PANNORAMIC® digital slide scanners
Product specification sheet

Pannoramic 250 FLASH III

Ultrahigh throughut volume scanner
World class brightfield and fluorescent whole slide scanning
300-slide digital slide scanner
Ultra-high-speed scanning
Compact design.

Common characteristics:

- High-resolution scanner **imaging optics**
- **300 slides** fully automatic loading and scanning
- Automated **tissue detection** and automated **coverslip detection**
- Outstanding 0.12 µm/pixel resolution is achieved with the 40×/0.95 NA (equivalent to 80×magnification) objective
- **Multilayer** (Z-stack) scanning (optional)
- **Extended Focus** scanning (optional)
- 1D and 2D **barcode reading**
- **Scan method**: area scanning with autofocus.
- **Slide sensor to detecting the empty slide positions inside the loaded magazine**.

In the case of fluorescence upgrade

- **High-end fluorescent (FL)** illumination engine
- **9-tubes FL scanning** with 9 individuals, software-controlled FL filter tube positions
- **45-logical channel FL scanning** up to 45 individual, software-controlled FL channels
- **Multiband FL filter** support
- **Slide sensor to detecting the empty slide positions inside the loaded magazine**.

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Acceptable **slide format** (Pannoramic 250 FLASH III):

Slide	Cover slip
Length: 75.0 to 76.2 mm **Width:** 25.0 to 26.0 mm **Thickness:** 0.9 to 1.2 mm – 45° beveled or 90° corners – Grounded or cut edges – Recommended: Colored area for placement of barcode stickers	**Length:** max. 50 mm **Width:** max. 48 mm (recommended: 44 mm) **Thickness:** No. 1 and 1.5 (0.13 to 0.16 mm and 0.16 to 0.19 mm, respectively)

Detailed technical specification

Pannoramic 250 FLASH III

Dimensions (width x depth x height)	
Pannoramic 250 FLASH III Base Unit	approx. 680 mm x 690 mm x 550 mm
Pannoramic 250 FLASH III Control Unit	approx. 186 mm x 618 mm x 430 mm
1920x1200 Display (24”) (not included)	approx. 559 mm x 204 mm x 384 mm
Power supply Unit (24 V)	included in the P250 housing
Weight	
Pannoramic 250 FLASH III Base Unit	approx. 46 kg
Pannoramic 250 FLASH III Base Unit with fluorescent option	approx. 49 kg
Pannoramic 250 FLASH III Control Unit	
Display (24”) (not included)	approx. 20 kg
Power supply unit (24 V)	approx. 7,1 kg
	included in the P250 housing
Ambient conditions	
Transportation / Shipment (packed)	
Permissible ambient temperature	-40 °C to +70 °C
Storage	
Permissible ambient temperature	+0 °C to +60 °C
Permissible relative air humidity (non-condensing)	max. 75 % at 35 °C
Operation	
Permissible ambient temperature	+10 °C to +35 °C
Permissible relative air humidity	max. 75 % at 35 °C
Altitude of place of installation	max. 2000 m
Air pressure	500 hPa to 1060 hPa
Degree of pollution	2
Operating Data	
Category of operating environment	closed room facilities
Protection class	I
Degree of protection	IP 20
Electrical safety	Under IEC 61010-1-2010+AMD1:2016, IEC 61010-2-081:2015, IEC 61010-2-101:2015
Electromagnetic compatibility	IEC 61326-0-6:2012
Over-voltage category	II

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Radio interference suppression	under EN 55011 class B
Noise immunity	under DIN EN 61326
Base unit input voltage	24 V DC ±1 V
Power consumption of the complete device	Max 350 VA
Power Supply Unit (24 V)	
Category of operating environment	closed room facilities
Protection class	I
Degree of protection	IP 20
Input voltage	100 to 240 V AC
Input frequency	50 / 60 Hz
Power consumption	max. 50 VA
Secondary voltage	24 V DC
Secondary current	max. 3 A
Fusing	2 x T 3,15 A / H, 250 V, 5 x 20 mm
Light sources	
Transmitted light operation	Precision-Aligned Pulsed Xenon Light Source
Average service life of light source	1 x 10^9 flashes
For Fluorescence upgrade:	
RGB fluorescent light source (**option 1**)	Lumencor SOLA SM II solid state light engine
Spectral bands	350 – 680 nm
Power consumption of Lumencor SOLA SM II light engine	120 W
Average lifetime of Lumencor SOLA SM II light engine	> 20 000 h
Advanced fluorescent light source **(option 2)**	Lumencor SPECTRA 6 solid state light engines
Channel switching speed	~ 10 µs
Spectral bands	380 – 740 nm, NIR upon request
Power consumption of Lumencor Spectra 6 light engine	120 W
Average lifetime of Lumencor Spectra 6 light engine	> 20 000 h
	Lumencor SPECTRA III L light engine
Channel switching speed	8 solid state sources including LEDs, lasers, and
Spectral bands	proprietary luminescent light pipes
Power consumption of Lumencor Spectra 6 light engine	~ 10 µs
Average lifetime of Lumencor Spectra 6 light engine	6 special wavelengths 380 – 740 nm
	120 W
	> 20 000 h
Software	
In the case of DX version:	
Pannoramic 250 FLASH III Diagnostic Control Software	included by the Pannoramic 250 FLASH III System
Case Viewer – Digital Microscopy Software Application	included by the Pannoramic 250 FLASH III System
Slide capacity & loading	
Slide capacity	300 (12 magazines / 25 slides per magazine) or continuous loading
Slide loading	Automatic
Available objectives	
20x/0.8 NA	(1st objective, default)
40x/0.95 NA	(2nd objective, **optional**)

