

Two^{MP}: Transforming biomolecular characterisation

Refeyn's Two^{MP} mass photometer is a user-friendly benchtop instrument. It measures the mass of single biomolecules and macromolecules, opening up new possibilities for analyzing biomolecular interactions, sample purity and more.

A new era in biomolecular analysis

The Refeyn Two^{MP} mass photometer (Fig. 1) is the ideal instrument to characterize biomolecules, study their function and optimize conditions for working with them. It can be used to study protein interactions, oligomerization and macromolecular assembly (Fig. 2), and to assess sample integrity and homogeneity.

In addition to **proteins and protein complexes**, the Two^{MP} can measure **nucleic acids** as well as larger particles, such as **macromolecular assemblies** and **nanostuctures**.

The Two^{MP} uses mass photometry technology to measure the mass of single molecules and particles directly **in solution, without labels**. It operates in a wide range of native buffer solutions, and can also be used to measure proteins on lipid bilayers and membrane-mimetic systems.

The Two^{MP} features excellent resolution; high count rates make it possible to detect even low-abundance species. The mass distribution results are intuitive to interpret, even without prior knowledge.

The Two^{MP} fits on a laboratory benchtop (Fig. 1) and can be operated easily by users with basic lab skills. It requires very little sample and works fast. A single measurement—including data analysis—takes under five minutes.



Fig. 1 The Refeyn Two^{MP} - biomolecular characterization on the benchtop.

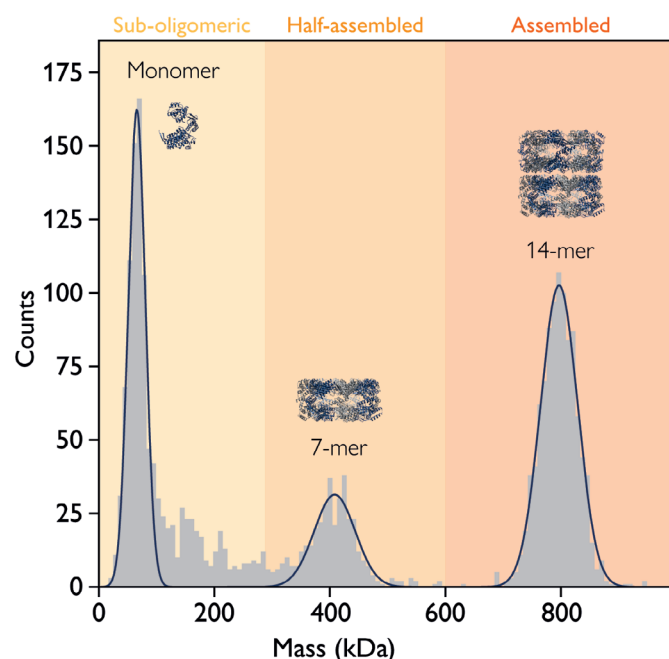


Fig. 2 The Two^{MP} can be used to monitor macromolecular assembly. The molecular chaperone GroEL assembles into two stacked heptameric (7-mer) rings. The mass histogram clearly shows populations of monomers, 7-mers and 14-mers, demonstrating the Two^{MP}'s ability to capture the individual steps of this assembly process.

What the Two^{MP} offers

- **Accurate measurement of true native behavior**
 - In solution, in a variety of buffers and compatible with membrane proteins
 - Label free no need to modify samples
- **Information on all sub-populations in samples**
 - Single molecule counting
 - Broad mass range and high dynamic range
- **One assay format delivering multiple results**
 - Homogeneity, structural integrity, activity
 - Minimal sample required
- **Quick, user-friendly operation**
 - Benchtop design
 - Results within minutes
 - Data are intuitive to interpret

