



# Octet RED96e System

*Unmatched versatility for discovery, development and quality control*

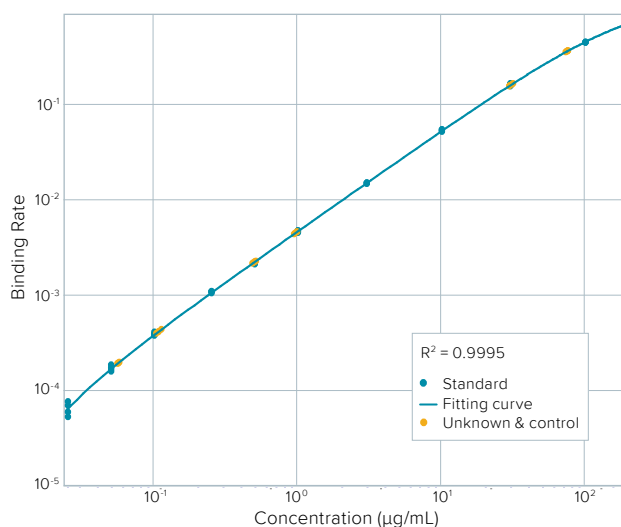
## Key features

- High-quality kinetic screening and affinity characterization
- Microfluidics-free Dip and Read™ format reduces assay time and maintenance cost
- Eight parallel, independent channels for maximum speed and flexibility
- Versatility to detect anything from small molecules to mammalian cells
- Non-destructive sampling allows full sample recovery
- Up to 12 hours of unattended run time
- Sample plate cooling for temperature sensitive proteins
- Perfectly suited to operate in GxP-regulated environments

The Octet® RED96e system detects a diverse range of biomolecules from small molecules to proteins to mammalian cells. The Octet platform offers an advanced fluidics-free approach with a wide variety of off-the-shelf Dip and Read biosensors for rapid binding kinetics and quantitation analysis. The system utilizes ForteBio's Bio-Layer Interferometry (BLI) technology, enabling direct detection of specific proteins and other biomolecules — even in complex mixtures like cell culture supernatants and lysates. The 8-channel Octet RED96e system performs quantitation of 96 samples in 32 minutes, and kinetic screening of 64 samples in 1.5 hours. Analysis can be done using a single channel or up to eight channels, enabling more flexibility in sample throughput when needs change. An optional microplate evaporation cover minimizes losses in sample volume, allowing full post-analysis sample recovery even after a 12 hour experiment.

## Quantitation assays

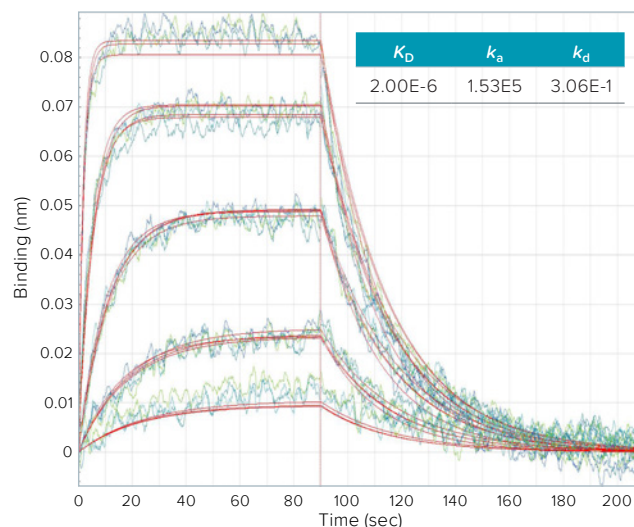
The Octet RED96e system directly measures the presence of specific proteins and other molecules in solution with minimal interference from complex matrices. Accurate and reproducible concentrations can be determined in as little as two minutes per sample or 32 minutes for a whole plate using a simple, one-step assay (Figure 1). High sensitivity in quantitation can be achieved to sub-ng/ml levels with 2-step and 3-step assay formats, allowing automated measurement of contaminants such as host cell proteins and residual protein A faster and more precisely than ELISA. Process economics can be improved further by regenerating and re-using the biosensors.