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Number of supported objectives	2 (dual)
Motorized objective changer	Yes, for 2 objectives

Identification of slides / Barcode reading

Identification of slides via preview camera (VRmC-8+ Pro): Storage of barcode area as image and interpretation of barcode label as character string; the following 1D and 2D barcode types can be interpreted:

1D barcodes:

- Code39 (ASCII encoding)
- Code128 (UCC/EAN128) (ASCII encoding)
- Code 16K
- Interleaved 2 of 5
- Standard 2 of 5
- IATA 2 of 5
- Matrix 2 of 5
- Telepen
- Code93 (ASCII encoding)
- Code 11
- MSI
- Codabar
- Patch Code
- Pharmacode
- EAN-13 (Numeric encoding)
- EAN-8 (Numeric encoding)
- UPC-A (Numeric encoding)
- UPC-E

2D barcodes:

- Aztec
- Data Matrix (Numeric encoding, Alpha encoding, AlphaNumericPunc encoding, AlphaNumeric encoding, ASCII encoding, IS08 encoding)
- Micro QR
- Maxicode (Encoding mode 2, 3, 4, 5, 6)
- MicroPDF417 (Standard encoding type)
- PDF417 (Standard encoding type)
- QR (QR code Model 1, 2 encoding)

Recognition of tissue area

Via the USB preview camera (VRmC-8+ Pro) with automatic threshold

Exclusion of cover glass	Automatic (in DX)
Remove of specks from digitization	User selectable (in RX)
Scan inside marker (selectable)	Only areas encircled by marker pen will be scanned
Multiple tissue areas selectable / recognized automated	Yes

Image digitization

12 MP high performance CMOS digital imaging camera for brightfield scan mode	Global Shutter CMOS
Pixel size	5.5 µm x 5.5 µm
	4096 x 3072 pixel

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Camera resolution	
Digital slide image resolution:	0.24 µm / 40x
Pixel resolution with 20x objective and C-mount adapter 1.6x	
Pixel resolution with 40x objective and C-mount adapter 1.6x	0.12 µm / 80x
Connection type	CoaXPress – 4 lanes
25 MP high performance CMOS digital imaging camera for brightfield scan mode	Global Shutter CMOS
Pixel size	2.5 µm x 2.5 µm
Camera resolution	5120 x 5120 pixel
Digital slide image resolution:	0.24 µm / 40x
Pixel resolution with 20x objective and C-mount adapter 1.6x	
Pixel resolution with 40x objective and C-mount adapter 1.6x	0.12 µm / 80x
Connection type	CoaXPress – 4 lanes
For fluorescence option:	
4.2 MP Scientific CMOS digital imaging camera (advanced FL camera) **(optional)**	13.3 x 13.3 mm monochrome sCMOS (CIS2020) sensor
Pixel size	6.5 µm x 6.5 µm
Sensor resolution	2048 x 2048 active pixel
Bit-depth	16 bit
Digital slide image resolution:	
Pixel resolution with 20x objective and C-mount adapter 1x	0.33 µm / 30x
Pixel resolution with 20x objective and C-mount adapter 1.6x	0.20 µm / 50x
Pixel resolution with 40x objective and C-mount adapter 1x	0.16 µm / 60x
Pixel resolution with 20x objective and C-mount adapter 1.6x	0.10 µm / 100x
Cooling	Peltier element with forced air
Connection	Dual CameraLink
4.2 MP Scientific CMOS Back Illumination digital imaging camera (advanced FL camera) **(optional)**	13.3 x 13.3 mm monochrome sCMOS (CIS2020) sensor
Pixel size	6.5 µm x 6.5 µm
Sensor resolution	2048 x 2048 active pixel
Bit-depth	16 bit
Digital slide image resolution:	
Pixel resolution with 20x objective and C-mount adapter 1x	0.33 µm / 30x
Pixel resolution with 40x objective and C-mount adapter 1x	0.16 µm / 60x
Cooling	Peltier element with forced air
Connection	USB 3.0
5 MP high performance CMOS digital imaging camera (advanced FL camera) **(optional)**	Global Shutter CMOS (Sony IMX250)
Pixel size	3.45 µm x 3.45 µm
Camera resolution	2448 x 2048 pixel
Digital slide image resolution:	
Pixel resolution with 20x objective and C-mount adapter 0.63x	0.27 µm / 40x
Pixel resolution with 20x objective and C-mount adapter 1x	0.17 µm / 60x
Pixel resolution with 40x objective and C-mount adapter	

