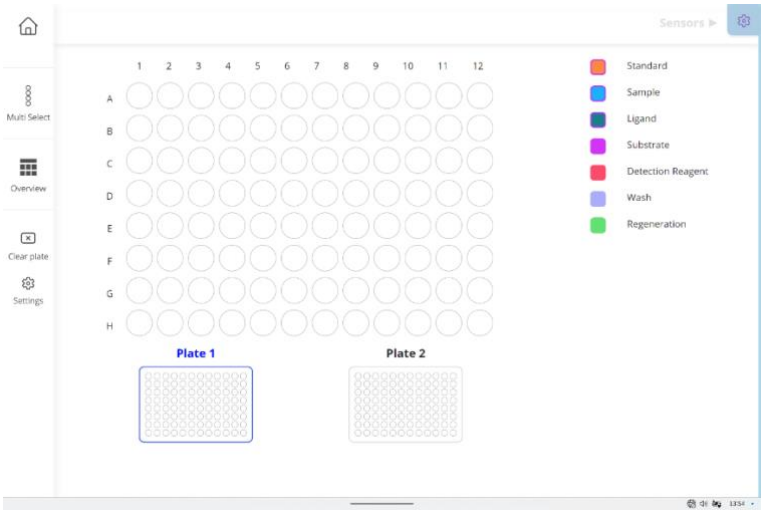


Step 3: Define Plate Layout

In the plate view, tap wells to assign the **reagent type** (e.g., sample, substrate, standard), see **Figure 3.3**.
This defines the function of each well in the experiment.

Use **Multi Select** to assign types to groups of four wells simultaneously or deactivate it for individual selection.

Figure 3.3. Plate view for assigning reagent types to each well.



Step 4: Assign Reagents to Plate

Once reagent types are assigned, tap each well to enter further details, such as:

- Reagent name or description
- Concentration (for standards)
- Units (e.g., µg/mL, vp/mL)

After filling in the details (**Figure 3.4a**), tap **Apply** to confirm.
Once all wells are assigned and filled in (**Figure 3.4b**), tap **Sensors** to continue.

Figure 3.4a. Reagent detail entry view for naming, concentration, and unit selection.

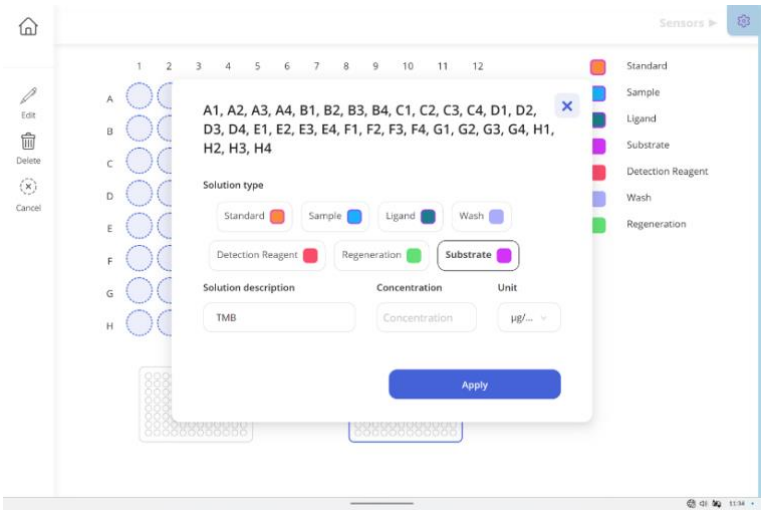
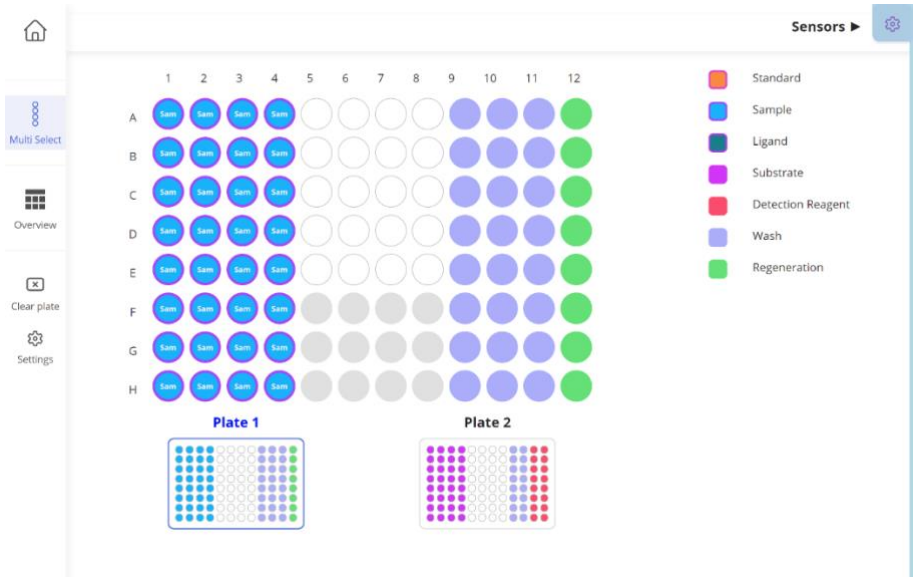