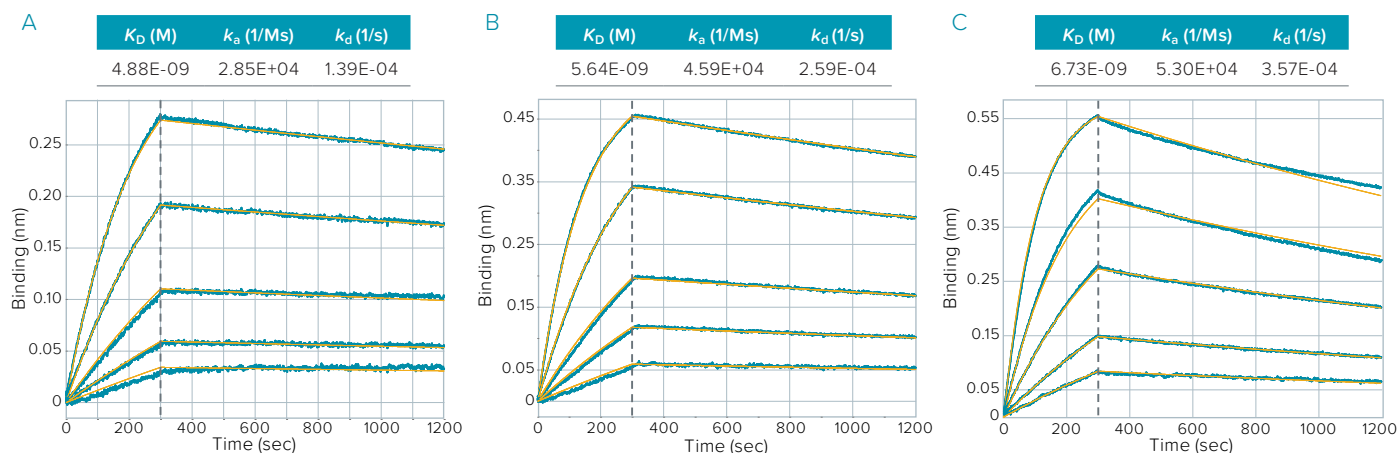
**Figure 1:** Human IgG Quantitation. Example data from human IgG analyte binding to Protein A biosensors. Binding was performed at 30°C, with a shake speed of 1000 rpm and a two-minute read per well. Human IgG solution was prepared at 0.025 µg/mL up to 300 µg/mL and the standard curve shown on a log-log scale was generated using the initial slope algorithm and fitted with the unweighted 5-parameter logistic (5PL) regression model.

## Kinetic assays

The Octet RED96e system monitors binding events in real time to calculate on rates ( $k_a$ ), off rates ( $k_d$ ), and affinity constants ( $K_D$ ). The superior sensitivity of the system enables measurement of small organic molecules (Figure 2) and kinetic constants over a broad range. The temperature of one 96-well sample plate can be controlled from 15–40°C, which enables reliable kinetic determinations from low up to physiological temperatures for temperature sensitive proteins (Figure 3). Additional advantages afforded by sample cooling include the ability to rapidly determine binding rate constants at multiple temperatures to extrapolate thermodynamic measurements. The Octet RED96e system's eight channels can be used independently to measure samples for screening purposes or in tandem, pairing the sample read with a dedicated reference for high-quality kinetic characterization.



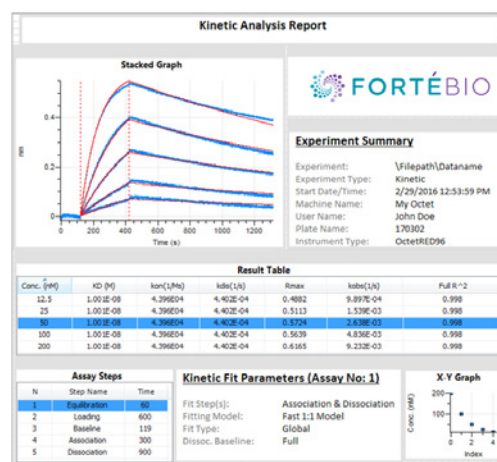
**Figure 2:** Small molecule kinetics. Example data from benzenesulfonamide (MW 157 Da) binding to biotin-carbonic anhydrase loaded on Super Streptavidin biosensors. Binding was performed at 25°C, with a shake speed of 1000 rpm. A 100  $\mu$ M benzenesulfonamide solution was prepared and serially diluted 1:4.



**Figure 3:** Large molecule characterization. Example data from human Prostate Specific Antigen (PSA, MW 30 kDa) binding to a biotinylated anti-human PSA mouse monoclonal antibody loaded onto Streptavidin biosensors. Binding was performed at 15°C (A), 25°C (B) and 30°C (C), with a shake speed of 1000 rpm. A 200 nM PSA solution was prepared and serially diluted 1:2 to obtain the 5 concentrations run.

## Octet Data Analysis HT software

Pre-defined templates in Octet Data Acquisition software streamlines setup prior to running an assay and minimizes training needs. Octet Data Analysis High Throughput (HT) software can overlay data from multiple plates over an extensive range of parameters and metrics to analyze acquired data from an entire project, thereby reducing analysis time from hours to minutes. Data Analysis HT Analysis settings in Octet Data Analysis HT software can be saved and re-loaded for new similar datasets to speed up routine assays. The software can also generate customized reports of the experiments, combining various data elements such as graphs, text boxes, data tables, images and experimental details (Figure 4). These reports are ready to be uploaded to an electronic notebook or stored in the company database.



**Figure 4:** Octet Data Analysis HT software enables making customized reports that can be uploaded into electronic notebooks and added to the database. In addition to customized report, Data Analysis HT enables analysis of multiple plates and experiments together to maximize workflow efficiency.

