

Specifications

Optics

EXCITATION OPTICS

OPTICAL PLATFORM

Northern Lights contains a fixed optical assembly configured with one to three spatially separated laser beams. Laser delays are automatically adjusted during instrument QC.

LASERS

One laser configuration: 488nm: 50mW

Two laser configuration: 488nm: 50mW,
640nm: 80mW

Three laser configuration: 405nm: 100mW,
488nm: 50mW, 640nm: 80mW

BEAM GEOMETRY

Flat-Top laser beam profile with narrow vertical beam height optimized for small particle detection.

EMISSION OPTICS

EMISSION COLLECTION

Fused silica cuvette coupled to high NA lens for optimum collection efficiency to optical fibers.

FORWARD AND SIDE SCATTER DETECTION

FSC: high-performance semiconductor detector with 488nm bandpass filter.

SSC: Two high-performance semiconductor detectors with 405nm and 488nm bandpass filter. Note: 405nm side scatter applies to three laser configurations only.

FLUORESCENCE DETECTORS

Proprietary high sensitivity Coarse Wavelength Division Multiplexing (CWDM) semiconductor array per laser enabling more efficient spectrum capture in the 420-830nm range. No filter changes required for any fluorochrome excited by the 405nm, 488nm, and 640nm lasers.

STANDARD OPTICAL CONFIGURATION

Violet detector module (only available in three laser configurations): 16 channels uneven spaced bandwidth from 420nm-830nm.

Blue detector module: 14 channels uneven spaced bandwidth from 500-830nm.

Red detector module: 8 channels uneven spaced bandwidth from 650-830nm.

Fluidics

SAMPLE FLOW RATES

Low: 15 μ L/min, Medium: 30 μ L/min, High: 60 μ L/min, Plate high-throughput mode: 100 μ L/min

FLUIDIC MODES

Long clean, SIT flush, Purge filter, Clean flow cell

MANUAL SAMPLE INPUT FORMATS

12x75mm polystyrene and polypropylene tubes

STANDARD FLUIDIC RESERVOIRS

4L fluid container set with level-sensing provided. Compatible with 20L sheath and waste cubitainers.

VOLUMETRIC SENSOR

Volumetric measurement during sample recording enables calculation of counts per μ L for any gated population.

PLATE LOADER OPTION

96-well microtiter plate capability

Throughput time 35 minutes at High Throughput mode sampling 7 μ L/well

Plate stage temperature: 4-30°C

PLATE LOADER CARRYOVER

Default mode: \leq 0.3%, Low Carryover mode: \leq 0.1%, High Throughput mode: \leq 1%

Performance

FLUORESCENCE SENSITIVITY

FITC: $<$ 110 MEFL, PE: $<$ 35 MEFL, APC: $<$ 15 MEFL, Pacific Blue: $<$ 200MEFL

*measurements based on an average from three systems and performed using SPHERO Rainbow Calibration Particle (RCP-30-5A) based on its peak emission channel.

FLUORESCENCE LINEARITY

FITC $R^2 \geq$ 0.995 / PE $R^2 \geq$ 0.995

FORWARD AND SIDE SCATTER RESOLUTION

Performance is optimized for resolving lymphocytes, monocytes, and granulocytes.

SIDE SCATTER RESOLUTION

Capable of resolving 0.2 μ m beads from noise.

CARRYOVER

$<$ 0.1%

DATA ACQUISITION RATE

35,000 events/s*

*Three-laser system

Software

SPECTROFLO® SOFTWARE

Live unmixing during acquisition

Developed specifically to streamline assay setup, data acquisition, and file export

Automated QC module

Autofluorescence extraction

Raw and Unmixed FCS 3.1 files

Electronics

SIGNAL PROCESSING

Digital signal processing with automatic window gate adjustment.

22-bit 6.5 log decades.

Threshold using any single parameter or combination of parameters.

PULSE SHAPE PARAMETERS

Pulse Area and Height for every parameter. Width for scatter parameters and one fluorescence parameter for each laser.

Workstation

OPERATING SYSTEM

Windows® 10 Pro 64-bit

PROCESSOR

Intel® Core™ i7 processor, 3.6 GHz

RAM

32GB

HARD DRIVE

500GB SSD / 1TB SATA

VIDEO PROCESSOR

NVIDIA® HD GeForce

MONITOR

27" UHD 4K Monitor

Installation Requirements

Dimensions (W x D X H)

INSTRUMENT DIMENSIONS

Without loader: 54 x 52 x 52 cm

With loader: 58.4 x 62 x 52 cm

INSTRUMENT WEIGHT

Instrument weight: 61 kg

Loader weight: 13 kg

COMPUTER DIMENSIONS

29.1 x 9.25 x 34.4 cm

RECOMMENDED WORKSPACE

157 x 72 x 132 cm

Room Requirements

POWER

100-240V, 50/60 Hz, 2A max

HEAT DISSIPATION

500W with all solid-state lasers

TEMPERATURE

17-28°C

HUMIDITY

20%-85% relative non-condensing

AIR FILTERING

No excessive dust or smoke

LIGHTING

No special requirements

Regulatory Status

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