Figure 3.4b Completed plate layout showing final well assignments



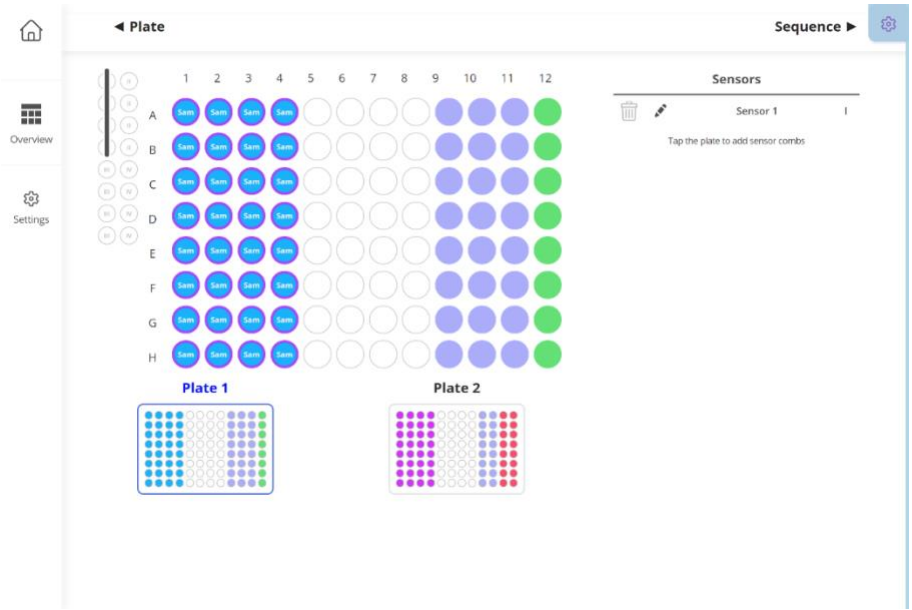
Step 5: Assign Sensor Strips

In the sensor view, tap on the wells that will serve as starting positions to assign each sensor strip.

Each strip contains four probes. Assigned strips appear in the list on the right-hand side under the corresponding plate (**Figure 3.5**).

Note: The assay setup uses two plates: **Plate 1 (left position)** and **Plate 2 (right position)**. Recommended starting positions are provided in the relevant assay kit manual documentation. For physical handling, refer to the **Amperia™ User Manual**.

Figure 3.5. Sensor view showing assigned starting positions for sensor strips.



Step 6: Define Measurement Sequence

The measurement sequence, including the timing and order of steps, is defined in the sequence view

Each step is created by selecting a **time-card** — a reusable block that specifies how long the sensor should remain in a given well.
To define a step:

1. Select or create a time-card (e.g., “Sensor Priming”, “Regeneration”)
2. Tap the wells the strip should visit during that time

Using time-cards allows the same duration to be reused across multiple steps. If timing needs to be adjusted later, editing the time-card will automatically update all associated steps.

Each sensor strip must have its own complete sequence. Steps appear as **step-cards** at the bottom of the screen and can be reordered or deleted.

Figure 3.6a shows the overall sequence view; **Figure 3.6b** illustrates an example where a sensor strip is assigned to wells for a 10-minute “Sensor Priming” step.

Figure 3.6a. Sequence view with time-cards and step assignment.

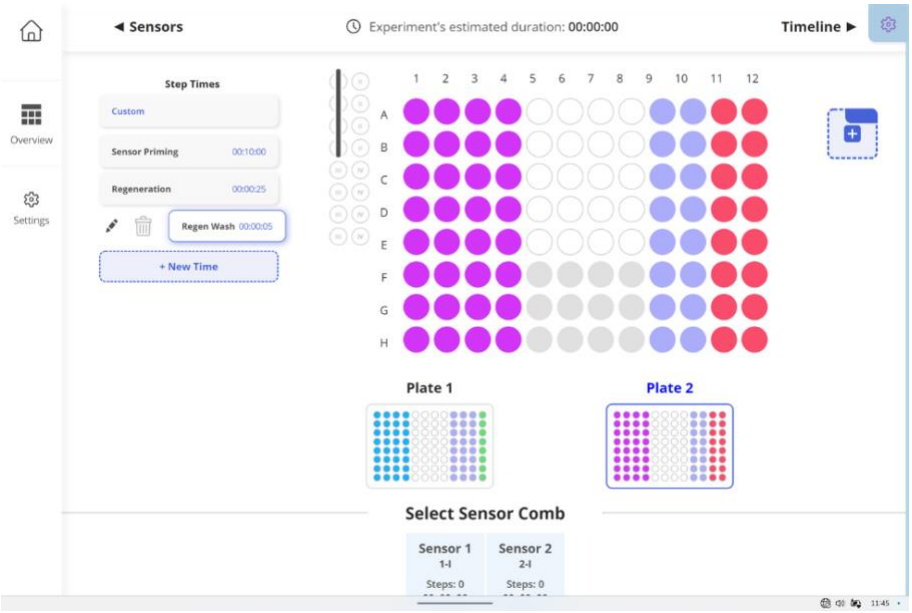
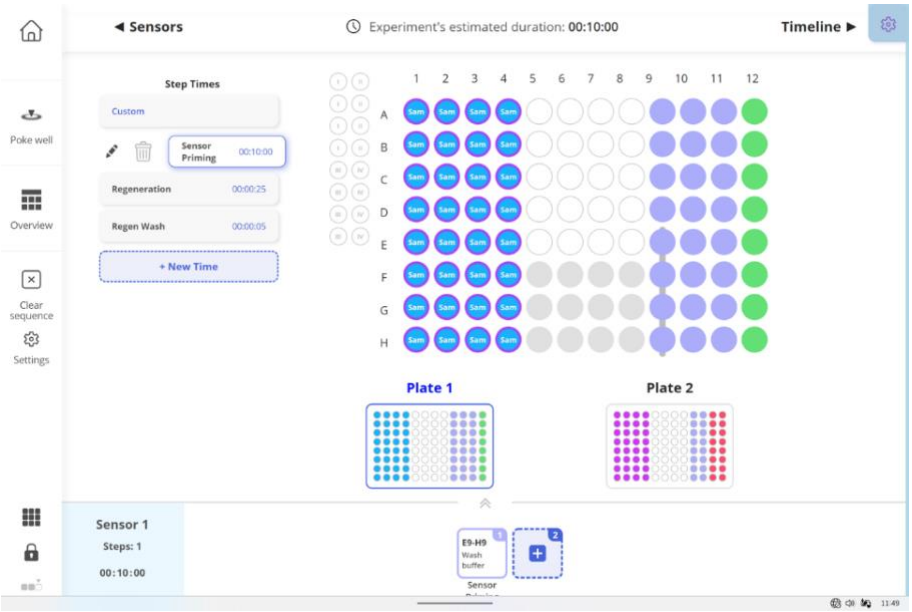