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0.63x	0.14 µm / 75x
Pixel resolution with 40x objective and C-mount adapter 1x	
Connection type	0.09 µm / 110x
	USB 3.0
Scanning speed (brightfield, 20x objective, 15 mm x 15 mm)	
0.24 µm / pixel (40x) resolution	60 slides / hour
(1.6x camera adapter, 12 MP high perf. CMOS)	
Net Scan time / slide (0.24 µm / pixel)	30 sec
0.12 µm / pixel (80x) resolution	
(1.6x camera adapter, 12 MP high perf. CMOS)	40 slides / hour
Net Scan time / slide (0.12 µm / pixel)	75 sec
Control Unit and required system resources	
CPU	Intel Xeon Gold 6240 18 Cores / 36 Thread or similar
RAM	Min 256 GB
Hard Disk (SSD) for OS	256 GB SATA III
Hard Disk (HDD) for data	2x 1TB SATA III
Graphics Output	1x DVI (1920x1200), 2x DisplayPort (4096x2304)
Ports	4x USB 3.0
	6x USB 2.0
	10/100/1000 Ethernet
Input units	CameraLink
Operating System	keyboard, mouse
Zero Noise function	Windows 10 Pro (64)
System management	Intel® vPro™ technology, DeskView
Green technology	manageability suite
Features of the Diagnostic Scanner Software (DX)	
Digital slide properties	
Digital slide format	MRXS
Image type	.JPG,
Slide export	DICOM, MRXS,
Scanning mode	Brightfield only
Integrated Scanning system to Diagnostic product package	
Recognition of tissue area	
Via the USB preview camera (VRmC-8+ Pro) with automatic threshold	
Exclusion of cover glass	Automatic
Remove of specks from digitization	Automatic
Scan inside marker (selectable)	Only areas encircled by marker pen will be scanned
Multiple tissue areas selectable / recognized automated	Yes
Digital Slide Storage	
Scan to local network (Slide Server not included)	Yes
Scan to PANNORAMIC Information System's server (Slide Server not included)	Yes
Scan to local Hard Drive	Yes
Scanner features	
Fully automated scanning process	Yes

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Secured access to the DX scanner software	Yes
Multiple user levels	Yes
Easy to use scanning operation	Yes
Automated sample detection	Yes
Automated image quallity check	Yes
Automated rescanning process in the case of poor image quality	Yes
Priority scan	Yes
Multiple server handling during scanning operation	**Yes**
Automated image quallity check	**Yes**
Event History export to csv	Yes
Central Log Service server client connection. External control of the satet of the scanning process.	**Yes**
Multilayer Scan (Z-stack) (optional)	
Number of layers	1-30
Adjustable layer distance	0.2 µm - 2 µm
Flash Z stack scanning mode	**Yes**
Multiple Scanning mode	**Yes**
Multiple Color Profiles & Color Schemes	**Yes**
Image compensation	**Yes: 1 to 10**
Barcode parsing	
- Digital slide name	Yes
- Patient identification	Yes
- Scanning mode auto selection through LIS/PIS	Yes
Preview types	Brightfield

Fluorescent scan option with legacy scanner software or RX version	
Nr of recordable fluorescent channels	45
Fluorescent filter positions	9
Fluorescent filter selection	Automatic
Multiband filter support	Yes, in case of **„Advanced fluorescent light source"**
Software-aimed flat-field correction compensation method	Yes

Digital Slide Storage with RX scanner software	
Scan to local network (Slide Server not included)	Yes
Scan to cloud infrastructure (Slide Server not included)	Yes
Scan to local Hard Drive	Yes

Scanner features	
Scanning with selectable magnification	Yes
Scan progress indication on the preview image	Yes
Live image view	Yes
Show image during scanning	Yes
Auto focusing in live view mode	Yes
Manual focusing in live view mode	Yes
Navigation on the preview image	Yes
Selectable focus frequency	Yes
Adjustable image quality	Yes

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Multiple image encoding	Yes
Multilayer Scan (Z-stack) (optional)	**Yes**
Number of layers	1-30
Adjustable layer distance	0.2 µm - 2 µm
Extended Focus (sharpest image for each FOV) (optional)	**Yes**
Multiple Scanning profiles	**Yes**
Multiple Color Profiles & Color Schemes	**Yes: 1 to 5 + Custom**
Image compensation	Yes
Barcode parsing - Digital slide name - Output folder name - Scan profile auto selection	Yes
Scan Quality Control	Yes
Preview types	Brightfield, Fluorescent Prescan,
Event Call Handling	
External Application Call - Slide scan finished - Scan error occurred	Yes
Message Call - Slide scan finished - Slide scan stopped - Scan error occurred - Scanning warning	Yes

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