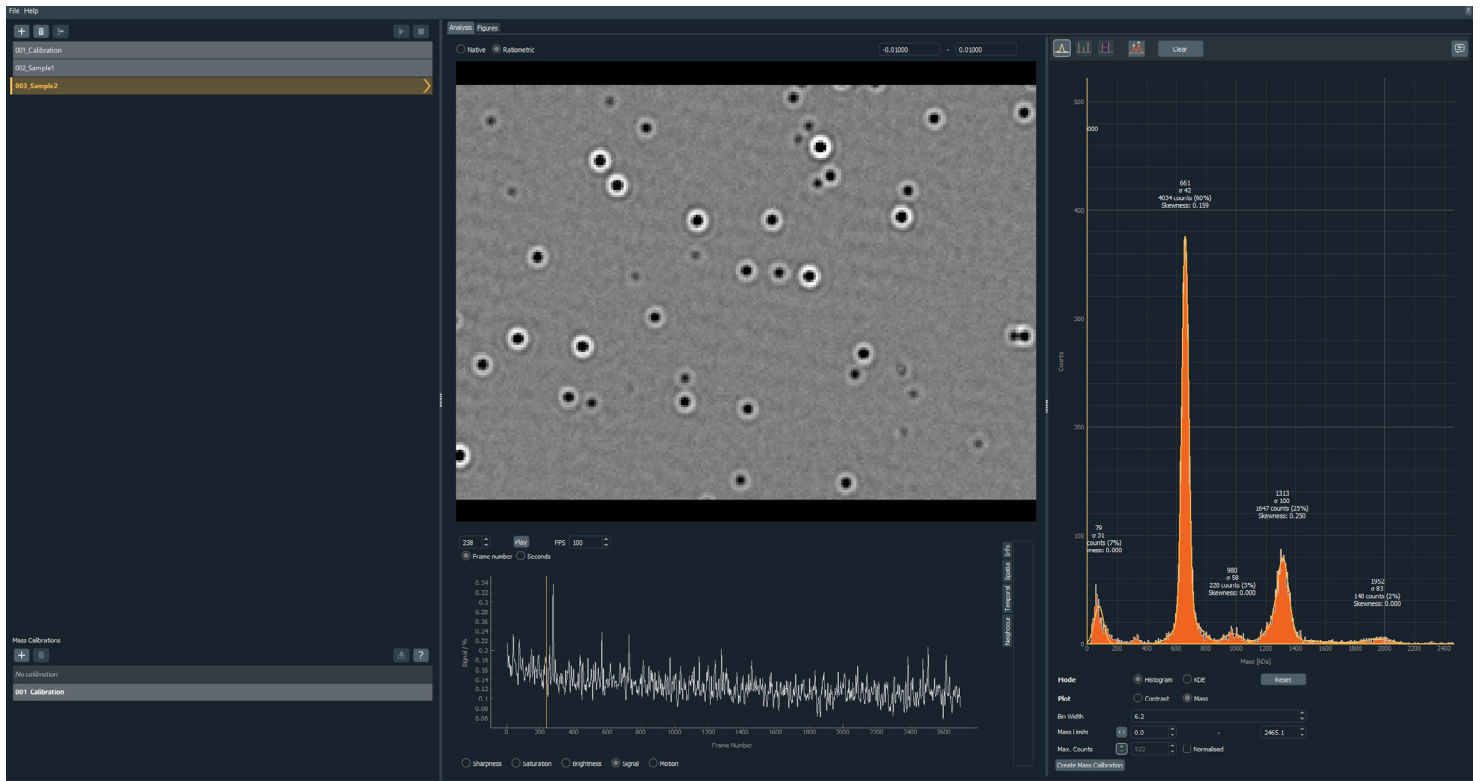


Fig. 3 Data analysis with the Two^{MP}. A screen capture of Refeyn's Discover^{MP} data analysis software shows the mass photometry movie (top middle) and the resulting mass histogram (right). The trace in the centre at the bottom can be used to monitor image parameters (sharpness, contrast, etc.) over time.

Intuitive software

The Two^{MP} comes with Refeyn's software for mass photometry data acquisition and analysis (Fig. 3).

The included software packages are:

- Refeyn Acquire^{MP} for data acquisition
- Refeyn Discover^{MP} for data analysis

Intuitive user interfaces make it easy to collect, analyze and visualize your data – including the calculation of empty/full ratios. Figures can be directly generated and exported from within the software.

Two^{MP} key specifications

Mass range	30 kDa – 5 MDa
Resolution (FWHM)	25 kDa @ 66 kDa 60 kDa @ 660 kDa
Mass precision	± 2%
Mass error	± 5% (single measurement)
Concentration range	100 pM – 100 nM
Sensitivity	<< 1 ng of protein
Wavelength	488 nm
Field of view	4 x 11 μm (@ 500 Hz) up to 12 x 17 μm (@ 135 Hz)
Pixel size	12 nm

Two^{MP} installation requirements

Instrument dimensions	504 x 314 x 135 mm (WxDxH)
Instrument weight	30 kg
Power outlets	Four required (100 – 250 V)
Temperature	20°C +/- 2°C, no direct air flow over the instrument
Relative humidity	< 70% at 20°C
Peripherals supplied	Electronics unit (430 x 330 x 133 mm, 10 kg), PC and monitor