Figure 3.6b. Example of sensor priming step assigned using a 10-minute time-card.



Step 7: Build Sub-Sequences (Optional)

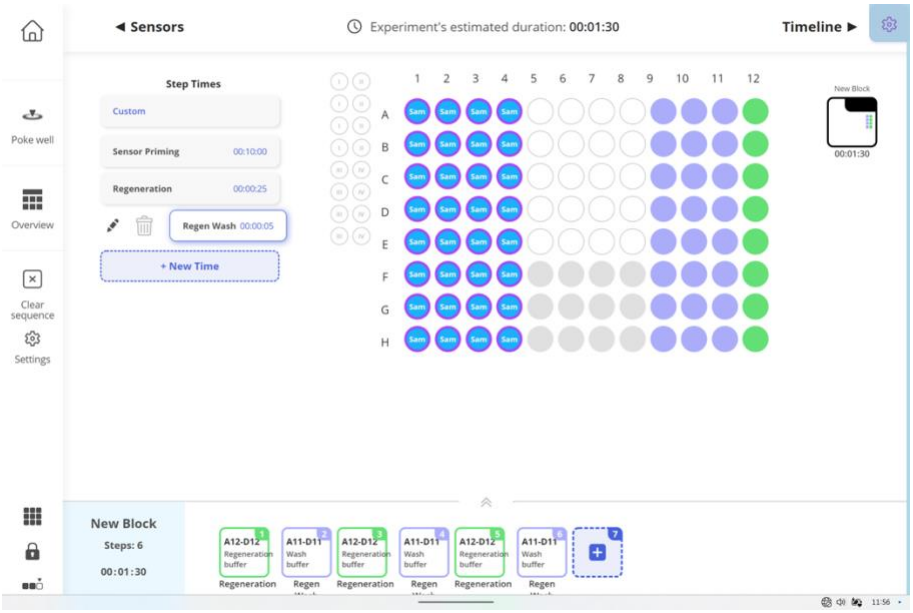
Sub-sequences are reusable blocks of steps that can be inserted into a sensor's measurement sequence. This is useful for repeated routines, such as regeneration cycles.

To create a sub-sequence:

1. From the main sequence view, tap the **+ block** icon (top right)
2. Add steps as you would normally (select a time-card, then wells)
3. When finished, tap the green tick and assign a name (e.g., "Regen")

The saved sub-sequence can then be inserted into the sequence for any sensor strip (**Figure 3.7).**

Figure 3.7. Sub-sequence block view for defining and saving repeated step groups.

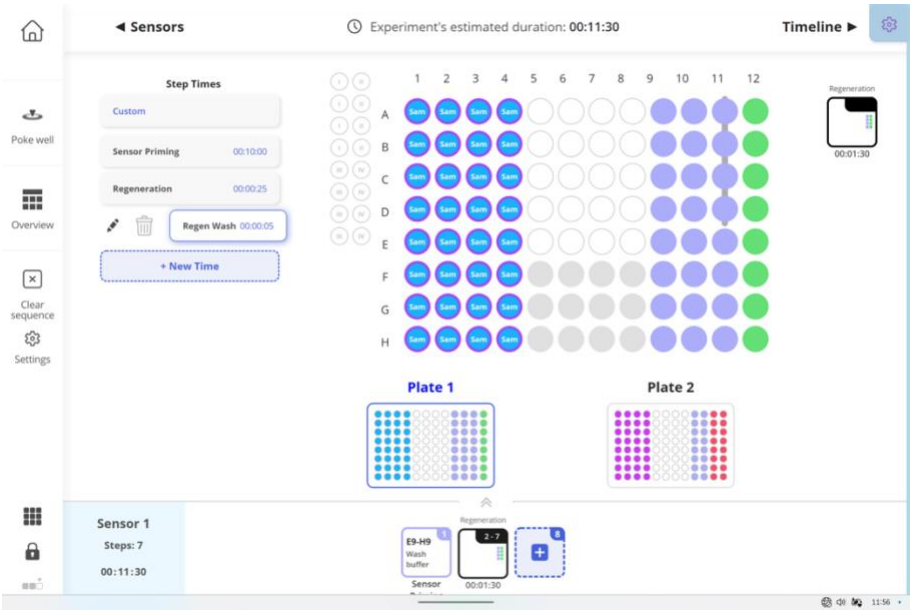


Step 8: Add Sub-Sequences to Sensor Strips (Optional)

Once a sub-sequence block is created, it can be added to the sequence for any sensor strip.