## Operate in GxP regulated environments

The Octet RED96e system has been developed to operate reliably in a regulated environment. ForteBio offers 21 CFR Part 11 software and a full line of GxP products and services as part of the Octet RED96e GxP Package. These include:

- Octet CFR software and ForteBio FB Server features such as:
  - Controlled access with multiple user privileges — administrator, developer, supervisor, lab user
  - Primary data integrity — digitally signed acquired data that is rendered invalid after data tampering
  - Electronic signatures — enable data to be locked after analysis is complete
  - Enhanced audit trail — all actions are recorded and time-stamped with details of old vs. new values
  - Full control of routine assays that speed up analysis — method files and analysis settings can be saved for routine assays
  - Customized reports — created by combining various data elements such as graphs, text, data tables and images ready to be uploaded to your ELN
- Installation and Operational Qualification (IQ/OQ) and Performance Qualification (PQ) packages ensure your system is qualified and operate as intended and that performance meets specifications
- Performance Certification (PC) services maintain your system in a calibrated state and in peak condition
- Customer-run Software Validation Package and support to trim validation time down to just three days
- Biosensor Validation Support Services for multiple biosensor lot sampling and selection
- Excellent Global Technical Support assistance

## Octet RED96e system specifications\*

### Technical information and specifications

<b>Detection technology</b>	Bio-Layer Interferometry (BLI)
<b>Biosensor type</b>	Disposable, single-use fiber optic biosensors with optional reuse by regeneration and/or re-racking in the sensor tray
<b>Information provided</b>	<ul style="list-style-type: none"><li>• Yes/No binding</li><li>• Kinetic and affinity analysis (<math>k_{obs}</math>, <math>k_a</math>, <math>k_d</math>, <math>K_D</math>)</li><li>• Specific and selective detection of molecules, even in crude samples</li><li>• Relative and absolute quantitation of specific proteins in crude matrices or purified samples</li></ul>
<b>Data presentation</b>	<ul style="list-style-type: none"><li>• Plots displaying real-time kinetic binding sensorgrams, fitted result plots, and residuals of fits</li><li>• Concentration data analysis including calibration curves and output of tabulated concentration data</li><li>• Tabulated kinetic data</li><li>• Epitope binning and cross-blocking matrices and trace overlays</li></ul>
<b>Sample types</b>	Proteins, antibodies, peptides, DNA, RNA, liposomes, bacterial cells, viruses, mammalian cells, small molecules in various media including serum, buffers containing DMSO, periplasmic fractions, untreated cell culture supernatants, and crude cell lysates
<b>Number of spectrometers</b>	8
<b>Maximum simultaneous reads</b>	8
<b>Data collection rate</b>	2, 5, or 10 Hz
<b>Sample position and format</b>	1 standard 96-well, black, flat bottom microplate
<b>Sample volume</b>	180–220 $\mu$ L/well, non-destructive testing
<b>Orbital flow capacity</b>	Static or 100–1500 rpm
<b>Analysis temperature range</b>	15–40°C, 1°C increments

\*All specifications are subject to change without notice.

Kinetics	
Workflow	Up to 8 assays in parallel; up to 96 assays per 96-well plate
Molecular weight detection	> 150 Da
Analysis time per sample	Real-time kinetic binding experiments from 5 minutes to 4 hours, or up to 12 hours with the evaporation cover
Association rate constant ( $k_a$ )	$10^1$ – $10^7$ M <sup>-1</sup> s <sup>-1</sup>
Dissociation rate constant ( $k_d$ )	$10^{-6}$ – $0.1$ s <sup>-1</sup>
Affinity ( $K_D$ ) constant	1 mM–10 pM
Baseline noise	≤ 3.5 pm (RMS)
Baseline drift	≤ 0.1 nm/hour

Quantitation	
Workflow	Up to 8 assays in parallel; up to 96 assays per 96-well plate
Analysis time per sample	Human IgG quantitation in 2 minutes for 8 samples, ≤ 32 minutes for 96 samples
Direct quantitation range for human IgG with Protein A Biosensor	0.05–2000 µg/mL

Instrument	
Dimensions (H x W x D)	19.5 in x 22 in x 18.2 in (49 cm x 56 cm x 46 cm)
Weight	72 lb (32.7 Kg)
Electrical requirements	Mains: 100–120/200–240 VAC, 50/60 Hz, 4 A max
Power consumption	200 W (300 W peak)
Data handling and storage	
PC operating systems	<ul style="list-style-type: none"> <li>Windows® 10 Professional, 64-bit</li> <li>Windows 7 Professional, 64-bit</li> <li>Windows 7 Professional, 32-bit</li> </ul>
Compliance	
Safety standards	CE, Nemko

## Ordering information

Part No.	UOM	Description
OCTET RED96E	System	Includes Octet RED96e instrument, Octet software, desktop computer, LCD monitor, accessory kit and one-year warranty
OCTET RED96E-GxP	System	Included Octet RED96e instrument, Octet CFR software, desktop computer, LC monitor, accessory kit, IQ/OQ kit, PQ Kits and one-year warranty
18-5132	Pack	Single-use evaporation covers to extend the experiment up to 12 hours. 3 covers per pack

For more information about ForteBio's Octet platform for label-free, real-time detection of biomolecular interactions, applications, and services, visit [www.fortebio.com](http://www.fortebio.com) or contact us directly.



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