Loop-X

Mobile Imaging Robot

Loop-X™ is setting new standards in image guided surgery by introducing robotics to high-end intraoperative 2D and 3D imaging.

Features

- Lightweight, slim design
- 2D and 3D imaging capabilities
- High image and registration accuracy
- Robotic movement
  - Flexible adjustment in 6 axes
  - Automatic position storage with every image
  - Automatic positioning, guided by navigation*
- Positionable lasers for vertebral level finding, incision planning and definition of scan range
- Wide gantry clearance
- Gantry tilt
- Wireless control
- Battery powered maneuverability
- Collision prevention and detection measures
- Patient tailored, non-isocentric imaging*
- Continuous, flexible beam collimation to spare radiation sensitive tissue and optimize image quality by reducing scatter radiation*
- Predefined and customizable scan protocols (including pediatrics)
- Extra-large field of view*
- DICOM interface: storage and worklist
- Built-in DICOM Viewer
- Deep navigation integration
- Compatibility with Cirq®

*optional feature

Technical Specifications

Physical Specifications

Footprint, W x D x H	182 x 87 x 189 cm // 72" x 34" x 74"
Weight	520 kg // 1,146 lbs
Gantry Clearance	102 – 121 cm // 40" – 47"
Viewing Cart Required	No (available if desired*)
Power Requirements	230 V (±10 %), 50 / 60 Hz
	120 V (±10 %), 50 / 60 Hz
Internal Line Impedance	≤ 2 Ω for 230 V / ≤ 0.43 Ω for 120 V
Built-in Storage	5 TB HDD + 256 GB internal SSD

Robotics

Control Interface	Wireless control tablet & foot switch*
Mobility Linear Movement	Transverse, longitudinal, lateral
Movement Range: yaw / rotation	360°
Gantry Tilt	Up to +30° / -60° for 2D and 3D imaging
	(for navigated scans, tilting may be limited)

2D Imaging

2D Imaging Modes	
• Single Image	FOV (isocenter), L x Ø: 25 x 25 cm // 10" x 10"
• Fluoroscopy (pulsed & continuous)	FOV (isocenter), L x Ø: 25 x 25 cm // 10" x 10"
• Last Image Hold (LIH)	
• Cine Mode (recording of frames)	
• Snapshot Mode (immediate imaging)	
• 2D Extended	FOV (isocenter), L x Ø*: 25 x 25 – 60 cm // 10" x 10" – 24", stitched

3D Imaging

FOV 3D (ring center)	
• Large FOV, L x Ø	25 x 25 cm // 10" x 10"
• Extra-large FOV, L x Ø* (Dual Short Scan)	25 x 25 – 48 cm // 10" x 10" – 19"
• min. FOV, L x Ø	3 x 3 cm (stepless variable)

Imaging Characteristics

Spatial Resolution	up to 21 LP / cm
Pixel Pitch	150 µm (physically binned to 300 µm)
Matrix	up to 1.024^3 voxels, user selectable resolution
Voxel Size	down to 0.25 mm, adapted to FOV dimension

*optional feature

X-Ray Generator / Tube

Generator Type	IMD HF1 GMX-350/S2
Energy Range	40 – 120 kV
Current Range	0.2 – 8 mA continuous
	5 – 30 mA pulsed, small focal spot
	40 – 120[1] mA pulsed, large focal spot ([1] 2D acquisition)
Cooling System	Oil – passive
Pulse Length	2 – 35 ms (pulsed 12 Hz)
Anode Type	IAE RTM 780
Anode Angle	10°
Focal Spot Size	0.3 / 0.6 mm
Inherent Filtration (fixed)	4.4 mm Al eq. @ 75 kVp
Additional Filtration	Filter Wheel and Filter Carriage Inserts (motorized), Bow-Tie Filter with 0.3 – 3 mm Cu (optimized for pelvis) Filter settings optimized for specific patient weight and height including dedicated pediatrics settings

Collimator

Dynamic Collimation	4 independent jaws for asymmetric collimation

X-Ray Detector

Detector Type	Varex XRD4343RF
Scintillator	CsI (TI)
Panel Size	43.2 x 43.2 cm // 17" x 17"
Flat Panel Resolution	up to 2,880 x 2,880 pixels @ 150 µm

Ports

Interfaces	Ethernet (for navigation, hospital network, Wi-Fi extension) Power supply
Network (PACS)	IEEE 802.11n Wi-Fi-4 450 Mbps
Others	1 x HDMI 1 x USB 1 x USB-C on Remote Control Panel (+ additional hub to connect monitor and input devices)

Environmental Conditions (Operation)

Temperature Range	15° C – 32° C
Relative Humidity	30 % – 60 % (no condensation)
Air Pressure	800 – 1100 mbar
Peak Heat Output	250 W standby 1600 W during image acquisition