To do this, select the strip, then tap the saved block to insert it into the timeline. The sequence will now include both individual steps and sub-sequence blocks (**Figure 3.8**).

Figure 3.8. Adding a saved sub-sequence block to a sensor strip's sequence.



Step 9: Review Timeline View

The timeline view shows a schematic of the full experiment, with each sensor strip represented as a sequence of steps over time (**Figure 3.9a**).

Delays can be manually added to individual strips to avoid overlapping movements (**Figure 3.9b**). To ensure a smooth execution without conflicts between operations on different strips, please allow at least 60s between sequence transitions on different strips.

To apply a delay:

1. Tap the **settings icon** next to a sensor strip
2. Select the desired delay time
3. Tap **Set Offset** to confirm

Figure 3.9a. Timeline view showing full sensor strip sequences.

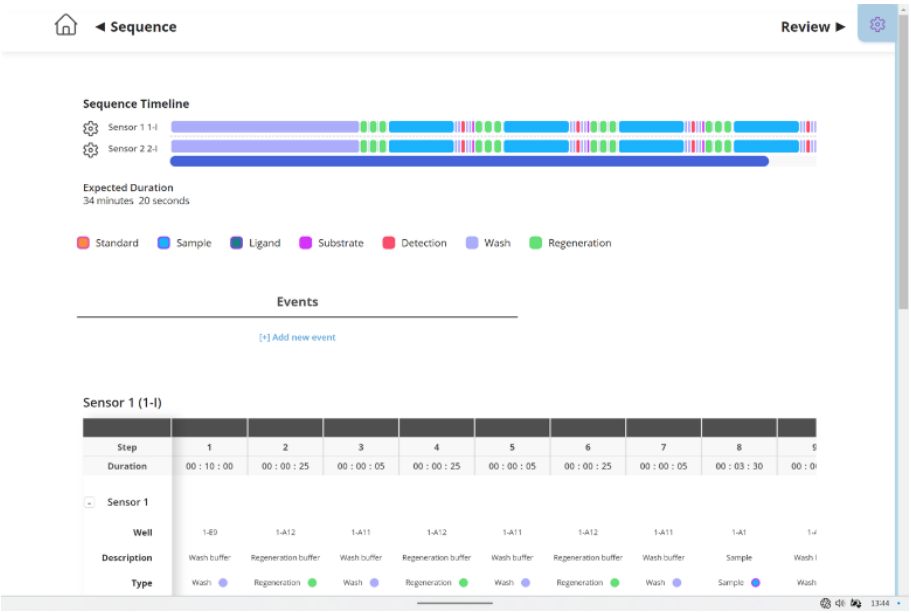
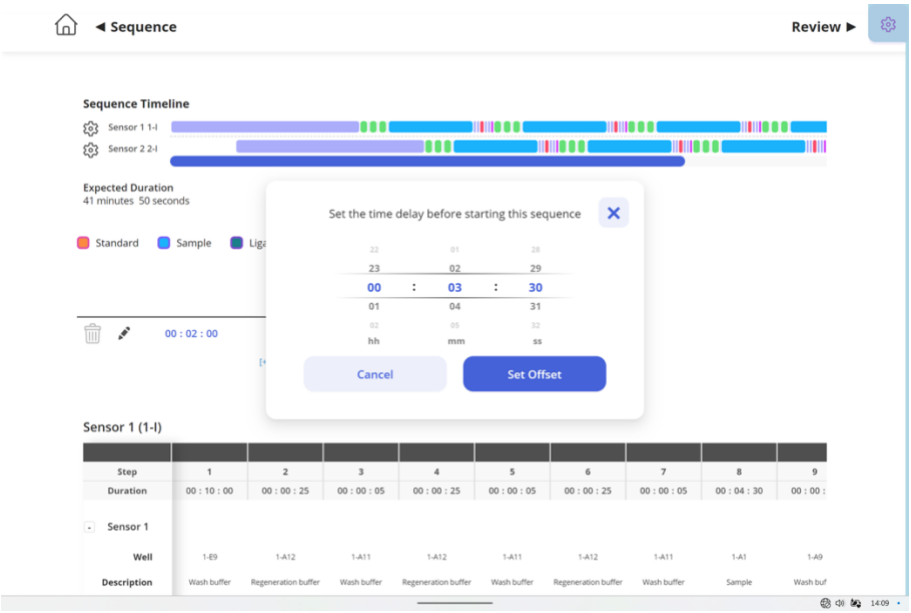


Figure 3.9b. Offset settings used to apply delays between sensors.



Step 10: Change agitation speed (Optional)

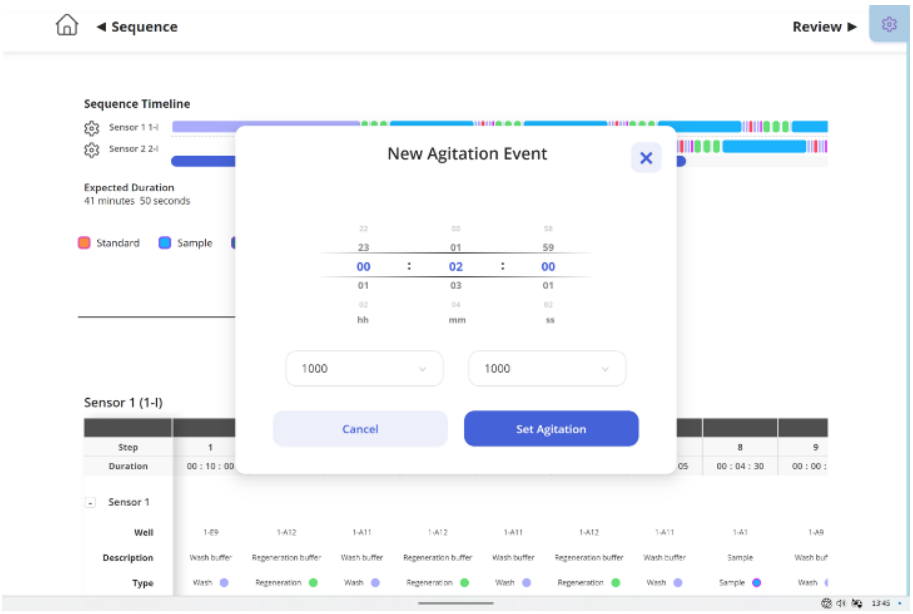
Agitation speed can be adjusted at specific timepoints during the experiment using the event scheduler in the timeline view (**Figure 3.10).**

