
Specifications

⇨ All of the following specifications apply to both the PowerWave™ XS and PowerWave™ XS2 models, *except* optical resolution, as noted on page 9.

Microplates

- All models accommodate standard 6-, 12-, 24-, 48-, 96- and 384-well microplates, 60-, 72- and 96-well Terasaki plates (with adapter), and up to 8 Bio-Cells™.

Electrical

- **Power source:** 24-volt external power supply
- **Voltage range:** 100-240 V~ ± 10% @50-60 Hz
- **Power consumption:** 100 VA max.

Physical

- **Dimensions:** 8.5 in. L × 8.5 in. W × 16 in. H
(21.6 cm × 21.6 cm × 40.6 cm)
- **Weight:** 24 lb. (11 kg)

Environmental

- **Operating conditions:** 15° - 35°C (59° - 95°F)
- **Relative humidity:** 10% - 85% (non-condensing)

Hardware

- **Light source:** Xenon flash light source: 10 W max. average power; Life: 1 billion flashes
- **Incubation option:** Temperature Control: 4° (39.2°F) over ambient to 50°C (122°F)
Temperature Variation: ± 0.5°C (± 32.9°F) across the plate @ 37°C (98.6°F) (250 µl per well with the plate sealed)
- **Display:** None

Speed of Reading

The actual plate read time and accuracy are dependent on the method of reading:

- **Normal** mode is the slowest of the three available modes. After positioning the well over the beam, the instrument waits 100 milliseconds before taking the measurement (8-flash data collection). **Note:** The 100 ms delay is to allow for more complete fluid settling.
- **Rapid** mode is faster than Normal mode because the instrument does not wait before taking the measurement (8-flash data collection).
- **Sweep** mode is the fastest of the three available modes. The plate carrier sweeps each row past the optics channel without stopping, and collects data with a single flash at each well as it goes by.

The following read times are based on a single or dual wavelength measurement. Actual reading speeds may vary, depending upon the reading wavelength selected. Each wavelength has a unique location within the monochromator, and the different locations require varying amounts of time to position.

96-Well Read Timing	630 nm	630/ 450 nm
Normal Read Mode	Single	Dual
Endpoint	52 sec.	100 sec.
Rapid Read Mode	Single	Dual
Endpoint	42 sec.	80 sec.
Sweep Read Mode	Single	Dual
Endpoint	18 sec.	32 sec.

Kinetics

All three read modes are available in Kinetics mode. Single Wavelength reads are limited to the following minimum times.

- 49 seconds from A1 to A1 in Normal mode, single wavelength, depending upon density of solution.
- 40 seconds from A1 to A1 in Rapid mode, single wavelength.
- 14 seconds from A1 to A1 in Sweep mode, single wavelength.

384-Well Read Timing	630 nm	630/ 450 nm
Normal Read Mode	Single	Dual
Endpoint	152 sec.	298 sec.
Rapid Read Mode	Single	Dual
Endpoint	112 sec.	221 sec.
Sweep Read Mode	Single	Dual
Endpoint	30 sec.	56 sec.

Kinetics:

All three read modes are available in Kinetics mode. Single Wavelength reads are limited to the following minimum times.

- 150 seconds from A1 to A1 in Normal mode, single wavelength, depending upon density of solution.
- 112 seconds from A1 to A1 in Rapid mode, single wavelength.
- 26 seconds from A1 to A1 in Sweep mode, single wavelength.

Optical Specifications

- **λ range:** 200 to 999 nm
- **λ accuracy:** ± 2 nm
- **λ repeatability:** ± 0.2 nm
- **λ bandpass:** 2.4 nm
- **Detector:** Photodiodes (2) measurement and reference channels
- **Resolution:** 0.001 (PowerWave™ X5); 0.0001 (PowerWave™ X52)

Optical Performance (flat- and round-bottom full-well plates)

Absorbance Measurement Range: 0.000 to 4.000 OD

Accuracy:

0.000 to 2.000 OD $\pm 1\% \pm 0.010$ OD Normal and Rapid modes, 96-well plates

0.000 to 2.000 OD $\pm 2\% \pm 0.010$ OD Normal and Rapid modes, 384-well plates

2.000 to 2.500 OD $\pm 3\% \pm 0.010$ OD Normal and Rapid modes, 96- and 384-well plates

2.500 to 3.000 OD $\pm 3\% \pm 0.010$ OD Normal 96-well plates

0.000 to 1.000 OD $\pm 1\% \pm 0.010$ OD Sweep mode, 96- and 384-well plates

Linearity:

0.000 to 2.000 OD $\pm 1\%$ Normal and Rapid modes, 96-well plates

0.000 to 2.000 OD $\pm 2\%$ Normal and Rapid modes, 384-well plates

2.000 to 2.500 OD $\pm 3\%$ Normal and Rapid modes, 96- and 384-well plates

2.500 to 3.000 OD $\pm 3\% \pm 0.010$ OD Normal mode, 96-well plates

0.000 to 1.000 OD $\pm 1\%$ Sweep mode, 96- and 384-well plates

Repeatability:

0.000 to 2.000 OD $\pm 1\% \pm 0.005$ OD Normal and Rapid modes, 96- and 384-well plates

2.000 to 2.500 OD $\pm 3\% \pm 0.005$ OD Normal and Rapid modes, 96- and 384-well plates

2.500 to 3.000 OD $\pm 3\% \pm 0.005$ OD Normal mode, 96-well plates

0.000 to 1.000 OD $\pm 2\% \pm 0.010$ OD Sweep mode, 96- and 384-well plates

❖ For the above performance, the Gain on Optics test should be **below 6.0**.