General Specifications

Microplates
The Synergy 2 accommodates standard 6-, 12-, 24-, 48-, 96-, 384-, and 1536-well microplates with 128 x 86 mm geometry, and the BioTek Take3 Multi-Volume Plate. Note: 1536-well microplates are not supported for luminescence measurements. Maximum Plate Height: Absorbance mode: plates up to 0.8" (20.30 mm) high Fluorescence/Luminescence modes: plates up to 1.25" (31.75 mm) high PCR tube trays up to 1.25" (31.75 mm) high (may require an adapter) Injector models dispense to standard height 6-, 12-, 24-, 48-, and 96-well microplates.

Hardware & Environmental	
Light Source:	Absorbance: Xenon flash light source, 10W maximum average power, lamp life 1 billion flashes (not user-changeable) Fluorescence: Tungsten quartz halogen, 20W power, lamp life 1000 hours (user-changeable) TRF (and optionally for FI and FP): Xenon flash light source, 60W maximum average power, lamp life 1 billion flashes (not user-changeable)
Dimensions:	17.5" D x 15" W x 17.5" H 44.5 cm D x 38.5 cm W x 44.5 cm H
Weight:	With all modules installed, without power supply or dispense module attached, approx. 57 lbs. (25.8 kg)
Environment:	Operational temperature 18º to 40°C
Humidity:	10% to 85% relative humidity (non-condensing)
Power Supply:	24-volt external power supply compatible with 100-240 V~; +10% @50-60 Hz
Power Consumption:	250W maximum
Incubation:	Temperature control range from 4º over ambient to 50ºC. Temperature variation ± 0.50°C across the plate @ 37°C (250 µl per well with the plate sealed).
Plate Shaking:	Low, Medium, High and Variable shaking speeds. Shake time is programmable by the user.

Absorbance Specifications

Accuracy, Linearity, Repeatability	
All qualifications were conducted using 96-/384-well, flat bottom microplates. For the performance described here, the Gain on the Optics Test should be below 10.0.	
Measurement Range:	0.000 to 4.000 OD
Accuracy: 0.000 to 2.000 OD ±1.0% ±0.010 OD Normal/Rapid modes, 96-well plates 0.000 to 2.000 OD ±2.0% ±0.010 OD Normal/Rapid modes, 384-well plates 2.000 to 2.500 OD ±3.0% ±0.010 OD Normal/Rapid modes, 96-/384-well plates 2.500 to 3.000 OD ±3.0% ±0.010 OD Normal mode, 96-well plates 0.000 to 1.000 OD ±1.0% ±0.010 OD Sweep mode, 96-/384-well plates	
Linearity: 0.000 to 2.000 OD ±1.0% Normal/Rapid modes, 96-well plates 0.000 to 2.000 OD ±2.0% Normal/Rapid modes, 384-well plates 2.000 to 2.500 OD ±3.0% Normal/Rapid modes, 96-/384-well plates 2.500 to 3.000 OD ±3.0% Normal mode, 96-well plates 0.000 to 1.000 OD ±1.0% Sweep mode, 96-/384-well plates	
Repeatability: 0.000 to 2.000 OD ±1.0% ±0.005 OD Normal/Rapid modes, 96-/384-well plates 2.000 to 2.500 OD ±3.0% ±0.005 OD Normal/Rapid modes, 96-/384-well plates 2.500 to 3.000 OD ±3.0% ±0.005 OD Normal mode, 96-/384-well plates 0.000 to 1.000 OD ±2.0% ±0.010 OD Sweep mode, 96-/384-well plates	

Optics	
λ range:	200 to 999 nm
λ accuracy:	± 2 nm
λ repeatability:	± 0.2 nm
λ bandpass:	2.4 nm
Detector:	Photodiodes (2) Measurements are reference channel-corrected for light source fluctuation

Read Timing			
Endpoint read time is from plate start to plate stop. Kinetic read time is from A1 to A1 read positions.			
Endpoint 96-well plate		Single 630 nm	Dual 630/450 nm
	Normal 0 ms delay:	34 sec	53 sec
	Normal 100 ms delay:	43 sec	73 sec
	Sweep:	22 sec	35 sec
Endpoint 384-well plate		Single 630 nm	Dual 630/450 nm
	Normal 0 ms delay:	77 sec	143 sec
	Normal 100 ms delay:	115 sec	220 sec
	Sweep:	32 sec	56 sec
Endpoint 1536-well plate		Single 630 nm	Dual 630/450 nm
	Normal 0 ms delay:	231 sec	450 sec
	Normal 100 ms delay:	385 sec	757 sec
	Sweep:	53 sec	97 sec
Kinetic 96-well		Single 630 nm	
	Normal 0 ms delay:	21 sec	
	Normal 100 ms delay:	31 sec	
	Sweep:	11 sec	
Kinetic 384-well		Single 630 nm	
	Normal 0 ms delay:	66 sec	
	Normal 100 ms delay:	104 sec	
	Sweep:	22 sec	
Kinetic 1536-well		Single 630 nm	
	Normal 0 ms delay:	219 sec	
	Normal 100 ms delay:	373 sec	
	Sweep:	42 sec	