To define an agitation event:

- Tap Add new event
- Set the time relative to the start of the run
- Choose agitation speeds for Plate 1 (left) and Plate 2 (right)
- Tap Set Agitation to confirm

This feature can be useful in workflows that require different mixing intensities at different stages.

Figure 3.10. Agitation event setup screen with plate-specific speed settings.



Step 11: Finalise and Start or Save

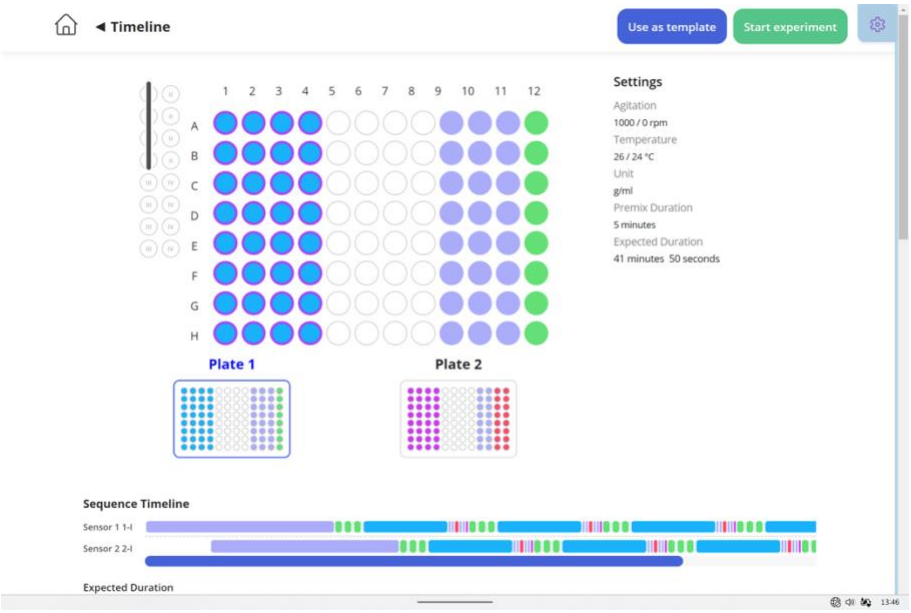
Once the sequence and timeline are complete, tap **Review** to access the final experiment summary (**Figure 3.11**).

From the review screen, you can choose to:

- Tap **Start Experiment** to begin the run
- Tap **Use as Template** to save the setup for future use

When saving as a template, you'll be prompted to name it and choose whether it can be modified when reused.

Figure 3.11. Final overview screen with options to start the run or save the setup as a template.



4 Data Analysis

The built-in analysis software of Amperia allows quick generation of standard curves, quantification of samples, and visualisation of results. Data can be exported for further use or reporting.

Note: Figures shown in this section are representative examples and may differ from actual experimental data or screen layouts.
For assay-specific analysis guidance, such as calibrator placement, concentration ranges, or tag conventions, please refer to the relevant assay kit documentation.

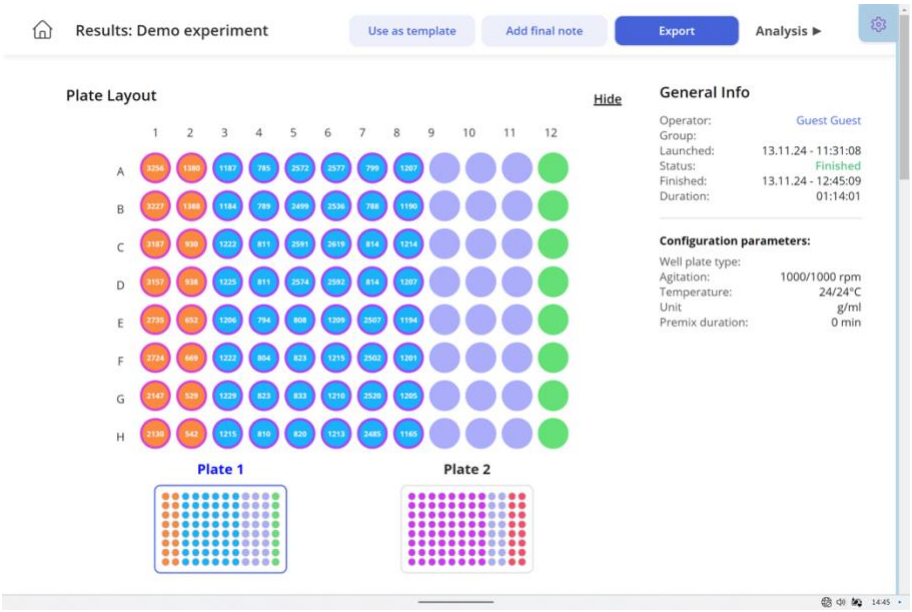
Step 1: Start a New Analysis

From the results view, tap Analysis to enter the analysis workspace **(Figure 4.1**).

A list of previous analyses (if any) is shown. Tap **New Analysis** to begin.

Enter a **title** and **operator name**, then tap **Create** to start the analysis session.

Figure 4.1. Starting a new analysis from the results view.



Step 2: Generate a Standard Curve

After creating a new analysis, the full dataset is shown in the analysis workspace (**Figure 4.2a**).

If standards are present, they can be used to generate a calibration curve.

Tap **New Chart**, then select **Generate Standard Curve**.
The software will automatically apply a 5-parameter sigmoidal fit to the data (**Figure 4.2b**), following best practices for calibration curve modelling in ligand-binding assays, as described by Azadeh et al. (2018) https://doi.org/10.1208/s12248-017-0159-4.

Figure 4.2a. Analysis workspace showing available data and option to generate new charts.

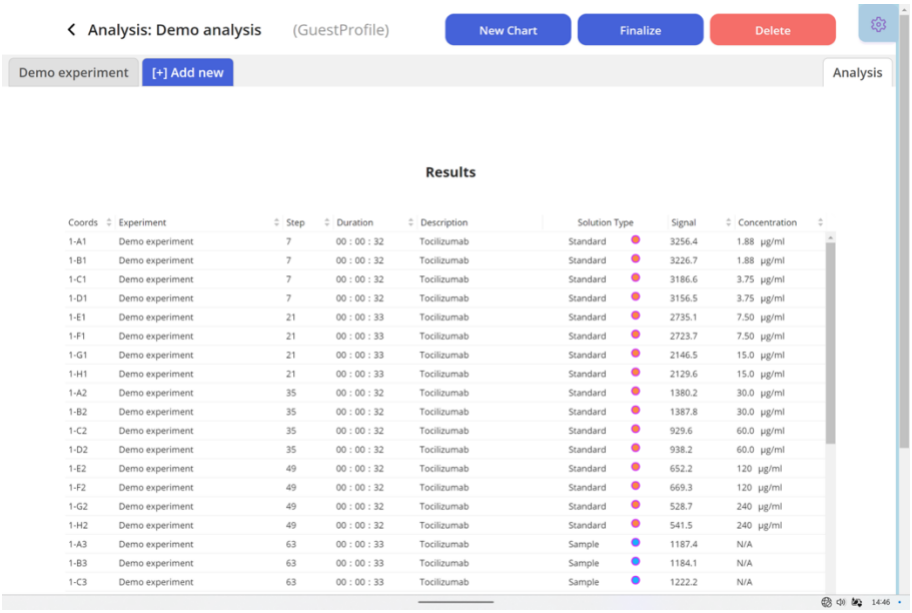


Figure 4.2b. Automatically generated standard curve using included calibrators.

Step 3: Edit the Standard Curve (Optional)

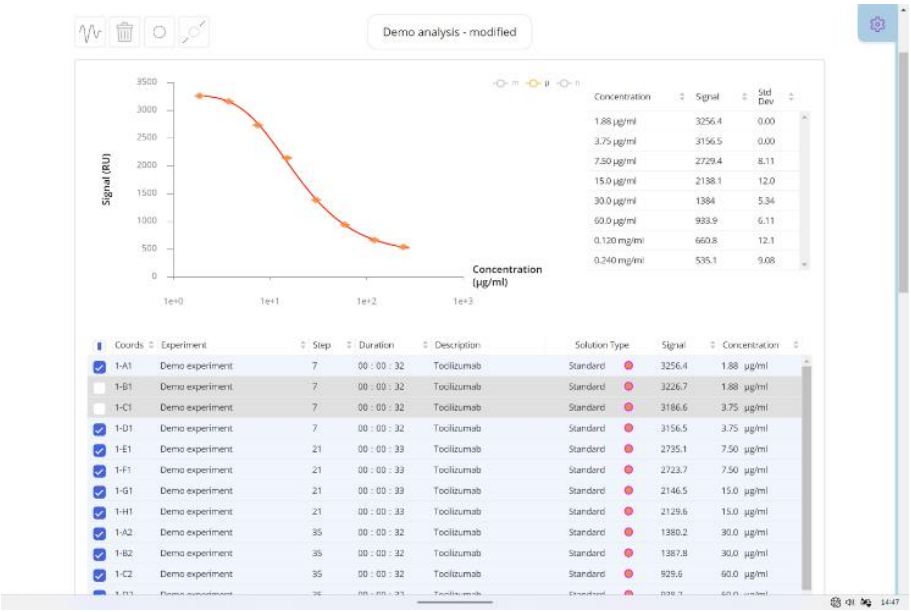
To adjust the standard curve, tap the **pen icon** in the top-left corner of the chart (**Figure 4.3**).

This opens the edit view, where you can:

- Deselect specific data points (e.g., outliers)
- Rename the chart for clarity

Once editing is complete, tap the **wave icon** to apply changes and return to the main view.

Figure 4.3. Editing a standard curve by deselecting data points and renaming the graph.