Luminescence Specifications

50 amol/well flash ATP in a 96-well plate (low-noise #49984 PMT)
500 amol/well flash ATP in a 96-well plate (red-shifted #49721 PMT)

Fluorescence Specifications

Read Timing	
Because of the possible wide variations in setup, the following benchmark conditions are specified:	
Excitation Filter:	485/20 nm
Emission Filter:	528/20 nm
Samples per well:	10
Delay before sampling:	100 ms
Delay between samples:	1 ms
96-well read:	99 sec
384-well read:	339 sec
1536-well read:	1256 sec

Optical Probes
Bottom position: 1.5, 3, or 5 mm diameter probes can be installed Top position: 3 mm diameter fixed, with motor-driven moveable apertures to reduce the diameter to support different plate formats

Sensitivity	
The following specifications apply to 96-well read formats using the Tungsten bulb.	
5 mm optical probe Bottom reading	10 pg/mL solution of Sodium Fluoroscein in PBS 40 reads per location averaged, 350 ms delay before read 150 µL per well signal-to-noise ratio greater than 2 Excitation 485/20, Emission 528/20 Hellma 96-well quartz plate or Greiner SensoPlate 62.5 ng/mL solution of Propidium Iodide in PBS 40 reads per location averaged, 350 ms delay before read 150 µL per well signal-to-noise ratio greater than 2 Excitation 485/20, Emission 645/40 Corning Costar 96-well plate with black sides, clear bottom
3 mm optical probe Bottom reading	20 pg/mL solution of Sodium Fluoroscein in PBS 40 reads per location averaged, 350 ms delay before read 150 µL per well signal-to-noise ratio greater than 2 Excitation 485/20, Emission 528/20 Hellma 96-well quartz plate
3 mm optical probe Bottom reading	125 ng/mL solution of Propidium Iodide in PBS 40 reads per location averaged, 350 ms delay before read 150 µL per well signal-to-noise ratio greater than 2 Excitation 485/20, Emission 645/40 Corning Costar 96-well plate with black sides, clear bottom

Sensitivity	
The following specifications apply to 96-well read formats using the Tungsten bulb.	
1.5 mm optical probe Bottom reading	40 pg/mL solution of Sodium Fluoroscein in PBS 40 reads per location averaged, 350 ms delay before read 150 µL per well signal-to-noise ratio greater than 2 Excitation 485/20, Emission 528/20 Hellma 96-well quartz plate 250 ng/mL solution of Propidium Iodide in PBS 40 reads per location averaged, 350 ms delay before read 150 µL per well signal-to-noise ratio greater than 2 Excitation 485/20, Emission 645/40 Corning Costar 96-well plate with black sides, clear bottom
3 mm fixed optical probe with movable apertures, Top reading	2 pg/mL solution of Sodium Fluoroscein in PBS 40 reads per location averaged, 5 mm Z-axis offset, 350 ms delay before read 200 µL per well signal-to-noise ratio greater than 2 Excitation 485/20, Emission 528/20, Dichroic 510 nm Corning Costar 96-well solid black plate 0.16 ng/mL solution of Methylumbelliferone in CBB 40 reads per location averaged, 5 mm Z-axis offset, 350 ms delay before read 150 µL per well signal-to-noise ratio greater than 2 Excitation 360/40, Emission 460/40, 50% mirror Corning Costar black strips

Time-Resolved Fluorescence	
96/384-well plates:	250 fM Europium (plate and well modes), 20 reads per location, 5 mm Z-axis offset, 350 ms delay before read
Integration Interval:	20 to 16000 µs
Delay:	0 to 16000 µs
Granularity:	1-µs steps

Fluorescence Polarization	
96/384-well plates:	5 mP at 1 nM Sodium Fluorescein, 60 reads per location, 5 mm Z-axis offset 350 ms delay before read

Models with Injectors

Dispense/Read	
Specifications apply to models with the dual-reagent dispense module	
Plate Type:	Dispenses to standard 6-, 12-, 24-, 48-, and 96-well microplates with standard 128 x 86 mm geometry
Detection Method:	Absorbance, Fluorescence, Luminescence
Volume Range:	5-1000 µL with a 5-20 µL tip prime
Accuracy:	Dispensing deionized water with 0.1% Tween 20 at room temperature: ± 1 µL at 5-50 µL ± 2% at 51-1000 µL
Precision:	Dispensing a 200 µL solution of deionized water, 0.1% Tween 20, and dye at room temperature: < 2.0% for volumes of 50-200 µL < 4.0% for volumes of 25-49 µL < 7.0% for volumes of 10-24 µL < 10.0% for volumes of 5-9 µL