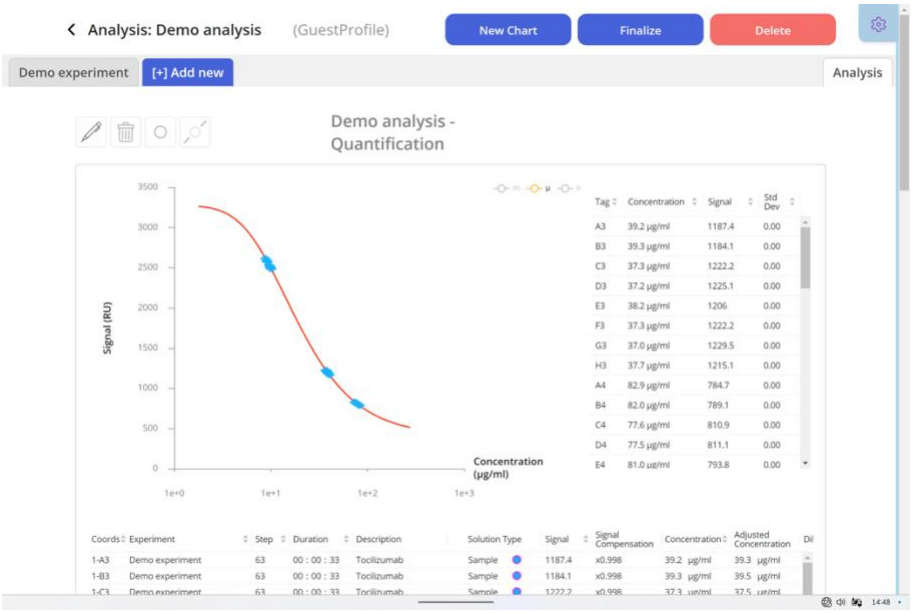
Step 4: Quantify Sample

To quantify samples using the standard curve:

1. Tap **New Chart**
2. Select **Quantify**
3. Choose the standard curve to apply (tap the chart to select it)

If multiple curves are available, select the appropriate one. The software will calculate concentrations for all wells labelled as “Sample” based on the selected curve (**Figure 4.4**).

Figure 4.4. Sample quantification view using a selected standard curve.



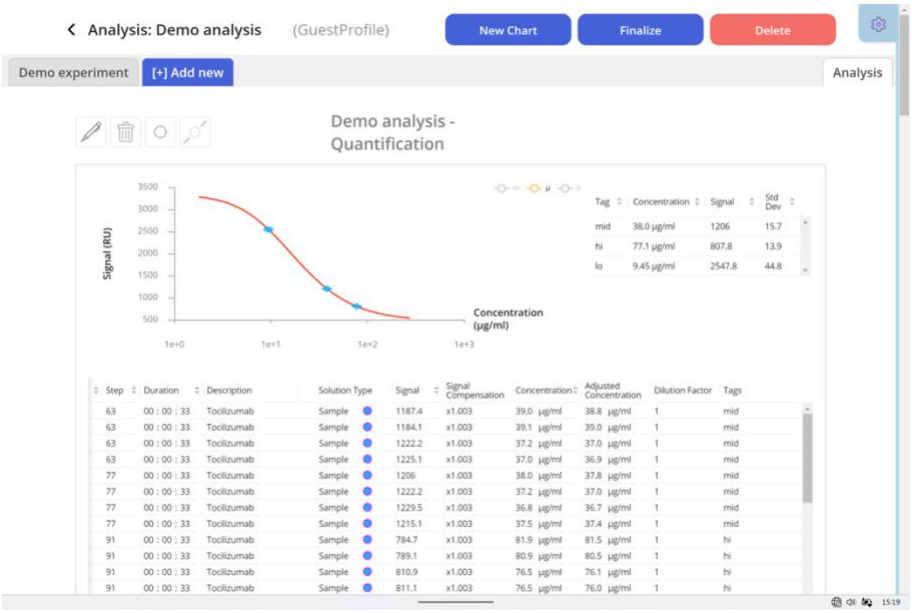
Step 5: Group and Tag Samples (Optional)

To group replicates or compare sample categories, you can assign tags to individual wells (**Figure 4.5**).

- Tap the **pen icon** to enter edit mode
- In the **Tags** column, enter a label for each sample (e.g., “lo”, “mid”, “hi”)
- Tap the **wave icon** to apply changes

The chart will automatically update to show grouped values and summary statistics.

Figure 4.5. Editing the chart to group samples by tag and display aggregate values.



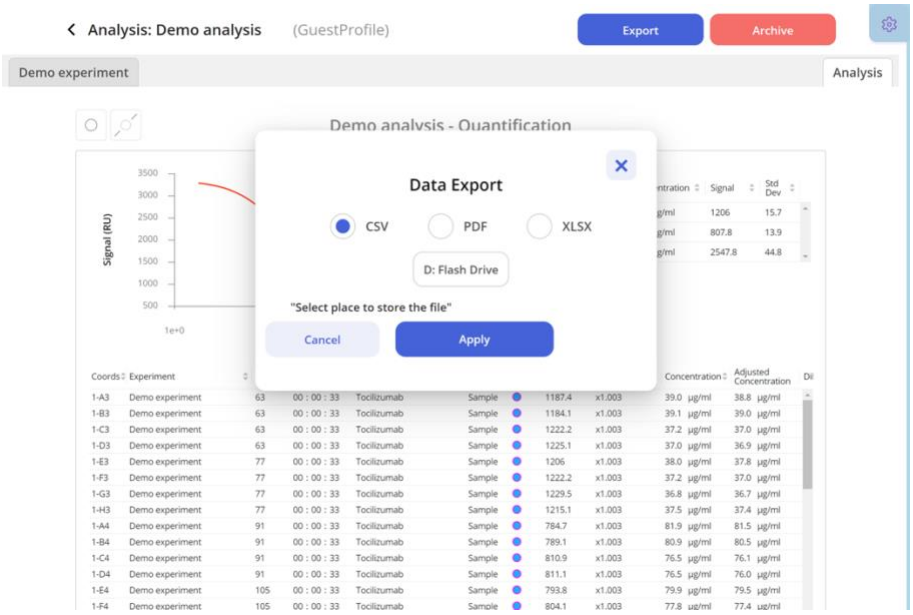
Step 6: Export Analysis Results

Once analysis is complete, results can be exported in multiple formats **(Figure 4.6)**:

1. Tap **Finalize**
2. Select **Export**
3. Choose a file format:
    - **.csv** – raw numerical data
    - **.xlsx** – formatted spreadsheet
    - **PDF** – summary with charts

Insert a USB stick into the port on the side of the screen. Once detected, select the USB drive and tap **Apply** to complete the export.

Figure 4.6. Export menu showing file format options and USB selection.



5. Software Summary and Support

This manual has outlined the core functions of the Amperia™ Software, including experiment configuration, sensor and sequence setup, and integrated data analysis. The system is designed to support a range of quantification workflows while maintaining ease of use and flexibility.

For detailed assay procedures, recommended sensor layouts, and reagent-specific instructions, always refer to the relevant assay kit documentation. For hardware setup, maintenance, and safety guidance, consult the **Amperia™ User Manual.**

For troubleshooting common issues, refer to the Appendix at the end of this guide.

Appendix: Common Issues and Troubleshooting

Issue	Possible Cause	Suggested Action
Software unresponsive or frozen	Touchscreen or system glitch	Hold the power button for ~15 seconds to force a restart. Power cycle the instrument.
Sensor strip not detected	Incorrect positioning or strip not properly inserted	Remove the strip and reinsert. Confirm correct starting well. Refer Amperia™ User Manual for positioning guidance.
"Start Experiment" button greyed out	Missing configuration (e.g., sensor or reagent layout)	Check that all required steps are completed: plate layout, sensor positions, and sequence.
Data not exporting to USB	USB not recognised or not selected	Ensure USB is inserted fully and recognised. Select it from the popup list before tapping Apply.
Standard curve looks abnormal	Incorrect calibrator placement or input values	Review well assignments and concentration entries. Refer to the assay kit manual for recommended layout.

For unresolved issues, contact support at info@abselion.com or visit www.abselion.com

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

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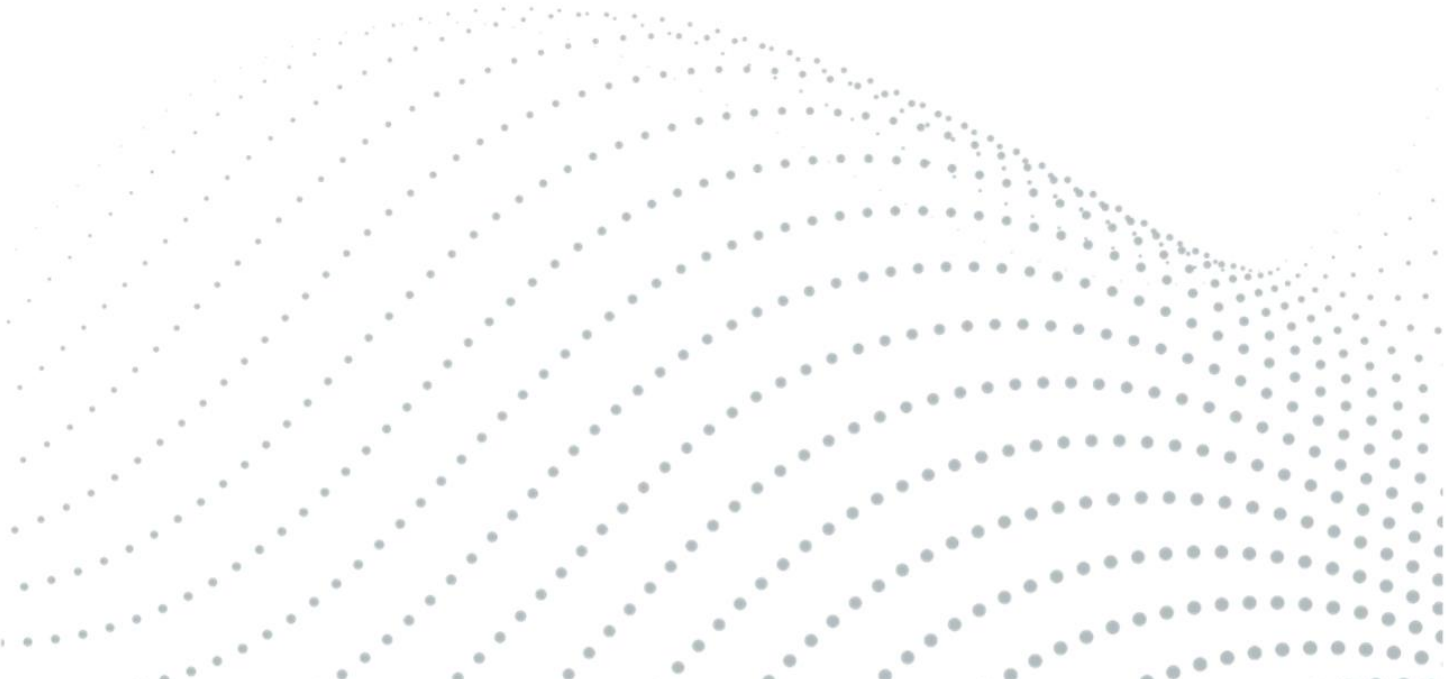

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